



CLARION: Building Climate-Resilient Ports for the Future

Climate change is no longer a distant challenge, it is already reshaping how ports operate across Europe. Rising sea levels, extreme weather events, and changing environmental conditions are putting increasing pressure on critical infrastructure and global supply chains. Against this backdrop, the [Port of Antwerp-Bruges](#) joined the European [CLARION](#) Project, a Horizon Europe initiative consisting of twenty partners. The consortium is led by Delft University of Technology and also includes other leading ports such as Rotterdam, Hamburg, and Constanța. Together, we are committed to shaping a sustainable future for the maritime sector by developing and implementing innovative climate adaptation solutions.

Why We Joined CLARION

As one of Europe's largest and most innovative ports, Port of Antwerp-Bruges is committed to future-proofing its infrastructure and operations. Climate change brings new risks: more frequent storms, rising sea levels, and unpredictable weather can disrupt port activities and threaten the smooth flow of goods. By joining CLARION, we can work with other leading ports and research institutions to find solutions that keep our port safe, reliable, and sustainable.

Participation in CLARION also fits with our mission and vision: to be a world port that creates sustainable added value as a lever for a resilient society. Our vision is to be a smart, safe, and climate-neutral world port, ready for the challenges of tomorrow. CLARION's collaborative approach aligns perfectly with our core values: innovation, sustainability, safety, and partnership. By joining CLARION, we anticipate climate risks, accelerate the transition to sustainable operations, and reinforce our role as a pioneer in sustainable port development.

Within CLARION, Port of Antwerp-Bruges participates in two pilot projects, working closely with two other Flemish organizations: [Brabo](#) and the [Antwerp Maritime Academy](#). Together, we are developing demo cases that tackle real-life operational and training challenges posed by climate risks:

Smart Monitoring for Stronger Infrastructure

The port's steel structures, such as quay walls and pipelines, are constantly exposed to water and weather, making them vulnerable to corrosion. In CLARION, we are deploying smart sensors and autonomous monitoring systems to detect early signs of rust and wear. This allows us to carry out maintenance before small issues become big problems, ensuring safer operations and extending the lifespan of our infrastructure. The International Maritime Academy brings its academic and practical expertise, ensuring that the outcomes of the pilots are rooted in both research and best-in-class maritime education.

Safe Mooring, Even in Extreme Weather

Storms can put moored ships at risk, especially roll-on/roll-off vessels that carry cars and trucks. Traditionally, extra tugboats are needed to keep ships safe during bad weather, which is costly and not always sustainable. Together with Brabo, we are testing innovative mooring systems that keep ships securely in place, even during storms. This not only improves safety for workers and cargo but also



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reduces costs and environmental impact. Brabo, renowned for its towage and mooring expertise, brings invaluable operational expertise to the project. Their involvement ensures that innovations like the shore tension system are practical, effective, and tailored to real-world conditions. Brabo's hands-on experience bridges the gap between technological development and daily port operations.

Our motivation to participate in CLARION is clear:

- **Innovation:** The project allows us to test and implement cutting-edge technologies that would be difficult to develop alone.
- **Collaboration:** By working with Brabo, the Antwerp Maritime Academy, and other European partners, we benefit from shared expertise and best practices.
- **Sustainability:** The solutions we develop help reduce our environmental footprint and support the transition to low-emission transport, in line with the European Green Deal.
- **Resilience:** By making our port infrastructure more robust, we ensure that Antwerp-Bruges remains a reliable gateway for trade, even as climate risks increase.

Our experience with CLARION so far has been positive. The project's collaborative approach has fostered strong partnerships and accelerated the adoption of new ideas. The pilot projects in Antwerp and Bruges are already delivering valuable insights, and the results are being shared with other ports to maximize impact across Europe.

Brabo's operational expertise has been essential in testing new mooring solutions, while the Antwerp Maritime Academy's research has strengthened our approach to infrastructure monitoring. Together, we are building a port that is not only ready for the challenges of today, but also for the uncertainties of tomorrow.

CLARION demonstrates the power of European cooperation. By joining forces, we can achieve more than any port could alone. Together, we can build a resilient, sustainable, and innovative port sector that benefits all of society.

For Port of Antwerp-Bruges, CLARION is more than just a project, it is a commitment to our mission, vision, and values. By investing in climate resilience and working with trusted partners like Brabo and the Antwerp Maritime Academy, we are shaping the future of European ports and setting a standard for others to follow.

Contact:

For more information about Port of Antwerp-Bruges and our commitment to sustainability and innovation, visit [Port of Antwerp-Bruges](#). For more information on the Clarion project, please visit the [website](#).

