WATERBORNE

Zero emission waterborne transport

Strategic research & innovation agenda

01

WHO ARE WE?

Waterborne TP Association

A **European Technology Platform** for the **Waterborne** sector

- All waterborne stakeholders such as ship-owners, shipbuilders, maritime equipment manufacturers, infrastructure and service providers, classification societies, universities or research institutes, waterway and port operators.
- Dialogue between members, the EU Institutions, and Member States.
- Common medium and long-term R&D Vision and a Strategic Research Agenda (SRA).
- Waterborne = Maritime + Inland Navigation and lakes + Ports!

Waterborne TP Association
Research Members

Waterborne TP Association
Industrial Members

ONE SEA
Autonomous maritime ecosystem

ESI

cea

ABB

airseas

BUREAU VERITAS

Navantia

RINA

IHC

CANTIERE NAVALE VITTORIA

PONANT

CHANTIERS DE L'ATLANTIQUE

Concawe
Environmental Science for European Refining

NAPA

intecsa industrial

DAMEN

DNV·GL

European IWT Platform

ROYAL ASSOCIATION OF NETHERLANDS SHIPOWNERS

FINCANTIERI

ib
influencing business

WÄRTSILÄ

KONGSBERG

Lloyd's Register

MAN Energy Solutions

MEYER WERFT
PAPENBURG 1795

Royal Belgian Shipowners' Association

MV WERFTEN

NAVAL GROUP

MAERSK

ABS

Waterborne TP Association
Academia

Aalto University
School of Engineering

KLU
KÜHNE LOGISTICS UNIVERSITY

SDU
University of
Southern Denmark

TU Delft

UNIVERSITY OF
Southampton

UCL

UCA
Universidad
de Cádiz

Waterborne TP Association Associations

Danish Maritime

Norwegian Centres of Expertise
NCE Maritime CleanTech

ASSONAVE
Italian Association of Shipbuilders and Related Industries

WEGEMT
EU MARINE UNIVERSITY ASSOCIATION

EuDA

ECMAR

Deutsches Maritimes Zentrum

GICAN

LIGHTHOUSE
SWEDISH MARITIME COMPETENCE CENTRE

VSM

mare Technology Cluster FVG

magellan
European Affairs Consultancy

NETHERLANDS MARITIME TECHNOLOGY

PFMT

SEA Europe
Shipyards' & Maritime Equipment Association

European Commission

European Partnerships

#HorizonEU

Research and Innovation

New approach to European partnerships: overview

New generation of objective-driven and more ambitious partnerships in support of agreed EU policy objectives

Key features

- **Simple architecture and toolbox**
- **Common set of criteria**
- **Coherent life-cycle approach**
- **Strategic orientation**

Co-programmed

Based on Memoranda of Understanding / contractual arrangements; implemented independently by the partners and by Horizon Europe

Co-funded

Based on a joint programme agreed by partners; commitment of partners for financial and in-kind contributions & financial contribution by Horizon Europe

Institutionalised

Based on long-term dimension and need for high integration; partnerships based on Articles 185 / 187 of TFEU and the EIT-Regulation supported by Horizon Europe

European Partnerships: what is new?

- Only support partnerships if there is evidence that they are **more effectively** achieving **policy objectives** than Horizon Europe alone
- **Fewer partnerships with higher impacts (from 120 – 49)**
- Common and coherent **framework** of criteria along the life cycle of partnerships, across all pillars, even across programmes and other regulations (e.g. EIT, DEP, space)
- Unified **umbrella** branding to improve visibility
- Increase openness and encourage a broader set of actors to participate
- Improve coherence between partnerships and Horizon Europe, also the missions
- **Time limited** with conditions for phasing-out the Programme funding

Common for all European Partnerships

- **Strategic orientation:** Priorities are defined as part of the strategic planning of Horizon Europe;
- **Necessity test for European Partnerships**, compared to traditional calls:
  - **Directionality:** based on agreed objectives and expected impacts that are underpinned by Strategic Research and Innovation Agendas / Roadmaps;
  - **Additionality:** commitments from partners to mobilise and contribute resources and investments;
- **Common set of criteria** along their life-cycle, defined in the Horizon Europe regulation (and the draft criteria framework);
- **Union contribution:** clearly defined at the outset for the full duration of the initiative.

➔ In their implementation and certain features they differ, with the co-programmed being the most simple to prepare and implement, and the institutionalised the most complex.

A. Co-programmed European Partnerships (I)

- Most relevant **current types of actions**:
  Contractual Public-Private-Partnerships under Horizon 2020;
- **Legal form:** Contractual Arrangement / Memoranda of Understanding, signed between representatives of the partners and the Commission;
- **Who signs typically**:
  - For the European Commission: the Commissioner responsible;
  - The partners: organised in one (or more) associations representing their members (industry, research organisations etc.) ;
  - Member States: high-level representative of the respective national ministry / administration;
- **Content** of the Contractual Arrangement / Memoranda of Understandings: objectives, key performance and impact indicators, and outputs to be delivered, as well as the related commitments for financial and/or in-kind contributions.

A. Co-programmed European Partnerships (II)

- **Scope:** Based on a Roadmap / Strategic Research and Innovation Agenda (SRIA), **agreed with the Commission Services**;
- **Commitments and Contributions:**
  - European Commission: Union budget is implemented in the Horizon Europe Work Programme;
  - Partners (including Member States): implement their commitments and contributions under their responsibility;
- **Annual Work Programme/Activity Plan:** Roadmap/SRIA is each year translated into agreed priorities and activities necessary to achieve objectives:
  - European Commission: call topics for the necessary range of actions (R&I, Innovation actions, CSA, prizes ….);
  - Partners: their own activities and investments;

A. Co-programmed European Partnerships (III)

Who does what?

- **Partners provide input** (priority setting) to COM services for the drafting of the respective parts of the Annual Work Programme, **and can apply to the open calls for proposals;**
- **Commission adopts Annual Work Programme** (comitology involving the Programme Committee) and implements the calls with its executive agencies;
- **Partners implement their commitments** (activities/contributions, investments) under their responsibility and report on these;
- **Association provides back-office** with important functionalities;

Partnership

Intervention logic

PORTFOLIO OF ACTIVITIES

- Increasing use of Sustainable Alternative fuels
- Electrification of waterborne transport
- Increasing energy efficiency
- Design and Retrofit solutions for the new and existing fleet
- Digital Green to improve efficiency
- Sustainable bunkering and charging solutions for climate neutral ships

OVERARCHING OBJECTIVES

- Elimination of GHG emissions from ships to help mitigate climate change
- Elimination of **air pollution** from ships for a healthier environment in ports and coastal areas
- Elimination of **water pollution** from ships for healthier seas and oceans
- Ensuring the EU's competitiveness in clean, climate neutral shipping and maritime technology

2030 – 2050 goal

1. To demonstrate zero-emission solutions for all main ship types and services before 2030.
2. To implement economically viable European technologies and concepts for zero-emission waterborne transport.
3. To facilitate the development of regulations and policies at national and international level.

2050 VISION: REALIZING ZERO-EMISSION WATERBORNE TRANSPORT TO THE BENEFIT OF FUTURE GENERATIONS

For Europe to lead the transformation of the waterborne transport sector into a zero-emission mode of transport which has eliminated all harmful environmental emissions.

Vision & objectives

Elimination of GHG emissions

- To develop and demonstrate solutions for the **use of climate-neutral, sustainable alternative fuels** applicable to **ships with high energy demand (e.g. long distance shipping) before 2030**;
- To develop and demonstrate **before 2030** solutions for the **integration of high-capacity batteries** solutions as single energy source for **short-distance shipping (up to 150 to 200 nautical miles)**, as an additional energy source for all main ship types in environmentally sensitive areas, and to increase operational efficiency;
- To develop and demonstrate solutions to be able to **reduce the (alternative) fuel consumption** of waterborne transport, including by the use of renewable energy, by **at least 55 % before 2030, compared to 2008**;
- To develop and demonstrate **solutions for port based supply infrastructure** (i.e. infrastructure for bunkering of alternative fuels and electricity) **needed to enable zero-emission waterborne transport**, to be implemented **by 2030 at the latest**;
- To develop solutions for clean and climate-neutral, climate-resilient **inland waterway vessels before 2030**.

Vision & objectives

Elimination of air pollution

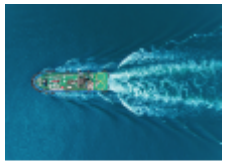
To develop and demonstrate solutions to cut **coastal and inland pollution to air** from inland waterway transport and maritime shipping by at least 50% by 2030, compared to current levels.

Elimination of water pollution

To develop and demonstrate solutions to **eliminate pollution to water** (including harmful underwater noise) from ships, by 2030.

STRATEGIC RESEARCH & INNOVATION AGENDA

Timeline



Proposal Zero-Emission Waterborne Transport

Partnership Proposal for a Co-Programmed Partnership in the framework of Horizon Europe

End of May 2020: Final draft proposal

June – draft SRIA

Beginning of July 2020: Public Consultation of Strategic Research and Innovation Agenda (SRIA)

End of August 2020: Final SRIA

2021: launch of the Partnership (1st call)

2022: Update of SRIA

2022: Launch of 2nd call

WATERBORNE

Strategic Research and Innovation Agenda for Zero-emission waterborne transport

Zero emissions

Implementation pathways

- Simplification of fleet into 6 ship types
  - ❑ Long distance ships
  - ❑ Cruise ships
  - ❑ Ferries
  - ❑ Inland vessels
  - ❑ Short-sea ships
  - ❑ Offshore ships
- Distinction made in trade
  - ❑ Liner or tramp service

Long-distance ships

- Retrofitting
  - ❑ ICE on sustainable alternative fuels
  - ❑ Wind assistance
  - ❑ Fuel blending and dual fuel
  - ❑ Energy efficiency measures
- Newbuilds
  - ❑ Duel fuel ICE on sustainable alternative fuels
  - ❑ Electric drive system
  - ❑ Full benefit from energy efficiency technologies

Inland vessels

- Prime focus on retrofitting
  - ❑ Sustainable alternative fuels with ICE
  - ❑ Switch to electric drive trains
  - ❑ Battery electric
  - ❑ Hybrid
- New builds
  - ❑ Profit from increased energy efficiency
  - ❑ Hydrogen application
- Stepping stone in marinization of on-shore technologies

Cruise ships

- Existing vessels already using electric drive trains
- Large hotel load wrt propulsion load
- Combination of options
  - ICE with sustainable alternative fuels
  - Batteries for port approaches
  - Fuel cells (e.g. hydrogen)
  - Energy efficiency + renewables
  - Early adaptors

Ferries

- Many ferries are quite old, focus on replacement
- Up to 200 nm
  - ❑ Battery electric
  - ❑ ICE with sustainable alternative fuels
  - ❑ Fuels cells
  - ❑ Smart power supply in ports
- Beyond 200 nm
  - ❑ Batteries used for port approach
  - ❑ Impact of energy efficiency measures

Short-sea ships

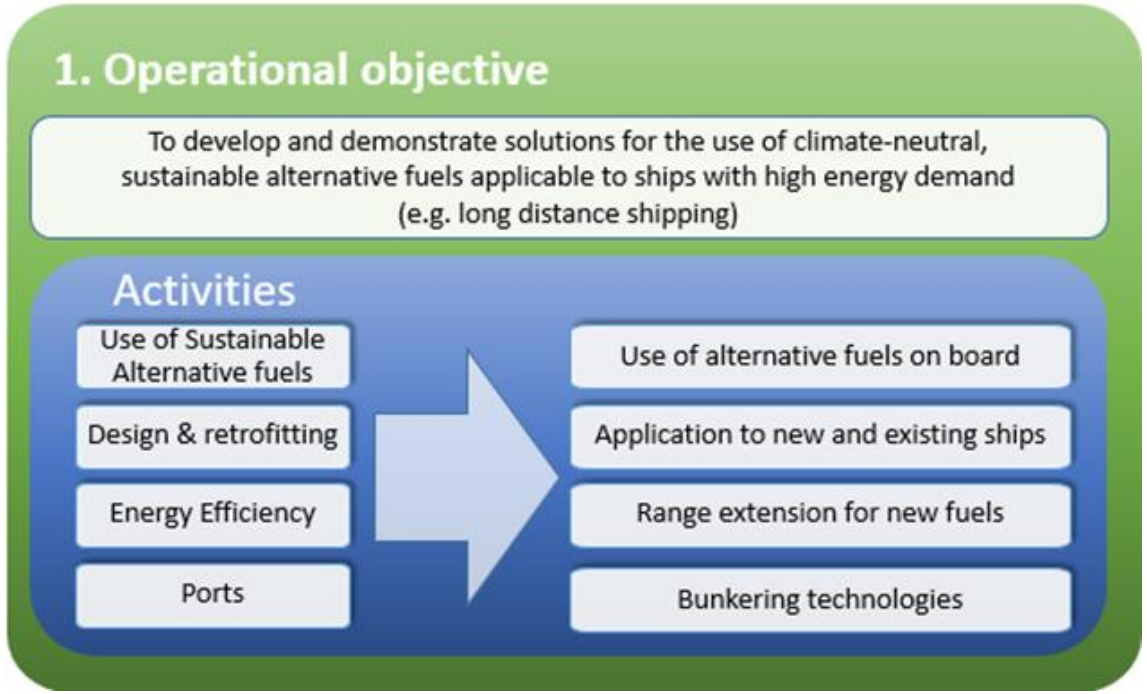
- Upscaling of IWT technologies
  - ❑ Hybrid ICE on sustainable alternative fuels + electric
  - ❑ Fuel cells
  - ❑ Wind assistance
- Tramp services
  - ❑ Dual or multiple sustainable alternative fuels
  - ❑ ICE
  - ❑ Batteries for auxiliary power

From objectives to activities

Zero emissions

- Six main activities
  - ❑ Use of Sustainable Alternative fuels
  - ❑ Electrification
  - ❑ Energy efficiency
  - ❑ Design & Retrofitting
  - ❑ Digital green
  - ❑ Ports

From objectives to activities



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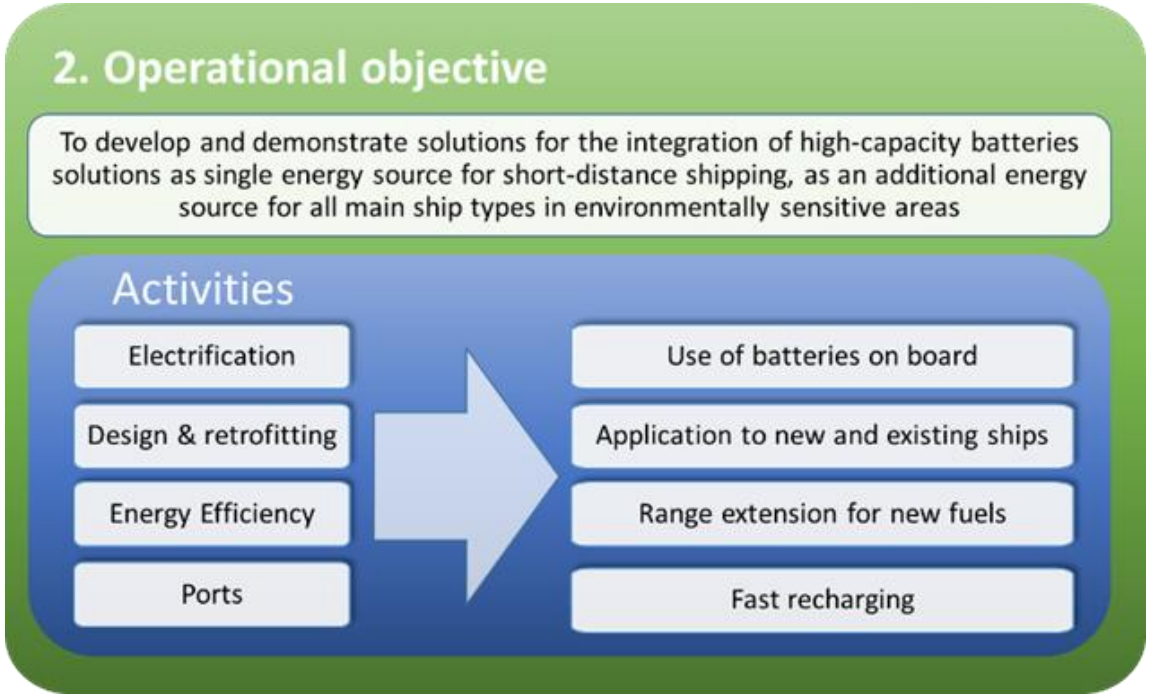

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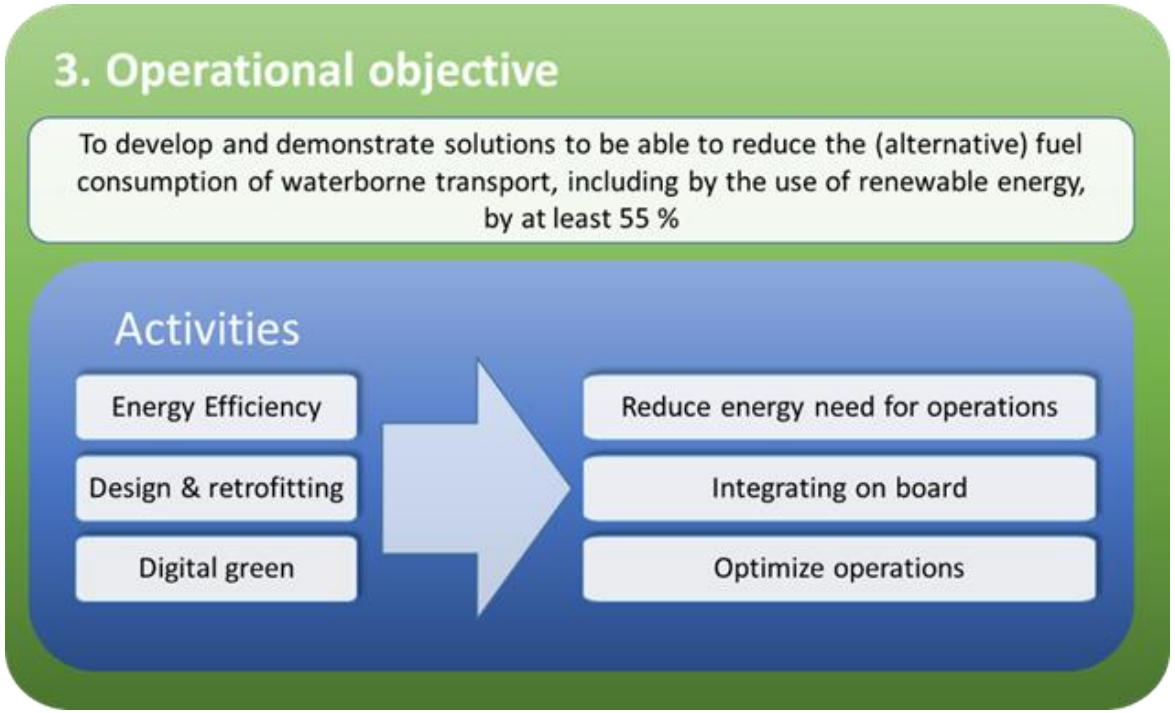

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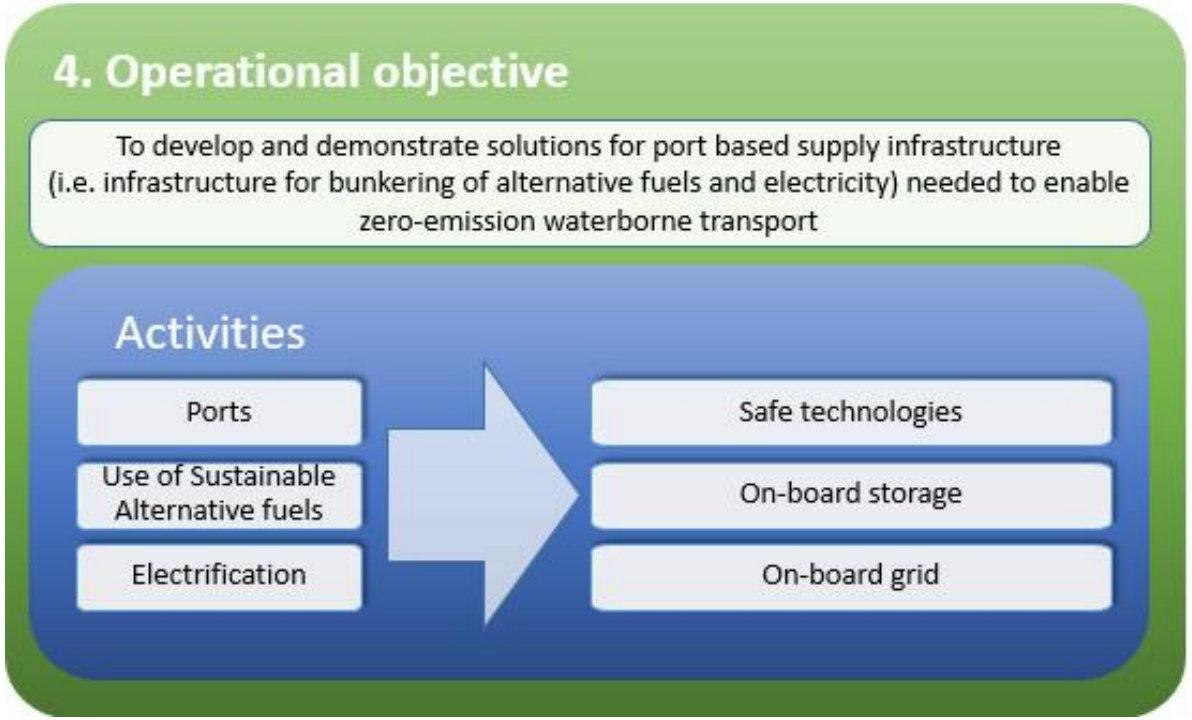

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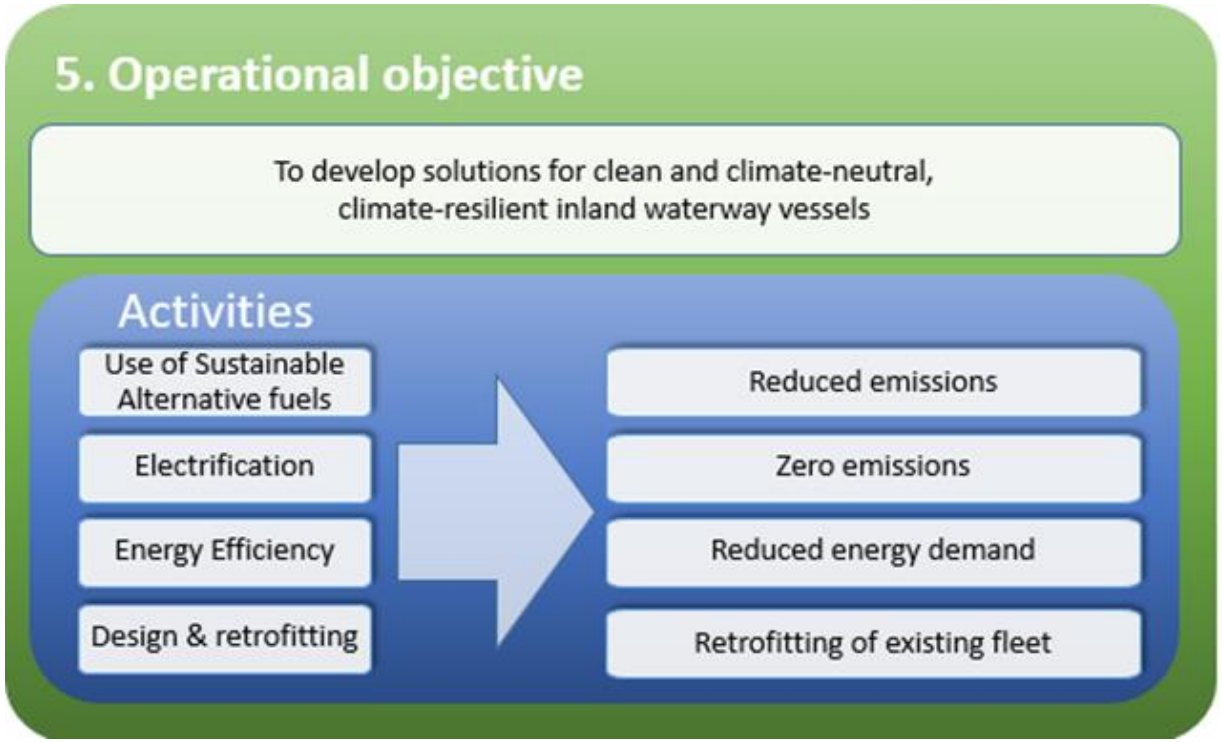

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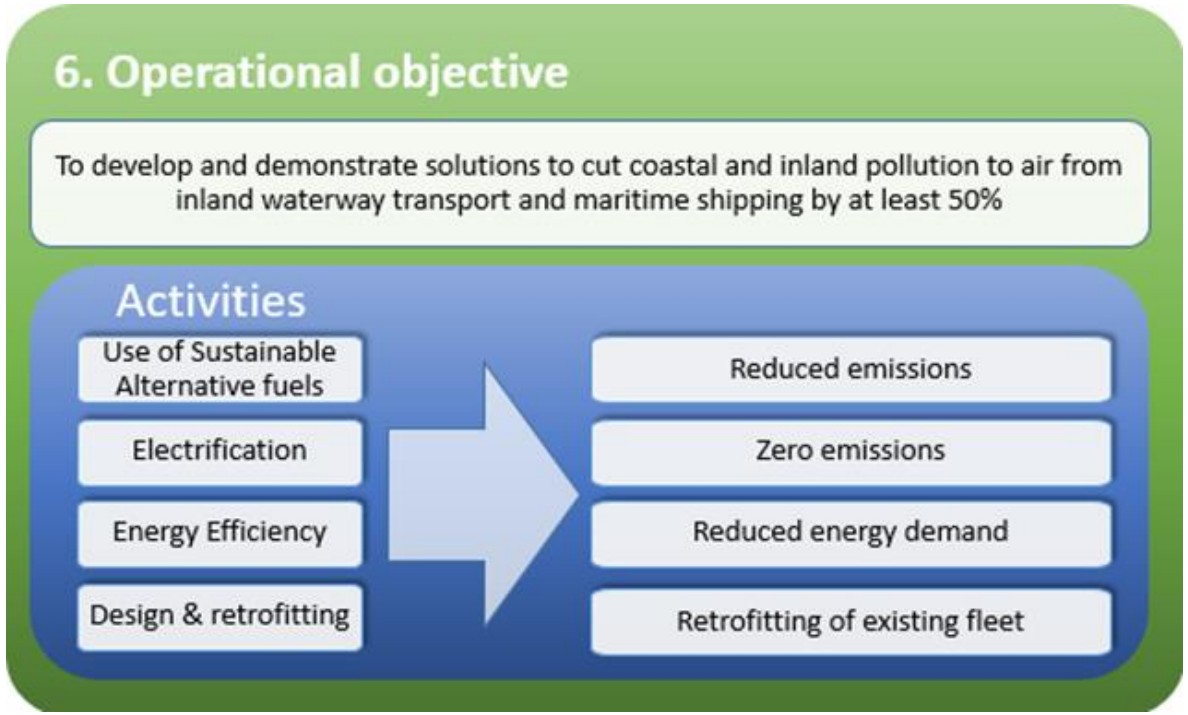
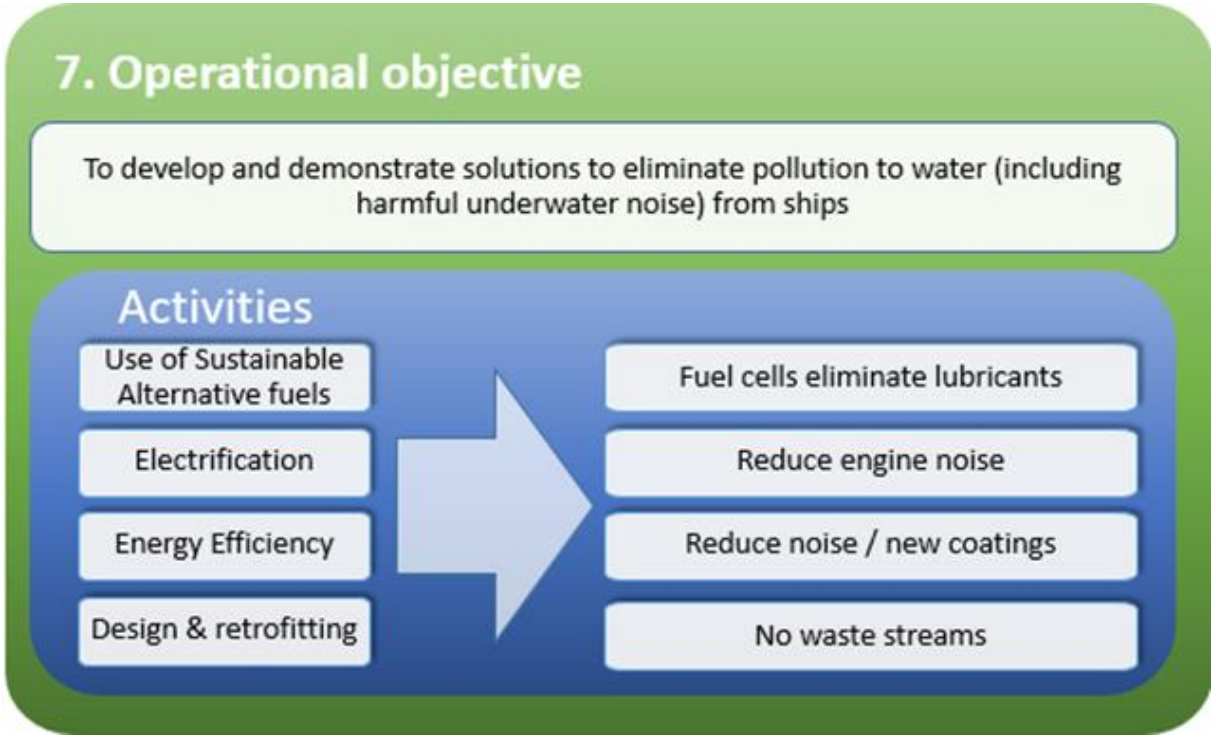
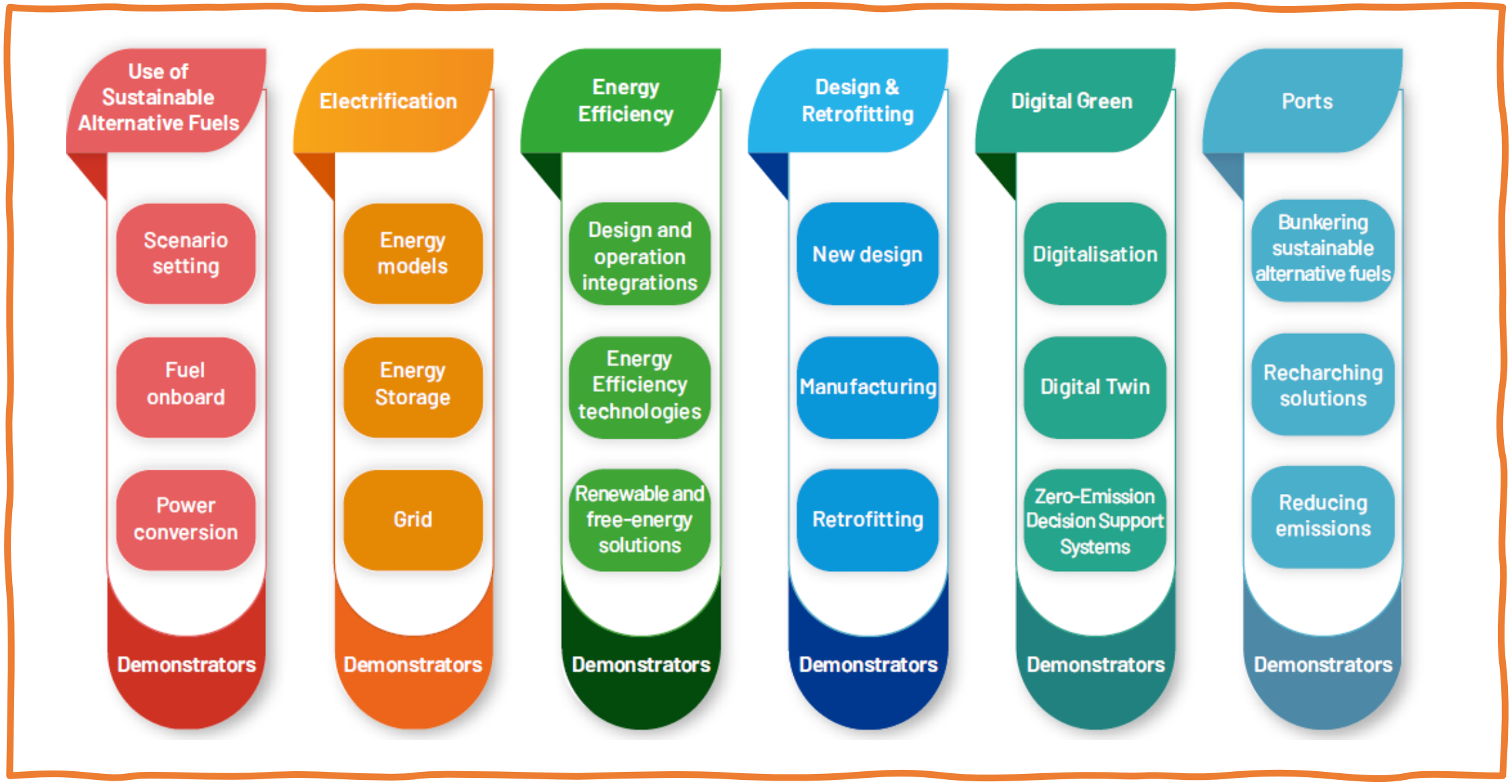


From objectives to activities

Water pollution




Use of Sustainable Alternative Fuels
Scenario setting
Fuel onboard
Power conversion
Demonstrators
Electrification
Energy models
Energy Storage
Grid
Demonstrators
Energy Efficiency
Design and operation integrations
Energy Efficiency technologies
Renewable and free-energy solutions
Demonstrators
Design & Retrofitting
New design
Manufacturing
Retrofitting
Demonstrators
Digital Green
Digitalisation
Digital Twin
Zero-Emission Decision Support Systems
Demonstrators
Ports
Bunkering sustainable alternative fuels
Recharching solutions
Reducing emissions
Demonstrators

Questions?

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