C-PORTS “Circular Economy in European Maritime Ports.”

The maritime industry, ports and ships have been progressively incorporating electrical and electronic equipment (EEE) to improve the efficiency of their operations. Such equipment is used to improve ship performance as well as safety, including the use of energy-efficient engines, navigation systems, and communication systems. In addition, electrical and electronic equipment is used to reduce emissions from ships, such as air pollution and noise pollution, as well as to reduce their environmental footprint.

With the digitalisation of the economy the manufacturing of Electrical and Electronic Equipment is rapidly increasing. EEE has severe negative environmental and climate impacts arising from materials use, emission of air pollutants & greenhouse gasses, chemicals use and waste. Additionally, planned obsolescence is often used in EEE.

The increasing consumption and production of EEE makes its complex and challenging waste stream one of the fastest growing ones.

Manufacturing plays a major role in Europe and industrial development is a key factor for the EU's competitiveness. Manufacturing is in smart and (sustainable) specialization strategies in many regions. It is also a sector that is rapidly increasing, as "everything gets electronic" with the increasing digitisation of the economy, and **maritime industry**.

However, EEE has severe environmental and climate impacts arising from material use, emissions of air pollutants and greenhouse gasses, chemicals use and waste.

EEE has a low product efficiency resulting from wide use of built-in obsolescence (designing products with an artificially limited lifetime), technical obsolescence (older versions of a product not served, forcing people to buy the replacement) or marketing-induced obsolescence (making people perceive a product as old-fashioned).

The increasing consumption and production of EEE in the maritime sector makes its waste stream one of the fastest growing ones.

E-waste is a difficult waste stream as it is very complex and contains a mix of materials including hazardous materials, precious metals, a substantial part of EEE (about 20%) are plastics, the so-called E-plastics.

These are especially problematic in the waste stream as they contain chemical/flame retardants. The recovery of e-waste is technically (limited recycling capacities) and economically challenging due to the high labour costs for dismantling, sorting, recovery and recycling versus the currently low value of the recovered materials (except the metals).

There is a high awareness of all the above-mentioned challenges and strong (top) political commitment to change and the transition to the circular economy.

ICT and Electronics, batteries and vehicles are highlighted as key product value chains in the EU Circular Economy Action Plan 2020 (CEAP 2020) for urgent, comprehensive and coordinated actions. **IMO in the report “E waste management in port areas”** mentions the

importance of the growing problem of electronic waste and that the management of e waste in port areas is mitigating the environmental and health risks. Legal and regulatory requirements; international treaties such as the Basel Convention and national laws.

The goal of the Circular Inno Lab:

To foster sustainable growth by transforming the production of electrical and electronic equipment in Europe towards circular and resource-efficient processes, value chains, products and services, and to minimize the negative impact of EEE by **equipping students with the knowledge of a new way of thinking.**

Enable key actors from academia and policy to facilitate the transition to the Circular Economy by applying solutions with EEE manufacturing SMEs in three thematic areas:

- Design
- Materials & recovery
- Circular business models & value chains

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