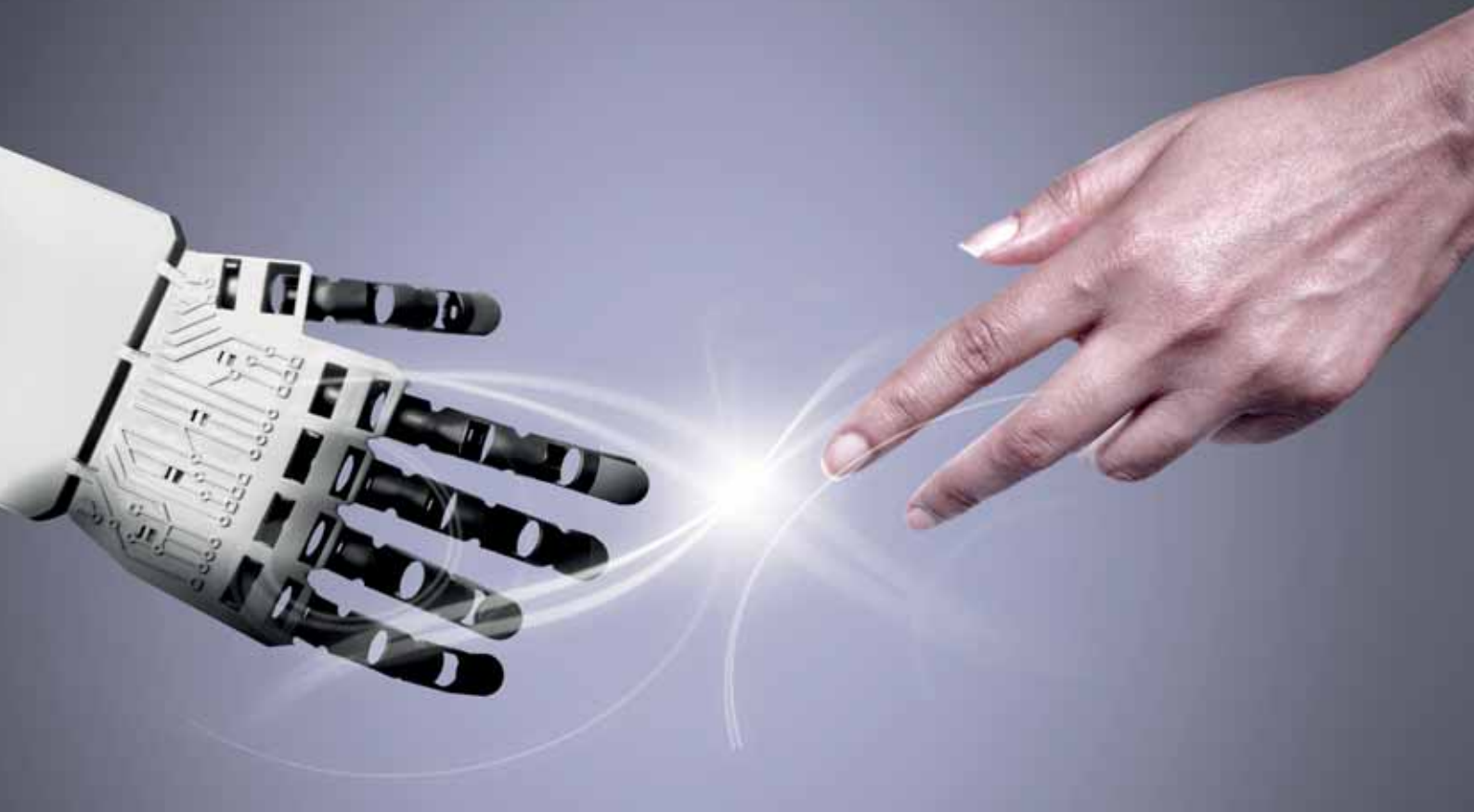




European
Commission

Opportunity now: Europe's mission to innovate



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For Marie-Christine

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Acknowledgements

This short report seeks to make sense, for European actors, of the needs, practices and insights of innovators around the world.

It is the fruit of a policy review, carried out at the request of the President of the European Commissionⁱ from within the European Political Strategy Centre (EPSC), his in-house think tank. I am grateful for this opportunity.

The report, also available as an EPSC Strategy Note, is published here with full notes and references, as well as a substantial set of illustrative articles. These articles explore key issues in greater depth or offer examples of pilot activities that are ripe to be scaled up across Europe. They have been produced for the most part by members of the cross-Commission Innovation Network that has supported the review over its ten month life. Some contributions have been offered by non-Commission authors. For all of their support I am most grateful.

Gaps and gaffes in all parts of this volume are down to me. Any value has flowed from many generous and frank supporters and stakeholders in Europe and beyond, of whom the list published here marks only the tip of an iceberg.

The report has been informed by very many outside contributions, both solicited and spontaneous, from many walks of life and many Member States as well from other continents. The quality and breadth of these contributions underlines, I feel, both a general recognition that innovation is critical to Europe's future and a willingness to see a truly European collective effort in what is a global innovation race.

I must single out the two institutions whose members' hospitality has made this year both fulfilling and feasible: Ann Mettler's European Political Strategy Centre and Lucas Kello's Cyber Studies Programme at the Department of Politics and International Relations in the University of Oxford.

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Etterbeek, June 2016

The mandate

In June 2015, President Juncker appointed Robert Madelin his senior innovation adviser, with the mission to:

- “...bring external trends, policies and issues to his attention and to the attention of the Commission at political and technical level...”;
- “...bring fresh thinking to the way in which the Commission develops and implements innovation policy to help overcome problems in bringing European ideas to market and adapting finance to innovative growth...”; and to
- “...report by June 2016 on ... how best to position Europe as a global pro-innovation actor... how to bring European ideas to market, what regulatory and policy framework can best support this and how more effectively to create deep and agile finance for innovative growth”.

Introduction

Europe has always been a world-leading inventorⁱⁱⁱ. We retain the core skills and deep science culture that have made this possible. In this century too, Europe can contribute a great share of the world's new tools, in genomics and biotech, in data and materials, in energy and nutrition, in propulsion and cognition, in health and well-being, both physical and mental.

It is not to be taken for granted that Europe will continue to fulfil its innovation mission. The future of innovation in Europe is less a theoretical or empirical question and more one of intent and principle. Do we choose politically to be innovators?

If Europe failed in its 21st century mission to innovate, the blame would lie not with the world but with ourselves. But if we choose to hold to the innovator's path, we can succeed: and in doing so, we shall innovate our way to social inclusion and sustainability as well as to productivity, growth and jobs.

This volume offers four key messages to European decision-makers eager to innovate but unclear on what is at stake or on the choices that confront them.

It's complicated... (Chapter 1)

Innovation works best if we all understand what is really going on. Innovation ecosystems have a complex life of their own. Too often, even if policy-makers really know better, we imagine innovation in a linear way, as a pipe-line with inputs and outputs.

The mythical pipeline exists, since science remains at the heart of much that is new. But where we focus only on the pipeline, we miss the real needs of Europe's more diverse and demand-driven innovation system. We must instead work from a more accurate map of the system. This implies more open collaboration, both globally and between citizens, governments and inventors at home.

Everyone must own the Revolution (Chapter 2)

The world is on the crest of a wave of revolutionary disruption. Europe can choose to own, not merely experience, this Revolution. Europe could also easily miss the wave, if we quite humanly ignore it, or exaggerate its challenge and freeze in impotence. Europe can catch the wave by drawing on our strengths as a mature community of values and an open society. But success requires the collective courage to open and sustain a different public conversation.

Focus on People, Places and Processes (Chapters 3-7)

Europe needs better assets. We have to get back to basics. Innovation is not all about money and research. Both matter hugely, and Europe must continue to work hard on both fronts. But they are not enough.

This means paying greater attention to three key foundation stones of innovation: upskilling Europe's people, using local strengths to underpin local innovation, and transforming public processes. We too often underplay these tasks as being beyond our competence or effective reach. But we need at least a complete, shared understanding of these key drivers of our innovative capacity. We need a common sense of mission to favour European innovation in our rules, and in our schools.

And the public sector must change faster. EU 1.0 cannot deliver Europe 2.0. The Commission can and must become a beacon for embedded innovation.

We can seize the opportunity now (Chapter 8)

It is time to make a fresh start. Feasible, fresh initiatives in the year ahead, joined up at local, national and EU level and pursued at scale, will bear fruit by the end of the decade. We need all innovation actors, the young as well as the historic incumbents and their older leaders, to co-create Europe's innovation road-map and build Europe's own future. This note offers examples of feasible action, but is a case for action, not yet an action plan.

1. Innovation: It's complicated... and complex

While a new idea is a thought about something new or unique, and making that idea real is an invention, innovation is an invention that has a socioeconomic effect. Innovation changes the way people live.

Wiebe Bijker

Innovation is anything new that changes the society adopting it. Innovation and creativity have always been intrinsic to being human^{iv}. Certainly innovation is essential to the ascent of man: wondering what would happen if we did things a bit differently, seeking easier solutions to life's challenges. In the last two years, humanity has embraced innovation more fully than ever before. Innovation is acknowledged as intrinsic to the achievement of the UN Global Goals, just as it is essential to the ten priorities of the current European Commission mandate.

Creativity & Design-Driven	Workplace & Employee Innovation	Public Sector Innovation	Social Innovation
Data-Driven Innovation	Technological R&D	Disruptive Innovation	Organisational Business Model Innovation
Open Innovation 2.0	Frugal Innovation	Responsible Innovation	Digital Innovation
Regulatory Innovation	Marketing Driven Innovation	Knowledge Base (non Rnd) Innovation	?

Source: European Commission

- **What is innovation?**

Innovation is often thought of as the adoption by everyone else of the inventions of scientists and technologists, whether in a disruptive 'entrepreneurial' context^v, by firm-led incremental improvement or in an integrated technocratic effort of the 'Entrepreneurial State'^{vi}. None of these models are outdated, and the State-led model has particular relevance in a century of long-term and massive challenges.

But innovation has always been even broader than that, and included new business models (Florentine banking) or social innovation (British Friendly Societies).

Today, as the 'friendly spin-offs' of open innovation and the makers' movements make a come-back, the sources and sauces of innovation have never been more varied: innovation is really complicated^{vii}.

Innovation is also more complex than ever. Complexity, chaos and non-linearity have been seen since the 1970s as the defining features of our age^{viii}. But still our advanced societies find it hard to make robust policy for a complex innovation system.

A complex system is a place where:

- no one can have a complete map of the actors and forces at play,
- the system's behaviour is not simply the sum of the behaviour of those parts,
- feedback loops surprise us and change the behaviour of the system,
- the system is "autopoietic": behaving in a self-driven way and not just in ways we have yet to understand^{ix}.

EU innovation policy acknowledges this complexity. As the Innovation Union strategy^x already made clear, sound policy for innovation will look at organic and porous systems, and fluid activities within them, rather than at a closed network. But policy is theory. EU and EU Member States acknowledge that their practice mostly side-steps the complex reality^{xi}. We tend too much to work as if innovation were supplied through a pipeline, where upstream research delivers innovation in the market-place.

The pipeline theory is too simple^{xii} and leads to policy over-simplification: we look at measurable supply inputs and the intermediate outputs of publications and patents, with no systematic accounting for demand, adoption or real-world outcomes. This is not a solely European dilemma. But if Europe can begin to correct it, we shall do better in the innovation stakes.

In reality, our innovation economy is not a Roman aqueduct but a "muddy pond". Rich but obscure. Innovation requires of all actors, corporate, academic, civic and political, the instinct of the hunter-gatherer, not the farmer; a longer and broader view of needs and opportunities; an enterprising portfolio of risk-taking in place of fixed plans; a culture encouraging the rebellious over the blindly loyal^{xiii}.

None of this means that Europe could discount established innovation pathways. Almost two-thirds of US innovation, for example, comes from companies employing over 500 employees^{xiv}. Europe still needs a share of that: strong EU-based and EU-invested corporates moving from new to big ideas, and from big to global scale.



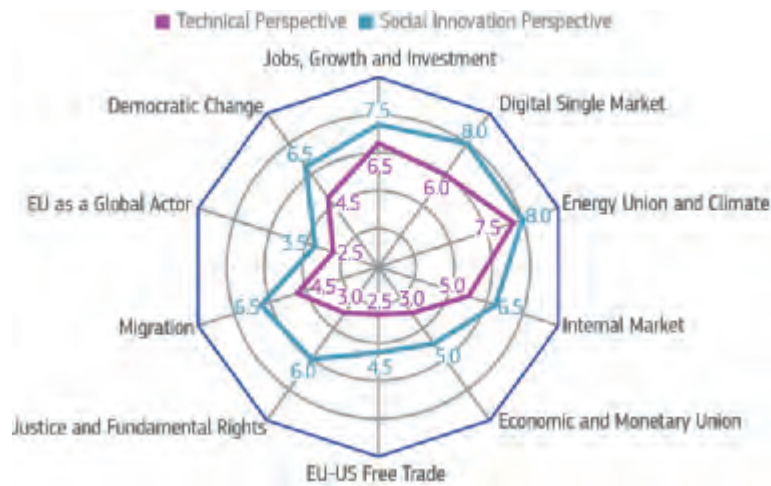
Source: [N. Colin – The Family](#)

Big public science projects, such as the Flagship on the Human Brain^{xv}, remain essential. Europe needs increased, not diminished support in schools for Science and Technology, but also for the Arts. We need big spending, public as well as private, on science and data infrastructure, also on skills in the tertiary and business sectors.

- ***Defining an Innovation Mission for Europe***

Europe needs a distinct Innovation Mission, separate from but not instead of its research policy. That Mission will best succeed if it has four key planks:

- Broad political and societal ownership of an innovation mission designed to deliver for productivity, growth, jobs, social inclusion and sustainability.
- Concerted cooperation, with full mutual accountability, rather than an innovation theatre of well-meaning discourse followed by institutionally weak, slow and variable follow-up^{xvi}.
- A foundation of priority investment in core assets: individual people, local centres of excellence, European public administration.
- More focus on cross-continental scaling by and between innovators, who themselves work off more granular local plans, rooted in local strengths and needs.



Source: European Commission

And what are the essential parameters that the innovation mission must respect?

- Everyone has their own take. Here are the key ideas found in the writings of many of the leading observers^{xvii}:
- Innovation is more than science and technology. Social, demand- and needs-driven innovation matter more than ever. Organisational, service and business models are innovative, too.
- Innovation spirit cannot be faked. Innovators have a right to expect authentically innovative public institutions.
- Public effort must cover the full range of innovation preconditions facing market failure in Europe: human capital formation, science, entrepreneurial environment, patient public capital, intermediary enablers.
- Europe's response to this opportunity must intentionally target outcomes that help everyone; and must confidently reach across constitutional hurdles in order to create pragmatic alliances for action that link up the different layers of responsibility from local to trans-continental.
- Everyone is an innovator now, and needs the chance to join the system. Science and responsible innovation start from open-ness and engagement with everyone. People and organisations with a stake in all sorts of innovation must be systematically involved in policy-making.
- Everyone needs the skills to play: entrepreneurial creativity and positive risk-taking, broad arts and science learning, hands-on experimentation with real-life problems.
- Innovation requires, at EU and lower levels, both places for "contamination" and more widespread "pollinators", "enablers" or intermediary actors: to make sure that potential partners find each other and learn more promptly and often from each other's successes and failures.
- Future opportunities will come in the space between the product and the consumer^{xviii}: "prosumers" will co-design services based on new data insights^{xix}. People and organisations with a stake in all sorts of innovation must be systematically involved in policy-making.
- Digital tools change all previous assumptions about the thresholds and perimeters for successful new endeavours. So we underperform if we focus only on incremental change. Europe must make a portfolio of higher-risk bets in support of speculative and even disruptive insights; must watch the radar screen for innovation promise emerging out of more academic work, and must be ready with the tools to help investigators become innovators, creating marketable Intellectual Property from the research and finding a market for it, in Europe^{xx}.

- Policies cannot be optimised for just one sort of innovation Digital is far from being everything. For bio-innovation, timescales, infrastructure and cash needs are still orders of magnitude greater than for IT. Social innovators have another different set of needs.
- Young, often immaterial, high-growth companies are here to stay^{xxi}. They need public support and attention in their own right, not as part of the too-diverse category of "SMEs". The success of Europe in high-growth start-ups will also depend on established firms learning to partner with them. This is VERY hard for incumbents^{xxii}.
- Innovation is a global opportunity: ideas, capital and individuals have choices and will exit or by-pass hostile, as well as enter supportive, jurisdictions.

The remainder of this chapter outlines the last point: open approaches to innovation.

- **Open Governance**

In the century of complex systems, competitive advantage will accrue to communities and jurisdictions able to adapt to unpredictable developments. Mechanistic, predict-and-control logic will systematically fail in a complex system: it will omit new actors, fail to account for feedback loops and overestimate linear returns to effort. Such approaches already impose increasing opportunity costs and increasing downside risks on European society and enterprise: their under-performance erodes both economic opportunity and government legitimacy.

A systems approach will help administrations to map more subtly what is going on. Then we will be more modest in action, will favour the experimental, but also be more attentive to change, faster in response and readier for repeated fine-tuning^{xxiii}. Modesty is the key. Where power and knowledge are evolving and widely distributed, governments who want to succeed must operate in a more cooperative and open manner^{xxiv}. And the choice of tools must favour participation in place of control, self-organisation rather than centralisation^{xxv}.



The systems approach is no recipe for *laissez faire*: Europe still needs detailed and clear definitions of which authorities are in charge where, and how they cooperate across frontiers. A systems approach typically requires more attention to the maintenance of a strong and open network between all actors. Systems also depend on the long-established fundamental duties of government: to be coherent and to respect legal deadlines for action...

- ***Open Innovation***

A more open approach matters for innovators as much as for government.

Traditionally, innovation has taken place in centralised, closed and inward-looking elite circles.

Now, Open Innovation 2.0 (OI2.0) is more and more outwardly focussed and collaborative. Innovation can be open but still hierarchically owned and managed (an innovation "mall") or open and flat (an innovation "community"). Central to success is a shared search for shared value. The OI model may not work in all cases, since to hit the shared value target requires quite challenging changes in hitherto top-down and elitist practices in technology and innovation.

Europe is lucky in having OI2.0 communities of practice within which game-changing experiments continue to multiply, at EU and at national level, as well as in cities and regions. In Luxembourg, for example, various public and private partners cooperate on a focused set of initiatives: a lean start-up support program, the use of design and user experience methodologies in the public sector, and the launch of a policy innovation lab for the Ministry of Public Affairs. And Europe is probably leading the world in social innovation: in private experimentation,^{xxvi} in civic cooperative approaches^{xxvii} and in public funding for Digital Social Innovation.^{xxviii}

- ***Global Cooperation***

Innovation in the Internet age is planetary. Value chains are becoming steadily more inter-regional^{xxix}. Protectionist or restrictive walls can be built only at disproportionate economic - and moral - cost. In an open world economy where every country and every 'sector' inter-connects, poor policy on one issue drags down EU competitiveness in everything else, just as a set of mutually reinforcing positive policies can multiply the overall impact of each small breakthrough. No issue is an island^{xxx}.

To innovate, Europe must nurture home-grown talent but also welcome all possible ideas, entrepreneurial know-how and capital, whatever their origin and whatever their affiliation. The basic conditions of doing business (product regulation, employment law, corporate tax) are key determinants of the location of high-value investment^{xxxi}.

Innovative open-ness is a European value, because Europe is arguably THE planetary continent. We have suffered periods of patchy introversion: but (so far) nothing as deep or lasting as in Asia or America. Created by historically international nation states, the European Union is, by design and practice, the indispensable partner of global interdependence and cooperation^{xxxii}. Europe preserves its ways of life by sustained participation in global cooperation and global institutions.

Seen in this light, Europeans have a huge stake as innovators in preserving sound shared rules^{xxxiii}. Rules for trade, investment, IPR, but also for taxation, sustainable development and the regulation of the new. European companies and investors world-wide want more, and more positive, regulatory cooperation between governments and global innovation leaders^{xxxiv}. Europe's innovative bankers dream of a G20 for FinTech regulators to allow faster and more secure global-scale rollout of innovation^{xxxv}. Europe is, with China, a cheer-leader for the reconfiguration of financial accounting. Indeed, this is just one point on which the China chair of G20 offers an opening to broaden communication with Beijing across the whole set of global economic policy themes.

Immigration policy itself, however contentious, has a strong innovation impact.

New people are overwhelmingly the source of new ideas^{xxxvi}. More than one-third of innovators in the US were born elsewhere (a group that accounts for only 13% of the population!). Similar figures are reported by European campus incubators. But if the internationally mobile are an asset, too many go to the US, Canada and Australia than come to Europe. The European Research Council has played a sterling role in attracting and retaining top researchers. But more generally, EU fears and a fortress mentality can only increase our handicap in attracting and retaining global innovators. This requires just as much attention as the development of fresh employment opportunities at home.

Europe must also attract fresh foreign companies and capital. On the start-up scene, Europe has 4 of the top 20 world ecosystems, they are among the fastest growing, and (as in US and Asia) they increasingly attract foreign capital to investment rounds and global citizens to the start-ups funded^{xxxvii}. Recent initiatives, by StartUpEurope^{xxxviii} as well as national networks, to hold road-shows in other continents seem promising ways to learn globally and attract back both talent and cash. Global economic diplomacy has never been so important.

2. Owning the Revolution

The more we think about how to harvest the technology revolution, the more we will ... have an opportunity to shape the revolution in a manner that improves the state of the world.

Klaus Schwab

Europe's innovation mission coincides with a momentous global cycle of disruption. Whether we call this the Fourth Industrial Revolution^{xxxix} or the Fifth Human Revolution,^{xl} that makes for challenging times.

- ***A shared vision of our innovative future***



Source: European Commission

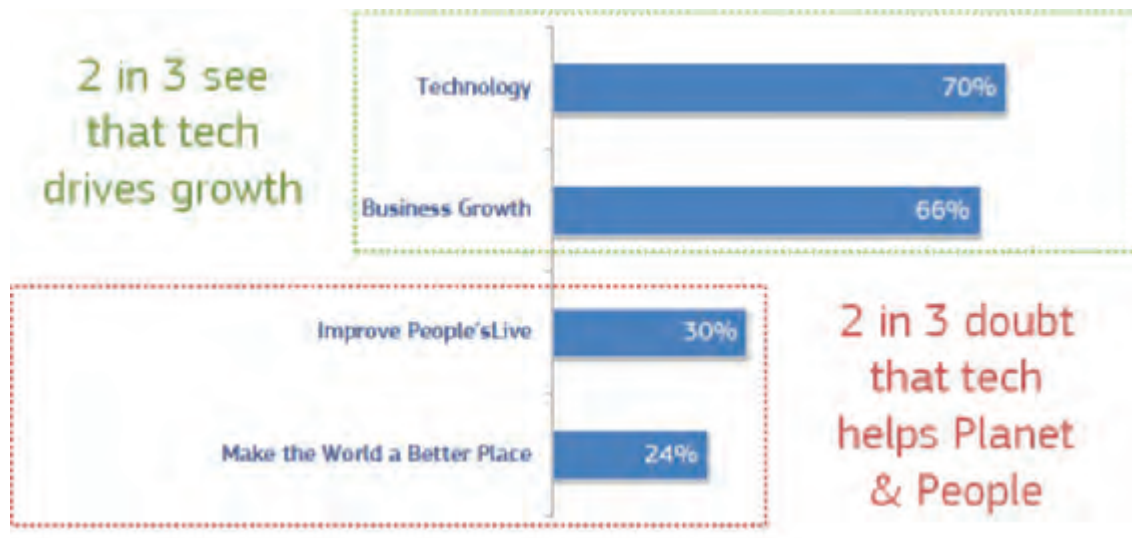
To navigate the challenges and create our own opportunity, we need clear, high-level EU goals for the outcomes we want from the Revolution: outcomes in productivity, growth and jobs, but also in social inclusion and sustainability^{xli}. We need to look at these big issues together because their success depends on our ability to innovate: innovation changes trade-offs and allows sustainable development where business as usual cannot.

This common frame of vision^{xlii} is essential if Europe is to embrace innovation and if member states and citizens are to be both willing and able to innovate^{xliii}. This holds good:

- for political legitimacy reasons: it is only if all citizens and workers, in all regions, social situations and sectors, have good reasons to believe that they are actively involved in the shaping of an innovation policy, and that its risks, benefits and costs are fairly shared, that they will support it
- for efficiency reasons: innovation increasingly relies on cooperation. It is only if all partners in the cooperation have good reasons to believe that (again) its risks, benefits and costs are fairly shared, that they will engage in this cooperation.

With shared goals, Europe can look beyond the fires close to hand, and embrace the future without needing to predict and control it, precisely because we have made a self-confident commitment to a future that we want and believe to be feasible.

World-wide, and not particularly in Europe, we have some way to go before public opinion has this confidence and enthusiasm^{xliv}. Most global influential citizens agree that innovation will boost growth. But at the same time, most feel that the world is moving uncomfortably fast, and only 1 in 3 expect systematic alignment between innovation and their individual and family needs, or between innovation and a sustainable planetary future.



Source: [2015 Edelman Trust Barometer](#)

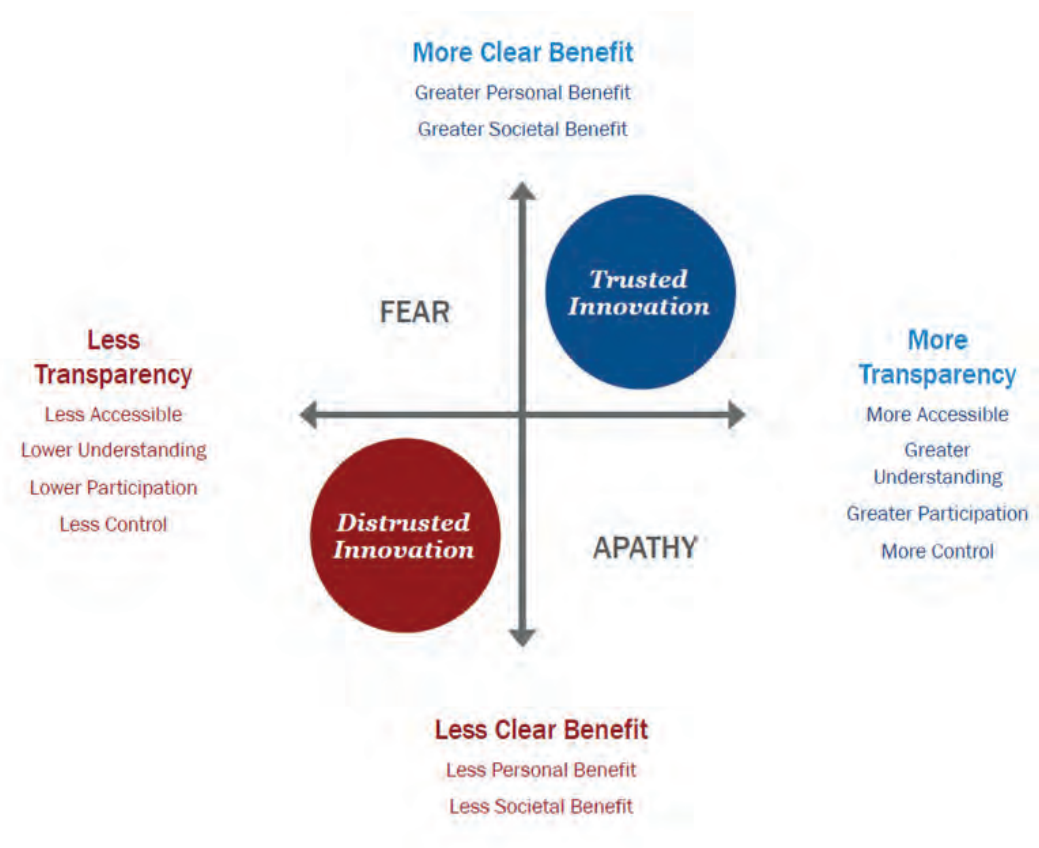
EU-specific surveys^{xlv} as well as national data^{xlvi} largely disprove the myth of overwhelming innovation scepticism in European public opinion. People still love to understand and to try out the new, as long as they do not suspect it is foisted upon them without upstream engagement. The same surveys show that EU public opinion positively wants innovation to contribute: on health, education, energy, transport, growth and inter-generational equity.

So an innovation mission that delivers on these broader challenges will be well aligned with the EU vision of its future. And there is good recent evidence that this alignment is achievable:

- The UN Global Goals^{xlvii} are rooted in the realisation that sustainable and inclusive futures for the planet depend on innovation-driven change,
- The UNEP Inquiry^{xlviii} points the way to re-integrate in our financial system the long-term needs of the global economy,
- The OECD beyond GDP^{xlix} and Integrated Reporting^l movements offer holistic metrics,
- There is in Europe wide social support for a positive innovation, defined^{li} by European industrial labour unions – "innovation by all and for all" – and supported jointly by EU labour and management^{lii},
- The corporate social contribution is increasingly recognised, both in global surveys^{liii} and in EU policy,
- The concepts of Open Science and Responsible Innovation^{liv} offer a blueprint for improving public science.

- ***Taking part in our future***

To build and maintain a more holistic and positive innovation vision will require the greater involvement of everyone. But where do we involve them? Participation is a foundation for trust, and we know how to do it. For example, there is a proven tool-box for science-to-citizen engagement, although it is not yet widely enough deployed^{iv}.



Source: 2015 [Edelman Trust Barometer](#)

Open structures to prioritise innovation can be created within each political institution:

- All Parliaments (like Poland's...) need a standing innovation committee,
- All executives (like Sweden's, or Switzerland's), need a top-level council for innovation to map and voice the evolving to-do list,
- All would benefit from something like Denmark's Board of Technology, which both socialises science and brings society's needs into focus for investigators and tool-makers.
- Participative policy-making^{vi}, as piloted with great success by Dialogik or UK Open Policy Making, will link these institutions to broader networks, including "museums of the future", such as those hosted by ArsElectronica in Linz or at La Villette.
- At EU level, an initiative to pilot, as widely discussed, a European Innovation Council can be designed to involve everyone with a stake in innovation: today, there is an innovation void in EU policy debate, even if more established players enjoy plenty of voice and access.
- It is equally important that innovators be present in assessing rule-making, from the Regulatory Scrutiny Board down.

Within public administrations, too, a more participative and coherent network of actors is badly needed. Innovation is too much addressed through parallel instrument-led activities.

In some administrations, such as that of New Zealand^{lvii}, broader policy commands draw under one lead the range of innovation-driving policies, from innovation and science as such to markets, housing and labour law.

In Europe, we need equivalent coherence within a different and larger structure. One initiative would be to create innovation task forces driving greater innovation across departments of the Commission, and in the parallel structures of the Parliament, Council, Economic and Social Committee and Committee of Regions. Already, the ad hoc network that underpinned the writing of this report revealed lots of energy and ideas, buried behind vertical siloes and under excessive top-down control. As one core mission, such networks could share insights and build synergy both within and between institutions. They would also offer a better knowledge network for similar national and local actors.

Across all institutions, the most urgent need is to break down barriers between and within programmes and institutions, to de-silo. To take a single example, EIT networks, the H2020 Policy Support Framework for national research, Joint Research Centre expert analysis and the Smart Specialisation process are all useful, but proceed too often on parallel tracks. Bringing them together would significantly improve policy impact and financial efficiency. In this area, the recently launched INPACT^{lviii} gives a great new platform on which not only volunteer actors but also the EU institutions should now come together. And closer to the Council, the High Level Group on Innovation Policy continues since the Polish Presidency to do good work.

- ***Planning together for future challenges***

The creation of a more coherent vision and of a more coherent conversation does not imply that the impact of innovation can be all good and smooth. Innovation provides tools and it is the way they are used that produces good or bad outcomes. Change itself means effort for all and at least short-term losses for some.

So shared ownership of the innovation revolution does not require the EU to swallow whole all that is new. But it requires us to resist zero-risk goals or the avoidance of all hazard. It requires instead a deeper and earlier effort to master the trickier aspects of technology-driven societal change. We cannot simply predict that the robots or the gig economy will eat our jobs, and then make rules about that alleged danger. We need to set ourselves the harder task of planning to benefit from the best of new manufacturing and service technologies, while maintaining decent income for decent employment and a life-long funded social safety net^{lix}.

The reconciliation of the current revolution with our values and goals will often depend on a reframing of the debate to look more widely and further ahead. It may well also require regulatory innovation. For example:

- Distributed Ledger Technology can enable the frictionless management of contract, payment, tax and social security settlement for as little as an hour's work in the gig economy^{lx},
- Household or individual basic income, and life-time social budgets for the education, health and skills of each citizen, mediated through similar technology networks, may then be feasible as the key to a welfare society in the Internet age^{lxi},

This broader policy debate will not just respond to public concerns as to the future of the European way of life. It is an agenda that is essential to preserve Europe's productive potential. Social inequality in Europe needs attention not just because it avoidably shortens the healthy lives of innocent fellow citizens^{lxii}. Inequality also, in fresh OECD analysis^{lxiii},

seriously hampers economic growth: with a modest increase in inequality over two decades costing a range of European economies between 2 and 3 points of cumulative GDP.

On this assessment, Europe can best own the innovation revolution by reaffirming the social pillar of Europe's priorities as part and parcel of the open market economy. That broad vision is the key enabler for trust. Because Europeans have nothing in principle against innovation, and flock to its excitement and its benefits, but seek increased clarity that innovation is part of a good future for their families and themselves.

3. People, Place and Process

The ascent of man has never in history come to a stop. But the ascent of the young, the ascent of the talented, the ascent of the imaginative: that has become very halting at many times.

J. Bronowski

If Europeans want to share and win the broader benefits of innovation, what should be the new policy mix?

Too much innovation discourse focuses on the volume of research, the quality of funding processes, or the substance of IPR. Such factors matter hugely. They are the heart of public science and are rightly still core business. They are subject to rich ongoing discussion and action, and remain key drivers for breakthrough science and high-tech business.

Even so, meeting the science and funding challenges is not a sufficient condition today for innovation success. Chapters 3, 4 and 5 make the case for dramatically more ambitious, European-level attention to three underweight fields: human capital, geography and public institutions. Chapters 6 and 7 deal with research design and finance.

- ***It's about People***

For Europe to flourish in the present age, we must focus more attention on all those individuals who make their lives in the EU^{lxiv}. Europe no longer enjoys the old monopolies of know-how and technology or dominates the ownership of planetary resources. Europeans have yet to fully internalize what this means for Europe's choices. In the decades ahead, like South Korea 60 years ago, Europe will flourish and thrive only by the relentless development of creative people. Europe has no other asset.

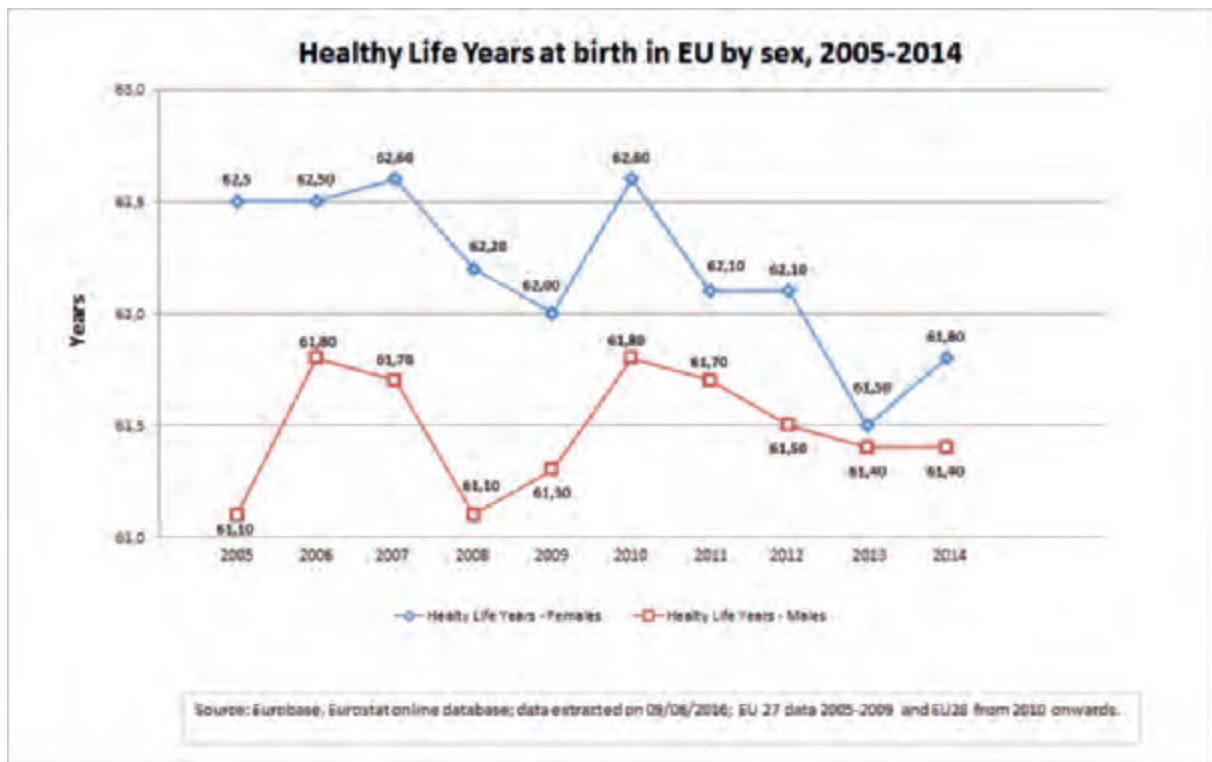
Most EU citizens are complacent about the state of Europe's human assets. Our collective health, education and skills all deserve higher investment, greater public policy attention and effort. To be resourceful and effective in the 21st century, every individual must be nurtured, in mind and body, in know-how and creativity.

- ***Health***

We focus on curing the sick but do not do enough to support good mental as well as physical health.

In cognitive and emotional wellness, the European Brain Council's Year of the Brain^{lxv} remade the positive case for investing in brain well-being. This is a goal that covers the full gamut of innovation, from genomics^{lxvi} and high-throughput neurological databases to web-based virtual reality support for psychotherapy. Yet these issues of stigma are woefully underfunded.

Physically, too, we can feel proud about average overall longevity, but we should not ignore the stagnation and in many places marginal decline in the share of our lives spent in good health (Healthy Life Years). This state of affairs implies both avoidable illness for fellow-citizens and a work-force shrunken by impaired physical mobility and an unduly early end of productive activity.



Fortunately for labour competitiveness, there is new scope for innovative answers to public health. The new opportunity comes from sticky and fun mobile health applications for health promotion, as well as from online systems for diagnosis, treatment and support of patients. The new age of health-promoting innovation is driven by the over-the-counter demand of individuals, by health systems, but also by enlightened employers, such as BASF. To make sense, the new tools need to be managed for shared benefits across the existing public, private, health and social service siloes, and not only by curative health professionals and state payers.

This public health and over-the-counter innovation boom is in full synergy with the digital transformation of curative health services, the data-driven boom in medical discovery and testing, and the coming age of genomic medicine, with for example the deployment of genomic discovery to accelerate both diagnosis and cure of rare and hitherto intractable disease^{lxvii}, or the timely and cost-effective creation of made-to-measure, genuinely personal immuno-oncology solutions. We need an approach to health innovation that links all these opportunities together. We need big bets in public-private partnership on innovative medicines. But we should not leave it all to the curative blockbusters. The Health Community coming together under the European Institute of Innovation and Technology (EIT) is well placed to develop the missing relationships.

- ***Education and skills***

In an age of innovation, and an age of ageing, we need every resident, every citizen, to get the best chance in life and to receive special help if they face special difficulty, not only at school but over their whole life. This is good for individuals but also essential for society. With increasing evidence and certainty, we know that we must nurture both mind and body. We know that individual nurturing from conception to kindergarten matters more than anything and from kindergarten to the teens more than the rest of life.



Source: [BT plc](#)

Again, our results are poor^{lxviii}. While Korea, for example, keeps functional innumeracy down to 5% of its adult population, EU Member State numbers range from 15 to 25%. EU skills too often improve neither between generations nor (unlike US) over working life. Some Asian and Nordic school-leavers are more skilled than the university graduates of other EU countries. This state of affairs is not only morally dubious in an inclusive knowledge society but strategically self-harming. Erasmus+, and Europe 2020 targets to reduce early school-leaving and boost tertiary education are all very well, but miss the deeper drivers of this sad state of affairs.

Without imagining any top-down or one-size solution, Europe does need a serious, shared policy push in this field. We already have, within the OECD, clear good practice recommendations. We have, within the EU, world-class early years teaching, which Asian or African countries are picking up, but which neighbouring Member States resist as being impossible to transplant between cultures^{lxix}. We should join and share.

Our collective push has to start young: 5 million children begin primary school this year in the EU. We have a long decade within which to improve their life chances beyond the mixed experience of the school-leavers of 2016.

Life-long learning and the skills agenda is an acknowledged Top Ten priority. There is an emerging cluster of specifications for a no-regrets skills policy:

- As artificial intelligence and robotics help with ever more tasks, the impact on each individual's work will clearly be big^{lxx}, but precise patterns and timetables for change remain unclear.
- We must all use all of our talents throughout life: both sides of the brain and also our hands: this is not 'un-academic' but human, and essential to create innovators. It requires the re-weighting of life towards life-long arts and creativity as well as technical thinking, adaptive learning skills, emotional as well as cognitive intelligence^{lxxi}.

- The young need local heroes, from whom they can grasp the ethical as well as practical realities of a fast-changing world. Teachers cannot alone or in a closed class-room convey the excitement of the revolution outside, or the ethical values that will help Europe succeed^{lxxii}.
- Adolescents must have school-years and young professional exposure^{lxxiii} that gets them closer to the real world: this is about experience and not only apprenticeships.
- We must work harder on inclusion, so that double-digit shortfalls in functional skills are no longer acceptable.

We can build this broader campaign on foundations already laid with the Grand Coalition for Digital Jobs^{lxxiv}, and that is indeed the message of the New Skills Agenda for Europe. But we need to expand this strategy into a wider and more coherent set of actions from early childhood to adult education.

Launched with top-level support in 2013, the Coalition is grass roots in intent. It offers a distributed model for matching individual skills portfolios with employer needs, across specific locations, with learning opportunities, EU-supported but locally made. The coalition is a going concern with national networks in half the Member States. It has broken old siloes between skills actors, especially between government, education and business. It has proved that there is huge unmet demand for such training, that at least 40% of that demand is from girls and women, and that the employment opportunities following training are real. Now is a good time to go to scale. The coalition can grow faster if we create Internet-age support tools, using real-time labour market data and data analytics to better map needs and gaps^{lxxv}. But broader cooperation and sustained impetus will be key to success.

But the coalition alone may not be enough to redesign an educational system for Europe that creates innovative potential as the core asset on which future prosperity depends.

Dedicated approaches to early childhood innovation thinking, earlier and more consistent exposure to experimental and creative problem solving, as well as measures to prepare an aging workforce to adapt, are widely acknowledged but have proven difficult to scale.

A renewed commitment to an impact agenda for innovation-oriented education is a no-regrets investment for Europe – the opportunity cost is likely unaffordable.

4. Location

The fundamental reality of any civilization must be its geographical cradle. Civilizations are regions which both confine man and undergo constant change through its efforts.

Fernand Braudel

Internationalist and globaphobe alike too often think that Global Value Chains have reduced the world economy to homogenised soup. They are wrong^{lxxvi}. Not even the EU Single Market always responds to a one-size-fits-all policy. Indeed, with a Union of 28 and rising, the range of our diversity has hugely increased. Europe needs deeper reflection as to how to combine loyalty to local reality with strong bridges to carry local success to continental and global scale.

Innovation very much still depends on location. There is plenty of scope for place-based public policy. Evidence from Europe confirms that Druckerian clusters remain a source of advantage, and that distance between assets or actors is often still a relative handicap. It is rare to see effective cooperation span 50 kilometres. Indeed, in the UK, Switzerland and elsewhere, we see world class innovators moving their teams over distances as little as 10 kilometres to be on-site, so great is the premium of absolute colocation over mere proximity^{lxxvii}.

- **Smart Specialisation**

This is why the insights of Smart Specialisation^{lxxviii} are crucial, and why it makes sense to define innovation goals at regional level. Smart Specialisation's open and multi-stakeholder discovery process changes mind-sets. Instead of every region going silicon, trying to match global excellence in disciplines in which they have no track record, each region can identify home-grown strengths, talents and needs, then buy in new-to-region innovations, boost local growth, meet local challenges, and only maybe thereafter seek to home-grow new talents.

Identifying smarter goals for a given region is only a beginning. Once we have better goals and a wider group of stakeholders focussed on them, there remains the non-trivial task of using the broadened network to deliver the plan and to reshape the key local innovation institutions, be that the university or something else.

Progress so far in smart specialisation suggests that most regions apply the new approach too gently: they find it hard to create a risk-taking culture on the public side, hard to involve users and business, hard to give space for social innovation. Regions that embrace smart specialisation as a transformational opportunity and not just a transactional game, can overcome these challenges over a few cycles. Persistence is the key.

There can be no one-size blueprint for this sustained local change agenda^{lxxix}. But smart specialisation across the EU does require some key new actions:

- A clear policy of support for Regional Technology Organisations (RTOs) as key enablers within and between local ecosystems, and a clearer permission for each RTO to operate across all Member States,

- A stronger commitment by managers of EU structural and investment funds to use the 15% spending allowed "out of area" in order to bring in expertise, for example from leading RTOs or from excellent universities elsewhere in EU,
- A systematic search by innovative cities for cross-border cooperation with innovators elsewhere, exemplified by the Pact of Amsterdam^{lxxx} and its overdue EU Urban agenda,
- The multiplication of multi-regional partnerships on the lines of the excellent Vanguard Initiative^{lxxx} so that success to date in joint cross-region piloting of innovation can be expanded to pre-commercial procurement and scaling.

The European Institute of Innovation and Technology (EIT)^{lxxxii} is an as yet under-valued asset. Its business-education-research networks have begun a pioneering journey on unknown paths of cooperation. The journey has not all been easy, but the next steps are fairly clear: EIT can cut a lot of red tape by using to the full the derogations available under its current legal framework. New Knowledge and Innovation Communities (KICs) can accelerate progress by learning from the pioneers. If EIT can also maintain independence from old incumbent actors and centralising politics, stretch its currently too selective networks across the whole of the EU and become more joined up with research and society, it will offer a really effective intermediary for innovators across all Member States. EIT also deserves to be more fully integrated in EU policy debate, invited into Public-Private Partnerships and other technology networks under Horizon 2020 (H2020) and used as a privileged source of evaluation for innovative research and investment.

- ***Extension***

Smart Specialisation and smarter institutional architecture will both favour greater innovation. But perhaps surprisingly, the biggest and fastest returns to effort will come from introducing innovation that is not new to the world, but is new to the region, city or firm.

Europe needs to do more for the systematic 'extension' of each given innovative solution to every region and sector where it can bear fruit. The roots of public intervention in support of innovation lie in nineteenth-century Europe, as well as in the American mid-West, where agricultural extension schemes brought best practice to the farm faster than would otherwise have been the case. US advanced manufacturing still benefits from this sort of public-private partnership: granular, painstaking and effective.

Similar efforts in Europe have had startlingly big and rapid pay-offs. Irish small firms received a grant of up to 2500€ or 50% of costs for a change project to 'get on-line'. This small bet inspired companies who may previously have been under-informed or under-confident to try new tools. Within a year, 60% of beneficiaries had ventured for the first time into export sales, turn-over was up 20% and new jobs had been created^{lxxxiii}.

There are many needs in many sectors for the sort of help that Ireland has piloted. In advanced manufacturing technology, where the US has a government-led extension partnership, EU suffers an uptake gap between large firms (75+% using best-in-class kit) and medium firms (65% not using the kit). Digital Innovation Hubs^{lxxxiv} under the Digital Single Market can be part of the answer to this sort of under-performance. Impact Hubs^{lxxxv} already help social enterprises scale in Europe. Foundations such as Access^{lxxxvi} or Bertelsmann help to ready charities and social start-ups for capital investment and scaling. But as for the Grand Coalition, a joined up effort between all countries and regions is needed to meet EU-wide need effectively on these fronts.

- ***Universities as Entrepreneurial Ecosystems***

The university must do more than teach and investigate^{lxxxvii}. Today's innovative university is the key to regional innovative success.

Those responsible for Europe's tertiary assets strive to improve under difficult circumstances. But too often, universities behave as if they were "communities of inertia". Very few European academic institutions are yet committed to radical change. With deep change, Europeans can win top place among the Young Universities of the World^{lxxxviii}. Without deeper change soon, academia as a whole will fail to offer the artificial reefs of interdisciplinary knowledge creation around which lagging countries and regions can become globally viable growth economies. It is probable that only a strong political shove will shift the governance and mind-set of universities to pro-innovation risk-taking and effort.

The transformation needed here is lateral and disruptive. A move beyond the generation, dissemination and curation of knowledge to the civic and entrepreneurial university: a place that is good for society and innovation as well as good at research and teaching.

As Philip Nolan, President of the National University of Ireland, has put it:

The university in the future will not be an isolated institution, but a vital node in a fluid network of interdependent knowledge organisations, which together create an innovation system. This requires universities to rethink their structures and processes, enterprise to re-evaluate their conceptions of value, risk and return, and governments, through regulation and funding, to promote an intimate and mutually beneficial interaction between public universities and private knowledge enterprises.

This is a vision much discussed around Europe, fully consistent with Open Innovation 2.0, with civic involvement in innovation, with Smart Specialisation. The idea of urgent university transformation is somewhat left to one side in EU debate, perhaps for reasons of deference to national prerogative and to academic elites. But the changes needed are so closely connected to innovation success that we must assess together how fast Europe can shift and ensure that we learn more securely and faster from each other how best to make the change.

This is not virgin territory. On the basis of a brief survey, it is clear that there are some proven, generally feasible and often ignored starting steps on this journey.

Nor does it imply any "sell-out" of the integrity of academic life. The key is to have strong checks and balances to preserve university autonomy, and then to permit very deep co-existence. Netherlands' Eindhoven University of Technology, for example, produces a very high proportion of papers co-authored by industry. Of its 300 professors, half work full-time and are employed by the university. The other half are part-time, and about 80 per cent of staff in this group are employed by industry, splitting their time between working at the university and working in business. The university funds half the cost of long-term research programmes with industry, as long as the academics involved can secure the rest of the funding from business, but refuses to conduct research with industry that cannot be published.

A blueprint for entrepreneurial universities would include the following:

- As talent managers, universities should move decisively to recruit for, incentivise and reward academics for entrepreneurial endeavour. Evidence shows that this is not dumbing down the academic side. On the contrary, entrepreneurial stars are also star

professors. Entrepreneurial universities can only be created by academics for whom entrepreneurship and innovation matter and who can spread that message.

- Students need help to become successful investigator entrepreneurs: they need more responsibility and resources as academics at an earlier stage; they need entrepreneurial academic role models; they need to be well taught business as part of their core curriculum; they need access to digital engineers resourced to help all other disciplines; they need easy and above all fast access to follow-on financial support, so that they can go from workbench to prototype and even spin out their ideas without being forced off the campus.
- Universities should create not just science parks, but build, within the academic setting, cross-disciplinary and open meeting places, where fresh opportunity and ideas can thrive. These should be open to enterprise, so that they become a recognised local source of innovative solutions for their partners, and to civil society, so that Open Innovation can flourish. In this way, universities will become the meeting place for practitioners dealing with real problems in a real-world context. Companies will be able to scout for ideas, source talent and share. Professors in residence with companies and entrepreneurs in residence on-campus can both help to seed good practice in universities developing this approach for the first time.
- Matching this effort, universities need to bring onto governing body more challenging outside voices from civil society, venture capital and business. This will help the comfortable university to feel more keenly the pressure to perform while helping the less well-endowed to think lean and ambitious. It will consolidate the commitment to persistent improvement. And it can bring these benefits without any politicising or dumbing down.
- Real inter-disciplinarity in teaching needs more than the familiar mix-and-match modular menus. Success depends on the painstaking development of integrated programmes. It may take, to quote the example of Digital EIT Masters, 4 or 5 years to bring a 2-year course from inception to cruising speed. But the pay-off is a pipeline of ambidextrous winners, brilliant at tech AND business, able both to win thesis prizes against all-comers and to get value-added ideas to market almost before graduation.
- Last but most crucial, the role of technology transfer offices (TTOs) must shift decisively from creating value for the university up-front to supporting the downstream creation of value by students and faculty. TTOs tend^{lxxxix} to seek too great a piece of the action, deterring many investigators from attempting to go to market and weighing down the prospects of the rest. Evidence from Asia, Europe and America is clear: small shares on founding (3-5% max) and big support is the way to success. Well-supported successful founders come back and support the *alma mater* out of all proportion to the meagre returns earned by leonine TTO contracts.

In some parts of Europe, the tertiary ecosystem faces other challenges, whether in the form of academies of science that take too much of the money for too little innovation, or zero-sum competition, instead of porous and fluid cooperation, between university, institute and contract research. The Commission's Policy Support Framework allows EU-wide peer review of the resulting under-performance, but bolder steps at national level alone can bring solutions.

The universities' road to future-proof relevance and excellence everywhere will not be comfortable, but it is essential work if Europe is to get a full return on its innovation spending. Combined with more effort in early years and inclusive education to increase the talent pipeline, a rebuilding of the tertiary asset of Europe is the essence of excellence in the new age of discovery. The EU institutions can help, both by convening the debate, and by including innovation in ongoing Commission evaluation of Higher Education, as well as in the mid-term reviews of Horizon 2020 and the structural funds.

5. Modernising Governance

For forms of government let fools contest;

Whate'er is best administer'd is best.

Alexander Pope

The open governance ideal was first set out in EU thinking in 2001^{xc}. It marked a step beyond Weberian conceptions of public service. In turbulent times, it was clear that professionalism and efficiency were no longer enough. Open, participative, transparent, coherent and accountable institutions hold the road better^{xc}.

The 2001 policy has since been refined by a rapidly growing body of more recent evidence and practice^{xcii}. The emerging consensus recipe for 21st century public administrations covers four key areas:

- Attitudes: governments need to embrace change. To import an entrepreneurial mindset^{xciii}. To dare to be creative in the face of crisis, to experiment across a range of risk-taking ideas, not picking winners but letting losers go. To favour outcomes over rules, response to changing reality over following the plan.
- Engagement inside: to get there, public service managers must make the engagement and development of people their top priority^{xciv}. Engagement requires a sense of purpose, of mastery and of autonomy. With this, public service can be filled with passionate, self-starting creatives rather than merely obedient and diligent experts. They in turn will be credible convenors of participative policy-making. There are always blockers to confront on such a change journey, but a quick and low-cost culture audit^{xcv} can help to use the positive culture-shapers, to win the trust of the majority and to circumvent opposition.
- Engagement outside: allowing outside parties in is the most crucial and challenging step. To make data easy to understand and explore. To share in problem analysis, to co-design possible initiatives, to test prototypes.
- Tools: Tools to connect civil servants among themselves^{xcvi}, citizens among themselves and both groups with each other. Tools to offer everyone horizon-scanning, foresight and data-driven knowledge, and to enable future scenarios to be explored iteratively in credible models^{xcvii} and in Policy Laboratories. Most radically, public tools to help communities find solutions for themselves, without waiting for top-down prescription^{xcviii}.

Reform on these lines is key to innovation success for Europe. Any institution can and indeed must play: at EU or national or local level, in administration, manufacturing, services and academia.

- **Commission 2.0**

The European Commission has advanced more in this area than is usually acknowledged, no doubt because most of the experiments have yet to go corporate. But the foundation is there.

The Commission should now set the pace:

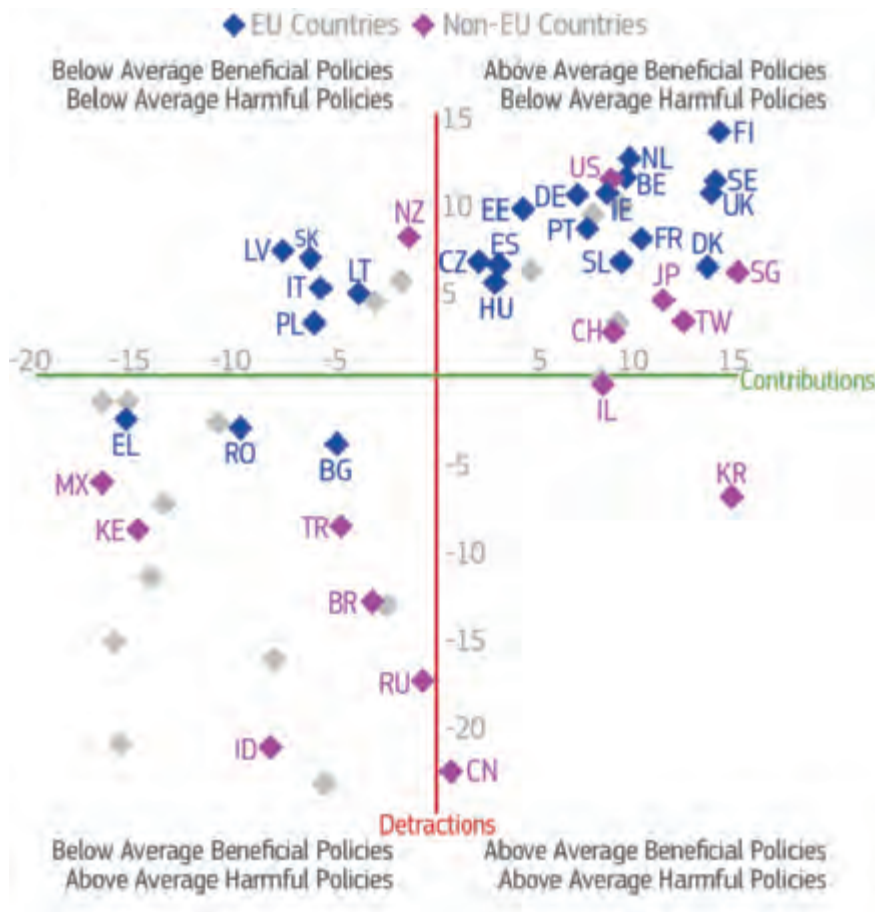
- joining the Open Government Partnership^{xcix}, a platform built on the principles of 2001, and recently opened to non-state public entities.

- sharing, through this and other networks, Commission-built open source tools such as Futurium^c, just as other Digital Leader governments (EU or not) are sharing their own software and skills around the world.
- Leading an EU-wide increase in effort around the implementation of the G8 Open Data Charter^{ci}, to which Commission^{cii} and G8 members are committed but on which progress is uneven^{ciii}.
- Moving fast on digital-by-default services and Once-Only data requirements, which together can save Europe 15 billion Euros of overhead^{civ}.
- Mainstreaming Internet-ready regulation^{cv}, in search of similar big wins. This means moving from (for example) a requirement to label a product to recognition in law that on-line provision of such information can be better for the customer (who now often chooses the energy efficient fridge on-line not by examining it in a show-room), and better for market efficiency.
- On internal engagement, to re-visit internal working culture, on the basis of some simple rules^{cvi},
- On tools, to accelerate the roll-out of the cutting edge knowledge tools currently piloted under the label CONNECTED platform^{cvi}, , and already endorsed in principle for corporate use,
- To use ESPAS and the EU Policy Lab not only for continental but for global knowledge management and data science, where Europe can lead the world on issues ranging from bee health to financial stability and oceans.
- To devote more effort to deeply rethinking what evidence for policy needs to be if policy is to remain legitimate and effective: the Chief Science Adviser experiment and the current Science Advice Mechanism both point in the right general direction, but we still lack designated senior scientists embedded in each policy pillar and networked across the public administration, as well as globally.^{cvi}

None of this is trivial. The implied cultural change starts with fast and easy promulgation. It requires sustained and persistent senior management example to modernise prevailing mind-sets. But: all these steps, and there are more, promise decisive and immediate impact on the standing of public service as well as on its overall morale and efficiency. With such an agenda, Europe could move faster towards becoming a pro-innovation space.

- ***Regulation for, not against innovators***

How good is Europe at creating a pro-innovation rule-book? This breaks down into two questions: what do we do to help innovators? And how far do we do things that are a hindrance?



Source: [ITIF – Information Technology & Innovation Foundation](#)

It is true that over recent years some specific hard cases grab and hold the headlines. They greatly damage the reputation Europe needs as a reliable place for innovators, and predictability matters more in many sectors than the fine detail of the rule-book.

The picture is not all black, however:

- recent US-based expert assessment^{cix} suggests that, on both scores, at least a plurality of EU national environments for innovation are broadly fit-for-purpose;
- the most important issues for tech innovators may not be tech regulation: EU-based digital platforms complain as much if not more about discontinuities in the Single Market in insurance, property and consumer law.

So if we could move the whole of Europe towards our own existing best-in-class models, innovators across the EU would certainly feel the benefit.

Such a shift implies that governments in Europe decide to change.

We can begin by making clear that Europe wants to host companies with new ideas and global ambitions; that we offer functional, liveable and exciting cityscapes for innovative folk; that we are open as a matter of principle and not only in theory to new business models, even if they disrupt incumbent business and require hard work by regulators (another class of incumbent!).

Such a shift also requires a smarter default response to something new. Too often, regulatory policy debate around new technology comes down to a false stand-off between "wait and see" or "do something now". Europe can instead offer to "look AND wait": the recent European Parliament report on Blockchain^{cx} shows how this might work.

The key is greater agility: to act more promptly as a new "thing" emerges (in this case Bitcoin), to gather people with insights as well as interested but less informed parties, to gather evidence of both facts and hopes or fears, to accelerate society's collective learning.

Prompt, collective enquiry of this sort is too often opposed, for fear that looking will tempt us, like toddlers, to touch and hurt what we have not yet understood. So the condition for more prompt and energetic looking would be a stronger collective acceptance that we should touch only when we have some understanding of what is going on, and should then touch to learn more before we even begin to assess what must be done (so, as conversation evolves, we understand that the issue is not Bitcoin, or even crypto-currencies or Blockchain, but distributed ledger technologies and how to maximise their beneficial use across society and not just in financial services).

The new Better Regulation package^{cxii} offers the best-ever foundation for making this kind of shift. A detailed box of tools with which to refine *ex ante* checks, to see and avoid regulatory double jeopardy, to weigh more fully the benefits of innovation as well as the risks of intervention, and vice versa.

The package is notable, too, for a first-ever EU political definition of the benchmark for effective and trustable self- or co-regulation. Building on long administrative experience at both EU and national level, this promises faster and more easily adjustable rules to frame activities that may not be easy targets for full legal rule-making^{cxiii}. It is excellent that the latest literature^{cxiii} gives added support for such approaches and additional evidence of what constitutes good practice. And also important that the implementation of such novel instruments will be supported by a commission-convened Community of Practice^{cxiv}, since here Europe operates both as pathfinder and as a learning organisation.

The *ex post* evaluation of rules for continuing regulatory fitness (REFIT) can also be expected to harvest much low-hanging fruit: bearing in mind, for example, that today it takes 26 steps for a mobile telecommunications operator to get access to harmonised radio spectrum. But the execution of the Better Regulation philosophy calls for brave and expert judgment.

Innovation needs Goldilocks regulation. An unregulated free-for-all creates operator uncertainty. Heavy rules offer only the certainty of excess costs. Somewhere in the middle is just right, but defining the middle is the art.

Stretch goals in eco-matters, for example, can seem just right, and often in fact are a promising driver for change^{cxv}. But it is too easy for regulators to get it wrong:

- To under-stretch, to the benefit of incumbents, by allowing the mere dilution of harmful refrigerants where much safer products are available, or a marginal adjustment in energy efficiency where greater gains are achieved already, if not from the same firms in the same places.
- To overreach, by setting standards for components and also for assemblies, with the result that Europe's installed technology innovation capacity is dragged towards the rule-driven pursuit of unfeasible or disproportionate goals.
- To set arbitrary if well-meaning constraints, such as the prohibition on low-calorie sweeteners unless they cut calories by minimum 30%.

Such unintended deleterious impacts can only multiply where technology and markets move faster than our grasp of the trends:

- How can we keep track of the heterogeneous uses of myriad substances in complex value chains world-wide^{cxvi}? Can new simulation techniques, for example high-throughput *in silico* modelling of ecotoxicity, both reduce development costs for business and better target regulatory focus on the most risky substances? If so, then this could be a good candidate for a major flagship investment in public science support for Better Regulation.
- How can we assess whether a new societal goal, such as reparability or recyclability, is a suitable client for regulatory or standards-making "support"? We cannot assume it is so, although such a hypothesis always deserves due diligence to show that it is likely so, or an experimental approach at small scale to test the real-world impact.
- How do we reduce the burden of up-stream laboratory testing, where real-time data enables adequate oversight to keep markets safe? Of compulsory and micro-defined physical labelling where consumers can access on-line data?^{cxvii} Of regulatory checks, where thanks to the Internet the reputation mechanism is more effective than regulation?^{cxviii} It is perfectly possible today for governments to let anyone who wants to begin operations in what has been hitherto a sector run by *ex ante* licencing, on the sole condition^{cxix} that they become accountable by opening for real-time oversight the large data sets they use to run their business. We should pilot such experiments soon in Europe.
- How do we use Internet and data tools to improve monitoring and enforcement? The certainty of detection and penalty should be easier to create in the 21st century, and that can be crucial for consumer confidence in an innovation-rich market: from "Mad Cow" to Madoff to Dieselgate, horsemeat to implants, it is the failure of enforcement that undermines trust, both in public administration and in the market. Where the consumer accounts for 55% of GDP, against under 20% for public expenditure, that matters.

One response to the increased uncertainty should be increased clarity in our regulatory principles around innovation. The Council of Ministers has agreed to take into account the impact on innovation in the process of developing and reviewing regulation in all policy domains. So the principle is clear. How can we best implement it?

- ***Embedding Innovation in Regulatory Practice***

Beyond applying this principle case-by-case, we could deploy as a pilot some omnibus pro-innovation rules offering additional guidance to regulators^{cxx}. The result should be a new social contract, allowing innovators out of the laboratory and into the streets, and giving them the benefit of the doubt, at least if they on their side subscribe to open and responsible innovation norms.

A positive, but not lax, framework for innovation would require a two-way deal with several building blocks:

- "Responsible Innovation", including strong citizen engagement with both science and innovation^{cxxi},
- Legal basis for regulatory discretion to allow and control piloting, and to adjust standards in light of technological development and new data,
- Scope for insurance-innovator-regulator conversations to ensure that the market for insurable innovation risk is taking as much of the burden as possible,
- Innovator-regulator cooperation and information sharing,
- A positive duty to remove existing burdens as they prove unnecessary^{cxii}, and to regulate with a view to supporting growth,

- The designation of a single local regulator as the 'primary authority'^{cxviii} for applying a law, so that operators have a single interpreter of their duties, on whom other regulators can also rely,
- Regulatory sand-boxes, especially for FinTech, allowing regulators and innovators to get to know each other upstream of requests for product approval,^{cxviii} and close involvement of start-ups and venture capitalists in advisory boards of regulatory authorities^{cxviii}
- regulator-regulator cooperation,
- a safeguard mechanism,
- periodic evaluation^{cxviii}.

It is happily, pretty clear that such a deal is perfectly constitutional^{cxviii} and there is a cluster of precedent and good practice, too:

- Vehicle type approval at EU level, where since 2007 any national regulator may licence any novel type, subject to certain simple conditions of substance and procedure^{cxviii}.
- Green innovation deals in the Netherlands^{cxviii}.
- Council support^{cxviii}.

We now need to seed more widespread experiments, well beyond the circular economy, and to gather experience from across Europe.

6. Research

In research, the Horizon recedes as we advance.

Mark Pattison

Almost every debate on innovation ends up sooner or later focussing on research policy and access to money. They are the subject of this chapter and the next.

On a systemic view, these two issues are hugely important, and should remain core business: we shall not be an innovation super-power if we scrap the flagships of big science. But that does not mean that they should be the prime targets for a game-changing fresh start in European innovation. Public budgets relevant to innovation (not by any means only

H2020) do not bulk large enough in the overall volume of public and private spending.

A full account of the significance of 'research' for 'innovation' lies beyond the scope of this review.

Research is not the only driver of the system of innovation. It is one of ten or so key success factors identified in innovation literature. And at corporate level, for example, only 17% of innovation spending is on R and D, with the bulk going on other components of Knowledge-Based Capital (design and data, skills and software, organisation and marketing)^{cxxxix}.

Research impact measurement is therefore hard because linkages in a system are not one-to-one. A recent global review by the World Economic Forum Council on the Economics of Innovation identifies similar shortcomings in almost all the impact indicators used worldwide: a bias to technology-intensive sectors, poor granularity and poor predictive power. The Commission's own advisers have suggested^{cxxxix} an overall re-assessment of the current indicators on research and its innovation impact and in any case more careful use of what is available to draw policy conclusions.

It is not certain that EU policies need to be based on our very own metrics. But to the extent that we do maintain in-house effort, it must be very openly managed and peer-reviewed, to avoid any charge that we rely on less than robust models^{cxxxix}. And impact measurement should be coherent across our plethora of overlapping but under-connected instruments: across, for example, digital EIT communities, IT-focused H2020 partnerships, and regions with structural fund digital goals. Common self-evaluation and progress reporting will certainly identify both gaps and overlaps, and could create rather rapidly a more robust and coherent network of actors.

- **Research Strategy**

Research policy is essential for some and helpful for innovation, even if it is no "silver bullet".

Fundamental and excellent research is one indispensable driver of innovation. The innovation mission of Europe cannot succeed overall if it is accompanied by a drift away from fundamentals: US fundamental research spending was increased, not reduced, for the Kennedy moon-shot. The success to date of our own big research bets, notably in the Human Brain Project^{cxxxix}, suggest that, beyond the recently announced Quantum Flagship, future similarly ambitious endeavours should be launched.

In that spirit, it is worthwhile to record, if only for separate implementation, the most promising suggestions for innovation-friendly and no-regrets change to research policy that have emerged in the course of preparing this Note.

The main messages on Research are to:

- Revalidate and rethink research itself as a key driver for the EU's policy priorities, including the societal challenges of inclusion and sustainability as well as knowledge, growth and jobs.^{xxxv}
- Protect the budget for public research, covering fundamental discovery on a large scale, long-term road-mapped coalitions of investigation (the so-called Public-Private Partnerships) and focussed research in support of public policy (notably sustainability and climate), as well as small-scale pathfinding of the sort pioneered by the so-called FET Open budget;
- Simplify public research procedures and get closer to fixing the real innovation blockages;
- Build better networks, starting from what exists, such as in the set of European Innovation Partnerships ^{xxxvi}
- Work harder on rebuilding excellence in lagging regions, but not by distorting H2020;
- Use the Mid-Term Review to ensure that innovators get full and easy access to EU funds, and that innovative opportunities (and innovation experts) are built into all stages of the funding pipeline, from calls to project management to outcomes.
- Increase public funding for the big infrastructures of science;
- Build digital data skills among and at the service of research communities^{xxxvii}.

- ***Infrastructure and skills***

Research equipment needs a step-jump in public support if we are to keep abreast of the booming opportunities brought by new technology at the intersection of the formerly separate fields of nano-bio-cogno-data science, in fields such as data-driven genomics and immuno-oncology.

The great disciplines (and we must hope their leading European practitioners) are merging. As convergence and data-driven investigation transform every discipline, so excellent and innovative science will depend on world-class kit in plentiful supply at manageable cost. This means a significant increase in the share of available funding that goes to computing and curation tools for science. It also requires greater public incentive for excellent interdisciplinary work, over the siloing of science.

Even today, to take just a single example, ecological sustainability could be much better assessed and assured if more super-computer capacity were available to exploit the very detailed data map that already exists, thanks to satellites and sensing. Anyone contemplating greenfield or even urban development anywhere in the world can in theory today make use in real time of the very large data sets that map the planet's diversity and highlight what species need careful management. With computing resources too scarce, and default mentality rooted in the old ways, most cases rely instead on crude, ill-validated and dated land use categories.

More generally, since the focus here is on innovation, society will only get the most out of research and innovation to the extent that the very high-speed communications capacity of Europe reaches everyone, however remote from the big urban centres. Broadband is a drag on development for too many towns and for too many people.

With infrastructure, there is a growing need for skills: new tools need fresh training in their use. Data skills must become as widespread as card indexing sheets in all disciplines.

We also need Digital Humanities. This means incentives for systematic companion research in both the hard and the social sciences (including game theory) into the changes that flow from innovation breakthroughs. The launch of such sister projects is already underway in pursuit of Responsible Innovation in digital fields such as Artificial Intelligence or Health. We also need to think about the sociology of networks and to think hard about the very different relations that will exist across a Blockchain-enabled network.

7. Money

Money is like muck: not good except it be spread.

Francis Bacon, 1625

- **Research Funding**

Funding processes must get much simpler still. Further simplification is challenging: it will require the exercise of collective courage by budgetary and controlling institutions allowing the fund-holders to adjust the risk map. But it is a must.

Funding rules that are simple for public payers and their controllers are for that very reason too often unfit for the purposes of the entrepreneurial university or innovative private researcher. The conditions for EU funding continue to deter some excellent teams in some excellent institutions from even bothering to read the H2020 calls. For new-born innovators without standard affiliations, emerging from the makers' movement or the distributed ledger world, such barriers are even higher, and public funding is irrelevant, although funding needs can still be a killer.

Budgetary and control authorities need to give permission for funds to flow less tidily if we are to truly support innovation:

- Funders must work harder up-stream to avoid investing too close to what has been done already: repeating known pilots is a real and expensive trap.
- In support of the more systematic translation of research into innovation, we need urgently to roll out across all sectors the Innovation Radar successfully piloted by the Commission in the IT field in 2014-2015 (and supported by Commissioner Moedas in his own policy pronouncements during the last year)^{exxxviii}.
- Funders must have discretion to give greater weight to critical mass bets and less to spreading support thinly across a score of clusters doing much the same thing.
- Promising tools such as for pre-commercial procurement are totally under-used. This needs more political push, more human resource and more of a community of expertise and practice, across the EU^{exxxix}.
- Down-stream, where the challenge is scaling^{exl}, we need to allow expenses in such taboo fields as marketing, which has traditionally been viewed as too far from the lab bench, but which in the still novel concept of Knowledge-Based Capital is very much in-scope.
- Extension schemes to spread new-to-region innovations deserve a lot more emphasis.

More challenging is a change of mind-set from isolated project consortia or even large inward-looking networks running 'their' contractual partnership to porous and organic ecosystems in which even newcomer free-riders are welcome to visit and learn.

Collaborative research is perhaps the defining DNA of EU policy. But more can be done. The European Innovation Partnerships represent a piloting of this sort of culture. The Aho Group report on the first wave of experiment has called for more ambitious design of the next wave of these 'Outriders for European Competitiveness'^{exli}: there does need to be a renewed effort here, rather than the abandonment of the idea. Because EIPs sit well with the logic of broader networks as a key success factor for innovative Europe. But they will need to be open by design to smart Regions, H2020 teams, EIT communities etc.

Finally, and the most delicate point, we must resolve in the next year or so, not just further discuss, the North-South, East-West tensions between Member States^{cxlii}. For the sake of excellent research and continent-wide innovation, Europe needs a pact of mutual generosity between Member States, so that on the one hand taxpayers' money can flow to the best clusters in the most promising fields of endeavour, without recourse to national sharing, but, on the other, newer actors are involved and not left behind. One way to do this would be to use structural specialisation funds to offer grant support for the participation, in successful consortia, of additional investigators from institutions otherwise not so successful in the European Research Area. We also need to deploy funding specifically to integrate so far excluded regions and universities and innovation hubs across the EU in networks such as EIT KICs or H2020 partnerships which have so far failed to reach all 28.

- ***Money for Innovation***

Many initiatives are underway at EU level to increase innovators' access to investment finance. The key need now is for speedy action and prompt impact.

Beyond what is underway, evidence gathered in the last months indicates that following areas deserve more serious attention.

The first is risk capital. At household level, 3 million citizens of the EU hold non-real estate assets above a million Euros, so if just 10% of that cohort put 10% of these assets into innovation risk portfolios, 30 billion additional capital would be available.

Such newcomers clearly come into the game first time in response to clear signals such as tax incentives. They also need examples in their immediate vicinity. One way to foster investment is to increase support for the Business Angel Communities, so that they can more rapidly seed the Angel Investor culture in Member States where it has been largely unknown^{cxliii} and to foster more venture capitalism. This could be supported direct from EU funds, including the structural funds, as part of current efforts under EFSI (a Fund of Funds for Innovation) and H2020 (capacity-building for Angels in all Member States).

At the same time, there should be a re-assessment within the current agenda of the Capital Markets Union as to the systemic failure of capital markets to reliably provide adequate patient capital for manufacturing (and other) innovators. This market failure has been a subject of constant complaint in at least some parts of Europe for over 50 years^{cxliv}. Most recent analysis^{cxlv} suggests that cross-Europe coordinated patient capital providers could play a greater intermediary role in plugging the gap. This suggests scope for structural initiatives alongside the recent European Fund for Strategic Investments. The need for pension funds to be brought fully into the risk game also needs attention, not least in managing the risk profiles that the prudential regulator imposes.

We should not ignore this last point simply because of current short-term facts, such as near-zero interest rates, the faltering IPO cycle or the unicorn bubble^{cxlvi}. These are all fascinating and significant phenomena, but when the cycles move on, Europe will still need a better safety net of patient capital.

And indeed, public funders can legitimately seek permission from budgetary authorities and auditors to share risk with their beneficiaries: we need to define success for innovative investment vehicles as being less than cost recovery case-by-case, and monitor portfolio performance without imposing tight goals even at that level. Entrepreneurs need to see that public funders take risks, and that like Venture Capital veterans they welcome repeat business from leaders of 'failed' projects.

In addition, there seems to be a need to expand the scope of support for 'mission-led business' beyond that allowed by the Regulation on European Social Enterprise Funds. This text seems in its adopted form to have too narrow a scope to produce the desired jump in capital for social innovation. We should be sure to cover all fully profit-distributing businesses that identify their primary purpose as tackling social and environmental goals. New social investment business models in general deserve serious public support^{exlvii}.

The last, and maybe heretical, option, even if it is fully compliant with state Aid and other requirements, is a cooperative initiative to roll out across all Member States the best of existing national pro-innovation tax policy.

- Offer substantial tax incentives for proportionate household risk finance experiment action (the UK example?)
- Extend tax advantages more systematically to investments wherever engaged across the EEA (the French example?)
- Give grant aid and not only tax credits, so that really young firms can benefit (the German example?)
- Match best-in-Europe incentives for start-up funding models, for example in the treatment of stock options.

None of this is to suggest any naive optimism as to the impact of tax incentives. The political economy of tax breaks shows that it is all too easy to create tax credit junkies, whose innovation strategies are distorted by the easy money. It is clear that low and stable corporate (and personal) tax rates have greater impact on innovation outcomes than short-term *ad hoc* shifts in policy. And good tax design is hard: in the field of R and D tax breaks, a single Member State can find its different tax tools placed among both the ten best and the ten worst tools in operation^{exlviii}.

Still, if all are doing it, it would be better to do it together. European tax fragmentation means a certain randomness in one driver for innovation; and creates a huge business in tax collection and optimisation. A small package deal on these lines would contribute both an important signal that all Member States want to help all innovators, and a modest experiment in voluntary cooperation over a relatively delicate matter.

8. Opportunity Now

To dare is to lose one's footing momentarily. Not to dare is to lose oneself.

Soren Kierkegaard

The claim of this volume is that feasible fresh initiatives in the year ahead, joined up and at scale, will bear fruit for Europe by the end of the decade.

Two final questions:

- What makes it urgent to do any of the sundry things outlined above?
- What comes first: are there small steps, and quick wins?

- ***The case for action***

There are five good reasons to act now:

- There is no alternative. The revolution is all around us: we cannot survive on power or on cost, nor can we even count on trickle-down productivity to keep us in touch with the rest of the world if others become the lead geese^{cxlix}. Our choice is to be a cork in the flood or masters of our fate. Not a choice.
- Innovation alone gives us a chance to build the future we want: with innovation, we can hit the 10 priority targets, score on the UN Global Goals and respect COP21. We can achieve social inclusion and sustainability as well as growth and jobs.
- Innovation is central to Europe's sustained competitiveness. It increases the value and reduces the cost of European ideas, built in Europe but exported world-wide. Today's accelerating technology cycles enable Europe, like everyone else, to achieve fresh leadership, with breakthrough discoveries made and exploited locally, but can just as easily lose us our current mastery of familiar niches.
- By committing to innovation, we become fitter for the future. A pro-innovation stance helps to make society attentive to its future and resilient in face of crisis^{cl}. We also move away from the risk of being a 'community of inertia'^{cli}, where we persist in values, beliefs and routines that served in the past but betray us now.
- Finally, the innovation choice is asymmetrical: an innovative society can fine-tune what it does with its discoveries, but a continent that lost innovative capacity would also lose that choice.

- ***The paths to action***

A serious change of policy choice in favour of our innovation mission cannot be made in a single step. So this is not an action plan. But it exemplifies with executable ideas the breadth of the agenda. Nor can we succeed by cherry-picking: the systemic challenge of innovation requires broad and sustained commitment^{clii}. The European Innovation mission needs to be launched on the basis not of a check-list but of a few guiding principles.

1. Innovation will get the sustained top-level attention it deserves: institutions will sustain that conversation, involving everyone with a stake in innovation, not only funders and beneficiaries.
2. We can achieve a lot by extending to all localities and all players the best ideas and tools that we have to hand. Boot-strapping innovative change in firms of all sizes,

rooting innovation in the real-world skills and needs of every region, scaling what works.

3. We shall embark on the prompt and persistent re-making of public service: Commission 2.0.
4. We shall direct our regulators to foster invention and the marketing of the new.
5. We each have distinct roles, but we shall be mutually accountable for our progress. We will make together, each at our local level, some bold bets on change in tricky areas: education, health, universities, tax; and some bolder bets on potential breakthrough technologies, notably genomics, the brain, distributed ledgers and quantum.

Conclusion

Europe enjoys an unbroken record of making technology breakthroughs from which all the world now benefits.

Europeans still largely love the new, but want to feel involved in the road to innovation, and to understand the benefits to their own locality and family. We still have needs and remain as inventive as any part of Humanity. But in our adoption of the new as well as in our social structures, we do seem to have lost a sense of urgency, while the innovative capacity of other continents continues to evolve at a pace we do not currently match.

If we want to continue our innovation mission, we must give sustained and serious support to innovators. The political choice is how far we shall continue to be one among the sovereign global purveyors of such innovation, and how far reduce our role to that of a needy user.

The key issue is what society we want: innovation is a necessary but not sufficient condition for social inclusion and sustainability as well as productivity, jobs and growth. Shall we seize the innovation opportunity? This note rests on the conviction that Europe will want to remain an innovator in and for the world, and that we Europeans can still do that.

Insight articles

- ***Foreword***

This is not a conventional volume of policy. The report itself was composed with great latitude as to its content, but within draconian limits as to its length. For the European Commission colleagues who joined me in the "Innovation Network" supporting this policy review, it was clear from the first that there were deeper insights to be shared than would be possible in so short a compass. These insights have been co-curated by the team and are included in the short insight articles within this annex. I have intervened little, mainly to select contributions and to order them in a way that helps the reader to see their relevance to the body of the report.

Articles contributed by non-Commission authors are clearly marked. The in-house articles are the work of many hands.

- ***Reader's guide***

This annexe contains 67 articles, each of which offers additional insight on some aspect of EU innovation.

[Section 1](#) contains basic background.

[Section 2](#) sets out the positions of key EU players, including some recently adopted institutional agreements.

[Section 3](#) focuses on how we can better nurture people.

[Section 4](#) explores the role of innovation in creating sustainability and social inclusion.

[Sections 5 and 6](#) describe some successful current actions, which both invite support and raise policy challenges.

[Sections 7 and 8](#) conclude with proposals to better accommodate the needs of innovators and to modernise public service.

All sections and many articles are highlighted by footnotes in the main text. Those that have been submitted by private stakeholders in kind response to a request for help are clearly indicated. All other articles have been co-created by the Commission's in-house innovation experts. The article on public procurement is an exception, resulting from the seamless blending of stakeholder work ably led by Malcolm Harbour with the thoughts of Commission procurement policy experts.

Section 1.

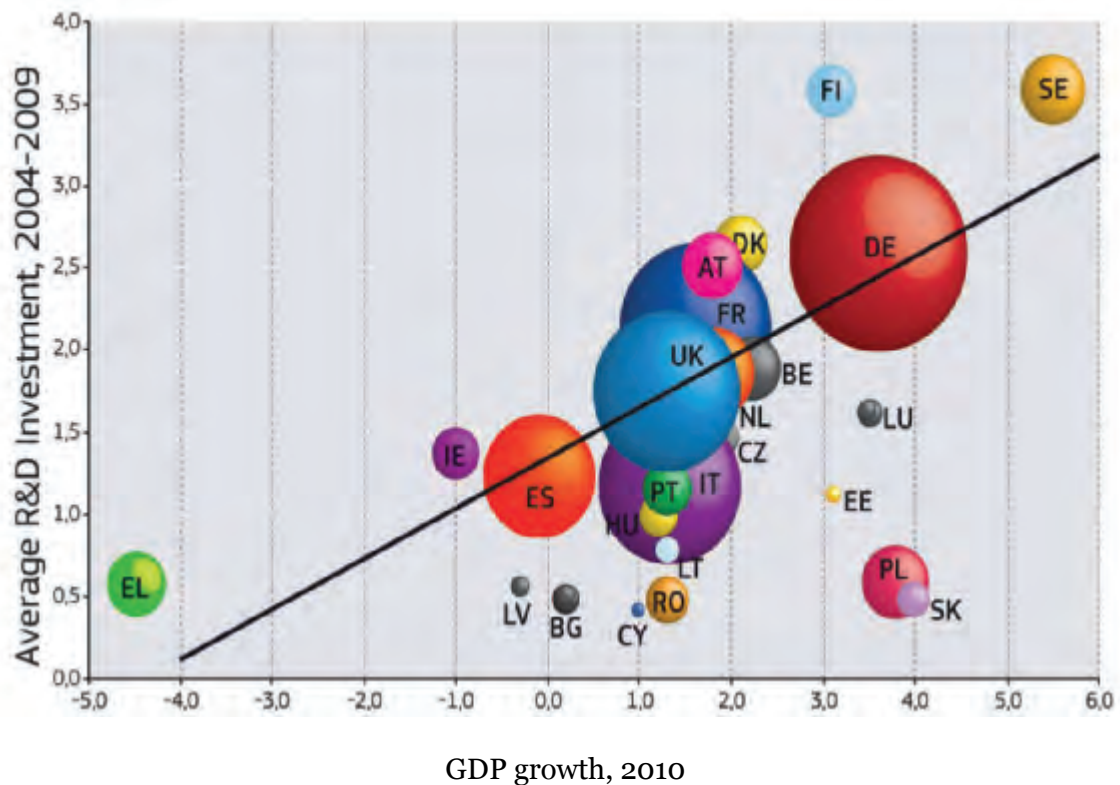
Basic Background

1. Why Innovation? The Basics

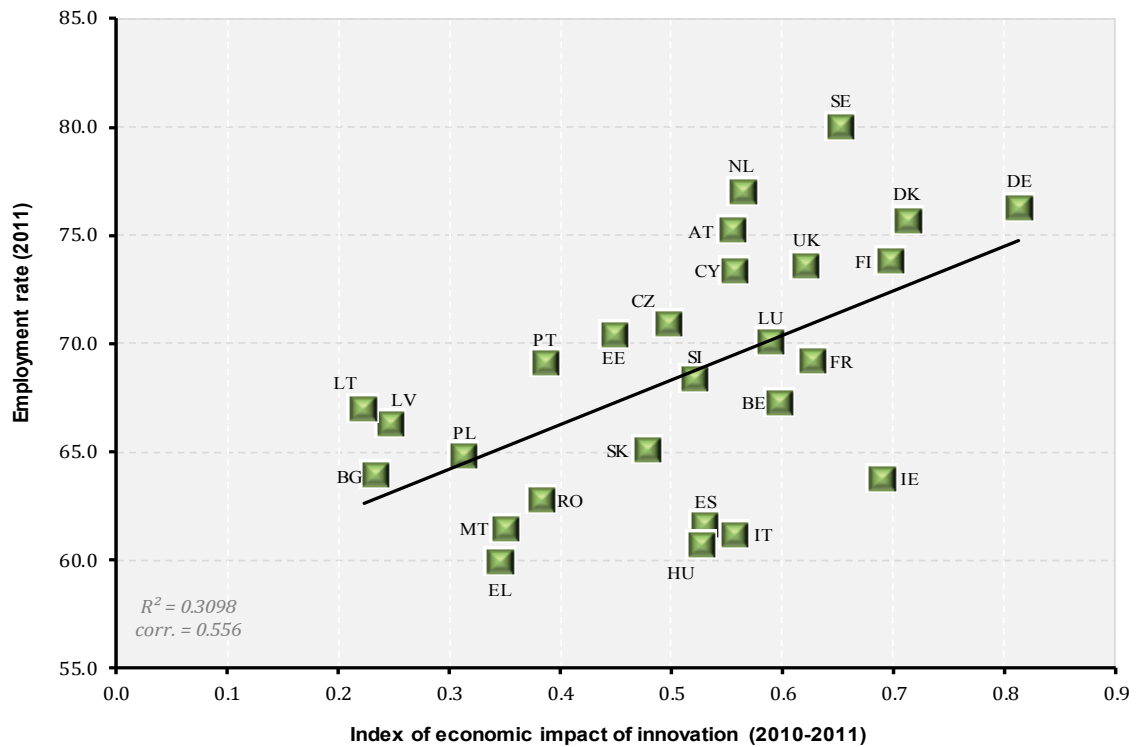
A couple of charts to emphasise how strongly innovation links to growth & jobs and public sector efficiency.

See here for a fuller analysis of the link between innovation and sustainability.

Innovation as a driver for Growth

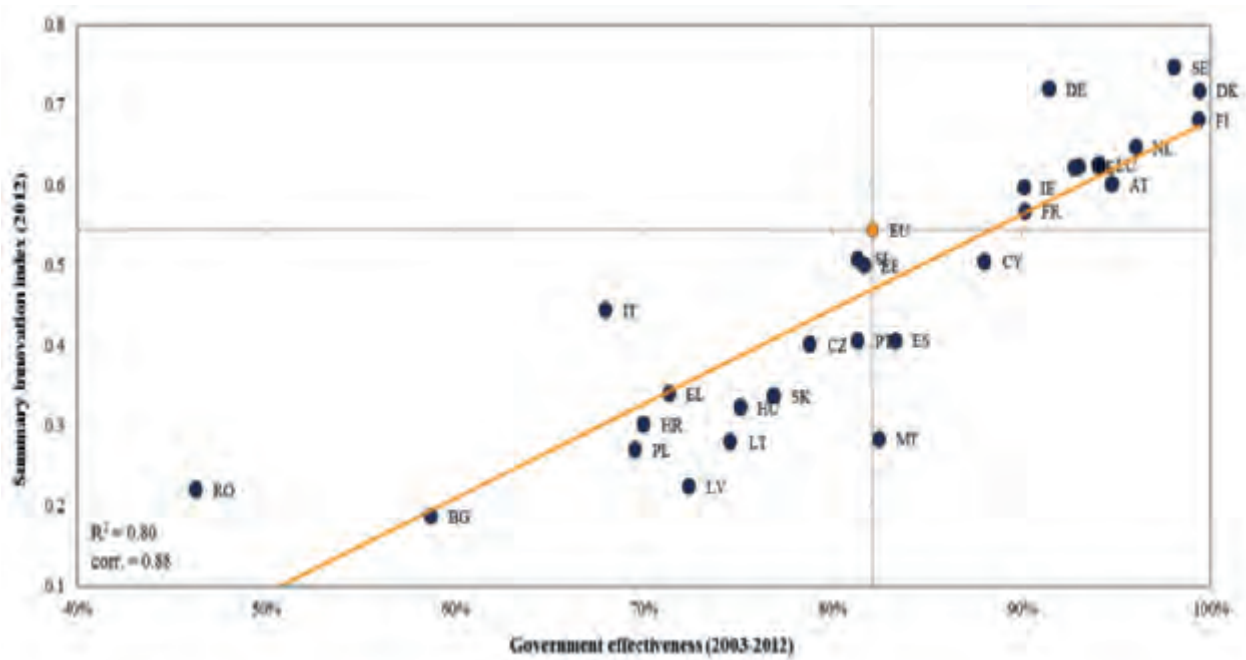


Innovation as a driver for Jobs



Source: DG Research and Innovation - Economic Analysis unit (2013)
Data: Eurostat, Innovation Union Scoreboard 2013

Innovation as a driver for Public Sector Effectiveness



Contributed by Stephan Raes, Permanent Representation of the Kingdom of the Netherlands to the EU in Brussels, Belgium

2. Understanding innovation

Briefing

February 2016



Understanding innovation

SUMMARY

Innovation can be defined as the adoption of new products, processes, marketing or organisational approaches that create a valuable outcome in terms of financial benefit, wellbeing or efficiency, to name a few. Given its impact on smart, inclusive and sustainable growth, innovation is at the heart of European policies and one of the priorities of the Dutch Presidency of the Council of the European Union for the first six months of 2016.

The innovation process occurs in an ecosystem in which companies, public research institutions, financial institutions and government bodies interact through the exchange of skills, knowledge and ideas. The model of open innovation is used to describe the flows between these actors.

New insights on the innovation process and the organisation of the innovation ecosystem lead to the requirement to design a new policy mix that includes, above all, policies in support of research and development to foster innovation; policies for education and training to provide the workforce with the relevant skills; and policies to promote a sound business environment and to encourage engagement in innovation and entrepreneurship.

In addition to supporting the more technical aspects of the innovation process and ecosystem, these policies also need to spur the development of a culture of innovation which involves creative thinking, collaboration, initiative, openness, a positive approach to failure, and high trust within organisations and society as a whole.

Despite its positive aspects, innovation is capable of inducing potential long-term negative social, environmental or economic outcomes. Approaches involving responsible ways of undertaking research and innovation, as well applying the precautionary principle, aim to address these shortcomings.



In this briefing:

- A multidimensional concept
- Innovation and growth
- Models used for describing the innovation process
- The innovation ecosystem
- Innovation policies and regulation
- Towards a culture of innovation
- Risks and limitations
- Main references

A multidimensional concept

The key characteristics of innovation

'Innovation' is a concept that includes each of the three following features:

- **novelty:** an element of change from the current situation;
- **adoption:** a change that is embraced by its potential users; and
- **outcome:** value, for example profits for a company, increased efficiency of a process or improvement of the wellbeing of users.

An additional aspect of innovation is that unlike an invention, which is usually considered an individual accomplishment, it results from a process involving the cooperation of numerous actors.

Different levels of impact

An innovation that is a game-changer for a whole sector or market will be referred to as a **disruptive innovation**, classical examples of which are the car, ready-to-assemble furniture and video-on-demand. An innovation that produces fundamental changes in a sector, for example, the smartphone, is known as a **radical** or breakthrough innovation. Innovations – usually – occurring inside a given organisation and with lower impact, as in the case of a new model of the same smartphone, are defined as **incremental** or sustaining innovations.

Different types of innovation

The Organisation for Economic Co-operation and Development (OECD) recognises four types of innovation, described in detail in its [Oslo Manual](#) for measuring innovation (Table 1). Product and process innovations, often based on new knowledge and/or new technologies, are strongly linked with research and development (R&D) activities. Organisational and marketing innovations are usually the result of the adoption of new methods, concepts and/or strategies.

Table 1 - The four types of innovation as defined in the Oslo Manual

Type of innovation	Characteristics
Product innovation	A good or service that is new or significantly improved. This includes significant improvements in technical specifications, components and materials, software in the product, user-friendliness or other functional characteristics.
Process innovation	A new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software.
Marketing innovation	A new marketing method involving significant changes in product design and packaging, product placement and promotion, and/or in the pricing of goods and services.
Organisational innovation	A new organisational method involving changes in business practices, workplace organisation or external relations.

Source: OECD, [Oslo Manual](#), 2005.

Innovation and growth

In 1942, US-based economist and political analyst Joseph Schumpeter laid out his theory on 'creative destruction', considered the foundation of innovation economics. According to this theory, innovation opens up new opportunities and markets that lead to the replacement of existing activities and actors, inducing dynamic evolution of the economic fabric. An innovation gives its proponents competitive advantages when commercialising new products, services or processes on the market. However, the more diffuse the innovation becomes, the fewer advantages its proponents receive, which thus implies the need for a continuous process of innovation. Today, this dynamic process is considered one of the key engines for economic growth.

In a [document](#) describing the strategy that needs to be in place to encourage innovation, the OECD recognises that 'there is widespread agreement that innovation is an important driver of growth, especially in the long run'. However, the OECD admits that 'the conceptual and empirical links between innovation and growth are complex', despite the clear correlation between them.

Innovation influences three production factors which have an impact on economic growth:

- **tangible capital value**, which is improved by technological progress embodied in physical capital;
- **knowledge-based capital (KBC)**: R&D activities, skills or organisational capital; and
- **multi-factor productivity growth**, which is boosted by non-technological innovation and spill-over effects of investments in technology or KBC.

The OECD estimates that 'the different components of innovation together often account for at least 50% of economic growth.'¹ Nevertheless, it also draws attention to 'other important goals for public policy, such as the environment or well-being, that are also affected by innovation.' These findings reflect evolution in the work of the OECD, involving the preparation of a more global approach to the relationship between innovation and growth, which takes into account the effects of innovation on sustainable and inclusive growth.

Models used for describing the innovation process

In the past four decades, six models¹ have been proposed to help understand how innovation occurs and to give insight into the relationship between innovation and growth. The first two models, known as the **linear models**, describe innovation as a simple succession of discrete steps. In the first, called the **technology push** model, the process starts with the production of new knowledge through basic research. It continues with the design of new products based on this knowledge, then with their manufacturing, marketing and commercialisation. In the second, known as the **market pull** model, the linear process starts with the users' need that drives the development of new products in the same sequence. The linear models have since been widely criticised as too simplistic to describe the complexity and diversity of the innovation process.

The third generation of innovation models, known as the **coupling models**, introduced interactions and feedback loops between the different steps outlined in the linear models. While these models advocate better integration of R&D and marketing activities, they still describe innovation as a process fully internal to an organisation, as did the linear models. This limitation is addressed in the fourth generation of **interactive**

models that integrate external interactions with key suppliers of knowledge, products and processes (upstream) and with active customers (downstream).

External interactions are given a central role in the fifth generation of models, the **network models**. In them, the innovation process requires continuous exchange between different actors. Companies are not just connected with their suppliers and customers, but also, for example, with some of their competitors through strategic alliances. They accumulate knowledge from various sources and integrate the different steps which the linear models considered as successive, both internally and in parallel to each other.

In the past two decades, these networking aspects have been extended further, as a result of which the **open innovation** model has emerged. In this model, the boundaries of organisations are fully porous. New ideas and paths to markets can be generated and exploited internally or externally in various combinations. Companies rely not only on their own R&D divisions but also on external sources of knowledge, and develop ideas either internally or externally through spin-offs or joint ventures. This attitude allows increased flexibility and lowers the risks associated with innovation.

The study of the innovation process has shown that innovation is a complex and uncertain phenomenon. It does not simply consist of turning ideas into products, as is often believed by the adherents of the outdated linear models. In the context of the latest innovation models, networking activities are considered essential, as innovation is no longer seen only as an internal process but as one that needs to remain open to, and seize opportunities from, external interactions.

The innovation ecosystem

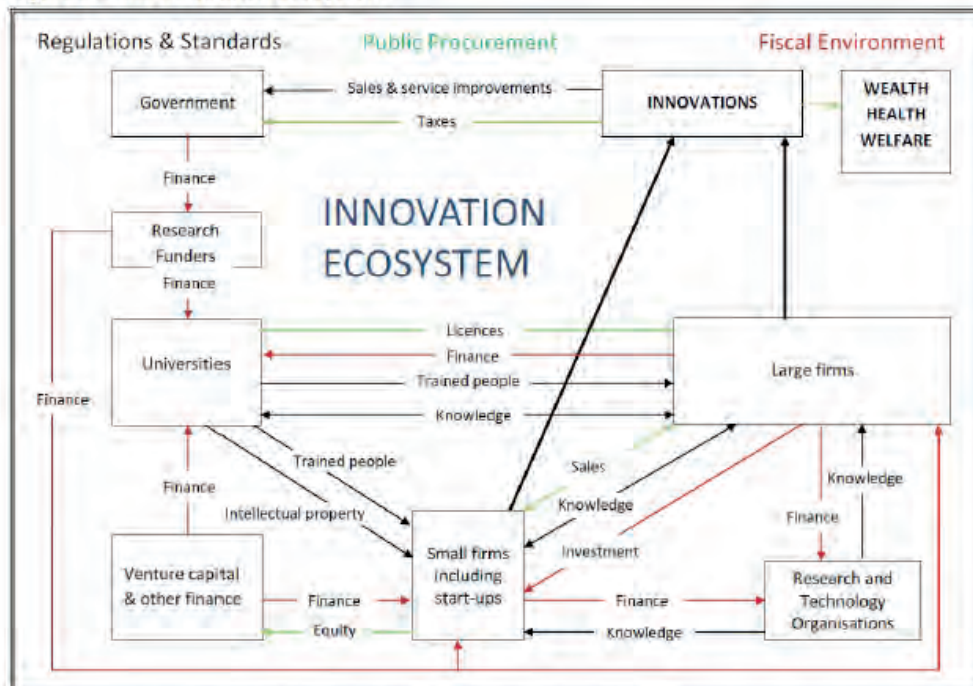
The open innovation model is based on the [assumption](#) that 'innovation is a distributed process across many actors, companies and other organisations, and is influenced by regulation, policy and social pressure.'

Innovation occurs in the context of an ecosystem, with different actors taking part in the process:

- large and small companies, including start-ups, that commercialise innovations;
- universities and research-performing organisations that train people and produce new knowledge;
- venture capital, research-funding organisations and other financial institutions that provide funding for R&D activities and business development;
- government actors influencing the innovation environment through policies, regulations and the adoption of standards.

The term 'innovation ecosystem' was coined to reflect the continuous interactions and flows of skills, knowledge and money needed between these actors for the innovation process to be sustained (Figure 1).

Figure 1 – The innovation ecosystem



Source: [Improving the Framework Conditions for R&D](#), Luke Georgiou, June 2015.

Innovation policies and regulations

Innovation policies aim to improve and facilitate interactions between the actors of the innovation ecosystem in order to enhance the performance of the system as a whole. Based on the latest models mentioned above and the description of the ecosystem, it is obvious that innovation is influenced by more factors than just R&D policies. When addressing innovation, policy-makers should consider a wide range of aspects, as suggested by the OECD:

- a skilled workforce to manage the different steps of the innovation process;
- a sound business environment that encourages investment in KBC;
- a strong and efficient system for knowledge creation and diffusion; and
- policies that encourage companies to engage in innovation and entrepreneurial activity.

As different levels of government (European, national, regional, local) have an impact on the policies supporting these different aspects, good coordination and a strong focus on governance, including effective monitoring, are required in the design and implementation of these policies.

When developing strategies for innovation, policy-makers need to consider a full set of policy measures addressing, for example, education and training, labour markets (including international mobility), product markets and financial markets, and regulatory reforms. These policy measures should also address the need to establish strong and well-governed universities and public research institutions, develop knowledge infrastructure including broadband and digital networks, and introduce tax incentives for investing in R&D. The overall policy mix needs to be tailored to the national or local context in order to be fully effective. The high number of parameters

that influence the innovation process implies that there is no one-size-fits-all solution. At European level, the [Innovation Union flagship initiative](#) is the key policy supporting innovation within the context of the Europe 2020 strategy.

Enhancing innovation policies requires making a careful assessment of interventions that have an impact on them. The [Innovation Growth Lab](#), an international project coordinated by [Nesta](#), a UK non-governmental organisation fostering innovation, addresses the links between innovation and growth. This project aims at enriching the body of evidence regarding the impact of different interventions on the innovation ecosystem, in order to provide better insight to policy-makers.

Innovation Union flagship initiative

The Innovation Union flagship initiative is aimed at strengthening research and innovation systems in Europe. The European Commission seeks to fully establish the European Research Area, develop strategic research agendas on key challenges, and enhance joint research programming between Member States. It aims to develop innovation in the private sector, with a particular interest in supporting SMEs. The Commission also strives to improve interactions between education, business, research and innovation. The flagship initiative invites Member States to reform their research and innovation systems to allow for better interoperability at European level and to foster EU cooperation. It also invites them to support education in science, maths and engineering, as well as to prioritise knowledge expenditure.

[Industrial Innovation in Transition](#) is an EU project funded under Horizon 2020, the EU framework programme for research and innovation, to 'create a holistic understanding of what are the current best practices in the most innovative companies in order to provide an evidence base for reviewing how well the current innovation policies support the adoption of new innovation processes.' Based on the conclusions of the project, recommendations will be made to policy-makers on drafting sound innovation policies.

Towards a culture of innovation

Developing a culture of innovation – a particular set of values, norms and patterns of behaviour that stimulate the innovation process – appears nowadays as important as managing the innovation process itself. In order to thrive, innovation needs a new global approach and a fresh mind-set on 'how to do things' that includes creative thinking, collaboration, initiative, openness, a positive approach to failure and high trust.

At company level, the culture of innovation is related to a trustful working environment that not only allows any employee to suggest new ideas, but also provides support for realising them. For this to happen, all employees need to share their company's global vision and objectives, but also to be afforded relative flexibility in how to achieve them so as to be encouraged to 'think outside the box'. Companies need to establish collaborative links both internally and externally, which can be done only if their workforce has good networking skills. Last but not least, the capacity of companies to stay open to external ideas is becoming increasingly important.

Policies aimed at supporting the innovation process and improving the innovation ecosystem need to take this cultural component into account. According to the OECD's [Science, Technology and Industry Outlook 2014](#), one key step in this direction consists of raising public awareness of, and interest in, science and technology. A second step is to foster entrepreneurship and improve the cultural perception of entrepreneurial activities. Here again, policies can help develop, for example, a positive attitude towards

risk-taking and failure. Finally, policies should address the capacity of public and private research and innovation institutions to better cooperate with each other and with other innovation ecosystem stakeholders on issues related to workers' mobility, flows of knowledge and intellectual property rights, and financial incentives.

Regarding all these aspects, education and training play a key role in the development of a culture of innovation, by providing the current and future workforce with the right skills for innovating.

Risks and limitations

Whether at the European, national or local level, citizens seem to generally have mixed feelings towards innovation.² Cautious and at times negative, their attitude originates partly from the fact that innovations that are designed to solve a problem in the short term may have unexpected consequences in the long term (perverse effects, hidden costs, negative social and/or environmental outcomes, etc.). A well-known example is the use of asbestos for insulating buildings, which was later established to be a source of health issues in the longer term. The use of fossil fuels that helped trigger the current climate change phenomenon is another such example.

To respond to these limitations, the concept of 'responsible research and innovation' (RRI) has been introduced in the context of the European framework programme for research. As [defined](#) by the Commission in 2012, RRI 'means that societal actors work together during the whole research and innovation process in order to better align both the process and its outcomes, with the values, needs and expectations of European society.' Linked with the concept of the [precautionary principle](#), RRI attempts to take into consideration various aspects of the consequences of the innovation process to prevent negative social, environmental or economic outcomes.

Another aspect of the cautious attitude towards innovation is linked to the negative outcome of the 'destructive creation' process. The introduction of innovations that replace existing products and companies can provoke negative effects on the socioeconomic fabric, such as unemployment of low-skilled workers. The rapid replacement of vacuum tubes by electronic transistors, leading to the decline or disappearance of large companies in the 1950s is a vivid example of this effect. Training and education policies are needed to address the adaptability and the employability of the workforce in order to avoid such effects.

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Endnotes

¹ Diagrams of the different models discussed here can be found on the [website](#) of IPASCO.

² A Commission [Eurobarometer](#) survey showed in 2005 that 49% of respondents from the EU-25 were either 'anti-innovation' or 'reluctant' to embrace innovation.

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3. Global cooperation: a consistent European strength

The EU has a clear interest in promoting global governance. We must work at planet level to achieve our objectives of sustainable development, security, peace and equity: objectives no territorial actor can secure alone. Positive transnational cooperation is possible and the EU should show a willingness to experiment in order to improve it. The global dimension must be part of any EU deliberations on governance. This note summarises the link between core EU values at home and worldwide. ¹

Europe's stance on global cooperation must reflect the conviction that society, as opposed to only individuals, markets and State, does exist; and that a society does exist within the European Union within which governance can be discussed and improved. Democracy is essential to governance but governance is sometimes criticised as introducing non-public and more selfish elements into the public sphere of government. The danger of privatising and eroding democracy clearly exists but including business and civil society in governance can reduce some of the imperfections of government.

There are two sets of reasons for the pursuit of better governance beyond EU borders: growing interdependence driven by economic globalisation; and the rise of threatening, transnational challenges such as climate change and poverty which require greater effort and shared responsibility at global level. These twin pillars of a forward European vision are as true in 2016 as in 2000!

The existing system of governance, although it has achieved much, still has many shortcomings which contribute to conflict, poverty, and unsustainable development. Current institutions of governance are increasingly criticised as being unaccountable, lacking transparency and legitimacy and being incapable of responding to today's challenges. There is considerable scope for improving these institutions and complementing them with new tools. The EU has much to contribute to this task but it must also improve its own ability to provide input if it is to realise its full potential. Like the institutions of global governance, the EU must improve transparency and openness to voices from outside and strive to speak with a single, coherent voice.

This report analyses governance beyond the EU's borders with an emphasis primarily on first pillar themes: its conclusions are, therefore, a first set of ideas which could usefully be tested in fields covered by other parts of the Treaty.

We submit the following recommendations compiled 15 years ago, but which remain relevant to today's challenges:

¹ This is an extract from "Working Area No 5 - An EU contribution to better governance beyond our borders". Report of the Working Group - 'Strengthening Europe's contribution to world governance' Working Group 5. Chairman: R. Madelin; Rapporteurs: R. W. Ratchford, D. Juul Jorgensen

- In line with its global responsibility, the EU should devote greater attention to the impact of EU policies on third-country partners as well as on ourselves, using both economic and non-economic definitions of well-being; and to promoting a positive view of the scope for cooperation with our partners at global and regional levels.
- High priority must be given to the development and use of analytical tools that help EU citizens and policy-makers to understand the impacts of policy innovation, *ex ante*, as well as *ex post*. No policy should be defined without using such tools for assessing its overall impact on EU interests and also, where relevant, on global interests. This implies a significant allocation of resources to the development of these tools.
- Broader participation in EU deliberations on global policy can help to provide a sounder basis for decision-making. We favour the inclusion in our deliberative processes (though not decision-making) of third-country players, governmental or not, with an interest in EU decisions. Such consultative inputs are crucial to the quality and legitimacy of EU policy.
- It is desirable and in the EU's interest for international policy-making to favour steady progress, a willingness to tolerate those who can only move more slowly and a commitment to ensuring that common policies are written at the appropriate global and regional level, and that all players are given the capacity, know-how and resources to apply them.
- The EU should use the growing range of proven approaches to global problems (benchmarking, peer review, non-hierarchical governance, soft law and, where appropriate, co- and self-regulation) to build on the successful elements of hard international public law. It should not follow the favourite recipes of the past without close assessment of possible lower cost alternatives or complements.
- The EU needs to ensure that its internal institutional operability and decision-making processes are more responsive to those elements of its citizens' objectives which are supportive of global governance.
- The EU should explain to its citizens the added value of it taking an active role in global governance.
- Given its weight, responsibility and interest, the EU needs to strengthen significantly its international representation and ensure that it speaks with a single voice in international and regional forums.
- The EU should continue to nurture greater coherence and integration between all policy areas, including by reviewing structures, in order to strengthen its contribution to global governance: the sustainable development strategy is a key opportunity to do this.
- Drawing on ideas emerging from Member States and civil society, the EU should launch a comprehensive internal discussion on the necessary reform of multilateral institutions in the medium to long term. The aim should be to boost the effectiveness and powers of enforcement of such bodies by identifying resources and structural change taking into account the specific nature of problems confronted by each organisation and scope for action at global/regional level.
- In the short term, the EU should strive to promote greater coherence between existing international organisations. The EU should also continue to champion greater openness and transparency in international organisations. The aim should be that all members can play a full role, institutions are open to contributions from outside players, and institutions have greater legitimacy in the eyes of those affected.

4. Industry 4.0

The digital transformation touches everyone. Bakers as well as geeks. Traditional sectors need a clear plan of their own. Internet and Data-driven transformation: factories become digital, products become services, and prosumer models dominate

- ***What are the challenges?***

Several national and regional initiatives such as *Industrie 4.0* (DE) or *Industrie du Futur* (FR) were launched recently. Addressing the challenges of digital transformation at national level alone though bears the risk of leading to further fragmentation of the single market and to efforts below the critical mass needed to attract private investments.

The state of the digitisation of industry varies across sectors, particularly between high tech areas and more traditional ones, between large companies and SMEs and also between Member States and regions.

Digitisation of the industrial fabric brings about new regulatory challenges. This includes issues relating to data generated by a multitude of new smart products or liability of more autonomous systems.

The need for new multidisciplinary and digital skills is exploding, such as combined data analytics and business or engineering skills. Working in a digitised economy will require new skills and capacities including more creativity, communication and adaptability. It will require a massive upskilling of the workforce at all levels.

At the same time, advances in automation, robotics and smart systems are increasingly transforming the nature of work, not only for repetitive tasks but also for sophisticated tasks in administrative, legal or supervisory functions.

- ***What will be the benefit of successful action?***

With more than 4% of GDP, the ICT sector in Europe represents a significant share of the economy, employing more than 6 million people. The added value of this sector in the EU (production of digital goods), spanning from components to software products is above €300 billion and represents close to 10 % of the added value of industrial activity overall.

Close to a third of the growth of the overall industrial output in Europe is already due to the uptake of digital technologies. Similarly, more than a quarter of the growth of value added in the automotive sector comes from the integration of digital innovations in the car and in the design and production of cars.

A recent study commissioned by the Federation of German Industries (BDI) suggests that further digitisation of industry in Europe will bring significant growth to the EU's total industrial added value. Conversely, a delay in digitisation could lead to massive losses of more than €600 billion in EU GDP per year by 2020 compared to a business-as-usual scenario.

Finally, digital innovations are a key enabler for meeting the objectives of many of our societal challenges from sustainable health systems to the improvement of resource and energy efficiency as addressed in Commission policies like the Energy Union and the Circular Economy.

- ***What is being done and who needs to do more now?***

A governance framework is being set-up in which the various national and regional initiatives will be gathered. The goal is to align the plans of the EU in this area with those of the national and regional initiatives, in particular related to large-scale testing and experimentation in a number of strategic application areas such as connected and automated driving.

Europe needs to benefit from digital innovation hubs which focus on:

- Providing easy access to digital technologies to every company in the EU, wherever situated and whatever size or sector.
- Networking and collaboration of digital competence centres and cluster partnerships.
- Sharing of best practices and developing a catalogue of competences.

Regarding the regulatory framework, areas for intervention include:

- Propose a legislative initiative on free flow of data within the EU in order to remove or prevent unjustified localisation requirements introduced by national legislation.
- Clarify the emerging issues of data ownership, access and re-use rules especially for what concerns data generated by sensors and other collecting devices.
- Review the legal framework for autonomous systems and IoT applications in particular safety and liability rules and explore the legal conditions to allow large scale testing across borders

... and, in the area of skills:

- Organise a social dialogue on the impact of digitisation on work, starting 2016.
- Support cooperation at EU-level between industry and education providers on relevant curricula in schools and universities on ICT upskilling and retraining.
- Connect industry and research organisations to the national and EU Grand Coalitions, and stimulate commitment from industry to take action.
- Engage digital innovation hubs in skills for mid-caps and SMEs.

5. Smart Specialisation for Regional Innovation

Smart specialisation is the name given to entrepreneurial innovation that matches the needs and opportunities of a given region. Europe's rich diversity is one of its most valuable innovation assets. Local innovation initiatives deliver results because they respond to local needs and opportunities. Regional, smart specialisation holds the promise to bring a targeted boost to innovation across all regions in Europe. Effectively linking up related regions and clusters across Europe can lead to greater scale of innovation at lower cost, and a deeper, more resilient innovation knowledge network inside the European Union.

- **What will be the benefit of successful action?**

- A world-leading network of innovation clusters in Europe. The benefits of clusters have long been recognised, especially for SMEs. Start-up clusters, food valleys, creative industries cities, or even non-location specific clusters for financial services such as those in Ireland are hotbeds of innovation. Creating a network of clusters will make Europe's innovation fabric scale up and grow, and more resilient
- Accelerate uptake of ideas as flexible governance mechanism to speed up process of putting new products and services into market
- Matching EU research strengths with business needs by putting in motion the wealth of knowledge existing in the EU to increase competitiveness of EU businesses and accelerate uptake of solutions to tackle societal challenges
- Quick public policy response to ever changing global and local economic environment – flexible mechanism to increase resilience of local economies to external shocks
- Strategic alignment of investment pipelines in industry and research, in private and public sector – avoidance of scattered, fragmented and duplicated investments
- Integration of local communities across business sectors, scientific disciplines and EU territories – decreasing the degree of information asymmetry
- Enhancement of interregional cooperation between innovation actors across EU – exploiting EU single market potential through enhance collaboration of innovation actors in related activities
- Emergence and development of EU value chains – co-creation and demonstration of initiatives possible if economy of scale and scope at EU level is used
- Increased leverage effect of EU funding – attract private investors to realistic and bankable innovation initiatives

- **What are the preconditions of success?**

- Real and continuous interactive process (so-called Entrepreneurial Discovery processes) between businesses, universities, research centres, and wider groups representing civil society that mobilise innovation actors, generate new ideas and bring them effectively to market.
- Modern government means focusing on providing the right conditions to empower key actors to contribute to the strategic development of the territory. Government needs to be much more engaged in helping design and develop the collaborative investment projects as a key driver of Entrepreneurial Discovery. New skills in public administrations require collaboration skills, leadership, team and working as well as the ability to translate feedback into effective public policy.

- Political leadership is necessary to embed design and implementation of smart specialisation in the overall policy making of the region, based on a shared commitment of a broad range of innovation actors to a common vision of regional economic development.
- Openness to the external world is a must in the global economy. Innovation networks call for regional and innovation policy that goes beyond regional and national borders and are not afraid to be benchmarked and cooperate with others.
- Transparent monitoring mechanisms - besides the legal obligations - should be understood as a management tool for the strategy. Good monitoring system helps public authorities to properly implement and react promptly to inappropriate deviations.

- ***What is being done and who needs to do more now?***

- Rolling out Smart Specialisation across Europe. European Structural Investment Funds on research, technology and innovation can only be given if a proper smart specialisation strategy is in place. However, more ESIF programmes than just research and technology should build on smart specialisation, and H2020 funding should be used more systematically to complement the research part of the strategy.
- More than 120 national or regional smart specialisation strategies have been submitted to the European Commission, and a total of €66 billion is allocated directly in 2014-2020 to implement smart specialisation strategies. More cooperation between regions is needed to create European value chains, synchronise private and public investments and increase impact. Such trans-national, inter-regional and cross-border cooperation will also help industry finding missing competences, access different research and innovation infrastructure located in other European regions, and identify new business opportunities beyond their geographical boundaries.
- Development of thematic smart specialisation platforms at EU, national and regional level – especially for SMEs, who do not have the resources to invest in networking and participation in innovative projects. Intermediaries exist^{cliii} that can kick-start and facilitate the collaboration processes between businesses and researchers to design and implement projects, while others can provide financial engineering advice to make emerging projects bankable
- Continuous conceptual, technical and financial support through the use of ESIF technical assistance, the S3Platform, expertise from academia, OECD and World Bank, and through peer-to-peer reviews

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6. Smart Specialisation: the case for Energy

This paper shows what can be achieved when Smart Specialisation meets Energy policy. It highlights what could be achieved with serious and consistent push towards smart specialisation across all thematic priorities of the European Union. Smart specialisation in Energy aligns energy innovation activities at national, local and regional level through the identification of the technologies and innovative solutions that support in the most cost-effective way the EU energy policy priorities. It helps in coordinating, rationalising and planning respective energy strategies of business and research communities at local, regional, national and EU level. It also helps link energy business and research from different EU regions to work on specific smart specialisation areas e.g. cost reduction in offshore wind or optimised corrosion management, introducing modelling, sensing and design in energy.

- ***What will be the benefit of successful action?***

The smart specialisation approach is now widely applied in European countries and regions as a way to deliver innovation priorities under the EU cohesion funding. However, a more integrated approach linking regional funding with thematic EU priorities and policies would reinforce the effort to achieve the wider Europe 2020 goals and a more efficient uptake of EU funds in the different thematic areas, as well as in the individual territories of the Union.

- ***What are the preconditions of success?***

A key element for success is the wide collaboration of stakeholders and policy makers, both inside the Commission and outside, at the different territorial levels. This is necessary in order to avoid fragmentation of efforts and to ensure full consistency across themes and territories, while having specific focus on the global objectives of the EU policy action (e.g. Energy Union, Digital Single Market, Industrial Renaissance, etc.).

- ***What is being done and who needs to do more now?***

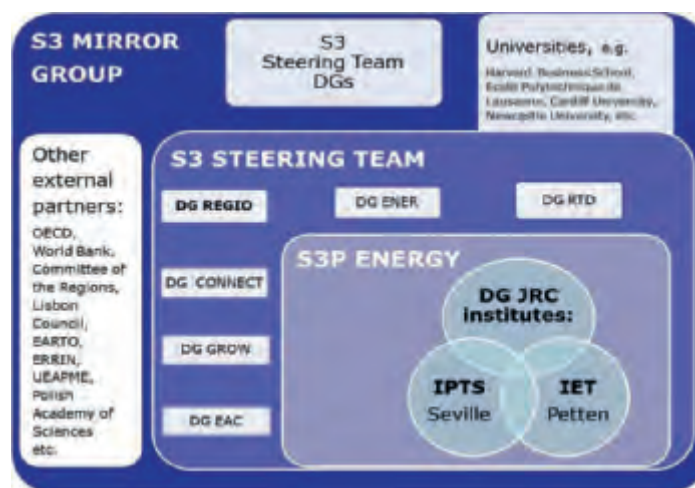
The first attempt to bring together both regional policy and thematic policy in a consistent platform-type approach in the area of smart specialisation has been the European Commission's Smart Specialisation Platform on Energy (S3P Energy).

This is a project which aims at 1) supporting the optimal and effective uptake of the Cohesion Policy funds for Energy; 2) assists countries and regions to set up strategies to accelerate the development of a technology-based low-carbon economy; 3) helps the implementation of the smart specialisation strategies of those regions that have chosen energy-related priorities in their strategies.

The S3P's The Smart Specialisation Platform on Energy's structure is summed up in the following figure.



The [Smart Specialisation Platform on Energy](#) works with many other stakeholders both in and outside the Commission, such as the OECD, the World Bank, universities, and major network organisations. Furthermore, it has direct contact with regional/national authorities in the EU.



The conditions to make this configuration effective is the ability to translate collaboration within the institutions into concrete projects, joint initiatives and trans-border cooperation, in order to achieve real impact on policy action on the ground. Monitoring mechanisms are a very important feature of this scheme, as they can track impact both on thematic objectives and on regional development.

The thematic approach to smart specialisation is also particularly relevant in the phase of implementation of smart specialisation strategies, as this phase requires the operationalization of strategic objectives (i.e. smart specialisation priorities) into concrete funded projects.

The European Commission is currently working on setting up a number of thematic smart specialisation platforms in policy areas, which show to be particularly recurrent in the smart specialisation priorities set in regional and national strategies. This refers for instance to: (i) industrial modernisation; (ii) agro-food; (iii) digital growth.

7. Developing Top Academic Institutions to support Innovation2.0

Competitive innovation ecosystems depend on a stimulating higher education and research environment. Academic institutions are key.

Such a statement is obvious at local levels. Regional technology innovation ecosystems such as the Silicon Valley, Boston, Tech City in London, Paris-Saclay or the Beijing ecosystem are [rated by the MIT Technology Review](#) as being the most promising worldwide for the years to come. Each benefits from the collaboration with an academic fabric located in its area, which includes at least one when not more research universities supported by several colleges and vocational schools.

Identical configurations are at work when considering countries or regions of the world. An obvious case is provided by the USA. Its dynamic leadership is dependent from a sophisticated blend of business entrepreneurship, federal funding and skilled labour force, a key contextual factor being the existence of a dense network of universities. While in 2013 the countries members of the European Union (EU) had an estimate of more or less 3.300 active higher education institutions (HEIs), the number reached an estimate of 4.500 universities and colleges granting degrees across the various states of the USA. Quantity per se does not really make the whole difference, at least not as much as quality. The world leadership of the US innovation ecosystem relies first of all on the quality of its academic production both in higher education and in research.

US HEIs are overrepresented among the best of the best universities worldwide as measured by metrics of excellence. For instance 22 of their universities are ranked in the top 30 segment of the world league as defined by the 2015 Annual Ranking of World Universities - better known as the Shanghai ranking. By comparison only four HEIs located in countries members of the EU - all four being British - join this segment³. The leadership of US HEIs covers fields such as emergent technologies, but not only. It is also the case for most academic areas, from life and earth sciences to humanities and social sciences where their colleges and vocational schools are persistently positioned as world benchmarks. Academic contribution to innovation ecosystems does not mean an overspecialization in a few niches while dropping any attention for general education and for research in basic science as well as in social sciences and humanities. Cutting edge innovation production requires intellectual agility and cognitive openness of the labour force. Its educational background matters as much as its professional expertise. Size as such does not by itself make a difference. For instance the California Institute of Technology includes 300 faculty members and enrolls 2.130 students, 55% being postgraduates.

2 By Jean-Claude Thoenig. A chapter for the book edited by Stefan Schepers and Klaus Gretschmann. «[Revolutionising EU Innovation Policy : Pioneering the Future](#) ». London, Palgrave, 2016. By kind permission of the Editor.

3 Another university based in Europe is ranked in this segment: the Swiss Federal Institute of Technology at Zurich.

Universities and institutes of technology acting as knowledge hubs inside performing innovation clusters look alike in the USA as well as in other regions of the world. They cover a wide spectrum of academic domains. Their classrooms provide at the same time excellent teaching to high calibre students and their research labs outstanding knowledge that might be in a way or another of relevance for societal needs and economic progress. Leading research universities set benchmarks not only inside their national environment but also for universities located in other regions of the world⁴. They define new academic knowledge agendas others would later imitate. They operate in the forefront of innovation. They definitely are research universities but of a special kind. In the USA they are part of a class of HEIs that comparatively speaking are running so-called very high research activity⁵ While metrics based ranking approaches have been welcomed by many EU member state policy-makers, no classification has ever been developed at the levels of the EU as such and of most of its member states, as if all HEIs would be equal - a principle crystallized into their legal frame - , and even much more equal than the US stratified system, this even if in fact this is not the case in terms of quality production and of support by steering agencies.

A collateral strength of the US academic fabric relates to its density. Would two or three leading domestic HEIs start to underperform, their decline would not induce major damages for the whole innovation ecosystem capacity competitiveness as such, at least less than what would be the case inside an EU based ecosystem as of today. This evidences to a large extent the robustness of the US innovation ecosystem since many years. Ferocious competition is at work between HEIs to attract talent and deliver knowledge. The same happens to get successful access to federal grants and donors such as companies. For private as well as for public research universities such revenues are a matter of financial survival. [For instance](#) one fifth of the operating revenues of the University of California at Berkeley are federal grants and contracts. But for Washington policy-makers this is less a worry than a resource: would one HEI fail, many other substitutes are accessible to play the game.

The People Republic of China, while still lagging as compared with the USA, has since a few years also paved the road to high competition dynamics in building a national ecosystem based on two main pillars: the academic excellence of some of its HEIs, close linkages with innovative firms and emergent markets, for instance associated inside a local or a national cluster.

Therefore to develop a competitive innovation ecosystem at national and a fortiori at regional levels such as the EU requires a web of strong academic institutions that play a role of knowledge hub in research and in education. They have to evidence an actual strategic capacity of their own enabling them to get their projects funded by private donors, companies as well as by public grants, to allocate a great deal of attention to evolving societal needs as well as to new economic opportunities.

4 J.C. Thoenig and C. Paradeise. 2014. « Organizational Governance and the Production of Academic Quality: Lessons from Two Top U.S. Research Universities ». *Minerva*, 52 (4): 381-417.

5 The Carnegie Classification of Institutions of Higher Education is a framework for classifying US colleges and universities in terms of missions. HEIs classified at the top in terms of academic quality grant at least 20 doctorate awards per year. Their research activities are assessed by research expenditures, the number of research doctorates awarded, the size of research-focused faculty, and other factors.

They should also contribute to overcome mental and practical obstacles to business-university cooperation - such as preferences for subsidies because presumed academic freedom - that may still survive in some countries such as France and new EU member states. In any case such academic institutions will have to play a major role in defining new horizons for knowledge development, as is the case today for multidisciplinary issues. Their performances have to be rather consistent across time and domains. Scientific merits are considered as the main criterion of success in a competitive environment

- ***Where is the EU academic landscape heading to?***

Building a stronger academic capacity inside the EU is an ambition often considered as a geopolitical and socioeconomic priority for the years to come. Though a dozen or so of its universities may compete with their US counterparts, the EU has not yet reached a critical mass so as to build up a competitive innovation ecosystem of its own. It may even be lagging as compared with Asian upcoming ecosystems such as China and India. While time goes by, many obstacles have still to be overcome by the EU and by its member states before giving birth to relevant achievements.

Reforming academic institutions is often considered to be a desperate cause when not a nightmare to avoid. Inside the EU the landscape remains highly scattered when not heterogeneous at the local level - HEIs operating according to a variety of statutes and constitutive rules - and at the level of the member states - higher education and research affairs being steered with very different approaches.

A series of initiatives have already been launched to decrease the fragmentation of the European academic fabric. For instance some common standards such as the Bologna agreement about education diplomas have been defined and implemented by member states. Specific programs funding student exchanges and supporting R&D projects have also been launched by the EU budget. In the last twenty years new ideas have spread around to handle the challenges raised by evolving societal expectations. A worldwide massification wave of enrolled students has gone hand in hand with a commodification of higher education - students being more and more mobile internationally - and a corollary globalization of world standards - world league ranking being a major reference. Higher education and research are supposed to contribute increasingly as the vehicles to build a knowledge society, as defined by the EU Lisbon agenda of 2001. At the same time taxpayer money has become scarcer and policy makers less generous. Some concepts prescribed by the OECD and the World Bank have for the best or the worst been supported by policy-makers in most member states: quality benchmarks such as the ideal-type of the so-called World Class University, ranking metrics to assess academic performances, increasing attention allocated to cost rationalization and New Public Management principles ⁶.

To some extent the structural opposition between three models of higher education and research - the Anglo-Saxon, the German Humboldtian, and the French Napoleonic model - is slowly fading away⁷.

⁶ C. Paradeise and J.C. Thoenig. 2015. *In Search of Academic Quality*. Palgrave Macmillan.

⁷ C. Paradeise, E. Ferlie, I. Bleiklie and E. Reale (Eds.). 2009. *University Governance Western European Comparative Perspectives* (Dordrecht; Springer). Differences between the three models refer among other things to the degree of proximity between the universities, the state,

Relevant steps forward have already decreased heterogeneity in the world of European academia. Agreeing to share common standards or joining intergovernmental research programs generates positive incremental achievements, even if sometime they may require patience and compromises. Nevertheless much remains to be achieved. The legacy of the past still remains an influential source of heterogeneity.

One fundamental reason is that national steering of higher education and research affairs remains very active when not even more than previously. A de facto quasi-hegemony of member state policy-makers is not per se to be considered as a good or as a bad principle on the road to a EU innovation ecosystem building. What is at stake is a pragmatic question: do the ways member state public authorities actually steer the domain of higher education and research facilitate the capacity of the EU as such - not to be restricted to the sole EU policy-makers - to build such an ecosystem? Facts may suggest that this may not be the case, at least within the very next years. To a large extent this delay is the consequence of many fault lines in the EU policy-making system. For some issues are handled at the EU level and many others remain member state competence while at the same time the economy is more and more a single market one. No effective governance system has been implemented until now to overcome these fault lines. For instance the Open Method of Cooperation as defined in Lisbon in 2001 has clearly failed. Traditional cooperation styles remain much too slow to cope with rapid technology progress and on-going market evolutions.

It is often mentioned that national policy-makers are not spontaneously eager to welcome initiatives that might open the door to third parties - other member states, the EU Commission, etc. - to have a say about how to steer their own national jurisdiction. Except to catch financial opportunities foreign interference in my own backyard is not really welcome. I as a member state want to keep the final say when not exclusive control about my academic affairs including the steering of the HEIs located on my territory. Even when common principles are shared that may harmonize the EU academic landscape they actually induce more heterogeneity across countries. This is what happens most of the time about the autonomy of HEIs.

Flexibility of local research and education entities is a crucial pre-requirement to allow them to be more active contributors to innovative ecosystem building and performance. Autonomy is the name of the game. An HEI should benefit from a very relevant room of manoeuvre to define by its own a strategic capacity, therefore to have much discretion for instance about its revenues and its expenditures, about which partnerships to build with other parties of its cluster or about the financial vehicles to run joint programs with companies. Policy-makers, politicians and HEIs heads claim *urbi et orbi* that autonomy has to be allocated. This does not at all imply that public universities should be privatized. Nevertheless wide differences exist between countries for instance in terms of the decision-making capacity of their own governing bodies to allocate their budgets, to raise revenues such as tuition fees, to set up institutional arrangements and vehicles such as endowed foundations attracting money from donors, and to deliver specific diplomas.

and the referential community (local or national), the status of the universities (whether similar or different in the same country), the ties between education and research activities, and inner institutional and organizational structures of universities. See G. Neave. 2003. " The Bologna Declaration: Some of the Historic Dilemmas Posed by the Reconstruction of the Community in Europe's Systems of Higher Education », *Educational Policy*, 17 (1) :141-164;

A comparison between public and non-public hubs of regional ecosystems suggests that the former benefit from a high level of strategic capacity despite the fact that they are part of a state system. Constitutional and legal factors may matter but at the end what makes the difference is the way the system is actually steering its HEIs. Such is the case when comparing a private foundation such as the MIT with a campus such as Berkeley that is part of the major public university system in the world. Both research universities operate in very autonomous ways, a slight difference being that the Berkeley is not allowed to decide in a discretionary way the level of tuition fees of most of its students⁸. An identical autonomy-based steering mode is also how the Swiss federal authorities manage their relations with their two very successful institutes of technology at Zurich and Lausanne.

What happens inside the EU? A study made by the European University Association suggests that the autonomy principle does not at all carry the same meaning and content when comparing how member states and German Länder steer their HEIs⁹. Four different components of autonomy are assessed: organizational, financial, human resources, academic. The scorecard suggests major differences. Two countries, UK and Estonia, score at the top on all four facets. A few other countries such as France and Greece score rather very low in terms of autonomy of their HEIs. Most of the other countries allocate moderate autonomy, sometimes high on one or two facets and average when not low on the others. In synthesis the impressively wide spectrum evidences that the flexibility capacity of local HEIs varies dramatically from one country to another, some been agents acting in a highly centralized national system and other being able to act in an entrepreneurial mode in decentralized systems.

Worse, in some cases the right hand of policy makers ignores what their left hand does. The way the authorities apply their policies, far from making the changing environment of academia easier to understand and therefore anticipate, in fact amplifies uncertainty and even confusion by producing a series of effects, which, although they are not always contradictory, at least contain their share of ambiguity.

On one hand, policy-makers use more or less coercive measures to drive the universities. They force them to rationalize their administration, to take on new missions, to adopt a rationale based on the quest for excellence and to implement rulings and laws that follow each other at high speed. In France, for instance, three new laws regarding higher education and research were introduced between 2006 and 2013. They concerned a very scattered collection of points, ranging from how to implement the Bologna Declaration or to cooperate, and how local institutions may combine forces or even merge, to defining teachers' responsibilities, languages of instruction or institutions' accounting systems. Guidelines gush forth with no time for the preceding one to be deployed in the field before the next arrives. The more productive and pushy the policy makers become to try to get results, the less things actually change on the ground and vice versa. These lead the academic institutions to navigate between great caution and opportunism. Public policies also encourage opportunistic tactics, which make use of the tools for purposes other than those they were designed for. In UK, the Conservative government introduced a ceiling to university tuition

⁸ J.C. Thoenig and C. Paradeise. 2014. « Organizational Governance and the Production of Academic Quality: Lessons from Two Top U.S. Research Universities ». *Minerva*, 52 (4): 381-417.

⁹ T. T. Estermann, T. Nokkala and M. Steinel. 2011. *University Autonomy in Europe*, vol. II, *The Scorecard*. Brussels: European University Association.

fees of £9,000 per year. The idea was to ensure financial protection for all universities. In fact, it is used by some of them to increase the number of students they recruit by maximizing their investments on additional academic personnel recruitment and infrastructure building. More precisely, the top-rank institutions are the ones to gain the most from the provision and they do so at the expense of the mid-range institutions, because the latter do not have the same advantages as the former in the competition to attract mobile students. Opportunism is also expressed in several EU countries by HEIs hunting for students from outside Europe, because they pay tuition fees that are significantly higher than the legal cap set for national residents and Europeans.

Another practice of central policy makers is to develop procedures and uniform indicators themselves and impose them top-down relocating micro-management into HEIs. Nevertheless, the latter remain closely controlled by the incentives and evaluations to which their performance is henceforward subject. This remote control is a modern version of bureaucratic administration, which combines the invention of common performance or quality criteria with the assignment of financial resources, the formulation of formal structures and the verification that they are actually applied. In fact, it inflames the paradox of seeking to create autonomy. It makes them more compliance seeking, instead of heightening their local strategic capacity. In fact their dependency on how the resources of public policies are used is increased. The local HEIs that the central officials wanted to make more autonomous by giving them administrative expertise, in fact behave like disciplined agents in the eyes of their principals, who assign resources to them. This happens in countries that also hope to spend less taxpayer money for academia. In UK, the performance criteria used in universities are defined by the ministry - using categories built with the support of academic peer committees - which implements them via the Research Excellence Framework when assigning financial resources.

The argumentation underlying the observations listed in this section is that reform dynamics as currently in process are not by themselves going to facilitate the creation of a competitive academic capacity at the level of the EU as an innovation ecosystem. Despite some initiatives launched to have member states adopt shared standards or even join common programs in research and in education, dysfunctional consequences have not made the landscape capable of generating spontaneously pre-requirements to harmonize policies so as to build up sufficient academic institutional capacity to back up a European ecosystem. More specifically the obstacles refer to the strength of national steering approaches. They keep playing a decisive role, in some cases more than ever. All are trying to address identical issues such as increasing international competition and decreasing public money. But each does it in its own way. Path dependence remains strong. The current landscape, which was diverse, enters a phase of complexity. National policy-makers' good will is less the problem than the fact that they basically have to care first and above all about their own jurisdiction, that they do not share identical cultural and cognitive mind-sets, and that still major differences are at work between the constitutive blueprints ruling the various countries. The idea of building up the academic support for a EU ecosystem might be listed by them not as a priority on their agenda, but as a source of distraction. As stated by a former minister of higher education, "why rush? It is a good idea, but to consider in a few years. And do not forget that inside the EU colleagues from other countries are also competing with my own country, higher education and research being a major factor for our national balance of payments".

- ***Learning from change reforms***

To expect that a majority of member states will spontaneously put much pressure so as to push the EU and its ruling bodies to handle the issue might be a do-gooder wish but has very little chance to occur.

Unfortunately as time goes by, the delays might become more and more longer to catch up with other regional or national ecosystems and to put the EU among the leading continental competitors worldwide, would the goal be to develop not just two or three competitive academic poles but at least twenty when not more for 2025. To give birth and develop academic poles initiatives have to be considered and launched at least ten when not twenty years in advance. The problem is that a 2025 time horizon is quite short. Three lessons should be kept in my mind by policy-makers, whether at the national or at the European level, when considering how HEIs should and could contribute more intensively and actively to hem a EU competitive ecosystem emerge. They may be listed as three "don'ts": do not waste time to launch as soon as possible change processes, do not anticipate immediate relevant outcomes, do not set up a centralized governance process of the new academic fabric.

First, time required is quite long. A former president of Harvard used to say a century ago that to build another HEI such as Harvard would require at least half a century. Such wisdom remains valid today. The Federal Institute of Technology at Lausanne was considered since its creation as a decent but average local HEI. Nowadays it is the academic hub of a highly performing local innovation ecosystem, it is ranked as #17 of the world league according to QS and has joined the top hundred segment of the Shanghai ranking world league. It went through a radical change of its research and education strategy, it modified its governance style and it built up strong partnerships with companies dealing with emergent technologies in numerous fields. This transition period started already in the early 1970s. It is still going on according to the blueprint that had been defined half a century ago and became implemented step by step under the leadership of three different presidents. In other terms changing and remodelling academic institutions requires patience and continuity. As social and human organizations they have to address managerial and strategic challenges such as to attract and retain talented faculty and students, to set up productive cooperative ways to make different disciplines compatible under the same roof, to upgrade and diffuse cutting-edge R&D production, etc. Running them in a sustainable manner as top of the pile HEIs requires much more than sheer charismatic leadership or business firm inspired strategic capabilities and operational skills¹⁰. Such ambitions cannot be achieved by decree and require changes cannot be managed top-down. This may lead to contradictions. For policy-makers tend to underestimate the importance of time horizons when launching a reform policy. Sometime they dream that this or that university would be a good candidate to join the ranks of the elite of the elite. They forget that academic change requires long time horizons that are not compatible with electoral time horizons. They expect positive outcomes to occur short term, which often means before the end of their political mandate.

Second, policy-makers are sometime willing to allocate plenty of taxpayer money to build a new campus, to buy costly equipment, and to attract star faculty members.

10 J.C. Thoenig and C. Paradeise (2015). *The Strategic Capacity of Academic Institutions*. Working paper, Université de Paris Dauphine and Université de Paris-Est Marne-la-Vallée. Jean-Claude Thoenig is emeritus senior research director at the Centre national de la recherche scientifique and at the university of Paris-Dauphine. A sociologist by training, he was an associate dean and professor at INSEAD and a professor at the Federal institute of technology in Lausanne. His major publications deal with higher education and research, business firm management and strategies, public policy analysis and evaluation, public management, and intergovernmental relationships. He has been a consultant for the European Commission, multinational companies and national public authorities.

Money is not the main effective vehicle or incentive to grow academic hub, though it is needed. They may also believe that the size of the faculty and the number of registered students are pre-requirements for success, which is far from true when considering the quality and status of most world- class universities. A spectacular case is provided by the Paris-Saclay university project. To add an academic critical mass to an already very promising technological innovation cluster developed in this suburban location by companies, whether multinational or local companies, and public research institutes such as the *Centre National de la Recherche Scientifique* and the *Commissariat à l'Énergie Atomique et aux Énergies Alternatives* the French government has up to now spent about 6 billion euros to build new infrastructures and to fund research programs of such a greenfield project. The intended ambition is to catch up with the Federal Institute of Technology in Lausanne and with Cambridge, the success criterion being to rank this new institution among the top 20 of the world league. The way is to merge 17 already established institutions some being more than 200 years old such as the *École Polytechnique*. They also do not *a priori* share much in common - a French understatement - as they cover a variety of different domains such as management, engineering, information technology or agriculture. Some are actually specialized research institutes and others classic universities. Some are elitist *Grandes Ecoles* - for instance the *Ecole Polytechnique* steered by the ministry of Defence, the *Ecole Normale Supérieure de Cachan* steered by the ministry of Higher education, and the business school called HEC Paris and ranked as one of the two ones in Europe, which is steered by the Paris Chamber of Commerce. Others are public universities such as the university of *Paris-Sud*. This project would regroup 300 research laboratories, 15.000 faculty and doctoral students, and spent 15% of the French public research budget. Will money and size make the difference is a question still open considering the internal heterogeneities when not open resistance attitudes to full merger that have been expressed since its start [several years ago](#).

A third lesson derived from scientific observation of higher education steering relates to the unintended consequence of centralization. The more HEIs are parts of centralized systems, meaning that the less they are autonomous, and the less they have some form of control on their own resources, the less they compete between themselves but also with HEIs that do not belong to their own system. It would be too easy to blame them and only them. In fact steering of centralized systems is a key part of the problem. To develop differentiation and competition means to develop inequality among them. For instance this is occurring whenever public decision-makers refer to a unique model of HEI positioning as it may be discerned in the policy incentives and tools. One best way approaches require each university to align its way of doing according to standards set by world leaders such as Harvard and/or Cambridge. The unintended consequence is a classical benchmarking paradox. If all universities would adopt the same strategic responses to try to align themselves according to the same model, a hierarchy would be generated, which is eventually made visible by rankings benefitting some and disqualifying others while directing a large number of them away from certain necessary missions of higher education. Performance in leading edge research is one about many missions of HEIs. When each of them focuses its efforts to comply with it, even when it is often unreachable for many, the ability to accomplish other missions such as undergraduate education or contribution to local development can deteriorate. Does it make sense to cut the financial funds allocated to HEIs that are not able to compete with research universities - they are many among small and mid-size institutions - but are more or less performing in grading students for labour markets, and to pretend that they do not need cutting-edge knowledge based education? A similar question may be raised about autonomy. As a principle decentralization is a good steering approach for academic affairs. But some nuances might be helpful in defining its content. Research universities as academic hubs need even more autonomy than other HEIs to be competitive in handling their main mission.

A cutting-edge research environment refers to a highly competitive international environment - he who runs the faster wins - and it becomes even more difficult for policy-makers to assess them, research assessment basically requiring academic criteria more than administrative guidelines. A way to give room to competitive games and spirit is that public steering systems do not have a monopoly of higher education: other research universities exist that are not institutionally part of their jurisdiction and even are run as private institutions that are research universities. In that case public HEIs get a stronger capacity to negotiate with their steering bodies.

- ***Why federal approaches are more successful in generating and implementing academic changes.***

How to bring the issue of the academic contribution to European innovation on the EU agenda? As of today the role of Brussels remains associated with the fact that EU governing bodies are basically considered as providers of ways and means to sponsor arenas that set up new research projects and allocate additional funding to academic activities. Their policies are considered as legitimate as far as they basically remain distributive policies. To suggest that the EU as such might endorse a more constitutive approach raises eyebrows, constitutive meaning that EU policy tools would require institutional capacity to steer and reform academic affairs. Hostile prejudices expressed are many: the fear to give birth to a centralized and distant policy-making level, political opposition and ideological resistance to more European integration, etc. How to make an evolution happen is a serious issue not only because member states may be shy to see Brussels leading the game, but also because reforming the institutional academic fabric might imply choices that would not satisfy every state, in particular those that may not evidence the existence of an academic hub potential located in their country.

Torn apart between the Charybdis danger of not playing a part at all and the Scylla idea of building up from scratch a new institutional academic system of their own, steered in a centralized and bureaucratic manner, the EU institutions such as the Brussels based Commission should define a third alternative. One may wonder whether a federalism-based model of policy-making should not be considered.

Switzerland provides a fascinating example of a major reform of its institutional academic landscape run in a federal mode. Up to the end of the 20th century, the Swiss universities were steered and funded by cantons. Local parliaments and executive branches of each of them were in charge, benefitting from some additional funding allocated by the Confederation. The national government steered two HEIs of its own called federal institutes of technology, one in located in Zurich and one located in Lausanne, the latter having been set up and steered by the local canton but transferred to the federal policy-makers in the early 1970s. Several cantons also had set up by their own initiative undergraduate colleges (*Technicums*) to supply highly skilled labour force to local companies. The cantons were very proud of their own HEIs, as markers of their identity, as autonomous polities and sources of prestige whether locally or in some cases internationally. The first Shanghai ranking positioned three Swiss HEIs (the universities of Zurich and Basle as well as the Federal Institute of Technology of Zurich) in the one hundred top world segment. The small country called Switzerland was the third best ranked country in terms of the percentage of its HEI, much lower than the USA but close to the UK, and in any case in absolute terms much higher than any other member state of the EU.

But by the end of the 1990s several reasons pushed the executive branch of the Confederation to consider that a reform of the landscape was becoming a must: the massification of students enrolment whether domestic or foreigners, the recession of taxation revenues, the fear that the Swiss quality of academic production would drop given a much tougher international competition.

While most cantons were still caring about their own university future and autonomy, Bern put political pressure to put the issue of the reform of the whole national landscape on its agenda. Early on the initiative raised major cantonal resistance from political parties and cantonal policy-makers. It became headline news as a drama in the media. But at the end a new national law was passed that designed an integrated system including three categories: federal institutes of technology, universities, specialized *Hautes Ecoles* such as the former *Technicums* and other vocational schools from education to art. The process enacted to set up this quasi-revolution is worth considering for it explains to a large extent how this achievement was made possible.

The federal policy-makers co-opted the stakeholders involved - academics, heads of HEIs, political party leaders, cantonal policy-makers, business associations, etc.- and shared with them intensive analysis, constructive deliberation and lasting negotiations in order to overcome obstacles and design acceptable but also rational compromises. Horizontal coordination Swiss made means that stakeholders are respected as expressing relevant arguments, solutions and ideas. They also share a common public good reference and ideological pragmatism. The national and the cantonal levels played win-win games. As the 20 September 2011 federal law states it, "the Confederation takes care jointly with the cantons about the quality and the competitiveness of the Swiss domain of higher schools". The public status of academic institutions and much taxpayer money are pragmatically blended with support to and from private firms. A direct linkage is made between the massive attraction of academic talent from foreign countries and the economic benefits the Swiss economy could derive from it. For instance the two federal institutes of technology are generously funded by the national parliament so as they may keep charging low tuition fees to foreign students. Policy-makers in Bern are also by law committed to allocate the same amount of taxpayer money for the coming four years, the two institutes being able to work with a time horizon that will remain stable. Integration means that the various academic institutions involved are simultaneously cooperating - their heads meet several times per year in Bern, their research laboratories manage joint projects - and competing - for instance to raise funds from private donors or from research grants. Academic quality as controlled by a dedicated body makes the difference for the benefit of the single winners but also for the benefit of the very successful national innovation ecosystem and its strong academic hub.

Though the Swiss case should be considered as a showcase given its major achievement, other countries also address academic affairs using identical approaches. Within the EU this also happens in Germany. What is theorized as *Horizontale Politikverflechtung*¹¹ defines a common way to set up arenas facilitating deliberation and negotiation systems co-opting the various parties and stakeholders, the Bund, the Länder, the academic community associations, the industry, etc.

Federalism also is at work in the USA when considering the steering capacity of academic hubs from a national innovation ecosystem perspective. In the USA the estimate of the number of active institution granting degrees in 2013 was around 4,500. Comparatively speaking the US number includes a higher proportion of non-public institutions operating under a variety of legal and fiscal statuses. Public sector universities and colleges report to state legislatures. The executive branch also steers federal research laboratories in various domains, from energy to health.

¹¹ A. Benz, F.W. Scharpf and R. Zintl. 1992. Horizontale Politikverflechtung. Zur Theorie von Verhandlungssystemen. Frankfurt am Main, Campus

Such a heterogeneous academic fabric might be very complex to handle by the federal level given its heterogeneity and also the importance of pork barrel practices. Yet Washington plays a decisive role in a persistent manner in the way to allocate differentiated funding to universities in particular in the field of major research and development programs. It defines and operates a policy that supports primarily universities playing a decisive role in R&D and that operate like academic innovation hubs. In fact the federal policy is in line with a classification - which is not a ranking metrics - of higher education institutions according to their actual distinctive mission - for instance in fields such as research, education or local development. The Carnegie Foundation for the Advancement of Teaching, an independent not for profit body, updates this [classification](#) every fifth or sixth year. In fact policymakers trust academics' judgments. Professional and HEIs associations as well as think tanks and foundations have been since the end of the 19th century and still are today very active and influential actors whenever constitutive policies are at stake to reform the national academic landscape. The National Science Foundation keeps advising top policy-makers and evaluating federal research programs. Whenever academic and scientific issues are under consideration, federal policy-makers give much credit to stakeholders such as academics, state governors, leading think tanks and private foundations, just to name a few. Pioneering massive support given to some leading research universities to domains such as nanotechnologies, agronomy or IT gave birth to leading innovation ecosystems.

The argument of federalism as underlined here should not be understood as implying that only federal states can make it. The purpose is more pragmatic: it refers to a style of approach effective, whenever a common good to deliver having been defined as the rationale, - such as upgrading the European competitiveness as well as addressing societal needs -, some changes may be required in a field such as the academic landscape reforms, the issue being not yet positioned as a priority for political agendas, the legitimacy of the institutions formally in charge of the future of ecosystems being not yet shared by influential stakeholders. In contexts that *a priori* seem stalled in terms of change, stakeholders adopt a collaborative approach. Co-optation, negotiation, and cooperation as processes facilitate the way to deal with divergent views. These collaboration culture and methods are useful in multi-layered governance systems such as supranational ones whenever objectives are clear and strategies to achieve them are flexible. Federalism as a style of policy-making means polyarchy. The EU Commission should play two roles much more than it is used to- act as a convener and a coach. It should not govern as a regulator or a standard setter as it is the case for policies dealing with markets.

In pluralistic democratic polities' passions, suspicions and prejudices often play a crucial role and may hinder the construction of new solutions. Therefore deliberation and aggregation remain poor alternatives. Governance based on agnostic visions may be more adequate¹². This principle refers to the give-and-take that occurs between actors or stakeholders who consider each other as adversaries, not enemies. An enemy defines his/her stance involving the symbolic death of the other party. The conflict is a zero-sum game. One actor takes it all or loses it all. Though enemies may even respect one another, their purpose is to kill each other. An adversary bases his/her stance on a dynamic of conflict, which is not the same thing. Conflict is resolved through a compromise or a synthesis. For adversaries share enough values or objectives to make negotiations possible in which neither party wins or loses. It expresses respect for the adversaries.

12 C. Mouffe. 2009. *The Democratic Paradox*. London, Verso.

- ***First steps matter***

The ambition to develop a specific EU innovation ecosystem implies that the EU academic fabric, while evolving by considering good practices at work in other regions of the world, should not just replicate models already existing in the USA, in India or in China as one best ways.

The political leadership of the Commission should help European stakeholders leave the zone of indifference and enter a zone of shared acceptability about required academic evolutions. The scenario to avoid is to subcontract the task mainly to administrative approaches and routines. Setting up arenas and processes keeping stakeholders busy preparing reports but with no access to policy-making capacity would not change much. The issue has to be considered as a transversal policy, meaning that it should not be under the sole jurisdiction of one specific general directorate located in Brussels. Federal steering requires know-how and legitimacy that are quite different from administering programs that fund specialized knowledge domains and educational niches to competing institutions. Constitutive policies and the inequalities they may induce require some form of political legitimacy, and not sheer bureaucratic excellence.

How higher education and research should contribute to the building of a highly competitive European Union innovation ecosystem is an issue that cannot be addressed as such independently from all the other policy facets such an ambition covers. Interfaces between the world of academia and the other stakeholders involved or to be involved are key concerns that have to be addressed straight on to overcome prejudices about academic affairs as long as their contributions make sense for and get appropriated by companies, public service institutions, users and citizens, just to mention a few.

Therefore suggestions and ideas as expressed hereunder should be related to reform initiatives made for other innovation policy domains such as property rights, cluster management or public service delivery. They also imply that the ambition itself of building such an ecosystem within the next ten years is endorsed and legitimized by the political authorities ruling the European Union. Yet the suggestions made hereunder may seem quite modest. They should be considered with two lenses. They avoid defining right from the beginning major institutional change blueprints related to the roles and jurisdictions of the EU and its member states about a domain, higher education and research, in which the stakeholders involved will have to cooperate anyway. They are first steps able to generate halo effects in the mid-term.

A. To identify and assess potential European level academic hubs.

A preliminary step would be to identify HEIs having the potential to play the rule of cutting edge innovation hubs.

This initiative should be launched as soon as possible and supply detailed information within a short time period. Its mission would be to list Europe based HEIs from the point of view of several perspectives such as the network of partnerships they are embedded in, the type of domains they are covering, their way to manage and diffuse knowledge downstream, the relevant knowledge developments they may produce in the very coming years, their capacity to cooperate with non-academic innovation stakeholders, their ability to react to new opportunities and to multidisciplinary requirements, and how they are positioned internationally. This would also cover the quality of their internal management as organizations, their ability to attract talented faculty, researchers and students, and their funding policies.

A priori not more than two dozens of HEIs may qualify for such a study as far as they would fit criteria similar to those used by the Carnegie Foundation to label very high research activity universities, but more weight and attention being given to their role and potential as academic innovation ecosystem hubs.

The Presidency of the Commission should mandate this study and fund it. It would be assigned to professionals well acquainted with academic affairs. An independent body would supervise it with the support of outside experts. The High Level Policy Group on Innovation Policy Management might help define which HEIs to observe, which information and data to collect, and how to interpret them. The European Political Strategy Centre as well as the Joint Research Centre of the EU Commission could provide advice and play role as well.

The next step would be to define a classification - and not a ranking - of HEIs as academic innovation hubs.

This should be subcontracted to a dedicated institution being autonomous enough so as not to be vulnerable to third party administrative or political interferences¹³. Every fourth or fifth year the classification would be revised in line with possible evolutions having occurred in the meantime at the level of single HEIs. This classification would provide a guidance tool for companies in search of adequate partnership environments and for policy-makers in charge of economic development, but also and above all for EU policy initiatives to support HEIs active and competitive as EU level innovation actors, in various ways such as supporting partnerships with companies, other universities and research institutes as well as public service agencies, cutting-edge innovation initiatives and programs. They might also deliver some form of quality certification.

It may happen that some member states may not be immediately eligible to get a HEI located on their own country selected or even classified. In any case *saupoudrage* of support should be avoided: academic quality and contribution potential are the names of the game. At the other extreme one scenario to avoid during the implementation phase of any EU distributive policy is hyper concentration. For instance a French program of support to set up local competitive clusters launched an initial call to select only 12 of them with a support of 100 million € each. This was not feasible facing strong demand and lobbying by local economic and political actors. Yet the task force in charge was powerful enough to drive the government to accept the creation of 3 categories: world-level clusters, potential world-level clusters and so called national clusters. De facto 70 clusters were selected since the 12 world-level ones got over 3 years nearly 150 million € of support each, the 'potential' ones - another 10 - some 20 each and the 50 'national' level 5 each or less. The lesson was learnt and the criteria applied to a different program aimed at upgrading HEIs academic excellence concentrating 75% of the 7 billion € program on the top layer, 15% on the promising layer and 10% on the focused layer.

B. A dedicated policy arena

Another initiative to be taken by the Presidency of the Commission would be to open new avenues to coordinate mid and long-term development perspectives of the many stakeholders. In line with some principles described in section 4 of this chapter, the purpose

13 The US National Science Foundation could provide a reference. Some of its academic members are assigned full time for a 5 to 7 years to handle such jobs.

would be to set up an arena where various stakeholders would meet a few days per year to debate and share points of view, ideas and experience.

This could be a dedicated council dealing with specific academic development reforms or a section of a council dealing more broadly with the construction and the governance of the European innovation ecosystem as a whole. Its members might be people in charge of executive functions operating at the European, national or local levels, steering higher education and research affairs as well as economic development policies, heading HEIs, companies and professional associations, etc. Such an arena would favour open discussion and informal negotiation opportunities. It would debate, assess and report about initiatives and opportunities, achievements and obstacles, that are of relevant interest for the linkages between academic, societal and economic needs, cooperation, flexibility and shared action logics being at the core of competitive innovation systems. It could get some advice and backup from a pool of European and non-European experts in innovation management, science prospective, or innovation cluster design.

C. Articulating research and innovation: the challenge of transversality

In the coming years policy makers will have to fit the requirement of designing and managing transversal policies.

Articulating research and innovation policies is by far more productive than keeping them separate. Being locked in their unique space paradigm, the risk is that they become too supply-oriented and forget demand. They may also be prone to vested interest capture processes or to routine biases. To build a very performing European innovation ecosystem and therefore to develop high level academic hubs evidencing the potential to collaborate with economic actors, transversal policies become a decisive pre-requirement for public policymakers at the EU level but also at national and local levels. Policy-maker mind-sets make less and less sense when they consider that clear-cut differences exist between normal vs frontier science or between core vs project-based funding. Though the evolution of technologies, life and nature sciences should still attract major attention, social sciences and even humanities should also play a relevant part more than they currently do given evolving societal needs and the impacts they may have for users and public authorities who are supposed to appropriate the benefits of innovation. Fostering a broad science base for innovation purposes will more and more remain an old type of science policy approach. Policy-making paradigms should evolve. Special attention should be given by the Commission to support such an ambition, which is not really the case currently.

The EU budget is far from being irrelevant, at least considered in global terms. Main EU programs are well endowed, to say the least. For instance the Erasmus program has an overall indicative financial envelope of 16,45 billion € for the seven years (2014-2020). Horizon 2020, which is supposed to be the flagship EU program dedicated to research and innovation program, gets a funding of nearly 80 billion €. Two of its major sections are the Marie Skłodowska-Curie actions with an estimate of 6,16 billion € to be spent between 2014 and 2020, and the European Research Council with a budget of 13,095 billion € for the same period. Apparently money is not a major obstacle and innovation is considered as an explicit matter of priority. Yet a closer analysis suggests four observations. First, some of the programs support initiatives that are not explicitly focused on innovation: this is the case with Erasmus. Second, though specific programs are labelled as dedicated to projects combining research and innovation, in fact the reference to innovation gets much less attention than the reference to research, in particular for grants funding HEIs projects. Third, innovation focused sub-programs do not explicitly fund the mid-term development of specific HEIs but research projects, each of them being assessed for its own scientific merit. Fourth, some of the programs are in fact run as a set of sub-programs each covering a specific when not narrow thematic niche. In other terms a silo dynamics is at work between sub-programs,

not to mention the fact that the same silo logics may also occur across the various programs when not across initiatives taken by various units inside the Commission.

To support the ambitions listed above as soon as possible allocating additional funding from the Commission budget should not be a major obstacle. As important when not more the challenge is organizational and administrative: how to run successfully an institutional development focused project, which means how the various segments of the Commission will actually cooperate to address policies combining research, innovation and education facets while at the same time fostering economic competitiveness and social welfare by a closer and more fruitful collaboration between academia and industry. The Commission should handle such a project with adequate professional skills and innovative operational processes. For the institutional development of HEIs requires not only or mainly to allocate more funds but also and above all to coach and convene a multilayer action arena. A dedicated task force reporting to its Presidential level could be seriously considered as a way to supervise administratively an unusual but decisive ambition such as the contribution of its academic landscape to the new EU innovation ecosystem.

8. Pro-Innovation Regulation

Regulation is not pro- or anti-innovation in itself. Well-designed rules serve to correct for market failures, adding to economic efficiency and growth and to provide economic, social and environmental benefits to society at large. As regulation can impact both positively and negatively on innovators, what matters is the way regulation is designed and applied.

- ***What will be the benefit of successful action?***

Regulatory frameworks that are innovation-friendly enable companies to bring innovations to the market more quickly. A stable, predictable and flexible regulatory framework that can cope with the fast pace of innovation in the modern world, will help us to address grand challenges, take our place in an increasingly digital world and draw investment towards European companies.

- ***What are the preconditions of success?***

Innovation activities are expensive and often require long-term investments with a relatively high level of risk and uncertainty. If companies are to make the required investments of time and money, they need the right balance between legal certainty, predictability and stability on the one hand and the flexibility to adapt to market, business model and technological trends on the other. This balance will vary from sector to sector and will only be struck when innovation effects are systematically considered across all policy areas.

An innovation-friendly regulatory framework is not an act but a constantly iterating process, responding to changes in the innovation eco-system. Over time, as expertise continues to develop among legislators, the innovation impacts of regulation will become better integrated with the regulatory process. Some principles include:

- Regulation that is outcome-based rather than prescriptive in nature is more friendly to innovation: it avoids favouring incumbents and allows the scope for innovations not only to meet but to exceed the primary aims of a regulation.
- It is better to have regulation that is up-to-date and predictable and to consider the regulatory framework holistically so that regulations with one aim do not work at cross purposes with regulations in another area.
- The actual impacts of a policy are context-dependent and depend not only on regulatory design at EU level, but also the implementation at Member State level.

- ***What is being done and who needs to do more now?***

Regulation is not pro- or anti-innovation in itself: it serves to correct for market failures, adding to economic efficiency and growth and to provide economic, social and environmental benefits to society at large. Countries like Sweden, Denmark, Finland, and Germany are Europe's innovation leaders, where innovation performance is more than 20% above the EU average; they also have a strong set of regulations. As regulation can impact both positively and negatively on innovation; what matters is the way regulation is designed and applied. An 'innovation principle' could anticipate the potential innovation impacts of policy or regulatory proposals and allow them to be addressed, allowing Europe to build a regulatory framework that meets the primary aims of relevant regulations and boosts our capacity for innovation.

Key elements of the Commission's [Better Regulation](#) Agenda – such as consultation with stakeholders, the use of factual evidence, and transparency across all stages of the policy cycle – will be important elements in building an innovation friendly regulatory framework. For the first time there is a 'research and innovation tool' in the Commission's Impact Assessment guidelines. This allows for the innovation impacts of new or amended legislative measures to be assessed. The next phase will be to extend use of the innovation principle to all policy and legislative measures in order to create an environment that stimulates innovation. The REFIT Platform allows stakeholders to request an examination of their concerns about the impact of regulation, including on innovation, to the Commission.

A remaining challenge is the difficulty of obtaining data to quantify the costs and benefits of legislation. Regulatory costs are immediate costs, which fall on a limited number of stakeholders. Regulatory benefits (such as clean air, clean water, safe food, etc.) are more diffuse and spread throughout society for the benefit of all. Using pilot cases where the impact on innovation of existing legislation in a specific domain at both EU and Member State level can be tested is a good way forward as the Dutch experience in its "[Green Deals](#)" has shown.

The Commission is launching a pilot on Innovation Deals, which are a means of clarifying and finding flexibility in the existing regulatory framework. A more ambitious vision could be to examine [Innovation Havens](#) as an appropriate framework for the real-life testing and demonstration of innovative solutions even if not all existing procedures and requirements of legislation are complied with fully.

9. High Growth Innovative Enterprises

Europe's High-Growth Innovative Enterprises (HGIEs) represent just 4% of firms, but create about 50% of jobs, Europe should be looking to support them, rather than focussing on sustaining incremental innovation in existing industries.

- ***What will be the benefit of successful action?***

HGIEs boost high quality employment, and are drivers of productivity, economic growth, innovation, structural change, economic renewal, and they are often instrumental in addressing societal challenges such as ageing, the circular economy, and renewable energy.

- ***What are the preconditions of success?***

HGIEs are not necessarily start-ups. Studies have shown that high growth of enterprises in some cases only takes place more than ten years after the founding of a company. After this relatively long phase, they often only grow for a certain period. As it is often hard to identify HGIEs *ex ante*, the most effective policies are those broad-based policies which aim to improve the conditions that allow HGIEs to emerge irrespective of sector and type of firm.

Firms often go through different growth stages (start-up, survival, success, take-off-high growth, maturity), each of which has their particular challenges. In the high growth phase typical bottlenecks in Europe revolve around two areas: financing and access to appropriate human resources¹⁴.

- ***What is being done and who needs to do more now?***

The existing EU policy agenda related to broader policy domains including the Single Market agenda, Capital Market Union and the Digital Single Market can help improve framework conditions for HGIEs. The Commission (JRC, RTD, GROW CONNECT and ECFIN) is analysing the framework conditions and national policies relevant for HGIEs. However, there is limited statistical data on HGIEs and there is a shortage of evaluation studies.

National measures to support HGIEs are required, but it is less clear how effectively HGIEs are actually supported. Many Member States have tried to address the problems related to finance and high skilled labour. Policy measures have been implemented in many countries to improve the situation for start-up funding, but there are still problems with the availability of funding at the scale-up stage in Europe. There are policies to foster education in Science, Technology, Engineering & Mathematics, and management & entrepreneurship training for technical students or for high tech entrepreneurs in accelerators, but the effectiveness of these measures is not yet clear.

14 As a result HGIEs have been found to play a role in providing jobs for individuals that are otherwise often marginalized on the labour market (e.g. immigrants, the young, females, those with unemployment histories, Coad et al., 2014). See also Churchill and Lewis, 1983; Lee, 2014; "Breaking Through, Scaling-up", Science Business, 2016.

- Target support measures at the high growth phase, for example by putting a temporary (e.g. 2 year) freeze on labour costs or taxes for firms that expand employment significantly for the first time. For example, a temporary tax rebate could facilitate the expansion of firms from one to two production plants.
- Make R&D support schemes more effective by favouring radical innovations by SMEs and mid-sized firms. Such support often has a higher impact than support for incremental innovation, and HGIEs are often instrumental for achieving radical innovations.
- Smart regulation should take into account the extent to which existing and new regulations hinder the growth of disruptive business models. There seems to be a need for more regulatory flexibility.
- Systematically carry out impact evaluations of the effectiveness of support schemes and other measures relevant for HGIEs. Improved statistics on HGIEs are also required. The Commission could for example consider to set-up a HGIE scoreboard to compare the performance of Member States and help identify best practices for promoting HGIEs.

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10. Competition and innovation

Innovation involves the pursuit of new market opportunities. The core element of innovation is often to redefine markets and compete with established firms using new business models. Protection of markets and sectors from competition often results in a lower rate of innovation, a lower speed of technology adoption, and lower productivity. See also [note 26](#) on the need for more flexibility in labour markets.

- ***What will be the benefit of successful action?***

The role of competition for innovation has been the subject of much debate (Schumpeter, 1942, Arrow, 1962). The common view has emerged that keeping markets open in the sense of being "contestable" is a key enabler of innovation. "Contestable" means that innovating firms are able to gain profitable sales in competition with established firms by providing better or cheaper products or services to customers, e.g. using new business models (Shapiro, 2012). Setting-up a service such as Uber is for example only possible, if the market for providing taxi-type of services is contestable.

The impact of more contestable markets would be a key enabler of innovation. It could extend to all sectors and all types of innovation (technological, organisational, marketing etc.) as well as result in faster rates of technology adoption.

- ***What are the preconditions of success?***

Market regulation and competition policy are linked, and they can both be positive and negative for innovation, and work against each other. Competition authorities have to take into account the regulatory environment, when they assess competition cases.

Heavy regulation can stifle innovation by protecting incumbents. Competition policy normally only has a smaller role in such sectors. The liberalisation of many previously heavily regulated sectors has resulted in more innovation, for example in air transport and telecoms, but it has also meant that competition policy has taken on a more important role as a regulatory instrument, and therefore it has become more important that competition policy is pro-innovation.

Globalisation has created new challenges for EU State aid control, because Member States due to EU State aid control in some cases have not been able to match aid offered by countries outside the EU. While there is some scope for intervention under WTO anti-subsidy rules, it does not always seem to be sufficient or practical.

Pro-innovation oriented market regulations and competition policy are necessary as is a willingness of stakeholders, including social partners to accept change. Policy makers are challenged to shape policies to mitigate the negative effects of change.

- ***What is being done and who needs to do more now?***

EU merger and antitrust policy and national policies today constitute a seamless system with close cooperation between the Commission and the Member States, but competition policy has been criticized for not having a sufficient pro-innovation stance both in relation to mergers and antitrust.

A state aid modernisation package was adopted in 2014. As a result there is today more scope for Member States to give State aid to SMEs and for R&D and innovation. This includes specific provisions for so-called "Important Projects of Common European Interest" (IPCEIs), which could for example be industrial projects considered of "strategic interest".

There has been good progress towards the internal market for goods. Still, product regulation (food, chemical, waste, product safety, consumer information, etc.) allow for national specific rules on the basis of health and safety derogations to better protect citizens, but this also results in fragmentation of the internal market.

An important step towards a well-functioning market for services was taken with the adoption of the Services Directive, but there are important shortcomings. National regulations such as the rights of establishment and the granting of authorisations create barriers to the internal market for services.

Innovation would be supported if:

- Competition policy focuses on keeping markets open to entry.
- EU competition and internal market policies were better coordinated.
- Member States' market regulation policies were better coordinated.
- Member States avoided implementing national laws favouring national firms, (e.g. maximum size requirements on supermarkets).
- EU regulations for goods were made under full harmonisation with no possibilities for Member States to introduce national rules based on health and safety.
- Member States exploited the increased possibilities to support SMEs and R&D and innovation as a result of the State aid modernisation package.

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11. The EIT in the EU Innovation Landscape ¹⁵

Europe often develops ideas but fails to scale them. The EIT is maturing well and recent Communities learn from the original pilots. This note makes the case for a much more positive profile for EIT and a more central role in the innovation landscape.



- ***The EIT already creates a favourable environment for innovation & entrepreneurship***

Open and excellence-based

The EIT operates in more than 30 innovation hubs covering 15 Member States and supporting the entire innovation value chain, from education, research & development to business creation. The innovation hubs are entrepreneurial ecosystems hotspots for Open Innovation 2.0 and knowledge transfer. With more than 800 partners, the EIT and its five existing Knowledge and Innovation Communities (KICs) boost the innovation capacity of Europe and its regions by bringing together this innovation value chain with governmental organisations and agencies, societal interest groups and the financial sector as stakeholders. These stakeholders engage with each other and pool resources, including infrastructure, equipment, knowledge, technology, finance and people to achieve critical mass and to bring products and services to the market.

The EIT and its partnerships have a substantial degree of flexibility, a necessity to respond quickly to emerging challenges and for an enabling infrastructure for innovation and entrepreneurship in Europe. The EIT offers real added value: unique opportunities and a test bed for interaction and experimentation with new innovation models, mentoring, the exchange of good practice, and finding efficient and effective ways of working with national and regional initiatives (e.g. Smart Specialisation, providing support for start-ups and accelerating ventures). The EIT also accepts that failure is an intrinsic element of any innovation process and should be learned from, a point that is often lost. A dedicated programme, the EIT Regional Innovation Scheme, has been put in place to widen participation in the EIT's KICs to areas in Europe with below- average innovation capacity.

- ***The EIT actively boosts innovation and entrepreneurship in Europe***

bottom-up and result-oriented

The EIT inspires highly productive interaction between innovation hubs, stakeholders, start-ups and scale-ups. Thanks to this effective and constructive relationship, access to talent, knowledge and markets and support for new innovative business ventures is continuously fostered by the EIT and its KICs. The EIT takes a transdisciplinary approach, crossing the boundaries between disciplines, sectors, research, higher education and business, science and society, and involving all actors in the innovation value chain.

Both technological and non-technological innovation are addressed by the EIT. To be a real driver of disruptive innovation, the EIT's funding model enables a rapid re-channelling of funds when new opportunities arise. Unique entrepreneurial educational programmes are at the heart of the EIT's work; programmes designed to train a new generation of innovators and entrepreneurs and provide them with the competences and skills Europe needs to become a smart, sustainable and inclusive economy. Teams with partners from the Knowledge Triangle take a bottom-up, result-oriented approach, co-creating new products, services, processes and business models. Entrepreneurs and start-ups are coached and assisted in the development of business models and in launching innovations on the market. Good practice is identified and made available by the EIT Community and its KICs across Europe through the outreach programmes.

- ***The EIT identifies and addresses shortcomings in the EU innovation system***

impact-driven

Through its activities, the EIT gains valuable insights into boosting innovation capacity in Europe. These insights will be provided to the European Commission as part of the consultation on a European Innovation Council:

- No other EU body has comparable experience in holistically tackling major societal challenges. The EIT's KICs are delivering innovations in key areas: climate change, sustainable energy, raw materials, digitalisation, healthy living and active ageing; with food, added value manufacturing, and urban mobility to follow soon. The EIT can therefore provide thematic expertise in these areas and make a significant contribution on how to create favourable framework conditions for innovation by removing existing regulatory barriers and by creating adequate incentives.

12. Use EU funding for local innovation

Mapping the Digital Knowledge Innovation Community (KIC) nodes against the EU structural & innovation funds (ESIF) regions focussing on ICT identifies much scope for countries to draw in KIC activity with the sort of out-of-country spending that is authorised but not generally exploited under ESIF.

- ***Digital KIC are embedded within the European ICT Poles of Excellence***

According to the [Atlas of ICT activity in Europe](#) produced by the [European ICT Poles of Excellence](#) (EIPE) study, only a very small number of EU regions demonstrate intensive ICT activity. Furthermore, those regions are themselves concentrated in a small number of countries. Most of Europe's ICT activity takes place in 34 regions. Only twelve EU Member States (Germany, the UK, France, Sweden, Finland, the Netherlands, Belgium, Italy, Ireland, Denmark, Austria and Spain) host all of the top 34 regions. The top locations include München, London and Paris. With the exception of Trento, the list of the EIPE includes all the EIT digital Knowledge Innovation Communities.

The geographical concentration of high scoring regions and the high concentration of ICT activities do not come as a surprise. It is the predictable result of agglomeration, a process widely described in economic literature and also observable in the US (Silicon Valley, North Carolina knowledge triangle, Boston route 128) and elsewhere (Bangalore in India or ChangzHead of Unit in China).

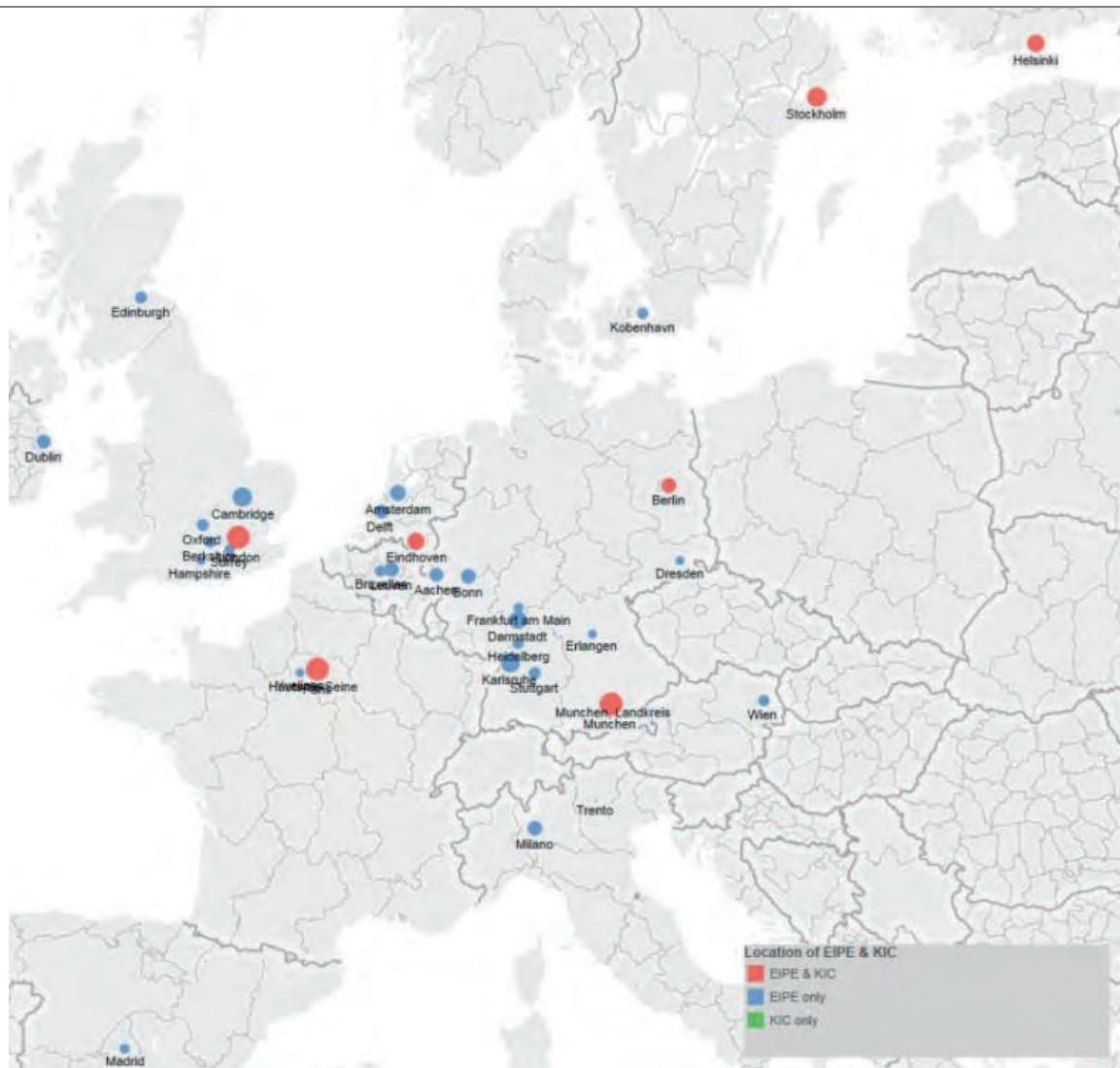
Factors such as the spatial proximity of similar and related firms and industries and the general tendency of people and economic activity to locate in large cities and economic core regions all lead to agglomeration. The agglomeration of R&D, innovation and business activity facilitates local knowledge spill overs and fosters the local business system. This is reflected in strong co-location patterns of production and research units in close proximity.

- ***Building blocks of excellence***

Excellence in ICT is made up of high and balanced performance in R&D, innovation and business activities. For example, München, number 1 in the overall EIPE comparison, ranks 1st in R&D, 3rd in innovation and 4th in business. Similarly, London holds 5th, 9th and 1st position in the individual sub-indicators.

Key locations of ICT activity in Europe have very rich and diverse R&D, innovation and business landscapes. But their high scores reflect also high quality of activities. For example, Computer Science faculties belonging to universities based in München, Paris or London are highly recognized by the business and academic world. The inventive output and products developed by start-ups based in EIPE are very attractive from the business point of view. As a result, London and Paris are Europe's largest recipients of venture capital funding and that they are among the most important destinations for new business investments by ICT firms.

Location of European ICT Poles of Excellence and EIT digital KICs



Note: The map represents the location of 34 regions considered as European ICT Poles of Excellence and EIT digital Knowledge Innovation Communities. Further details can be found in [The Atlas of ICT Activity in Europe](#).

- ***Diversity among EIPes***

A deeper level of analysis of the data carried out in the case studies shows that EIPes are characterised by several commonalities.¹⁶ It also shows they have pronounced differences. Among the commonalities, the concentration observed from a geographical perspective is also observable in the activities and the financing of the public and private organisations in the regions.

¹⁶ For details, see "Analysing the European ICT Poles of Excellence: Case Studies of Inner London East, Paris, Kreisfreie Stadt Darmstadt, Dublin and Byen Kobenhavn".

However, the regions are also very diverse as regards size (e.g. population, area); status (e.g. global cities, capital cities, regional capital cities, etc.); institutions and policies (e.g. at national, regional and local level). Not all the regions are neighbours to one or more similarly-ranked regions. Proximity is unevenly distributed with some regions being more isolated than others. The local industrial composition varies, favouring the development of ICT activity in close relation to specific vertical sectors. The current assets of each region appear to be rooted deep in time, with their current activities and profiles resulting from a history going back several decades: industrial structure, policy decisions, institutional settings, migration and education outcomes, etc.

Regions have various levels of endowment in ICT R&D, innovation and business. Most of the EIPEs have global reach, with intense cross-border activities, and have gained a strong hub position in a usually very complex web of network connections. However, the internationalisation of each activity follows different patterns. Some regions have a more local orientation (within the EU), e.g. Byen København, while others, e.g. London, have far reaching connections (US & Asia). Each region has developed a different portfolio of partners, resulting in different network structures emerging for activities, locations, etc.

All of the above aspects contribute in turn to diversity in specialisation, each region showing one or several specific strengths. This impacts the region and results in very differently-balanced EIPE profiles. These differences in individual rankings across the sub-indicators give some hints as to the composition and details of the European ICT landscape. In particular, it shows how different and unique each location is and that all of them have their strengths and weaknesses.

- ***Nurturing or creating EIPEs?***

This "scarcity of excellence" poses a challenge to policy making. It is not so much the resulting performance that makes this goal difficult, but rather the foundations on which excellence has been built. The EIPE study shows that excellence builds on long-standing assets that may vary from region to region but always reflect a history of several decades. The exclusive assets of global or capital cities, a deeply-rooted industrial tissue, the long-term outcomes of policies, the presence and development of major players such as educational institutions and large firms - all these deeply rooted aspects have combined over time to produce the intense ICT performance of just a few regions today.

Scientific literature and local stakeholders usually claim that the emergence of Poles of Excellence is not a matter of policy-making, but of business, including the existence of one or several vertical markets to serve. Does this mean that policy has nothing to offer to ICT Poles of Excellence?

ICT Poles of Excellence emerge as important, if not essential parts of ICT activity in Europe. These locations deserve some policy nurturing at European level, for which there is a range of options, e.g. acquire a much deeper knowledge of their performance, profile and dynamics; foment strong and public acknowledgement and public image of their high level of excellence; include EIPEs in the European ICT-related growth strategies; provide specific business conditions including those related to human resources and mobility; give priority support to global reach and networking; put in place supportive demand-side policies. This range of policies must be tailored to the specific characteristics of each existing EIPE, while acknowledging and supporting a European ICT Poles of Excellence vision, mainly justified by the efficiency benefits expected from agglomeration and the role of global hubs.

Aiming to raise the performance of low-performing regions might also be rewarding. These regions often have unbalanced or average strengths and weaknesses.

A much deeper knowledge of their performance, profile and dynamics could allow tailored support to push them up the EIPE excellence scale.

The EIPE observations could be beneficial within a more systemic perspective that questions the pattern of the overall European ICT innovation system and its position at global level. EIPEs could be seen as the main hubs of a global multi-centred network, with internal interdependencies within one global market. Hence, the study offers a unique set of insights into the pattern and relations within the European ICT Innovation System. It identifies its main players, their performance, their distribution, and their networks. This information can be used to support European policies which aim to reinforce research and innovation system at European level.

13. Teaming for Excellence 2.0

While the flow of talent from economically weaker parts of Europe continues, the financial and economic crisis has revealed serious deficiencies in the performance of public administration of the relevant countries. Both factors are connected and strongly affect the innovation capacity of the economies concerned.

- ***What will be the benefit of successful action?***

Inefficient public administration can make innovation even more risky, adding uncertainty and costs caused by nepotism and red tape. To pursue a career in a place where good connections trump merit is a bad choice. And it is for the strong commitment to merit that many talented Europeans move overseas to power the innovation engine run by top universities and tech firms.

According to an initial idea from Member of the European Parliament Herbert Reul, a region's principal task is to create top conditions for innovation, to allow knowledge to spin out quickly into new business activity. Teaming up with an excellent research institute can transfer know how, brand the region and ensure more targeted use of structural funds (which have often been spent on research infrastructure without ensuring long-term benefit). Unlike top-down, smart specialisation strategies, teaming builds on the mobilising effect of a competition and the inherent interests of the partners that would even benefit the regions which don't win.

- ***What is being done and who needs to do more now?***

Current EU funding instruments do not address this problem adequately. With a few exceptions, such as European Research Council grants, administrative burden is still too high to make funding attractive to excellent researchers or innovators considering leaving the EU. Nor does any of the existing funding instruments target the innovation environment and, as one of its key factors, the quality of public administration.

There is one funding instrument though which could fill that gap. The "Teaming for excellence" calls for teams of regions that are eager to catch up in R&I and existing excellent research institutions. The teams compete for significant funding from H2020 to establish an excellent research institute in the region. The grant awarded to the winner will fund operational cost of the new institute (in particular competitive salaries).

The first call of teaming focussed on immediate innovation output instead of scientific excellence. As a result, many of the best of Europe's research institutions dropped out in the first phase. Also, the issue of innovation environment was ignored.

To become a game changer, future calls for "teaming of excellence" should focus on two areas for improvement:

- On the side of the research institution, focus on excellence in research instead of close to market R&D&I. World class research attracts talents. Talents generate new ideas which attract in turn venture capital, paving the ground for breakthrough innovations. Focus on research excellence will also avoid issues with state aid when using structural funds, that funding of activities closer to the market is often faced with.
- To enable the transition of ground-breaking ideas and discoveries into new products and services the region would need to improve the quality of public administration (e-

government, one stop shops for business registration, immigration services etc.) and rule of law. Further-more regions should create the conditions for hosting an international research community and attracting innovative businesses, including an excellent education system (international schools and kindergartens, high quality vocational training) and medical care with staff proficient in internationally used languages and other factors improving the quality of life.

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Section 2.

Players and Positions

14. The Dutch EU Presidency: innovation at the heart of policy making

Innovation has been a core horizontal priority for the [Netherlands EU Presidency](#). (January – July 2016)

By innovation we not just mean the strengthening of public and private R&D, but also the process of the development and adoption of new and existing technologies and business models, often brought forward by digitization and the use of other key enabling technologies. Such innovation is not just developed by incumbent research institutes or larger firms but also by **new entrepreneurs and start-ups**.

The importance of innovation obviously stems from its significance for **productivity growth, jobs and competitiveness**. For long term prosperity Europe cannot just compete on costs, and has to focus more on innovation, be it incremental innovation, catching up processes, and radical and disruptive new innovation.

Secondly, innovation is key to dealing with existing (and new) **societal challenges**, from climate change, to health and mobility.

Innovation may not be an end in itself, but is probably the most important precondition for a strong, prosperous and sustainable Europe for the years to come.

The Netherlands Presidency has organized numerous **events and initiatives on innovation**, from the informal Transport and Environmental Council on sustainable transportation, a manifest for an innovative urban agenda, a stakeholder conference and council conclusions on the circular economy, to the informal COMPET ministers meeting in January focusing on framework conditions to innovation, the Single Market and the collaborative economy. In May 2016, the Netherlands Presidency organized a successful back to back COMPET (Single Market and Industry) and Telecom Council on the digital single market and innovation, and a COMPET Council (Research) with a focus on open access and innovation friendly regulation.

As to the achievements of the Netherlands Presidency on innovation, we particularly want to highlight the two sets of **council conclusions** '[Better Regulation for Competitiveness](#)' and '[Research and Innovation friendly Regulation](#)', adopted respectively on 26 and 27 of May, both dealing with the impact of the regulatory framework on innovation and research.

As is so beautifully underlined in the SWD of Commissioner Moedas, **the regulatory environment is more and more a critical driver for the success of innovation in Europe**, and at the same time, the breath-taking pace of innovation also puts the regulatory framework and process under pressure.

In the two sets of council conclusions¹⁷ that have been adopted by the Council, we have brought forward **two concepts** that for the Netherlands Presidency seem key to deal with the challenges innovation poses.

The first is the **Innovation principle**. The conclusions indicate that “when considering, developing or updating regulatory measures the Innovation principle should be applied, which entails taking into account the impact on research and innovation”. By this, the Council for the first time unequivocally calls for innovation to be put at the heart of the policy making process. Some may not feel comfortable with the term ‘principle’; others may ask how this relates to the Precautionary Principle, which obviously in no way is or can be disregarded. Others may argue that this is a concept brought forward by big business alone, and would not reflect the interests of other actors. In the view of the Netherlands Presidency its quite simple: the innovation principle should be seen as a vigorous and sometimes even uncomfortable beacon, that should remind us at all stages of the policy making process that where possible the regulatory framework should enable innovation and be future proof. That reminds us to make sure we find the most efficient way of dealing with public policy goals not just today but also for the years to come, and not just enable the innovation of today’s incumbent players but also – particularly – that of the challengers of tomorrow.

The second concept entails the so called **Innovation Deals**. Innovation Deals aim to “address regulatory uncertainties identified by innovators, which can hinder innovation within the existing legal framework”¹⁸. Innovation Deals, inspired by the Netherlands Green Deal approach, serve at least two purposes. As bottom-up public private initiatives by innovators, they help to identify and address perceived regulatory barriers to innovation, and hence help innovative projects move forward. And secondly, they allow for policy learning and room for experimentation and hence help to strengthen the regulatory process. We are very pleased by the open invitation by the European Commission on 26 May to come forward with proposals for Innovation Deals in the domain of the Circular Economy.

Incorporating these concepts in the European approach to regulation is **complex**. The question if regulation is good or bad for innovation is unanswerable at aggregate level. Clearly in many cases regulation is not just good but even a prerequisite or catalyst for innovation. It is also complex because the identification of where possible bottlenecks are and what the exact policy response to this should be is not always clear and far from easy. Calling upon stakeholders to bring forward the obstacles they perceive is obviously an important step. However, not only may stakeholders have cost related regulatory bottlenecks more easily on their radar than innovation related barriers, also an important question is if consulting incumbent stakeholders sufficiently safeguards that the views of the challengers and innovators of tomorrow are well taken into account.

But the complexity also relates to possible fundamental ambivalences within the relation of regulation and innovation that need to be assessed and addressed.

The first relates to **the rapid speed of innovative change compared to the pace of the regulatory process**.

17 <http://data.consilium.europa.eu/doc/document/ST-9580-2016-INIT/en/pdf> and <http://data.consilium.europa.eu/doc/document/ST-9510-2016-INIT/en/pdf>

18 European Commission SWD 2015 298 final

In the two years or more it may take to finalize a European regulation, innovative change may have changed the circumstances dramatically with regulation being fit for the previous war, not the one of today or tomorrow. Does this mean we have to focus more on updating existing regulation instead of developing new regulation? How can we make regulation more goal/outcome-oriented or technology neutral, and hence more future-proof? And should this not call for some modesty of policy makers, both in Brussels and Member States, since developing regulation that from its inception is outdated is not likely to do society a favour?

The second relates to **predictability**, clearly an important aspect of regulation that gives certainty to business in their innovative investment decisions. However, at the same time regulation should be **flexible and adaptable** to reflect the effect and potential of innovative. Perhaps we need more room for experimentation before regulation is developed. How do we reconcile the need for predictability with flexibility?

The third relates to **variety and scale**. The Single Market at large is the chimney for the Promethean fire of European innovation, providing innovators with the necessary oxygen to scale up their activities. A strong level playing field stands at its core. However, the regulatory barrier for innovators in the ecosystem in one Member State may not necessarily be identical to that in another Member State. Since the optimal scale for such innovative ecosystems (and hence regulatory challenges) is not necessary that of EU28, in which situations should local variety in the application of EU legislation be allowed (for instance as an outcome of Innovation Deals) and in which situations it should not?

Because of this complexity, the council conclusions adopted call upon the Commission and Member States to further **explore and assess how regulation can be made more future proof and innovation-friendly**. For the Netherlands Presidency this call for further exploration in no way should give the impression that the challenge we face is not urgent, or that business as usual is the motto, even with the inclusion of an innovation tool in the Commission Impact Assessment toolkit. With the first important steps having been made, the Netherlands very much hopes that our Trio Partners as well as the Commission – and of course the three institutions at large - will forcefully continue to work on this issue. Innovation in the context of a strong and effective Single Market is of key importance for growth and jobs the years to come. Europe needs innovation to be at the very heart of policy making.

15. A pact for innovation

The pact is a new platform for more open collaboration between decision-makers and innovators

A Pact for Innovation



Why Europe needs 'A Pact for Innovation'

The objective of the Pact for Innovation (INPACT) is to create a space for close collaboration between key stakeholders and the European Institutions. The collaboration is meant to result in concrete solutions addressing the pressing issue of multiple barriers preventing a strong and globally competitive innovation performance in Europe at all levels: national, regional and local.

A close cooperation both at the level of the different Commission DGs as well as the stakeholder community will help strengthening Europe's innovation performance.

INPACT calls for a joint effort to create pro-innovation conditions to overcome well-known weaknesses in turning knowledge created by research and inventions into innovation providing "added value" for Europe's economy and citizens. The signatories of INPACT share the vision that a globally competitive and successful Europe needs stakeholders and institutions to work together in an integrated approach to ensure that innovation can deliver solutions to major challenges Europe and the world are facing. Europe needs to modernise and implement Quadruple Helix principles.

To move quickly from research and invention to innovation and accelerate the market uptake of innovations, Europe must build on its existing strengths but also address shortcomings by creating a favourable environment and encouraging the next generation of entrepreneurs to take risk.

The focus of INPACT is on implementation of actions within identified priorities, where concrete timely changes can be achieved best at EU level. Harnessing Europe's innovation will be best achieved by creating strong value chains and effectively orchestrating innovation ecosystems at all levels. The signatories commit to implement INPACT projects across EU borders, individual regions and sectors by 2020.

INPACT Priorities

A) *A coherent set of EU policies for innovation*

- i) Ensure a horizontal approach in EU innovation policy making with a particular attention on synergies between industrial, digital and research and innovation policies as well as those that address major challenges.
- ii) Based on a political mandate, the Commissioner for Research, Science and Innovation should foster the coordination of policies relevant for innovation across the Commission. A hand-in-hand cooperation with the Commissioner for Jobs, Growth, Investment and Competitiveness is indispensable.
- iii) Create a supportive regulatory framework that fosters innovation, strengthens transparency and focusses on the quality of legislation.
- iv) Apply systematically analysis on the consequences for innovation during the impact assessment of new and reviewed policies and legislation in various sectors.
- v) Ensure an important role of science in the decision-making process with high standards for science in policy making.
- vi) Foster a better exchange of best practices in innovation policy between member states and the EU to stimulate new solutions how to turn research into innovation and innovation into successful business.
- vii) Make sure that political structures and processes are adapted to new technological and societal challenges, while ensuring a strong role for stakeholders.

Seize the opportunity: position innovation at the heart of the Europe 2020 Review

A Pact for Innovation

B) *Re-focusing and aligning EU budgets and investments towards innovation*

- viii) Use the mid-term reviews of the MFF, Horizon2020 and the ESIF funds to scale up innovations creating new European-wide markets.
- ix) Take into account the important role of intergovernmental organisations and Joint Programming through which Commission funds are strongly leveraged by national innovation funding.
- x) Align various funding programs and instruments to overcome "Valley of Death" to ensure a smooth transition from invention to innovation and the creation of economic value and employment. This should be considered for all critical phases from early stage to growth as well as on the way from SME to mid-cap and international market leader.

C) *Improve Citizens and Investor confidence in Europe*

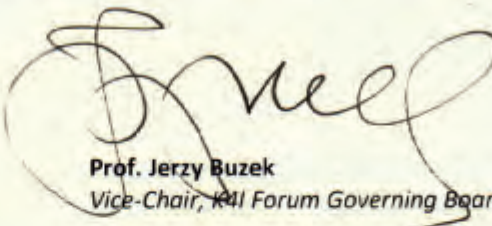
- xi) Enhanced tools for science communication and dialogue with key stakeholders to increase the understanding in the public for science and innovation in society and strengthen the relationship between scientists, societal stakeholders, media and the public.
- xii) Increase consumer and investor confidence in Europe by creating an EU wide dialogue between the different communities to find a balance between technology driven developments and those that are relevant from an environmental-, health and safety perspective.

D) *Paving the way for the next generation*

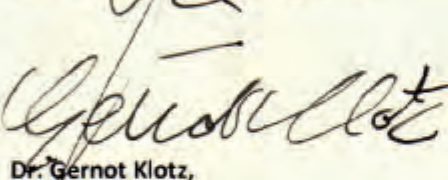
- xiii) Foster the engagement of the next generation of scientists, researchers, inventors and innovators.
- xiv) Prepare the future by strengthening networks of young innovators and entrepreneurs to gain critical mass across Europe. Appropriate skills sets have to be developed and made available in national curricula from primary school to master degree levels.



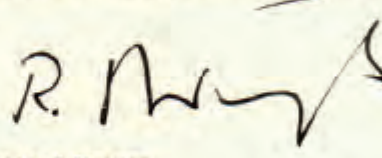
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Dr. Gernot Klotz,
President, K4I



Dr. Roland Strauss,
Managing Director, K4I

Brussels, 7 December 2015

The launch of the Pact for Innovation is taking place during the Opening Ceremony of the 7th EIS on December 7th 2015. The initial signatories invite committed stakeholders to co-sign in combination with the demonstration of their commitment.

INPACT is open to cooperate with other dedicated stakeholder groups working in the field of EU Innovation. Key elements of the governance are described in Annex 1 of this document.

A Pact for Innovation



ANNEX 1

Governance and implementation

1. **Engagement:** The Pact for Innovation (INPACT) is launched on December 7th, 2015 during the Opening Ceremony of the 7th European Innovation Summit. Initial signatories are the K4I Forum political members and the K4I leaders. The signed document is handed over to the Commissioner for Research, Science and Innovation.

Other stakeholders willing to engage are invited to co-sign and demonstrate their engagement by actively contributing to the implementation of INPACT priorities.

2. **Transparency and openness:** The Pact will discuss the most urgent questions related to innovation and report on progress. A first progress report will be presented at the INPACT Forum meeting in June 2016. INPACT is open to work with other stakeholder groups working on innovation.
3. **High-level leadership and commitment:** The implementation of the Pact will be steered by a 'Leadership Group' (LG) from committed pro-innovation public, private and non-governmental organisations. The LG will define the working programme and supervise its implementation. A Chair and two Vice-Chairs will be nominated/elected. The Commissioner for Research, Science and Innovation, a core group of innovation-literate MEPs around the K4I Forum leadership and the President of the Committee of the Regions are invited to represent the EU institutions in the LG.
4. **Concrete proposals for implementation:** The Pact will establish Working Groups along the priority areas. These will develop proposals to be endorsed by the Leadership Group and submitted to the European Commission
5. **Meetings:** The Pact for innovation will convene twice a year. The European Innovation Summit will host one of two annual Innovation Forums. The Commission is invited to participate in the organisation of the Innovation Forum in June 2016.
6. **Formal set-up:** Following commitment of a critical number of stakeholders, the platform will be set-up formally
7. **Financing:** Financial contributions from the committed stakeholders and institutions will ensure the long term financing of the INPACT activities.

16. Social partners call for a focus on competitive & sustainable industry¹⁹

We strongly acknowledge that robust industrial production and manufacturing industry are indispensable basis to weather the multiple challenges we are currently facing. As the backbone of the European economy, industry significantly contributes to economic growth, employment and innovation. Due to its beneficial impacts on other sectors and its strong spill over effects on important value-chains, EU industry is crucial to overall economic performance and competitiveness. In the EU, industry accounts for 52 million direct and indirect jobs, approx. 80% of private research and development and more than half of exports. A vibrant and thriving industry in Europe will benefit the economy in general. This will in turn be essential to create new job opportunities and reduce unemployment.

Back in 2012, the European Commission set the goal of raising the share of industry in GDP from 16% to as much as 20% in 2020. However, over the years, the situation has been deteriorating. The manufacturing sector was particularly affected by the crisis, with employment declining by 16% and production by over 9% between 2008 and 2014. Europe has not yet found an exit to a worrying process of de-industrialization that puts economic recovery and jobs at risk.

While we acknowledge the new Commission's effort to look at the issue and draw a framework of possible solutions, we believe this is far from enough to return industrial investments to pre- crisis levels. A competitive and sustainable industry must again be at the core of the EU policy agenda.

European industry needs the right framework conditions and a stable environment to be innovative and competitive, and ultimately to be in a strong position to tackle societal challenges. New impetus is needed to foster investment, to ensure well-functioning labour markets as well as a skilled workforce, to promote worldwide markets access while using effective trade defence instruments, to increase support for digitalisation, to match energy and climate policies with competitiveness and to embrace the innovation principle.

Therefore, we call on the European institutions' leadership to demonstrate a stronger commitment to develop and strengthen our industrial basis. Stepping up the efforts is essential to bring Europe's industry back on to a path of sustainable growth and to boost employment. European institutions must act now, through an updated and concrete action plan on industrial policy. We stand ready to contribute.

Sincerely yours,



Luca Visentini General
Secretary ETUC



Markus J. Beyrer Director
General
BUSINESSEUROPE

17. Evolving Europe – Thought Leadership by COBCOE²⁰

This is the view from a grass-roots, pan-European business network: a valuable validation of the debate inside the "Brussels bubble".



Report on the findings of the pan-European business survey; establishing sentiment and defining action to reform EU policy and secure support to promote internal and external competition.

COBCOE January 2016



20 Council of British Chambers of Commerce in Europe – www.cobcoe.eu/publications/evolving-europe/

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BACKGROUND

THE EVOLVING EUROPE PROJECT

COBCOE is an independent, non-profit making organisation representing British chambers of commerce and business associations throughout Europe. Acting as an umbrella organisation, it works with its member chambers to advance international trade and business.

COBCOE's core membership of over 40 chambers of commerce and business organisations represents around 8000 business members. A further 50 chambers of commerce and similar organisations based in the UK and around the world are affiliates.

This network means COBCOE is uniquely placed to highlight the challenges facing companies and business people operating in Europe. Reform, however, is a continuous process and Europe needs to evolve to provide the conditions for success.

Through the Evolving Europe project, COBCOE aims to give business a voice in identifying how Europe needs to change to facilitate greater competitiveness. Launched in the summer of 2015, the Evolving Europe project encompasses research, debate and analysis, the results of which are contained in this report.



FOREWORD

By David Thomas MBE, Executive Chairman, COBCOE



COBCOE's work in undertaking this pan-European quantitative and qualitative research provides policy makers and regulators across Europe with evidence-based recommendations to promote internal and external competition. Europe has achieved a great deal, but has to improve competitiveness in the internal market and in international business to realise its potential to remain a leader in global trade.

The conclusions drawn from this report offer a real chance to cement prosperity in the EU. COBCOE will continue to work to improve the conditions for doing business across Europe through its activities, representing and promoting good business practice around the world.

EVOLVING EUROPE PROJECT TIMELINE

- | | |
|-----------------------|--|
| Spring/Summer 2015 | – COBCOE members undertake various research projects |
| July 2015 | – Inaugural meeting of Evolving Europe Steering Group |
| August - October 2015 | – Evolving Europe Internet-based survey
– Telephone interviews |
| November 2015 | – Preliminary results released
– London Debate 11 November
– Brussels Debate 17 November
– Follow up qualitative interviews |
| January 2016 | – Evolving Europe report published |

ACKNOWLEDGEMENTS

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Stephen Huyton
Group Financial Director
Thermopatch International b.v.

Also supported by the Smurfit
Kappa Group

COBCOE member chambers of commerce and business associations

The almost 1000 companies that completed various surveys

The company executives who donated considerable time for
qualitative survey interviews

Members of the public who attended the London and Brussels
debates which contributed significant feedback

NatWest/RBS for support not only with the venue for the London
Debate, but also by ensuring that as many business voices as
possible were heard as to the issues that may prevent more trade
being undertaken by SMEs, so vital to the EU as a whole

The British Chamber of Commerce in Belgium for hosting the
Brussels debate

The London School of Business and Finance (LSBF), notably Professor
James Kirkbride, for the initial evaluation of survey results and
interim report

ICAEW for providing background research and reading materials

Daniel Franklin, Executive Editor *The Economist*, for moderating the
London Debate

Kompass for enabling the Europe-wide dissemination of the survey
to companies

Global University Systems whose students from LSBF and the
Grenoble School of Management took part in the London Debate

Yellow Jersey PR

The Evolving Europe London Debate

11 November 2015



The Panel (left to right): Andy Bagnall, Director of Campaigns, CBI; Sir
Thomas Harris, Chairman, European Services Forum; Jackie Minor, Head
of Representation, EC Representation in the UK; David Thomas MBE,
Executive Chairman, COBCOE; Daniel Franklin, Executive Editor, *The
Economist* (Moderator); Martin Manuzi, Regional Director, Europe, ICAEW;
Will Tanner, Partner at Finsbury and Vice-Chair of Business for New Europe

INTRODUCTION

In November 2015, COBCOE released the preliminary results of its comprehensive pan-European survey on reforming the way the EU operates in order to promote and instill competition in business. The findings were debated at the Royal Bank of Scotland in London on 11 November and in Brussels on 17 November. The preliminary conclusions from these events were fed back into the iterative research and evaluation process leading to this, our final report. This independent initiative brought an unprecedented level of engagement from European business, demonstrating the importance of the subject and the central role and position of COBCOE and its members in EU commerce.

500 additional indirect respondents' views obtained through contemporaneous surveys carried out by COBCOE members

The survey was conducted between August and mid-October 2015 using an internet based survey template to which companies were encouraged to contribute. The survey comprised responses from more than 40 countries across Europe, including all 28 EU member nations. The survey template contained 14 quantitative and four qualitative questions, which more than 250 corporate respondents completed. Some 500 additional indirect respondents' views were obtained through contemporaneous surveys carried out by a number of COBCOE members using the same research themes.

Of the respondents undertaking the initial Internet based questionnaire, more than half indicated a willingness to engage in further verbal enquiry. The process was extensive, with questioning lasting over an hour. This additional research offered clarification and an opportunity to test the sample on some of the themes arising from the initial Internet based survey.



50%

Further qualitative sample survey by telephone of more than 50% of the direct respondents

More than 40 countries across Europe including all EU countries



EXECUTIVE SUMMARY

Inconsistent implementation of regulation causes inefficiencies and barriers to development

The findings, collated from the quantitative and qualitative responses of nearly 1000 companies in over 40 countries, clearly indicate that regardless of operating location size or sector, business believes that reform is necessary for the protection of Europe's position in the global economy. Further qualitative telephone survey sampling of the original respondents enhanced and deepened the messages that the survey itself delivered, as did the key discussion threads from the two debates held in London and Brussels.

The lack of a single market in services has a negative impact on innovation and economic growth

Regulation, although seen as heavy, was claimed as necessary to maintain commercial quality and trust. However, inconsistency of implementation across the EU, manifesting in wide variation of interpretation between member countries, and sometimes even within countries, was asserted as causing significant inefficiencies and barriers to economic development.

There needs to be a new effort in developing financing options

It was claimed that regulation should be based upon commercial utility, with policy and implementation being the products of an equal partnership between business and commercial directives. The lack of a single market in services is negatively impacting on innovation and economic growth in Europe, and leaves European business under-represented in any future trade deals.

A serious skills gap exists across all sectors, constricting growth and innovation

Finance is critical to business. It was decided that new effort should be directed towards developing a broader range of financing options. These included developing alternative funding mechanisms, such as Peer-to-Peer platforms. The EC should be encouraged to facilitate the unhindered development of alternative financing sectors, building an extra-bank lending system similar in structure to that found in the United States.

A large section of businesses are prepared to move registration to outside the EU if progress in reform is not achieved

A serious skills gap exists across all sectors and geographies in Europe, and is constricting growth and innovation. Ensuring close cooperation between educators and employers must become a reality by the mid-term. However, in the immediate term, it is essential to gain access to talent irrespective of origin and location.

Having both a strong national identity and 'brand', combined with the supranational EU equivalent, was seen to significantly benefit competitiveness.

The majority of European businesses wish to stay resident in the EU. However, a large section of businesses are prepared to move registration to outside the EU if progress in reform is not achieved.

From these issues, specific recommendations were distilled covering the way regulation is drafted to minimise the ability of member states to interpret regulation in a way that creates inconsistency; covering the implementation of the single market in services; engaging directly with the EC in emerging Peer-to-Peer platforms across Europe to help fund SME growth and innovation to complement bank lending; and finally to allow companies to recruit staff with required skills from outside the EU to fill the identified skills shortfall.

KEY FINDINGS

Specifically, respondents overwhelmingly confirmed that reform should focus on three key areas: regulation, finance and innovation. It was repeatedly indicated that these themes comprised the essential, overarching factor of competitiveness.

Professor James Kirkbride, Vice-Rector and Director of LSBF, stated in his commentary to the interim report: "Competition within the EU must be ensured in order to retain global commercial position and influence. This point is echoed by respondents to the Evolving Europe survey, and is made doubly important by increasing globalisation and the trading power of emerging economies.

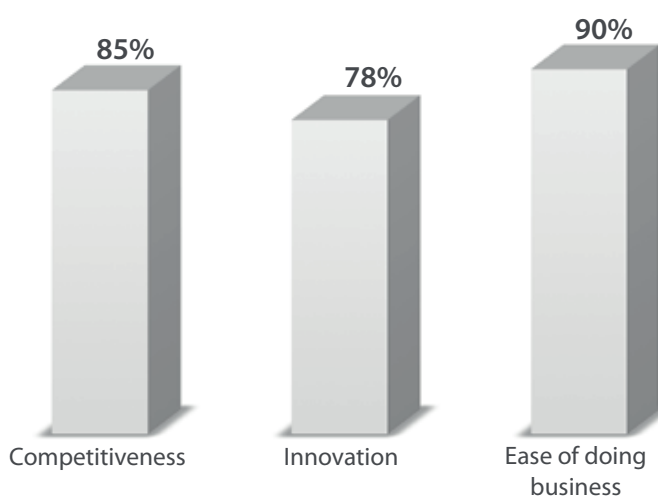
"Europe must review its commercial regulation conception and implementation procedures in order to assist the development of efficient business. Perceptions that such efficient commerce is currently restrained through lack of access to finance, talent, innovation and poor regulation application, indicated by survey respondents, must be recognised and responded to at a supranational level. The idea of an EU business brand must be encouraged in the context of developing competitive advantage."

Although respondents felt somewhat protected from outside competition by the single market system in the EU, they appeared to find it much harder to compete on the global stage as a result of their Union membership.

There was consensus regarding existing pan-European pressure on EU institutions to consider and act for business and promote their needs concerning global competition. There was, however, mixed opinion surrounding whether EU institutions were already recognising this, or would change the way they sought to support business.

The Evolving Europe Steering Group identified competitiveness, innovation and the ease of doing business as the three key areas of concern, with which survey respondents strongly agreed, as the graph on the right shows. Further research and debate confirmed that reform should focus on the three key areas of regulation, finance and innovation, which comprise the essential, overarching factor of competitiveness.

Survey respondents agreed that the debate should focus on



KEY FINDINGS

Respondents saw regulation as inflexible and unfit for purpose

Good regulation was seen as a mechanism with which to support the presentation of European companies as reliable partners in global trade

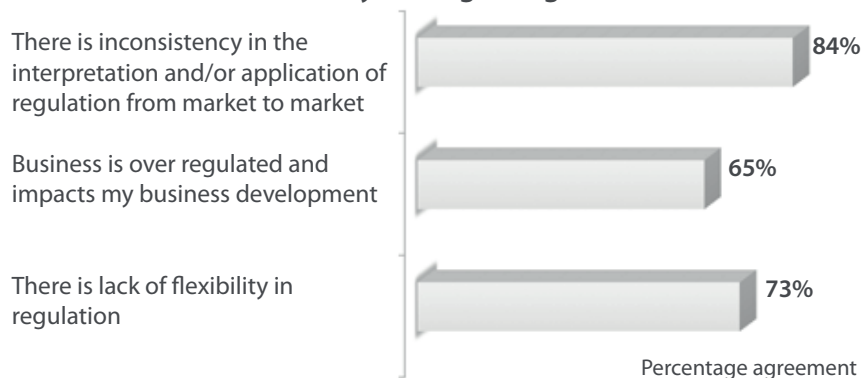
REGULATION

Regulation was uniformly accepted as necessary, with the generally acknowledged caveat that the regulatory load is too heavy. Inconsistent implementation across Europe and variation in interpretation by individual member states, sometimes even internally, resulted in commercially detrimental inefficiencies. This was seen as a significant barrier to economic development. Respondents advocated the development of an executive adjudication body for the implementation of standard interpretation. In both the initial Internet based questionnaire and the later verbal research this point was strongly supported, although there were differing opinions as to whether or not it would be pragmatic to establish a new oversight body or implement operational and efficiency improvements to the existing framework, so as to remove the potential for multilateral interpretation of regulation.

Respondents saw regulation as inflexible and unfit for purpose. The qualitative answers, developed further during telephone interviews, presented the view that regulation from Brussels is written and imposed by people without the necessary and relevant specific industry or business experience. They indicated a wish to see regulatory reform be premised upon, and designed to, support business, expedite verification procedures and drive quality and the achievement of competition. Furthermore, the creation of a more bilateral approach to regulation involving a partnership between commerce and administration/legislature was advocated. It was proposed this should take the form of an independent council to standardise implementation and interpretation.

Good regulation was seen as a mechanism with which to support the presentation of European companies as reliable partners in global trade, and as producers of high quality trusted products, whether they be goods or services. Good regulation was seen as an important way of giving commercial players a marketing advantage in the global trade environment. Respondents from the follow-up discussions reinforced the need to differentiate between global competition, the EU and countries within the EU as being, "well regulated trusted partners in business and trade."

Initial survey findings – regulation



KEY FINDINGS

Respondents do not see banks as the 'go-to' partner for flexible financing to respond to competitive global pressures

There is a clear wish for the EU to support alternative sources of finance

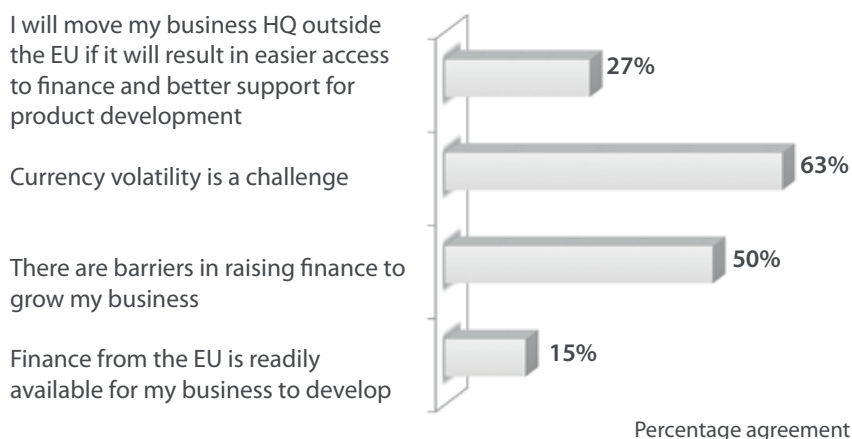
FINANCE

Finance and the development of a broader range of financing options for business was viewed as critical by respondents. Encouraging the EU to reform in favour of developing extra-bank financial services and alternative finance was seen as essential to address the misalignment caused by the current system, which is almost entirely bank-dominated outside the UK. Clearly, the respondents do not see banks as the 'go-to' partner for the provision of flexible financing to respond to competitive global pressures. Respondents repeatedly stated that banks are not lending or cannot lend, and that if they do their procedures are too complex for all but large borrowers. This point was confirmed in Brussels by an attending senior banker. He stated that under present regulation it was less 'balance-sheet encumbering' (i.e. less expensive) for a bank in Europe to provide mortgage debt on price-inflated real estate than it was to finance SMEs.

Alternative sources of finance are attractive to respondents, especially Internet based businesses, but their provision across Europe is seen as very patchy. There is a clear wish for the EU to support this area. Respondents complained that increasing the role of the Private Equity/Venture Capital finance sector is not being encouraged by the EU. As a result of this, outside the UK and Scandinavia, respondents did not see Private Equity/Venture Capital as a possibility for their financing needs.

There was much debate surrounding possible EU action, whether it should encourage member states to domestically advocate these financing options or whether the EU should lead the way in its supranational capacity by channelling some of the Juncker development money through new and existing finance providers. In further questioning, respondents preferred the latter, with some lamenting their governments' inability to act quickly.

Initial survey findings – finance



KEY FINDINGS

It is essential for the EU to do more to assist the development of domestic Private Equity and alternative financial sectors

An interesting point made by several respondents in later discussion was that the capital markets and Private Equity environment dominate the USA, while in Europe banks remain preeminent. This cannot continue if Europe is to compete properly with the US, especially taking into account the trend in bank regulation. Therefore, it is essential for the EU to do more to assist the development of domestic Private Equity and alternative financial sectors. Follow-up questions confirmed that respondents saw closer alignment to the US-style system and markets as a solution to this issue.

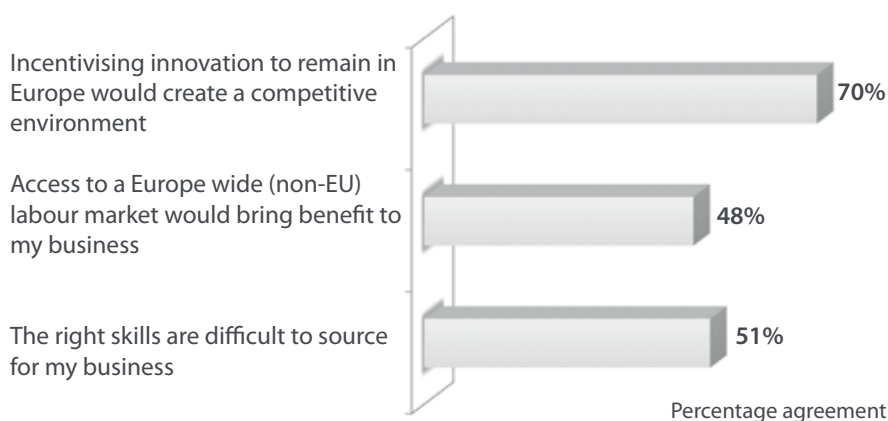
The EU itself was not seen as a source of finance for growth and innovation, except in the East, where structural funds have had an important recent role directly with business.

SKILLS AND MOBILITY

Innovation and its promotion, essential to competitive development, were seen to rely upon closing an existing and serious skills gap. Both the initial survey and qualitative follow up indicated that this problem is felt across multiple business sectors, across a wide range of skills and across the whole of Europe. Hindrances to solving this issue were viewed as highly damaging to growth. Ensuring close cooperation between educators and employers was asserted as being a necessity, and was confirmed as such in both the London and Brussels debates.

It was widely stressed in the survey that cooperation needs to become a reality by the mid-term. However, in the immediate term, gaining access to talent, indiscriminate of its source, is critical. Europe was declared to lag behind the US in skills development, and there were claims that China is about to overtake Europe in this area.

Initial survey findings – skills and mobility



KEY FINDINGS

It is possible that the ongoing refugee crisis, combined with the UK's renegotiation of its position in the EU, will further hamper or delay solving this issue. Respondents engaged in the second round of questioning stressed that a way must be found for accessing key skills, irrespective of their geographic origin, or Europe would face the rapid erosion of its competitive position as a trading bloc.

OTHER ISSUES AFFECTING COMPETITIVENESS

Exchange rate volatility

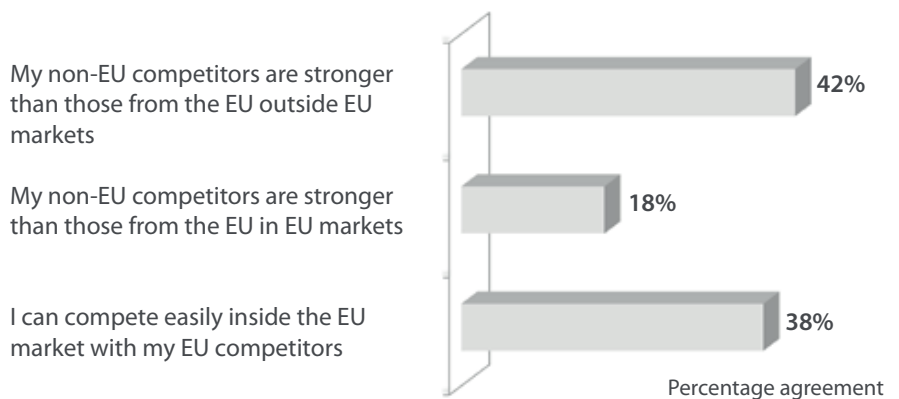
Euro exchange rate volatility was seen as a significant trading issue for the respondents, both within and outside the single currency area. Major imbalances are being caused by volatility in the euro, created by individual government budgetary policies and the aftermath of the 2008-10 financial crises. These factors are disrupting competition in the single market as well as causing problems in global supply chain relationships.

Innovation and flexibility

Although in general our respondents indicated a desire to remain within Europe, there was a sizeable minority (some 28%) who indicated that they would relocate to be able to operate in an environment conducive to competition. This was an issue ignored in the Brussels discussion, and only briefly touched on in London.

Qualitative questioning showed that the minority prepared to leave Europe held this view very strongly, and looked to the USA as a possible location. The view was based firmly on the greater access to flexible finance and skills.

Initial survey findings – competition and markets



KEY FINDINGS

EU identity and 'brand'

Respondents recognised the significant benefit of having both strong national identities and brands, and a common EU identity. This was seen as an assertion of the importance of product quality, coupled with a complementary European 'common brand' indicating quality, dependability and engendering trust.

This point was the most controversial of those discussed in both London and Brussels, and created a clear split in audience opinion. Audience members from larger countries did not discern the importance of this issue for smaller countries. However, all participants engaged in further questioning confirmed that whether they were in support of this concept or not, they did not want the EU to begin efforts to develop a formal 'EU Brand' in any way or form.

Respondents believed that the EU enhances national brands in many cases, with Europe representing quality, reliability and trustworthiness. A European identity allows a business to align with a solid commercial reputation, demonstrating that they operate according to a certain set of high standards. This is valuable to businesses across the region and can offset price issues in competition.

The Evolving Europe Brussels Debate 17 November 2015



The Panel (left to right): Tom Parker, Vice President, British Chamber of Commerce in Belgium (BCCB); David Thomas MBE, Executive Chairman, COBCOE; Philippe de Backer MEP; Thomas Spiller, President, BCCB

CONCLUSIONS

Competitiveness is essential

The results of COBCOE's unprecedented pan-European business survey of close to 1,000 businesses across more than 40 countries have produced clear conclusions. Regardless of where a company is domiciled, reform was seen as necessary for the protection of Europe as a competitive trading bloc. Specifically, the respondents confirmed that there should be three areas of reform focus: regulation, finance and innovation, which came together under the overarching theme of competitiveness.

Heavy regulation and inconsistent implementation hinders growth

Regulation, although heavy, was seen as necessary to maintain quality and trust. However, the inconsistency of its implementation across the EU through wide variation in interpretation between member countries, and sometimes even within countries, was seen to cause much inefficiency and create barriers to economic development. Regulation should be designed and only implemented to support business and drive efficiency, thus creation and implementation of regulatory policy must involve a partnership between business and regulators.

Services need a single market

The lack of a single market in services is having a negative impact on innovation and economic growth in Europe, and leaves European business under-represented in any future trade deals.

The range of financing options must widen

Finance and the development of a broader range of financing opportunities to business is critical, this includes developing Peer-to-Peer platforms. The EC should be encouraged to enable the unhindered development of alternative finance. This should mitigate the present pre-eminence of the banking sector, and align the system closer to the US example.

Filling the skills gap is crucial

A serious skills gap exists across all sectors and geographies in Europe. This is seriously constraining growth and innovation. Ensuring close cooperation between educators and employers must become a reality by the mid-term. However, in the immediate term, gaining access to talent, irrespective of global origin, is crucial.

European identity can benefit business

There is seen to be a significant benefit to competitiveness from having both strong national identities and brands in the area of product quality, coupled with a mutually complementary strong European 'common brand' of dependability and trust.

Lack of reform will cause some businesses to relocate

European companies wish to remain domiciled in the EU, however there is a large section of business prepared to move registration to outside the EU if progress in reform is not made.

PROPOSALS

The responses from European businesses and the discussions following the survey publication have led to the following proposals:

- A change in the way regulation is drafted to minimise the ability of member states to unilaterally interpret regulation, avoiding inconsistency
 - A body to be established within the EC to provide formal, homogenous interpretation and implementation of regulation
 - Implement a single market in services before any other trade agreement is signed (e.g.TTIP)
 - EC to either establish a Peer-to-Peer financing portal for SMEs, backed with cash from the Juncker funds or, more preferably, establish a fund that would invest through existing Peer-to-Peer platforms. This should encourage the development of new portals in member countries in which they do not yet exist, complementing bank lending
 - Allow companies to recruit staff from outside the EU to fill the identified skills shortfall
-

FURTHER INFORMATION



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18. Fuelling EU policies with an Innovation Principle ²¹

The EU Council of Ministers referred in its [May conclusions](#) to the need to better embed the Innovation Principle in EU policy and practice. Here we have the business vision of the issue.

BUSINESSEUROPE, the European Risk Forum and the European Round Table of Industrialists

June 2015

Introduction

The EU is lagging behind major competitors in its ability to invest in research and turn these investments into marketable products and services. Economies such as China, South Korea and North America are competing for global innovation leadership and the pace of change is increasing. In these countries, the R&D intensity is up to two times greater than Europe, which will ultimately reduce competitiveness. Europe was once the innovation leader, but it must now compete with other faster moving markets, where capacity to innovate, adapt, and exploit new technologies will be critical for success. Regulation has an important influence on innovation and priorities of innovative companies. Regulatory frameworks can however be managed and influenced by policy-makers, when seeking to improve regional competitiveness.

Recent steps taken by the European Commission to recognise some of the links between innovation and regulation have been well received by the private sector. To build on the ideas set out in the new Better Regulation Guidelines and science based policy making agenda and to shape a more positive and progressive innovation policy, the European business community believes that EU institutions now need to incorporate the **Innovation Principle** as an integral component of the policy-making process.

This joint statement from BUSINESSEUROPE, the European Risk Forum and the European Round Table of Industrialists, indicates how the Better Regulation agenda may be used to stimulate confidence to invest in innovation in Europe. In particular, it discusses what the Innovation Principle should look like in practice and the additional changes that are required to European governance and policy-making to make this possible.

Innovation culture driven by the Innovation Principle

A culture change is required to protect Europe's ability to innovate and to stimulate investment, jobs and growth, for the benefit of Society, including consumers, regulators and producers. Embracing the "Innovation Principle" will help to achieve this objective. Ensuring that,

"Whenever EU institutions consider policy or regulatory proposals, impact on innovation should be fully assessed and addressed".

A key element of this approach would be to routinely evaluate and address potential impact of EU legislation and policies on innovation, during policy formulation, co-decision, implementation and when reviewing or reforming established legislation. Such a systematic focus would make an important contribution to better innovation policy. It would provide a powerful stimulus to invest in innovation and it would set the basis for more inclusive and sustainable growth, and prosperity for all. Conversely, hasty or poorly advised legislation and policies, which fail to address these concerns, are likely to result in disproportionate impact on European innovation and longer-term competitiveness.

21 [BusinessEurope, The European Risk Forum and the European Round Table of Industrialists](#)

Avoiding damaging decisions: The “innovation checklist”

The Innovation Principle initiative calls for culture change, not just a formulaic regulatory procedure. However, evaluating the impact of policies and regulations on innovation may be a complex process, as different interventions can generate different types of impact on innovation. This impact can be sector specific or it may have more profound and far-reaching implications, over short or longer-term horizons. However, it is nonetheless recommended that EU policy and legislative initiatives should be systematically evaluated against an “innovation checklist” of selected criteria, to avoid unnecessary, unforeseen and unintended consequences. This should for example include:

Improving implementation of existing legislation: Embracing the spirit of the Innovation Principle at both member state and regional level would help to avoid unnecessary regulatory burden and uncertainty for those who wish to invest in innovation. Member states have a tendency to “gold-plate” EU legislation at national level, making compliance by companies more arduous and costly, undermining one of the core benefits of the Common Market.

Keeping pace with a changing world: To keep pace with rapid scientific and technological progress, better innovation policy requires a shift of emphasis from prescriptive regulation to a more dynamic and adaptive model. A predictable, regular and timely review of existing regulation is therefore required. Too frequent and far-reaching reviews of regulations may also increase uncertainties and as a result reduce willingness to invest in innovation. A pragmatic and balanced approach, which keeps pace with rapidly evolving technologies but also provides predictability is therefore required.

Creating space for innovators to measure and manage technological risk: Regulation which solely concentrates on risk avoidance and removal of scientific uncertainty and fails to consider both risks and benefits, stifles technological innovation. This type of regulation tends to result in companies directing limited budgets towards “defensive R&D”, for compliance, at the expense of more innovative and discovery oriented research.

Without compromising safety, legislation should seek to provide frameworks which encourage investment in innovation while minimising loss of limited resources to unnecessary defensive R&D. Achieving this objective will be required to unblock Europe’s full innovative potential and to improve competitiveness in the longer-term.

Weighing risks of alternative solutions in comparison: Regulation which solely concentrates on the downsides of a single approach or solution may result in de-facto accepting an even bigger penalty for society due to either the acceptance of the status quo (i.e. not innovating) or the application of other approaches that carry different risks. Comparison with other available options should always be part of the analysis.

Risk governance for innovation-friendly EU decision-making

Generation and use of scientific evidence plays an essential role in stimulating confidence to invest in innovation. In order to justify investing substantial sums of money in technological innovation, investors need to believe that it will be possible to demonstrate sufficient safety to justify approval for market access. This type of credible and relevant scientific evidence provides an objective basis for both policy makers and investors to decide whether or not to



invest in new technologies. Governance procedures are therefore required to ensure that scientific evidence is generated and used as a reliable basis for policy making, across the EU institutions, and that it is not used as a tool with which to manipulate or justify the policy making process.

Credible and independent scientific advice should be established within EU institutions, with power to go beyond interests of any single establishment, directorate general or interest group, to ensure scientific method and standards are upheld.

However, it is also important to recognise that scientific evidence alone may not be sufficient. Other societal factors may need to be taken into consideration, but these legitimate needs should not be confused with the need for robust, credible and unbiased scientific evidence.

A new stimulus to drive innovation

The spirit of the Innovation Principle applied at key stages throughout the legislative process would send a powerful and positive message to innovative organisations. It would build confidence to invest in innovation and as a result would help to create jobs, growth, economic recovery and longer-term competitiveness.

To succeed, better innovation policy must be placed at the centre of EU policy-making, along with appropriate structures and processes to ensure good governance. This should for example include:

- provision of credible and independent scientific advice to the European Commission, the European Parliament and Council, to ensure high scientific standards and transparency,
- routine evaluation of impact on innovation, within the EU Commission's revised impact assessment procedures, including implementation of legislation and delegated acts,
- routine consultation with innovative organisations, from both public and private sectors, spanning the full range from university spin offs and SMEs to large multinationals,
- establishment of a law of administrative procedure to ensure appropriate quality, governance, and predictability when drafting and implementing legislation,
- development of a more holistic understanding of what it takes to succeed as an innovator and which barriers to entrepreneurship are encountered, and
- gathering of best practices in innovation policy to stimulate adoption at both member state and European levels.

Pledge

BUSINESSEUROPE, the European Risk Forum and the European Round Table of Industrialists look forward to a constructive dialogue with the EU Commission and relevant stakeholders, to stimulate investment in European innovation, through cooperation and development of better innovation policy.

19. The Pact of Amsterdam

Europe is not yet skilled in the shaping of responsibilities between municipal, regional, national and Union actors. The zero-sum game of subsidiarity has been a long-standing handicap in building an Urban Agenda for Europe. The recently adopted Pact of Amsterdam has broken the log-jam, so that Europe's cities can cooperate to be smart and sustainable world-leaders





Establishing the

Urban Agenda for the EU

‘Pact of Amsterdam’

Agreed at the Informal Meeting of EU Ministers Responsible for Urban Matters on 30 May 2016 in Amsterdam, The Netherlands.

On 30 May 2016, in Amsterdam, the Netherlands, upon the invitation by the Netherlands Presidency of the Council of the European Union (EU), the Informal Meeting of EU Ministers responsible for Urban Matters was held.

The meeting was also attended by the Vice President for Energy Union, the European Commissioner for Regional Policy and Representatives of the European Parliament (EP), the European Committee of the Regions (CoR), the European Economic and Social Committee (EESC), the European Investment Bank (EIB), Norway, UN Habitat and relevant stakeholder organisations such as EUROCITIES and Council of European Municipalities and Regions (CEMR), as well as the European Urban Knowledge Network (EUKN), URBACT, European Observation Network for Territorial Development and Cohesion (ESPON) and European Forum for Architectural Policies (EFAP).

Preamble

The European Union is one of the most urbanised areas in the world. Today, more than 70% of Europe's citizens lives in an Urban Area¹. The UN projects that by 2050 this percentage will reach 80%³. The development of Urban Areas will have a major impact on the future sustainable development (economic, environmental, and social) of the European Union and its citizens.

Urban Areas of all sizes can be engines of the economy which boost growth, create jobs for their citizens and enhance the competitiveness of Europe in a globalised economy. At present, 73% of all jobs and 80% of people aged 25-64 with a tertiary education are based in European cities, towns and suburbs. Urban Areas are, however, also places where challenges such as segregation, unemployment, and poverty are concentrated.

Considering the above, Urban Areas play a key role in pursuing the EU 2020 objectives and in solving many of its most pressing challenges, including the current refugee and asylum crisis. Urban Authorities⁴ play a crucial role in the daily life of all EU citizens. Urban Authorities are often the level of government closest to the citizens. The success of European sustainable urban development is highly important for the economic, social and territorial cohesion of the European Union and the quality of life of its citizens.

The need for an Urban Agenda for the EU

In order to realise the full potential of the European Union and deliver on its strategic objectives, the Urban Agenda for the EU strives to involve Urban Authorities in achieving Better Regulation, Better Funding and Better Knowledge (knowledge base and exchange):

- EU legislation is to a large extent implemented in Urban Areas and has direct and indirect implications for Urban Authorities. EU legislation sometimes has conflicting impacts and its implementation at local level can be difficult. Therefore, EU regulation should anticipate these difficulties.
- Urban Authorities are among the key beneficiaries of EU funding. Access to existing funding is however sometimes administratively burdensome. The Urban Agenda for the EU aims to improve accessibility and coordination of existing funding possibilities and to contribute to their simplification.
- Knowledge on how Urban Areas evolve is fragmented and successful experience can be better valorised, diffused and exploited. The Urban Agenda for the EU therefore intends to enhance a better urban policy knowledge base and the exchange of good practice.

Delivering the full potential of Urban Areas requires a joint approach between both sectoral policies and the

1 This figure is based on the 'degree of urbanisation' definition of an urban area (cities, towns and suburbs): <http://ec.europa.eu/eurostat/web/degree-of-urbanisation/overview>

2 The term 'Urban Areas' is used in the Pact to denote all forms and sizes of urban settlement and their citizens, since the precise definition of a 'City' and an 'Urban Area' differs from one Member State to another.

3 This projection is based on national definitions which may differ from the 'degree of urbanisation' definition. The EU level results, however, are almost identical to results from the 'degree of urbanisation' definition.

4 The term 'Urban Authorities' is used to address the relevant public authorities responsible for the governance of the aforementioned 'Urban Areas', be it local, regional, metropolitan and/or national authorities.

different levels of government. A balanced, sustainable and integrated approach towards urban challenges should, in line with the Leipzig Charter on sustainable European cities, focus on all major aspects of urban development (in particular economic, environmental, social, territorial, and cultural) in order to ensure sound urban governance and policy. There is a need to enhance the complementarity of policies affecting Urban Areas and to strengthen their urban dimension. This can be achieved by involving all levels of government, by ensuring coordination and effective interaction between policy sectors, in full respect of the subsidiarity principle and in line with the competences of each level. The Urban Agenda for the EU offers a new form of multilevel and multi-stakeholder cooperation with the aim of strengthening the urban dimension in EU policy. Each stakeholder is free to determine its own level of participation in the Urban Agenda for the EU.

In order to address the increasingly complex challenges in Urban Areas, it is important that Urban Authorities cooperate with local communities, civil society, businesses and knowledge institutions. Together they are the main drivers in shaping sustainable development with the aim of enhancing the environmental, economic, social and cultural progress of Urban Areas. EU, national, regional and local policies should set the necessary framework in which citizens, NGOs, businesses and Urban Authorities, with the contribution of knowledge institutions, can tackle their most pressing challenges.

The Urban Agenda for the EU acknowledges the polycentric structure of Europe and the diversity (social, economic, territorial, cultural and historical) of Urban Areas across the EU. Furthermore, the Urban Agenda for the EU acknowledges the importance of Urban Areas of all sizes and contexts in the further development of the European Union. A growing number of urban challenges are of a local nature, but require a wider territorial solution (including urban-rural linkages) and cooperation within functional urban areas. At the same time, urban solutions have the potential to lead to wider territorial benefits. Urban Authorities therefore need to cooperate within their functional areas and with their surrounding regions, connecting and reinforcing territorial and urban policies.

Establishing the Urban Agenda for the EU

Along the road towards the Urban Agenda for the EU many milestones have been reached, as is reflected in the list of declarations from the Ministers responsible for Urban Matters (see annex). The latest one, the Riga declaration (June 2015), provides political support for the development of the Urban Agenda for the EU, acknowledging its potential contribution to balanced territorial and sustainable development and the achievement of common European goals.

Today, the EU Ministers responsible for Urban Matters have reached, at their informal meeting in Amsterdam, agreement on the establishment of the Urban Agenda for the EU as set out in the 'Pact of Amsterdam'. The 'Pact of Amsterdam' describes the main features of the Urban Agenda for the EU. However, the development of the Urban Agenda for the EU is an ongoing process. The Urban Agenda for the EU will be taken forward by Member States together with the European Commission, the European Parliament, the Committee of the Regions (CoR), the European Economic and Social Committee (EESC), the European Investment Bank (EIB), representatives of European Urban Authorities and other relevant stakeholders.

I Objectives and scope of the Urban Agenda for the EU

The Ministers affirm that:

- 1 The Urban Agenda for the EU aims to realise the full potential and contribution of Urban Areas towards achieving the objectives of the Union and related national priorities in full respect of subsidiarity and proportionality principles and competences.
- 2 The Urban Agenda for the EU strives to establish a more effective integrated and coordinated approach to EU policies and legislation with a potential impact on Urban Areas and also to contribute to territorial cohesion by reducing the socioeconomic gaps observed in urban areas and regions.
- 3 The Urban Agenda for the EU strives to involve Urban Authorities in the design of policies, to mobilise Urban Authorities for the implementation of EU policies, and to strengthen the urban dimension in these policies. By identifying and striving to overcome unnecessary obstacles in EU policy, the Urban Agenda for the EU aims to enable Urban Authorities to work in a more systematic and coherent way towards achieving overarching goals. Moreover, it will help make EU policy more urban-friendly, effective and efficient.
- 4 The Urban Agenda for the EU will not create new EU funding sources, unnecessary administrative burden, nor affect the current distribution of legal competences and existing working and decision-making structures and will not transfer competences to the EU level (in accordance with Articles 4 and 5 of the Treaty on European Union).

Scope

- 5 In line with the Council Conclusions of 19 November 2014 (Doc. 15802/14), the Urban Agenda for the EU will fully respect the subsidiarity principle and competences under the EU Treaties. Moreover, the Urban Agenda for the EU is based on the European Council Conclusions adopted on 26/27 June 2014, which state that, in line with the principles of subsidiarity and proportionality, the Union must concentrate its actions on areas where it makes a real difference. It should refrain from taking action when Member States can better achieve the same objectives.

The Urban Agenda for the EU focuses specifically on three pillars of EU policy making and implementation:

5.1 Better regulation

The Urban Agenda for the EU focuses on a more effective and coherent implementation of existing EU policies, legislation and instruments. Drawing on the general principles of better regulation, EU legislation should be designed so that it achieves the objectives at minimum cost without imposing unnecessary legislative burdens. In this sense the Urban Agenda for the EU will contribute to the Better Regulation Agenda. The Urban Agenda for the EU will not initiate new regulation, but will be regarded as an informal contribution to the design of future and revision of existing EU regulation, in order for it to better reflect urban needs, practices and responsibilities. It recognises the need to avoid potential bottlenecks and minimise administrative burdens for Urban Authorities.

5.2 Better funding⁵

The Urban Agenda for the EU will contribute to identifying, supporting, integrating, and improving traditional, innovative and user-friendly sources of funding for Urban Areas at the relevant institutional level, including from European structural and investment funds (ESIF) (in accordance with the legal and institutional structures already in place) in view of achieving effective implementation of interventions in Urban Areas. The Urban Agenda for the EU will not create new or increased EU funding aimed at higher allocations for Urban Authorities. However, it will draw from and convey lessons learned on how to improve funding opportunities for Urban Authorities across all EU policies and instruments, including Cohesion Policy.

5.3 Better knowledge (base and knowledge exchange)

The Urban Agenda for the EU will contribute to enhancing the knowledge base on urban issues and exchange of best practices and knowledge. Reliable data is important for portraying the diversity of structures and tasks of Urban Authorities, for evidence-based urban policy making, as well as for providing tailor-made solutions to major challenges. Knowledge on how Urban Areas evolve is fragmented and successful experiences can be better exploited. Initiatives taken in this context will be in accordance with the relevant EU legislation on data protection, the reuse of public sector information and the promotion of big, linked and open data.

- 6 The Urban Agenda for the EU will rely on the principle of an integrated approach to sustainable urban development as the guiding principle to achieve the goals of the three policy pillars. The Urban Agenda for the EU will, in addition to the organisations mentioned in the Pact of Amsterdam, make use of existing European policies, instruments, platforms and programmes such as the opportunities offered by Cohesion Policy, including its sustainable urban development strand⁶, Urban Innovative Actions, URBACT, ESPON, the ‘Covenant of Mayors’, Civitas 2020, RFSC (Reference Framework for Sustainable Cities), EUKN. It will make full use of the European Innovation Partnership ‘Smart Cities and Communities’⁷ as established by the Commission.
- 7 The Urban Agenda for the EU will foster coherence between urban matters and territorial cohesion, as set out in the Territorial Agenda 2020. The Ministers responsible for Territorial Cohesion and Urban Matters will be periodically informed by the DG meeting on urban matters about the development of the Urban Agenda for the EU.
- 8 The Urban Agenda for the EU will contribute to the implementation of the UN 2030 Agenda for Sustainable Development, notably Goal 11 ‘Make cities inclusive, safe, resilient and sustainable’ and the global ‘New Urban Agenda’ as part of the Habitat III process.
- 9 The Urban Agenda for the EU should be implemented in full transparency. All interested parties should have equal access to information about the state of play of the Urban Agenda and should have equal possibilities to contribute to the Urban Agenda for the EU.

5 Funding is defined here as the provision of financial resources and/or instruments to finance a need, program or project.

6 Article 7 of the ERDF Regulation 1301/3013

7 European Innovation Partnership on Smart Cities and Communities established by the Commission Communication of 10.7.2012 (C(2012)4701 final); <http://ec.europa.eu/eip/smartcities/>

II Priority Themes and cross-cutting issues of the Urban Agenda for the EU

The Ministers agree:

- 10 That, taking into account the priorities of the EU 2020 strategy for smart, sustainable and inclusive growth, the initial list of Priority Themes (in no particular order) for the Urban Agenda for the EU is as follows (see Work Programme of the Urban Agenda for the EU for an indicative description of the themes):
 - 10.1 Inclusion of migrants and refugees.
 - 10.2 Air quality.
 - 10.3 Urban poverty.
 - 10.4 Housing.
 - 10.5 Circular economy.
 - 10.6 Jobs and skills in the local economy.
 - 10.7 Climate adaptation (including green infrastructure solutions).
 - 10.8 Energy transition.
 - 10.9 Sustainable use of land and Nature-Based solutions.
 - 10.10 Urban mobility.
 - 10.11 Digital transition.
 - 10.12 Innovative and responsible public procurement.
- 11 That these Priority Themes will guide the actions of the Urban Agenda for the EU (as listed under 14b, c, and d).
- 12 That the complexity of urban challenges requires integrating different policy aspects to avoid contradictory consequences and make interventions in Urban Areas more effective. In line with the competences and responsibilities of the different participants and taking into account that the EU does not have competences on some of these issues, the Partnerships shall consider the relevance of the following cross-cutting issues for the selected priority themes:
 - 12.1 Effective urban governance, including citizens participation and new models of governance.

- 12.2 Governance across administrative boundaries and inter-municipal cooperation: urban-rural, urban-urban and cross-border cooperation; link with territorial development and the Territorial Agenda 2020 (well-balanced territorial development).
- 12.3 Sound and strategic urban planning (link with regional planning, including 'research and innovation smart specialisation strategies' (RIS3), and balanced territorial development), with a place-based and people-based approach.
- 12.4 Integrated and participatory approach.
- 12.5 Innovative approaches, including Smart Cities.
- 12.6 Impact on societal change, including behavioural change, promoting, among other things, equal access to information, gender equality and women empowerment.
- 12.7 Challenges and opportunities of small- and medium-sized Urban Areas and polycentric development.
- 12.8 Urban regeneration, including social, economic, environmental, spatial and cultural aspects, also linked to the brownfield redevelopment with the objective of limiting greenfield consumption.
- 12.9 Adaptation to demographic change and in- and out migration.
- 12.10 Provision of adequate public services of general interest (within the meaning of Article 14 TFEU in conjunction with Protocol Number 26).
- 12.11 International dimension: link with the New Urban Agenda (Habitat III) of the UN (to be agreed upon), the Sustainable Development Goals (SDGs, 2030 Agenda on Sustainable Development) of the UN and the Paris Agreement on climate change of December 2015.

III Operational framework of the Urban Agenda for the EU

The Ministers agree:

- 13 That the Urban Agenda for the EU is a coherent set of actions of key European actors. It is a new form of informal multilevel cooperation where Member States, Regions, representatives of Urban Authorities, the European Commission, the European Parliament, the Union's Advisory Bodies (CoR, EESC), the EIB and other relevant actors work in partnership.

- 14 That the actions ensuing from the Urban Agenda for the EU belong to the following categories:
 - a *Themes* – The Urban Agenda for the EU will focus on a limited number of Priority Themes (see chapter II).
 - b *Horizontal and Vertical Coordination* – Thematic Partnerships are a new instrument for multilevel and cross-sectoral (horizontal and vertical) cooperation to deliver more effective solutions to urban challenges and ensure a more integrated approach at the level of Urban Areas.
 - c *Impact Assessments* – To reduce conflicting impacts of EU legislation on Urban Areas and burdensome implementation at local and regional level, when assessing territorial impacts, it should be explored if better methods as well as specific tools can be used on issues relevant for Urban Areas. This can be done by taking the possible impact of EU legislation on Urban Areas more into account, both in EU policy making and the legislative process.
 - d *Knowledge* – The exchange of knowledge and experiences as well as monitoring results in Urban Areas will be central to improving and assessing the effects of the Urban Agenda for the EU and relevant EU actions. Therefore, more reliable data on Urban Areas is needed and should be exchanged, while taking into account the relevant EU data protection legislation, the need to minimise administrative burdens and the heterogeneity of Urban Authorities.

The concrete actions under these categories are listed in the Working Programme of the Urban Agenda for the EU.

- 15 That the governance of the Urban Agenda for the EU will work as follows:

The activities of the Urban Agenda for the EU will be coordinated by the DG meeting on Urban Matters. The DG meeting on Urban Matters will:

- a Ensure that the actions are organised in such a way that they are transparent, conceived with and supported by (representatives of) Member States, Urban Authorities and the European Commission, mutually reinforcing and having the most effective impact on EU policy making;
- b Report to the Informal meeting of Ministers responsible for Urban Matters and Territorial Cohesion;
- c Monitor progress on the actions of the Urban Agenda for the EU;
- d Provide feedback on the Action Plans to the Partnerships;
- e Give informal guidelines for future developments of the Urban Agenda for the EU;
- f Evaluate the current and future set of actions of the Urban Agenda for the EU at the latest by 2020;
- g Review the initial list of Priority Themes which will be revised by the Informal Meeting of Ministers responsible for Urban Matters.

In the Working Programme, the Operational Framework of the Urban Agenda for the EU is described in more detail. The DG Meeting on Urban Matters will review the Working Programme and suggest amendments to the Ministers responsible for Urban Matters for approval. A report on the amendments made will be submitted to the General Affairs Council (GAC).

IV Partnerships

The Ministers agree:

- 16 That Partnerships are the key delivery mechanism within the Urban Agenda for the EU.
- 17 That the aim of the Partnerships is to develop a multilevel and cross-sectoral governance approach in an open and transparent way in order to achieve the wider objective of the Urban Agenda for the EU as listed under Part I and based on a strong involvement of practitioners from Urban Authorities. The Working Programme explains the working method of the Partnerships in more detail.
- 18 To ensure focus and real impact on the ground, Partnerships should have a bottom-up approach analysing, inter alia, concrete cases in Urban Areas which exemplify bottlenecks and potentials.
- 19 That each Partnership will formulate an Action Plan with concrete proposals for Better Regulation, Better Funding and Better Knowledge, related to the theme of the Partnership, which can be regarded as non-binding contributions to the design of future and the revision of existing EU legislation, instruments and initiatives.
- 20 That the input of the Partnerships for future and existing EU regulation with an urban impact will be submitted for consideration, after informal guidance by the DG Meeting on Urban Matters, to the European Commission. Furthermore, these proposals could be brought to the attention of incoming EU Presidencies in view of their possible inclusion in the working programme of these Presidencies.
- 21 That participation in Partnerships is voluntary.

V Member States

The Ministers agree:

- 22 To take the appropriate steps for the implementation of the Urban Agenda for the EU and engage, as appropriate, relevant bodies at all levels of government in the implementation of the Urban Agenda for the EU, in line with their respective competences and the principle of subsidiarity.
- 23 On the need for better involvement of relevant key partners, including representatives of urban and regional authorities, in the preparation as well as the evaluation of EU policy through existing opportunities for consultation available to Member States.
- 24 To strengthen dialogue with the European Commission about how to improve the exchange of data on Urban Areas at the EU level (including the urban audit), taking into account the need to minimise administrative burdens as much as possible.
- 25 To promote, as appropriate and in line with the proportionality principle, the improvement of the knowledge base and the proportionate collection of data on urban development issues, referring to different types of urban units at EU level, taking into account the need to minimise administrative burdens as much as possible and using existing tools and instruments.
- 26 To engage with Urban and Regional Authorities, the European Commission, the European Parliament, the CoR and the EIB, whilst respecting the principle of proportionality, in the debate on improving existing instruments in Cohesion Policy and other EU policies aimed at urban development, the more wide-spread and effective use of financial instruments by Urban Authorities, and the deployment of the European Fund for Strategic Investments in relation to funding in Urban Areas. This includes simplification of rules across funding programmes and instruments.
- 27 That the Urban Agenda for the EU should be regularly discussed by Ministers responsible for Urban Matters, preferably at least once every 18 months.
- 28 To take note of the Council Conclusions of 12 May 2016 on the New Urban Agenda prepared in the framework of the third United Nations Conference on Housing and Sustainable Development (Habitat III).

VI Urban Authorities

The Ministers agree:

- 29 That Urban Authorities are invited to take an active role in the Urban Agenda for the EU and to provide the required expertise for all Urban Agenda for the EU actions, since they play a crucial role in the Urban Agenda for the EU, providing political guidance locally and crucial insights on needs as well as expertise on how best to tackle the challenges they face.
- 30 To encourage Urban Authorities to capitalise on the knowledge and capacity of specialist EU Urban networks in the relevant Partnerships.
- 31 To call upon Urban Authorities to continue to work together with Regional Authorities, the private sector, local communities, knowledge institutions and civil society in bringing forward the Urban Agenda for the EU.
- 32 To invite the CoR, as the Union's advisory body formally representing regions and municipalities at EU level, to contribute to the further development of the Urban Agenda for the EU.
- 33 To call upon and directly involve EUROCITIES, CEMR and other bodies representing Urban Authorities, to contribute to the further development of the Urban Agenda for the EU and the exchange of good practices, and to make use of the outcome of the Urban Agenda for the EU actions, especially the work of the Partnerships.
- 34 To encourage networking and exchange of knowledge between Urban Authorities of Urban Areas of all sizes and between different levels of government.

VII European Commission

The Ministers agree:

- 35 To welcome the progress of the European Commission as set forth in the Staff Working Document on the Results of the Public Consultation on the Key Features of an Urban Agenda for the EU.
- 36 To call upon the European Commission to play an active role and continue facilitating the implementation of the Urban Agenda for the EU within its existing budgets, including the provision of basic technical assistance to the Partnerships from 1 January 2017 onwards.
- 37 To call upon the European Commission to align its actions on strengthening the urban dimension of EU policies to the Urban Agenda for the EU.
- 38 To call upon the European Commission to further strengthen in a transparent way its coordination and streamlining of policies directly or indirectly impacting on Urban Areas, in order to enhance the complementarity of the policies and strengthen their urban dimension, in particular in the areas of Better Regulation, Better Funding and Better Knowledge.
- 39 To call upon the European Commission to set up a one-stop-shop for matters regarding the Urban Agenda for the EU and the urban dimension of EU policies and thereby to facilitate full, reliable and customised information for Urban Areas and stakeholders.
- 40 To call upon the European Commission to ensure the continuity, coherence and coordination of the Urban Agenda for the EU by supporting, where relevant, the implementation of the set of actions of the Urban Agenda for the EU, particularly the work of the Partnerships.
- 41 To call upon the European Commission to respect urban diversity and consider, after guidance by the DG Meeting on Urban Matters, in a transparent manner and where appropriate, the results and recommendations of the Partnerships when drafting relevant proposals for and reviewing EU legislation, instruments and initiatives.
- 42 To call upon the European Commission to report back regularly to the Council, for the first time in the course of 2017, on the implementation and results of the Urban Agenda for the EU.
- 43 To call upon the European Commission to continue to work with Urban Authorities and their representative organisations through the various existing opportunities for consultation and feedback offered, when developing relevant new policy and legislative initiatives and evaluating existing EU strategies, policies and legislation.
- 44 To call upon the European Commission to continue to explore improved assessments of urban impacts, where relevant, as part of the Impact Assessments, using available tools and including stronger stakeholder involvement. These improved Impact Assessments, if applied proportionally, can be important instruments to better incorporate the urban and territorial dimension in new EU initiatives, in line with the objectives of the better regulation agenda.

VIII European Parliament

The Ministers agree:

- 45 To thank the European Parliament for its active contribution to the Urban Agenda for the EU and to encourage future cooperation in this field with the Committee on Regional Development (REGI) and the URBAN Intergroup, as well as with other Committees and Intergroups whose scope has a clear urban dimension.
- 46 To welcome the emphasis of the European Parliament on the use of better regulation in relation to the strengthening of the urban dimension in EU policy.
- 47 To invite the European Parliament to consider, where appropriate, the results and recommendations of the Partnerships after guidance by the DG Meeting on Urban Matters, for the agenda of relevant Committees when discussing relevant new and existing EU legislation.

IX European Investment Bank (EIB)

The Ministers agree:

- 48 That the EIB plays an important role, also in cooperation with other international financial institutions and national promotional banks, in the financing of investments in areas covered by the Urban Agenda for the EU, in grant-loan blending for urban investments, and in advising Member States and cities about urban project preparation and financial instruments.
- 49 To invite the EIB to support the development of better funding approaches in the urban context, including through financial instruments, in cooperation with the European Commission.
- 50 To invite the EIB to contribute to the work of the Partnerships in particular with regard to better funding and better knowledge.
- 51 To invite the EIB to reflect, where relevant, the outcomes of the Urban Agenda for the EU as appropriate in its urban lending, grant-loan blending and advisory services approach in the urban context taking into account the need to support sustainable urban development strategies and without jeopardising its financial discipline.

X Civil Society, Knowledge Institutions and Business

The Ministers agree:

- 52 To recognise the potential of civil society to co-create innovative solutions to urban challenges, which can contribute to public policy making at all levels of government and strengthen democracy in the EU.
- 53 To invite the EESC to contribute, within its competence, to the further development of the Urban Agenda for the EU.
- 54 To invite civil society organisations, knowledge institutions and businesses to provide informed advice on all actions within the framework of the Urban Agenda for the EU aimed at Better Regulation, Better Funding and Better Knowledge.

Annex

Pact of Amsterdam

List of Reference Documents

The Pact of Amsterdam builds on the following list of documents adopted at Informal Meetings of Ministers responsible for Territorial Cohesion and/or Urban Matters:

- The 'European Spatial Development Perspective – Towards Balanced and Sustainable Development of the Territory of the European Union' agreed at the Informal Council of Ministers responsible for Spatial Planning in Potsdam, May 1999.
- The 'Lille Action Programme' adopted at the Informal Council of Ministers responsible for urban affairs held in Lille on 3 November 2000.
- The 'Urban Acquis' adopted at the Informal Council of Ministers responsible for territorial cohesion, held in Rotterdam on 29 November 2004.
- The 'Bristol Accord' adopted at the Informal Council of Ministers on sustainable communities held in Bristol on 6-7 December 2005.
- The 'Territorial Agenda of the EU - Towards a More Competitive and Sustainable Europe of Diverse Regions' adopted at the Informal Council of Ministers responsible for spatial planning and urban development held in Leipzig on 24-25 May 2007.
- Leipzig Charter on sustainable European cities, adopted at the Informal Council Meeting of Ministers on urban development of 24-25 May 2007 in Leipzig.
- The 'Marseille Declaration' adopted at the Informal Ministerial Meeting of Ministers responsible for urban development on 25 November 2008.
- Toledo Declaration, adopted at the Informal Council Meeting of Ministers on urban development of 22 June 2010 in Toledo.
- Territorial agenda of the EU 2020, agreed at the Informal Ministerial Meeting of Ministers responsible for Spatial Planning and Territorial Development of 19 May 2011 in Gödöllő.
- The 'Road map' for the implementation of the new Territorial Agenda adopted during Polish presidency in November 2011.
- Declaration of Ministers towards the EU Urban Agenda, adopted at the informal meeting of EU ministers responsible for Territorial Cohesion and Urban Matters, Riga, 10 June 2015.

Other Intergovernmental documents

- The Treaty of Lisbon amending the Treaty on European Union and the Treaty establishing the European Community, signed at Lisbon, 13 December 2007 and entered into force on 1 December 2009.
- Council Resolution of 12 February 2001 on architectural quality in urban and rural environments (2001/C 73/04).
- The strategy 'EUROPE 2020', approved by the European Council on 17 June 2010 following the Commission Communication 'EUROPE 2020: A strategy for smart, sustainable and inclusive growth' dated 3 March 2010 (COM(2010)2020); and the renewed 'EU Sustainable Development Strategy', adopted by the European Council on 15/16 June 2006.
- General Affairs Council conclusions of Nov 2014 (point 32).

The following list contains important reference documents for the Pact of Amsterdam and the development of the EU Urban Agenda. The presence of a document on the following list should not be taken as endorsement of its content:

Presidency Conclusions

- Presidency Conclusions adopted at the Informal Meeting of the Directors General of Territorial Cohesion/ Spatial Development and Urban Development on 21 November, 2013 in Vilnius.
- Presidency Conclusions adopted at the Informal Meeting of Ministers responsible for cohesion policy of 24-25 April 2014 in Athens.
- Presidency Conclusions of the Luxembourg Presidency of the Council of the European Union on the occasion of the Informal Ministerial Meetings on Territorial Cohesion and Urban Policy (26 and 27 November 2015).

European Commission

- Communication from the Commission of 6 May 1997 entitled 'Towards an urban agenda in the European Union' (COM(1997)0197).
- The Communication from the Commission to the Council, the European Parliament, the Committee of the Regions and the European Economic and Social Committee entitled 'Green Paper on Territorial Cohesion: Turning territorial diversity into strength' dated 6 October 2008 (COM(2008)0616).
- The Working Document of the Directorate-General for Regional Policy 'Fostering the urban dimension – Analysis of the Operational Programmes co-financed by the European Regional Development Fund (2007-2013)' from November 2008; and the Guide from the Commission on 'The urban dimension in Community policies for the period 2007 – 2013' updated in December 2009.
- Commission's report entitled 'Cities of tomorrow: Challenges, visions, ways forward', October 2011.
- Communication from the Commission of 18 July 2014 on the urban dimension of EU policies – key features of an EU urban agenda (COM(2014)0490).
- Communication from the Commission of 16 December 2014 entitled 'Commission Work Programme 2015' (COM(2014)0910).
- Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee of the Regions. Commission Work Programme 2015. A New Start (COM (2014)910),
- Commission Staff Working Document / Results of the Public Consultation on the key features of an EU Urban Agenda (SWD(2015) 109 final/2).
- Commission's report entitled 'Cities of tomorrow: Investing in Europe', Brussels, 17-18 February 2014.
- Better regulation for better results – an EU agenda (COM(2015) 215 final).

European Parliament

- The European Parliament resolution of 24 March 2009 on the Green Paper on Territorial Cohesion and the state of the debate on the future reform of cohesion policy (2008/2174(INI)); the European Parliament report of 24 March 2009 on the urban dimension of cohesion policy in the new programming period (2008/2130(INI)).
- European Parliament resolution of 23 June 2011 on the European urban agenda and its future in cohesion policy.
- European Parliament resolution of 9 September 2015 on the urban dimension of EU policies (2014/2213(INI)).

EESC and CoR

- Opinion of the European Economic and Social Committee (EESC) of 21 September 2011 on 'Metropolitan Areas and City Regions in Europe 2020'.
- Opinion of the Committee of the Regions of 25 June 2014 on 'Towards an Integrated Urban Agenda for the EU'.

- Opinion of the European Committee of the Regions ‘The improvement of the implementation of the Territorial Agenda of the European Union 2020’, 17 April 2015.
- Opinion of the EESC ‘An EU urban agenda – strengthening the urban dimension of EU policymaking for a more effective delivery of Europe 2020’, 23 April 2015.
- Opinion of the EESC on ‘The future of the EU Urban Agenda seen from the perspective of civil society’ (exploratory opinion requested by the Netherlands presidency of the EU), 17 February 2016.
- Opinion of the European Committee of the Regions ‘Concrete steps for implementing the EU Urban Agenda’ (requested by the Dutch EU Presidency), 8 April 2016.

Other

- European Urban Charter, adopted by the Council of Europe’s Standing Conference of Local and Regional Authorities of Europe (CLRAE) on 18 March 1992, a Session held during the annual Plenary Session of the Congress of Local and Regional Authorities CLRAE (17-19 March 1992, Strasbourg).
- European Urban Charter II. Manifesto for a new urbanity, adopted by the Congress of Local and Regional Authorities (CLARE) on the occasion of its 15th Plenary Session, Strasbourg, 29 May 2008.
- EUROCITIES strategic framework 2014-2020: towards an EU urban agenda for cities, December 2014.
- CEMR Contribution to an Urban Agenda, February 2014.
- Vienna Declaration by the Mayors of the EU Capital Cities ‘A strong voice in Europe’, 21 April 2015.
- CEMR Position Paper, ‘Territorial development An EU Urban Agenda should facilitate local authorities’ action on the ground’, December 2015.
- Declaration by the Mayors of the EU Capital Cities on the EU Urban Agenda and the Refugee Crisis, 21 April 2016.
- European City Makers Agenda, May 2016.

Working Programme of the Urban Agenda for the EU

The Working Programme of the Urban Agenda for the EU describes the Operational Framework of the Urban Agenda for the EU in detail: the working method, concrete actions and the themes of the Urban Agenda for the EU. It supports the Pact of Amsterdam agreed at the Informal Meeting of Ministers responsible for Urban Matters on 30 May 2016.

The DG meeting on Urban Matters will review the Working Programme and suggest amendments to the Ministers responsible for Urban Matters for approval. A report on the amendments made will be submitted to the General Affairs Council (GAC).

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A Governance of the Urban Agenda for the EU

In addition to Part III of the Pact about the Operational Framework of the Urban Agenda for the EU, the Working Programme gives a further description of the Governance of the Urban Agenda for the EU:

DG meeting on Urban Matters

The activities of the Urban Agenda for the EU will be coordinated by the DG meeting on Urban Matters. When discussing matters related to the Urban Agenda for the EU, the DG meeting will include Member States, the European Commission, the CoR, CEMR, and EUROCITIES as members in order to reflect the multilevel character of the Urban Agenda for the EU. Partner States, EESC, EP, EIB, URBACT, ESPON and EUKN participate as observers in the DG meeting. Other stakeholders may be invited by the Council Presidency as observers.

When discussing urban issues related to the Urban Agenda for the EU, the DG meeting will be prepared and organised by the EU Member State holding the Council Presidency, who will co-chair the meeting with the Commission.

Urban Development Group

The Urban Development Group (UDG) is an informal advisory body to the DG meeting on Urban Matters. In order to both ascertain the autonomy of the Council Presidency to table its own priorities and ensure the continuity of the Urban Agenda for the EU, the Urban Development Group will have a dual purpose: to discuss urban issues in general at the intergovernmental level and to give advice to the DG meeting about the Urban Agenda for the EU. When deemed necessary, the meeting of the Urban Development Group will be divided in two different parts in line with the abovementioned objectives.

In the framework of the Urban Agenda for the EU, the UDG will work both as an advisory and monitoring body for the DG meeting.

When discussing matters related to the Urban Agenda for the EU, the Urban Development Group will include relevant representatives from Member States (urban national experts), the European Commission, the European Parliament, the EU Advisory bodies (CoR, EESC), EIB, representatives of Urban Authorities (CEMR, EURO CITIES), in order to reflect the multilevel character of the Urban Agenda for the EU. Partner States, URBACT, ESPON and EUKN participate as observers in the Urban Development Group. Other stakeholders may be invited by the Council Presidency as observers.

When discussing urban issues related to the Urban Agenda for the EU, the Urban Development Group will be prepared and organised by the Council Presidency, who will co-chair the meeting with the Commission.

Guidance

The DG meeting will provide non-binding guidance to the actions of the Urban Agenda for the EU upon advice of the Urban Development Group. This informal guidance is formed by consensus.

B Initial list of Priority Themes

The list was established based on a survey among Member States and representatives of urban and regional authorities in July 2015 organised by the Netherlands and under consideration of the Commission Staff Working document ('Results of the Public Consultation on the key features of an Urban Agenda for the EU, SWD(2015) 109 final/2), published on 27 May 2015 as well as the results of three thematic workshops on this matter (organised by the European Commission in September 2015). The Priority Themes are in line with the intergovernmental documents mentioned in the annex.

The list was presented to the DG meeting on Urban Matters in Luxembourg in October 2015 and agreed with in principle.

The themes were selected based on the following selection criteria:

- Themes must require integrated action at the EU-level and multi-level cooperation.
- Clear support of Member States, European Commission and Urban Authorities.
- Themes address the major challenges in Urban Areas.
- Themes have the potential to generate concrete results in a reasonable timeframe.
- Themes which promote the EU 2020 objectives.

This list may be reviewed by the DG meeting by consensus and will be revised by the Informal Meeting of Ministers responsible for Urban Matters. The DG meeting will review the list of themes yearly and provide guidance. Any member of the DG meeting can submit a detailed advisory proposal for a revision of the list based on the abovementioned criteria. In all cases the work of each Partnership will be focused on measures to make better use of existing EU regulations and funding in relation to Urban Areas and to showcase and share best practice, knowledge and evidence of what works. Partnerships will not generate actions which result in new EU regulations and new or increased funding.

The following introductions of the initial list of Priority Themes (in no particular order) are for illustrative and discussion purposes only. The descriptions will not in any way restrict future work or place limitations on future partnerships.

1 Inclusion of migrants and refugees

The objectives are to manage integration of incoming migrants and refugees (extra-EU) and to provide a framework for their inclusion based on willingness and integration capacity of local communities. This will cover: housing, cultural integration, provision of public services, social inclusion, education and labour market measures, chances of second-third generations, spatial segregation.

2 Air quality

The objective is to realise systems and policies to ensure a good air quality for human health. This will cover: legislative and technical aspects linked to a wide range of polluting sources such as cars, industries, agricultural activities, etc.

3 Urban poverty

The objectives are to reduce poverty and improve the inclusion of people in poverty or at risk of poverty in deprived neighbourhoods. Urban poverty refers to issues related to structural concentration of poverty in deprived neighbourhoods and solutions that need to be designed and applied with integrated approach:

- Place-based solutions: urban regeneration of deprived neighbourhood;
- People-based solutions: socio-economic integration of people living in neighbourhoods.

The focus will be on: spatial concentration of structural poverty in deprived neighbourhoods (and regeneration of these areas) and child poverty.

4 Housing

The objectives are to have affordable housing of good quality. The focus will be on public affordable housing, state aid rules and general housing policy.

5 Circular economy

The objective is to increase the re-use, repair, refurbishment and recycling of existing materials and products to promote new growth and job opportunities. For instance, additional measures to increase resource productivity by 30% by 2030 could boost GDP by nearly 1%, while creating 2 million additional jobs. The focus will be on: waste management (turn a waste into a resource), sharing economy, resource efficiency.

6 Jobs and skills in the local economy

The objectives are prosperity and low unemployment. The focus will be on: (a) attracting and keeping enterprises; (b) creating new enterprises; (c) producing and consuming locally; (d) supporting new ways of working; and (e) ensuring that skills meet the needs.

7 Climate adaptation (including green infrastructure solutions)

The objectives are to anticipate the adverse effects of climate change and take appropriate action to prevent or minimise the damage it can cause to Urban Areas. The focus will be on: vulnerability assessments, climate resilience and risk management (including the social dimension of climate adaptation strategies).

8 Energy transition

The objectives are to have a long-term structural change in energy systems i.e. shift to renewable energy and energy efficiency. The focus will be on: improving energy efficiency (also in buildings), fostering innovative approaches for energy supply (e.g. local systems) and increasing the local production of renewable energy.

- 9 Sustainable use of land and Nature-Based solutions
The objective is to ensure that the changes in Urban Areas (growing, shrinking and regeneration) are respectful of the environment, improving quality of life. The focus will be on: urban sprawl, development of brownfields and on renaturing / greening Urban Areas.
- 10 Urban mobility
The objectives are to have a sustainable and efficient urban mobility. The focus will be on: public transport, soft mobility (walking, cycling, public space) and accessibility (for disabled, elderly, young children, etc.) and an efficient transport with good internal (local) and external (regional) connectivity.
- 11 Digital transition
The objective is to provide better public services to citizens and create business opportunities. The focus will be on: data collection (including ownership), better use of open data, data management (including the capacity of citizens, Urban Authorities and privacy issues) and digital services (incl. new technologies) and accessibility of digital public services to disabled and elderly citizens (in accordance with international WCAG 2.0 standards).
- 12 Innovative and responsible public procurement
The objective is to use this powerful tool to address social and environmental objectives and to do more with less. This will cover innovative approaches in procurement.

C Description of actions under the Urban Agenda for the EU

The Urban Agenda for the EU will be implemented through a coherent set of actions. Under paragraph 15 in the Pact of Amsterdam four categories of actions are mentioned: Themes, Vertical and Horizontal Coordination, Impact Assessments and Knowledge. The different concrete actions under these four categories, aimed at improving the urban dimension of EU-policies, are the following:

- 1 Partnerships (see section D).
- 2 In line with the Commission Staff Working Document¹, improvement of the coordination by the European Commission of existing instruments and initiatives by:
 - a Mapping the urban related Commission initiatives in the selected Themes of the Urban Agenda for the EU with a view to identifying gaps, overlaps and synergies;
 - b Identifying the main actors, networks and platforms within the selected themes with a view to streamlining cooperation and exchange of good practice.
- 3 It will be explored, when assessing territorial impacts, if better methods as well as specific tools can be used on issues relevant for Urban Authorities by taking the possible impact of EU legislation on Urban Areas into account more, both in EU policy making and the legislative process.
- 4 Alignment of the Urban Innovative Actions with the selected Themes for the Urban Agenda for the EU by the European Commission.
- 5 Contribution of URBACT to the Priority Themes with its activities of exchange and learning through

¹ Commission Staff Working Document, 27 June 2015 (SWD(2015) 109 final/2)

transnational networking, capacity building, capitalisation & dissemination of urban knowledge and know-how.

- 6 Alignment of the work of the Urban Development Network (UDN) of the European Commission to the framework of the Urban Agenda for the EU by the European Commission.
- 7 The scientific work and solutions developed by the Joint Programming Initiative Urban Europe in the area of research and innovation will be used to promote and exchange evidence based proposals for urban policy and urban projects.
- 8 Contribution of specific research activities of the European Observation Network, Territorial Development and Cohesion (ESPON) to the selected Themes, where deemed relevant.
- 9 Organisation by the Presidency of the Council of the EU of the Informal Ministerial Meeting of Ministers for Urban Matters about the progress of the Urban Agenda for the EU, to be held preferably at least once during every Trio Presidency, with the participation of the Commission, the European Parliament, European Advisory Bodies, EIB, representatives of Urban Authorities and relevant stakeholders.
- 10 Continuation of the organisation of a biennial CITIES Forum by the European Commission to debate and report progress on the Urban Agenda for the EU to a wider audience.
- 11 Development of appropriate tools and formats to implement a transparent, inclusive and effective implementation of the EUUA.

The set of actions can be reviewed by the DG meeting. The Ministers responsible for Urban Matters will revise the set of actions.

D Working method of the Partnerships

I Organisation

1 Membership

Each Partnership is made up of Urban Authorities (cities), the European Commission, EU organisations (EIB, EESC, CoR), Member States, Partner States, experts, umbrella organisations (e.g. EUROCITIES, CEMR), knowledge organisations (e.g. URBACT, ESPON, EUKN) and stakeholders (NGOs, business, etc.). Participation is voluntary and open to all those interested, committed² and ready to dedicate resources, taking into account the need for balanced composition indicated below. It is important that all members of the Partnership have extensive experience and expertise on the topic.

A advisable composition of the Partnership: a partnership is composed of about 15 to 20 partners (balanced composition³).

Partners representing Urban Authorities

- a Five Urban Authorities to be nominated by the following parties:
 - i Member States, URBACT (upon approval of the Monitoring Committee) and the Committee of

² Commitment refers to endorsement, active involvement and leadership by people in positions of authority.

³ Balanced geographically and between Commission, Member States, Urban Areas and other stakeholders. With regards to the Urban Areas, there should be a representation of both 'bigger' and 'small and medium' cities.

the Regions can propose Urban Authorities for nomination to the DG meeting, which will select up to three Urban Authorities.

- ii EUROCITIES and CEMR can propose Urban Authorities for nomination to the DG meeting, which will select up to two Urban Authorities. In order to facilitate transparency and balanced representation in the nomination process, nominations of Urban Authorities for the partnerships will be presented by EUROCITIES and CEMR to the DG meeting before becoming final (if deemed necessary through a written procedure).
 - iii If insufficient Urban Authorities are nominated, the Coordinator of the Partnership may propose Urban Authorities for nomination to the DG meeting, after consulting with other partners, (if necessary through a written procedure).
- b EUROCITIES and CEMR may each nominate one representative of the secretariat of their own organisation.

Partners representing Member States

- c Five Member States to be agreed upon by the DG meeting on Urban Matters.⁴

Partners representing the European Commission

- d Commission representatives of the relevant DGs (number of representatives depends on number of DGs which need to be involved on the specific theme).

Partners representing stakeholders

- e The coordinators of the Partnership may propose others for nomination to the DG meeting such as:
- i Managing Authorities of ESIF;
 - ii EIB;
 - iii Experts (e.g., Universities etc.);
 - iv NGOs/ economic and social partners (at European level) notably the EESC/ civil society organisations;
 - v Private sector representatives.

Observers

- f In addition, the Partnership may include some observers (e.g. URBACT, EUKN).

Regions, Partner States, city consortiums or national city umbrella organisations can also be nominated instead of an Urban Authority as partner in the partnership through any of the routes set out above under 1.a.

If a Partnership is not complete at the start, during their first meeting, partners will decide on how to proceed on finding the additional partners. This could also be the case if members of the Partnership fail to contribute actively to the work.

Duration: The timeframe of each Partnership to achieve results is about three years. After these three years, the Partnership will present its results to the DG meeting. Thematic Partnerships may then be terminated or continued, if deemed necessary and on decision by the partners. The DG meeting shall be informed about any institutional changes in their Partnership.

⁴ It should not be the members of the UDG, but persons from the Member State with expertise in the Priority Theme and sufficient authority to take decisions (typically someone from a Ministry which is in charge of the theme concerned).

2 New Partnerships

Proposals for new Partnerships have to be presented to the UDG. The UDG will then advise the DG meeting about the proposals for new Partnerships. The DG meeting will decide on which theme a Partnership will start and when deemed necessary by the DG meeting the Informal Ministerial Meeting on Urban Matters will decide on this.

3 Coordinators

A Partnership will choose one or two of its members as coordinator(s), immediately after its establishment. The coordinator(s) will chair the meetings of the Partnership. Coordinators are the key actors to make the Urban Agenda for the EU operational. They are the main point of contact for members of the Partnership and other interested Urban Authorities, the Commission and Member States. Partnerships may ask the Commission to facilitate the process, among others concerning the coordination between Partnerships, and to provide assistance for Secretariat duties and for expertise at EU level.

The coordinators are expected to cover the cost of their work.

Responsibilities of the Coordinators:

- a Organising the Partnership meetings: preparing the agenda, sending the invitations, providing the meeting rooms (in their Ministry, City Hall, etc.), inviting (external) speakers where appropriate, drafting the minutes, etc.;
- b Chairing the Partnership meetings;
- c Organising the work between Partnership meetings (e.g. written consultation, asking for contributions, preparing documents, etc.);
- d Being the link between the Partnership and the Urban Authorities, the Commission and Member States, including the UDG and DG meetings, (including drafting a concise annual report) as well as a wider range of interested parties such as Urban Authorities, Member States not involved in the specific partnership and other stakeholders (in particular inform on the progress and offer the possibility to contribute e.g. through consultations, e-mails, updates, conferences, etc.);
- e Cooperation with the other Partnerships, when deemed of added value;
- f Participating and contributing to other working groups/ networks;
- g Coordinating the drafting of the Action Plan;
- h Monitoring and reporting on progress (through inter alia the website (see chapter III, paragraph 2 of the Working Programme));
- i Coordinating the work (e.g. ensuring that the contributions are prepared on time and at a good quality, mediating if there are different positions with a view to arriving at an acceptable position, etc.);
- j Coordinating the communication on actions and results (visibility);
- k Responsible for transmitting results from the Partnership to the DG meeting.

4 The Role of Partners:

The partners in a Partnership have specific roles and responsibilities:

- a Contribute to the implementation of different actions of the Action Plan;
- b Participate in the technical work of the Partnership with own resources;
- c Contribute to the Partnership through their own individual expertise but also the wider knowledge of the organisation they represent;
- d Assist in the debate about the Partnership within their territory.

II Phases & Deliverables

Step n° 1 - Stocktaking

In the first step, the members of the Partnership would identify the existing work carried out on the Priority Theme (strategies, actions and working groups/ networks covering these issues at EU level). As the aim is to avoid duplication but rather ensure coordination and reinforce what is already being done, this step is crucial to decide how to move forward in building the Partnership (for example: adjust the topic of the Priority Theme and assessing the relevance of main cross-cutting aspects (as mentioned under C.1); limit the scope of the Partnership; organise active participation to existing strategies, actions and working groups/ networks to ensure that the urban dimension of all Member States is taken into account; etc.). In this stocktaking step, the members of the Partnerships would also identify the sources of funding and expertise which could be made available for the functioning of the Partnership. The Commission will contribute by providing the stocktaking at EU level.

Step n° 2 - Preparatory actions (Identifying bottlenecks and potentials)

In the second step, the members of the Partnership would identify the bottlenecks and the potentials to identify the areas on which the Action Plan should focus. This will require in depth- research and analytical work. These could be at EU, national or local level. It would lead to a list of preparatory actions that are needed to define the final actions. The Partnership will take into account and respect the available data from Member States whose representatives are not included in the Partnership.

Step n° 3 - Define the objectives and deliverables

In the third step, the members of the Partnership would agree on a set of actions that address the issues of the Priority Theme (Action Plan). The proposed actions need to respect the principles of subsidiarity and proportionality. This should ideally be done in the first 6-12 months of the Partnership. A model Action Plan is available for each Partnership and should include:

- a Actions which could be, for example:
 - i Developing a proposal for better use of or adaptation of existing EU legislation and funding instruments;
 - ii Implementing a research project to find possible solutions and/or fill EU wide knowledge gaps.
- b Roadmap of each action indicating deliverables, target dates and the responsible organisation (e.g. Commission, participating Member States, Urban Authorities, etc.).
- c If appropriate, indicators and targets could be set (but only if there is a direct link between the Action Plan and the target).

Step n° 4 - Implementation of the Action Plan

In the fourth step, the members of the Partnership should coordinate the work (aimed at Better Regulation, Better Funding and Better Knowledge) on the implementation of the Action Plan with partners of the partnership and other interested parties i.e. other Member States, Urban Authorities and existing Urban Networks concerned, etc. (once the Action Plan has been designed and agreed). It is important that the members of the Partnerships develop links with the relevant authorities/ organisations/ enterprises/stakeholders and work in full transparency.

Step n° 5 - Evaluation of the Partnership

The DG meeting will coordinate the evaluation of the work of the Partnership after three years or earlier if deemed necessary by the DG meeting. Its outcomes should be presented to the DG meeting. The evaluation will provide input for other existing and new Partnerships and should, if appropriate, contain general suggestions for further exploration.

III Practicalities

1 Meetings & Gatherings

Each Partnership will decide how often it convenes. During the stocktaking phase, the Partnership may meet once every two months. In other stages, the Partnership could meet at least every six months to debate progress on the Action Plan. Meetings should preferably be held back to back with other meetings or events (for example a thematic event organised by one of the working groups of EURO CITIES) in order to generate synergies with other initiatives and to inform a broad public on the state of play of the partnership.

Additionally, once a year, the Commission intends to organise a meeting with all the Coordinators to discuss the progress of the work, identify synergies between Partnerships and raise organisational issues which the Commission and Member States could facilitate.

Also, the Commission intends to facilitate a yearly gathering where all partners of the Partnerships and others interested in the Urban Agenda for the EU will meet to exchange views and to network.

2 Website

A website has been created (www.urbanagenda.nl) where general information on the Urban Agenda for the EU can be found as well as information on each Partnership, such as participating partners, working documents, gatherings, outcomes of actions, news, dates of meetings, etc. The website will create an opportunity for other interested stakeholders to provide an input to the ongoing work of partnership or the Action Plans, as well as express their willingness to join / contribute to the Partnership. The coordinators are responsible for updating the website. It is imperative that each Partnership keeps this website up to date to guarantee transparency.

3 Monitoring and reporting of progress

The partnerships will monitor the progress of their work and submit a concise annual progress report to the UDG. On this basis, a concise annual summary report about the progress of the partnerships shall be drawn up by the UDG (to be coordinated by the rotating EU presidency in cooperation with the European Commission). After approval by the DG meeting, the Presidency, based on the outcome of the DG meeting will inform the Ministers responsible for Urban Matters, the European Commission, the European Parliament, and the Union's Advisory Bodies (CoR, EESC) about the progress of the Urban Agenda for the EU.

4 Financial support for the Partnerships

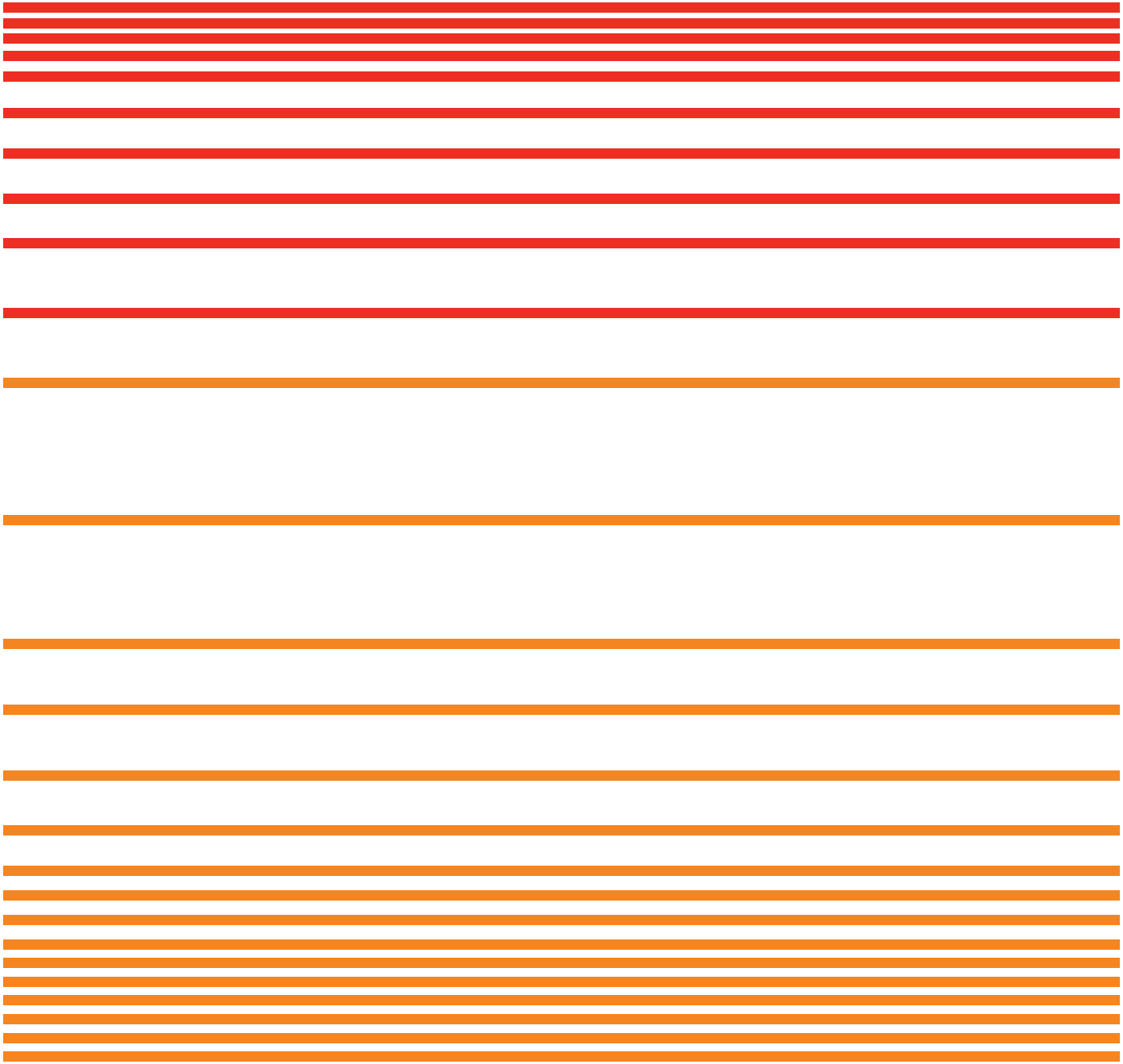
In 2016 the Netherlands has financially supported the first four (pilot) Partnerships: Air Quality, Housing, Urban Poverty and Inclusion of Migrants and Refugees.

To give an initial impulse to the first pilot Partnerships the Netherlands reserved € 50.000,- for each of the four pilot Partnerships to support their work (for example hiring of experts, conducting research a.o.). Even though travel and accommodation costs should be at the expense of each partner itself (i.e. participation should be seen as their normal tasks and is a condition for a real commitment to do some work), the pilot Partnerships revealed that some partners find it difficult to participate without financial reimbursement. If needed, the supporting budget can be used to (partly) reimburse partners.

In the Pact of Amsterdam the Member States call upon the European Commission to provide basic technical assistance to the Partnerships from 1 January 2017 onwards.

Some actions in the Action Plan may require funding. Therefore, it is important that the members of the Partnerships decide on their funding sources and maintain close links with the Funding Authorities and financing institutions (banks, public authorities, EIB, Managing Authorities of ESIF etc.) and keep a close eye on relevant EU calls for projects such as under the Urban Innovative Actions, HORIZON, COSME, LIFE etc. If actions in the Action Plan require funding, the way of funding should be described in the Action Plan.





20. Innovation by all and for all

We can be proud as Europeans that our Trades' Unions are among the thought-leaders on our innovative future. This is a paper of exemplary strategic scope, optimism and clarity.

Position Paper 2015 / 01



Document adopted by the 6th Meeting of the industriAll Europe Executive Committee,
Brussels, 9th – 10th June 2016
| IndustriAll 60/2015

Innovation by all and for all

Shaping a sustainable future for employment in manufacturing

Document adapted by the 6th Meeting of the IndustriAll Europe Executive Committee,
Brussels, 9th - 10th June 2016 | IndustriAll 60/2015

1. Rationale, vision and strategy for an innovation policy

The industry of tomorrow is shaped by the innovations of today. The projects that are currently in laboratories or on the drawing board will later become smart, high-performance products or more efficient and environmentally-friendly processes. They will displace market shares, value added and jobs. They will change skills and working conditions.

Innovation is permanent. It is the key to sustainable economic development. We cannot, and should not, try to resist it. But trade unions can, and should, take an active part in **shaping innovation**. By doing so, as a **pillar of an active industrial policy**, IndustriAll Europe will be a **protagonist of responsible change**, in industry and society.

IndustriAll Europe's **vision** is to shape innovation towards a model where innovation is open to all workers and all citizens, and for the benefit of all: "**Innovation by all and for all**".

Innovation should aim at:

- addressing **social, environmental and economic** needs
- **better products and better processes**, to support the positive differentiation of European industry on the global market and the long-term development of new, **high-quality jobs**
- a **fair conversion** towards a socially, economically and environmentally **sustainable society**.

In order to implement these aims, IndustriAll Europe has identified the following **five strategic options**:

1. Industry and public authorities should substantially increase **investment in Research & Development**
2. Regulation in the Internal Market must be predictable, consistent and ambitious, to remove barriers to innovation, and to foster a differentiation of products and processes through **quality**
3. The value added must be **distributed** along the supply chain, and wealth distributed within society
4. Innovation systems must foster **cooperation, democracy and workers' participation**, and produce systemic, socio-technical innovations
5. **Education and training** must provide all workers with the resources and skills to engage efficiently and confidently in innovation and change.

2. Implementing the strategy: concrete policy proposals

IndustriAll Europe encourages investment towards industry- and society-relevant R&D&I

IndustriAll Europe is generally **satisfied** with the recent developments in EU Research, Development and Innovation (R&D&I) policy, and with its clearer focus on industry- and society-relevant research, with broad cooperation among stakeholders.

The Excellent Science pillar of the Horizon 2020 programme will provide the background of scientific knowledge upon which new ideas can emerge. The Industrial Leadership pillar will support the quality-based competitiveness of European industrial products, and the efficiency of industrial processes in Europe. The Societal Challenges pillar will provide the technical and industrial tools needed to achieve the economically, socially and environmentally sustainable society that industriAll Europe calls for. The recently updated rules on State Aid for R&D, and the specification of a statute for Important Projects of Common European Interest (Art 107 3b, TFEU), give a more favourable framework for public support of R&D&I.

IndustriAll Europe believes that **European public funds for industrial R&D&I should only be granted for industrial applications within Europe.**

European rules on public support for R&D&I (and specifically on State Aid) must include the **condition** that the **first industrial application** of the R&D&I being supported by public funds must be set up within Europe. It is not acceptable to the industrial workers represented by industriAll Europe that funds from European public budgets be used to carry out the R&D of goods at low cost, only for them to then be manufactured elsewhere.

Additionally, the Lisbon Strategy target of 2000, which aims to dedicate 3% of GDP to R&D&I, is far from being reached. This is partly due to the structure of the industrial fabric in some Member States being less research-intensive. This is difficult to change.

As an intermediate and realistic goal for **European companies**, industriAll Europe proposes that they dedicate **more than 1.5 times the OECD average of their sector and of their size category** to R&D&I.

Tight and ambitious regulation in the Single Market must promote innovation in the quality of industrial products, processes and services

Re-regulate the Internal Market for goods and services

The Commission strategy of de-regulating at national level and re-regulating at European level must be used by trade unions as a means of supporting innovation. By enacting and enforcing **ambitious performance goals** for the social and environmental impact of industrial products, the European Union has been an engine of quality-based innovation. Health & safety regulation relating to dangerous substances and machinery in the workplace and in the public sphere, environmental regulation of industrial processes and of their pollution, performance requirements concerning the energy efficiency of automotive engines and of domestic appliances, eco-design requirements and eco-labels, continent-wide targets for the share of renewable sources in the electricity mix: all of these are contributing factors to the introduction of new, higher quality products and processes in factories and on the market; namely, the innovation that industriAll Europe is seeking to encourage. This regulation must be consistent and predictable, so that companies can plan their R&D. It should leave the technical solutions on how to reach these targets fully open.

IndustriAll Europe demands the **tight, ambitious and consistent regulation** of the European Internal Market of industrial products, and **ambitious targets** for energy performance and eco-design of industrial products.

Ensure trade union participation in the definition of "harmonised" standards

Standards are important for industrial policy. They define and segment the industrial products market, thereby influencing competitive positions of firms, and give legal certainty to innovators. European technical standards that support European regulation and policies are called "harmonised" standards. They are the tools through which the quality of products and processes is specified with the level of accuracy necessary to objectively assess whether it is attained or not. It must be ensured that these "harmonised" standards do not become the back door through which corporate interests water down social or environmental requirements.

To achieve this, the presence of workers' interests must be assured in those circles where "harmonised" standards are mandated and defined.

IndustriAll Europe demands that appropriate institutions and financial means be made available to **trade unions** to enable their **participation** in the **standardisation process** of "harmonised" standards, i.e. of those technical standards that support European regulation or policies.

An innovation system that distributes value added and wealth

The reality of contemporary innovation is very different from the simplified, heroic fiction of the lone innovator, which justifies "winner takes all" economic models. Innovation is performed by **cooperating teams** under an "**open innovation**" paradigm. In addition, technical objects are **systems**, so that the innovation is brought about by the **combination** of several innovations and existing technologies, and no single patent generates wealth by itself, in isolation.

Cooperative innovation in R&D consortia and in standardisation communities has developed a model of shared patents. **Free, Libre and Open Source (FLOS)** communities for software, and increasingly for hardware, go one step beyond, towards **shared ownership** of the rights protecting innovation.

IndustriAll Europe favours the definition of a robust legal environment for **Free, Libre and Open Source (FLOS)** software and hardware development, specifically ensuring that it cannot be privately appropriated.

Promote cooperative, systemic, socio-technical innovation

IndustriAll Europe promotes a vision of innovation where all workers, in all industries, are invited to participate in the design, implementation and testing of new socio-technical systems, and in sharing their benefits.

Innovation democracy: involve trade unions in the strategic orientation and programming of R&D

The **governance** of publicly-funded innovation processes must be transparent, and not left to academics or corporate interests, who are given a free rein and whose actions go unmonitored. Trade unions should intervene where **strategic orientations** are decided, and where the **selection criteria** of projects are defined. Their contribution should focus on the consideration of potential risks (specifically with regard to Occupational Health & Safety) and opportunities (specifically with regard to the differentiation of products and processes on the market), on the societal usefulness of the innovation strategies being proposed, on their coherence with policy goals, leaving the task of considering their feasibility and their economic efficiency ("value for money") to the technology experts.

IndustriAll Europe demands that trade unions **participate** in the **strategic governance bodies** of the current publicly-funded R&D programmes at European level.

Foster workplace innovation

IndustriAll Europe supports the concept of **workplace innovation**, where social dialogue and enhanced Information & Consultation rights at all levels ensure that benefits brought about by modifications to manufacturing processes, to work organisation or to the (material or immaterial) good being designed and produced are shared fairly between workers and employers. This involvement in the innovation process should not only relate to the transformation of the workplace, but also to its strategic goals.

IndustriAll Europe and its affiliates support enhanced Information & Consultation rights, as well as genuine and thorough **social dialogue** on **workplace innovation**, and demand that it be set up in areas where it does not yet exist. They are ready and willing to participate in this dialogue. They demand that workers and their representatives be directly involved in the discussion on innovation processes and objectives, in the determination of priorities, and on the strategy to reach them – in a process of "innovation democracy".

For a right to employee-driven innovation

Contributions from all employees in the firm must be welcomed into the innovation process. In all European firms, any employee should be allowed to have the **initiative** to innovate. S/he should be supported and encouraged to do so by a dedicated structure for employee-driven innovation (e.g. suggestion systems). The exact form of this right to innovate, its limits, the mutual rights and obligations of the employee and of the company, should be the subject of a fruitful **social dialogue**. IndustriAll Europe and its affiliates are ready and willing to engage in these negotiations.

IndustriAll Europe demands an EU-wide **right** for all employees to initiate **employee-driven innovation** – however, this must in no way become an obligation.

Provide all workers with sufficient knowledge and competence to participate efficiently and confidently in innovation

IndustriAll Europe demands that all workers in manufacturing be provided, on a permanent basis, with the **adult education and training** which enables them to understand, anticipate and cope with change, and to innovate.

This adult education and training, which must be provided to workers in order for them to positively overcome the disruptions of change, and to innovate, are: the **knowledge** to understand the situation and the practical **skills and competence** (the "know-how") to work in their new environment.

IndustriAll Europe identifies 9 possible Important Projects of Common European Interest as having a strategic transformation potential

IndustriAll Europe proposes to **concentrate** the public funds available for supporting strategic industrial innovation in Europe on the following list of 9 Important Projects of Common European Interest (IPCEIs).

- a) Smart distribution and storage grids for electric energy
- b) Electronic Components & Systems
- c) Nanotechnologies as substitutes for Critical Raw Materials
- d) Multi-modal, hybrid transport systems
- e) Open "Cloud" services
- f) Mass customisation of garments
- g) Thermal renovation of buildings
- h) Bio-based chemistry
- i) Disassembly factories for enhanced recycling

3. Conclusion

To achieve innovation to the benefit of all, and with the participation of all, we call on the social partners at European level to discuss and, if possible, agree on the best ways to promote innovation in the workplace, with enhanced employee initiative, and on education & training schemes preparing staff for innovation and change.

We call on the European Union to promote quality-based innovation through smart and ambitious regulation of the Internal Market, and through a robust Free, *Libre* and Open Source legal regime. We call for the involvement of trade unions in innovation and standardisation strategies.

We call on Member States to concentrate their public means on strategic R&D&I projects, and to develop their innovation policies in the manufacturing industries together with the social partners.

We call on all companies to invest massively in R&D&I, and to initiate a cooperative innovation strategy involving all stakeholders such as customers, users, business partners and, first and foremost, the staff.

Section 3.

Nurturing People

21. A Generation ahead – preparing tomorrow's innovators

There are 100 million under 15-s in Europe. We have the ability to better prepare these children for the future through systematic approaches to their competence development that will improve their creativity from an early age, laying the foundations for increased innovative capacities. No other investment can yield comparable public value; and none other might have a higher opportunity cost, should we fail.

- ***What will be the benefit of successful action?***

Successful action would dramatically increase the talent pool in Europe from which future innovations and entrepreneurs can spring, by mainstreaming the early development of a range of competences that contribute to innovative capacity. It would equip the next generation – regardless of social and cultural background – much more widely with the characteristics of so many successful innovators – including creativity, curiosity, critical thinking, perseverance, and positive risk attitudes.

These skills can also be expected to have wider benefits to society beyond innovation, as they equip the next generation with a fundamental basis for employability, personal fulfilment and development, social inclusion, and active citizenship.

- ***What are the preconditions of success?***

Broader awareness amongst all educational stakeholders is necessary but not sufficient, and a policy environment that is positively driven towards fostering innovation is required. There are three preconditions that will allow the mainstreaming of innovation-oriented competence development and the necessary educational practices:

- Nurturing a broad range of Key Competences in young people through learning experiences that are meaningful and that have relevance to the world outside of the school, and ensuring recognition of skills over passive knowledge, in order to be flexible in their future work and future learning;
- Supporting the fundamental role of educators by creating the right conditions for their work and by enabling them to develop the competences required, including through support communities and co-operation with external stakeholders.
- Accelerating policy reforms that take into account school governance structures, effectiveness of resources, staff remuneration and motivation, working conditions and curricula with the ultimate aim of improving the learning outcomes of young people in relation to their innovative capacities.

- ***What is being done and who needs to do more now?***

Action requires taking a systemic approach to improving the capacity of schools and educators to foster the innovative capacities of learners:

- Placing competence-based learning and creative, imaginative discovery and problem-solving processes at the heart of educational systems. Many schools promote creative and

interdisciplinary approaches to learning, yet frequently without equipping the teachers with the necessary competences, or without making time available against conventional requirements in curricula²².

- Developing innovator capacities in teachers through continued professional development and recognition of innovative practice by: support through leadership; exploiting the opportunities of new technologies; a diversity of formats and partnerships for professional development. Research shows that teachers are intrinsically motivated to develop new practices.²³ Having the freedom to innovate can improve job satisfaction, but many suffer from a lack of tools and incentives.
- Improving networking as a precondition to generating scale, such as through the further use of online communities of practice (such as the School Education Gateway and Teacher Academy) and innovation incubators (such as eTwinning).
- Scaling up innovative practices, methodologies and resources supported by the Erasmus+ programme (or other funding streams), which has contributed amongst other things, to the development and sharing of tools and approaches for developing some competences (including policy experimentation on entrepreneurship), but has not yet targeted a range of or interdisciplinary approach to competences in the context of fostering innovative capacities.
- Fostering innovation in the governance of school education systems through network effects, effectiveness of resources, and quality assurance mechanisms that motivate and support innovation by and within schools, in their own communities and contexts.
- Developing effective partnerships, with a wide range of stakeholders (industry, research, social entrepreneurs) and a clear commitment. Effective dialogues between government, school education, industry and research across Europe do exist but need to become the norm rather than an exception. They also need to reflect better the opportunities arising outside or in complement to the school environment through emerging networks²⁴, as well as independent collaborations and competitions. Such partnerships exist at higher education level but need to go beyond it and become a "new normal" for the school education level.
- For the European Commission, with its limited competence in this domain, and also given the large disparities within and between Member States, the most productive role is to set a positive overall context for investment in good modernised education; to encourage and push for change; and to help guide that change by drawing on the best European and global practices.

22 Some countries have mainstream approaches in place such as Estonia's cross-curricular theme "Technology & Innovation" or the development of the Netherland's "Education 2032".

23 OECD (2013) Teaching and Learning International Survey (TALIS), Eurydice (2015) The teaching profession in Europe. Also, unreleased JRC-IPTS data gathered for European Commission's DG Education and Culture finds teachers to be participants in MOOCs between 9.5% and 24.1%, with the rate being much higher in teacher-specific MOOCs. A recent MIT study finds 39% of MOOC participants to be self-described former or current educators.

24 Such as promoted by the STEM Coalition

22. The Leadership Academy for Poland²⁵

Innovation comes from central strategic vision, but also from the edges. Here is an example of an initiative which is local, compelling and authentic: everyone else needs this, too! Leadership Academy for Poland is an apolitical and nonpartisan initiative seeking to contribute to the development of good leadership for Poland and to create a network of exceptional Poles that will make a positive impact on the future of Poland and of the world.

Leadership Academy for Poland supports outstanding Poles through offering them access to unique, world-class education and professional development opportunities and through assisting them in their civic and public engagement.

The Academy features a world-class Harvard-type intensive leadership and management development program as well as continuous educational opportunities post-graduation. Academy's alumni will get access to a powerful professional leadership network of high-potential professionals.

Harvard professors, international speakers, business and community leaders with significant achievements and outstanding educators are expected to take part in and co-create the Academy's program.

The key objectives of the Academy are to:

- Select outstanding Poles that will make a significant impact and positively contribute to the future of Poland and of the world;
- Offer world-class, unique, educational and professional development opportunities;
- Develop leadership and management competencies among outstanding Poles;
- Inspire to civic and public engagement and spread positive values.

Leadership Academy for Poland is supported by Google, Orange, US Embassy.

Duration: 10 weeks in high-impact system 6 + 8 + 1, i.e. 6-day residential core training,

8-week individual immersion and 1-day residential closing.

We will offer up to **40 fellowships** for outstanding candidates. The Fellows' participation in the Academy will be without cost to them or their organizations, with the exception of their travel costs and incidental expenses they incur.

25 [The Center for Leadership](#) and [The Flying Mind Foundation](#)

A unique, world class program for leadership and management development spanning over 10 weeks and consisting of: 6 days of intensive, Harvard-type training, 8 weeks of individual, weekly full immersion exercises in the real world after the completion of the residential part of the program and 1 day . In addition, participants will have closed meeting with top-level business or community leaders as well as international speakers. After the program, fellows will have the opportunity to reconvene for a series of seminar meetings as part of their continuous education and networking opportunities.

Total duration of the program is 10 weeks and the key elements of the program are:

- 6-day residential intensive training with experiential and interactive learning, Harvard case studies, real-time cases, films and structured exercises;
- 8-week full immersion daily exercises for implementing insights into the ongoing work and forming habits;
- 1-day residential closing session in Warsaw;
- Closed meetings with Harvard professors and with top-level business and community leaders and international scholars;
- Peer consultation groups during which participants consult and receive consultations in small groups about key dilemmas that they face in their own leadership development work
- Continuous meetings and networking opportunities.

The program will be based on a unique methodology ***Leadership 4D - Experience***[™] and will cover three critical aspects of exercising leadership:

- People - how to lead people in organizations;
- System - how to lead in complexity and change the world;
- Self - leading oneself for leading others.

The program will be highly interactive and will feature a variety of teaching methods. In addition to formal Harvard case studies as well as a unique pedagogy of full-immersion as well as of a real-time case where participants will become a case itself, the program will use participant's own leadership failure cases, films and structured exercises, some of which will involve poetry. The participants will analyse business cases as well as social and political dynamics common to many organizations by analysing in-class and outside-class experience, including their own past challenges. The course will also feature an inner journey of self-reflection to uncover students' personal freedom and drivers that give meaning to their leadership work. Some assignments will be time intensive and challenging.

Key Benefits

- Sharpen your leadership and management skills and decision-making;
- Gain more in-depth knowledge about leading people and organizations;
- Get feedback on your current leadership dilemmas and projects;
- Discover how to strengthen your contribution to the world;
- Get inspired in closed conversations with Harvard professors and top-level leaders;
- Get support through powerful professional network.

23. To the children of Europe²⁶

Like the [Leadership Academy](#), here is a local-grown European start-up: this time it's for the children. Children don't all find local heroes in school and family, but all need a wider set of community role models. Exceptional people whose experiences and narratives can inspire and contribute to character growth. This grass roots project has been conducted in 80 schools and preschools in Slovenia, touching more than 30,000 children, 2000 teachers, and hundreds of role models, and gaining a 90+% satisfaction rating. We are scaling across Europe, so if you might become an ambassador yourself, [let us know](#)"

- ***The project***

The project's theoretical foundations are based on the *European Ethics and Values Framework*, a document we developed from historical and cultural bases of European values and ethics, as well as from major contemporary scientific value models. It incorporates the latest findings of psychology and neuroscience, such as the vital importance of early learning and internalisation of ethics and values for healthy brain development. It promotes systematic work from the preschool onward, and makes extensive use of new technologies. The main activities of the project are grouped into four steps:

- Discussion. Parents and teachers initiate discussion about role models with their children and pupils and encourage them to think about the role models in their lives.
- Search. Children look for their own role models and search for inspiring stories, articles or meaningful quotes of these people.
- Interaction. Teachers, parents and children organise meetings with their chosen role models, visiting them at their home or workplace or inviting them to their classrooms and schools to talk about their lives, decisions and experiences.
- Creation. Children write short stories of their role models that can include photographs and quotes. Teachers then collect these stories, group them into a book, and upload them on our website.

- ***The tools***

- **What You Need to Know.** A book with essential information for adults (teachers, parents, and others) who want to understand the project's underlying basics. It contains the theoretical foundations and scientific background of the project, explaining how values and ethics are formed and internalised in children's minds.
- **Role Model Stories.** A book of inspiring stories of people from different countries and different walks of life. The stories provide a good starting point for discussions regarding

26 [Jože Trontelj Institute for Ethics and Values](#)

values, decisions, behaviour, ethics and other important life issues, and serve as a sample for children to write their own role model stories.

- <http://tothechildren.com> The website is intended for teachers to facilitate their work with pupils, but can also be used by parents. The website contains instructions and infrastructure which any school (or other institution) in Europe can use to make its own role model book. It also includes other content that can be used by educators to supplement the teaching process.
- **Out of the Box Experience.** A box containing didactic games and other educational tools to make the concepts of ethics and values more understandable to children and encourage thinking and discussion about role models.

24. The Civic University²⁷

- A normative model of a university that is not only excellent in terms of conventional academic criteria but one which also seeks to contribute to the public good. This responsibility of the university to society is not new, but has been given greater saliency in the present century as the challenges facing society have heightened in intensity.
- At the same time universities also have to respond to the challenge of participating in a global higher education marketplace with its own internal logic in terms of competition for mobile students and academic staff
- Managing the tensions between the demands from within and without higher education, including embedding external engagement into the internal process of managing the teaching and research undertaken by academic staff.
- Conflicting signals in the external policy environment, not least in terms of the degree of focus of national governments on the global higher education marketplace relative to contributions to society.
- The focus in the academic literature, policy and practise on institutional performance within the higher education system has arguably given insufficient weight to the broader external environment within which the university has to operate, including the locality.
- Where a wider perspective has been adopted the emphasis has tended to be confined to performance in terms of income generated from commercial activities and ‘triple helix’ model connecting universities, business and government. Such moves towards a more corporate and entrepreneurial model of the university can be linked to the growth of managerialism in higher education.
- The “New American University” as one in which the university’s public role is (re)asserted through a set of top down design principles matched by an intentionally wide scope for bottom up creativity and entrepreneurship from faculty and non-academic staff
- More complex interwoven structures which combine top-down and bottom-up decision-making and shared normative orientations being taken into discussions and practices by a range of actors inside and outside of the university
- Universities need to be innovative in their own organisational structures, programmes, and activity-sets, according to their own interpretations of the pressing needs of society, interpretations of public values, and specific local and institutional contexts. They need to identify ways to institutionalise or stabilise new ways of working and de-institutionalise or modify current behaviours, structures and procedures.
- No country has explicitly prioritised innovation in processes of institutional governance and management, not only for individual universities but also in terms of the higher education system as a whole.
- The ‘challenge based university’ as a ‘community of knowledge hubs’ - not hard institutes but open spaces for intra- and inter-institutional collaboration involving staff and students working together to tackle societal challenges, including active contributions to regional innovation broadly defined. Empower individual researchers to establish

27 John Goddard, Emeritus Professor, Newcastle University, UK. Summary of the Conclusion to "The Civic University: the Policy and Leadership Challenges", John Goddard, Ellen Hazelkorn, Louise Kempton and Paul Vallance (eds.) (2016). London: Elgar

strategic frameworks, identify challenges and agendas of trans-disciplinary actions to address those challenges, with top management permitting an apparent looseness of control.

- Not a return to the traditional loosely coupled collegiate model of the university but rather a new more flexible and fleet-of-foot institution operating in a holistic fashion to engage effectively with society. Innovative ways of working with society at the academic ‘coal-face’ are incentivised and supported by institution wide mechanisms, for example in terms of degree regulations, recognition of civic engagement in promotion criteria and providing career pathways for those operating in boundary spanning roles.
- This notion of responsibility of research to the wider society is particularly relevant to the civic university as it embraces an approach to engagement beyond the business focus of other European programmes. It is not a new idea and has many facets such as research ethics, responsible governance of new and emerging technologies such as nanotechnology, corporate social responsibility, engaging citizens in the co-production of knowledge in ‘quadruple helix’ partnerships and plugging universities into national innovation systems that embrace social as well as technological innovation.
- The current techno-science paradigm, picking winners and global competition between research institutions based on rankings .But there are also pockets of user-driven and community-based innovation, the open source movement and areas where global competition is less important and where scientific knowledge production is opening up to accept input from parties other than professional scientists. Indications of trans-disciplinarity with social scientists and humanities academics working alongside engineers and medical scientists to deliver social innovation.
- The strong element of path dependency in the development of individual universities and higher education systems. Institutional change takes a long time and requires sustained leadership and considered attention to succession planning; this is tensioned against the high turnover of rectors/vice chancellors in some institutions and a highly complex and volatile external environment
- But a new generation of academics with norms and values more attuned to the needs of society than their predecessors may be emerging and this could bring about institutional change from below. Sharing experience across networks of universities seeking to handle the tensions between the demands of globalisation and civic responsibility could be one way not only to facilitate institutional learning but also create a greater saliency for the public good role of universities amongst policy makers inside and outside of higher education

25. The Grand Coalition for Digital jobs

There is a mismatch between the current skills/competences available in the economy and those that are being increasingly demanded. A collaborative process is required to bridge this gap by offering more ICT training; implementing job placement programmes; providing more aligned degrees and curricula at vocational schools and universities; and motivating young people to study ICT and pursue related careers.

This is an extract from the evaluation of the [Grand Coalition for Digital Jobs](#).

- **Background information**

The digital transformation of the economy and society is accelerating. The spread of big data, the cloud, the internet of things, developments in robotics and the ensuing radical transformation of industry ("Industry 4.0"), are having a major impact on the labour market and the type of skills needed in the economy.

To be sure, the digital transformation is changing the structure of employment. ICT has become an integral part of all jobs (replacing routine activities, complementing traditional occupations but also creating completely new tasks and jobs). The labour market has undergone a period of polarisation: demand for "routine" (medium skills) jobs, which can more readily be automated, has fallen, and employment is increasingly being concentrated at the high and low end of the skills spectrum. Moreover, technology is changing the functioning of the labour market (due to for example the emergence of App based employment services, such as Uber), with significant repercussions on employment conditions and work patterns of workers employed through these services.

A natural consequence of this digital transformation and rapid technological innovation is the quest for new types of skills. Yet skills development does not come about as fast as technological development leading to the need for increased numbers of highly-skilled digital technology experts in all sectors of the economy. It is estimated that there will be more than 825,000 unfilled vacancies for ICT professionals by 2020. This issue not only affects the ICT sector itself but the economy as a whole; contrary, to what most people think, over half of ICT professionals work outside the ICT sector.

Furthermore, there is an increasing need for digital skills and competences for nearly all jobs where digital technology complements existing tasks. Careers such as engineering, accountancy, nursing, medicine, art, architecture, and many more - will require some level of digital skills. By contrast, one third of Europe's labour force does not have sufficient digital skills. Finally, digital transformation is leading to the need for everyone to have at least basic digital skills/competences in order to live, work, learn and participate in an increasingly digital society. Here too, digital skills have been shown to be lacking: around 40% of EU citizens have only low level or no digital skills.

All these changes are resulting in a mismatch between the current skills/competences available in the economy and those that are being increasingly demanded. This is why in March 2013 the European Commission launched the Grand Coalition for Digital Jobs; an initiative that soon became the largest collaborative effort in Europe to date aimed to offer more ICT training; implement job placement programmes; provide more aligned degrees and curricula at vocational schools and universities; and motivate young people to study ICT and pursue related careers.

Today the Grand Coalition is a landmark initiative that has received over 60 pledges by about 100 stakeholders. Additionally, 13 national coalitions have been created, reflecting the priorities and actions of the Grand Coalition at local level (BE, BG, CY, EL, IT, LV, LT, MT, NL, PL, PT, RO, UK) and many more are in the pipeline (HU, ES, SK, SI, AT, DE). Besides, one of its most important achievements is that it helped to break down silos in the area of digital skills development and make collaboration happen, especially between governments, education and industry. Although more needs to be done to ensure cooperation among diversified stakeholders, the Grand Coalition has certainly been a stepping stone towards this direction.

The original goal of the Grand Coalition was to enhance ICT specialist skills, given the high number of vacancies for ICT professionals. As mentioned above there will be more than 825,000 unfilled vacancies for ICT professionals by 2020. This is why far many of the stakeholders in the Coalition are companies in the ICT sector, or with a primary interest in ICT specialist's skills. In 2015 we decided to take a broader perspective and to expand the Grand Coalition to address the digital skills gaps in the general workforce for all occupations. This is primarily attributed to related requests and interest expressed by many of our stakeholders as well as to the importance of addressing more profoundly the increasing need for digital skills and competences for nearly all jobs in the economy.

To a broad sense our activities in the context of the Grand Coalition have been dedicated to engaging European and national actors, increasing access and use of European funding, increasing political support and sharing best practices. In more specific terms, our activities could be divided into two distinctive, yet highly relevant, action pillars.

- The first pillar includes actions aimed at engaging the Member States, namely national governments. Most competences are with the Member States. Each country experiences specific challenges according to its own industrial characteristics, education structure and demographics. Also most instruments for education and training lie in the hands of the Member States. While some Member States are already very active in identifying and tackling digital skills gaps and mismatches, this is not the case everywhere. As a result action has to take place at the national/regional level. Accordingly, our goal is to encourage Member States to commit to more targeted action. This is why we are encouraging them to develop their own stakeholder partnerships ("National Coalitions") – government along with industry, education and employment actors at national level - to identify the issues and solutions that are right for them while benefiting from cross-European initiatives for example in terms of sharing best practices and benefiting from economies of scale.
- The second pillar includes actions aimed at engaging a wide range of stakeholders at European and national level. Such stakeholders include ICT and ICT-using companies (from banking to automotive, healthcare to energy, textiles to tourism), industry associations, social partners, various NGOs and many more. So far we have called stakeholders to get involved to the Grand Coalition by making pledges, i.e. concrete commitments to taking positive action to address the ICT skills gap. Pledges span from organising training programmes, including Massive Open Online Courses (MOOCs), to offering internships and apprenticeships, training teachers, organising awareness raising activities and many more. In order to boost the impact of the Grand Coalition in the end of 2013 we established a Secretariat: a consortium of 14 organisations active in the IT, education and SME communities were contracted for two years in order to support our work through a five-pronged strategy for reducing the skills gap in Europe. The Secretariat focused on action and local implementation. It aimed at amplifying successful local and national programmes and initiatives and sought to export these to other parts of Europe.

- ***Accomplishments of the Grand Coalition for Digital Jobs***

Three years have passed since the launch of the Grand Coalition. Certain challenges were inevitable, yet our overall assessment of this initiative demonstrates lots of accomplishments. The most important ones are listed below.

- ***National and Local Coalitions for Digital Jobs***

By January 2014, there were 8 National and Local Coalitions formed in 8 different countries. At the end of 2014 the number of Coalitions grew to 15, while in 2015 there was a further growth to 21 Coalitions. In particular, 13 Member States have formed National Coalitions, namely Belgium, Bulgaria, Cyprus, Greece, Italy, Latvia, Lithuania, Malta, Netherlands, Poland, Portugal, Romania, and the UK.

We worked to encourage the formation of new Coalitions within the Member States and to support the activities of existing ones. By "Coalitions" we mean both National Coalitions and Local or Regional Coalitions. National Coalitions are broadly defined as stakeholder alliances that cover a whole Member State territory and include at least one Member State Ministry or Agency, which sometimes is the coordinator of the initiative. Local or Regional Coalitions are stakeholder alliances that usually cover a Member State's region or several regions and the involvement of Governmental institutions is optional.

In addition to the ones formed, at least 6 more Coalitions are currently under formation, in Germany, Austria, Hungary, Slovakia, Slovenia, Spain, and Denmark, while more stakeholders are interested to activate Coalitions in other Member States.

The main actions implemented by the Coalitions during 2015 were:

- Training courses for young people and unemployed preparing for IT jobs, especially in coding and STEM
- Activities to prepare and certify young people in ICT
- Job placements
- ICT Career events
- Development of new partnerships and cooperation between business and educational sectors
- Participation in awareness raising campaigns

Several successful actions were implemented by the Coalitions in 2015. For example, in Romania the programme Go farther with IT is a secondary school initiative provides high school students with the curriculum to get them to a higher proficiency in using productivity applications. Over 3,000 students benefitted from this initiative and have certified their skills with the Digital Literacy Global Certification. In Malta, the eSkills Malta Foundation, in collaboration with the Ministry for Education and Employment and other private and public organisations, offers 14-15-year-old ICT students a one-week work exposure opportunity. This initiative aims to give students a taste of what it's like to be part of a vibrant ICT sector.

Around half of the existing Coalitions have established links with the Grand Coalition pledging organisations. Coalitions felt that this part needs to be improved by understanding which pledges have been successful and by learning from the experiences to be able to foster better collaboration. The following are some examples of cooperation: Spain and Portugal with Fast-track to IT (FIT) on the FIT4Jobs project; Romania, Latvia and Lithuania with Microsoft on their YouthSpark pledge regarding training and matching for digital jobs; Latvia and Lithuania with the ECDL Foundation.

The table below exhibits the impact of the Coalitions in numbers. These figures have been collected through an online survey. They are useful in giving a sense of the impact resulting from the activities of the Coalitions during 2015. Still, they should be used with caution because only 15 out of 21, i.e. about 70% of Coalitions have responded to the survey, while the impact of some Coalitions might be even higher if we take into account qualitative data and multiplier effects.

Target of coalitions	Status
People trained	Over 450,000
People reached through media	More than 3,400,000
Job placements	More than 5,000
Events organised	3,500
Stakeholders reached	Over 1,000

The Coalitions proved to be one of the most effective and attractive ways for stakeholders to address Grand Coalition key priorities at country level. However, these initiatives require particular attention and support measures to become successful and sustainable. Such support measures are (but are not limited to) attracting funding opportunities and political support.

- ***Pledges***

When we held the launch event of the Grand Coalition in March 2013 we had received just 12 pledges. Since then we have received over 60 pledges by about 100 stakeholders.

The table below exhibits the impact of the pledges in numbers. These figures have been collected through an online survey. Still, they should be used with caution because some pledging organisations have not responded to the survey, while the impact of some pledges might be even higher if we take into account qualitative data and multiplier effects.

Target of pledges	Status
People trained	2.437.332
People reached through MOOCs	223.359
Interns	21.007
Teachers (trained to use innovative technologies)	37.608
Students reached (e.g. from awareness school visits)	1.958.540
Job placements	6.312
Other	7.951.968
Overall total	12.600.126

- ***Placing Digital skills at the heart of a flourishing Digital Single Market***

The Commission launched the Digital Single Market (DSM) strategy in spring 2015. This means new jobs, notably for young job-seekers, and a vibrant knowledge-based society. Our ambition is that all consumers, businesses, workers, researchers and students will benefit from the DSM and this can only happen if they have the right skills. Indeed, the DSM highlights the importance and makes a commitment to the development of digital skills.

- ***Addressing digital skills at the highest political level***

Vice-President Ansip and Commissioner Oettinger have been actively promoting digital skills and encouraging Member States to design and implement effective national digital skills policies, in a collaborative effort.

In addition, Commissioner Oettinger held an informal ministerial debate on digital skills, with ministers of telecommunications, as well as other ministers dealing with digital skills, that took place in Brussels on 10th December 2015.

Moreover, a large part of our work with the Member States is dedicated to increasing access and use of European funding towards digital skills development. The Grand Coalition does not have a specific budget line to support its activities, but there are several funding sources at European and national level to support projects boosting digital skills. We believe that the role of the Member States is crucial since many of the funding tools, such as the allocation of national and European funding, lie in their hands. The European Council conclusions of October 2013 recommended the use of European Structural and Investment Funds (ESIF 2014-2020) for digital skills development. This includes the European Social Fund and the Youth Employment Initiative. An additional source of funding is Erasmus Plus.

- ***Sharing best practices and promoting stakeholder cooperation through targeted events***

Over the past 3 years we have organised numerous successful events, meetings and workshops with the purpose of bringing together various stakeholders, discussing the challenges they face and identifying solutions, enhancing cooperation among them and sharing best practices.

Recently, in November 2015 we organised the European Digital Jobs Fair in Madrid. In accordance with a modern job fair, the European Digital Jobs Fair included:

- Job interviews of skilled people from Spain with companies from countries with a high demand of digital technology experts, namely Germany, the Netherlands and the UK.
- The showcasing of ICT training opportunities for job seekers and ICT professionals willing to acquire new skills needed to pursue digital careers.

The Fair has been a great success. About 1,300 job seekers met with almost 100 companies either online or on-site, who presented more than 1,200 job vacancies. Furthermore, Commissioner Gunther Oettinger, Victor Calvo-Sotelo (Spanish Secretary of State for Telecommunications) and Juan Pablo Riesgo (Spanish Secretary of State for employment) participated to the high-level opening conference.

- ***A stepping stone towards stronger cooperation among stakeholders***

As mentioned above one of the most important achievements of the Grand Coalition is that it helped to break down silos in the area of digital skills development and make collaboration happen, especially between governments, education and industry.

Although more needs to be done to ensure cooperation among diversified stakeholders, the Grand Coalition has certainly been a stepping stone towards this direction. In some Member States cooperation between industry and education or between government and industry has always been difficult. For these countries the Grand Coalition allowed to remove some of the barriers and became a replicable model in the sense that: "if they do it in Europe we can (and should!) also do it in our country".

26. Restrict non-compete clauses imposed on highly-skilled employees

If you empower [kids](#) and [young leaders](#), why do we then allow contracts to disempower the brightest? If the ability of employers to restrict the mobility of highly-skilled employees through the imposition of excessively restrictive measures such as non-compete clauses were limited, Europe could see a rapid acceleration in the diffusion of innovative ideas.

- ***What will be the benefit of successful action?***

There are no systematic data from which it is possible to define the exact scope of use (OECD(2012)), but such clauses reduce the incentive to innovate, restrict knowledge spillovers, and by preventing mobility they restrict the breadth of knowledge acquired by employees. Removing or restricting the scope of non-compete clauses therefore has the potential to make highly-skilled employees more mobile or likely to become entrepreneurs.

The fact that non-compete clauses are non-enforceable in California may help explain at least partly the speed with which knowledge is diffused around Silicon Valley. The potential impact could be very big as the evidence shows that innovative young companies create the majority of new jobs, compared to existing companies (De Kok et al. (2011)). It is also widely accepted that knowledge diffusion has positive effects on the circulation of innovative ideas within cluster of young companies (start-ups). This promotes the innovations by new and young firms, which are important vehicles for innovations to enter the market.

There is evidence that job mobility is lower in many EU countries compared to non-EU OECD Countries (European Commission (2013)). The enforcement of non-compete clauses acts as a barrier to the mobility of inventors and skilled employees (OECD (2012)). Research has shown that rigid employment laws can hinder the development of innovative sectors that rely on rapid labour turnover (cf. Bozkaya & Kerr (2013)). The enforcement of such clauses also results in a waste of innovation opportunities. Moreover, over-stringent non-compete clauses could constitute a barrier in the Internal Market (both as regards free movement of workers as well as free provision of services and freedom of establishment – cf. European Commission (2002)²⁸).

- ***What are the preconditions of success?***

Non-compete clauses are used in the EU within the limits set out by national legislative frameworks. First, it would seem advisable to develop a common understanding of the appropriate scope of non-compete clauses. Second, it is also important that national judiciary systems are able to address disputes concerning non-compete clauses. Notable, it would seem important to be able to rapidly solve disputes.

28 Non-compete clauses in business-to-business relations are regulated by EU antitrust law.

Third, other conditions relevant to the facilitation of mobility of employees in general (e.g. accumulation of pension rights when working in different Member States; housing market policies that facilitate residential mobility) would also be important for succeeding in increased mobility of highly-skilled employees. In addition, there are specific well-known factors, which can make the transition from employee to entrepreneur more or less attractive such as access to finance and bankruptcy legislation that do not excessively penalise business failure.

- ***What is being done and who needs to do more now?***

The EU is in the process of adopting legislation on the legal protection of trade secrets against misappropriation. A European Parliament and Council Directive is foreseen for adoption in 2016. Therefore, truly proprietary innovative ideas should already be sufficiently protected against leaving employees' dishonest or opportunistic behaviour. Therefore, there would seem little need or justification to also allow the use of non-compete clauses as a means to protect trade secrets.

Policy options of a possible legislative initiative (such as a Directive harmonising national law) could range from (i) imposing a complete ban of non-compete clauses to (ii) restricting their scope in different ways in order to reduce their negative effects. Such restrictions could address issues like requiring a specific legitimate interest for the use of these clauses (e.g. to protect legitimate interests such as the employers' investment in knowledge that is embodied in employees, thus avoiding free riding by competitors); their duration; the nature of the would-be employer; the types of employee subject to the clauses (e.g. only certain key employees); and the level of appropriate compensation when they are imposed. The policy options could also distinguish between an employee leaving to a competitor and an employee setting up his or her own firm. Alternatively, this initiative could be turned into a non-legislative one: e.g. recommending Member States to take appropriate action, along the lines described.

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Section 4.

Sustainability and Social Innovation

27. The Sustainable Development Goals ²⁹

Science, technology and innovation are key tools for moving the world onto a sustainable path

The independent Expert Group on the "Follow-up to Rio+20, notably the Sustainable Development Goals (SDGs)" was established by the European Commission with the purpose of providing advice on the role of science, technology and innovation (STI) for implementing the new sustainable development agenda ("2030 Agenda").

The Report presents, as indicated in the Terms of Reference, "a reference framework in which research and innovation policy and related implementation measures are seen as engines of a transformative agenda built around universally applicable sustainability goals". Moreover, the Report provides recommendations, both in terms of general policy orientations and concrete areas of engagement, for EU STI policy to contribute to the implementation, in Europe and beyond, of the 2030 Agenda, as well as for possible engagements in international initiatives concerning STI. Finally, the annex contains proposals to better align the Horizon 2020 tracking system to the SDGs.

In September 2015 the United Nations agreed on a new global Agenda to take the world on a sustainable pathway. To be implemented, the new "2030 Agenda" will require a fundamental change in the approaches followed so far. In particular:

- The new Agenda is based on principles of universality (including the "no one will be left behind" principle but also the principle of "action in all countries for all countries") and integration, whereby environmental, social and economic dimensions are no longer separate pillars but intertwined to form an indivisible whole.
- The SDGs mark a shift in the economic and political relationships between developing, emerging and developed countries. This requires significantly rethinking not only the EU's external action, including development cooperation, but also domestic ones.
- The new Agenda calls for a new cooperative paradigm based on the concept of "full global partnership". As the transition towards a sustainable path of development requires time and the mobilisation of all citizens, stakeholders, business and policy makers, these processes obviously need to be conducted in a participatory manner.

STI is a fundamental tool to implement the new Agenda, as it allows improving efficiency in both economic and environmental senses, developing new and more sustainable ways to satisfy human needs, and empowering people to drive their own future. In the SDGs framework, STI features strongly both in Goal 17, as well as a cross-cutting one to achieve several sectorial Goals and Targets. Fostering innovation is part of Goal 9 related to resilient infrastructure and inclusive, sustainable industrialisation, while Target 9.5 elevates the role of research and innovation policy well beyond STI as one of the Means of Implementation. Moreover, the Addis Ababa Action Agenda (AAAA) has identified concrete STI policies and actions as key for meeting the SDGs. Finally, the negotiations for the Paris climate COP21 in December 2015 address STI issues, proposing a framework for enhanced action on technology development and transfer.

29 Report of the expert group "Follow-up to Rio+20, notably the SDGs.

- ***STI policies are vital to make the EU the global frontrunner of sustainable development***

In line with the "universality" of the SDGs, the EU has already committed to moving towards a sustainable Europe where people are "living well within the limits of our planet", but it needs to prepare adequate responses to the pressures on its economies, environment and quality of social life caused by global megatrends. The Report argues why the EU has both the *imperative* and the *opportunity* to become the global frontrunner of sustainable development (SD), also thanks to its strength in STI, recognised not only as one of the main drivers behind productivity increases and a key long-term lever for economic growth and prosperity, but also for environmental sustainability.

To do that, STI policies should be enhanced and aligned with the aspirations of the 2030 Agenda, making STI for SD policies (STI4SD) a key asset for the EU. The Report recommends the following three key avenues for change that cut across the specific recommendations proposed below:

- **switch the focus**, reorienting mind-sets and behaviours towards SD, reframing the EU's STI challenges, and refocusing from technology transfer to building innovation capacity;
- **strengthen partnerships**, enhancing engagement with developing countries in existing EU instruments, engaging all stakeholders (especially the private sector), developing tailor-made international STI initiatives;
- **"walk the talk"**, addressing causes of implementation gaps, ensuring domestic integration of the SDGs in/with STI, improving policy coherence, building up opportunities to benefit from the "data revolution", and setting up monitoring, evaluation and assessments of STI4SD.

- ***Recommendations***

Some of the recommendations can be implemented in the short-run, building on existing policy tools and instruments, others require more time to be carefully designed; some can be carried out at technical level, other require a political commitment about the orientation of EU policies, also vis-à-vis the rest of the world. More than fifty specific recommendations are presented in the Report, clustered and summarised in the following groups:

In terms of general policy orientations, the Report recommends:

- to undertake a stock-taking and analysis of current EU strategies, to assess how STI policies could help in addressing these issues, and to adopt a Communication on STI4SD, to describe the proposed framework and to illustrate a concrete action plan in this field.
- that the EU applies for itself and advocates for specific levers and investment in STI4SD accelerators selected by the AAAA (as the Least Developed Countries' Technology Bank and the Multi-stakeholder Forum on Science Technology and Innovation for the SDGs), moving beyond technology transfer and towards a broader emphasis on innovation systems;
- to promote international efforts for capacity building and education for innovation and entrepreneurship, strengthen the use of aid flows for STI purposes, consider capacity building and early inclusion of social innovation as part of the initial investment projects evaluations by Multilateral Development Banks and International Financial Institutions;
- to promote an initiative to ensure that the global intellectual property regime is consistent with the aims and action mechanisms of the 2030 Agenda,
- to use tools such as Horizon 2020, LIFE and the EU structural and innovation funds in a synergetic way to make EU cities as STI breeding grounds for experiments;

- to develop a strategy to make businesses and people benefit from the "Data revolution", making Europe a champion in the digital world.

To improve the orientation of STI policies towards SDGs, the Report recommends:

- to integrate in the future Horizon 2020 work programmes the SDGs framework and language, increase the share of Horizon 2020 funds allocated to SDGs oriented projects and align the Horizon 2020 monitoring of the expenditure contributing to SD with the key underpinnings of the 2030 Agenda;
- to set up science-to-policy task forces for each SDG in order to diagnose the STI needs along the innovation chain, and consider trade-offs and possible conflicts for each goal/target;
- to develop a framework to guide investments in STI on projects, programmes and initiatives with transformative potentials, institutionalise a "high-impact logic" that allows the prioritisation of investments, and promote the creation of "Rating systems for STI4SD investment projects";
- to develop an ERA initiative for SDGs, promote the internationalisation and access for developing country participants in EU innovation instruments and research infrastructures by extending their remit and mandates, and establish incentives to "globalise" key on-going EU innovation and Public-Private Partnerships initiatives;
- make the mission of the European Institute of Technology fully aligned to the SDGs.
- As **policy coherence** is crucial to minimise the cost of transition to SD, the Report recommends:
 - to engage in the conceptualisation of Policy Coherence for SD, pursue alignment of EU STI instruments and of EU external policies to the SDG framework, and promote a similar alignment of Member States' STI policies;
 - to include in the ongoing "mapping and gap analysis" of EU policies vis-à-vis the SDGs an analysis about how STI tools could help in supporting actions aimed at filling the gaps or in improving policy coherence, and complement the policy gap analysis with an implementation gap analysis;
 - to evaluate the policy coherence between internal market rules (including state aid), international trade rules and STI4SD policies; evaluate how the coherence between existing tools needs to be improved, especially in the linking of the domestic and the external dimensions;
 - to systematically integrate the SD perspective and the SDGs in social innovation research;
 - to produce an annual report and/or database on actions taken in its STI policies.

As **communication and information on STI4SD** is vital not only to foster investments towards SDGs, but also to change policy makers', citizens' and stakeholders' behaviours, the Report recommends to:

- to put more effort into communicating the knowledge gained in Horizon 2020 projects in support of the SDGs;
- establish an effective communication between the science and the policy community, in order to both inform policy makers about emerging issues and the role that STI can play to identify feasible solutions, and improve the science base in policy making;
- to build a communication/education strategy on the possible change in production and consumption patterns, supported by a strong package on circular economy and by engaging behavioural economists;
- to initiate annual or biennial awards on STI4SD.

The Report also provides suggestions for **engagement of the EU with international initiatives** linked to STI4SD. Besides recommendations concerning existing initiatives, it is proposed:

- to follow and take stock of the developments in relevant global STI related initiatives;
- to support the effort aimed at the global monitoring process, follow up and review of SDGs;
- to take a leading role in existing international collaboration on selected 2030 Agenda topics, building on EU recognised strengths and leadership, and to promote the establishment of new cross-thematic international initiatives that will drive change across the SDGs, where the EU is a recognised global leader.

To ensure remaining on the right track, once the objectives on aligned policies are set, an **efficient and effective evaluation framework of STI4SD is required**. Therefore, the Report recommends to:

- to establish a permanent observatory of changes and trends in new, emerging and potential future technologies for SDGs, and set up a grassroots surveillance framework for ongoing evaluation of STI4SD policies;
- to expand the Horizon 2020 ethical framework to EU international STI4SD initiatives;
- to establish non-financial Ratings Agencies in the field of STI4SD and include the Common Defence and Security Policy in the evaluation scheme of STI4SD success.

Finally, the Report also identifies opportunities for specific research to support implementation and better policies for SDGs. In particular, the following areas should be considered as candidates for research topics:

- interdependencies between SDGs, to identify both critical trade-offs between policies aimed at achieving specific SDGs and how they can be mitigated through synergy solutions and possible multipurpose actions;
- governance for the SDGs at national level and for improving the links to other levels;
- improvement of the availability and timeliness of data related to SDGs and new approaches to train statisticians and data scientists;
- the function and effects of internal market rules (including State aid rules) to foster innovation for SD;
- improvement of social innovation research to address SD in a comprehensive way, to effectively stimulate practices for the adoption of behaviours oriented to SD.

28. Social Innovation

Successful social innovation (SI) can solve some of society's biggest challenges – including greater social justice, environmental degradation, and building more resilient societies, capable of responding to shocks without falling apart. Social innovation offers new ways of reaching the global goals set for sustainable development in new ways. It lays the foundations for a new generation of entrepreneurship and business models targeting the real economy.

- ***Taking new aim at society's wicked problems***

While technological innovations continue to inspire awe with the wealth generated through new gadgets or online services, a growing community of "social innovators" are asking how to use them to solve the wicked problems of society. Social innovation allows societal goods to be delivered in new ways, involving a new range of stakeholders (often non-state actors), bringing about organisational changes even at systemic level (e.g. new growth or economic models). Although ICT is an enabler in most social innovation activities (to increase the efficiency, transparency, reach and effectiveness of existing processes), it is the unprecedentedly large-scale human cooperation possibilities offered by ICT networks which enable a whole new range of distributed, grassroots bottom-up solutions to sustainability challenges based on network effects or collective intelligence, contributing to an increased collective awareness of societal problems and possible collective solutions.

- ***What are the preconditions of success?***

Social innovations" are innovations, e.g. new or significantly improved goods, methods and processes, which use means that engage society and aim at gains for society rather than for the individual innovators, e.g. innovations that enhance society's capacity to act. Ideally, social innovation has the potential to contribute as a "system changer" actively engaging citizens to address issues that matter to them and develop innovative solutions in partnership with all sectors of society.

Technological innovations often open the way for social innovations that would otherwise not be possible. For example, without network technologies enabling distance learning, the Open University could not have existed. On the other hand, technological innovations often lead to changes in social organisation and the way we interact with each other. For example, mobile telephones changed the interpersonal relationships including inside the family. The social dimension of technological innovations is long recognised. It is important to engage citizens in the innovation process (facilitated by digital tools) and to promote scientific, economic and social progress at the same time. Social innovations can also be disruptive, leading to institutional changes and policy reforms, and upsetting established structures and relations while creating new solutions.

Concretely this approach entails the following dimensions:

- Pull together society's resources, bringing the public, private and social spheres, focus on knowledge and build on experimentation to deliver new solutions in areas that matter to European citizens
- Boost entrepreneurship and create new jobs, with a new focus to address the needs of society while developing competitive solutions and opening new markets in new areas
- Ensure that the *broad approach to innovation* becomes reality, so that Europe invests in the future of its citizens, harvesting youth potential, building on peoples' capabilities and skills and empowering societies in Europe and beyond
- Reply to major challenges of our societies, many also shared with our neighbours, which can only be tackled through innovative approaches and through international cooperation and joint efforts.

- ***Success at scale requires a joined-up end-to-end approach***

Understand: Unlike many traditional approaches to product or service innovation, effective social innovation requires a deeper understanding of the complex societal dynamics that drive change, including the role that technology plays in these changes. More multi-disciplinary research results – including new experimental approaches outside the conventional academic settings - must find their way into the hands of social innovators.

Seed : Social innovation requires a different seeding mechanism, combining elements of community-centred design, youth entrepreneurship, and new networks together with new forms of financing and organisation. Seeding successful social innovation requires non-traditional innovation actors to be involved, and frequently non-traditional forms of organisation, frequently going beyond the established set of innovation stakeholders.

Grow : A successful infrastructure to grow – and ultimately scale – social innovation carries a number of preconditions. Some growth conditions include an effective mechanism to allow reuse of successful solutions between innovators; new sources of financing and impact investments including a bold public procurement obligation to consider social innovation solutions; as well as new legal structures that for social innovation businesses that offer favourable conditions in terms of tax, ownership, and legal protection.

Digitize : An important additional precondition for success in social innovation is access to the necessary digital infrastructure, including access to data on which many future social innovations will be built. Next to the need for widespread availability of cheap high-quality broadband, access to open government data or affordable access to privately held data in the public interest constitute further success conditions.

- ***What is being done and who needs to do more now?***

A [number of research](#) projects have [addressed social innovation](#) dynamics as their core topic, including [the digital aspects](#). But these initiatives are piecemeal, and do not necessarily equip the broader social innovation community with the necessary tools.

Council conclusions on fostering youth social entrepreneurship [exist](#), yet so-called mini-enterprises are formally supported only in a handful of countries. A high-quality (Commission-supported) [social innovation exchange exists](#), linking to events and funders, including a Commission sponsored social innovation [competition](#). But the visibility, impact and scalability of these innovations can still be greatly increased.

More work is needed to link these networks of innovators to the emerging area of [impact investment](#) and to use innovative ways of public procurement to are a financing mechanism of social innovation, e.g. by evolving the initial ideas around [social impact bonds](#), or expanding the use of considerations of [wider social and environmental costs and benefits](#) when awarding public procurement tenders. This requires transparent easy-to-use models of social return on investment.

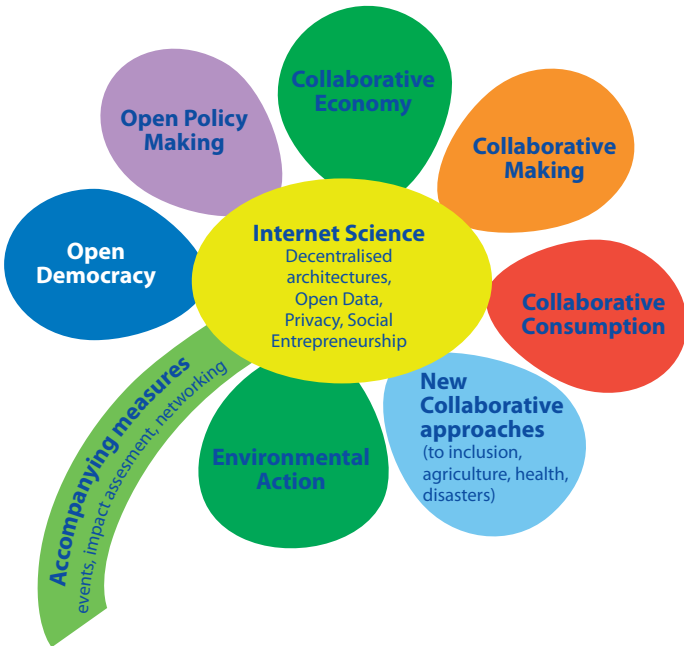
Free access to Open Data is already [established policy across](#) the EU, [data markets are being surveyed](#), and efforts are [emerging](#) that [connect data science for greater public value](#). Beyond access to and use of data, the wider use of technology for social good is being examined by a [number of initiatives](#), including most recently on the question of [how block-chain technology can play a role in building social finance](#).

- **Who needs to do more now?**

Joining up across silos. While there are many valuable avenues in the existing work-streams, current efforts are individually sub-critical, and collectively dispersed without any strong, coherent political leadership. In the Commission alone, the DG involved include GROW, EMPL, JRC, CNECT, RTD, EAC, and no doubt others as well. These efforts require a stronger internal network, and more visible and vocal political leadership.

Address policy gaps with experiments. New regulatory instruments are being experimented with across the globe, for example using social impact bonds (see above), or by establishing [benefit corporations](#), e.g. in Italy, that even top venture capitalists are seeing as a [driver for change](#).

Invest political capital through aspirational leadership. Strong, loud and clear political messages around social innovation have the potential to ignite social innovation in Europe and create a positive dynamics at grass roots level at a time when Europe is crisis-shaken. The positive return-on-investment – as well as the opportunity costs – are likely to be enormous.



- ***Digital Social Innovation enabling participatory innovation***

Digital social innovation ideas have the potential of creating a new kind of innovation ecosystem, based on participatory innovation, providing new social and commercial services leveraging on human collaboration, which can have a profound impact on the way society is organised. At the same time, participatory approaches escape traditional regulations, and create ethical dilemmas which cannot be resolved without a deeper understanding of their techno-social implications.

A precondition for the success of participatory innovation is a radical shift in the current asymmetric data governance models, which are extremely centralized in the hands of a few corporations worldwide. New entrants should instead be able to obtain access to big data directly from citizens, in a decentralised data governance model guaranteeing privacy as well as identity, creating a level playing field for commercial or social entrepreneur of any kind and any size, and preserving the digital sovereignty of European citizens. Available technologies such as P2P and block chains can be instrumental in implementing this model, restoring symmetry in the way data is being managed over the Internet.

Piloting this kind of innovative collaborative digital social innovation activities in a coherent research and innovation Horizon 2020 framework, thriving on open data, is also key to understand how best to shape the distributed paradigm which will then support them. We need a **global EU vision** encompassing all the strongly entangled economic, technological, social and policy aspects, which would otherwise remain fragmented and lead to market distortions and regulatory breakdowns.

29. The circular economy

Today's economic model is based on extracting finite resources, turning them into goods, and throwing them away. This is unsustainable. Circular innovation closes the loop between disposal and creation, using design, sharing, reuse and recyclable materials to minimise systemic waste. Europe needs to lead the transition to a growth model based not on disposability but on regeneration of resources.

- ***What will be the benefit of successful action?***

Growth would be decoupled from resource depletion, with consequent social & environmental benefits. Re-cycling allows companies to shield themselves against resource volatility, achieve cost savings and competitive advantage as well as an attractive, future-proof value proposition. Consumers benefit as harmful substances are phased out, re-manufactured products are cheaper yet offer the same quality as new, and new forms of leasing or pay-per-use can be more affordable than buying. Circular thinking can drive regional development as R&D-intensive SMEs find new ways to turn locally available waste into new products, replacing or reducing inputs of imported virgin materials. Repair, remanufacturing and recycling creates more jobs and causes fewer emissions than either landfill or incineration.

- ***What are the preconditions for success?***

It is difficult for secondary materials to compete with cheaper, primary raw materials when environmental costs are not reflected in their price. If operating costs were to reflect the long-term costs to the societies and environment, sustainable businesses would become more viable. Systemic measures need to align market incentives with the goals of the circular economy. Value chains need to be redesigned to form closed loops.

- ***What is being done and who needs to do more now?***

Some forward-thinking companies have already started becoming "circular", demonstrating win-wins for them and their customers. Such innovation can involve both product design and business models. For example, Fairphone is a Dutch smartphone designed and produced with minimal harm to people and planet, using conflict-free minerals and a design for longevity, reparability and safe recycling. Renault has a factory in France where it takes back its engines, refurbishes them and sells again; such remanufacturing is more profitable than producing from new raw materials. Philips sells lighting as a service for business customers: customers only pay for the light, and Philips takes care of the investment and the replacements; the service-based business model again incentivises durable and sustainable design.

Public policy, such as the recently adopted [EU circular economy strategy](#) needs to focus as much on information flows as on materials flows in the circular economy. Becoming "Internet-ready" is an essential criterion for success. The fusion of information with digital networks is allowing business sectors from commerce and transport to energy and agriculture to review their entire operations. Data-driven decisions are making it possible to optimise products and business models. The same needs to happen to turn Europe's market for secondary raw materials into a dynamic exchange platform.

The first step towards optimising the use of resources across the value chain is to make information available about their material composition (including hazardous chemicals),

their reparability and recycling. A product passport containing such aspects has been proposed by the expert group European Resource Efficiency Platform.

Product information needs to be made available in digital format so that the data can flow across the digital networks cheaply, efficiently and in real time. Tagging and tracking of products can give precise information about where and when discarded objects become available as a resource for next use. Digital tools also include mobile applications, and online sharing and exchange platforms. With the advent of the Internet of Things, physical objects with sensors and software will make it possible to generate further useful information, for instance, about a product's condition.

The Commission needs to align all EU policies, regulation and funding with the circular economy objectives, including through the Better Regulation process, and address areas where EU actions still prop up the old linear "take-make-throw away" model.

Public procurement needs to introduce circular criteria, while fiscal policy needs to correct negative externalities such as carbon emissions, pollution and waste. Governments need to reward companies that mitigate such negative impacts; and stop subsidising unsustainable economic activity. This also requires adequate metrics and robust models.

Business needs to respond to customers who value environmentally and socially responsible behaviour, and who are involved in collaborative consumption, sharing and exchange platforms, as well as services based on access to rather than ownership of goods. Currently companies often aim to sell as many products as possible, as often as possible, which offers little incentive to extend product lifetimes. Moving to a business model based on access to products as a service, and therefore retaining ownership of the materials, allows companies to reap the financial benefits of designing for durability, easy refurbishment, upgrade and recycling.

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30. Green Infrastructure as a provider of multiple nature-based services and benefits

Green Infrastructure is about more than just biodiversity. If it is to deliver the potential benefits, it needs to scale up as part of a strategically planned network.

- ***What will be the benefit of successful action?***

Green Infrastructure is made up of natural, semi-natural and artificial elements that together function as a strategically planned network to deliver multiple nature-based services. These networks of green elements provide e.g. economic benefits, improve quality of life, support a green economy, contribute to protecting biodiversity, safeguard and enhance the provision of ecosystem services, such as water purification, air quality, space for recreation and climate change mitigation and adaptation. Green Infrastructure can also provide new business opportunities for innovative companies and industries and lead to new business models. Green Infrastructure brings alternative solutions to traditional grey infrastructure designed to fulfil specific needs, such as water and air purification or carbon sequestration. It provides improved financial and social cost-benefit outcomes both directly (e.g. through employment in GI projects and their management) and indirectly (e.g. through potential for increased property values and lower spend on clean-up and treatment).

In the EU, as in other parts of the world, ecosystems continue to be degraded compromising their capacity to deliver the optimum range of ecosystem services to human society. Green Infrastructure - a strategically planned network of natural and semi-natural areas in optimal condition designed and managed to deliver a wide range of ecosystem services - has the potential to halt and reverse such ecosystems degradation with a view to maximize the benefits from ecosystems services to society.

Green Infrastructure (GI) aims at improving quality of life in many ways, through its environmental, social and economic credentials, based on the multifunctional use of natural capital. Potentially a very valuable policy tool, GI's multi-functionality can contribute to the achievement of a number of policy aims and fulfil the needs of a variety of stakeholder groups in a very cost-efficient way.

- ***What are the preconditions of success?***

Mapping and assessing ecosystems and their services, including on green infrastructure and associated ecosystem services mapping, is required. This knowledge base has then to be translated into relevant indicators, and included in policy setting, with guidance and examples on how to translate concepts for the enhanced delivery of multiple ecosystem services into concrete action.

Then, with a view to enable Green Infrastructure solutions to develop their full potential, they must be connected to each other as part of a strategically planned network of sufficient scale.

A new conceptual paradigm is needed which should lead stakeholders to favour and choose first green infrastructure options instead of grey infrastructure.

- ***What is being done and who needs to do more now?***

The Commission adopted in 2013 a Green Infrastructure Strategy, 'to promote the deployment of green infrastructure in the EU in urban and rural areas'. This is a key step in implementing the EU 2020 Biodiversity Strategy and specifically Target 2 that requires that 'by 2020, ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems'.

Some actions are already taken at local, regional, national and European levels, but benefits associated with Green Infrastructure will increase in proportion to the scale and connectivity at which they are deployed; therefore a more effective promotion of Green Infrastructure at all relevant levels is necessary. Given that the EU has no competence on spatial planning; Member States and their local authorities have to play a proactive role there. The benefits European citizens can enjoy from Green Infrastructure will be maximised if its elements are consistently maintained and enhanced across all scales.

There is also a need to assess technical standards and innovation possibilities relevant for new Green Infrastructure markets, in relation to physical elements, methodologies and procedures. The Commission has started to initiate a reflection on the matter, involving European standardisation bodies, but this work stream needs to be continued and accelerated.

Moreover, to date, large-scale infrastructure initiatives have been devoted to transport, energy and ICT¹. Developing an equivalent instrument, the trans-European priority axes for GI in Europe, TEN-G (based on trans-European networks in grey infrastructure sectors), would have significant benefits for securing the resilience and vitality of some of Europe's most iconic ecosystems, with consequential social and economic benefits. Such initiatives would also act as flagship initiatives that could serve as examples at national, regional and local levels and boost the importance of the development of trans-European GI in policy, planning and financing decisions.

The Commission Communication on GI foresees that it should carry out an assessment of the opportunities for developing an EU TEN-G initiative; and recent calls from the Council (Conclusions, 16 December 2015) and the EP (Resolution on the biodiversity mid-term review, 2 February 2016) reconfirm their support to the development of such an TEN-G initiative.

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31. Low Carbon Innovation

With the Paris Climate Agreement in place the scene is set for a move to a low carbon, climate resilient global economy. This worldwide transition demands a fundamental shift in technology, energy, economics and finance. Innovation and new technologies are the best instruments to tackle the climate change challenge and bring breakthrough solutions. European companies are at the forefront of this effort, and a dedicated low-carbon innovation policy will be key to support them in reaping the associated benefits. An Innovation Fund to support highly innovative, low-carbon first-of-a-kind projects in European industry and energy production will be set up and financed by revenues from auctioning EU ETS allowances.

- **What will be the benefit of successful action?**

At the international climate conference in Paris, December 2015, a global climate agreement was reached, which marks the beginning of a global transition into low-carbon, climate resilient investments and growth. The announcements by 187 countries of their Intended National Determined Contributions (INDCs), which will cover more than 95% of global emission in 2020, demonstrate a decisive turning point towards comprehensive and collective global action.

The EU's contribution to the Paris Agreement, the 2030 Climate and Energy Framework, sets a binding emissions reduction target of "at least 40%" domestically by 2030 compared to 1990. This will bring new opportunities for innovation and investment in renewable energy, decarbonising energy-intensive industries, low-emissions transport, energy efficiency, and many other sectors for sustainable growth within Europe's economy.

New low carbon technology markets are also opening up globally. In 2015, China installed half of all new wind capacity worldwide, but also the US and Brazil set new records (together with Germany)³⁰. With the Paris Agreement in place, renewables and other low carbon technology markets are expected to expand globally in the coming years. The full implementation of the INDCs will require the energy sector to invest \$13.5 trillion in energy efficiency and low-carbon technologies from 2015 to 2030, representing almost 40% of total energy sector investment³¹. For electricity alone, seven out of every ten units of additional electricity generation through to 2030 are projected to be low-carbon, bringing the share of total electricity generation from low-carbon sources from one-third today to nearly 45% in 2030.

³⁰ The Global Wind Energy Council (GWEC)

³¹ International Energy Agency: Energy and Climate Change - World Energy Outlook, special briefing for COP21

- ***What are the preconditions for success?***

For European industries such an increased focus on climate change globally is another opportunity to remain or become the world-leader in low carbon technology while avoiding carbon leakage.

To succeed, sustainable finance will be needed. Green and sustainable finance has evolved within the EU from a niche product into a mainstream approach. Institutional investors and other large scale asset owners and managers start to recognise the risk of stranded assets and the importance of better financial disclosure. The EU's Action Plan for the Capital Market Union recognises the need to shift to a low-carbon and resource-efficient economy. Internationally, new financial instruments are meant to "shift the trillions": within a few years, a dynamic green bonds market has developed, banking regulators have come together through the Sustainable Banking Network, the Financial Stability Board has launched a task force on climate disclosure, and China, as part of its G20 Presidency in 2016, has launched a Green Finance Study Group.

While the low-carbon economy will be a major driver for competitiveness and growth, and awareness is being raised on the need to align financial systems with sustainable, low carbon development, strengthened and dedicated low-carbon innovation policy will be key to support European companies reaping the associated benefits.

As part of the 2030 climate and energy framework, the European Council agreed for the EU Emissions Trading System 2021-2030 to deliver an increased target of 43% compared to 2005 as the EU flagship policy for the transition to a low-carbon economy. It was further agreed to create an Innovation Fund financed by revenues from auctioning EU ETS allowances to support highly innovative, low-carbon first-of-a-kind projects in European industry and energy.

The scope of the Innovation Fund will be to support demonstration projects of innovative renewable energy, environmentally safe carbon capture and storage (CCS) and low-carbon innovation in industry. Some 400 million allowances will be reserved from 2021 onwards for this purpose. In addition, a further 50 million of the unallocated allowances from 2013-2020 will be set aside to enable the Innovation Fund to start before 2021.

The legislative proposal for the revised ETS Directive does not specify the technical details of the Innovation Fund. It will be necessary to develop operational rules once the revision of the ETS Directive is agreed, taking into account emerging experiences from existing funding mechanisms. As such, the Innovation Fund will be complementary to the European Fund for Strategic Investments (EFSI) and to Horizon2020.

- ***What is being done and who needs to do more now?***

Different modalities for the future set-up of the Innovation Fund will need to be investigated. While both grants and green financial instruments can effectively address financial barriers for low-carbon innovation, financial instruments have a higher potential to leverage more private investments while grants and equity-type finance may be able to focus on more innovative projects. The Innovation Fund should be a catalyst for businesses willing to grasp the opportunity to lead the way in developing new technologies and low carbon innovation.

More specifically, for the expansion to manufacturing industry, barriers to investments in low carbon innovation in industry will need to be analysed, such as financial, technical and operational needs when developing new technologies and their market update. The Innovation Fund is aimed at helping to overcome those barriers.

32. Innovation in Social Services

When faced with changes in business models, increasing demand and budget constraints, maintaining quality social services requires innovation to incorporate new solutions that alleviate pressure on services.

- **Rational**

In coming years, a stronger emphasis on activation, more equality between women and men, changed social preferences and values, and, as a consequence of an ageing society³², increased demands of care support³³ will be key elements characterising our society and framing modernisation of social protection systems.

The demand for social services is increasing due to the development of new needs driven by the demographic changes (such as ageing, where the 65+ share in population will increase 80.5% between 2008 and 2060 and the share of the 80+ will increase 185,4 %³⁴); the economic and social consequences of the ongoing crisis (in terms of high unemployment, in-depth and in-work poverty, exclusion and growing inequalities); greater personal aspirations and awareness about rights (persons with disabilities and other social rights); technological developments (not only in terms of employment impact³⁵ - and skills mismatches³⁶, but also of increasing social divergences); and other changing health and social challenges (the increasing prevalence of chronic and mental diseases as well as stress and loneliness).

New demands are placed on social services in addition to the traditional functions they deliver., "Transitions between jobs, between, work and time for re-skilling and also between family and care responsibilities and employment would be more frequent and therefore will have to be better supported than today"³⁷ In this context, Social Services are expected to cooperate with other services in order to provide personalised support, for instance, to contribute to the integration into the Labour Market of those further away, such the long-term unemployed³⁸ or those facing multiple forms of social exclusion, and, more generally to improve productivity and growth.

32 EC 2015 Ageing Report

33 PC and EC Report "Adequate social protection for long-term care needs in an ageing society".

34 Euro pop 2010 populations projections

35 World Economic Forum 2016: Report on "The future of Jobs". An estimated net employment impact due to the Fourth industrial revolution of more than 5,1 million jobs lost due to disruptive labour market changes over the period 2015 -2020, with a total loss of 7.1 million jobs –concentrated in Office and Administrative jobs – and a total gain of 2 million jobs, due to the Fourth industrial revolution

36 A report from the US Department of Labour already indicated that 65% of 1999's grade school kids will end up at jobs that were not invented at that time".

37 EPSC Strategic Notes "The future of Work: Bolstering resilience for a world of change"

38 Council Recommendation of 15 February 2016 on the integration of the long-term unemployed into the Labour Market.

- ***What will be the benefit of a successful action?***

Modernisation of social protection systems is an important focus of the European Commission as part of progress towards achieving the targets set out in the Europe 2020 strategy. The Social Investment Package (SIP, 2013³⁹) emphasized that there is an added value in focussing on innovative social policies and embedding innovation in evidence-based policy-making. Social innovation is a powerful means to achieve innovation of services across all levels and types of governments, facilitating partnerships with social organisations and private service providers⁴⁰ (IESI) and reaching three of the most widespread policy objectives: increasing access and take-up of services, improving their quality and reaching out to the most disadvantaged.

- ***What are the preconditions of success?***

One of the main elements of the proactive response to social protection against long-term care dependency include measures aimed at "realising the full potential of technology to help older people remain at home, to raise the productivity of care services and to compensate for the decline in the number of carers". " Despite rising evidence about the positive impact, large scale use of the potential of technology and innovation for improving the productive of LTC is still largely unrealised".⁴¹

- ***And who needs to do more now?***

High quality, integrated and personalised social services implies developing new responses to identified social needs, support social investments⁴², and providing integrated and personalised social services, improving their quality, access, coverage, and affordability (looking at the organisation and adaptation of social services schemes in line with the general quality principles presented in the "Voluntary European Quality Framework for Social Services".⁴³) and enhancing their efficiency and effectiveness.

ICTs would help in ensuring high-quality and cost effective services and in reducing social services fragmentation by favouring one stop-shop approaches and integrated social services. ICTs can contribute also to make the services more pro-active, closer and tailored to person's needs, and to extend the reach and take-up of social services. ICTs can act as a catalyst for social innovation and thereby social services due to the potential opportunities for open collaboration, involvement of citizens and relevant actors (facilitating the establishment and functioning of partnerships).Information and communication technology often enables innovative practices through electronica data sharing, assistive technologies, online

39 Social Investment Package

40 IESI project: JRC_ IPTS: "Role of ICT-enabled Social Innovations promoting social investment in integrated approaches to social services provision.

41 Social Protection Committee and European Commission Joint Report 2014 "Adequate social protection for long-term care needs in an Ageing Society"⁴¹,

42 EC Social Investment Package and EC Recommendation on "Investing on Children".)

43 "Voluntary European Quality Framework for Social Services".

communities and apps⁴⁴. Finally, ICT is also a vehicle to increase monitoring of outcomes and accountability.

In addition, to embed innovation in effective and pro-active policy frameworks for quality social services several key elements/instruments would need to pursue further efforts.

- Greater involvement of public authorities is key to achieve sustained outcomes from social policy innovations and broader partnerships are needed, involving civil society organisations, the private sector and stakeholders operating in the social economy in connection to social services.
- Innovative approaches to social services to identify what works and what doesn't work .are needed. In spite of many examples of innovative experiences in the social services field, a more systematic assessment will add further value. This requires developing new tools for measuring outcomes, economic and social, resulting for the implementation of innovative approaches to social services.
- ICTs enabling technologies would play a major role in this but quicker translation of new technologies into the social field is necessary. Reversing current slow pace seems justified, given the high share of new employment opportunities in the social sector and the clear impact/ contribution of ICT-based innovations have in supporting social investments in the social field. However, these solutions only materialise rapidly on the ground when social innovation is encouraged to take full advantage of them ⁴⁵(IESI)
- The potential of social clauses in public procurement, building on the implementation of current EU Directives, need to be fully utilised by public authorities responsible for social services. In this regard, innovative procurement, such as PCPs and PPIs can help public authorities in articulating solutions and ICTs play a major role in this. For instance, SILVER, a transnational PCP⁴⁶ Nordic lead project, aims to carry out the development of new robotics based technologies that will allow for 10% more elderly people living independently at home by 2020, while maintaining the same amount of care staff and quality of services.

Ensuring high quality social services to citizens is no doubt part of a social AAA European Union. Member States have to plan and organised themselves to be able to address this strategic challenge. As experiences from other challenges show, Member States adopting strategic decision earlier will be better positioned in the future. Social innovation is one of the tools to be used. There is also an ample divergence on taking-up of social innovation among member States that justifies an added value of work in this field at European level.

Structural Funds are expected to better mainstreaming innovative actions into policies and thus better piloting the systemic potential of social innovation according to the current regulations. In particular, in order to support implementation of ESF, s operational programmes, a common framework has been established covering social innovation for enhanced transnational cooperation. The European Commission is also supporting

44 See IESI Project

45 IESI Project

46 PCP (Pre-commercial procurement is the procurement of research and development of new innovative solutions before they are commercially available. PCP is normally connected to PPIs (public procurement of innovative solutions).

innovation in social services in Member States through direct management programmes, such as the EaSI programme.⁴⁷

ICT based technologies will become more and more relevant in the future of social services (design, access and delivery) in particular through social start-ups.

There are risks and opportunities in the process of incorporating ICT-enabled technologies and in this sense it would be very important to develop policy guidance for stakeholders involved in particular on how and on what conditions ICT-based technologies can be supportive of ensuring high quality of social services in the EU.

Finally, there are important connections between social economy activities and social services that merit further consideration. Actors operating in the social economy, including social entrepreneurs, are important drivers of social innovation and active inclusion outcomes.

47 EaSI program

33. Impact hubs help social enterprises scale up into Europe⁴⁸

A pilot scheme from Impact Hub is helping social entrepreneurs expand into other territories. Scaling manager Devi Clark explains how it works and Open Cinema's Christoph Warrack shares his experience of the scaling programme.

An invaluable package of support for over 100 European social enterprises is being piloted by the Impact Hub network. Their scaling programme is running across eight European cities, helping social entrepreneurs to grow their business by pairing them with scaling managers across their network.

Devi Clark is one of those scaling managers. She works at the Kings Cross hub and is currently advising a number of social enterprises. She's well qualified for this, having formerly worked as an enterprise development officer for Community Innovation UK, before spending five years as a business coach. Perhaps most importantly of all, she's walked the walk, having set up her own social enterprise, [The Outsiders Network](#).

Impact hubs are one of the many unsung heroes operating in the social enterprise world. Describing themselves as 'part innovation lab, part business incubator and part community centre', with this scaling program, the hubs are essentially acting as enablers for social ventures to expand.

Although they seem like part of the furniture now, the first hub appeared only ten years ago in Islington, North London. They now have 7,000 members in 82 hubs operating in 49 countries around the world. Should the scaling programme prove successful, the idea is to expand it beyond Europe; hubs in the Americas have already expressed an interest in participating.

The hubs themselves are social enterprises, with users paying membership for access to office space and business services. Additionally there is the opportunity to make connections, build networks and collaborate. Any kind of business can join but members are primarily social businesses.

They are nexuses for networks in the social innovation space so they are at the sweet spot for scaling social innovation

The scaling programme offers a wealth of services for free, although if it proves successful, that may change in the future. The current incarnation is being funded by four foundations in the UK, Spain, Greece and Italy with JP Morgan being the most familiar name among them. So what's in it for the hubs themselves?

48 Lee Mannion 26th August 2015 – [Pioneers Post](#)

Clark tells me the reason for this programme “is our desire to change the world through supporting social enterprise. We think that combining business and social or environmental impact is a powerful mix.

“Scaling is a critical time for a business. Like start up, it is a time when a business needs to examine its structures, aims, finances and team. You need to balance growth and realism and ensure both are done sustainably. We want to help those enterprises with potential to succeed to scale their impact and ensure that the social sector doesn't have to keep re-inventing the wheel.”

22 social enterprises from the UK have signed up and the European network is itself part of the attraction – half of them have ambitions to scale overseas. The hubs are able to put social enterprises in touch with scaling managers in the various European locations who can offer local knowledge. There is also the opportunity to access the expertise of business experts in other countries who mostly offer their time pro bono. “We have sales, HR, strategy, digital marketing, innovation, legal and accounting specialists, to name but a few,” says Clark.

The insider's view

[Open Cinema](#) are one of the social ventures in the scaling programme. They run a network of film clubs for homeless and social excluded people. Attendees get a chance to programme the films they would like to see and films are often introduced by the actors and directors who have made them. The homeless charity, [St Mungo's Broadway](#) has carried out research that concluded taking part in social and cultural activities such as Open Cinema provided mental health benefits. Isolation was alleviated and anxiety and depression were reduced as a result.

CEO of Open Cinema Christoph Warrack tells me that they have received enquiries from people wanting to operate Open Cinema in 69 other countries since they started in 2009. When he became aware of the Impact Hub scaling programme via a chance meeting at the [RSA](#), he saw a way that he could make it happen.

Initially their aim was to formalise a manual on a digital platform for people who wanted to operate Open Cinema in any given country to do so. As Warrack puts it: “If an Open Cinema at a community centre in Turin wanted to open, they could essentially go to the platform, find a manual and start using it.”

Impact hub helped him focus on territories where Open Cinema would be a good fit and where there would be a good chance of achieving traction and growth. Warrack was then introduced to scaling managers in Stockholm, Milan and Madrid. After extensive consultation their verdict was that Open Cinema have good grounds for developing a pilot next year. “Because we're a tech platform we can scale fairly efficiently and quickly once the licensing and translation elements are in place; then it's just a case of marketing and onward support,” explains Warrack.

Impact Hub have offered a three month programme led by the [International Centre for Social Franchising](#) (ICSF) which is going to help formalise the manual. If all goes to plan, by Spring 2016 Warrack will have appointed officers in Sweden, Italy and Spain and Open Cinema will be piloting their first projects in those countries.

Warrack was already an admirer of Impact Hub before he got involved with the scaling programme: “My first port of call to try and build up a network of contacts in a given country was going to be the Impact Hubs because they are powerhouses of dynamic social innovators. They are nexuses for networks in the social innovation space so they are at the sweet spot for scaling social innovation whether it's recruiting, operations, legal or finance.”

He is also effusive in his praise for the service he has received, particular when comparing it to his experience of other similar projects. “The key point to underline is that they have always sought to apprise, understand and then scale the particular characteristics of Open Cinema as a particular innovation rather than having a programme of funding, needing to find social innovations to fit their criteria and then, if they couldn’t find them, making them fit that criteria whether or not that’s good for the social innovation – and therefore compromising the integrity of that innovation along the way. There are prominent offenders in that respect out there.”

Warrack thinks that Open Cinema could have moved in this direction without the scaling programme but that it would have taken longer and their progress would have been less focused. “The value of this is that we haven’t had to go off and apply for things, perhaps writing 100 page applications to get the support. They get the support as an intermediary and all Impact Hub want is for us to be doing more of what we already know really works.”

Applications for the Impact Hub scaling programme are closed in the UK, however other countries are still accepting applications at this [link](#). It includes blogs and webinar recordings from some of the training seminars already run, so anyone can make use of the resources.

Section 5.

Great Stories, Ideas for Scaling Up

34. The Human Brain Project – major achievements⁴⁹

Europe is a world-leader in Brain Science. We were the first to launch a Brain Flagship. We have just achieved globally impressive proofs of concept. We have only just begun.

The Human Brain Project (HBP) was launched in 2013, and in that time has paved the way for major progress in our understanding of the brain, one of the greatest challenges in modern science. The Project is a vast and ambitious one, and scientists hope that by understanding more about the brain, they will have more insights into how we interact with each other and the world around us, and about brain diseases and potential treatments. The researchers also aim to develop powerful new computing technologies based on how the brain functions. The Project is one of European Union's Future and Emerging Technologies (FET) Flagship Projects.

The Project's researchers intend to create a European Research Infrastructure based on Information and Communications Technology (ICT); various HBP Subprojects contribute to this goal. At the end of March, the HBP released first versions of six ICT Platforms, which will form the heart of the infrastructure, to the public. These Platforms are tools that can be used by scientists everywhere to help in their own research, as well as contributing to the depth of knowledge being created by the HBP. They consist of prototype hardware, software, data and databases, and computer programming interfaces dedicated to different areas, i.e. finding and analysing shared neuroscience data (Neuro-informatics Platform), reconstructing and simulating areas of the brain (Brain Simulation Platform), providing the necessary computing power for complex simulations (High Performance Analytics and Computing Platform), gaining access to real, anonymised patient data to help understand brain diseases (Medical Informatics Platform), using computers inspired by how the brain works (Neuromorphic Computing Platform), and using virtual robots and environments to test simulations of the brain (Neuro-robotics Platform). Other HBP Subprojects support and feed these Platforms and are designed to, for example, expand existing data on the rodent brain, generate similar complex data for the human brain, study cognitive tasks and functions, address essential theoretical concepts in the field of neuroscience, and explore the social, ethical and philosophical implications associated with the Project. The researchers rely heavily on collaboration with other colleagues to achieve their aims, and therefore intend to support and interact with the scientific community worldwide.

49 An EU co-funded project where majority of partners are universities, public/non-profit private research organisations or non-profit organisations

- ***Notable achievements so far***

Digital reconstruction of a crucial part of the rat brain: An international team led by researchers at EPFL produced a draft digital reconstruction of the micro-circuitry, i.e. the complex ‘wiring’, of the rat neocortex, the part of the brain involved in sensory perception and motor commands. This is a significant accomplishment because it demonstrates that it is possible to make a successful digital approximation of brain tissue, and is an important first step towards digital reconstruction and simulation of the whole brain. The researchers could also validate findings from live (*in vivo*) experiments and get new information that was not possible from biological experiments, for example the importance of the role of calcium. The results were published in the prestigious journal *Cell* (Markram H et al. *Cell* 2015;163:1-37).

European Institute for Theoretical Neuroscience (EITN): The EITN was established in 2014 as part of the HBP’s theoretical neuroscience activities, and is operated under the Directorship of Alain Destexhe by a unit of the well-respected Centre National de la Recherche Scientifique in Paris. The EITN is a prime example of the HBP’s openness to the broader scientific community - it creates strong interactions and invites new ideas and theories to the Project. The Institute hosts many workshops, both internal to the HBP and with many non-HBP participants, and invites scientists to conduct relevant research at the EITN for up to three months.

HBP Collaboratory: The HBP Collaboratory, a web-based collaborative portal that integrates all of the HBP’s Platforms via a single sign-on procedure, was introduced. The Collaboratory acts as the entry point for the HBP Platforms, and also collects Platform tools (e.g. software, databases, functions) in one place, so that researchers can organise them into their own personal collaborative workspace. Here, the researchers can build their research teams, describe their project, collect the tools they want to use, and share data, ideas, code and workflows.

Neuromorphic computing systems: The University of Heidelberg and University of Manchester, two of the HBP’s partners, are pioneering efforts to develop neuromorphic computing systems, i.e. systems inspired by the way the human brain works. These, and the TrueNorth system by IBM, are the only neuromorphic systems in the world capable of running simulations of brain circuit systems with state-of-the-art models of brain cells (neurons), cell-to-cell connections (synapses) and plasticity (the brain’s ability to change) in either real time or accelerated time. Neuromorphic systems are expected to be a new paradigm in computing, and have unparalleled capabilities to study crucial brain characteristics, such as learning, plasticity and development. They offer a new way to analyse and interpret data, and to understand and test scientific hypotheses.

Medical Informatics: The Medical Informatics Platform (MIP) is an innovative system for researchers, doctors, epidemiologists, and health managers to unlock and analyse data contained in databases of various hospitals and clinics. Individuals can find and use the data without having to transfer it to a central data bank first. Researchers often find it a difficult and time-consuming process to examine combined data from various places, but the MIP makes such examinations faster and more efficient. Scientists anticipate that by discovering patterns (‘biological signatures’) in these data, they will be able to make new assumptions about brain diseases, and hence more accurate classification of brain disorders based on certain features in the brain, as well as signs and symptoms. The data may also help with unanswered questions around public health and epidemiological topics.

General innovation: The HBP has a dynamic approach to scientific and technological innovation. For example, the Project intends to determine the current levels of technological innovation across the 100+ Partner Institutions and to develop strategies (‘roadmaps’) for innovation in neuroscience, medicine and computing. In the next phase of the Project, the

HBP will initiate 'innovation hubs' to help the flow of knowledge between the HBP and local industries, especially by making these industries aware of relevant new technology emerging from the HBP. These hubs will be a cooperative venture between the industries and local members of the HBP Consortium; good examples of these are already emerging from Spain.

35. Smart Design Innovation for Healthcare in Europe⁵⁰

In the decades ahead, the world will save individuals from genetically coded illness and premature death. The integrated health framework created by Europe's social systems for health give us an unequalled platform to lead the world. The UK's [100,000 Genomes Project](#) and President Obama's [Precision Medicine Initiative](#) both underline the degree to which healthcare has entered a paradigm shift to precision medicine. The advent of Next Generation DNA Sequencing (NGS) technologies allows for detailed molecular characterisation of congenital disorders and cancers via fast sequencing of patients' DNA at affordable cost. Furthermore, self-learning algorithms can now accurately analyse that sequenced information and leverage the gigantic amount of data in an individual's medical records with a direct benefit for the patient. Coupled with molecular evidence to provide more accurate diagnostics, physicians can now to take better and faster decisions with more effective treatment plans.

The revolution in using genomic data in routine clinical practice is rapidly progressing and has been made possible thanks to the dramatic price drop of NGS technology, which has enabled its adoption by hospitals. While in 2010, use of this equipment in European hospitals was restricted to research departments, today almost every European university hospital has deployed the technology for diagnostics benefitting thousands of patients every year. Advances in the field of data analytics – bioinformatics – mean that advanced algorithms now eliminate biases from raw NGS data to reach the sensitivity and specificity demanded by clinical grade standards, regardless of the type of sequencing technology used.

Because technology is no longer a limiting factor in ensuring the adoption of clinical genomics in routine medical practice, it is now time to focus on adopting a collective approach, pooling data and knowledge of clinical interpretation, to help accurately diagnose and efficiently treat all European patients. Only with this kind of plan will all hospitals reach the same standard and that precision medicine will be a reality today rather than in a decade, when projects such as President Obama's Precision Medicine Initiative will be completed. Eliminating silos and collectively making use of patients' data, while respecting strict security and privacy standards, is a must and it is actually already possible to better diagnose any patient suffering from cancer and hereditary disorders.

Leading the revolution as the global leader in Data Driven Medicine, Sophia Genetics has triggered rapid advances in clinical genomics in recent years by bringing together expertise in genomics, bioinformatics, machine learning and data privacy. Launched in April 2014, Sophia DDM®, its analytical platform for clinical genomics, already connects over 140 global healthcare institutions, among which 90% are public hospitals. This has created the world's largest clinical genomics community for molecular diagnosis.

50 This paper is contributed by [Sophia Genetics](#), a European leader in its field.

By pooling the data of healthcare institutions across 20 European countries, Turkey and Israel, Sophia DDM® enables accurate, standardized and secure genomic data analysis, as well as facilitating knowledge-sharing of clinical interpretation between diagnostics experts, thereby unlocking the immediate benefits of precision medicine for patients.

Sophia DDM® is a software-as-a-service platform designed to perform routine clinical diagnostics testing for cancer and inherited conditions. Hospitals benefit from its cutting edge algorithms to more accurately diagnose pseudonymised genomics patients' data at speed and at scale. All 140 healthcare institutions using Sophia DDM® today mutualize their NGS data and share with each other their knowledge on genomic variants interpretation to contribute to the constant improvement of the platform, and its analytics. Thanks to a simple bottom-up approach, in only two years Sophia DDM® has been able to create the largest clinical genomics community globally.

To date, Sophia DDM® has contributed in diagnosing 36,000 patients and a total of 80,000 patients is forecasted for 2016; placing Europe ahead of the US in precision medicine. Notably, Sophia DDM® respects patient data privacy and allows patients to remain owners of their personal information, protecting the system from changes such as those currently going on with Safe Harbour for instance.

The first success factor of Sophia DDM® is that the platform has been creating a clinical standard to work independently of the technologies used to produce patient DNA sequence information within European public and private healthcare institutions. Thanks to sophisticated machine learning and pattern recognition algorithms, the platform has been able to deliver accurate, reproducible and repeatable genomics variants detection and annotation – the most important KPIs for any physician engaged in diagnostics – consistently across very different healthcare infrastructures. The second factor has been the ability to technically connect healthcare institutions and increase the number of this network's nodes to a critical mass. The last factor has been to build a platform that allows healthcare institutions to perform their analysis in less than two hours and share the results of these automatically with the network, creating a coherent and collective intelligence that everybody can benefit from. All this with the constant aim of benefitting patients.

As a consequence, Sophia has removed the bottlenecks for fast, accurate data analysis, rendering hospital workflow more efficient with shortened diagnosis turn-around time and reallocation of staff from bio-informatic data analysis to clinical data reporting, at the end of the value chain. In addition, it truly unlocks the democratisation of Data Driven Medicine in Europe since the platform also allows member hospitals and labs that lack the NGS technology to sequence their patients' DNA, to send their biological samples to another member of the community, and still maintain their clinical expertise by accessing their patients' results and producing their own clinical reports in their hospital, via the online platform. Thanks to this “healthcare without borders” approach, the Sophia DDM® platform and community promises to bring the benefits of NGS technologies to all European citizens, with applications in oncology, cardiology, paediatrics, metabolic disorders and hereditary cancers.

The question is now how to leverage the power of such a trusted technology to scale-up adoption of precision medicine in Europe and address the needs of millions of patients? There are multiple answers from which three stand out: 1) increase budget for clinical genomic data interpretation, 2) define clear and pragmatic European guidelines for data pooling, and 3) accelerate the adoption of drugs with companion diagnostics.

Now there are no bottlenecks to genomic data analysis – bioinformatics – for routine clinical diagnostics, public authorities should invest funds in clinical interpretation with additional staff budgets allocated to this, rather than to bioinformatics. EU institutions need to play a

greater role in making sure we address the next bottleneck of clinical interpretation, through education, right staffing and budget allocation. To date, healthcare is missing the force and the skill set to advice on actionable clinical decision based upon analytical reports.

In addition, pooling data and sharing knowledge is crucial to improve the understanding of disease management. But our experience has taught us that it is not always a straightforward process. Often, knowledge is siloed in the hospitals department that treats a patient, or in the laboratory that is researching a specific disease or complaint, and there is no complete patient picture. This can reduce the usefulness of data in predicting outcomes, or restrict its role in improving overall understanding of disease management. For instance, in oncology, being able to compute patients' metadata, such as successful treatments, remission, failed therapies, or images of tumour sections, on top of a patient's genomic data, would allow to be even more accurate and build patient clusters to identify optimal treatment plans. Therefore, European data protection and security guidelines should be rapidly adopted to build an EU compliant data pooling framework and foster a more active approach to sharing pseudonymised data and knowledge between healthcare institutions. Sophia DDM® provides a good example of how powerful this community spirit can be, while respecting patients' data privacy and security.

Finally, a whole new potential could be unlocked by urging large pharma actors to leverage Sophia DDM®'s community and collective intelligence to efficiently and quickly support companion diagnostics for new drugs available on the market. In fact, Sophia DDM® can work in such way that as soon as a drug is going to the market with a companion diagnostic, Sophia Genetics can immediately help hospitals to validate in their labs any new NGS based companion diagnosis and get up to speed to properly and quickly respond to the demand of physicians prescribing the new drug. In addition, the community could also be leveraged even before a drug is being prescribed, working with pharmaceutical companies in early stage of drug development.

To conclude, the adoption of Sophia DDM® by 140 healthcare institutions in only two years' time has proven that Data Driven Medicine can be a reality today and represents a fantastic opportunity for patients, clinicians and governments alike around Europe. By focusing on clinical grade analytical performance and data protection and privacy, Sophia Genetics has been able to build the required trust to motivate over 140 public and private institutions to build a collective intelligence so that the information of a patient in Paris can help better diagnose and treat patients in London. This performance and intelligent design could now be leveraged by EU institutions as a standard to accelerate this movement, to the benefit of European patients, at the same time ensuring better spending of public money and resources.

36. Innovative arts policy in the public sector: the case of NATO⁵¹

It is time to bridge the cultures, to reintegrate the insights of the Arts with the discovery of science. Europe has other thought-leading examples such as [CERN](#). The EU begins to [support the field](#) but must do more. In Brussels, one striking example is emerging right now: how NATO have reached out to art as a privileged partner to the core business of the organisation. This article explains how.

- **Background**

The opening of the new NATO Headquarters in Brussels in 2017 offers the opportunity to develop innovative art policy in the public sector. NATO established an International Staff Art Committee to coordinate art contributions from NATO member countries to the new NATO HQ in December 2014.

The notion of art at NATO HQ is not new. The launch of an art programme was foreseen in the past in the context of the move to the new NATO HQ at Porte Dauphine in Paris. The move to the new NATO HQ in Brussels presented the opportunity to re-consider this idea. A comprehensive inventory of the artwork displayed and stored in the current NATO HQ was conducted in April 2015. Immediately afterwards, a private art consultant was appointed to develop a framework to manage art and artefacts in the new HQ. The framework was approved by NATO member countries in April 2016.

- **Objective**

The objective of this report is to recognize and explain the innovative art policy developed by NATO, in the context of the transition to the NATO HQ.

The approved framework sets criteria for future art donations and loans from NATO member countries. These criteria follow four work streams and two themes, in order to provide overall coherence.

The work streams take into consideration the decision of NATO countries to preserve and transfer the existing art collection to the new NATO HQ and the desire expressed by several nations to contribute new artefacts in the future.

The four work streams are described below:

- NATO Arts Heritage Project: a permanent display in the visitors' area of the new premises to exhibit a selection from the current NATO HQ art collection. Digital displays will provide information about the individual artefacts and their relevance as a historic donation to NATO.
- Commemorative Project: permanent displays of artefacts that commemorate a significant event in the donating member country's history with NATO. The artefact will be enhanced by an information tool, accessible to visitors, which will constitute the platform

51 The article is contributed, with the permission of the NATO authorities by a key leader in the project, Luis Miguel Girao – [Artshare](#)

to discover, through innovative digital systems, historic information about the artefact and its relevance to NATO.

- Interactive Media and Fine Arts Project: a rotational project including both interactive and real-time art and artefacts reflecting NATO activities and fine arts. A permanent digital support structure will be the platform for presenting the interactive art and artefacts produced on a regular basis.
- Performance Arts Project: a rotational project that will celebrate the cultural diversity of the Alliance by offering areas of the new NATO Headquarters as the stage for concerts and performances, as well as the opportunity to connect to cultural events from NATO member countries remotely.

The proposed work streams serve the purpose of supporting member countries in defining a possible contribution to the new NATO Headquarters, and in making decisions on the previously donated artefacts. Each member country can join any number of work streams.

The work streams have been developed around two themes: history and dialogue. The Arts Heritage and Commemorative projects focus on the historic aspect, the relevance of a key event for a member country in NATO history. The Interactive Media and Fine Arts and the Performance Arts Projects focus on dialogue. Multi-layered cultural exchange through art will support dialogue and consultation which are at the heart of NATO's mission. Dialogue will start within the member country by engaging national art institutions that will donate, lend or commission new artefacts and/or recommending visiting artists (e.g. museums, foundations, art academies, artistic collectives).

NATO, through the Art Committee, will accept contributions from Nations that fit into one of the work streams, and will be responsible to recommend a suitable location for each donation to be displayed.

The case of NATO in art policy development is remarkable for several reasons. On one hand, it develops an innovative framework, on the other, it reinforces the importance of the consultation process through mutual cultural exchange. This is crucial for a public institution that builds trust, enhances security and prevents conflicts via dialogue and consultation. Interactive art and digital tools in this context enhance NATO's effort to fulfil its mission.

37. StartUpEurope

Disruptive innovation depends on an ability to foster the success of start-ups and their conversion into high-growth companies. Here is a classic case of EU public policy, ripe for exponential growth.

- ***What will be the benefit of successful action?***

One key pre-requisite for this to happen is the availability of a dense network of connected local ecosystems translating into a “start-up continent” of interlinked key players such as investors, entrepreneurs, corporates, universities and local authorities. The StartUpEurope initiative, which aims at developing networks and connecting local ecosystems and players all across the continent, is already an important step towards the right direction.

However, the ambition behind the connected European ecosystem will only reach its full potential if ongoing initiatives such as the Digital Single Market, the Capital Markets Union, the Single Market Strategy and StartUpEurope work together with the aim to help start-ups grow and create jobs across Europe.

This paper's proposal revolves around improving the connectedness and density levels of the European ecosystem in order to foster the appearance of high-growth companies and how the main EU initiatives should work together to contribute to this aim.

Firstly, by strengthening the connectedness and density of the "Innovative ecosystem", an increased pool of innovators can reasonably be expected, consequently multiplying the chances of successful outcomes at varying levels (jobs and financial growth but also social innovations and overall spill over effects).

Secondly, the transformational effect of start-ups will have a positive impact on net job creation. While the high-growth young firms (i.e.: less than 5 years old) only account for 5% of the new firms that survive, recent data from the Organisation for Economic Co-operation and Development (OECD) indicate that start-ups have a disproportionate impact on job creation :from 21% of the total job creation in the Netherlands to 52% in Sweden.

At the same time, start-ups are bringing new, lean ways of working, characterized by agility and the capacity to act fast, an additional stimulus to foster competitiveness in many sectors.

- ***What are the preconditions of success?***

Three elements are the main pre-requisites to facilitate the creation of successful start-ups leading to high-growth companies:

- The market size: representing the number of potential buyers. The first imperative element for start-ups to succeed is surely a big market to penetrate and expand their products and services. Digital Single Market (DSM), Capital Market Union (CMU) and Single Market Strategy (SMS) work to strengthen the different aspects of a single market for start-ups: operations in the online world, access to capital markets, setting up a businesses, etc.
- The density of the ecosystem (i.e.: investors, knowledge/universities; corporates, authorities...). Secondly, in order to foster the growth of start-ups, Europe needs much

more density of actors supporting start-ups. For instance, in Silicon Valley the density is notably high, as in a small area start-ups enjoy from Business Angels, Accelerators, co-working spaces to Universities. This density is the differentiating factor for the success of Silicon Valley versus the rest of the United States.

- The business operating costs. Finally, the other factor decisive for the proliferation of start-ups is the related costs associated to start up a project. Start-ups will certainly be attractive to set up their business in a location where costs, such as labour, rent and financing are lower. All four initiatives of the Commission might have a positive impact on reducing costs and time for the benefits of start-ups.

The combination of these elements has been illustrated in a formula providing the chances of success of a start-up endeavour within a specific area:

$$\text{Success} = \text{market density (ecosystem)} / \text{costs}$$

- ***What is being done and who needs to do more now?***

Several ongoing key initiatives are already working towards the right direction: the Digital Single Market (DSM), the Capital Markets Union (CMU), the Single Market Strategy (SMS) and the StartUpEurope (SE).

They all bear the potential benefits to strengthen the market for start-up as well as reducing the operating costs (including costs associated to looking for capital).

Similarly, each of these initiatives have different proposals for start-ups, DSM (VAT, copyright, ..), SMS just launched the Start-up Initiative aiming to create a favourable environment for SMEs, start-ups and scale-ups in the single market, and CMU (insolvency law, support venture capital and equity financing, alternative finance, etc.).

However DSM, CMU and SMS are in their early stages and need to work closely with the relevant actors of the ecosystem to ensure that they deliver what is needed by the start-ups taking into account that this new industry is not sufficiently well organised in terms of lobby.

Given its proximity role with existing ecosystems and diverse classes of key actors (e.g.: female entrepreneurs, tech and young entrepreneurs) and the many actions it is undertaking (e.g.: facilitating access to the right combination of finance, connecting with customers from other MSs and finding skilled employees from anywhere in Europe...), StartUpEurope could be a natural keystone to facilitate synergies and dialogue between CMU/DSM/SMS and the different parts of the ecosystem.

There is also a need of coordination between the different strategies, and more effort can be put to define concrete actions that will be easily executed. Moreover, these actions should be co-created with the 'real actors'. Therefore, it is important that representatives of the four EU initiatives meet with the relevant actors from the ecosystem to extract the better actions from DSM, CMU, DSM according to the start-ups view point, and execute them. In some cases the start-ups might come with new technological solutions that will make unnecessary to create new regulations. Finally, more joining up should be undertaken between existing initiatives and related nodes. This would contribute to a higher ecosystem density without generating a brand new work package for start-ups.

For example, many EU initiatives have a geographical element, often with associated hubs and ecosystems: Regional Smart Specialisation, Knowledge and Innovation Communities and H2020 are natural candidates for joining-up ecosystems, physically but also virtually.

38. Solidarity University: innovating from our own people's narrative⁵²

This volume makes the theoretical case that innovation serves values. This start-up pioneer shows how values in reality grow through very smart social innovation.



Solidarity University: Innovating from the People's Narrative

Striking oil or mining lithium depends far more on knowing where to dig than on the digging itself.
Larry Keeley

Innovation is hot. In modern business it is a must to be innovative. Papers, blogs, conferences and journals are explaining why: either you disrupt or you will be disrupted. Society is at the boundary of a new era. Technology is ubiquitous and software is eating the world (Marc Andreessen). The evangelists of this era confront their audiences with the inevitable and face them with a choice: do you eat or will you be eaten? Innovation is about survival. The survival of the smartest.

EU innovation policies

It is against this background that the European Union has developed recent innovation policies. In the Lisbon-agenda the EU expressed its aspirations to become the most dynamic and competitive economy in the world. Research and innovation would lead the Union to that point.

However, even if innovation can lead to prosperity, it is still just an instrument. It has to be directed and defined by underlying values. The effectiveness of innovation is mainly depending upon its ability to solve real problems for real people. EU-strategies underlying newer innovation programmes like Horizon 2020, speak explicitly of 'tackling societal challenges' as one of their key objectives. Innovation needs to help people, it is an instrument to serve society.

Therefore, it's essential to know what these challenges are and with what type of solutions society is served best. A proper analysis of the needs of society is of paramount importance to innovation strategies. Or, in the words of innovation expert Larry Keeley: 'Innovating requires identifying the problems that matter and moving through them systematically to deliver elegant solutions.'

Need finding

But how can you do this? How can one make a thorough analysis of the needs of people when they themselves are not always aware of their needs? This is exactly why the Solidarity University has been established. In order to have effective policies for innovation and change, organisations need to have a good understanding of the people which they are serving. The Solidarity University guides civil servants, providers of health and social care, politicians, entrepreneurs and others through this process. We inspire to and assist in getting close to people and communities again and collect knowledge helping to serve them better.

Areas in which Solidarity University has applied this method are social care and welfare, housing and sustainability, environmental planning and education. In all these programmes the power of language is used to bring organisations close to people. We are doing this by a narrative approach. We collect stories from people and doing so, we gain insights in their lives and the dynamics of their communities. We gain understanding of the connectedness within the communities: what are the gaps? And where are the natural forces, which eventually can be used in service delivery? The knowledge of these stories is shared with the different stakeholders and based on that projects are initiated to improve the lives of people and communities.

52 Arend Roos – CEO www.solidarityuniversity.org

de Zeeuwse Huiskamer

One of the programmes, which is running for a couple of years now, is *de Zeeuwse Huiskamer* (the Zeeland Living Room). In the Dutch province of Zeeland, like in many other places, organisations have been struggling with the issues of independent living. Budgets for health and welfare services have been cut and government responsibilities have been shifted from national to local level. At the same time the percentage of senior citizens is growing. In order to cope with this, elderly people need to live longer in their houses and organisations need to deliver their services in new ways. Collaboration of the different stakeholders, like homecare, city council and housing corporations is crucial to maintain viable service levels.

Some have high expectations of technology. Several experiments with this (e.g. in telecare) failed. It was hard to have a decent service level *and* a viable business case. From that moment a different approach was chosen in Zeeland. Need-finding was essential before designing new services. There was a growing awareness that organisations were incapable of gaining knowledge about their customers themselves. They were programmed to look to the market through the eyes of the offer that they had developed over the years. And through the eyes of a hammer, the world is full of nails.

Then *de Zeeuwse Huiskamer* was born. Using methods from cultural anthropology and soft systems methodology, organisations have been brought into new contact with people and communities in Zeeland. A space was created in which their stories were told and shared. Analysis of these stories helps public and private organisations to design new services or products. It helps to define new ways for joint services.

This is an ongoing process. The real work, collecting the stories of people, is an intensive and grateful task. After a couple of years, *de Zeeuwse Huiskamer*, has become one of the main instruments to bring the worlds of people and systems together and to explore new ways for independent living and to improve the quality of life for Zeelandic seniors.

Solidarity University

Since January 2016 the Solidarity University has been established to bring this methodology to a higher level. Besides the current projects, the Solidarity University will inspire a broader audience via conferences, (executive) training programmes and publications. Cooperation with the University of Amsterdam and the International Institute of Social Studies in The Hague brings academic quality to its activities.

At the Solidarity University, it is our ambition to contribute to a world in which innovation policies start with what they serve in the end: the people's narratives.

Arend Roos

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39. National Digital Strategy - Ireland's Trading Online Voucher Scheme ⁵³

This article explains how a very small, smart investment of public effort can multiply our economy's potential... in months, not decades. The digital economy represents 6% of Ireland's GDP, is growing at approximately 40% per year since 2012 and supports approximately 116,000 direct and indirect predominantly digital jobs. Irish consumers spend around €850,000 per hour, 24 hours a day online. With up to 70% of Ireland's annual online spend currently going overseas, targeting Irish businesses for online trading is a key jobs and economic imperative.

In Ireland today, however, less than 1 in 3 small businesses are selling to customers online.

To address this challenge, the Trading Online Voucher Scheme was introduced and piloted under the 2013 Action Plan for Jobs and rolled out nationally under the 2014 Action Plan. The Scheme is a key action under the business strand of the [National Digital Strategy](#) which was published in July 2013 and is currently available to small businesses nationwide.

The Trading Online Voucher Scheme aims to get more small businesses trading online. It offers a financial incentive of up to €2,500 to small and micro businesses to develop their online trading capability (subject to match funding), coupled with training from the LEO in how to implement the voucher productively.

- ***Progress to date***

The Trading Online Voucher Scheme opened for applications nationally in July 2014. It is available through the Local Enterprise Office, the “First Stop Shop” for anyone seeking information and support on starting or growing a business in Ireland. The network consists of 31 offices across Ireland. Each LEO received a quota of vouchers to allocate to its client base. The quota was determined based on proportionate share of total enterprises (2012 Central Statistical Office data) in their respective area of responsibility.

The LEOs and their mentors are working with applicant companies to ensure high quality applications. Some 2,000 vouchers have been awarded to successful applicant companies to date.

Trading Online Vouchers are attracting small businesses from across a wide range of sectors including: retail, manufacturing, food, and professional services.

- ***Publication of Survey Results***

Evaluation of the business outcomes and the policy impacts of the Scheme forms a key part of the Department's overall management of the Scheme. A survey of 500 participating small

53 [Department of Communications, Energy & Natural Resources](#), 28 April 2016

businesses was completed in March 2015. Key findings on the impact of the Scheme on: Growth, Jobs, and Exports, including selected case studies, were published in a [report](#) in July last.

Key survey results ⁵⁴ are as follows ⁵⁵:

- 4 out of 5 respondents say that the Scheme's application process is helpful in crystallising their business objectives for online trading.
- Export Indicators:
 - **40%** of businesses are now getting customer interactions from **new markets**.
 - Most important **export markets** are UK, USA and **Northern Ireland**.
- Growth Indicators:
 - Since commencing trading online **85%** of businesses see an increase in **customer enquiries**. Note: This is significant as this is the beginning of the sales funnel. One clear way of increasing sales is to increase the sales funnel.
 - Direct **sales** have already increased by **21%** as a result of trading online.
 - Online trading is not displacing existing sales in 60% of businesses.
 - **99%** of businesses see their **online store** becoming more important for their business in the next 6 months. The reason is to drive lead generation and sales.
- Employment Indicators:
 - **73%** of the businesses said that trading online effects their **work practices**.
 - Currently businesses are spending an additional **11 hours** per week managing their trading online presence.
 - **95%** expect this portion to increase by on average of **42%** in the next 6 months.
 - **71%** expect to need to add new **Jobs** to cope with increased business.
 - The average number of new jobs per company is expected to be **1.38 jobs** in the next 12 months.

A further evaluation of the impacts of the scheme has been conducted in 2016, the results of which will be published in the coming weeks. The results reaffirm that the Trading Online Voucher Scheme is having a positive impact on businesses who engage with it.

54 The response rate to the survey was very high at almost 45%.

55 88% of respondents had successfully implemented a trading online project. Of 12% who had not, 85% had not yet completed their project

40. European Flexi work Space

This is a public policy pitch, seeking believers, backers and a proof of concept. Who will buy?

A European flexi working space would enable certain types of work to move to the available workers rather than the inefficient alternative of moving job seekers from one place to another in search of employment.

- ***What will be the benefit of successful action?***

Labour market rules have traditionally been geared towards promoting the mobility of job seekers. A European Flexi work Space could reduce skills gaps and unemployment notably in the ICT and engineering professions by creating new types of flexible work arrangements using advanced ICT environments, shared workspaces and distributed competence-centric flexible working patterns.

This is different from traditional telework, which is used in an employee-company work relationship. What is proposed is an employer-employee relation over distance that may involve a national border, with high flexibility and possibilities for sharing work based on competences of the individual worker. Such work may move from home to flexi work centres, and also provide a local work environment for the workers. The shared communications and hardware resources can lower the threshold for individuals to start working at a distance.

This could overcome mismatch between high-skilled, unemployed people in some parts of Europe and companies elsewhere lacking high-skilled labour.

- ***What are the preconditions of success?***

A pilot scheme would test the feasibility of an integrated approach linking ICT, co-working centres and labour market schemes for pensions and social security to a common European work platform. It would also test the regulatory needs for a single European flexi work space, which would require adaption of legislation concerning social security, taxation and pensions.

- ***What is being done and who needs to do more now?***

Flexi work is about creating new work schemes beyond the existing employee-employer telework schemes, which mainly exist locally. Another existing and growing phenomenon is the teleworking hubs from which employers can access their organisations not needing to work from home. There are platforms on commercial basis⁵⁶ which serve mainly subcontracting-type work, and there are several interim service providing companies, but in these business models the overheads tend to be quite high. The interim service business

⁵⁶ eLancer is a commercial platform which helps match subcontractors (individuals) and companies needing labour with particular competences. It is not an interim agency but a site providing the contact.

model is also not particularly suitable for highly-skilled expert jobs where the employee often works on a freelance basis.

A pilot action could look at how to enable a worker to address her/his own and personal collaborative working space in any flexi centre in the (open) network and work securely with his/her own data space in the cloud, not allowing the data to be mixed across different co-workers or projects.

This would involve the creation of a secure approach where the resources (physical access and equipment) and the virtual work space in the cloud would be automatically and securely configured irrespective of where the worker is.

The flexi centre approach would allow also testing how to deal with workplace social issues. This could build on the experiences from many cities and municipalities, which are creating virtual collaborative spaces. The pilot project could start small and be technology driven at the beginning with for example a H2020 research programme objective, but it is not a technology initiative. Scaling-up could be funded under the ICT mandate in H2020 or from other instruments, implying collaboration across Commission services

Legislative issues would have to be discussed with amongst the Commission services concerned based on the findings of the pilot action. As appropriate studies analysing the socioeconomic impact of the new approach as well as issues related to scalability, worker status, pension, social security and taxation should be launched.

- **References**

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Section 6. Innovation Opportunities, Regulatory Challenges

41. Blockchain and its application in fintech and beyond

Blockchain offers a tremendous potential for innovation and competitive gains but poses challenges for the design of pro-business policies and regulatory frameworks.

- ***What will be the benefit of successful action?***

Blockchain enables encrypted registration and transition of ownership in real time without recourse to intermediaries (such as banks, notaries or estate agents). The objective of action in the field of block chain is to turn Europe into an innovation leader by creating an environment that spurs the development of stable, safe and reliable block chain applications in product and service markets through regulatory and commercial competition. This will lead to innovative business models that will broaden the spectrum of innovation beyond pure technological innovation, as they foster process, service and organisational innovation as well.

- ***The specific benefits include:***

- Improved access to finance, notably for SMEs: Web 2.0 based applications in combination with existing securities markets and new forms of alternative finance (crowdfunding) enhance the spectrum of finance for enterprises, notably SMEs. Stock exchanges in Europe (Nasdaq in Estonia) have started enabling transactions and the execution of investor rights based on block chain. Crowd operators are also developing block chain-based protocols. Examples include Bitbond, a firm that offers crowd-lending with Bitcoins, and Crowdaura, which emits bonds based on block chain technology.
- Promoting entrepreneurship: The facilitation of innovation will foster entrepreneurship, notably in younger generations familiar with Web 2.0. This will mostly happen in collaborative environments applying advanced, distributed and smart manufacturing.
- Facilitating transactions of all types for consumers: Blockchain enables smart contracts, i.e. contingent contracts that are machine controlled and underlie a broad spectrum of applications in IoT contexts, not only for enterprises but also consumers. As a result, the emergence of IoT in mass markets (500 million citizens) will result in competitive gains for early developers and adopters in the EU.
- Simplification of administration for enterprises and citizens: After a gatekeeper has authorised access to the system, users can carry out transactions in real time and seamless, without the need to involve third parties. This results in reduction of administrative burden for enterprises and enhanced e-government solutions for companies and citizens. First examples (Estonia) have already been implemented successfully.

All of these applications have in common that they massively reduce transaction costs by saving time and money whilst enhancing the level of security and reducing the risk of fraud on a systemic level by increasing transparency. This could reduce risks such as those that resulted in the 2007/08 financial crisis, where opaque and unsecured financial transactions led to systemically dangerous debt positions with subprime loans, which caused a series of defaults that destabilised the global economy.

- ***What are the preconditions of success?***

Blockchain is a disruptive technology that moves exceptionally fast (also compared with the emergence of the PC, internet or crowdfunding). The first precondition of success is to develop an understanding of its technical underpinnings and, based on this, opportunities and risks, both in financial markets and the real economy. This is particularly important for regulators. There is currently no block chain specific regulation in place, but there will soon be calls to move in this direction. Only a thorough understanding of the technology will enable a balanced approach that will allow for the full exploitation of opportunities.

There is also the need to discuss the use of industry standards. Currently, there are parallel experiments with different types of block chain based applications, which results in sound competition but – after time – a risk of incompatible standards. It is an open question to what extent applications need to be standardised, but the issue as such needs to be explored.

Third, there is a need to ensure adequate access to finance for start-ups that develop block chain based applications, so as not to leave the field to larger incumbents that absorb all technological expertise. EU funding needs to be opened for block chain and – more broadly – FinTech applications. This requires close coordination between Commission services.

- ***What is being done and who needs to do more now?***

Market operators (securities exchanges, crowd operators, banks) have very recently started exploring the potential of block chain, and so have first public entities (Estonia, non-EU countries such as Honduras). Commission services have only recently (as of end-2015) started analysing these developments. Action is thus required along the three following lines:

- Creation of fora that educate regulators and the business community on the opportunities and risks: First efforts are being made inside the Commission (e.g. CNECT, GROW, JRC) to steer this process. There is a need for more in-depth dialogue and coordination, both between the Commission services concerned as well as with leading market operators, to set up a list of issues and to stay informed on latest market developments.
- Collection and assessment of best practices: FinTech and real economy applications of block chain are mushrooming, which results in steep learning curves. A database should be set up to track and evaluate these applications and to provide the necessary empirical evidence on which sound policy making can be based.
- Spurring innovation in the EU through co-financing and non-financial means: Commission services should assess their programmes to enable financial and non-financial support, notably for EU block chain start-ups. Non-financial support could also include quality labels, promotional measures and the creation of a block chain award similar to the Small- and Mid-Cap Awards for listed SMEs.

- ***References***

European Commission (2016): "Blockchain applications and services", Business Innovation Observatory Case Study No. 68, forthcoming.

42. Big Data Infrastructure

The modernisation of Europe's economies requires the public sector to develop joined-up data management infrastructure for the public good.

- ***What will be the benefit of successful action?***

Exploiting the full potential of big data requires a solid technology infrastructure, along with the necessary skills to set it up, maintain and operate it. Often, innovators in public administrations or SMEs tend to start with pilots with limited scope in order to test the value of this new way of processing information and showcase its benefits to management. However, the initial investment, in terms of time, budget and resources, can appear prohibitive. In addition, the number of available technologies, tools and framework is increasing, making the choice more time-consuming.

The big data infrastructure will provide a full stack of big data and analytics technologies deployed on a cloud environment, for piloting and testing purposes, as well as relevant data shared by the community of users. The infrastructure will help:

- Facilitate the launch of pilot projects on big data, data analytics or text mining, by providing the infrastructure and the software tools needed to start a small project;
- Determine which big data software tools are most useful for public administrations;
- Provide support on the use of big data methods, technologies and techniques;
- Share and re-use datasets for experimenting with analytics technologies;
- Build an international collaboration community to share ideas and experiences on the technical aspects of using Big Data.

- ***What are the preconditions of success?***

The services of the Commission and public and private entities in Member States should have applications suitable for Big Data projects and be willing to spend the time to launch relevant pilot projects, and animate the community by contributing to the big data environment with data, tools or algorithms.

- ***What is being done and who needs to do more now?***

In the last few years, several initiatives have been launched within the European Commission and in Member States' public administrations, with the aim of combining and leveraging internal and external data to support policy-making and to make better-informed decisions. Projects have been launched in citizen participation, transport, education and crime prevention. Big data and data analytics technologies have helped in this regard, and a very large number of big data solutions from different vendors are already available. However, their set up can be costly and time consuming, and the required investment is potentially not worth for smaller projects or proofs of concept.

The availability of a turnkey test environment would encourage early adopters to begin pilot projects, fostering the take-up of data-driven administration models.

A number of departments of the Commission are already launching pilot projects and studies in the area of big data and data analytics, among which:

- an action under the [ISA Programme](#), which is currently collecting best practices in Member States' public administrations in analytics and big data technologies to support decision-making, along with the supporting organisational and operational processes. Additionally, it is launching a number of pilot projects within the Commission to demonstrate in practice how these technologies can help: scientific papers text mining for identification of research trends, national implementing measures analysis, and analysis of the ICT job market through information available on European job posting websites.
- the [data4policy](#) initiative, with the aim of producing an inventory of big data for policy initiatives in European Union Member States and abroad, a report about state-of-the-art in innovative data-driven approaches for evidence-informed policy, and six case studies.
- a Tool for Innovation Monitoring (TIM), based on technology forecasting, and exploiting data coming from patents, publications and news. JRC is using big data analytics in Earth and environmental sciences through the [Digital Earth Platform](#), which can help DGs working in this policy area.
- a task force to explore how big data analytics can complement official statistics with information coming from different source (e.g. mobile data, Wikipedia stats).

These different initiatives, as well as national initiatives in Member States' public administrations, do not use a common infrastructure, and nor do they share results and tools via the same platform.

A centralised set of technical capabilities and adequate support to build, operate and maintain a common big data infrastructure according to the needs of the interested stakeholders would generate considerable efficiencies. Other commission services, along with interested organisations in Member States, could contribute to its development by providing relevant content: additional tools (e.g. open source analytics modules), data, and methodologies/guidelines for specific policy or geographical areas, thus creating a community of users that will maximise its reuse.

43. Data as a Service

The European Commission needs a single entry point for all its data, as well as the tools to analyse that data.

- ***What will be the benefit of successful action?***

The service offered would have a "prosumer" perspective, with qualified users (innovation stakeholders) using the data according to their needs, and in turn contributing by feeding back the outcome of their efforts (including algorithms) into the common body of data in the public domain. On top of the data, this service would be enriched by data analytics tools, in particular data virtualisation. Data virtualisation allows users to analyse data without knowing its technical details, such as how it is formatted or where it is physically located.

This initiative proposes to:

- Create a single entry point for all European Commission data which would abstract the differences between the underlying native formats (unified data access layer)
- Provide users with shareable and reusable data analytics tools. These tools, to be developed on top of the unified access layer, would enable users to conduct advanced multi-source data analysis.
- Help users to find and understand relevant data sources by specifying the meaning of the data (a common semantic interoperability framework to the different data sources).
- Create a competency centre for data analysis within the European Commission. The competency centre would, upon request, provide data science know-how and assist users in the exploration of exploitation of European Commission data.

The main benefits of the "Data as a service" initiative would be:

- Easier and more flexible access for users of European Commission data, thanks to the single entry point and common data analytics tools.
- Strengthening the European Commission's capability to respond to the data revolution by setting up a competency centre for data analysis and through the development of a modern Commission-wide data infrastructure.
- Reducing the phenomenon of different Commission services paying twice for the same external data source by facilitating the sharing and reuse of data within the Commission.

The diagram below provides a schematic high-level representation of the target architecture envisaged by the initiative.

The initiative would target both European Commission internal users and the general public. In order to cater to the different needs of these two broad categories of users, access rights to data sources and to analytical services would be differentiated according to the user profile.

- ***What are the preconditions of success?***

In order to succeed, the initiative requires:

- An EC-wide agreement on the scope and general governance (ownership, service level agreements, etc...) of the "Data as a service" initiative.
- The thorough analysis of the suitability of different architectural styles for flexible data integration (such as data virtualisation or data federation) to provide the unified data access layer. It is not immediately clear which style or combination thereof would be most appropriate to achieve the goals of the "Data as a service" initiative.

Given the elements above, it may be advisable to start developing the "Data as a service" initiative with a pilot involving a handful of DG's to identify potential pain points and pitfalls. A successful pilot could be easily expanded to cover additional use cases as needed.

- ***What is being done and who needs to do more now?***

Eurostat has launched a project to enable the reuse of its own dissemination chain by other Commission DGs. It is the first example of reuse of common visualisation and analytical tools within the Commission. The EU Open Data portal provides a catalogue of the data of the EU institutions. The catalogue's metadata and some of the datasets are available as Linked Open Data. These projects address individual facets of the "Data as a service" paradigm. For example, while the EU Open Data Portal allows users to find data produced by the EU institutions, the data itself is made available in different native formats. This lack of syntactic interoperability makes data integration and data matching difficult.

The proposed initiative would thus aim at combining and extending the results of the ongoing projects mentioned.

44. Leading the expansion of Financial Innovation Services

Small firms in the EU rely too much on debt financing, but banks are often risk-averse and the overall volume of risk capital invested in Europe is low. With the massive adoption of digital technologies, we are witnessing a new emergence of alternative financing options and the development of a new generation of technology-enabled financial innovations, "Fintech". An extended service portfolio emerging from Fintech's assets combining debt and equity could strongly impact the way small firms are funded at different stages, in different markets and with different ambitions.

- **What will be the benefit of successful action?**

There is an ongoing and increasing trend around the global expansion of crowdfunding and while U.S. and Asia are ahead Europe, some Member States are developing rapidly in the field, especially in UK. This might ultimately lead to the "institutionalisation" of crowdfunding, notably in terms of investors. For instance, in equity-based crowdfunding a growing number of venture capital and angel investors are co-investing alongside or in parallel with 'crowd investors'.

As this trend also concerns banks and peer lending platforms, it enables more volume to be combined with more advanced techniques and experiences to finance firms (as well as individuals). Such combinations would unlock opportunities to tap into new or unexploited customers' segments and diversified services.

Besides enabling diversified financing options, Fintech also introduces innovation for merchant and e-commerce finance, invoice finance, online supply-chain finance and online trade finance that facilitate small firms operations at wider scale and affordable costs.

As a consequence of the momentum and increased venture capital already invested in Fintech⁵⁷, new lines of innovative services are gaining maturity and market traction. This opens new venues for SMEs businesses (e.g.: such as export activities) and one can reasonably expect that the SMEs funding and operating landscape will receive a positive boost.

Since Fintech lowers market entry for small players, it will also help revamping the banking sector and associated services. It somehow invites bigger and established actors to revisit their approaches and services' offers. Fintech will consequently ease and democratise access to several financial services for SMEs besides reducing their own operating costs.

⁵⁷ From 2013 to 2014, equity investment into FinTech companies has quadrupled from \$4 billion to more than \$12 billion and estimates for 2015 are even more impressive (says a recent WEF report)

Thanks to new funding solutions such as peer-to-peer lending, online supply-chain/trade finance and other e-commerce finance, the recently reported failure rates of banks-financed SMEs could be reduced. Indeed, recent surveys (SAFE2015) indicate that 21% of the European SMEs who applied for bank financing did not obtain the financing they had planned for. This is particularly true for smaller innovative companies - the higher the risk of the company, the lower their chances to get financing.

- ***What are the preconditions of success?***

Preconditions of success revolve around an effective leadership for Fintech ecosystems in Europe.

This ecosystem should at least feature the following elements: a vibrant European start-ups scene, available investments in Fintech and the existence of Research and Innovation talents and teams;

- ***What is being done and who needs to do more now?***

Several of the aforementioned preconditions appear to be in place:

- Everywhere in Europe talented young people create start-ups notably in digital areas, building on excellent EU scientific and engineering competencies. This is particularly true for Fintech. We count also serial entrepreneurs and a few successful EU scale-ups in the areas. But we need more of those scale-ups as well as more engagement of established financial players.
- Investment in Fintech are on the rise, and while activities and investments in this field have been massively focussed in US and the Silicon Valley over the recent period, we see now the strengthening of EU hubs, with notably London, Berlin but also to a lower extent Paris and other EU places that want to catch- up.
- Europe benefits from excellent Research and Innovation talents and teams, which are furthermore much cheaper resources in Europe than in the US.

Building on the above solid foundations, further initiatives could help establishing a strong leadership for Fintech ecosystems in Europe. The following suggestions go in this way and provide room for many different actors.

- Supporting the implementation of best practices across Member states in terms of regulatory compliance and support to innovation, e.g. through regulatory sandboxes.
- Helping to develop collaboration between the traditional banking/finance industry and Fintech for example by
- Facilitating a dialogue and experiment between incumbent financial industry and new Fintech companies;
- Supporting emerging solutions, in a focused way by spotting the best initiatives and projects and offering them a range of support, including pilot actions for operational and legal validation.
- Facilitating the definition and use of standards
- Helping to reinforce the visibility of European Fintech ecosystem, hubs and companies
- Leveraging existing plans to allow a focussed investment on specific thematic areas, targeting for instance the development of a European Fintech industry. The European fund for strategic investment (EFSI) which is reinforcing EU capacities for financing small and innovative firms appears to be a natural candidate. The schemes proposed under this EFSI window are very attractive and meet a high demand, notably from banks. The equity part is currently being enriched with new approaches for reaching more firms

through various types of investments beyond the traditional VC models. For instance, funds-of-funds, business angels, technology transfer based approaches will be supported through EFSI.

- As part of the Capital Markets Union initiative and other financial regulations activities, the conditions should be reassessed for making banks or other financial companies more "innovation minded", and to play a more active role in cooperating in Fintech. This should concern actions at the incubating or accelerating phases but also a greater role in acquiring innovative Digital firms (a role that is largely played by the US platforms leaders (the GAFAM)).
- Ensure the regulatory approaches for financial and digital related areas including the Digital Single market are reviewed in line with the multi-stakeholders consultation stimulated by the Green Paper on Retail Financing

- ***References***

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45. Open Data and Transparency

Despite G8 promises and best effort, small companies in Europe cannot take advantage of the opportunities of Big Data because of restrictive practices by the public sector and by the internet giants. These restrictions stifle growth and prevent the development of new products, services and jobs. More EU financial incentives and legislation obliging certain types of data to be made publicly available would improve matters.

- ***What will be the benefit of successful action?***

Big Data is already providing benefits but presently these benefits mainly accrue:

- to large companies that collect the data (Amazon, Google, Facebook). This limits competition through constraints on newcomers and has a global impact on patterns of wealth creation and accumulation.
- through persuading consumers to click on advertisements; the societal benefits of which are not immediately apparent. Individuals are generating data through their online behaviour and ultimately produce value for specific actors with, arguably, no retribution, user lock-in and enforcing data asymmetries;
- in cases where the data are relatively homogenous (for instance, position data from mobile phones for traffic density).

Public bodies hold much data but they are not easy to find, often with restrictions on use and with different baselines, units, formats and standards, despite commitments made through the Public Sector Information Directive, G8 and Open Government Partnership around open data. Some large quasi-monopolist private companies now also hold much data.

Freeing up more (interoperable) data would potentially boost the development of new products and services, support applications for the common good of humanity and society, open new avenues for research and usefully inform public policy. In particular, this would allow smaller start-up companies to access markets at a much lower entry cost. For example, in the maritime world we can imagine services to detect illegal fishing or improve offshore wind farm performance. In tourism, useful local services could be built upon phone mast data that allows positions of nearby phones to be analysed.

- ***What are the preconditions of success***

The preconditions for success are a commitment from the Commission services to work across policy areas and the public to be reassured that fundamental rights to privacy will be protected.

- ***What is being done and who need to do more***

The two main approaches are (1) legislation obliging certain types of data to be made publicly available (2) a voluntary approach including funding support.

A number of legislative initiatives are in place from the EU. The Public Sector Information Directive is the most relevant but limited to data owned and generated by public institutions. Resistance from public bodies who fear for the loss of their monopoly status is still inhibiting progress. Meteorological data are a good example. Progress is being made but it is slow. In

addition, the Directive does not indicate any particular data format, increasingly problematic when volumes and frequency of data are high.

The INSPIRE Directive does provide extensive formatting instructions for certain types of environmental data but this is limited to public bodies exercising some type of authority in this field. This legislative framework could serve as an initial model for regulating other types of data collection and reporting of public interest.

A notable example is the French legal initiative ("loi du numérique"), going beyond open public data and making it compulsory for private institutions receiving public money to also open their data. In addition, the legal text grants access to the National Statistics Institute (INSEE) to privately owned data of public interest.

A broader legislative intervention can be explored at European level with regards to access to privately held data for supporting public policy and public services delivery, and research. The scope of such initiative is not a surveillance/security enforcement policy.

The voluntary initiatives supported by the EU include the Copernicus programme which distributes data from observation satellites and the European Maritime and Fisheries Fund which supports the collection, assembly and distribution of fisheries and oceanographic data.

The problem with research projects is that they are limited in scope and time and therefore not a sustainable instrument for the continuous collection, cleaning and distribution of data. This has long been recognised by the research community. For instance, the EGDI-Scope project concluded that the EU had wasted more than €700 million trying to get a coherent geological picture of Europe. Not least through the EU Public Cloud and Data Infrastructure initiatives, the Commission has made a strong statement to the open release of research data for Horizon 2020 funded research. The outstanding question remains as to how research data, seen as an infrastructure itself, can be sustainably and more broadly opened up for reuse. Public investment, also through Horizon 2020 or its successor, could be made for routine data acquisition and interpretation.

In the private sector, Facebook, Twitter and Google do allow registered users to analyse trends to a limited extent and, e.g. Google has begun an initiative in partnership with the Oceana environmental lobby group to make positional data from fishing boats available.

Notwithstanding the complexity of the market and privacy implications, with a range of business models from completely open data to completely closed data, transparent data markets will not happen without action. These marketplaces would facilitate access and allow selling, buying or renting data, encouraging a flow of data and valuating data sets, arguably in a still unclear data ownership environment.

Up to now EU initiatives on data held by private bodies have focused on preventing rather than encouraging greater transparency; for valid reasons such as protecting fundamental rights to privacy. Computational privacy shows that it is never possible to ensure complete privacy but there are legal and emerging technical solutions to reduce the risks to fundamental rights. There are no general rules. Each case needs to be looked at on its merits.

- ***Approach***

- Multi-stakeholder approach and broad public consultation to better scope the extent and nature of the problem and to identify what data are most wanted by public, business, researchers and civil society. This framing stage should also build on ongoing efforts around the data value chain, platforms and the free flow of data.

- Impact assessment and study to check who holds and owns these data and possible legal basis for encouraging release
- Potentially an Open Data Regulation and pilot projects e.g. on research data, data markets, privately owned data of public interest.

- ***Data & Evidence***

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46. The pilot's ghost: Living with Drones

Automated drones are technically possible but incompatible with laws which follow an aviation, pilot framing. We must regulate the pilot's ghost.

- ***What will be the benefit of successful action?***

Regulation on the use of drones is in its infancy, but technological trends are moving ahead fast. Pilot skill is likely to become less important as innovations such as anti-collision software, formation flying and “stay away from there” algorithms proliferate. The drone will fly itself in one possible future.

We need to ensure a continuing and fruitful innovation with drones.

- ***What are the preconditions of success?***

That our legislation and its implementing rules not get bogged down in areas where politics are heated and risk appetites are low, such as data protection and security and that rules affecting performance evolve rapidly in the light of improving technology so as to remain proportionate as regards safety in particular.

- ***What is being done and who needs to do more now?***

The Commission has launched a proposal for an [aviation strategy](#), with a [new proposal](#) to replace its aviation Regulation which includes harmonisation of the legal treatment of drones weighing less than 150kg using a classical Single Market argument: there is fragmentation between Member States. Some have rules on drones in this category, some don't; and those that do have rules vary along a permissive scale. Harmonisation can do better. The logic of the impact assessment from a classical Single Market perspective used in aviation is ineluctable. However, from an innovation perspective, diversity/ subsidiarity are the reverse of the fragmentation medal. MS who haven't yet regulated drones must now regulate them. We are betting on a good harmonised outcome. Our process carries risks that some activities in certain MS will be more heavily regulated in future, albeit with the advantages of a common approach.

The Commission proposes an operation-centric, risk-based approach. Where an operation poses no risk, it should not be regulated in a disproportionate way, with three categories of progressively more risky areas of application. The lowest, "open" category of low risk drones – where one might expect the most innovation to emerge - would nonetheless face product regulation including product performance limitations and restrictions on flying over crowds. As regards enforcement, MS would need to designate an enforcing authority such as the police, raising the possibility of a chill factor. This approach will raise issues of agility, as technology evolves, and the usual consistency issues at MS level.

This proposal will go through the Transport Council and the TRANS committee of the EP, with LIBE opinion, presumably for the privacy issue. The European Aviation Safety Agency (EASA) has issued a detailed [technical opinion](#) which stresses proportionality.

Our action places an aviation framing on an innovative activity. This has its own legacy and the single frame approach contrasts with the plurality of end-user ideas for deploying drones in business and for leisure. For instance, drone delivery of parcels seems less and less

fanciful. It is becoming impossible to make a TV programme without drone footage. The risk is that our rules or their implementation may affect what is already happening.

Technological trends in drone development suggest that pilot skill will become less important as innovations like anti-collision software, formation flying and “stay away from there” algorithms proliferate. The drone will fly itself in one possible future. Maybe we should frame the debate differently, as if drones were robots, to avoid the pilot’s ghost. Can our legislative processes keep up and adjust to technical developments or will our framework fail on agility? We may perhaps do better than USA: the Federal Aviation Authority wants to register all drones including kids’ toy drones for a fee of \$5 and is experiencing pushback on evidence derived from bird strike statistics. The Market Surveillance mechanism managed by DG GROW will influence drone specifications and its smooth operation is important in order to support innovation, minimising regulatory friction.

DG MOVE is very aware of the wider prospects for drones as is EASA. There is however a risk that the inter-institutional process defaults into the aviation frame that they are familiar with; also that the politics of privacy may bubble over into disproportionality as drones often carry cameras. Political compromise may also impose disproportionate costs. We need ways of ensuring that framing of the issue is as wide and pluralist as possible throughout the process in order to mitigate the risk of a poor outcome to the legislative process, the “top down” one-size fits all approach. This could mean supporting MOVE with examples of drone applications and studies on the technological state of the art in drones, maybe even offering a knowledgeable official or a document to the TRANS Council WG; preparing the privacy part of the debate very carefully across the services in advance. There are some interesting developments in the Member States, with the Netherlands defining unregulated zones for drone experiments and [Finland](#) very supportive.

We need to be vigilant that infant civilian drone activities are not squeezed by a putative regulatory nutcracker consisting of aviation rules on one side and market surveillance on the other. After passage of the legislation, the Commission could publicise robotic drone developments in order to ensure continuing awareness of technical progress in EASA and MS. We could go much further. In order to promote continuing agility of regulation once in place, we could deploy an Open Innovation approach: use technical experiments as evidence inputs for agile adjustment of implementing regulation as robotic, autonomous flight evolves. This would need funding as EASA has no budget. Stakeholder feedback will be extremely important and should be sampled more often than is normal so as to capture any chill factor emerging in MS implementations. Can we already design data-driven performance indicators? We need an engagement strategy, not just a one-way communications strategy, as currently foreseen in order to maximise real-time stakeholder feedback. Our representations could help us to identify civil society players and perhaps facilitate conversations so that we avoid “top-downism” and ensure that none of the 1000 flowers blooming in the innovation meadows at local level are trampled upon.

The Commission needs to ensure a joined up, stakeholder-driven approach. A Task Force-like mechanism would be one way of achieving this.

47. Decentralised Data Governance

Data Policy today is still out of date. We miss the fundamental architectural aspect of data today. Europe might need a new distributed platform.

In these days the hottest public debates addressing Internet developments focus on technological questions that are of crucial importance for the DSM, such as:

- The role of Platforms: how to prevent the concentration of power in the hands of a few data repositories operating at global scale, which is considered as an unavoidable consequence of network effects? As so few actors have access to big data, how to create a level playing field enabling new European entrants to implement innovative approaches benefiting from them, opening up new economic and social perspectives? How to define responsibilities, whether and how to regulate them?
- How to reap the benefits of big data aggregation in the DSM (e.g. in terms of commercial and public services, global science advancements, better statistics), within a clear legal framework, respecting privacy and ownership of data (see e-Privacy directive)? How to guarantee security of transactions and identity of users while at the same time preserving privacy and ownership of data stored in clouds that are located across different international technical and legal frameworks? How, in essence, to preserve the digital sovereignty of European citizens, preventing unauthorized usage of their personal data, on clouds, Social Networks and Internet of Things?

From a network architecture perspective, the issues above are all associated with the extremely centralised architecture of the dominant data platforms, both at the level of data storage and, more importantly, of data governance. Only a few actors in the worldwide scene (and none in Europe) have the ability of aggregating data of billions of people. This represents of course an opportunity for creating unparalleled new public services from such companies, but at the same time a source of uncompetitive advantage, extraordinary revenues from unlicensed exploitation of personal data, as well as an unprecedented risk for privacy leaks, given the exponential rise of devices connected to the Internet of Things, collecting private data anywhere. What's more dangerous for the data economy, the asymmetric concentration of data and power in the hands of a few global aggregators creates high barriers for new entrants and stifles innovation.

- ***A distributed paradigm, protecting EU values and creating new market opportunities***

Funds provided by Horizon 2020 can be a powerful tool to address the policy issues associated to centralization. If architectural issues (the network effects) have been the cause of this concentration, different architectures (not at physical level, but at data governance level) can ease it, by providing a parallel distributed paradigm, protecting EU values and creating new market opportunities dramatically improving the DSM perspectives.

This approach would try and break the "rules of the game" which have determined the success of the "data incumbents", addressing the architectural issue of centralization by building a highly decentralized communication infrastructure, enabling a fully decentralised storage and - most importantly - management of data.

The vision is to implement a distributed architecture where each piece of user-generated information (the most valuable asset in modern data economy) remains under the full control of the user (or the 'thing') who generated it (on personal data spaces such as their own personal devices or on "data boxes" at local level, including at home), and is subject to

on-demand aggregation by third parties. In essence, enabling fully decentralised data governance.

This is feasible under existing technologies: P2P networks have amply proven the feasibility and robustness of a distributed architecture for data communication. In addition, emerging concepts such as block chains and other distributed ledgers create the possibility of a fully decentralised certification and security of transactions (be they monetary exchanges or data exchanges). The main technological challenge is hence to generalise this kind of architectures to clouds, social networks and IoT in a standardised and robust manner, which requires further concerted advancements and standardisation in these fields.

From an economic and political perspective, the potential advantages for Europe are clear and broad reaching. All the current "data incumbents" are creating monopolies which lie outside of EU jurisdiction, dictating *de facto* data regulation, and stifling competition worldwide.

Once such a distributed platform is in place (also thanks to Horizon 2020 funding), it would then thrive on the richness of the decentralised innovation ecosystem that it supports, thanks to:

- Openness to new entrants and open innovation (see the Digital Single Market, e-privacy, General Data Protection Regulation): unconstrained by the access to big data, which they can obtain directly as open data by users with standardised agreements (on the model of CC licenses), new players can quickly implement innovative approaches to data fuelled commercial services, intrinsically guaranteeing privacy to their users, spurring a new innovation ecosystem and creating innovative participatory business models (a new privacy-by-design App economy, as well as new open hardware opportunities for mobile devices);
- Openness to new public services (see also e-government directives): the much lower economical barriers to data-based innovation would allow more SMEs and social enterprises to implement effective approaches for social innovation such as collaborative public services, collaborative economy, collaborative making, participatory consumption, environmental action, and even for testing innovative approaches to open policy making and open democracy.

This would be a unique opportunity to enable a credible parallel alternative to the current asymmetric data paradigms exploited by the dominant extra-EU platforms, fit for regulatory purposes. It will leverage on the recent call ICT12b "*Distributed Architectures for Decentralised Data Governance*" which is exploring the concept and gathering an interested constituency. It is also very timely and urgent, before further consolidation of the dominant positions takes place.

Such an effort would be part of a global EU vision for a Next Generation Internet, encompassing all the (strongly entangled) economic, technological, social and policy aspects, which would otherwise remain fragmented and lead to market distortions and regulatory breakdowns. This seeding effort within Horizon2020 will also be a clear signal to other funding agencies and private investors, triggering the appreciation and exploitation of the unique innovation and regulatory advantages enabled by this alternative.

Section 7.

Better Support for innovators

48. Not Euro-DARPA. But then what?

The post-war history of technological innovation is intimately entangled with almost legendary institutions that have invested in radical ideas and technology – DARPA, Bell Labs, or more recently Google X stand out amongst many. Copying such institutions will fail: we are different. They are embedded in a complex web of factors that cannot be transposed easily to other contexts; but evidence is now emerging on what portable qualities a public-sector innovation unit should have in order to stimulate innovation on the outside, while at the same time contributing to long-term organisational objectives.

This is a blueprint for an Innovation Unit.

- ***What will be the benefit of successful action?***

The key benefit of a high-quality innovation unit is to better connect the public administration with unusual and disruptive technologies – resulting in a novel stimulus for technological innovation, while at the same time opening new options for achieving the long-term objective of the public administration.

Such hybrid models can be considered two-way idea pipelines. On the one hand, they create targeted public sector demand for innovation, e.g. through prizes and procurement of innovation, market shaping forces can allow new radical innovation to emerge by design. On the other hand, the long-term objectives of the organisation can be met in innovative ways by connecting the public sector with unusual ideas and technological solutions.

- ***What are the preconditions of success?***

Organisations such as DARPA operate against a background of very large funding envelopes from military budgets, and in the political context of an established and enforced doctrine of global technological superiority, encouraging big bets and accepting failure. Such a model is unlikely to be transposable to Europe's innovation environment without adjustments. However, elements of success can be identified and transposed to innovation units or agencies. A recent proposal in this domain from NESTA contains many elements reused here from a European perspective.

There are a number of preconditions to success. Firstly, political demand for long-term strategic options for the organisations mission is paramount. Absent such political support, too many filters limit the innovation unit's horizon either to short time scales, or to conventional solutions and approaches that bear the comfort of recognition bias and not-invented-here syndromes.

Secondly, the responsible unit must have a dual role – to invest in innovative ideas, while at the same time shape the organisations strategy. This dual role is essential to avoid either of the conventional failings – strategy that is disconnected from external developments and trends, or innovation funding that is disconnected from the organisations strategic objectives. A solid, organic link to policy-makers and regulators is a *sine qua non*.

Thirdly, the innovation unit must have porous boundaries, so that ideas and knowledge flow freely between the innovation agency and the right external innovators, and equally freely with senior civil servants and political decision-makers. Concretely, this involves open staff

exchanges and placements, whereby civil servants and innovator can trade places – not as guests who are not allowed to touch the artwork, but with full decision-making powers. It also means that the innovation agency can get its hands dirty with innovation, not merely watching it. Space and time for experimentation, as well as access and support to innovation projects for the agency itself can bring the knowledge, skills, partnerships, and credibility that drive real change.

- ***What is being done and who needs to do more now?***

At the level of the European Commission, there is experience with innovation policy units, as well as foresight projects that combine several of the preconditions above – but not all. Many policy domains have long time horizons and will critically rely on new innovative and radical ideas – ranging from climate change to sustainable development goals. A wider mainstreaming of innovation and strategy units can link-up investments in innovation with strategic policy goals. The new European Innovation Council offers a promising new opportunity; the ability to procure innovation and or to issue incentive prizes and thus to shape markets must complement conventional research grants is key, however.

New initiatives such as the Policy Support Facilities aim to peer-review European innovation systems and help improve framework conditions for research and innovation; yet these do not so far encourage the collective emergence of new models, such as those outlined here.

As the global competition for ideas continues to increase, many are looking to understand what works in designing institutions that generate disruptive ideas. While every institution is bound by constraints, business as usual models without any change in boundaries is unlikely to generate the institutions for the innovation change Europe needs.

- ***References***

Stian Westlake: [If not DARPA, then what?](#)

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49. Public procurement for innovation

Public procurement needs to be repositioned in an innovative framework and no longer dominated by the legal process. Both customers and suppliers find the system complex and expensive and it does not encourage the deep dialogue required to understand and deploy new technologies. But, done properly, the public procurement of innovation can help to resolve many of the challenges now facing public authorities - delivering quality services with fewer resources, in more joined up ways, responding to users' needs more efficiently and effectively, stimulating local employment and economic growth.

- ***The Power to Bridge the “Valley of Death”***

Each year, public authorities across the European Union are spending around €2400 billion, some 19% of total EU GDP. The range of activities covered by these purchases is massive. It covers very large scale infrastructure and small community schools. It includes health, social services, education, and transport networks of all kinds. Public authorities are among the largest purchasers of IT systems and operators of web based services.

But it is not just the potential size and coverage that makes public procurement attractive. Its exploitation in public contracts has more power to produce sustainable results than any other innovation incentive. At the heart of innovative public procurement is the encouragement for customers to set demanding outcomes and technology challenges for prospective suppliers, either fully or co-funded, in order to generate the best results.

The competitive environment, with a possibility of a major contract at the end, does not just drive good results. The investment and engagement with customers that the contracting authorities provide comes at the most difficult stage for any innovative company. This support underpins the crucial stage where a new technology is being evolved, developed and tested, as it moves to a fully competitive offering. This stage in an innovation journey is often dubbed “the Valley of Death”. Innovative procurement offers a clear bridge across.

But the bridge is opened not just for the winning contractor. The research available on pre-commercial procurements indicates that all companies involved, even where they are unsuccessful in gaining the final order, gain benefits. Many have gone on to exploit the developed solutions and found other customers for their product or service.

For small and medium enterprises (SMEs) in particular, participation can be particularly attractive. Tendering should encourage SMEs to work with the public sector. The prospect of a significant contract from a public authority makes it easier for SMEs to raise capital from outside sources. If they are appointed as a lead contractor, their company becomes much more attractive and a much less risky proposition for investors.

From the perspective of the contracting authority, the ability to work closely with the supplier is likely to lead to better outcomes. Products or services can be much more closely aligned with the customers' requirements. There may be valuable intellectual property resulting from developments partly funded by the lead customer. The initial deployment of the protected product can be royalty free, or all future royalties from sales to other customers might be shared.

- ***Mainstreaming Innovation in Public Authorities***

The potential for deploying public procurement as an agent of innovation has been widely recognised in high-level European policy-making. (See Annex 1) The information technology sector played a leading role in pushing this onto the Commission's work programme in the mid-2000s. The Europe 2020 program included innovative procurement as a major goal, with support from both DG Research and DG Enterprise. It was explicitly endorsed at the 2011 European Council. The Commission has set up many programmes, co-funding innovative procurement projects, support web sites, forums and conferences.

Innovation support was a policy objective in the 2014 reform of the public procurement directives. These now support competitive dialogue which can be used in conjunction with pre-commercial procurement. The Commission has also designed an entirely new legal tool, the innovation partnership procurement.

However, the policy instruments being used to make innovative procurement a mainstream activity within the EU's estimated 250,000 public authorities are having comparatively little effect. The impact of support programs is confined to a relatively few authorities, countries and sectors. The new procurement rules are only just being adopted. They give a big opportunity to promote innovation as a procurement objective, but have had little impact so far.

The reasons for this lack of traction are not hard to find. Since most public authorities, due to the prevailing economic circumstances, are finding budgets are very tight, procurement teams are reluctant to proceed with uncertain, complex and potentially risky procurements. It is safer to procure an existing solution from an existing supplier where the tendering process is straightforward and easy to complete. Political leadership also tends to avoid more risky solutions which might have the tendency to run over cost or underperform. There are continued worries about contravening EU public procurement law.

Making organisations more innovative means changes in the culture and approach which can only be delivered by strong leadership. The commissioners of public services need to work in strategic and open minded ways with their procurement specialists. The adoption of radical new solutions may involve uncomfortable changes in organisation and responsibilities.

- ***Rethinking Public Support to Boost PPI***

If innovation in public procurement is to start delivering anything close to its full potential, it is clear that public policy instruments need to be reinforced and redirected. High level endorsement, combined with more funding and support must motivate innovation leadership within public authorities. Much deeper engagement with the Committee of the Regions is essential, particularly directed at the major city regions which have the resources and experience to become "Beacon" authorities.

There is now a "window of opportunity" to make this happen. The new public procurement rules are beginning to operate, requiring member states to improve the consistent application of public procurement rules and to establish fully resourced supervisory authorities. The innovation and growth teams in the Commission should be working with their public procurement experts to integrate promotion, training and capacity building into the deployment of the new rules. Special attention should be given to encouraging and supporting the first users of the Innovation Partnership Procurement. Any unclear elements in the rules, especially in relation to the State Aid issues arising from pre-commercial tendering, must be urgently resolved.

There should be more support to facilitate pre-commercial challenges, whether within one member state or trans-national. If support is too heavily focused on trans-national aspects of procurement this makes an already complex process even less attractive. Trans-national activity can only develop on the basis of strongly embedded procurement cultures in local authorities and that should be the priority.

Support for enterprises engaged in competitive procurement should be boosted. Within the remit of the Investment Plan for Europe, it should be possible to target SMEs who are nominated as lead suppliers as a result of pre-commercial procurements. Conditions could be added to SME support funds to ensure that a share was directed to suppliers active in public technology contests. Public authorities who wish to make major investment in procuring innovation should be supported with grants or loans. The Commission - and all other EU Institutions - should be looking at their own internal procurement procedures and become Beacons for innovative procurement. Public procurement teams across the board should be encouraged to gain Beacon status. There could be special category Beacon awards - for example in the areas of education and health.

- ***The Evolution of Policy Tools to drive Innovative Procurement***

Special approaches and different tendering procedures to encourage smart customers to work with smart suppliers have been deployed world-wide for many years. These were pioneered in the USA but have been increasingly used in Europe. Defence was the lead sector in which these tools began to be deployed. It was possible to make progress here because the tendering process is closed and subject to special security. However in the USA, the lessons from defence procurement have been spread to other sectors, and departments in the federal government have been given targets to purchase from smaller innovative suppliers.

In the European Union, the principal activity was within the ICT sector. It was DG information Society who persuaded DG MARKT to produce guidelines, in 2008, that made it clear that pre-commercial procurements could be carried out without infringing the prevailing rules. This enabled DG INFSO to start funding programmes to develop capabilities in pre-commercial procurement and support local authorities in undertaking more risky and complex procurements. Best practice started to be shared and procurement networks established. The potential for more sustainable solutions was also recognised.

The Aho report on Innovation in 2005 identified PPI as a major opportunity. The Europe 2020 program included innovative procurement as a major project with support from both DG Research and DG Enterprise. Enterprise established a budget line to help small companies work with public customers in deploying a wider range of new innovations. The Commission has supported expert support forums and there is a very active web site. Funding opportunities are regularly promoted.

In some countries innovation agencies also established their own support programs, in many cases working in coordination with the Commission programmes which often provided matched funding. Reports from innovation agencies suggest that, apart from established practice in defence, it is in the health sector that innovative procurement has had the most traction, with more successful transitions from a pre-commercial stage into final deployment.

A very significant development was incorporation of innovation support into the 2014 reform of the public procurement directives. These now incorporate extended uses of competitive dialogue which can be used in conjunction with pre-commercial procurement. The Commission has also designed an entirely new legal tool, the innovation partnership procurement which is intended to overcome the problems experienced by innovative solution

providers who find that they have been unable to move to preferred supplier status and reap the rewards from their development investment.

The real impact of the new rules is not yet apparent, as many countries have only just completed transposition. However in those countries where the new procedures are now operational, many authorities have started to exploit the potential for enhanced competitive dialogue. But there is no experience yet with the application of the innovative partnership procedure. Indeed this new and untested instrument is not a compelling proposition in a procurement regime which still remains worried about contravening EU public procurement law.

The commissioning member states have yet to produce a significant amount of documented evidence to support this largely anecdotal analysis. The Council committee, The European Research Area and Innovation Committee published a report in June 2015 which recommended member states to start collecting this data and benchmarking live performance in awarding contracts to innovative suppliers. There does not appear to be much progress in this respect and the ERAC report does not appear to have widespread circulation within the public procurement community.

50. Challenge Prizes

Traditional R&I funding frames thinking with the legacy of previous work and the administrative burden of current funding mechanisms discourages potential innovators. Challenge or inducement prizes can capitalize on the excellence, expertise and time of new talents and help to bring about breakthrough innovations.

- ***What will be the benefits of successful action?***

This alternative mechanism offers a cash reward to whoever can most effectively crack a defined challenge by prescribing the goal but not who the innovator should be or how the goal should be achieved. Although the European Commission is introducing a set of challenge prizes under its Horizon 2020 programme, Europe does not yet fully capitalize and capture the energy of its citizen to innovate via the Prizes approach. Smart prize designs can activate this huge untapped potential and leverage private investment into R&I - often a manifold of the initial prize offering.

- Providing novel solutions through mobilizing new talents and engaging new solver communities. By posing a radical simplification on the side of the participants and by democratising innovation, prizes will allow reaching out to independent innovators, those who are at the moment not participating in R&I programmes because they do not have the means or experience. Their mobilisation will allow driving the innovators' community efforts towards the resolution of intractable or neglected societal issues, by turning them into challenges, objectives and targets.
- Fostering innovation ecosystem and uptake of new technologies. On the one side, the call for breakthrough solutions stimulates the creation of new partnerships among independent inventors, students, academics, businesses, young entrepreneurs and start-ups willing to think out of the box, across sectors and disciplines. On the other side, the decomposition of great societal problems into achievable challenge prizes, can capture the creativity of the general public and engage the public as a strategic partner to help achieve different policy missions. It can also help to demonstrate the feasibility or potential of particular technologies and to promote its acceptability and uptake.
- Contributing to increase the private R&I investment in Europe. Experience shows that the leverage effect on private investment can be significantly high. The first EC challenge prize under FP7 (run by DG RTD Health to deliver a novel solution for the preservation and transportation of vaccines) assessed a leverage factor of 25-30 for the cash award of 2 million EUR. That means even hypothetically without having a winner in an area that has been identified as critical for the EU. US examples even accounted a leverage effect of 40-50.
- Increasing value for money and agility enabler. Challenge prizes are disconnected from costs incurred by the winner as they are awarded for the delivery of a close to market result (e.g. prototypes, demonstrators). Therefore, only outputs have to be evaluated. They are a prime example of 'value for money' as prizes will only be awarded to the contestant meeting the award criteria which defines what the breakthrough solution should be capable of proving. In addition, prizes empower public administration to quickly respond to a constantly changing environment of new challenges e.g. responding fast to pressing social issues such as migration, Ebola.

- ***What are the preconditions of success?***

- Ability to properly craft challenge prize designs. The "Prize mechanism" is not a one-size-fits-all. It is particularly well suited for niche areas that face market failure to resolve the problem because of the inadequacy of financial rewards for solving the problem and embed a societal benefit goal with near to market solutions. It is therefore crucial to develop prize designs which are ambitious yet achievable and with targets that can be objectively measured. Further, non-cash incentives such as access to networks, peer review, mentoring and capacity building among the solver community can be a strong pull factor for contestants to participate and should be considered in the prize design so as to engage solver communities and garner the public interest throughout the life time of a contest.
- "Prizes" mechanism to be an integral part of any funding programme. Prizes are unlikely to be exploited sufficiently by public administrations to unlock new innovation potential, as long as there is no assigned budget to it. It is crucial to ensure that prizes are part of any funding programme with their upstream associated budget envelope.
- Widening the pool of innovators and reaching out to the public. In order to attract new solvers and innovators to contribute to tackle the pressing societal challenges, it is important that the rules, procedures and communication efforts out-scope the usual stakeholder's fora and channels too e.g. via user-friendly application system and smart awareness/advertisement campaigns.

- ***What is being done and who needs to do more now?***

The EC has launched a first set of challenge prizes for Research and Innovation but the efforts and successes are rather modest compared to prizes run by national e.g. UK Longitude Prize, and international governments e.g. 150 Mio in US Challenge prizes.

Consequently, the usage of prizes in the policy mix at EU, national and regional level should be streamlined e.g. national public bodies, and the EC should lead in example with the design of ambitious market-creating prize challenges.

- Formalise prizes share in Horizon 2020 funding budgets to increase the uptake and the level of ambition for prizes across services.
- Enhance the concept of prizes in public administration and the ability of public actors to design them by investing into capacity building.
- Create a forum of best practices exchange on prizes based on national and international success stories to increase uptake of the scheme e.g. via collaboration with US Government Online platform for prize practitioners worldwide, the 'Network of Innovators'.
- Explore new forms of collaboration with partners to co-fund prizes e.g. by increasing prize budgets or through creating non-cash assets e.g. networking and communication activities which could further leverage the outreach and impact of the prize.

- ***References***

- [EC Horizon Prizes](#)
- [UK Longitude Prize](#)
- [US Government prize platform](#)
- [US market leader of disruptive prizes](#)
- [Deloitte Analyses of Public Sector Prizes](#)

51. Knowledge Market platforms

Too many ideas and research results are unexploited since they remain unknown to those with the will & imagination to turn them into products and services. A European Knowledge Market platform could bring about the flexible, collaborative innovation that will bridge this gap.

- ***What will be the benefit of successful action?***

A European idea and innovation market platform facilitating the fruitful circulation of ideas – including e.g. promising research results, prototypes, know-how, social innovation ideas, citizens' innovation, IP – could boost cross-border knowledge circulation. In addition to connecting ideas stemming from research with business opportunities, this tool would allow the flow of ideas among businesses, as well as among individual inventors and entrepreneurs. Furthermore, it could connect innovative ideas to innovative sources of funding. The possibility of consolidating innovation financing in line with the Capital Markets Union could be explored, including the use of the European Long Term Investment Funds (ELTIF) and European Venture Capital Funds (EUVECA) for channelling private funding into long term innovation investments.

- ***What are the preconditions of success?***

Intellectual capital assets including IP created through innovation processes represent a major share of the value of today's innovative businesses. Through trading the R&D and innovation investments can be leveraged and non-used IP can find application elsewhere in the market. The approach should explore possible market failures behind optimal knowledge circulation particularly from the demand point of view to ensure that ideas shared are turned into products and services. To be successful the European Knowledge Market platform would need to demonstrate a clear European added value over already existing platforms, address all elements of the innovation chain (supply, demand, financing, skills) that facilitate matching supply and demand and be able to scale-up from local to European.

- ***What is being done and who needs to do more now?***

Platforms based on similar concepts exist in Europe at national or local level, but not at the European level, hence Europe is missing out on the potential of the knowledge and ideas, funding sources and entrepreneurial spirit that could be exploited across borders. The European Knowledge Market platform could include elements from the initiatives which already have proved to be fully functional in Members States:

- [The Innovation Mill](#) (FI) commercializes “non-core” corporate IPR via start-ups and SME's. Innovation Mill operators help corporations to streamline and effectively manage the spin off process to support the core business, and to increase the R&D activities outside the corporation. It helps the clients find external funding to spin offs from public and private sources and to maximize their chances for successful growth. For entrepreneurs and SME's with good ideas for innovations, the experts can assist with fast-tracking a company by providing support services and networking opportunities with invaluable contacts and connections to corporations, helping to establish a position in the ecosystem, give access to capital from private and public sources, and support international growth. For investors, the Innovation Mill provides verified deal flow and access to ideas born in large corporations with entrepreneurs that have more industry experience. Innovation Mill funding can be used, for example, for integrating new

intellectual property into the existing technologies, marketing research, pilot projects, and the development of business operations

- [The IP Marketplace](#) (DK) is a free of charge online display window where you can look for trading partners and other kinds of partnership, and which facilitates the initial contact between trading partners. At IP Marketplace you can put your patents, patent applications, utility models, design and trademarks - so called IP rights - up for sale or out-licensing. You can also use IP Marketplace when searching for IP rights to buy or in-license, or when you are looking for partners for innovation projects that builds on patentable knowledge.
- [“The Innovation Commons”](#) (UK, NL) platform for universities’ technology transfer organisations to interact with each other as well as with enterprises, entrepreneurs, consultants, and finance providers. The concept rests on three main ideas: (1) tapping crowd wisdom, i.e. “identifying IP ideas that will work as business realities” for solving the common challenge of technology validation; (2) crowd sourcing, i.e. “matching consultants with commercial opportunities” to be able to scale business development; and (3) crowd resourcing, i.e. “financing business developments for the next generation”, for closing the funding gap. As regards crowd sourcing, the Innovation Commons acts as a promoter of crowd funding and funding through business angels.
- The India Venture Board (IVB) is an example of a public private partnership model, which could be used for the setup of European-wide online marketplaces for fundraising and trading. The (IVB is an online marketplace/platform which, first, provides investors with a “Deal Corner” where they can post investment interests and initiate transactions. Second, the IVB gives entrepreneurs the possibility to make investment pitches. Third, companies and investors can upload information about important developments, investments and deals to the IVB Announcement Board. The founders of the IVB are the Indian Private Equity & Venture Capital Association (IVCA), the Indian Angel Network, Mumbai Angels, the National Stock Exchange of India (NSE) and the state-owned Small Industries Development Bank of India (SIDBI). The public-private partnership element arguably adds to the credibility and reputation of the board.
- InnoCentive is a crowdsourcing company bringing together solution seekers and problem solvers and operating through open innovation and prize-based competitions. Through prize-based competitions organisations can post their biggest Challenges to various audiences e.g. employees, customers/partners, or for global network of more than 370.000 InnoCentive problem Solvers.

A feasibility study is currently under-way to assess the need for such a platform and its possible main features. In case the study came to the conclusion that it would be useful, a pilot platform would be used to test the idea before implementing it on a larger scale.

52. Out of all boxes, off the map

Experimentation is increasingly recognized for its added value in spurring innovation, from policy makers, academia and communities, to start-ups, tech companies and traditional businesses. The most innovative ideas don't arise from closed laboratory-type settings, but instead in real-life contexts with freedom to collaborate with others and try out often risky processes. A new generation of spaces but also a certain attitude is privileging unconventional thinking with the aim of coming up with out-of-the-box solutions that can induce positive change to society's challenges. From Policy Labs, Public and Social Innovation Labs, to Fab Labs, Makerspaces and Living Labs, the adoption of a "Lab approach" is manifold. It is foremost an open, bottom-up, citizen or user-led process, characterised by intense discussion and idea brainstorming, early needs assessment, co-creation, prototyping and testing before large scale deployment or commercialisation.

- **What will be the benefit of successful action?**

"Labs" stand out as unique connectors of diverse actors from private, public and hybrid sectors, potentially able to combine different types of knowledge across silos. As such, they are innovation spaces of untapped resources and ideas to address our scaled, complex, multi-dimensional, and urgent challenges, from education to production, ageing to employment.

For instance, Policy Labs or Public Innovation Labs can tackle policy challenges at all steps of the policy cycle (from agenda setting, implementation and monitoring, to evaluation) by designing feasible interventions that bring about concrete impact. Successful implementation of a "Lab approach" helps to prototype real-time solutions adapted to real contexts, reducing delayed responses, and avoiding incompatibility experienced by stakeholders. These solutions are tested at small or local scale before full deployment, which allows learning from initial errors, reformulating or improving options for implementation, and devising a robust plan. On another level, Fab Labs and Living Labs have proven not only to be hubs for entrepreneurship in creative professions and IT, stimulating the creation of jobs in local contexts, but also platforms for new governance models joining up more directly citizens, communities, policy makers, companies or NGOs.

- **What are the preconditions of success?**

Drawing from previous and on-going initiatives, the diversity of Labs also calls for a range of conditions for success and scalability, for instance:

Fit for purpose of a "Lab approach" in a given situation: check of existing contexts that are suited for applying an experimental process, that is, where citizens, users or stakeholders are at the centre and/or where new or unexpected solutions can be effectively used. No real integration of new insights brings the danger of wearing away the trust of involved actors.

Public-private partnerships to reduce initial risks and stimulate diversity: requirements or barriers of entry into a "Lab" setting should be reduced for an expanded range of users or stakeholders, for instance for communities with lower economic and cultural capital, small and medium-sized enterprises, or civil servants in highly restricted functions.

Early assessment of current ecosystem for applying innovative tool or process: not every practice previously successful will work in any context. It requires a careful analysis of the characteristics of a given environment (economic ecosystems, types of communities, political bodies, and/or cultural values) and subsequent adaptation. And crucially, innovative processes call for structural and clear links to governance systems and decision-making processes to be in place.

Reframing of intellectual property rights: strong legal protections against reuse and diffusion of knowledge can disincentive or slow innovation while benefiting incumbent actors and monopolies. Open Data in government, science and business, using open source tools, is to be further encouraged at a high political level, while putting in place strong mechanisms for privacy and protection of personal and/or sensitive information.

- ***What is being done and who needs to do more now?***

Previous research has shown citizens, users and communities as sources of knowledge and innovation for product and service development (Von Hippel 2005). Participatory and generative design are used extensively to fuel bottom-up innovation, for instance for systems development, co-creation of public services, or mutual learning (Sanders and Stappers 2012). Open innovation has proven to be an effective model where government, industry, academia and civil participants work together to co-create and prototype solutions (Chesbrough et al, 2016).

In practice, Living Labs, promoted for instance by the European Network of Living Labs ([ENoLL](#)) with over 170 active members worldwide, have successfully implemented a bottom-up approach, co-creation and real-life experimentation. Cities and regions are now increasingly considered as spaces for societal experimentation and demonstration of potential solutions for urban challenges such as civic participation, environmental sustainability or territorial competitiveness, taking further the development of Smart City strategies.

Fab Labs, Makerspaces, Media Labs, Design or Prototyping Centres, serve as community-oriented spaces offering machines, tools and learning environments for wider publics to experiment and develop their own projects, objects or prototypes. [Fab Labs](#) have a network of approximately 270 Fab Labs in Europe, also present in companies and [industrial groups](#). Many of such spaces are increasingly part of a supportive eco-system for [SMEs](#) in RIS³ (Research and Innovation Strategies for Smart Specialisation), with the goals of jobs creation, business activation and sustainable development to support overall regional development.

A growing body of experience comes from Policy and Public Innovation labs, units, offices and teams, working inside and outside government (national, regional, local or even single public service organisation levels) to address policy and systems change (Nesta 2014). For instance:

- [MindLab](#) is a Danish cross-governmental innovation unit (between the Ministries of Business and Growth, Employment, Education and Odense Municipality) which involves citizens and businesses in creating new solutions for society;
- [Behavioural Insights Team](#) (the "Nudge Unit") spun out of the UK Government and now jointly owned by Nesta, and is dedicated to the application of behavioural sciences to improve government policy and services;
- [EU Policy Lab](#) within the Foresight and Behavioural Insights Unit at the Joint Research Centre – European Commission, is a safe experimental space to co-design beyond

traditional boundaries (e.g. across DGs, with citizens) and to develop new integrated responses, processes and tools (EC 2013).

- ***Who needs to do more now?***

Incorporate participatory and user-centered methods at wider scale. Government, academia and business can integrate in their operational toolbox for instance design, ethnography and observation, behavioural economics and research in psychology, social experimentation, open data and big data.

Enable multi-stakeholder involvement in projects and initiatives. A "Lab approach" requires the best techniques in order to expand the range of actors in an open and inclusive way, for example community-engaging and crowdsourcing techniques to gather unique knowledge and know-how from citizens, users and stakeholders in real-time with quicker feedback loops.

Promote political and institutional change (public and private organizations). The challenge to address and engage with more complexity and uncertainty needs more adaptive and agile approaches. More structures and spaces for collaborative work are to be created and supported inside organizations or closely connected to them. A close monitoring of active partnerships between public and private actors, lessons learned and achieved changes is needed for quicker feedback loops.

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53. 21st Century Policy Making: Internet Ready Regulation

We cannot win by digitising the bureaucracy of past centuries. A fundamental challenge of 21st century policy-making is the clash between the traditional regulatory system and the digital world. On the internet, there is only one single market. It is largely borderless; it is global; and it processes many millions of electronic transactions every second. By and large, our regulatory apparatus, on the other hand, is slow, based on territorial jurisdictions, and frequently prescriptive. This leads to new phenomena - algorithmic financial trades that potentially destabilise the stock-market; inequitable tax distribution for global, on-line market places; and an emerging potential for the 'instant criminalisation of the new' as appropriations for new technologies are not always clearly in the public interest. The challenge of internet-ready regulation - beyond a mere case-by-case approach - is a keystone in a pro-innovation environment.

- ***What will be the benefit of successful action?***

The key benefit of successful action is a reduction of friction in economic activity and public service provision. Internet-ready regulation also offers new pathways to increasing effectiveness, efficiency, and responsiveness of regulation, as new data-driven measures for the effect, impact and uptake of regulatory measures can help focus on outcomes, rather than implementation.

- ***What are the preconditions of success?***

Firstly, a deep and wide understanding of the opportunities offered by digital technologies for improving the framing, the options and the implementation of regulatory measures. Secondly, a strong commitment from the top to support a deep review of legislation from a digital perspective, including a bold commitment to purge pre-digital legacy on the statute books. Thirdly, the availability of digital skills inside government to properly design internet-ready regulation. It is important to stress that currently there are very currently few "digital natives" in the business of making legislation!

- ***What is being done and who needs to do more now?***

The EU's better regulation package contains a commitment to include 'digital checks' in any new regulation. The Council of the European Union in its 2015 conclusions urged the Commission to include such digital checks especially in the its regulatory fitness review programme of past legislation.

At the same time, some leading Member States are pushing a data-driven transformation of government, especially in the domain of public service provision. This creates pockets of digital regulation from the perspective of service provision. Examples of Internet-ready regulation include recent legislative initiatives to mandate web-based energy labelling, an approach that can be extended to online food labels, pharmaceuticals, and any other regulated consumer product.

At the further end of the spectrum of potential internet-ready government activity, 'algorithmic regulation' is emerging as an option in some domains, where data-driven algorithms essentially contribute to monitoring or even corrective intervention. One global pilot project is in the domain of financial market regulation of derivative trading. ACTUS project is establishing a global data standard for the representation of financial instruments to support forward-looking financial analysis of granular transaction and position data. This data standard can be used to run algorithms – in this case mathematical representations of the state-contingent obligations embodied in the words of the legal contract – to assess systemic risk in the financial system. This is an example of "RegTech" in the financial services sector.

In addition to being designed for a world of internet mediated flows of data, these approaches will all also rely on public policy making better use of emerging new data technologies, beyond the open data movement. In general, public policy needs to be better equipped to acquire new sources of data and even dynamic data, allowing the derivation of new insights from data analytics, and their prompt integration into policy-making. A new generation of technology specifically aimed to support or improve regulation is now emerging under the banner 'RegTech'.

Internet-ready regulation, even in its idealised forms, however represents new challenges in the domain of public participation, engagement, transparency, and accountability. New asymmetries in the ability to access data, derive insights from this data, and to apply these insights in public policy pose entirely new challenges to governments and the chain of democratic accountability.

It is possible that sooner rather than later we may find ourselves taking a leap into a completely different conception of regulating economic and personal behaviour as [block chaining](#) continues to spread beyond its genesis in crypto currencies to, for example, smart contracts, healthcare records and beyond. In one example, the Ethereum decentralized platform already runs smart business contracts: without any possibility of, fraud or third party interference.

The key challenge for the future is to broaden and deepen our understanding of the implications – technical and structural - of current isolated and experimental approaches to internet-ready regulation across all of government, while maintaining a broad, inclusive and high-quality dialogue with all those who will be affected by this transformation.

Consider that the energy efficiency labelling legislation ("EcoSearch") proceeded only by specifying that data must flow between manufacturers and e-sellers, and that the e-sellers were mandated to display this data in a specific format (and not that e-sellers generate and display their own energy label pictograms for example). That resulted in verifiable and current data flowing freely on the internet. Such a flow in turn greatly facilitates the work of third parties such as consumer organisations and implementing authorities in doing their work. The approach is truly transformative, but mining the opportunities has barely begun. In the longer term, a ubiquitous internet of things tracking every component part, coupled with a block chain secured series of un-fraudable business contracts married to the capacity of authorities to ensure 100% compliance and the future is both exciting and challenging. There is much work to be done.

A bold, visible and robust programme for the digital enlightenment of the public sector is required, which will also include new approaches to engagement and accountability. Many such initiatives are underway under the eGovernment action plan, the Open Government Partnership, and OECD-led digital government initiatives. Yet these now also need to push more strongly beyond digital service provision to new forms of governance and engagement.

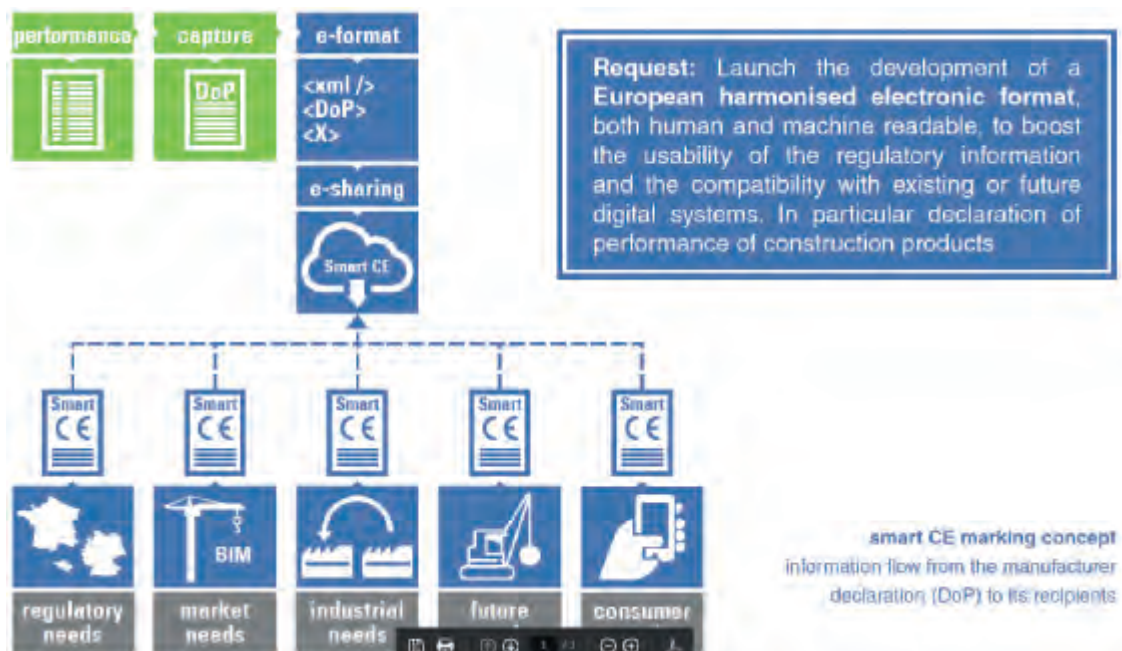
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54. Internet Ready Regulation : 21st Century CE marking⁵⁸

One of the greatest achievements of the Construction Products Regulation (CPR) is the European common language and formats for the exchange of information of construction products. The regulation guarantees transparency, availability and credibility of the information adding value to the products and services provided to users.

Construction Products Europe believes it is now the time to capitalise this success by making it accessible using digital means, maximising the benefits for a broader spectrum of users. Smart CE marking and electronic tools will enable the users to exploit the data manufacturers provide to the fullest potential and will allow them to develop new uses for this information in B2B and B2C communication in accordance with their needs.



Obeying to the principle of the CPR that information on essential characteristics shall not be expressed in other formats unless it is contained in the declaration of performance (DoP⁵⁹), the European Commission has the key role in ensuring that the achievements of the common language are translated into digital communication formats.

⁵⁸ [Construction Products Europe](#)
⁵⁹ Regulation (EU) No 305/2011 Article 8(3) - [Link](#)

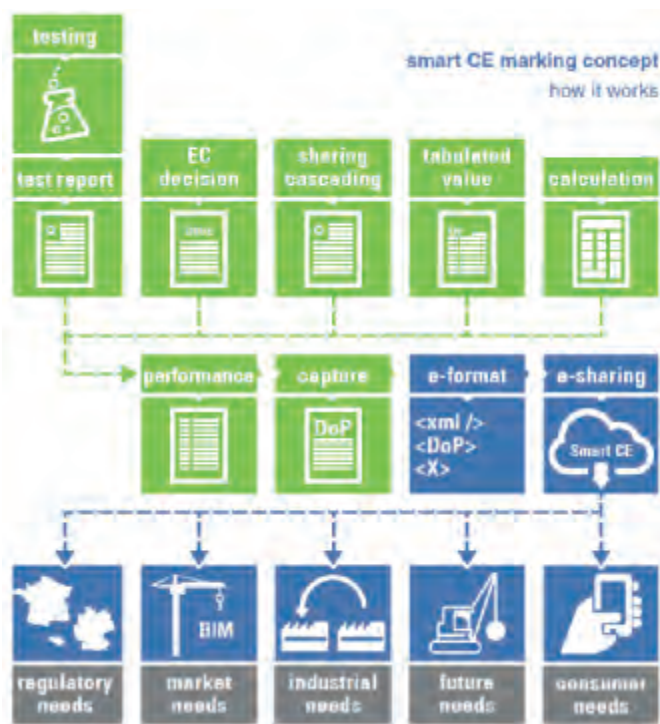
Similar initiatives already exist in the framework of REACH⁶⁰ and are considered the best solution to manage large amounts of information, while allowing the development of customised tools to fit the recipient needs.

- **Benefits of the harmonised digital communication**

Public authorities will be in a better position to develop tools to support the implementation of the national policies and to support relevant stakeholders (e.g. consumers, SMEs...).

Market surveillance authorities will benefit from the digital accessibility of the data, allowing them to check compliance of products with less effort.

The ‘smart’ use of Information Technology (IT) by construction service companies is a critical factor for success and growth of the European industry. Industrial and professional users, including contractors, engineers and architects will have all the provided data available in a user friendly and exploitable format enabling them to integrate the data in their relevant construction development tools (e.g. BIM – Building Information Models).



This proposal will provide benefits to all manufacturing companies independently of the size, including **small and medium-sized enterprises** (SMEs), increasing their chances to enter into new markets and global supply chains on fair terms. It will also fulfil the aspirations of manufacturers to test and declare values only once, for all.

Consumer organisations and NGO will have the chance to develop their own tools to facilitate the access of the information to satisfy citizens’ needs.

Information will be available and accessible for **future uses**, i.e. refurbishment and deconstruction of buildings, collection and management of waste, etc.

60 ECHA website: New exposure scenario communications package - [Link](#)

- ***Towards smart CE marking***

The use of new digital technologies is contributing to the European construction sector landscape and Smart CE marking would be the leading tool for the construction products market.

The Delegated Regulation of 30th October 2013 on the conditions for making a declaration of performance on construction products available on a website is a good example of the success of digital initiatives.

Construction Products Europe aims to have a clear, stable, proportionate and predictable regulatory framework for the implementation of the CPR, and a harmonised digital communication format:

- facilitates the access to information in a sustainable way;
- improves the ability of companies in the supply chain to interact electronically and seamlessly, avoiding or significantly reducing paper-based, manual data processing;
- ensures fair competition and a levelled playing field;
- reduces the administrative burden of multiple declaration and overlapping requirements;
- enables the construction sector to adapt to the fast pace of technological change, fostering innovation.

- ***Software, databanks and other IT tools***

The industry calls for a European harmonised electronic format to enhance the delivery of information to the market. This common electronic format is a precondition for interaction and compatibility between IT tools, be it software or databanks, from different developers. To be clear, Construction Product Europe does not call for the development of software, the creation of a new central databank or any other IT tool.

European harmonised electronic format will facilitate private or national initiatives to develop websites, apps, databanks, software and any IT tools to address the needs of regulators, markets and/or customers.

55. The Internet: a decisive advantage for regulators

With the advent of Blockchain, the internet will become the primary medium for the transfer of value and supervision of obligation. It has been said that when we look back in 20 years people will say of the internet that its primary function is to enable Blockchain – in much the same way as copper wires were seen through much of the past century as the means to enable telephony.

Imagine a Europe where citizens have access to all the information they want or need but where governments and corporations have access to data on a strictly "need to know" basis. A cynic might suggest that we live in the mirror image of this world in 2016, but cynics rarely understand that it is always darkest before the dawn.

Those who rail against corporate tax manipulation, illicit trafficking of armaments or people, environmental destruction or the adulteration of our food, frequently miss the bigger point: the internet as it has evolved to date allows us to see more and more clearly into these murky corners. More importantly still, the internet as it continues to evolve is furnishing us with the wherewithal to supervise, legislate and enable a degree of transparency in human affairs that has not been possible since we lived as hunter gatherers in small family groups (I make no judgement as to its desirability). Clearly this presents both challenges and opportunities.

The writ of paper based law making runs only as far as an army of enforcers can reach: from traffic wardens and health and safety inspectors to tax authorities. A case in point is the most important energy efficiency measure ever implemented in Europe (and responsible for more than half of all energy efficiency savings over the past 15 years): the simple, colour coded A to G Energy Efficiency label that we find stuck to the front of appliances from ovens to coffee makers in shops everywhere. These little labels "nudge" us to making the more energy efficient choice. The effectiveness of the system was compromised by the fact that only forty (40) designated label display conformance checkers existed across all 28 member states.

When, in 2010, the time came to implement labelling for on-line selling the team responsible proposed a simple but ingenious solution to the problem of "how do you stick labels on screens" by agreeing a set of obligations with manufacturers, on-line sellers, Member States and trade partners. But these obligations were anything but onerous; simply obliging the players in the chain to permit data to flow unhindered (efficiency data from the manufacturers to the e-sellers) or to display the required data in a particular format (e-Seller internet sites). The inherent "transparency" of the internet was harnessed and the legislation adopted by all players at virtually no extra cost and with no disruption to business models. Member states were equally happy as monitoring of conformance in the on-line world was made relatively trivial (the data is discoverable to everybody) and third parties were also served in being able to access real, verifiable data for comparison or other purposes.

By some estimates more than 2/3 of world trade is now internet enabled or intermediated. The search for value during the past six years of austerity has accelerated the process which is now irreversible. It is a truism that for business (if not yet for all legislation) the physical world is a special case of the on-line.

The challenge and opportunities for regulators are myriad and interconnected.

As mentioned above, the supervision of implementation in the online environment is technically trivial. In the online environment new rules can be deployed virtually instantaneously, and monitored ubiquitously. Where legislation can be promulgated and monitored at this speed and with this efficiency, could an infinitely lighter touch be imagined? Could guidance become the new legislative norm? Imagine this scenario for creating a piece of legislation (on corporate tax rates or a new motorway speed limit): design online legislative initiative - issue guidance - monitor conformance - modify guidance - identify the recalcitrant - issue threat of punitive intervention - assess peer pressure - evaluate legislative impact... all in a week. If we think this unlikely, we know little of how the internet already functions for citizens and businesses.

Furthermore, we know very well what a paper based piece of legislation looks like (even if we are increasing aware of its limitations in an internet world). We also know who we get to write it: informed lawyers. But who designs an online piece of legislation? What does it even look like? What are the respective impacts of reading a piece paper versus having a screen pop-up 'declare' something to you? or an on-Line store's computer declaring something to your computerised shopping program? What will online legislation look like in even ten years (look and feel, remember, hasn't changed essentially in over 3,500 years).

If rules can and will need to be deployed as rapidly as suggested, what does this do to the democratic process itself? What will the new role of Parliaments be? What will the role of the EU Parliament and Council be? Six month Committee Stages on the details of a useful legislative initiative will become as unthinkable as a google homepage that doesn't change every day. Is the Commission itself ready to "rapid prototype" legislation as described above? Needy candidates for internet-readiness assistance abound in the current Commission Work Programme - from financial services, to mobility of workers.

Clearly as legislators we have only begun to understand how radically our rule-making needs to change because of the internet. But though the internet connects billions of people and is wonderful for communicating, collaborating, researching and promoting there is one more Rubicon to be crossed.

With the advent of Blockchain, the internet will become the primary medium for the transfer of value and supervision of obligation. It has been said that when we look back in 20 years people will say of the internet that its primary function is to enable Blockchain – in much the same way as copper wires were seen through much of the past century as the means to enable telephony. Sooner rather than later we will find ourselves taking a leap into a completely different conception of regulating economic and personal behaviour as blockchaining⁶¹ continues to spread beyond its genesis in crypto currencies to, for example, smart contracts, healthcare records and beyond. Financial services organisations are already losing their exclusive hold as trusted intermediaries where trust can be guaranteed without the need for third parties. The same impact can be expected as "Les bons règles qui font des bonnes amies" become equally transparent and inviolable in all dealings and interactions : people to people, people to machine or machine to machine.

61 Excellent introduction here: <https://www.youtube.com/watch?v=YIVAluSL9SU>

56. Innovation Havens

Innovation Havens provide an appropriate framework for innovative solutions to carry out real-life testing and demonstration even if all relevant legislative requirements are not complied with. Innovation Havens could provide information on, and a means to address, regulatory gaps or barriers affecting innovation. As such they could be seen as one means of applying the 'innovation principle'.

- ***What will be the benefit of successful action?***

Challenges such as climate change, resource pressure, water scarcity, land degradation, and increasing [urbanisation](#), need to be addressed with a systemic approach to innovation. Many breakthrough innovations in these areas fall in grey areas where legislation is lacking or is not adequately designed, or relates to two or more policy areas, e.g. energy and material efficiency. The legal frameworks might not clearly allow and/or consider the demonstration of such innovative solutions, simply because they represent advancements compared to the state of the art at the time the specific piece of legislation was conceived. Examples include automated vehicles, sharing economy applications, re-manufacturing, secondary raw material markets, re-use of food, mass-customisation and personalised medicine.

In order to bring solutions to the market while building confidence among public authorities and investors, innovative solutions should be tested and demonstrated on a close-to-real environment with a validation and certification framework supplied by 'Innovation Havens', to be developed at European level. Investing in and upscaling innovative solutions cannot only give concrete answers to societal needs, they also reinforce Europe's competitiveness in the world.

- ***What are the preconditions for success?***

Innovation Havens would be governed by and implemented within strict boundary conditions, which do not undermine environmental, health and safety standards, while applying innovative solutions that contribute to better achieving policy objectives. There would be clear and pragmatic rules for liability, and to tort law responsibilities, so as to increase confidence of local authorities.

- ***What is being done and who needs to do more now?***

Innovation Havens could be one way of creating a harmonised, coherent and adaptive legislative environment at EU level that is favourable to innovation, by responding to early anticipation of needs, demanding high technical performance and quick adaptation to progress..

At Member States level, there is no harmonised approach to the demonstration of innovative solutions, and if derogations are possible at national level, then testing permits are generally provided on a case by case approach by local authorities.

The EU's [Regulatory Fitness and Performance Programme](#) identifies existing barriers and ways to remove them; Horizon 2020 and the Circular Economy Communication make reference to the Innovation Deals in order to clarify uncertainties arising from EU legislation.

The communication on upgrading the [Single Market](#) recognises the importance of innovative regulatory approaches that could be piloted to verify the feasibility and sustainability of innovative solutions.

Examples of legislation that includes provisions for experiment can be found very rarely at national level. The Directive [2007/46/EC](#) is instead an example of EU legislation where exemptions for new technologies or new concepts are considered in a specific article (art. 20) under specific conditions for technical requirements and on temporary basis.

Innovation Havens could be explored by different perspectives:

- At legislative EU level, it could be systematically considered and assessed the possibility of including a dedicated provision for real-life testing and demonstration of those innovative solutions that goes beyond the existing framework, but that contribute in better achievement the foreseen policy objectives;
- At member states level, networks of public authorities could be set up in order to exchange best practice on how allow the demonstration of innovative solutions and provide agreed guidelines;
- First examples of Innovation Haven could be piloted in the context of specific thematic areas, such as environmental technologies, in the frame of existing initiatives, for instance the EU Environmental Technology Verification pilot Programme.

57. Primary Authority: a profitable paradox ⁶²

This explains more process rules can reduce the transaction costs of compliance for regulated entities.

In the UK, 80 per cent of inspections are carried out by over 400 individual local authorities. Businesses with multiple premises or producing products sold across the country said that these inspections could be inconsistent, resulting in contradictory advice, wasted resources and duplicated effort. The UK Government sought solutions to ensure that local regulation was consistent across the UK, sufficiently flexible to address local circumstances, and more focused on supporting business compliance and growth. The approach adopted by Parliament in the Regulatory Enforcement and Sanctions Act 2008 was to allow businesses to form a statutory partnership with one local authority, which then provides assured advice for other local authorities to take into account when carrying out or considering the need for inspections or addressing non-compliance.

Primary Authority was launched in April 2009. Regulatory Delivery exercises statutory responsibility for its operation on behalf of the Secretary of State, nominating partnerships, issuing guidance, and resolving determinations. Agreements can cover broad or specific areas of local regulation.

- **Progress**

Primary Authority has doubled in size every year since its first anniversary. In May 2016, over 9500 businesses are in partnerships with 176 local authorities and fire and rescue authorities. Just under 8500 of these businesses are receiving advice through 'co-ordinated partnerships', typically as members of trade associations or franchises.

The participating businesses cover a wide variety of sectors and over 90 per cent of them are small or medium enterprises.

To enable thousands more smaller businesses to benefit from clearer advice and more consistent enforcement, Primary Authority is being extended to give businesses who have not yet started trading and businesses who only trade in one local authority area access to assured advice.

To support Primary Authority, the online Primary Authority Register has been developed. This versatile, interactive tool gives easy access to details on every registered partnership and the means to communicate with primary authorities, aiding dialogue about local compliance and feedback from inspections.

62 [UK Better Regulation Delivery Office](#) - Department for Business, Innovation & Skills

Primary authorities can highlight issues and make key information on business risks and systems readily available to other local regulators preparing to visit premises.

- ***Benefits***

Primary authorities provide robust, bespoke advice that must be respected by all local regulators. This enables businesses to invest with confidence in products, practices and procedures, knowing that the resources they devote to compliance are recognised.

Primary Authority provides a single point of contact for businesses operating across the UK marketplace, avoids inconsistency, and ensures advice is delivered with knowledge of how the business operates.

Primary Authority encourages a flow of information between local authorities, which drives improvements in compliance, targets enforcement resources where they are most needed, and informs consistent and proportionate responses to non-compliance.

- ***Impact***

The conclusions of an independent review of Primary Authority published in 2013 were very positive. It is seen as a means through which regulators can engage with the business community more effectively.

It has reduced duplication of effort between local authorities, helped promote a more risk-based approach to work in regulated areas, and cut the number of enforcement actions – as issues are now more often resolved informally.

Businesses were found to derive a wide range of benefits.

A recent [video](#) highlights some feedback

- ***Future***

Regulatory Delivery's current priorities are to build competence and capacity, assist the creation of more partnerships, and improve the quality of the advice provided.

Resources to help local authorities and businesses get the most from Primary Authority will continue to be added to the Primary Authority Register, including presentations, guides, information sheets and template documents.

Regulatory Delivery also runs free training courses for local regulators and workshops for partnerships considering an inspection plan, or the parties in prospective co-ordinated partnerships, and trained over 1000 local inspectors in 2013, over 500 local inspectors in 2014 and over 300 local inspectors in 2015.

58. Regulating for and with innovation: the example of UK FinTech ⁶³

As with the previous article, on Primary Authority, the essence of pro-Innovation Regulation is NOT changing the rules but changing the conversation and the culture. Here is just one example.

- **Introduction**

Good evening everyone.

It's a pleasure to be hosting you all this evening, it is very good to see so many of you here at the start of UK Fintech week.

Fintech week is looking at innovation in the round. This evening, I want to focus on just one aspect. How can regulation foster innovation in financial services? And as part of that how can we ensure that we have a regulatory environment fit for future innovation?

I'd like to start with the question, why does the FCA care about innovation? Primarily because of our duty to promote competition in the interests of consumers. One of the best ways we can promote competition is to foster disruptive innovation.

Disruptive innovation drives a number of dynamics in the market. A few firms will emerge as genuine competitors at scale to the existing incumbents. Many will be sufficiently interesting business models that they may find themselves purchased by bigger players and their technologies adopted in the mass market. And both of these developments may drive other incumbents to compete harder to retain or gain customers.

Getting these competitive conditions isn't something that only the regulator is interested in. That's why we have diverse representation here tonight from a cross-section of financial services firms, including start-ups, incumbents, as well as trade bodies, consumer groups and government.

Whilst we come to this event with different viewpoints, business models, and perspectives, one thing that we can agree on is that the environment in which we are operating is significantly different from just 18 months ago.

The 2015 EY Fintech adoption Index that surveyed six markets around the world found that on average 15.5% of digitally active consumers are users of fintech. The survey suggests that the average rate of adoption could double in the next 12 months.

63 [Speech](#) by Christopher Woolard, FCA Director of Strategy and Competition, delivered at the FCA's event on UK FinTech: Regulating for innovation on 22 February 2016. This is the text of the speech as drafted, which may differ from the delivered version

It's a sobering reminder of the pace at which the digital landscape is evolving and the scale of the challenge for us as a regulator to bear in mind when we think about both the risks that financial innovation may bring and how to balance that against creating unnecessary barriers to the many opportunities.

Our main way of addressing this set of issues has been Project Innovate and I wanted to say a little more about this now.

- ***The Project Innovate story***

As the Innovation Hub matures we are seeing firms that we supported being authorised. Out of the first wave of firms we supported, 18 have been authorised, and 21 are in the process of going through our authorisations process.

We launched Project Innovate in October 2014.

It has two main strands of work. The first is providing direct support to innovative firms and the second is policy and process improvement.

What does direct support mean? It's born out of the recognition that extended periods in development can burn cash for innovators. It isn't free consultancy or picking winners. Instead, we assist innovative firms to work with us. Some tech start-ups are completely unfamiliar with financial regulation which can be daunting; larger firms are more familiar with regulation but often have complex questions about their new propositions. We are here to help both types of queries as long as propositions meet our criteria that they are innovative and we can see benefits to consumers.

The Innovation Hub team also offers guidance pre-authorisation and gets the firm to think about how to best prepare for this. This year we want to make Project Innovate's service work end-to-end. Firms that have received initial support from the Hub will have their applications handled by a specialised Project Innovate authorisation process. After authorisation we will provide dedicated supervisory support, normally for one year.

The key to success here is an early engagement model that results in a better understanding of risks and benefits from both our perspective and also the firms progressing through this regulatory process. We don't just want firms to learn from us, but we want to capture their experience too in evolving markets.

Take for example one start-up firm who are here in the audience today. WealthKernel is a provider of automated wealth management solutions to institutional clients and in particular they want to use technology to change how smaller institutional clients receive financial advice. The Innovation Hub helped with their thinking before authorisation and they are currently going through that process now. At the same time we were able to explore the pros and cons of automated advice with comparison to the US market where this has gained a huge amount of traction and WealthKernel was able to play a role in our robo-advice forum. Engaging early on was as much as a discovery journey for us as it was for them.

In regards to new products, we have been able to be at the forefront of seeing these come into the market. For example, the insurance firm, CUVVA is a business that provides ultra-short term car insurance, allowing users to buy car insurance covering a period of a few hours, and allowing people to borrow or pool friends' cars. The Innovation Hub helped the firm think carefully about how their business model may fit into regulation. The firm has now been authorised by the FCA and is open for business.

To put these examples in a bit more context, through the Hub model, we have now received 413 requests for support and supported 52% of these firms. It is important to note that the 48% of firms we did not provide support to was because in most cases the idea was already established, in which case they can still take a standard route to authorisation, or more rarely we did not think it was likely to be in the interest of consumers.

As the Innovation Hub matures we are seeing firms that we supported being authorised. Out of the first wave of firms we supported, 18 have been authorised, and 21 are in the process of going through our authorisations process. That is about a 30% conversion rate. The firms that have been authorised include investment firms consumer credit firms and insurance intermediaries.

- ***International update***

While these examples and statistics illustrate successes domestically, the international context is just as important. In the past year, we have had over 25 non-UK innovators approach the Hub either for support or to learn more. Furthermore, if we want disruptive innovators at scale we need to think about how they can expand internationally with the minimum of friction.

This year through Project Innovate we aim to ramp up our international engagement. We are looking to have cooperation agreements in place with some key regulators to reduce some of the barriers to UK authorised firms looking to grow scale overseas and to assist non-UK innovators interested in entering the UK market. I am off to Australia next month to exchange views and ideas with ASIC, which in March 2015 launched its own “Innovation Hub”.

A number of overseas regulators have also introduced initiatives to promote innovation in financial services. Last year the Japanese FSA has launched a “FinTech Support Desk”. The Monetary Authority of Singapore has also formed a FinTech & Innovation Group responsible for regulatory policies and development strategies to facilitate the use of technology and innovation in the financial sector. And the CFPB in the US has Project Catalyst aimed at small firms. So we are not the only ones in this space and we can stand to benefit from learning from each other along the way.

- ***Regulatory Sandbox***

While we have made great progress to date with Project Innovate, it’s essential we don’t stand still. Our coming area of focus will look at policy and process improvement. We set ourselves an ambitious goal to create something practical and useful to foster innovation and are opening up the possibility of answering regulatory uncertainties through testing in a live environment. This will be known as the sandbox.

The Sandbox will allow businesses to test out new, innovative financial services without incurring all the normal regulatory consequences of engaging in those activities. It is safe to say that we have been inundated with interest about the sandbox.

We will offer a range of options for firms such as authorisation for testing; no enforcement action letters, and individual guidance and waivers for all firms. Safeguards for consumers and the financial system while testing will be agreed between the businesses and the FCA. One thing that we won’t compromise is lower standards of protection for consumers.

We also recommended options, the virtual sandbox as a testing environment and an umbrella scheme to allow one or more bodies to act as a sponsor for innovation. We see industry leading these working together and with the regulators in a more collaborative way.

In December 2015 we held a Sandbox event to elicit feedback from industry on FCA and industry recommendations made in our report. We had Innovate Finance, BBA, and ABI present their thoughts on industry recommendations outlined in the report. We are currently reviewing the feedback received on FCA options and plan to have the sandbox unit up and running later this Spring.

- ***RegTech***

In addition to this, we are also looking at ways of encouraging firms to be innovative with technology and helping them to help identify ways to integrate these new technologies into their business models. Most people refer to this as RegTech – thinking about solutions to issues that already sit squarely within the sphere of regulation.

Since our initial discussions with industry, we have launched a call for input to seek broader views on how we should progress our RegTech work. There are some key opportunities here, which include managing regulatory requirements more efficiently, and, an opportunity for us to understand how we can best support developments and potentially adopt some RegTech solutions ourselves.

One example could be distributed ledger technology, sometimes more popularly known as 'block chain'. There have been countless column inches devoted to this subject. The current development of distributed ledger technology has the potential to revolutionise financial services; whether it is the panacea of all ills in the financial world is yet to be seen. However it's clear that there are a lot of regulatory and consumer issues that will need to be discussed as the technology evolves. For example, how individuals gain access to a distributed network and who controls this process, along with what data security exists for users are vital considerations for us as a regulator.

Innovation can be an iterative process and the development of a digital solution is therefore unlikely to be perfect first time round. During the phase of any digital development, it's crucial that innovators are allowed the space to develop their solutions. The FCA continues to monitor the development of this technology but is yet to take a stance until its application is clearer.

In the meantime, we continue to work with firms developing distributing ledger technology solutions via the Innovation Hub to ensure consumer protections are being factored in during the development phase of this technology and the Hub liaises with the rest of the organisation to ensure a coordinated and informed approach.

We are particularly interested in exploring whether block chain technology can help firms meet know your customer or anti-money laundering requirements more efficiently and effectively. We are engaged in discussions with government and industry on this issue.

- ***Close***

The key challenge for government, industry and regulators is to continue to ensure the regulatory environment fosters the best of financial innovation. Our ultimate goal is that the benefits of competition can be realised in the interest of UK consumers.

So in conclusion, as the regulator we want to see a thriving market for financial innovation in the UK.

We only have to look at the fact that Project Innovate has been copied around the world to know that we operate in a competitive international environment.

Project Innovate has had a good introductory phase, what we need to do is keep pushing forward and not rest on our laurels.

The Sandbox is the logical next step and offers us, industry and consumers a good opportunity to test business models and products in a controlled environment.

The key challenge for government, industry and regulators is to continue to ensure the regulatory environment fosters the best of financial innovation. Our ultimate goal is that the benefits of competition can be realised in the interest of UK consumers.

We all have a part to play in that, and I look forward to our discussion this evening.

- The important thing is that the tax system should help entrepreneurs to cross the ‘valley of death’ – one participant said they had been involved with five good companies that had failed to make it
- The current investment culture is a revival of an attractive feature of 19th century capitalism in that private capital is being used to fund innovation. However, the EU and the UK are not where they should be. Europe is not a poor continent but it invests as if it were – while not taking a frugal innovation approach because it thinks of itself as rich.

59. Better methods for Better Innovation

The EU budget dedicates unprecedented resources to increasing the innovation potential of the EU and encourages the combination of different instruments to achieve common objectives. Improved monitoring of research and innovation can increase the targeting and effectiveness of these instruments as well as the policies of Member States. This should improve research and increase innovation; particularly in those regions and countries which are presently underperforming.

- ***What will be the benefit of successful action?***

Bringing more companies and regions into the knowledge economy will increase jobs, growth and competitiveness across Europe's diverse regions. Regions whose institutions underperform in research reduces the ability to attract further funding in competitive programmes, especially Horizon2020, and reduces the effectiveness of Structural Funds intended for research & innovation. The Member States that joined since 2004 still perform worse than average.

Better awareness of mechanisms and processes for combining EU financial instruments will allow new ideas to be developed that would otherwise not have got off the ground and foster a stronger collaboration at a local level between academic institutions, regional authorities and industry.

Joined-up reporting on innovation by the Commission can reduce fragmentation of approaches, help the Commission develop policies that target innovation, provide a consistent evidence base for the European Semester, support structural reform in Member States, increase the diversity of participation in EU research programmes

- ***What are the preconditions of success?***

A willingness of different ministries and local authorities within each Member State to work together, matched by better joint working practices within the European Commission.

For monitoring performance there are a number of loosely-connected initiatives including:

- The [RIO Country Reports](#) provide an overview of research and innovation policy measures and assessments of the innovation system performance at national level.
- European Research Area [Progress report 2014](#)
- The [Smart Specialisation Platform](#) provides statistical and financial information from the Seventh Framework Programme and structural funds, together with qualitative data on specific regional research and innovation priorities.
- The [European Innovation Scoreboards](#) provide a comparative assessment of research and innovation performance in Europe. The scoreboards help countries and regions identify the areas they need to address.
- In 2013 the Commission [Innovation Union index](#) proposed indicators for measuring innovation in terms of patents, skills, growth in knowledge intensive sectors and employment growth in fast-growing industries.
- The European Commission's [Innovation Radar](#) initiative gathers data about the innovations and innovators funded in Horizon 2020, and the needs of those innovators that need to be addressed for their innovations to deliver meaningful impact 'beyond the lab',.

- A number of non-EU efforts such as that of the OECD

For improving synergies:

- Smart Specialisation Strategies guide investments from the European Structural and Investment Funds. [The common provisions](#) oblige authorities to promote synergies with research programmes in these strategies.
- The Commission has published guidelines on "[Establishing synergies between European Structural & Investment Funds, Horizon 2020 and other related programmes](#)"

And for increasing research capacity

- The Horizon 2020 budget supports "Spreading Excellence and Widening Participation (including Teaming, Twinning, ERA Chairs and Policy Support Facility)" which is geared towards Member States with low-performing research and innovation. It does not include specific measures to link to ESIF.
- The [Stairway to Excellence](#) (S2E) initiative, launched by the European Commission aims to establish links between ESIF and H2020 for the EU13 countries.

- ***What is being done and who needs to do more now?***

These initiatives have already completed a significant number of support actions and built up a strong basis for the Member States to strengthen their innovation capacities and improve synergies between research programmes and European Structural and Innovation funds. There are some concrete examples to guide potential beneficiaries of EU funds but awareness of the opportunities and procedures to follow remains limited. The effort spent in preparing and maintaining the various reports and indicators of progress could be reduced by sharing efforts. A division of labour for this effort could be as follows:

Member States

- identify state-of-art research infrastructure that could provide competitive advantage in research consortia and look for funding from European Structural and Investment Funds
- Offer capacity building support for Horizon 2020 beneficiaries (training for proposal writing, administrative support, and additional incentives for researchers, etc.)
- design policy measures supporting synergies using [successful examples of synergies](#) from other countries

Commission

- Joined-up analysis and reporting on innovation can reduce the current fragmentation of innovation analysis in the Commission. Streamlining efforts through joined-up reporting on research and innovation would provide the basis for more coherent and complete approach to innovation in the European Semester.
- support research into research and innovation process to determine circumstances under which approaches such as open innovation accelerate development of new services and products
- feed lessons from Innovation Radar into funding programmes
- strengthen knowledge base for innovation recommendations in European Semester by developing common indicators for measuring innovation performance and streamlining input

Section 8. 21st century public service

60. The European Commission & innovation: walking the walk?

The European Commission needs to tap into its internal diversity and the multiple challenges of globalisation to capture the overlapping realities of innovation.

- ***What will be the benefit of successful action?***

Lower friction and a more inclusive, 360 degree, un-siloed approach to innovation within the Commission.

- ***What are the preconditions of success?***

Good institutional engineering and an avoidance of any default to "off the shelf" solutions to the Commission's difficulties with addressing innovation in-house, following delivery of the Chief Innovation Adviser's report: no new innovation tsars, or agencies; profound reflection upon the Commission structure as it is before any remedy is applied to the current situation. There is plenty of scope for error by default at the conclusion of the mission.

- ***What is being done and who needs to do more now?***

In the pre-globalisation era, national governments had much greater control over economies than they do now. The speeding up of processes and events and the disappearance of much traditional decision-making means that a hierarchical, silo model is no longer appropriate. Complexity is real-time and omnipresent; we observe a new policy-making wherein everything is connected to everything else, and the links between issues may even have greater strategic value than any one single issue.

As private sector organisations become ever flatter, the fragmented, pyramidal structure of public sector organisations is ever more anomalous. Internet platform managers talk about a "friction free" user experience; policy discussions will never be friction-free, but we need to remove the friction and biases caused by our organisational structure.

Silos do have some advantages: where routine operations need to be performed reliably and in a timely way under control, they perform well. They are ideally suited to routine tasks and situations where the context is stable. However, silos (or "verticals") are ineffective at innovation, which propagates characteristically in self-configuring nodal networks of people, usually self-organising on an informal basis. Companies which suffer the sclerosis of the silo model are swept away.

One approach is to preserve the advantages of siloes, not least for political oversight, while introducing the flexibility of innovation networks by combining siloes and nodes into a "dual operating system" organisation.

In this model, innovation would be undertaken by a nodal network organised around inspiring projects which recruit collaborators, freeing up the hierarchy to manage the regular business. The interface between the silos and the networks is the key success factor; it is however challenging both in terms of design and operation.

Within the Commission, there are some potentially nodal network-type bodies such as EPSC and JRC; certain DGs have experimented with Task Forces, with some success. The most

difficult challenge has been how to get their findings back into the organisation at strategic level, part of the interface issue mentioned above.

Siloes tend to reinforce the origin myth underlying many innovation models, a vision of science-driven, technology-mediated change, which depoliticises the wider forces of change that technology unleashes. Innovation should be about exploring a space with many options. The process of innovation should therefore include effective citizen engagement and enhance democracy, within the spirit if not the letter of Art. 11, TFEU.

Participatory approaches offer a chance to reduce biases and broaden the debate beyond individual technologies discussed within policy siloes. These public conversations bring values and visions of how the world is and are part of progress; but they often fall outside the policy debates provoked by innovation, based for instance on risk. When these elements are excluded, the result can be societal resistance, or even rejection of new technologies.

Such conversations will better capture innovations that are non-technical and often overlooked for example, services, organisations and social innovation. Successful engagement will therefore tend to boost the resilience of policy outcomes as well as helping to satisfy the need for accountability in face of change.

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61. EU Open government

Public administrations need to provide higher quality services while becoming more open and transparent. This requires a change in internal culture and the adoption of new processes and approaches around a decentralised architecture.

In the midst of a fragile economic recovery across Europe and overstretched public finances, many governments are faced with long-term issues such as ageing societies, mounting social security and healthcare costs, high youth unemployment and an outdated public service infrastructure that lags behind the needs of modern citizens and businesses. The ICT driven explosion of new business models, geographical dispersion of production and social media are also challenging the way governments operate and, above all, how they are perceived.

In addition to the public sector's role in catalysing innovation in the wider economy, there is an urgent need to power innovation within the public sector itself in order to unlock radical productivity improvements and efficiency gains, to foster the creation of more public value and a better response to societal challenges. As stated in the EU [eGovernment Action Plan 2016-2020](#), open, innovative and efficient public administrations are essential to sustaining economic recovery and unlocking Europe's growth potential, but also to make public administrations fit for the 21st century.

In order to transform the public sector into a much needed growth engine for the economy, the European public sector needs to leverage and improve their own capacity to innovate and drive concrete change processes. In order to maximise the benefit of the efforts already under way both in the EU and globally, the following design principles should be embraced: (i) co-design and co-creation of innovative solutions; (ii) adopting new and collaborative service delivery models and policy making processes; (iii) embracing digital technology and (iv) adopting attitudes that facilitate experimentation and public entrepreneurship.

- ***What will be the benefit of successful action?***

Public administrations across the European institutions and Member States at all levels would learn intensively from each other, co-create new solutions and engage in joint initiatives. Public administrations would be better positioned to ensure agile and personalised responses to new constituent challenges and to address the increasing demands of citizens. The proposed initiative would help unleash the potential of an innovative public sector with positive impact on efficiency, growth and social cohesion. In the long run, this collective effort would also set a global standard for the public sector.



- ***What are the preconditions of success?***

Such endeavour needs strong leadership (*Leading Innovation*) from the European Commission as well as Member States, backed up by political and financial commitments from both sides. It is important to clearly define the main stakeholders from the Member States public administrations, to lead the discussions and to participate in the agenda setting and implementation. Relevant stakeholders need to be informed of and inspired by the available solutions, successful practices that can be replicated in other contexts (*Informing Innovation*). In addition, there is a need to create the enabling environment for creativity to flourish and for innovative ideas to be generated and managed within public sector organisations, which may need reflection on the enabling framework conditions e.g. legal measures, governance models, organisational structures, learning and development, human-centred HR management, skills and working methods (*Enabling Innovation*). The smart use of digital technologies and the use and re-use of open digital assets (data, services, decisions, etc.) will be crucial for this endeavour – underway through the [eGovernment Action Plan 2016-2020](#) – as they can significantly improve efficiency, increase transparency, facilitate interaction, support cooperation across different administrations and connect public administrations with the outside world and across borders but also with society at large (embedded image from the [Report of the Expert Group on Public Sector Innovation, 2013](#)).

- ***What is being done and who needs to do more now?***

At present, several services within the European Commission are working intensively on restructuring and modernisation efforts in various sectors with the related public administrations in e.g. judicial reform, business-friendly public administrations, Single Market agenda, etc. Most of these efforts relate to the implementation of legislative measures or to specific areas identified during the analyses of the European Semester. Public administrations can and do however go beyond the mere obligations, but efforts at EU and national levels are not fully integrated into a cohesive strategy. Reporting in the European Semester is currently sporadic and potential complementarities cannot (yet) be exploited. In order to better exploit the various fragmented efforts, the European Commission should initiate:

- the establishment of a 'Public Sector Innovation Task Force' with the participation of relevant services within the EU institutions mandated to co-create public sector innovation initiatives with Member States, ensuring maximum leverage of the resources and activities applied across the EU in order to drive strategic innovation efforts in public administrations in Europe.
- the use and strengthening the specificities of existing platforms (e.g. the OECD Observatory of Public Sector Innovation, stakeholder engagement platform of the eGovernment Action Plan 2016-2020, the JoinUp platform, etc.) to create critical mass, attract stakeholders in an effective way, facilitate information flow and knowledge sharing as well as the connection between public administrations and with other stakeholders. These could accommodate an expanded wealth of knowledge and resources (e.g. the Quality of Public Administration Toolbox) and could facilitate collaboration between government innovation and policy labs.
- The establishment of a 'Public Sector Innovation Network' in the Member States, consisting of Member States' innovation practitioners that can coordinate and mobilise the relevant actors in their MS and could co-create concrete actions to be jointly implemented by interested public administrations. The eGovernment Action Plan 2016-2020 for instance has been conceived to enable networking via a digital platform and allow stakeholders, including Member States to suggest new joint actions. Via this

Network, a Public Sector Innovation Movement could be incited within the EU institutions and at various levels of public administrations in Member States.

62. Principles and processes for a functioning civil service department

This is the story of how, even in large organisations the permission to experiment can sow seeds of modern practice. In order to function well, a civil service department requires not only a clear and agreed structure to allow it to do the right things but also a common approach to the ways in which people act, in order to ensure it does things right.

The principles below are derived from ideas put in place in one Commission department when it was founded in 2012.

- **Responsibility**

Clear allocation of responsibility helps all colleagues to know who does what. There is always one individual named as responsible for delivery of an action, whether at Head of Unit or desk level.

As a general principle, managers delegate responsibility to colleagues at working level, relying on each colleague in each case to assess whether there is any need for input and guidance from other teams, or from more senior levels, and to secure the right input at the right time. We can do this because we have full confidence in the professionalism of each and every colleague. Professionalism means two things.

Above all it means that we do high quality work. We do our best, we develop our skills to do better, and we judge for ourselves when we need the support and contributions of our colleagues in order to do a good job. We trust each other to get on with the action needed.

Professionalism also means that we work to time; and that we empower each colleague also to allow them to work in a timely manner.

If I am the individual named as the responsible lead for an action, what does it change in practice? If I am responsible for delivering a piece of work on time, I deserve to have a reasonable assurance that all colleagues will do their bit on time. I also know I can rely on my managers to help me to get that support, and to ensure overall that my workload allows me to deliver. I am free, within the deadline, to do further checking, up, down or sideways. But I alone have the ultimate duty and right to move ahead, in order to keep to time, or exceptionally (and ideally by agreement with the author of the initial request) to decide to miss the original deadline because I cannot produce fit-for-purpose work by then and because the costs of delay are manageable.

Equally clear allocation of responsibility to sign off a piece of work is crucial. Ideally the lead signs off the work as fit-for-purpose. In some areas, there exist detailed rules laid down by central services. Wherever such rules leave any discretion, we apply it in the light of our professional vision of quality and timeliness.

The assignment of responsibility aims to ensure that all are informed, but that decisions are taken at the lowest possible level. Those who are indicated as responsible are free to delegate further, on grounds of their choosing, within their responsibilities. Managers may override even the processes where necessary to ensure the timely delivery of any piece of work, and otherwise take responsibility for late delivery.

Clear individual responsibility does not imply sole ownership, or prevent the broad and generous sharing of credit for every piece of work.

- ***Quality***

Our core commitment is to be fit-for-purpose, if not excellent, and on-time. The lead manager for any given project is accountable for this.

We assess our performance against this goal as one basis for our collective learning process. One performance indicator is our client satisfaction scores, for both timeliness and quality, reviewed at regular intervals.

Our benchmark is 100 % delivery on time. We track this at Unit level across the main outputs. We also, of course, aim at excellent content, and measure *ex post* our user's satisfaction with our output being fit for purpose. As we learn where improvements could be made, we make this a priority for training.

- ***Knowledge***

We take particular pride in acquiring knowledge, and in using it dispassionately, objectively and in a timely manner. We illuminate but do not pre-judge the political decision.

We need increasing quantities of high quality evidence in order to focus better our efforts. Data, evidence and knowledge, on our past, present and possible future impacts, economic, societal and other, must constitute the base of all we do. Only with evidence, both qualitative and quantitative, can we maintain our licence to operate and deliver good value for money in circumstances where resources for public action and societal compliance are both increasingly constrained. Only by focussing on sustained evaluation of past and present impacts as well as of future prospects can we ensure that we constantly learn from experience.

We aim to be the best at knowledge sharing. Consistent with our established interactive vision, we want a DG where everyone can know what goes on around them, where learning is constant and ideas flow in all directions, where there are systematic linkages between policy, regulation and research. We add value by sharing our insights and our judgements as well as documents and facts. Every colleague is empowered, both within their core tasks and on the basis of spontaneous collective initiatives, to participate in knowledge sharing and creative policy work.

- ***Concept First: Broad involvement, Full Transparency***

We maximise our chances of success by ensuring that everyone is involved up-front.

In all our work, regardless of who has the responsibility to sign off, implement, execute or otherwise advance a piece of work, colleagues keep all others interested informed of the development of their work in real time. Giving information is a unilateral duty: it implies no right of intervention or oversight for the recipients.

All individuals are encouraged to make proposals for initiatives. All are encouraged to develop their own ideas. Before an initiative becomes a DG-owned activity, we look for evidence-based positive validation by all with a knowledge and interest.

This approach is particularly important in the deliberations leading up to a concept agreement on new initiatives that will engage the DG in new work. But the circulation of information and ideas during the phase of execution must remain equally broad.

The key to broad involvement in-house is that:

- Management seeks broad, informal, exchange among colleagues at all times.
- Heads of unit are accountable for fully involving those with an interest.
- All Senior Managers will have had sight of major policy papers before they are submitted for final adoption.

The management of your sustained and open conversation, with outside interested parties can also be a source of much improved outcomes. This means more than issue-specific consultation. Responsibility lies with the lead manager, within the normal rules of confidentiality, to reach out widely enough and early enough, so that all interested parties have an opportunity to contribute to the definition of our problems and challenges, to our identification of key metrics and of our working priorities, to the sifting of options for action and to contribute to the achievement of the goals for which we are responsible.

Finally we ask our stakeholders, in constructing their own partnerships, to reach beyond their own comfort zone, engaging all EU society in their work.

- ***Linear Execution: Do each step once, get on with it:***

By linear execution, we mean that we agree up-front with all concerned what needs to be done and who is in the lead. We then get on with delivery. The lead team keeps colleagues in touch with progress and remains self-critical. But we only re-open or re-assess decisions and actions underway when there is new evidence.

63. Collaborative platforms

Public administrations are traditionally very slow followers: adopting decades late the new tools that give their stakeholders and lobbyists a cutting edge. In the digital age, the Commission shows that it can be an early adopter. The next un-resolved challenge is to scale fast.

Harnessing the collective intelligence of all staff through a strong, active and positive internal knowledge network is a powerful way for any organisation to deliver better, more impactful results, faster, at lower internal costs, and with greater staff satisfaction. Mature, tried-and-tested online tools are available off-the-shelf for professional support of collaboration and cross-organisational innovation and delivery. The CONNECTED Platform launched as a pilot with 19.000 users within the European Commission is an illustration of what is possible, and how a public sector organisation can transform itself.

- **What would be the benefit of successful action?**

Internal organisational frictions stand in the way of easy, effective, and empowered cross-organisational collaboration and knowledge-sharing. This reduces the impact of our work. Our policies should be built on the whole organisation's collective knowledge and delivered by bold, coordinated, sharp thrusts that generate lasting positive impacts noticed across the Union.

Instead, our delivery is often blunted and throttled through brittle collaborations, fragmented ownership, and the absence of state-of-the-art technologies to share insights and work in cross-organisational teams. Downstream coordination, rather than upstream collaboration, is the model conventionally favoured and frequently imposed in centralised structures. Outdated business processes rooted in a Weberian, paper-centric administrative culture, together with lack of staff empowerment to step even marginally outside of predefined assignments frequently further reduce our ability to generate joined-up policies.

User-centric digital technologies have irreversibly challenged the traditional organisational model by enabling networked knowledge production and sharing at virtually zero transaction cost. In many organisations such internal knowledge networks and collaboration environments have become the unnoticed, banal daily routine. In the Commission, like in other public sector organisations, experiments have started and delivered actionable insights on how to empower staff and deploy modern tools, while guaranteeing clear lines of responsibility, and on-time & on-target delivery. The CONNECTED collaboration platform is one such experiment.

The most prominent benefit of successful action is greater impact through better quality, more joined-up action delivered in less time. This vision is within reach through the President's unequivocal instruction to work across silos for fewer better elaborated initiatives that are easy to understand.

- **What are the preconditions of success?**

Firstly, a loud and clear top-level signal on the shift from coordination to collaboration. This needs decisive, senior management ownership to guarantee successful delivery and

implementation – many organisations have C-level executives with knowledge management responsibilities.

Secondly, a positive working environment that empowers and incentivises staff to share their knowledge and collaborate widely. In organisations where staff is enthusiastic about and committed to the organisation's mission, knowledge sharing and collaboration is generally easy. Staff give generously of their knowledge. Managers play a tremendous role in creating the preconditions for such empowerment, but this requires a shift from the manager-as-gatekeeper, to the manager-as-facilitator and guide. The right skill-set for staff and managers are a *conditio sine qua non*.

Thirdly, the right IT environment must be put in place, with digital-by-default business processes, and state-of-the-art, seamless, mobile-friendly user-centric collaboration tools, in support of the vision above. The recent revolution in user-friendly, zero-training technologies in mobile devices and online platforms has generated enormous, legitimate, expectations for staff to use tools to get their work done. Collaborating on a report or presentation should not be more difficult than sharing a cat picture with friends and family.

- ***What is being done and who needs to do more now?***

The CONNECTED platform has been piloted since 2012, and is being used by more than 6.000 staff regularly while more than 18.000 users have used the platform at least once. It has become the main tool at two Departments, and was designed to fill a collaboration gap corresponding to a modern vision of a public sector administration, and governed through a multi-disciplinary cross-organisational team.

Other IT platforms exist, but are frequently marred by one or more weaknesses – they are either local initiatives, not available beyond departmental boundaries, or are driven by IT availability instead of business needs, lack user-centric governance or user-friendly implementations, are disconnected from day-to-day business processes, or are not accompanied by the necessary organisational change processes that underpin successful transition to a fully internally networked organisation.

64. A Call for Agile Governance Principles⁶⁴

From the WEF advisory group that provided the underpinnings to the foresight foundations for progress for Professor Schwab's wake-up call, a vision of the sort of public bodies we need if we are to navigate the current revolution.

Software is changing the way we live. It is integrated into every aspect of our lives, bringing a speed, efficiency, and connectivity unimaginable just a few decades ago. Software is so integral to the way we conduct business, educate ourselves, and communicate with friends and family, most of us can't imagine a modern world without it. With innovations arriving at a breakneck pace, software applications will continue to expand and transform our lives well into the foreseeable future, touching every aspect of our lives.

The immense changes software brings are sometimes referred to by their technological nickname: a "disrupted world." As software "disrupts" our lives with its tremendous benefits for scientific, economic, and cultural endeavours it poses new challenges for policymakers as it enables the "gig" economy, driverless cars, and outside the norm methods of payments.

Governments will need a new framework for governance both in the ways evolving technologies and the personal and business opportunities they create affect policy decisions, as well as the means for efficiently executing government functions to the benefit of citizens.

Developing this framework requires an approach that is as novel as the technology it governs, one that is agile and responsive enough to accommodate software's enormous impact.

We, the members of the World Economic Forum Global Agenda Council on the Future of Software and Society, believe that such principles of agility are already successfully employed in the arena of software development. Section 1 of this paper outlines these agile principles and suggests ways governments can successfully implement methods already in wide use in software development. We further believe that these results-oriented principles are readily transferrable to government policy decisions and can help an economy lay the foundation for greater success. In addition, novel policy challenges are posed because of the ways software is driving the emergence of new economic activity. In section 2 we describe some of the transformative changes and identify a number of key policy challenges. Overall, we believe a system that is open and adaptive to change is more attractive to investment and opportunity.

64 World Economic Forum Global Agenda Council on the Future of Software and Society

- ***THE DRAFT PRINCIPLES***

The purpose of this section is to explain the agile principles and describe how, when applied to governance, they can lead to improved efficiency, public services, and public welfare, better equipping government agencies to respond to change. We recognize that it will be a challenge for government to respond to new software and technology developments and their impact on society, and we offer our continued support in this complex task. We hope the ideas presented here will provide a starting point for close collaboration between policymakers and the technology community.

We believe in governance systems that are robust, adaptable and responsive. Agile software development is a proven means to achieve rapid results which meet the goals of users efficiently. These methods are readily adaptable to governance. Through this we value:

- Outcomes over rules
- Responding to change over following a plan
- Participation over control
- Self-organization over centralization

That is, while there is value in the items on the right, we value the items on the left more.

Section 1: Agile Governance

⇒ *Outcomes over rules*

Governance should favour outcomes over rules-based compliance.

Agile software development prioritizes individual approaches and customer interactions over adherence to a rigid process. Delivering timely solutions is a more important measure of success than meeting a static checklist of rules. We believe the same principles should hold true for government actors. Governance should shift from the traditional focus on rules-based compliance to an outcome-oriented approach that can respond to changing dynamics. Implementing policy and executing on goals should evolve through incremental changes that are tested and measured for effectiveness as they are developed.

Actions:

- Systematic efforts to test policy outcomes by task and at each step in a process, including use of pilot programs and testing outcomes in measurable objective ways
- Develop a plan based on component elements and execute on each element as opposed to waiting for action until all the elements of the plan are established
- Remove impediments as they arise rather than attempting to anticipate and resolve all potential issues before executing on components
- Individual teams should be empowered to make decisions
- Empower the experts with substantive experience (as opposed to senior political managers)
- Develop the best team by including anyone with a relevant skill set, not just those within a particular agency or function

⇒ *Responding to change over following a plan*

Governments should employ flexible action plans that can adapt to change. Software development is agile because we proactively and routinely collect, analyse, and incorporate

feedback and data to inform decision making. This allows us to detect the need for change and adapt rapidly. Government can implement a similar approach by breaking down policy decision-making into incremental parts with short-term deadlines. As outcomes emerge, they can be analysed and the results used to adjust future policy making. Government should share this data accumulation with stakeholders over whom they legislate or regulate. These principles can also be used to encourage valuable experimentation since any negative impacts will be detected in time to adjust for a better outcome.

Actions:

- Requirements should be task specific and flexible based on evolving needs and information
- Adapt dynamically, as new issues arise in the course of executing on elements
- An impediment on one issue should not delay action on other component elements for achieving the goals
- Establish short term and frequent check-in benchmarks, test beds
- Create "sunsets" which require methods to be periodically validated or abandoned
- Use innovative metrics to assess outcomes and solutions

⇒ *Participation* over control

Governments should offer open and transparent collaboration with a wide range of citizens and interest groups.

In the software arena we deliver higher quality results by collaborating with customers during the development process, instead of adhering to a rigidly-constructed process. Government already responds to stakeholders. We believe government will more effectively address technologically-driven changes by also encouraging citizen engagement in the decision-making process. An important component of this approach is ensuring clear roles and responsibilities for government, industry stakeholders and citizenry. Input from these groups can also help policymakers devise incentives for voluntary compliance, which can be more effective than command-and-control style regulation. Precedents for this approach are already emerging. The U.S. Office of Science and Technology Policy has begun crowd-sourcing public comments on regulatory proposals through GitHub. And the U.S.-based non-profit Code for America has had great success with a project helping cities develop a web application that solves civic problems identified by citizens.

Actions:

- Solicit input from experts in other government agencies
- Seek input from best-available sources among stakeholders and citizens
- Develop formal and informal ways to exchange information and seek guidance on specific problems
- Cast a wide net for input through crowd sourcing and other communities

⇒ *Self-organization* over centralization

Governments should encourage and incorporate the self-organization made possible by technology.

Today's new technologies allow knowledge and power to be distributed more widely than ever before. They allow the collection and dissemination of experience, the collective assessment of problems, and the design and application of solutions and improvements. The

ability to self-organize decreases many of the burdens on central governance. Policymakers should embrace this organizational shift and redirect rule-making resources, and their influence, to those areas in which self-organization is less effective.

Actions:

- Organize collaborative groups based on highest value-input, not organizational affiliation, rank or political influence
- Re-evaluate, adjust, and as needed, restructure institutional and collaborative groups regularly
- Add and subtract resources based on dynamic needs
- Empower decision making as needed throughout the process rather than based on schedules

Section 2: Disruptive Software Creates New Enterprises & Novel Policy Issues

The result of agile software developments is innovation at quantum speed. That innovation creates novel markets such as the "gig" economic activity, new forms of conducting financial transactions, shifts in labour force to projects and away from full time jobs, and many more. Each of these developments poses "first impression" policy questions on taxation, worker rights, efficacy of monetary policy, and many more.

Today's laws and regulations governing employment, industry, and consumer protections were enacted well before the arrival of today's technological advances. In some areas, technology has so fundamentally changed the behaviours and processes being governed that the regulation is not fully relevant.

What follows is a set of opportunities for examining, and where needed, generating new policy in areas that are being transformed by the advent of software and other technology with the goal of embracing and not impeding these pro-entrepreneurship developments.

The Emerging Project-Based Workforce

Digital technologies and global communication infrastructure have significantly changed the concept of paid employment. Instead of employment based on a traditional contract for a fixed salary, a growing segment of the workforce now consists of project-based, small-scale entrepreneurship made possible by the immense connectivity of the Internet. Although the trend began with freelance computer programmers and designers, it has expanded to include such entities as Uber, which links customers to independent taxi drivers, and Airbnb, which coordinates property rentals between individuals. This so-called "gig economy" allows for highly-flexible working arrangements and promises to not only grow, but to evolve even more innovative ways to earn a living.

These new arrangements are attractive to employers and employees alike. But they also entail different approaches from established models, for example, they offer much greater freedom for individual entrepreneurship and adapting work schedules to individual's needs, but many do not offer the healthcare or retirement benefits normally provided under traditional employment schemes. Because they are on-demand, such jobs also offer little in the way of traditional job security. They may also create opportunities for "employees" to work "off-book" with the resultant tax implications. As the size and scope of this new workforce develops, policymakers will need to address whether new types of employee protection must grow with it.

Decentralized Payment Systems and Currencies

Digitally-mediated payment systems offer the benefit of instant, accurate and transparent transactions for all parties. Most, such as Paypal, operate via government-regulated financial institutions. But new systems are now emerging that are designed to operate outside of this traditional infrastructure. Some recent examples of digital asset and virtual payment systems, so called "virtual currency," include Bitcoin, Litecoin, and PPcoin. A decentralized, virtual payment system, the Bitcoin and similar networks allow peer-to-peer transactions, operating independently of government-regulated financial institutions.

Although virtual payment systems have gained in acceptability, their arrival raises novel governance issues. Policymakers must address such issues as accountability, consumer protections, and tax collection. As virtual currencies grow in scope and usage, policymakers will need to consider their potential impact on the stability of the national currency and the nation's monetary policy.

Peer-to-Peer Transactions for Services

Technological advances now enable individuals to interact with one another on a peer-to-peer basis for goods and services--the so-called "sharing economy." Intermediaries are emerging to coordinate and facilitate these interactions and include such operators as Uber and Airbnb. These marketplace developments enable individuals to use their assets (such as apartments and cars) in new ways to increase their incomes and better use these assets. Today, some of these operators provide terms of usage that include protections for those using and supplying services, further legislative actions may be needed to clarify the rights and obligations of the parties.

Autonomous Devices

Technology is allowing the automation of many functions. Positive Train Control, an advanced technology designed to automatically stop a train before an accident can occur, is already deployed in some parts of the U.S. and Europe. Driverless cars are currently in the testing phase. The arrival of these and future autonomous devices raises novel issues regarding responsibility and liability. For example, if a driverless car is involved in an accident, it is not currently clear how responsibility and liability will be apportioned among the manufacturer, software producer, and user. Policymakers should consider what changes to legal frameworks may be needed to encompass these new variables.

Data, Privacy and Security

Technology now allows the aggregation of immense datasets. Developing targeted understanding of consumers through data analysis and inference techniques is opening the way for businesses to provide new, highly customized services. Though these benefit companies and consumers, they also raise important concerns when it comes to privacy and individual autonomy.

At the same time, terrorist threats, cybercrime, and identity theft continue to grow in scope and frequency. Policymakers have responded with powerful measures for detecting threats and criminal activity in cyberspace.

The laws regarding these many competing interests, including how data on individuals is gathered and used, and especially what constitutes a lawful order for a 3rd party data processor to turn over user data to governments, remain fragmented and inconsistent across the globe. While some jurisdictions are enacting legislation to protect a consumer's right to

privacy and information self-determination (e.g. the right to be forgotten in Europe), others are lobbying for a system of total surveillance, placing national security above individual concerns. At the same time, users and service providers are increasingly relying on data to conduct online commerce. Policymakers must work toward legislation that will balance these complex goals with an individual's interests.

Inclusion in the Digital Age

Citizens today use technology to drive their businesses, advance their careers, increase their education, and for social and civic engagement. All of these activities foment a thriving economy. Citizens lacking the means to access the Internet, or the skills they need to use it, are unable to make these contributions, neither serving themselves nor the economy. Policymakers must reduce this digital divide by making access to the internet affordable while providing citizens with the knowledge they need to use it. In addition, policymakers may need to consider other ways to rebalance the technological inequalities between tech-savvy individuals, who understand and control advances in technologies, and less knowledgeable individuals.

65. Agility: a new way of working ⁶⁵

This is a slice of Agile thinking. It reflects the Commission's openness to challenge itself. The paper is an outside view but one with which Commission management is engaging as a source of reform insights.



65 This paper, the subject of many Commission conversations in the past year, is the reflection of ideas from the Agility Board, a public good, for-profit venture. See [From Fragile to Agile](#). If [WEF](#) captures the agile vision, here is a recipe allowing managers (public & private) to apply it.

AGILITY BOARD is an international, networked management consulting firm enabling executives to clarify, communicate and execute agile strategies to anticipate and respond faster and better across their markets and operating structures.



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Global Senior Partners.
Pioneers in Agility since 2003.
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A set of robust & innovative Agility practices.
To execute Agile Strategies,
To grow Agile Leaders.

FOREWORD

In the 2014 EU elections, with the rise of euroskeptic political parties, citizens have sent a strong signal of a lack of trust in the European Union (EU) delivering results to better people's lives. The Employee satisfaction survey of 2014 shows an active disengagement of the staff. This resulting of the lack of adaptation of the European Commission (EC) to an increasingly complex and interconnected world, where the pace of change is accelerating. Regaining the trust of the citizens starts by regaining the engagement of the employees and the delivery of better regulations.

This is a key political challenge for this new European Commission – who knows that it must re-invent “EC’s Way of Working”. The European Commission can evolve to manage uncertainty and complexity by focusing on becoming more agile in its operations. By becoming Agile, EC will provide what citizens want, when they need it, thanks to a better collaboration with the stakeholders and better anticipation on the context. And it will be able to do this because it is responsive, focused, flexible, and forward thinking to satisfy citizens' needs.

This report provides a view of what The European Commission Leaders could do to evolve towards agility, and what critical actions Leaders should consider undertaking if they're going to be truly agile in the new reality.

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1 EXECUTIVE SUMMARY

The imperative to evolve towards Agility

Since 2004, the European Commission's has been striving to meet citizens, stakeholders and employees' increasing expectations in a more turbulent world, with the following results:

- **Employee results: 2014 EC Staff Survey**
The European Commission (EC) staff survey in 2014, shows that 20,000 employees are not happy (net wellbeing = -5%), which results in a lack of motivation, and engagement.
- **Society results: Standard Eurobarometer 82 Autumn 2014**
The 507 Million European Union (EU) citizens have -13% of net trust (net=trust-no trust) towards EC.
- **Public Service results: Stakeholders satisfaction**
EC does not easily identify its stakeholders, and can't evaluate the induced, indirect or direct impact to them. Therefore the stakeholders' satisfaction is impossible...?

The interpretation of those results through senior managers' interviews shows that EC's conventional mind-set will prevent any evolution:

- "The EC shall maintain high level of integrity to minimize political impact and guarantee financial and ethical compliance. Therefore we can't take any risk or make any change."
- "Our complexity is a structural necessity, which prevents us to change."
- "We are so special, that what works in private sector, will not work at EC."

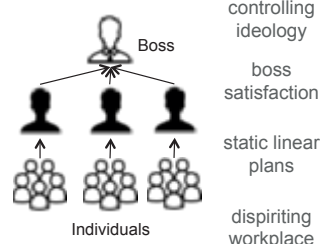
We are for the opinion that those worrying results show that the risk-averse nature of EC has prevented EC to do the necessary innovation to better anticipate and respond in a volatile environment. But the acceleration of technology and globalization, the volatility of the environment, have put pressure on EC to evolve towards more agility, even if it means taking on greater risk and the possibility of failure.

At the light of those facts, EC needs to engage in an evolutionary process to better anticipate and respond at all levels of the organization, and adopt a new way of working based on Agility mind-set where:

- We are accountable to our "customers" (EU citizens and stakeholders), to continuously understand their changing requirements and to deliver value accordingly, with mitigated risk for the organization.
- We control complexity through the Agile iterative and incremental approach, which enable us to evolve continuously.
- We liberate participative leadership and innovation by working in a collaborative mode.

The Vertical World of Hierarchy

operating vertically with a hierarchical bureaucracy
people reporting upwards to bosses



The Horizontal World of Agility

operating horizontally with a focus on the customer



How to shape an Agility culture across a DG within 6 months?

The challenge of the evolution to **Agile** is both ambitious and simple: it requires isolating one dedicated team of volunteers on a specific initiative, and leveraging the participatory leadership capabilities (1500 pers.) existing at EC, on the following 5 steps:

1. Focus on the most impactful initiative and define how to measure induced, indirect, direct impacts.
2. Form a pool of volunteers, organized in networked teams disconnected from the hierarchical structure,
3. Stop “*fear of failure about every thing*”, Start “*authorization of failure on technical matter*”, Mitigate “*political impact*”
4. Grow Agile Leadership through on-the-job learning labs in 120 days.
5. Repeat short iterations and incremental value deliveries in continuous collaboration with the stakeholders to continually fit to purpose.

Who, What and When?

Such Agile evolution will engage the following leaders:

DG DIR should initiate the transformation with the identification of the most impactful initiative

DG DIR should select the corresponding agents of the CORE TEAM among IC/participatory leaders

DG DIR should connect with VP to foster mutual engagement towards a shift to Agile evolution

VP connects with Commissioners to align on value of Agile evolutionary transformation

DIR R-HR could test new performance appraisal, satisfaction of the TEAM

What impact could we expect?

By implementing Agile Management we transform “stock of regulations”, “stock of translations” into flows of delivered value to stakeholders. Turning stocks into flows reduces cycle time by 20-30%, while increasing quality of the deliverables and citizen’s satisfaction through better interaction and care.

Engaging in this journey towards Agility, and leveraging our survey over 3500 organisations, we could expect to:

Improve productivity by 20% (turn “stocks of regulations” into flows)

Improve time to market by 20% (including political process)

Reduce costs by 10% (administrative management cost)

Improve Team’s satisfaction and engagement (Employee Net Satisfaction up to 60%)

Improve Stakeholder’s satisfaction and citizen’s trust (Citizen Net Satisfaction)

Return on Investment

To go up to speed, we could estimate the need for an Agility coaching capacity for 100 teams of 8 people, by 20 days per team, which represents around 2,000 man-days of investment per initiative. This is 12% of the direct gain from the reduction of the administrative management costs. So the ROI will range around 5 on the first 6 months.

The risk of failure of an Agile transformation is below 15%.

2 THE NEED FOR EC EVOLUTION TOWARDS AGILITY

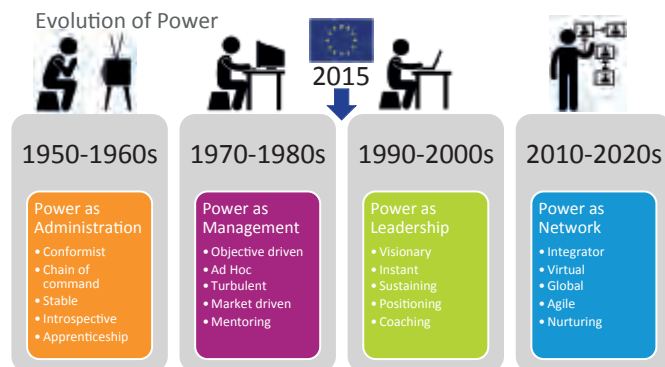
Since its origin, the purpose of EC is to create a stable and safe environment for the EU citizens by establishing a single market through a standardised system of laws and a monetary union.

Performance Trends

The Net Employee Satisfaction dropped from 66% to 54% for the period 2008-2014, with the consequence of lower engagement and performance. The citizen net trust in EU dropped from 25% to -13% resulting in soaring Euroscepticism. The Member States satisfaction is also down, resulting in higher expectations for impactful results. Additionally, there is constant pressure of the Member States to reduce the EC Budget resulting in a yearly reduction of 10% of the EC Admin Budget.

Evolution of Power

EC, as a supranational institution, proposes laws as well as negotiates decisions with the Member States and Parliament. The operating model of EC was originally based on Administrative Power that further evolved in 2000 to Management Power. However this type of power was not geared up to anticipate and respond to the new challenges the EU is facing: adapting our economies to the volatility of globalisation and digitalisation (1995), controlling the instability of the Euro system (2000), managing the complexity of the enlargement of the EU (2004) and the uncertainty of the financial crisis (2008).



A Need for New Leadership

In the light of those results, the need for evolution at EC is clear and the new Commission under the leadership of Mr Juncker has initiated the move by establishing a new form of power: the Leadership Power. It focuses on the political agenda, a vision for Europe, environmental sustainability and a new governance structure for EC.

The Inherent Risk Aversion

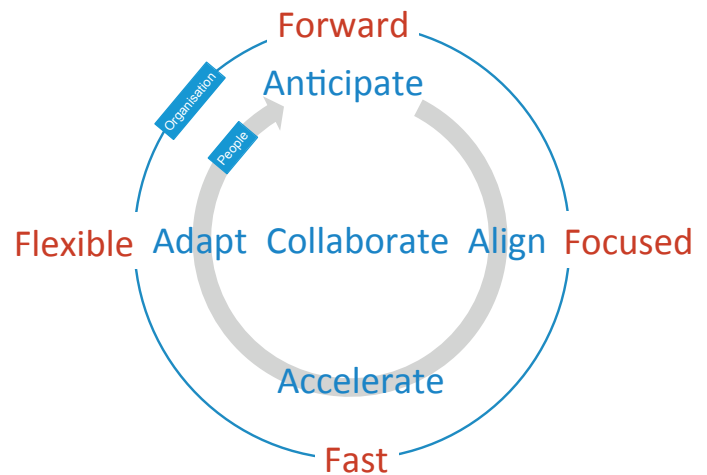
The challenge of this evolution towards a new type of power lies in the risk-aversion of the EC organisation. Implementing this new form of power, i.e. Power as Leadership, depends on how the College will be able to collectively engage the DGs towards the new agenda and on how it will align current processes to deliver better performance. Whatever would be the level of engagement of the new DG-DIRs, it will remain very challenging to re-engage actively disengaged employees. Despite the fact that this Power as Leadership was successfully used in the private sector from 1990-2000's, and it could today not be sufficient for weathering a Volatile, Uncertain, Complex and Ambiguous environment, and it will be necessary to innovate in Power as Agile Leadership.

Agile Leadership Power

Alternatively, in order to anticipate and to respond better to fast changing expectations from the citizens and to re-engage its staff, EC has the opportunity to engage into its transformation to Agility, a smooth evolution from the current Management Power towards an Agile Leadership Power. This Agile Leadership Power develops organisational capabilities as:

- 1) Anticipation / Forward thinking: the ability to imagine possible scenarios and to develop readiness.
- 2) Alignment / Focus: the ability to leverage and to engage internal and external knowledge and resources to enhance the mission.
- 3) Adaptation / Flexible: the ability to adjust and to meet changing requirements.
- 4) Acceleration / Fast: the ability to recognize and to respond with the requisite velocity to new circumstances.

Those four capabilities are harvested in a collaborative network (which already exists at EC in the form of Participatory Leadership).



Liberate Mental Agility

The aversion for risk is deeply engrained at EC, and the main beliefs supporting this aversion are: “our necessary structural complexity can’t change, because it prevents being expose to risk”, “we can’t measure our performance because of the complexity of the impact”, “the absence of “customers” that provide incentives for the private sector to take risks or innovate, is an excuse for EC impossibility to change” ... (senior managers quotes)

We consider this at the opposite of how EC should be managed to respond to the current and upcoming challenges that will require even more Agility.

3 WHAT MAKES EC RIGID?

A Systemic View of EC

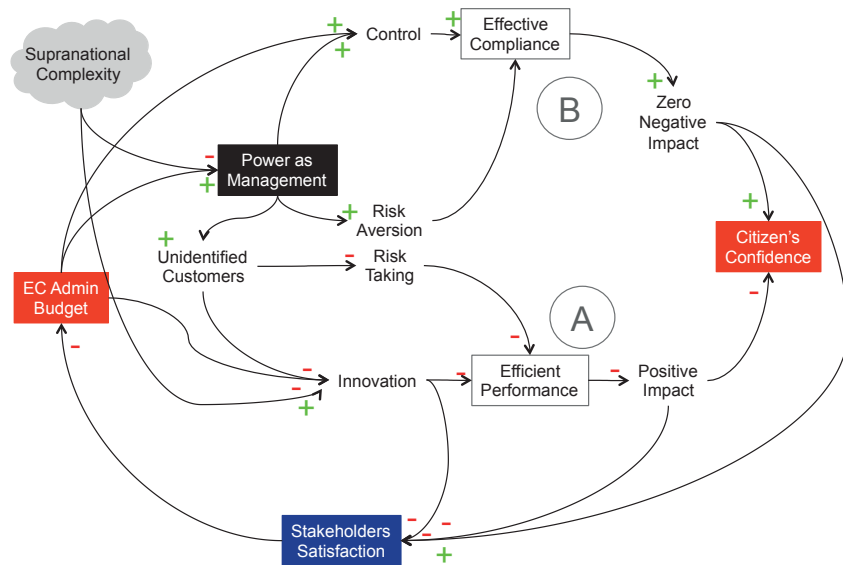
At the root of the systemic analysis, we identify the critical specificity of EC, which is being the worldwide unique supranational administration, reaching the highest level of complexity an organisation could be at.

In the graph below, the positive signs (+) shown in green mean reinforcement, a negative (-) red sign means a reduction. The graph is to be read starting from “Citizen’s Confidence”, and going upwards through the two paths as Positive Impact and as Zero Negative Impact.

The challenge of EC executive leaders is to balance the two paths (A/B) that create EU Citizen’s confidence and trust.

The first one (A) is aimed at generating a positive impact on EU citizens, which is to bring value to them, to improve their living standard.

The second path (B) is to generate an image of integrity, which fundamentally aims at keeping the minimum of negative image. The negative impact here is driven by any political issue, any ethical misconduct that may be relayed by medias, and which will trigger a negative appreciation of the EC by EU citizens.



The first path of generating a positive impact goes with the delivery of effective and measurable performance. It shall be reached by primarily developing a sense of innovation in the practices of EC, but also by encouraging technical and professional risk taking among staff. In order to promote these aspects and behaviours, the major obstacles to overcome are that EC does not have a clear understanding of its customers and that the management type of EC remains based on power as management. The second path, that is related to reach total compliance with no deviation, is achieved with the controls put in place as the type of Power as Management, still in place.

The solution to this ambiguous challenge is probably in the right balanced allocation of the budget to improve innovation, risk taking and suppressed non-value added control. Ultimately, the formal development of a new form of power such Agile Leadership Power, will have the intention to identify and care about customer’s expectation.

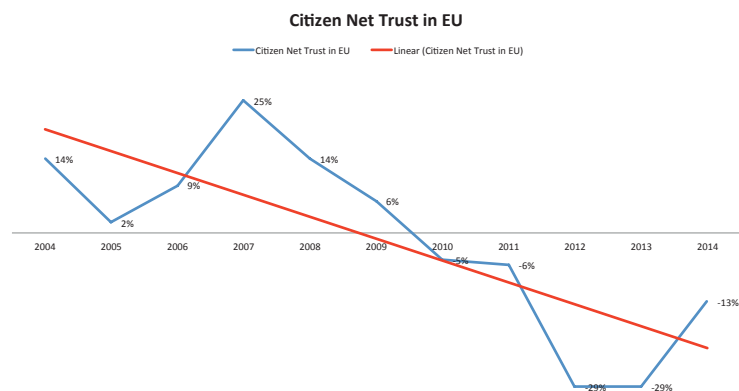
As EC is ranking at the top of the organisation complexity, as a supranational public organisation with multiple stakeholders, multiple cultures and languages, it is commonly admitted that outside experts neither can understand this complexity nor provide paths to improvement. We strongly advocate for the opposite proposition: an evolution at EC will only be possible with the support of external experts that bring a simple solution to master this complexity, just as Agility is made for.

Citizen Centricity vs. Stakeholders' Satisfaction

EC is rigid, because it lacks of customer centricity and legitimacy.

At EC, there is no clear identification of the final beneficiary of the organisation output. Of course, it is well understood that improving welfare and living conditions to the 507 Million European citizens is the target, but as there is only little interaction with them, they do not fit at the centre of the EC organisation concerns. In clear, the 507 Million EU citizens are not at the centre of every day work at EC.

Rather than a straightforward identification of its “customers” (the people who are benefiting directly from all of its actions), EC identifies a set of key stakeholders. Among them, which also include influential politicians, lobbies and medias, the focus in terms of output is set on Member State representatives. The evaluation and appreciation of the proposal made is often not related to the quality and effort put into the proposal, but related to a compromise between multiple stakeholders’ interests. Consequently, EC staff questions the purpose of their dedicated efforts to produce the best regulations, knowing that for political reasons, many of the proposals endure a risk of rejection, triggering a burdensome cycle of review.



EC could better work with stakeholders and citizens on a more systemic analysis of the measurable impacts and their evaluation. The way the impact assessment and measurement is done (even in the “better regulation package”) could benefit significantly from an Agile approach with iterative and incremental evaluation of the expectations of the stakeholders and citizens. This improvement would enable to early commit the Stakeholders in the design of the proposal with EC and therefore reduce the risk of rejection, get outcomes of the outputs and speed-up the political process. At the end minimize frustrations and burden for staff.

Risk as Excuse for Lack of Results

EC is rigid, because controls have become its critical path to sustain in a more demanding environment.

In the context of lack of alignment among stakeholders of EC, and of the difficulty to deliver measurable Public Service performance, the focus is put on guaranteeing very high standards of integrity in relation to personnel behaviour. It is commonly accepted among high executives at EC that what keeps EC alive in these turbulent times is the integrity level that was successfully built. Employees now develop themselves in a work environment that is driven by controls. Their first duty is Compliance rather than Performance. A low level of activity or production is better than taking risks.

Eradicating risk (political risk, wrong doings whatever they may be, which could be identified and raised by media) at EC is the first objective. The path, which has been chosen to eradicate risk, is through endless and day-by-day increasing controls. Another path could have been chosen, which is to build trust with employees, and to let them act and behave within the frame, enforcing exemplary sanctions in case of breach of this trust. For employees, the fear of involuntary wrong doings becomes the major concern.

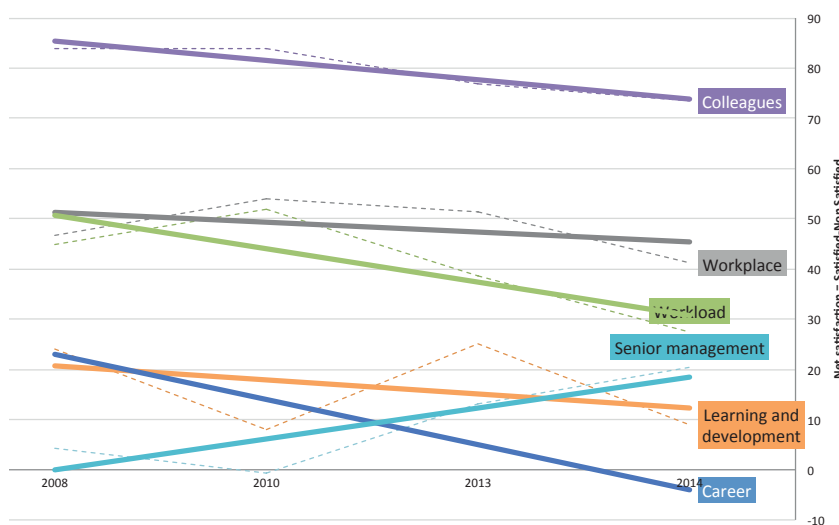
However, as there is no option to non-compliance of the ethical aspect, the right to fail on the technical aspect of the job should be recognised. This is a well-recognised management practice, which is not enforced at EC. This is a foundation stone to any organisation striving for continuous performance improvement.

Power as Management Doesn't Fit to Changing Environment

EC is rigid, because it does not question how its management principles fit to the environment.

The end of year 2014 survey among EC employees has shown concerns. Surprisingly some senior managers are able to find excuses, benchmarks and interpretations to ignore this strong signal. As in any other organisation, the main cause of employee disengagement lies in the type of power.

Employees Net Satisfaction Trends



Most of the indicators of the survey show a negative trend and very low values (in net satisfaction). In such situation, the root cause is always the Leadership and the Management, and the ability to evolve from an un-appropriate form of power to an ad-hoc power.

The good news is:

- EC Executive leaders are demonstrating the will to appoint more appropriate leaders and evolve leadership, curbing the political influence on the nominations.
- The EC employees are willing to see the management system evolve, in order to effectively contribute to the happiness of EU citizen and good readiness to change compare to other organisation.

Status Quo on Rigidity or Evolution towards Agility?

Rigidity at EC has developed due to the combination and addition of the four above described factors, as: performance measurement, political risk mitigation, type of power as management and reluctance to accept outsider opinions. We observed that a negative system dynamics is in place and self-sustain the trend to more rigidity and less engagement and results.

How could EC maintain such a level of rigidity, while many national public services are evolving towards agility? Few fundamental values are needed at leadership level to enable the shift: Curiosity, Collaboration and Courage.

4 HOW TO EVOLVE TOWARDS AGILITY AT MITIGATED RISK?

To ensure a smooth evolution towards agility, EC has already set-up fundamentals:

- A clear and focused Work Program defining scope, objectives, priorities,
- A refined policy and regulatory framework, with better boundaries between public-private and a new set of policy intervention tools with Better Regulations tool box,
- A core group of 1500 Participatory Leaders,

The missing part is the improvement of the delivery of the public services in the new framework, which covers:

- Better Performance management,
- Productivity increase,
- Costs reductions.

The Way to Improve Creates Risk

The way to improve is a fundamental factor of risk and risk perception. Due to the complexity of EC, choosing traditional change management or project management will increase risk of failure of the improvement program. The way the Strategic Program portfolio is managed is also a risk to the improvement program because any change in priority and budgeting would impact the improvement program.

Agility Mitigates Risk

Choosing an Agile transformation approach to improve performance and productivity will enable to deal in iterative and incremental way with the inherent complexity and the continuous change of requirements. Therefore an Agile transformation will first reduce the risk of failure of improvement, and then liberate innovation and courage to adapt and accelerate.

The Desire for Agility vs. Risk Controlled Environment

The first pre-condition for agility is that change has to begin at the top. EC leaders must desire change, which has been loudly expressed by the VPs. However it's critically important to "authorize failure" and, to encourage formally a risk controlled environment that will liberate the desire for agility at the staff.

Isolate from any Political Risk

We can limit the risk by leading the agile transformation of first instance initiatives out of direct exposure to Member States or Medias. The selected DGs shall be able to initiate the first Agile practice without the pressure from the outside World. After successful implementation, the "Agilisation" of the organization should lead to the delivery of value, gradually more exposed to the political environment.

Respect Prudential Governance and Aligned Vision

The highest levels of the EC shall support a selection of volunteers. The appropriate Commissioners and VP are likely to be key to change and encourage a culture where mistakes are acceptable, as long as the professional judgment and ethics are used in the decision-making process. A correct alignment on the vision and value should be set at all impacted levels of the organization dealing with Agile Operations. Financial/budget procedures and mandatory governance principles shall be applied in an efficient manner.

Secure the Perimeter of Agile Operations in the Organization

The volunteers represent a limited group of people, disconnected from the rest of the organization structure, working on small incremental deliveries during short iterations. We limit extensively the risk of impact in case of unsuccessful trial.

When a satisfying value has been delivered at the end of iterations, it will be possible to evolve towards the propagation of the Agile practice and mind-set with tested successful results.

The co-design of such iterative and incremental transformation has to involve a large group of participatory leaders to engage a DG wide conversation.

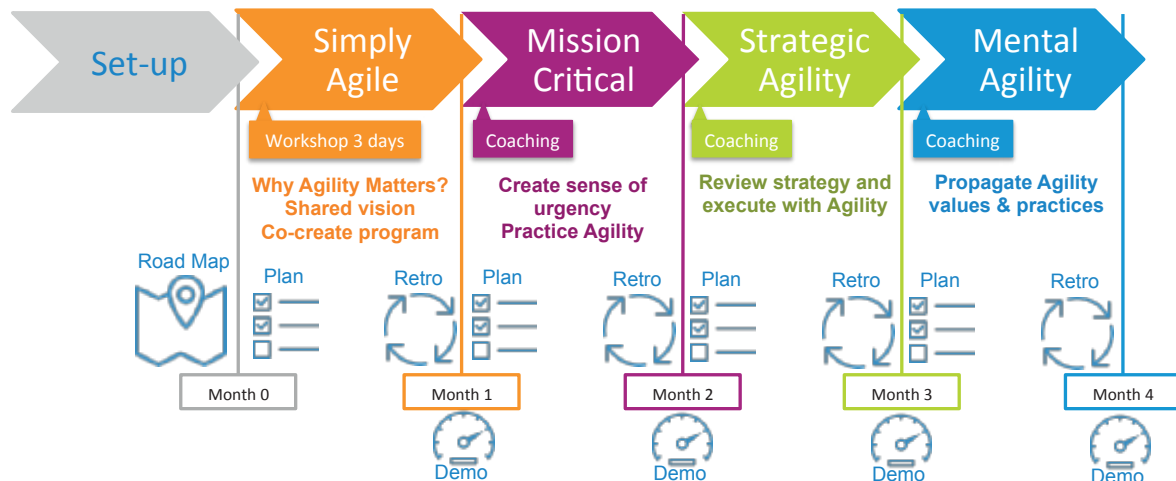
We then secure the environment before spreading the successful practice at a larger scale.

Typically we could turn around a complete DG into Agile way of working, just by changing the way the DG interfaces with its stakeholders, without impacting the other DGs.



Agile Leadership Labs

The group of volunteers will form an Agile team and be exposed to a on-the-job Agility Labs program, where cadenced workshops, synchronizations, field applications, demonstrations and retrospectives, under the supervision of an Agile Coaches will enable to grow Agile Leadership competencies in 120 days. During this period, the Agile Team will learn frequently from mistakes and will become performing after 5 iterations of 3 weeks.



Better Performance Management

One of the first priorities of the Agile team will be to co-design with its stakeholders the measure of the performance with Direct, Indirect and Induced impact, mapping the causality between the spending and the results. This will also help the stakeholders to clarify their expectations. This step will need multiple iterations and be subject to adaptation on the way but it is the only way to insure stakeholder's satisfaction.

Better Productivity

The second priority of the Agile team will be to focus on improving the flows of the main outputs related to the stakeholders' expectations. The main objective is to reduce the "time to market". The improvement will be done by iterations, involving the stakeholders at critical moments to ensure a clear understanding of the inputs and changes and how this is linked to the outputs. The participatory leaders will liberate creativity and benchmarking to ensure the Agile team is properly challenged.

Lower Costs

The third priority of the Agile team will be to reduce the waste and optimize the outsourcing and purchasing. The improvement will be done by iterations involving partners. The intention is to suppress non-value added activities (ie: administrative control) and to increase the fluidity of the scalable resources with more efficient budget and fraud control.

Better Employees Engagement

Through the collaborative and iterative approach Agility connects and cares of the employees, secures incremental value delivery, provides meaningful purpose and focus, lets team self-organize, enables frequent learning and measures leading indicators of satisfaction. Those practices reinforce the feeling of relationship, security, contribution, autonomy and growth.

TOP 5 PRACTICES



5 HOW WILL AGILITY ENHANCE PERFORMANCE AND SATISFACTION @DG?

The Agility approach will enhance performance and satisfaction at a DG level through 5 dimensions:

1. Public Service performance
2. Project Risk management
3. Public Employment performance
4. Employees results
5. Society results

Public Service Performance

By nature, Agile Operation is iterative and controls frequently the changing expectations of the stakeholders while insuring continuous delivery of demonstrated value. By implementing Agile Management we transform “stock of regulations”, “stock of translations” into flows of delivered value to stakeholders. Turning stocks into flows reduces cycle time by 20-30%, while increasing quality of the deliverables and customer’s satisfaction through better interaction and care. The productivity is improved by 20-30% by reducing the cost of waste.

Project Risk Management

As Agile Operation the project risk is reduced significantly (failure rate is 17%), thanks to the resource driven (not scope driven) incremental process, avoiding off-track delivery and budget. This also applies to Agile Transformation project itself.

Public Employment Performance

As Agile Operation is incremental value driven, the performance of the employee is firstly seen as a team performance. Then the team itself could easily assess the level of collaboration, contribution and mobility at the individual level. This will be sufficient to determine fair promotion and reward.

Employees Results

Because Agile operation changes the way of working by frequent collaboration, short iterations, value focused priorities, self-organised teamwork, continuous learning and improvement, the morale and engagement of the team increases in 80% of the cases.

Society Results

As Agile Operation is citizen centric, the performance should be evaluated in circles of direct, indirect, induced causal impacts. Therefore the scorecard is determined with reference to needs, with the basic depiction of who needs to be reached, what changes we need to see, a basic chain of expected results, and why these make a difference to the mission. The performance is measured incrementally across the impact circles and over the time, and technology can help to get quick feedbacks.



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66. Tree of Trust – Trust building, a priority for European institutions. ⁶⁶

New tools for modern management. Here is a scalable set of approaches as relevant in Africa as in Europe.

While trust has long been perceived as a core political, economic, and social value, it has not so far been viewed as a strategic priority directly impacting peace, political stability, human development and economic growth. Trust has also not been identified as a core leadership and management skill, specifically reinforcing corporate or institutional performance. Trust remains as more of an incantation than a reality. Some reasons for such a situation are that trust has been perceived as a "soft", subjective concept, difficult to quantify. To change such a perception, the following questions had to be addressed:

- ***Trust, from incantation to action***

- What are the main practical factors and behaviours that generate trust or distrust?
- How does one measure and analyse "soft skills" trust factors, and establish an objective "Trust/Distrust" diagnosis?
- How are such diagnostic methods and tools applied to impact concrete political, institutional, or corporate challenges?

The Paris-based think tank *Institut Confiances*, after 2 years of research, developed a model of the 7 key factors generating trust or distrust at the individual, corporate, institutional, regional or global levels: The "Tree of Trust".

The 7 Trust factors in brief

1. Consistency between words and actions, legibility, compliance with the "rules of the game". Lack of consistency between words and actions, deficit of transparency, non-compliance with the "rules of the game" are some of the main criticisms made against political leaders, CEO's of large companies, and senior management. They are not often perceived as managing in the best interest of their employees, their customers, their people, but rather in their own interest, having in mind their own career. Among reasons for such perception, is a "misalignment" between their words and their behaviour or actions. Such alignment is an essential pillar of credibility, ethics and trust. Conversely, misalignment generates quasi-automatically suspicion and mistrust, even giving substance to extremist ideologies. It is therefore urgent to work,

at the highest level, on key questions such as “How and how much should we be genuine in communicating our intentions?”

2. Acceptance of failure, trial and error. Acceptance of failure and trial-and-error is key to leadership, performance, and innovation. It greatly varies among countries, cultures, and education. Explicit acceptance of failure, trial and error reinforces the ability for a leader to generate precious bottom-up feedback from his team, including bad news and difficulties. Low acceptance reinforces individualism, lack of candidness. It also negatively impacts other trust factors such as co-responsibility and cooperation, acceptance of uncertainty, risk and complexity, or even kindness and tolerance.
3. Acceptance of uncertainty, risk, and complexity. When facing uncertainty, risk, and complexity, institutions often react by reinforcing controlling, reporting, adding always more indicators. This generates among staff, corporations, and citizens a feeling of disempowerment, lack of accountability, and frustration. The nature of controlling needs to be addressed. In particular, a move from “*ex ante*” to “*ex post*” evaluation criteria represents a major cultural change and managerial challenge. It also creates opportunities for considerable financial savings and competitiveness.



4. Empathy, kindness, recognition, tolerance. In our societies, kindness is still often perceived as a sign of weakness, of naiveté. To achieve high-performance, a manager should be “tough”, not express excessive warmth. Competitiveness therefore does not easily match with empathy, recognition and tolerance. Empathy may also be perceived as a risk of mixing one own feelings with his/her counterpart’s, of demonstrating a lack of neutrality and objectivity. How should one overcome such beliefs, and reconcile kindness with performance, empathy with results?

5. Co-responsibility, cooperation, emulation. The notion of “co-responsibility” is rarely debated, compared with other principles such as collective intelligence, partnership, transverse management. It means that most actions someone takes in his/her personal or professional life, have consequence on others. On a cursor, co-responsibility is equidistant from “disempowerment”, and “individual accountability”.
6. Timescale, putting in perspective, willingness to not obliterate the long term for the short term. Related to trust, timescale should be analysed in two meanings of the word: 1) Consistency between the present and the future, between short-term decisions and long-term projects; 2) Relations between the present and the past, including notions such as “memories” and “forgiveness”. How could I “forget” someone who betrayed me? Could I forgive him? Applied to the corporate environment, how to establish a cooperative professional climate after the merger of two organizations, when they competed with each other for years? More generally, how to overcome a historical distrust to shape a common History?
7. Independence of judgement when facing conflicts of interest or values. In multi-cultural institutions, the question of conflicts of values represents a major trust challenge. For example, some cultures and educations favour collective and cooperative behaviours, when others reward individual effort and performance. Some cultures and legal systems consider lying as a “sin”, and punish it badly, when others are more tolerant towards a lie. When managing a group of employees raised in such different backgrounds, how to find the right balance? How to take advantage of such diversity of values to set common goals, shared objectives, and team motivation?

- ***Applying the Tree of Trust model to key political, economic, and managerial stakes***

Since 2014, the Tree of Trust model has been applied to key political, economic and managerial stakes, with the support of large public institutions and companies.

- The “Trust Barometer”, to reinforce Leadership and Managerial Performance (see appendix 1, page 5)
- The French postal service “La Poste” decided to help senior managers self-evaluate their ability to generate trust in their management style. Feedback was discussed during individual and collective coaching sessions.
- Trust in Public Governance: On-going experience in Guinea-Bissau
- The World Bank Group launched in Guinea-Bissau a project aimed at reinforcing trust in the governance of the country, at the Government level, in a context of peacebuilding, human development and economic growth.
- Trust/Distrust as key factors in the Prevention of Jihadist Radicalism
- The French Ministry of Interior and Val d'Oise local administration (Paris region) launched a research project, to 1) help detect, among fragile youngsters and families, the level and nature of social distrust, likely to grow into radicalism, and 2) help professionals adjust appropriate strategies accordingly.
- Other public policies issues related to Trust/Distrust are under discussion
- “Reinforcing trust relations between job seekers, public employment services, and employers”; “Reinforcing trust between bankers and entrepreneurs to improve SME’s financing”; launching in Guinea-Bissau the first “Global Trust Index” to measure trust in all its dimensions, at a country level.

- ***What the model says and does***

Developing the Tree of Trust model and implementing it led to the following analysis:

- “Trust” or “Distrust” are too much of a global concept to allow for a precise diagnosis and strategy. They need to be divided into specific contributing factors, behaviours - the 7 “habitus” of the Tree - to expect a subtle understanding of the real challenges, and identify concrete areas of improvement.
- Once key factors to focus on are identified, it is critical to understand in-depth sources of distrust at individual, collective, institutional or global level. These dimensions, which lay in the “roots” of the Tree, are often not identified, not discussed, unconscious, or even the source of a collective denial: Beliefs, values, mental representations, fears, heritage, history(ies). They need to be “extracted from the roots” and discussed in a structured manner.
- The 7 areas in the Tree are, in most situations, intimately intricate and correlated. To improve any one of the factors, it is necessary to work on one or several others. Defining a trust strategy therefore requires a systemic approach.
- To expect improving trust with an external public - citizens, recipients, clients, media... - it is critical to, at first, reinforce trust with internal publics – executives, agents, employees, union representatives.... Internal and external trust are intimately correlated.

The Tree of Trust model is universal. Its 7 factors are as relevant in Europe as they are in Africa; in major public institutions as in small companies; at individual level as in small teams or large groups; applied to internal management issues as to public policies; geared towards highly-educated people as well as individuals with little or no education. Reversely, what is totally project-specific and needs to be adapted to each context, place, people, is the content of the “roots of the Tree” (beliefs, values, ...).

To expect improving trust at all levels of an institution, organizing conferences and seminars may help in an early phase to raise awareness, but is not sufficient. Specific tools (such as the Trust Barometer) and “train the trainer” programs need to be deployed to facilitate leverage, scaling-up of concepts and methods and reinforce ownership.

67. 21st Century Policy Making: Modelling

Today's top people grew up with models that were abstruse, un-provable and fed with outdated statistics. We have yet to awaken to the easy and real-time models of the data age. We urgently need to take a step forward.

There remains too much variation around EU policy-makers' valuations of modelling as a necessary tool, as well as around the strong life cases and the pitfalls to watch.

- ***What will be the benefit of successful action?***

By quantifying the impacts of policies, models confront qualitative evidence and beliefs with data. As a result models can bring proportions to the policy debate and improve the results by forcing policy actors to make uncertainties more explicit, as well as by bringing out clashes of beliefs.

Models are sometimes criticized for being inaccurate, but models cannot propose 100% accurate predictions. A good model does not reveal 'the answer'. Rather successful modelling sheds light on the uncertainties that matter most – either the 'known' unknowns of different possible futures or the unknown unknowns that the model cannot account for. The value of models resides in the understanding of the processes that are factored into the model. Understanding causal relations among variables and which variables matter the most will help policy makers to prioritise and decide on areas where further iterations are needed.

"Big data" from digital sources undoubtedly holds a huge potential for policy makers for example through the development of new algorithms for new types of analysis, which can motivate and enable the design of new or improved models. However, healthy scepticism should be applied to any analysis that is not testing a pre-defined hypothesis. Big data techniques will inevitably reveal new correlations and insights. Some of these will be counter-intuitive, but true and hugely valuable. Others will be spurious.

- ***What are the preconditions of success?***

Models should not be more complex than they have to be. First, over-complicated models increase the risk of error due to their complexity. Second, it is more difficult to build credibility, if a policy maker cannot communicate the mechanics and outputs of a model in simple terms.

Policy makers should exploit the strengths of different modelling approaches such as econometric, general equilibrium, and input-output models by using them in combination as appropriate for the issue at hand. The European Fund for Strategic Investments (EFSI), for example, is expected to unlock 315 billion euro of investments. The overall impact on GDP and employment can be estimated using a general equilibrium macroeconomic model such as the Commission's QUEST III model. This analysis can then be deepened with further analysis of the regional and sectoral impacts using models such as the Commission's regional RHOMOLO model, the GEM-E3 model for the impact on emissions, the TRANSTOOLS model for the impact on transport as well as input-output analysis.

Policy makers should work together with modellers throughout the process to ensure that expectations on both sides are set from the beginning. P

Policy makers should insist on open models, because transparency allows them access to quality assurance by a wider pool of expertise. Furthermore, policy makers need to recognise that modelling is a long term learning effort implying building relationships between policy makers and the scientific community, to incrementally improve models and their use over time.

Policy makers should remember that human behaviour is harder to model than natural phenomena. One particular problem is for example that publicly stating assumptions about human behaviour will in themselves influence that behaviour, leaving models constantly playing catch up.

- ***What is being done and who needs to do more now?***

The availability of "big data" in real time is an opportunity for developing improved models and new types of data analysis, and big data should be made available to policy makers. The quality of big data needs to be assured in order to be used correctly.

Model acceptance and use would benefit from more "gamification" of models, whereby models are made available to policy makers as web based applications with user-friendly interfaces. This allows users to build their own scenarios of future developments thus allowing a better dialogue on the relevant trade-offs and options and scenarios⁶⁷.

The Commission is improving its coordination on the use and development of models, but it is also necessary to look at the track record of using models and data in the Commission and the Member States and to involve the modelling community. Issues that need to be decided are the appropriate amount of effort to invest and which areas to be covered? The use of new types of "data hungry" models such as agent-based models, which may be useful to analyse for example food labelling and cyber behaviour could be explored.

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- Thanks also to the participants of two roundtables on "modelling in government" held at the University of Cambridge on the 14 November 2014 and 26 February 2015

67 See, for example, The UK Department of Energy's "[2050 energy calculator](#)"

Quotations

This is a short set of quotations that have inspired me in the last year of study.

- ***Quotations for innovators***

"The more we think about how to harvest the technology revolution, the more we will ... have an opportunity to shape the revolution in a manner that improves the state of the world"

(Klaus Schwab)

"Embrace the future, hold fast to your values"

(Dalai Lama)

"When institutions and attitudes reward attention to the future, to investment and innovation, societies become much more effective in navigating change"

(Geoff Mulgan)

"Innovation depends on creativity but few ideas emerge fully formed...Thinking and trial and error contribute to all kinds of innovation. This often happens through people trying out new ideas on a very small scale".

(Geoff Mulgan)

"The aristocracy of the intellect... is a belief which can only destroy the civilization that we know. We must not perish by the distance between people and government...that distance can only be closed if knowledge sits in the homes and heads of people with no ambition to control others, and not just up in the isolated seats of power".

(J. Bronowski, 1974)

"Knowledge is not a loose-leaf notebook of facts. It is a responsibility for the integrity of what we are as ethical creatures. You cannot maintain that informed integrity if you let other people run the world for you... We are nature's unique experiment to make the rational intelligence prove itself sounder than the reflex. Knowledge is our destiny. Self-knowledge, at least bringing together the experience of the arts and the explanations of science, awaits us".

(J. Bronowski)

"It is not the business of science to inherit the earth, but to inherit the moral imagination; because without that, man and beliefs and science will perish together".

(J. Bronowski)

"The ascent of man has never in history come to a stop. But the ascent of the young, the ascent of the talented, the ascent of the imaginative: that has become very halting at many times. Greek civilization fail by one test: (when) they limit the freedom of the imagination of the young".

(J. Bronowski)

- ***Quotations for Public Sector Managers***

"Bottom-up management: the difference between the pyramid and the plum tree"

(Gordon Mc Kenzie)

"The ideology of leadership [in] large-scale organisations today is as limiting to success as [was] feudalism in the middle ages".

(Gary Hamel)

"Leaders' fear to give up control trumps their ability to think, and they keep making decisions high up that would be better left to people lower in the hierarchy."

(Frédéric Laloux)

"A human experiences himself as something separated from the rest. This delusion is a kind of prison... our task must be into free ourselves from this prison by widening our circles of compassion to embrace all living creatures and the whole of nature in its beauty."

(Albert Einstein)

"Success, like happiness, cannot be pursued; it must ensue, and it only does so as the unintended side-effect of one's personal dedication to a cause greater than ourselves."

(Viktor Frankel)

"Job security...is a notion inspired by fear. It neglects the fundamental truth that everything changes, it dismisses the possibility that a person whose talents are wasted in an overstaffed organisation will find a better way to express his gifts where they are needed."

(Frédéric Laloux)

"We should be careful not to pursue goals that serve the organisation but not its purpose."

(Frédéric Laloux)

"Strategy can be full of deception and hubris. It can place too much faith in data, or analysis or models...Big machines work only because of small screws, and often the screws are skills, norms or cultures: which aren't immediately visible to the strategist looking down from a high."

(Geoff Mulgan)

"When knowledge is widely distributed, governments need to cultivate humility, and when power is widely distributed, they need to be collaborative not commander."

(Geoff Mulgan)

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I record here the names of our principal helpers in the last year. I cannot possibly have captured accurately the many sources of insight, and in particular have not reproduced the long lists of those whose contributions in sundry group discussions, private and public, have been the source of so much wisdom. I trust that anyone omitted will forgive me the unwitting error!

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Notes

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- cxv Franco and Marin, 2015.
- cxvi Cf European Risk Forum, Highlights Note 07, March 2016.
- cxvii See annexed article 53.
- cxviii See, for example, iwantgreatcare.com.
- cxix <http://datasmart.ash.harvard.edu/news/article/white-paper-regulation-the-internet-way-660>
- cxx See the annexed articles 41 to 58.
- cxxi Von Schomberg, 2011 and 2013.
- cxxii Cf the UK Deregulation Act 2015, 108 (1): regulators 'must...have regard to the desirability of promoting economic growth.'
- cxxiii Cf UK Regulatory Enforcement and Sanctions Act, 2008, Part 2. See annexed article 56.
- cxxiv See annexed article 57.
- cxxv <http://www.sfc.hk/web/EN/sfc-fintech-contact-point/>
- cxxvi Cf UK Regulatory Enforcement and Sanctions Act, 2008, Part 4.
- cxxvii European Commission, 2016d.
- cxxviii Directive 2007/46/EC of 5 Septmeber 2007.
- cxxix European Commission, 2016a.
- cxixx Most recently in the May 2016 conclusions of the Competitiveness and Research meetings of the Council of Ministers. See annexed article 14.
- cxixxi European Commission EPSC Note 7/2015.
- cxixxii See Sachwald, 2015, among other RISE papers,
- cxixxiii See annexed article 58.
- cxixxiv See annexed article 34.
- cxixxv Weber and Andrée, 2015. See annexed articles 27 to 33 and especially 27.
- cxixxvi Aho, 2014.
- cxixxvii Diamond, 2015.
- cxixxviii De Prato, Nepelski, and Piroli, 2015.
- cxixxix See annexed article 49.
- cxl Coutou, 2014.
- cxli Aho, 2014.
- cxlii Veugelers, 2016.
- cxliiii Clarke, 2012.
- cxliv The Wilson Report was fresh when the author began public service: it was not the first post-war call for patient capital in the Uk, and has had a worthy progeny of paper.
- cxlv Hughes, 2014.
- cxlvi Janeway, 2012..
- cxlvii Lipparini, Phillips, Addarii and Johar, 2015. Mazzucato, Penna, and Caetano, 2015.WEF, 2013.
- cxlviii European Commission, 2014a.
- cxlix OECD, 2015c.
- cl Mulgan, 2010.
- cli Sull, 2011.
- clii New and Castro, 2015.

NB: all links quoted above were checked and functioning as this text went to press, June 2016.

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