



Safeguarding infrastructure at sea



Blue Cluster takes full advantage of Flanders' location on the North Sea to implement a strategy for a competitive and sustainable blue economy



by achieving groundbreaking innovative partnerships



by providing access to state-of-the-art scientific knowledge



resulting in **sustainable economic activities in the North Sea and far beyond**



Maritime security innovation roadmap

RESILIENT and SECURE MARITIME INFRASTRUCTURE

Safeguarding

- energy supply and infrastructure
- communication networks
- maritime transport

in a dynamic geopolitical context, considering potential threats



30%

BE energy at sea in 2030

25HA

Energy Island

2

Port of Antwerp-Bruges 2nd largest EU port

302 M T/Y

goods transport through ports

OVERVIEW MAP



FISHING ALLOWED EVERYWHERE
WITH EXCEPTION OF THE OFFSHORE
WIND FARMS



SHIPPING ROUTES



ZONES FOR RENEWABLE
ENERGY



EXTRACTION AREAS



MARINE PROTECTED AREA
'VLAAMSE BANKEN'



MARINE PROTECTED AREA
'VLAKTE VAN DE RAAN'



ZONES FOR COMMERCIAL AND
INDUSTRIAL ACTIVITIES



BIRD PROTECTION AREAS



TEST ZONE FOR COASTAL DEFENSE



PORT
Zeebrugge

PORT
Ostend

DREDGING DUMPS



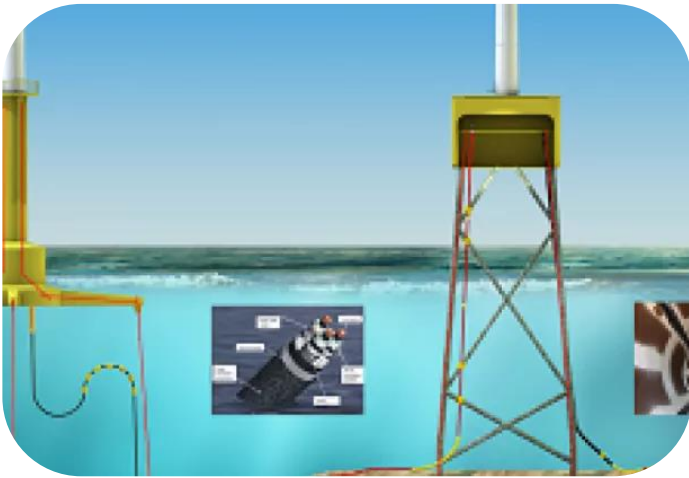
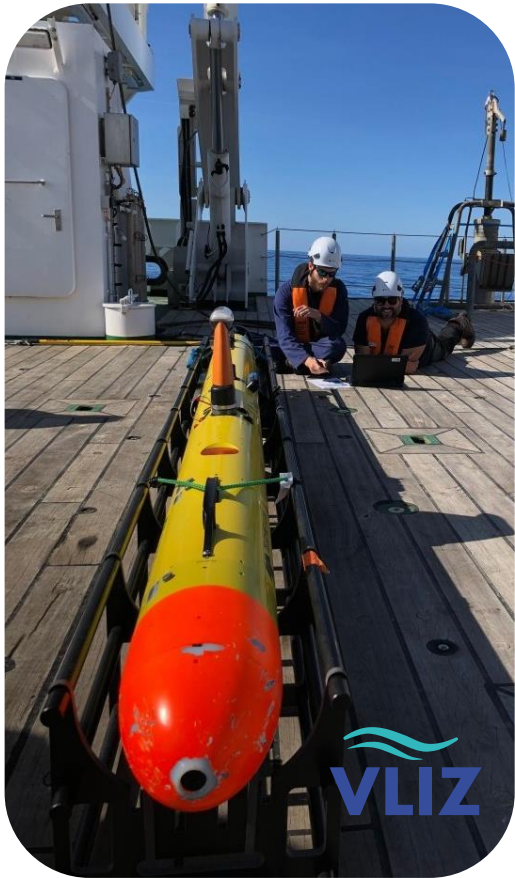
'PAARDENMARKT'



Nieuwpoort

The Netherlands

Projects | Blue Cluster



Innovation as an enabler

1. Monitoring

2. Data/Networks

3. Cyberresilience

4. Physical security

5. Cooperation



Monitoring

Continuous surveillance:

- above and below sea level
- drones and unmanned vessels
- Smart cameras
- Combination of sensors: acoustic-, radar-, laser, ... technologies

Detection of threats in harsh conditions

Situational awareness & understanding

- real-time monitoring, detection -> analysing & reaction





DATA/NETWORKS

- Automating data **collection** and **processing**
- Ensuring fast, reliable and **secure data usage** and **exchange**
- From awareness to intelligence & understanding
- AI and Machine learning
- Data **labelling** and **validation** to reduce false positives/negatives
- Network protection against **disruptions and attacks**





Cyberresilience

- IT/OT systemen
- End-to-end encryption, zero trust, AI & machine learning for anomaly detection
- Training & awareness

Sven Van Haelst - VLIZ





Physical security

- Traditional infrastructure & smart technologies
- Integrated sensors (sound, vibrations and movements) in harsh maritime environments, above and below water.
- Virtual security perimeters
 - acoustic & radar systems and fiber optics
 - smart buoys, light curtains and sonar fields
- Linking to immediate response mechanisms



Cooperation

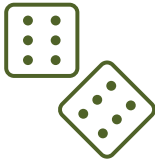
- Technology and information exchange (platforms) to support collaboration
- Shared dashboards
- Real time reporting & incident management
- Standardization, regulation, and international cooperation



Maritime security - securing infrastructure at sea



Operations at sea requires a new security approach



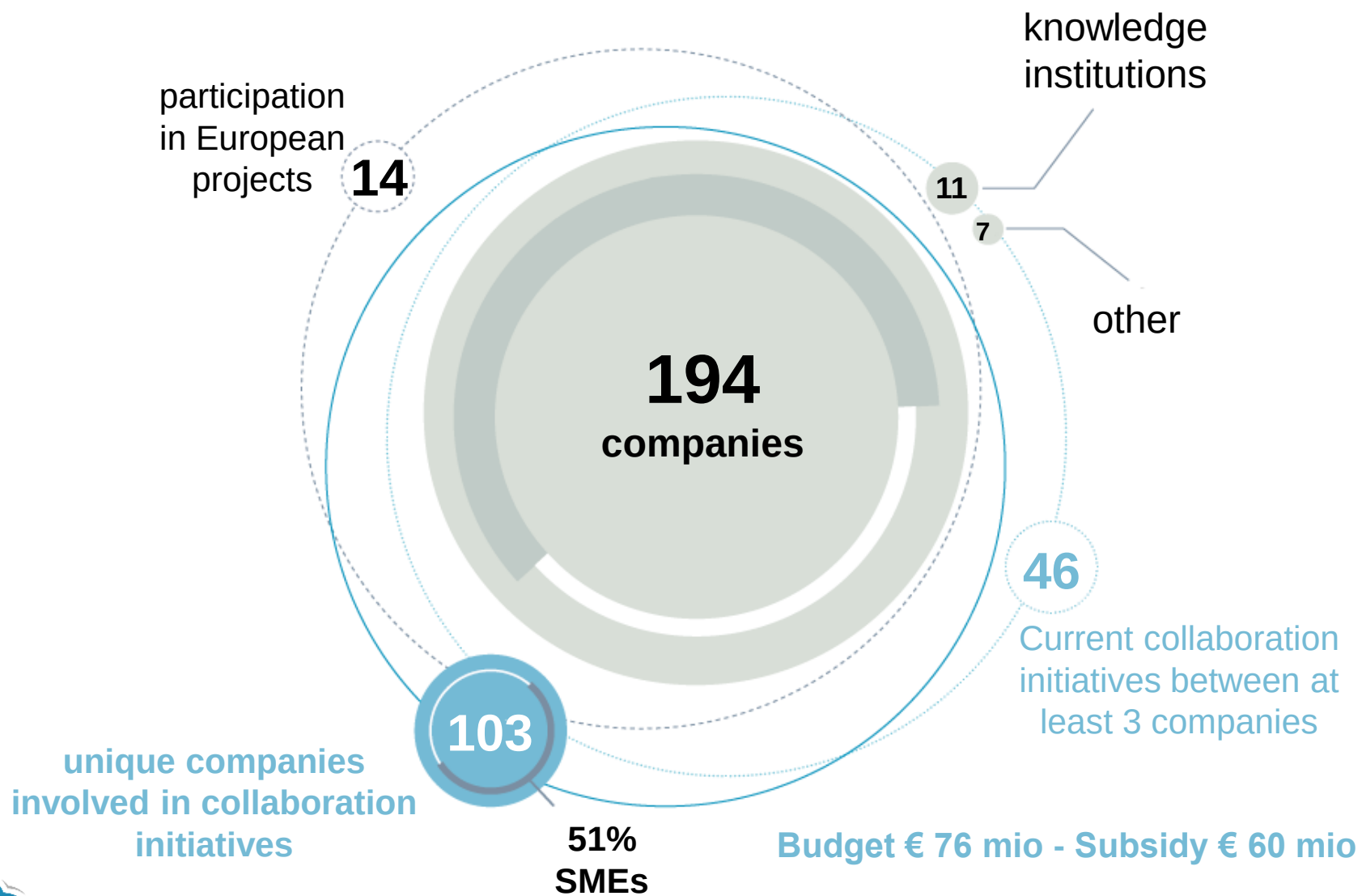
Emerging technologies present fresh opportunities



Cooperation & best practices will lead to innovation



Working together to conquer challenges



**REACH OUT,
COLLABORATE,
AND SUBMIT YOUR PROJECT IDEA!**



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We are Blue Cluster

