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Monika Elend – NTU International

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Circular Economy Network of Ports (LOOP-Ports)

Circular Economy initiatives from across Europe

Monika Elend

Project Consultant

NTU INTERNATIONAL

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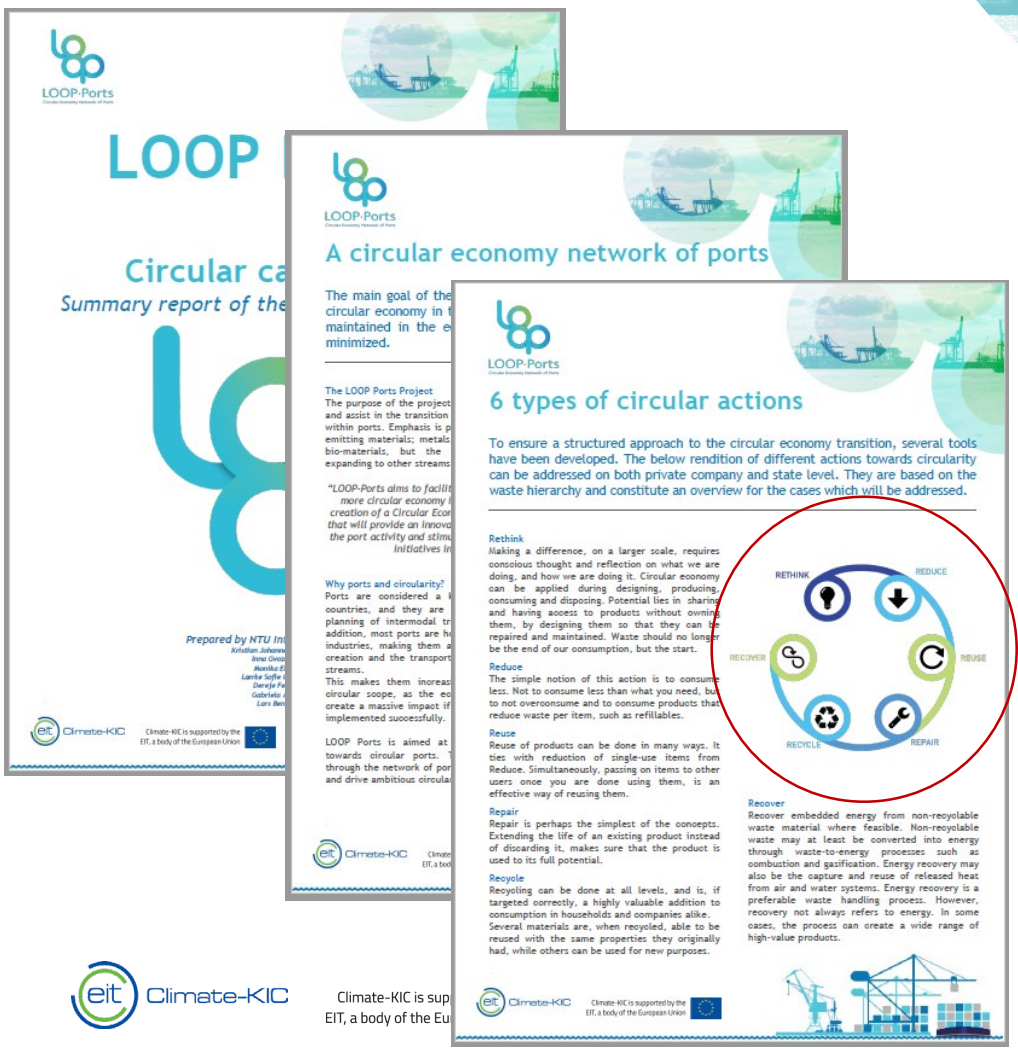

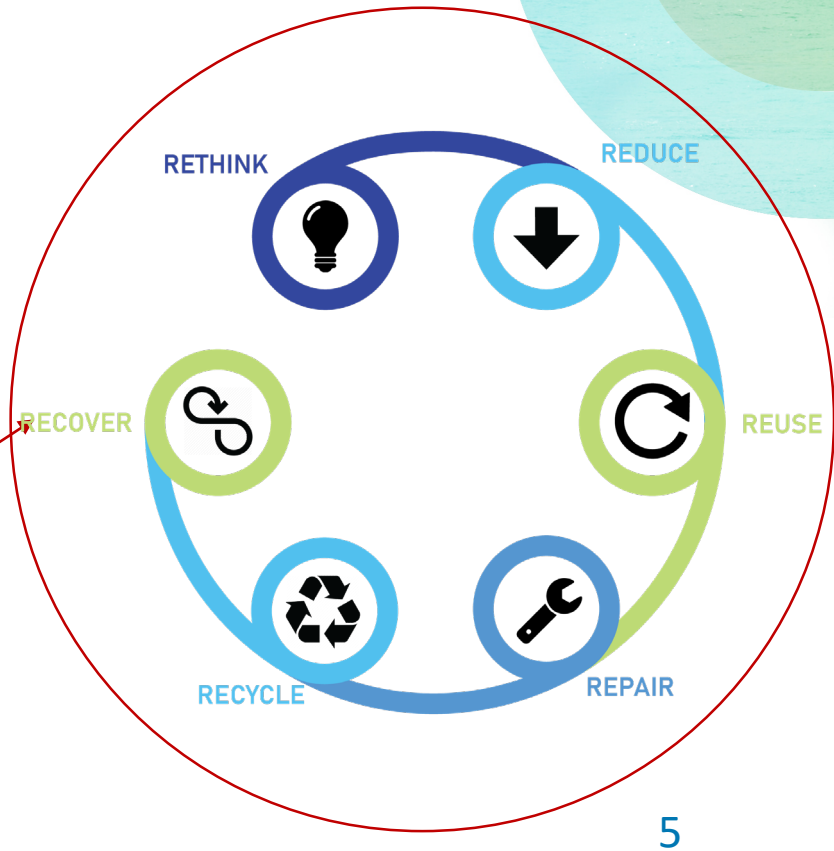

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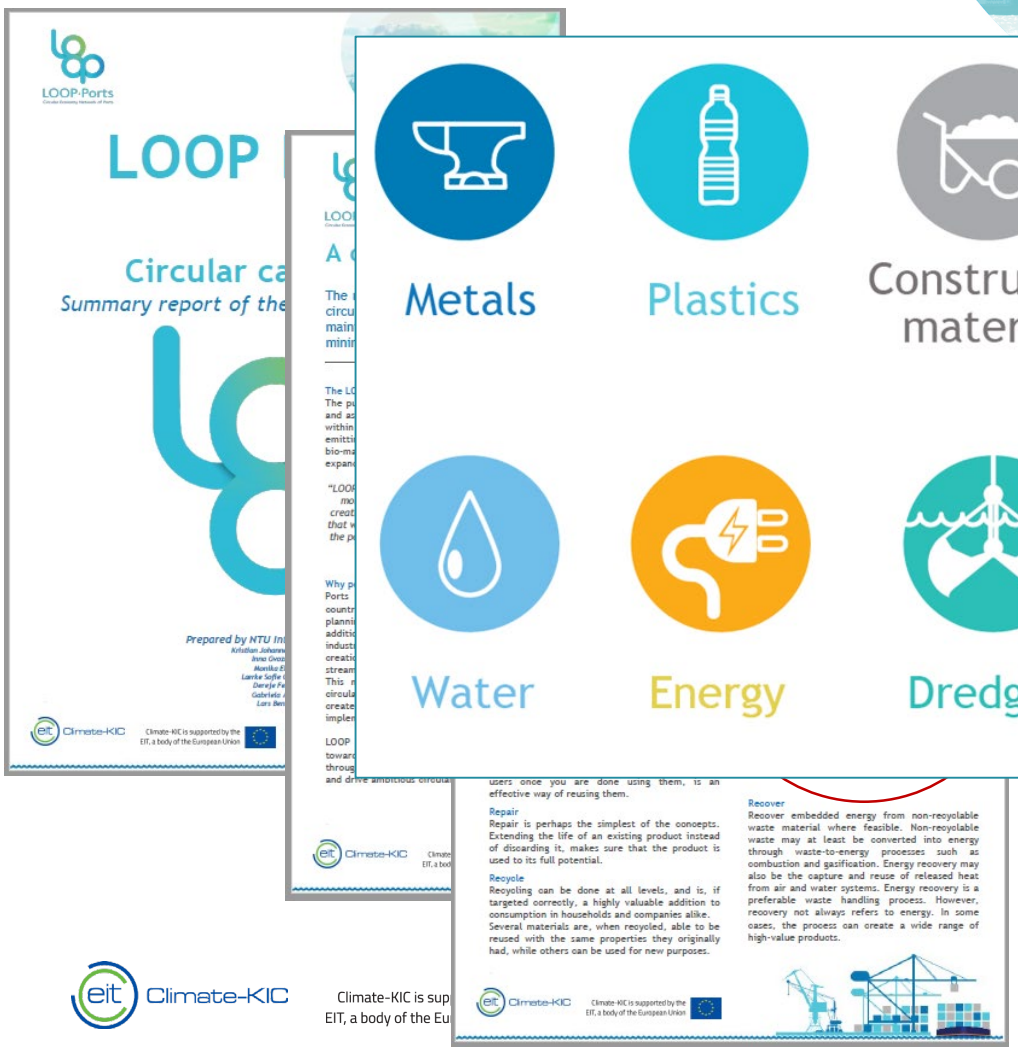

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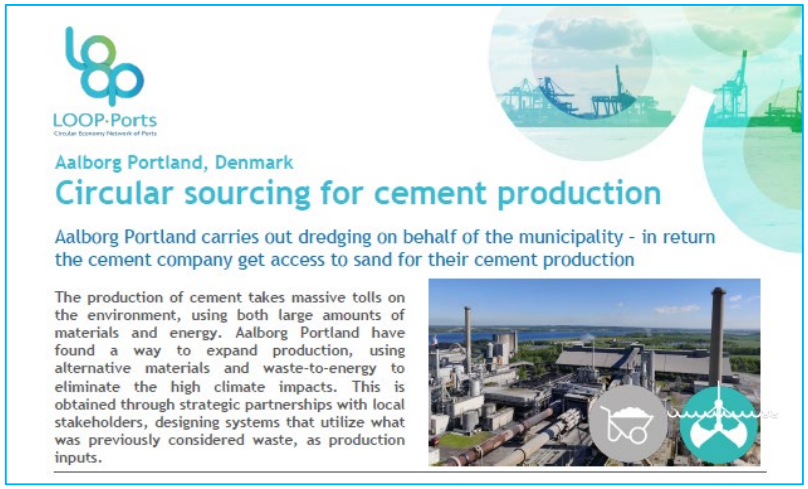

Using dredged material in cement production

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Replicability in other ports

- Dredging operations are being carried out across Europe
- Different ways of valorization and use of the material are available
- The right Legislation needed

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Port of Goro and Garibaldi, Italy

Plastics from aquacultural farms

In Italy, local stakeholders are developing approaches to ensure a sustainable production of mussels in farms, while avoiding the contamination from plastics

In the North East of the Adriatic Sea, most of the marine litter found can be traced back to the practice of mussel farming. Nylon, Polyethylene and Polypropylene are all materials with a high potential for recycling, and efforts are being explored to create circular supply chains needed to ensure this approach. Simultaneously, the development of biodegradable nets are being pursued, rethinking the classic design.

In the last years, more than 600 tonnes of fishing nets per year have been treated and converted into plastic strings and then sold to secondary plastic producers

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Replicability in other ports

- In Europe, shellfish farming represents around 60% of total aquaculture production
- Sustainable value chain development – involving key stakeholders
- Proper infrastructure for collection, reception and recycling

Key findings

- In the North East of the Adriatic Sea, most of the marine litter is linked to mussel farming.
- An initiative to create circular supply chains was launched that will reduce marine litter by collection and recycling of existing equipment.
- An initiative to develop bio-degradable or sustainably produced nets would provide a long-term solution.

RETHINK RECYCLE

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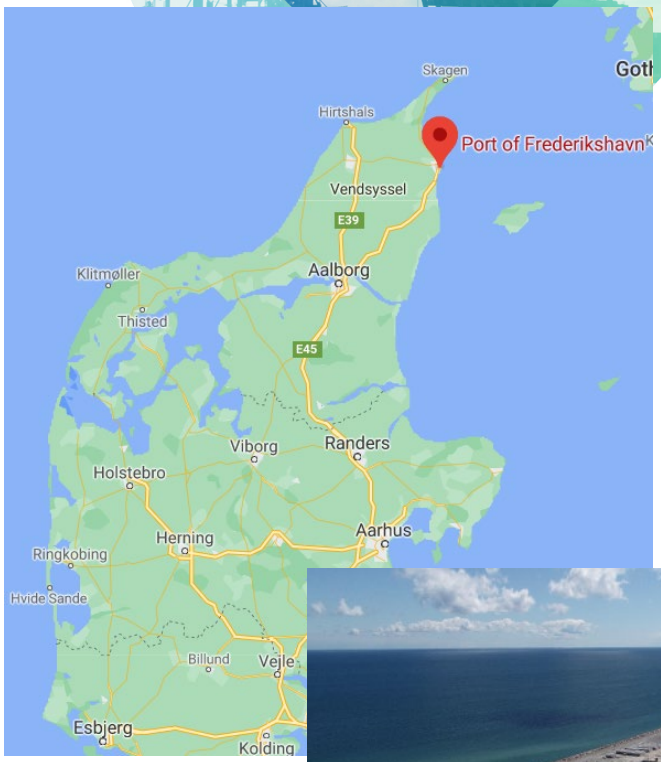
Port of Frederikshavn, Denmark

Circular Decommissioning of ships and rigs

M.A.R.S will, with the establishment of the first purpose-built decommissioning site in Europe, create new circular supply chains with local stakeholders

The ship decommissioning sector has been tarnished by stories of bad working environments on the beaches in Southeast Asia. With this increasing pressure on the global legislation has been rising. Couple this with a North Sea offshore sector in transition, and you get a rapidly growing decommissioning market in Europe.
Enter Modern American Recycling Services, a highly specialized US company, who have their eyes set on circular decommissioning in Europe.



The facility will be able to process between 200.000 and 300.000 tonnes of materials each year, generating around 200.000 tonnes of secondary steel as a result.

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Replicability in other ports

- Long term investment required
- Presence of highly specialized company
- The need for decommissioning is growing

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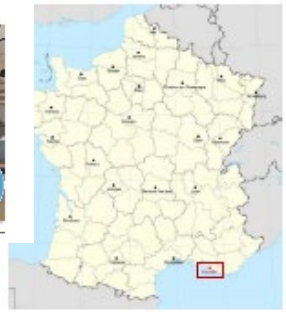
Port of Marseille, France

Capture of greenhouse gases in microalgae

The VASCO project is using state-of-the-art green chemistry to transform industrial fumes such as CO2 into a production microalgae

The project captures industrial fumes from large plants and use them to feed a production of microalgae. The algae, when harvested, is then used in the production of biofuels. As a result, the project turns CO2 into sustainable fuel.
The Vasco2 project has managed to successfully demonstrate the approach at pre-industrial levels, and through Vasco3, the partners are now targeting a full scale industrial demonstration.



Exploring ways of turning the algae into a range of different biofuels.
So far, the tests show that with a production of 1 hectare of algae pools, the approach is able to use 275t of CO2 to produce 280t of algae paste

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Replicability in other ports

- The ongoing research and project show promising results
- More research and testing required

Key findings

- The Port of Marseille is the largest freight port in France where one of the primary waste streams are GHG emissions
- The Vasco project focuses CO2 valorization by capturing CO2 in algae and turning it into biofuels
- The project engages different stakeholders interested in the development of new industry and addressing world's biggest waste problem, CO2

RETHINK REDUCE

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Port of Boulogne-Sur-Mer, France

Valorisation of fish by-products

Former waste streams from the fishing industry are being used to manufacture a range of high-value products in the nutrition and beauty industry

Since the 1970's a highly specialized cluster has been under development in Boulogne, targeting fish processing at all its different levels. From this, a wide range of by-products are produced. There were previously discarded as waste, but with innovative product development, the company COPALIS have managed to create a wide range of high-value products, supplying both the nutrition and cosmetics industries.

Around 25,000-30,000 tonnes of byproducts is used to produce:90% - animal nutrition, 7-8% - human nutrition, and 1-2% - cosmetics and dietetics

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Replicability in other ports

- Fish by-products valorization provides broad range of possibilities
- Research has been focused on the use of innovative, economically and environmentally sustainable extraction methods to preserve the biological activity of the molecules
- The replicability of this case study relies on researchers, policymakers and economic agents to understand the trends and the tools available

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The circular economy has an important potential for ports

Port areas are attractive for the recycling industry

The main reason for this is the proximity to cities, industries and the terminals

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