JOINING FORCES for the ENERGY TRANSITION in EU FISHERIES and AQUACULTURE

Directorate-General for Maritime Affairs and Fisheries (DG MARE)

Energy Transition Partnership in EU Fisheries and Aquaculture Workshop on Finance

Wednesday 28 February 2024, 09h00 –13h00

#ETP_FishAqua

Maritime Affairs And Fisheries

European Commission

Agenda

8h30 – 9h00	*Registration & Welcome coffee*
9h00 – 9h30	Welcome and introduction to the day (Moderated by Stephen DAVIES (DG MARE) Icebreaker Introduction to the challenge of research and innovation
9h30 – 10h30	Presentations: o Techno-economic analysis for the energy transition of the fisheries and aquaculture sector – Ecorys o Living Labs – ENoLL o Research and Innovation in Waterborne transport – The Waterborne Technology Platform V.Z.W. o Innovation in the Sustainable Blue Economy Partnership o Project examples in AZTI
10h30 – 10h50	*Coffee break*
10h50 – 11h30	Breakout session A: Identification of technological and innovation challenges & research gaps
11h30 – 12h15	Breakout session B: Identification of technological and innovation solutions & possible actions
12h15 – 12h50	Presentations of Conclusions and Recommendations by the groups
12h50 – 13h00	*Closing, incl. Next Steps*
13h00 – 14h00	*Light lunch networking*

European Commission

We count on you too!

How to connect to Slido:

1. WiFi: ECvisitor (Password: Welcome)
2. Go to Slido.com (or scan the QR code)
3. Fill in the code: #ETP_FishAqua
4. Answer the questions!

Sli.do

We invite you also to use social media with **#ETP_FishAqua**

Maritime Affairs And Fisheries

slido

European Commission

Warm-Up question

Imagine you are on a fishing or aquaculture vessel in 2050, what is the one innovation that you see making a significant advancement from today's vessels?

Maritime Affairs And Fisheries

ⓘ Start presenting to display the poll results on this slide.

Energy Transition in EU Fisheries and Aquaculture

Communication on Energy transition of EU fisheries and aquaculture
Four main areas to accelerate the transition

Governance framework

Improve the governance framework & coordination/ cooperation between stakeholders

Close the gaps in both available technology and knowledge through R&I

Research and Innovation

Energy efficiency

+

Energy transition

Carbon neutral by 2050

Improve the business environment, including in financing opportunities and awareness

Financing

Develop skills and a workforce that is prepared and ready for the energy transition

People & Skills

Knowledge and Innovation - deliverables

- Online platform: **ETP page within the EU Blue Economy Observatory website (**Online since Oct 2023)
- Compendium Published together with the Communication on 21 February 2022. To be updated online (with search function) in the EU Blue Economy Observatory website.
- Tool with impact of fuel prices in the fleet: Fishing Fleet Fuel analysis - European Commission (europa.eu) (Launched in May 2023)
- Opportunities to build synergies with networks and programmes to develop living labs (the EU-wide innovation ecosystem in real-life environments) including with the European Investment Bank:
- EP pilot call launched on 20/2/2024. Call closes in June 2024; Info day on 18 March.
- EU study on technological advanced and their costs/benefits for promoting and enabling the energy transition in the sector to gain better understanding of the costs, benefits, investment needs: Feb 2024

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ECORYS 90 Years Answering tomorrow's challenges today

Study summary

Techno-economic analysis for the energy transition of the fisheries and aquaculture sector

Contents

1 – Study context and objectives

The objective of the study was to map the low-carbon energy innovations and energy efficiency solutions within the EU fisheries and aquaculture sector by:

1. Determining the energy costs and related CO2e emissions of the current status of EU fisheries and aquaculture sector;
2. Developing a “Techno-economic analysis” of the innovative low-carbon technologies and energy efficiency solutions in fisheries and aquaculture;
3. Defining the main barriers and bottlenecks, as well as the possibilities of synergies by design for an efficient transition path.

2 – Fisheries sector analysis logic

A. **Baseline** energy costs and related CO2e emissions.

B. Identify and group **currently known innovations** that can reduce CO2e emissions.

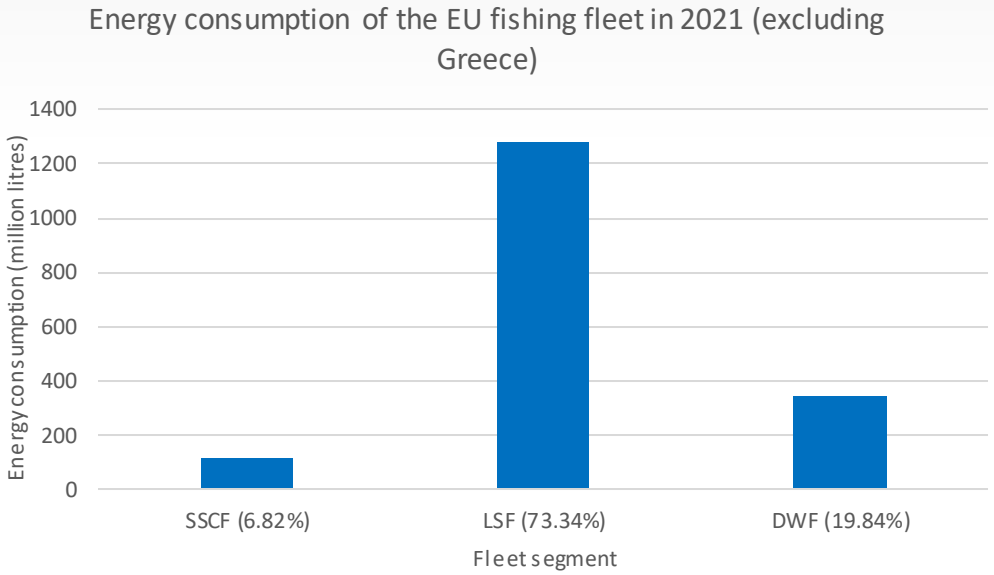
C. Estimate **readiness levels, required capex, required opex** associated with innovations.

D. Generate **Marginal Abatement Cost Curves** for short and long term.

E. Cashflow analysis to **assess payback/ net present value indicators**

F. **Risk-likelihood-consequence** analysis to address non-financial dimensions

2 – Fisheries baseline



- The fuel prices have shown variability from 2008 to 2023, with a peak between 2011 and 2013, as well as recently in 2022 which negatively affect fisher's income.
- The analysis reveals a decrease in average energy costs and CO2e emissions per tonne of fish over time.
- EU fishing fleet emissions account for 3-4% of EU maritime emissions, with LSF being the largest emitter.

2 – Fisheries sector emissions reduction opportunities

45 Innovations identified

A.	**Engine and propulsion innovations:** focus on enhancing engine efficiency	(10)
B.	**Vessel design and operations:** includes modifications to reduce vessel resistance	(3)
C.	**Alternative propulsion:** explores the use of biofuels, electrification and other non-fossil fuel sources	(9)
D.	**Assisted propulsion:** looks at wind-assisted technologies	(5)
E.	**Fishing gear:** modify nets and trawling methods	(9)
F.	**On-board processing operations:** efficient ice pumps and refrigerants for fish freezing processes	(3)
G.	**Facilitating processes:** such as smart steaming, route planning and energy monitoring devices	(6)

3 – Selected results for fisheries

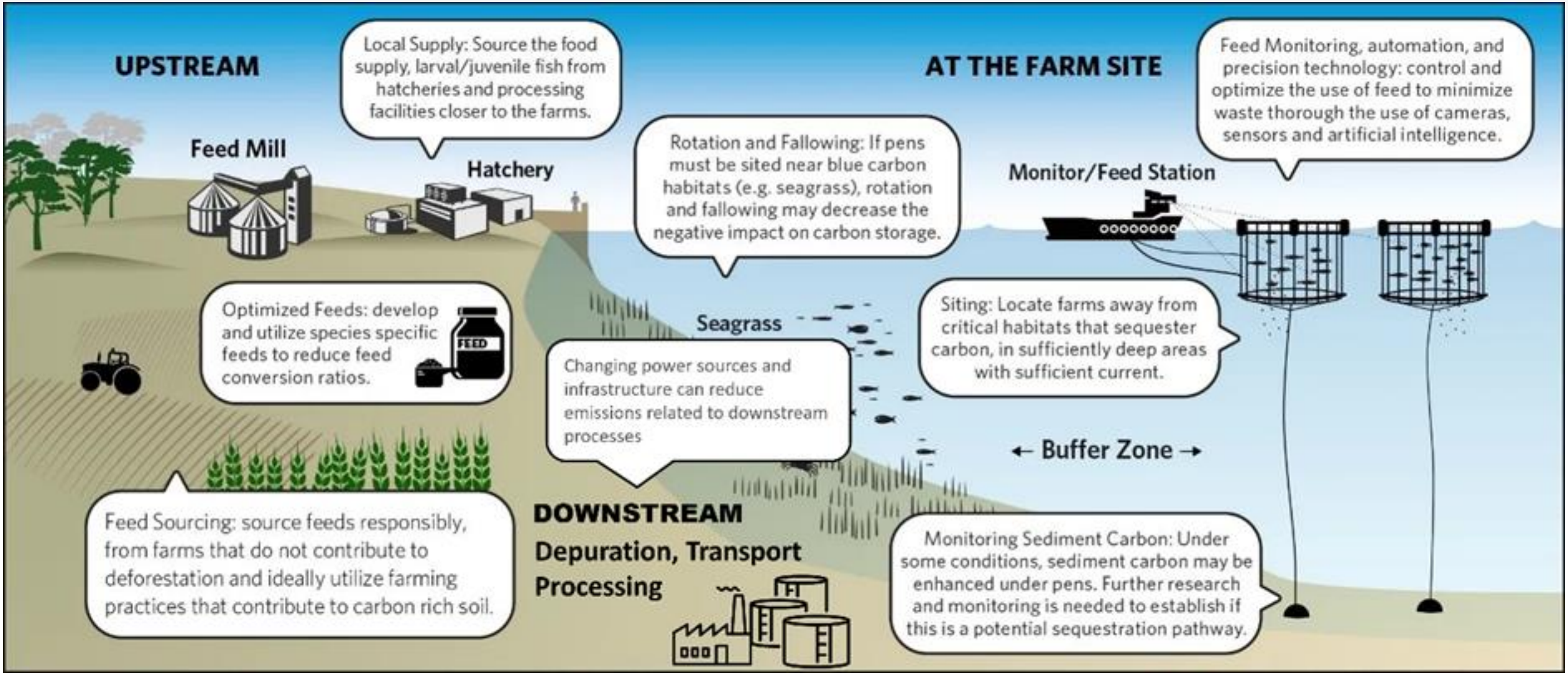
SSCF

- Analysed options for SSCF are loss-making with uncertain payback durations, no positive ROI.
- Significant financial gaps exist for these solutions to be profitable; diesel-electric solutions require up to EUR 488,616, energy audits as low as EUR 1,386.
- Biodiesel is the most promising for SSCF decarbonisation.

LSF and DWF

- Substituting trawlers with outriggers and sumwings offers best returns and significant CO2e reductions for LSF and DWF segments.
- Positive EAAs for from various technologies that also bring CO2e abatements reaching 25% for LSF and 40% for DWF >40m.

4 – Aquaculture sector analysis logic: complex supply chains



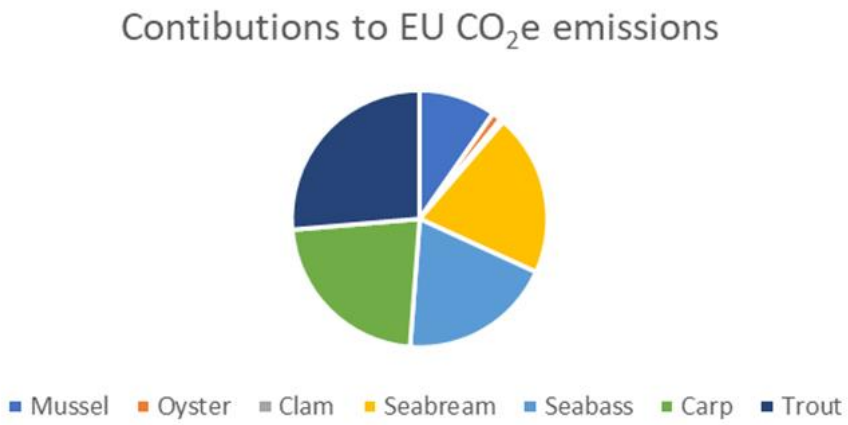
4 – Aquaculture sector analysis logic

- Identification of **main species farmed in EU** (in volume); and **main aquaculture typologies**.
- CO2e emissions estimated based on **Life Cycle Assessment**.
- Analysis of the peer-reviewed literature on the application of LCA to EU aquaculture.
- Development of an «LCA model portfolio» based on inventories published in peer reviewed papers.
- **Estimation of CO2e baseline emissions from EU aquaculture in 2019**, based on volumes and intensities of the main species/farming typologies.
- **Identification of the most promising innovations for reducing CO2e** emissions at farm sites.
- **Validation:** worskhops and targeted interviews.
- **Assessment of the CO2e reduction** using the model portfolio in representative case studies.
- **Assessment of economic indicators** for the main segments of EU aquaculture (case study approach).

5 – Emissions baseline development

Commercial species	EU production 2019 [tonne]	Total CO2e emissions [tonne]	Percentage contribution	EU Average Emission intensity [kgCO2e/kg lw]
S1.1 Mussel	453,559	208,170	9.8	0.46
S1.1 Oyster	101,683	32,318	1.5	0.32
S1.1 Clam	32,734	9,662	0.5	0.30
S1.2 Seabream	92,476	424,930	20.0	4.59
S1.2 Seabass	83,872	407,332	19.1	4.84
S2.1 Carp	80,195	481,170	22.6	6.00
S2.2 Trout	196,837	564,472	26.5	2.87
Total EU 2019	**1,041,386**	**2,112,085**	**100**	**2.043**

S1.1: Marine aquaculture: shellfish
S1.2: Marine aquaculture: finfish
S2.1: Freshwater aquaculture: extensive/semi-intensive
S2.2_ Freshwater aquaculture: intensive



5 – Case studies: medium size rainbow trout farm, northern Italy

Hot spots:
- ✓ Electricity
- ✓ Liquid oxygen supply

Solution:
- ✓ Installation of Photovoltaic
- ✓ Investment in oxygen generator (from air)

Medium farm, Italy	Total emissions [tonne CO2e /tonne fish]	Feed emissions [tonne CO2e /tonne fish]	Electricity emissions [tonne CO2e /tonne fish]	Oxygen use emissions [tonne CO2e /tonne fish]
Benchmark	2.420	1.128	0.364	0.841
S2: 100% electricity covered by PV	2.122	1.128	0.065	0.841
S3: oxygen generator: 100% electricity covered by PV	1.317	1.128	0.0102	0

Payback period: 11 years
Economic lifetime: 10-15
Year for payback: 2034
Internal Rate of Return (IRR): 7%

5 – Results summary

- CO2e emissions from EU aquaculture, 2.13 Million tonnes in 2019, represent 0.6% of the total emissions estimated by the EAA for the agriculture sector, which in 2019 amounted to 368 million tonnes.
- These emissions can be further reduced by implementing innovations already available and, in some instances, economically viable.

Innovation	Segment	TRL	Available	CAPEX (EURO)	OPEX	CO2e reduction potential in %
PV Installation	Land-based Aquaculture	9	Now	20.000 – 1.500.000	N/A	5-14%
PV Installation	Shellfish Hatchery	9	Now	250.000 – 300.000	N/A	43%
O2 Generator	Land-based Aquaculture	9	Now	150.000 – 500.000	N/A	16-33%
Barge	Marine Fish Aquaculture	9	Now	1.900.000 – 2.400.000	40.000 – 90. 000	8-13%
Electrification of boats	Marine Fish Aquaculture	9	Now	1.500.000	Depends on MS and distance to the coast	20-61%
Electrification of boats	Marine Shellfish Aquaculture	9	Now	250.000 – 750.000	Depends on MS and distance to the coast	41%

Thanks for your attention!

- Detailed study report is being made available (along with annexes on request)

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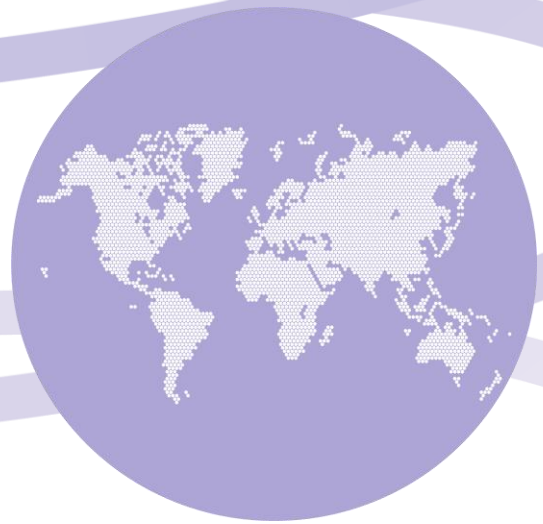


ENoLL – European Network of Living Labs

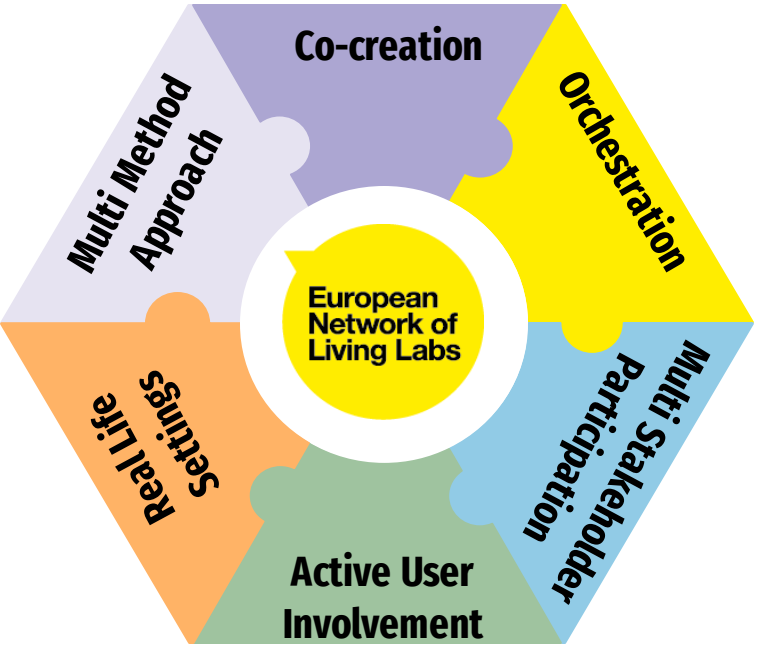
DG MARE, 28th February 2024

Martina Desole, ENoLL Director

European Network of Living Labs

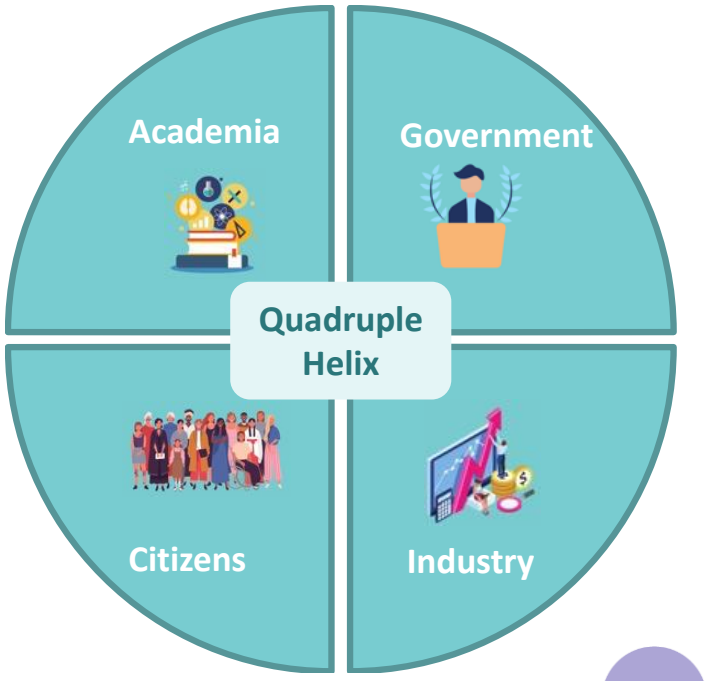
What are Living Labs?

Living Labs are **open innovation ecosystems** in **real-life environments** based on a **systematic user co-creation approach** that integrates research and innovation activities in communities, placing **citizens at the centre of innovation**



Living Labs operate as **intermediaries** among **citizens, research organisations, companies and government** agencies or levels for joint-value co-creation, rapid prototyping or to scale up innovation and businesses.

They are open innovation ecosystems in **real-life** environments using **iterative feedback processes** throughout the lifecycle approach of an innovation



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LLs are open innovation ecosystems

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OPEN INNOVATION

USER DRIVEN INNOVATION

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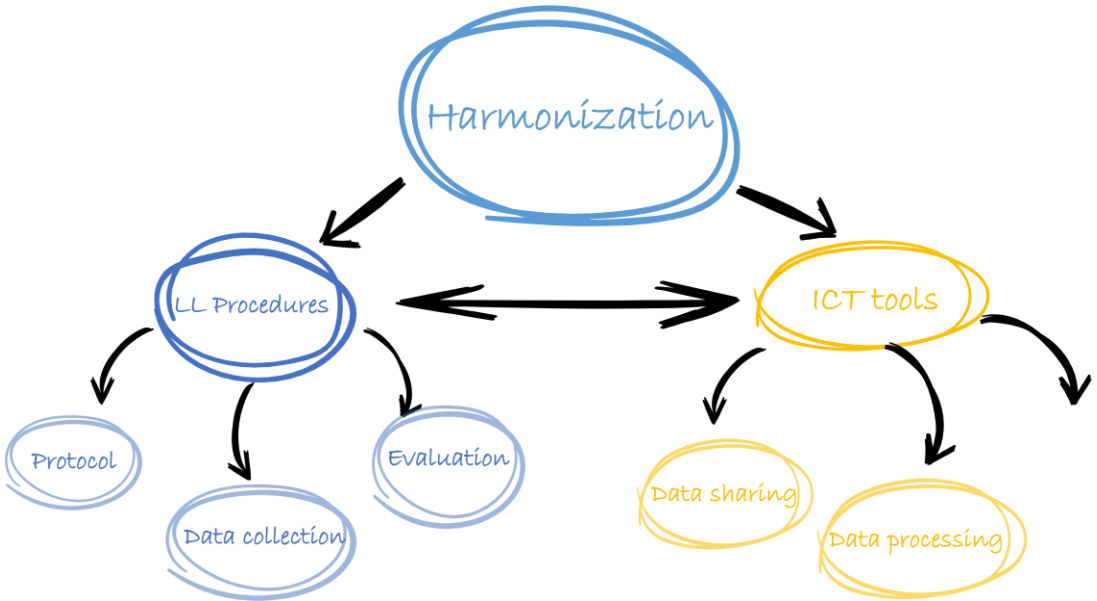
LL are a modern tool for research,

adapted to the needs of today, where citizen can contribute to the co-research and where Living labs can be considered at service of Science as **real Research infrastructures**, and as **Technology research infrastructures** depending on the innovation stage of maturity they are operating in.



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LLs in real-life environments

Living Labs are **open innovation ecosystems** in **real-life environments** based on a **systematic user co-creation approach** that integrates research and innovation activities in communities, placing **citizens at the centre of innovation**


Ethics Manager
Doctor/nurse
Family
Patient
Psychologist
Wearable sensor

URBAN LIVING LAB


Vessels
Renewables technologies
Academics & researchers
Fisherman
Food processing
Aquaculture

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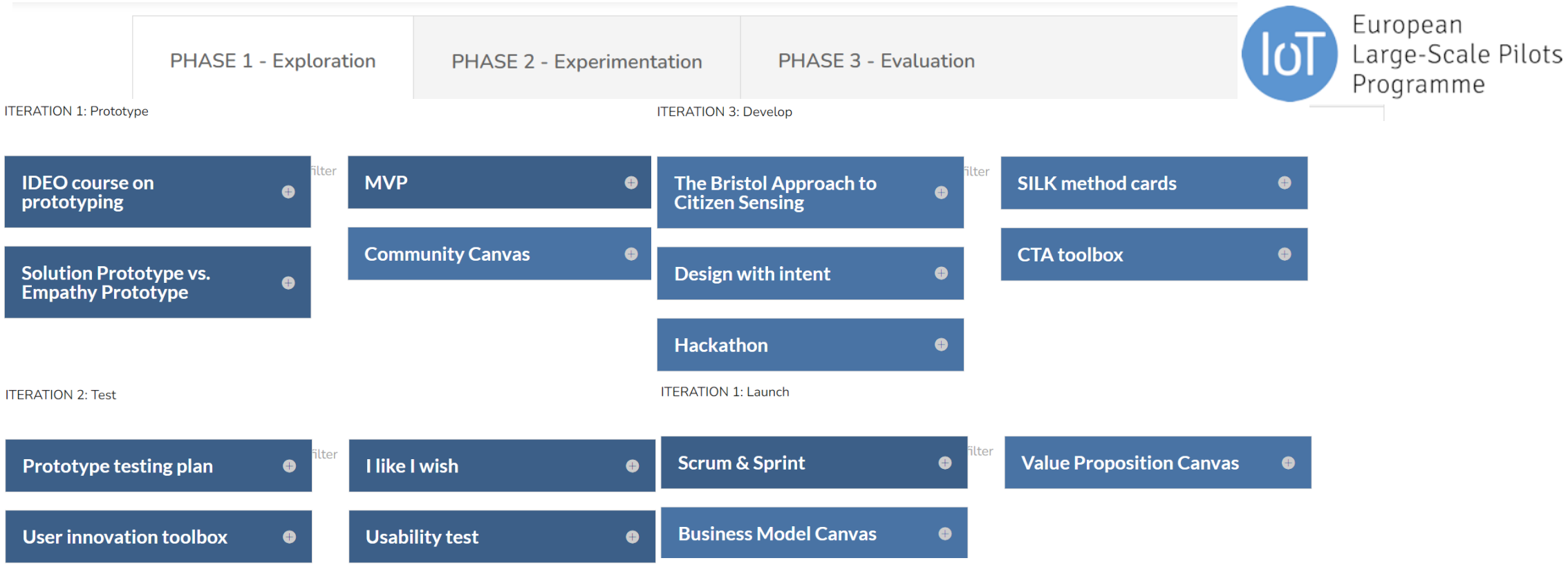
LLs are based on systematic user co-creation approach



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LIVING LAB INTEGRATIVE PROCESS – DESIGN THINKING

Problem space | Solution space | Deployment space

Empathise | Define | Ideate | Prototype | Test | Implement | Scale up

Select a practice

The context is researched to understand the socioeconomic and cultural setting. User behaviours and social practices are understood.

Integrate stakeholders

A People Public Private Partnership (PPPP) Model is used to integrate stakeholders.

Uncover barriers

Community based social marketing helps to uncover barriers.

Co-design plan

A common vision and shared goals enables mash up and then co-design with the users and not for the users.

Pilot an intervention

Real-life experimentation is carried out in the field.

Evaluate performance

Measurement, verification and performance scorecards enable scale up.

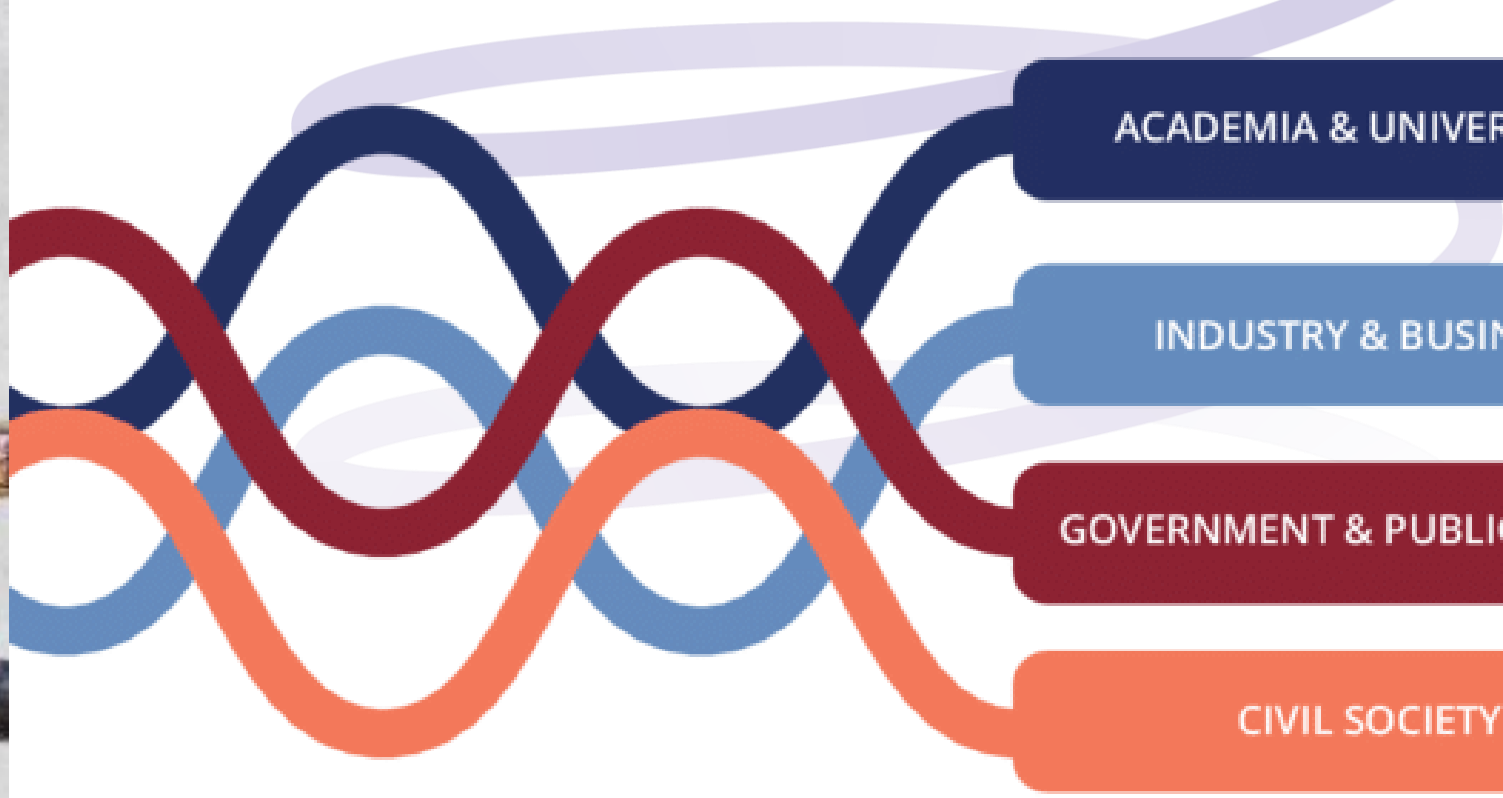
Demonstrate the system

Actual system proven in operational environment.

Exploit the solution

Test the solution outside the initial scope. Enlarge the solution, pollinate it and replicate it in other settings.

*Adapted from Mastelic, 2019



Living Lab are trustful regional ecosystems

Living Labs create a trustful environment that all stakeholders perceive as safe and neutral to open and contribute, understanding the value for them but also the value for the whole ecosystem

Regional Innovation Hubs

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Why Living Labs?

Derisk innovation

Transforming clients into developers, LLs support the creation of products and services that are more suitable for the market

Real-life environment

LL provide a real-life environment for **testing and validating innovations**

Bridge the research/market gap

LL help bridge the gap between research and market uptake, leading to **more impactful innovations**

Address complex societal challenges

LL are powerful tools for co-creating solutions that address complex societal challenges and **wicked problems** that are complex, dynamic, and often involve multiple stakeholders

Insights into the adoption

LL provide valuable insights into the adoption and **sustainability of innovations** in the long run

Involve end-users in the innovation process

LL involve end-users in the innovation process, ensuring solutions are **tailored to their needs**

Faster innovation cycle

LL facilitate **rapid iteration and prototyping of solutions**, leading to faster innovation cycles

Quadruple helix

LL enable collaboration between different stakeholders, including researchers, industry partners, and communities

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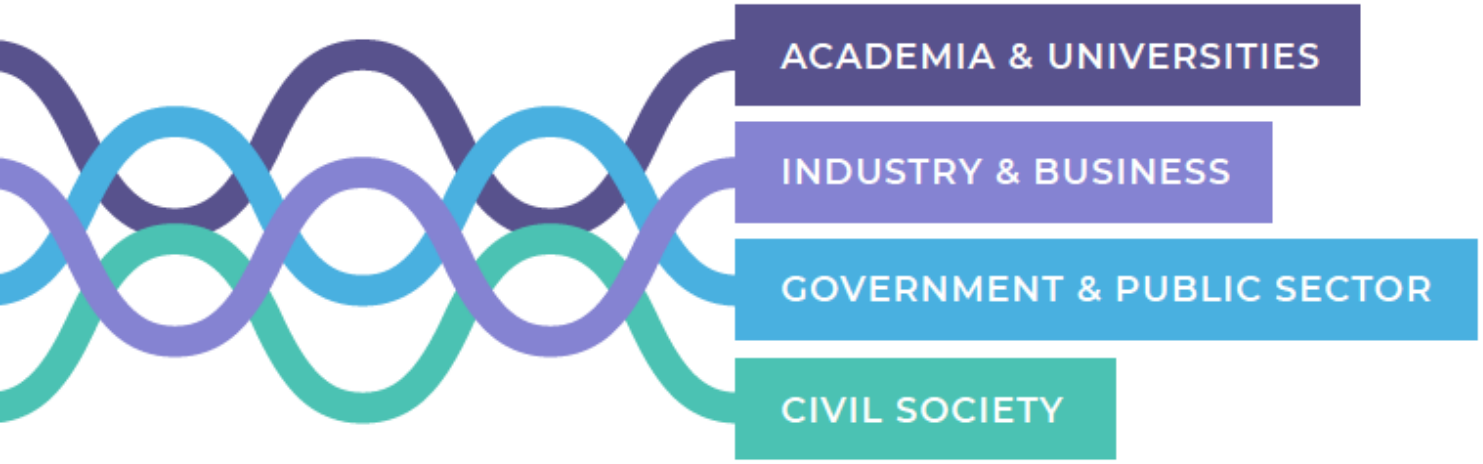
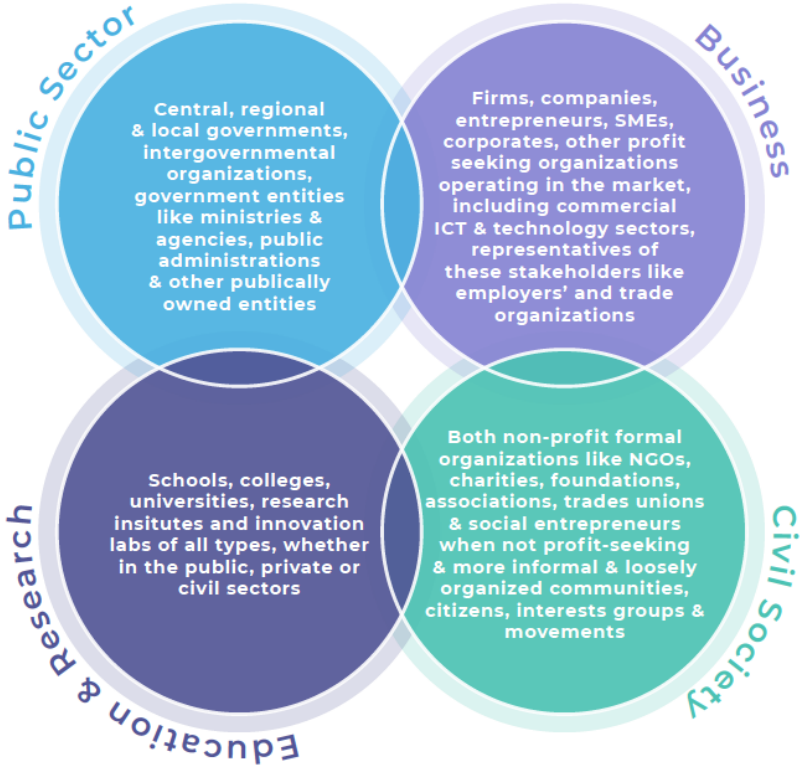
QUADRUPLE HELIX

Industry, Academia, Public Authorities and Citizens are part of the so-called Quadruple Helix model (QHM), where **users** are placed **at the heart of the innovation ecosystem**.

This means that **citizens/users must be considered as actors, not factors**, of the innovation process.





LIVING LABS CHALLENGES

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Theoretical & Methodological Challenges

Governance & Process-related Challenges

Actors' Motivations, Needs and Expectations

Ethical Challenges

http://www.diva-portal.org/smash/get/diva2:1239574/FULLTEXT01.pdf (Habibipour 2018)

Living Labs EU-wide recognition

22 topics within the **23-24 Horizon Europe work programme** explicitly ask to set-up/use Living Labs

Joint Working Groups ENoLL & European Commission

Living Labs cited as one of the five flagships of the **New European Innovation Agenda**

Living Labs EU-wide recognition

Partnership for Agroecology

A Soil Deal for Europe Mission

Zero Pollution – Green Deal

Cancer Mission

Climate-neutral and smart cities Mission

Climate Change Mission

Regulatory learning tool

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CASE STUDY ILVO MARIEN LIVING LAB

Flanders

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Via CO-CREATION TO SUSTAINABLE blue INNOVATION

The Marine Living Lab strives for accelerated and sustainable innovation in the blue sectors. Concrete questions from those sectors are picked up and worked out together with suitable partners into a tailor-made solution or project. The living lab has expertise and a broad network in fisheries, the marine environment, marine production, marine biotechnology and the blue economy in general.

Read more about the Marine Living Lab ↗

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Why Certification

ENoLL Living Labs undergo a structural and methodological quality assessment of their maturity as an innovation ecosystem. This seal of quality makes ENoLL Living Labs the **global standard on user-driven innovation.**

consistent use of a Living Lab approach


Timișoara,
România
24 -27 September
OpenLivingLab Days 2024


Timișoara,
România
OpenLivingLab Days 2024


ENoLL in Germany INFODAY
Aachen, 24 June 2024


ENoLL@ SSUNGA 79
New York, 16 – 18 September 2024 –
Sessions and Field visits


ENoLL in India
Bangalore, November 2024

European Network of Living Labs

Contact us!

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Martina Desole martina.desole@enoll.org

European Network of Living Labs

- what are living labs?
- how do you develop and set up living labs ?
- recent examples of living labs that R&D of technologies that are being used for energy transition in our sector or that can be eventually also used or considered for our sector.
- how do different stakeholders collaborate in your projects?
- what has been your biggest challenges and your biggest opportunities so far of living labs?
- how do we create the right environment for R&I, and attract the different stakeholders to create living labs?

WATERBORNE

Waterborne Technology Platform

01

WHO ARE WE?

Waterborne TP Association

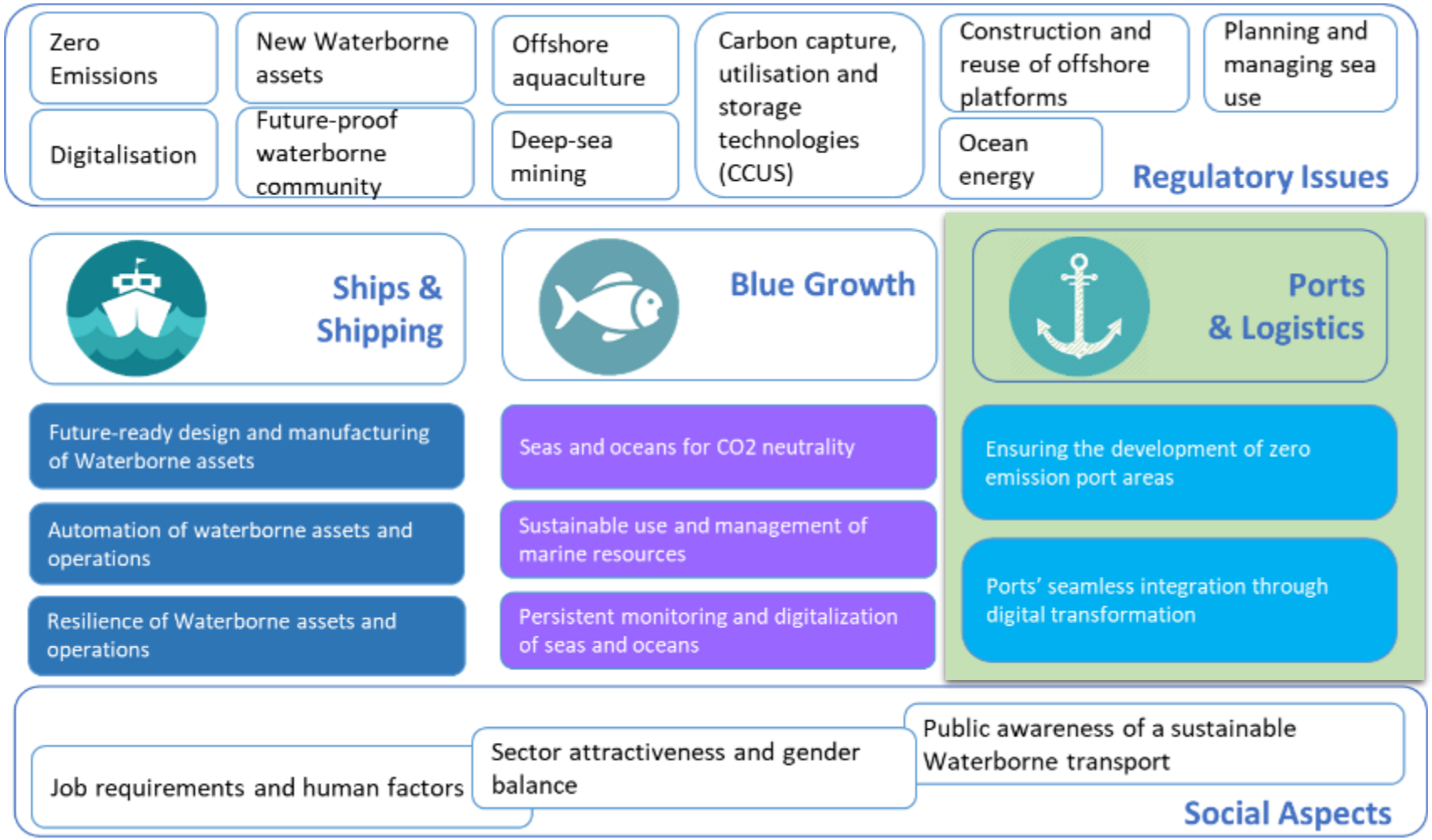
A **European Technology Platform** for the **Waterborne** sector

- 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;
- Currently 120 members, representing the main stakeholders of the European waterborne transport sector (shipyards, maritime equipment manufacturers, shipowners, research institutes, academia, associations, etc.…),
- Waterborne = Maritime + Inland Navigation and lakes + Ports!
- cPP on Zero-Emission Waterborne Transport and other activities
- Three working groups: Ships & Shipping, Ports & Logistics and Blue Growth

02

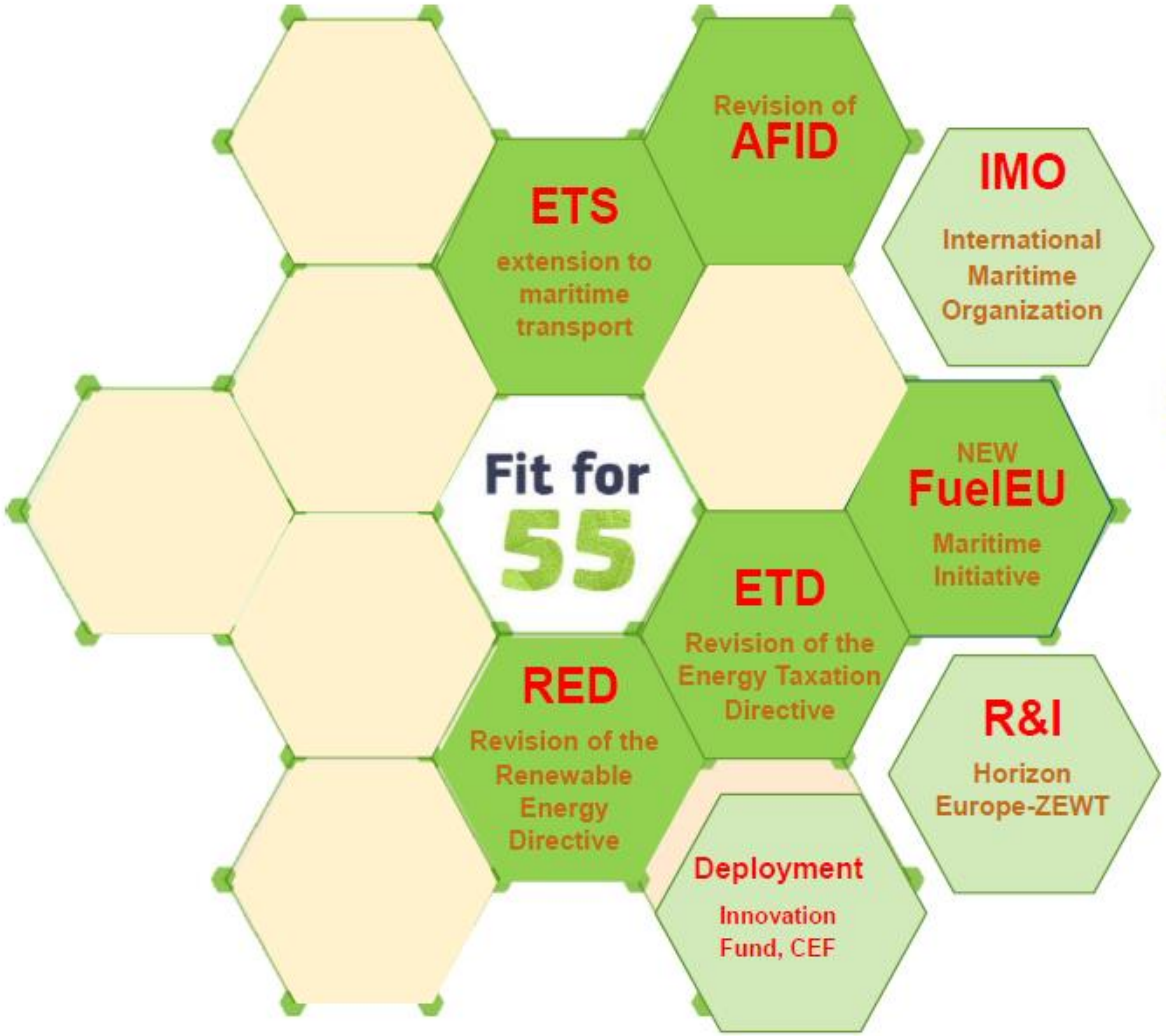
SRIAs OF THE WATERBORNE SECTOR

Strategic Research and Innovation Agenda (SRIA) for the European Waterborne Sector – Global view



Partnership

Decarbonising Waterborne Transport: "Basket of Measures"



MARITIME

ZEWT= Zero Emission Waterborne Transport Partnership

European Commission

What is an EU Partnership

Co-Programmed Partnership

- Collaboration between the EU and the Waterborne Association (crucial role of Member States and Associated Countries)
- Definition of roadmap for research, innovation, and technology development
- co-Programming of EU calls for research, including demonstration
- EU will run calls and projects in the normal way
- Spin-off: much more attention for maritime sector in other EU funds (Innovation Fund, CEF)

- Recognition of the importance of the sector (all actors in the waterborne transport ecosystem)

Zero-emission waterborne transport partnership

(*Co programed partnership, lead by Waterborne TP which mobilises a critical mass of over 100 partners, over €0.5 Bn EU funds leveraged 6 times with private investment to achieve zero-emission waterborne transport vessels*)

Strategic Research and Innovation Agenda:

R&I to develop and demonstrate zero-emission solutions for all main ship types and services by 2030 which will enable zero-emission waterborne transport by 2050.

Eliminating **GHG emissions** from new ships and retrofitted existing ships by means of sustainable alternative climate-neutral fuels, renewable energies, electrification and energy efficiency.

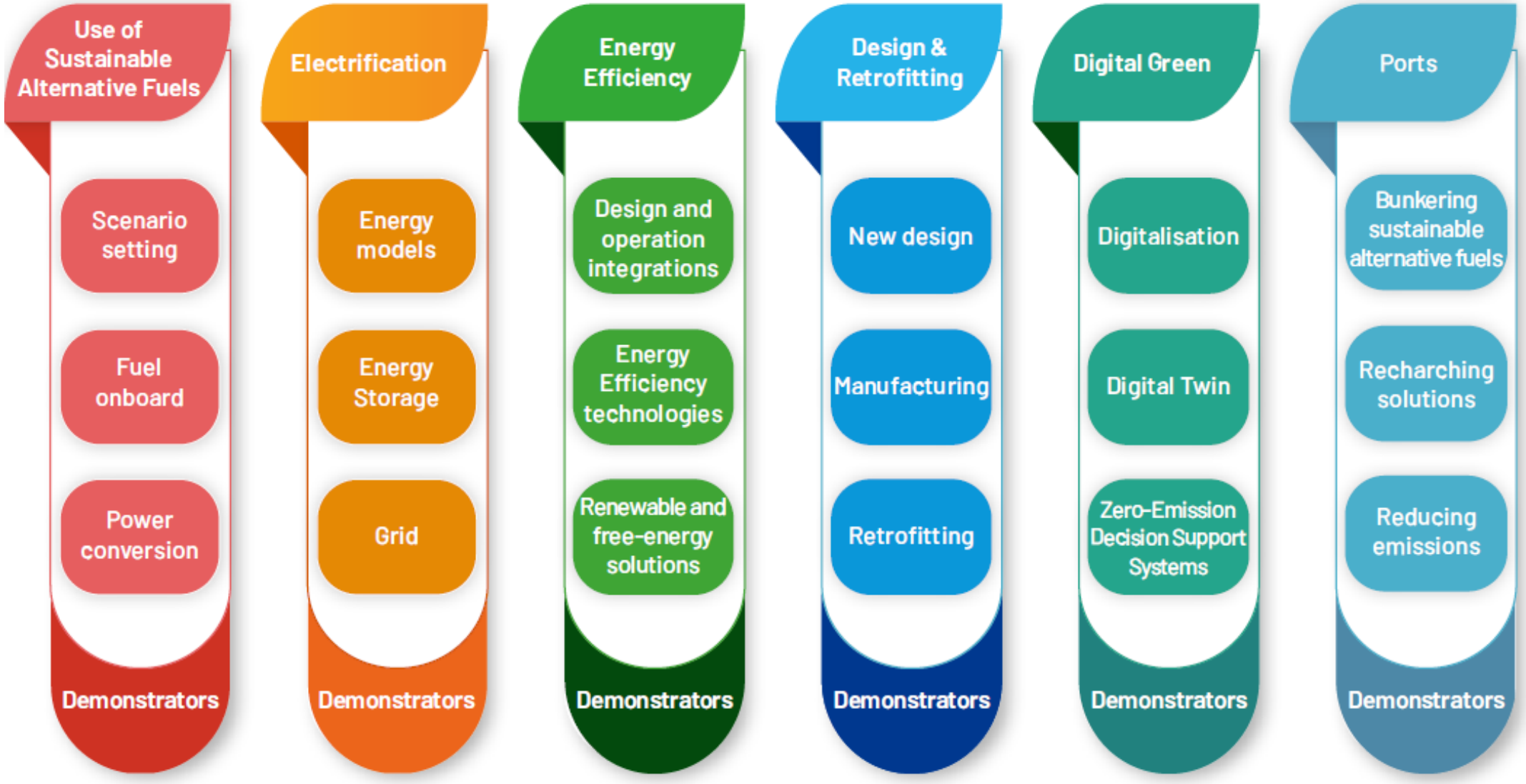
Cutting coastal and inland pollution to air by at least 50% compared to current levels

Elimination of pollution to water (including harmful underwater noise) from ships

Implementation pathways

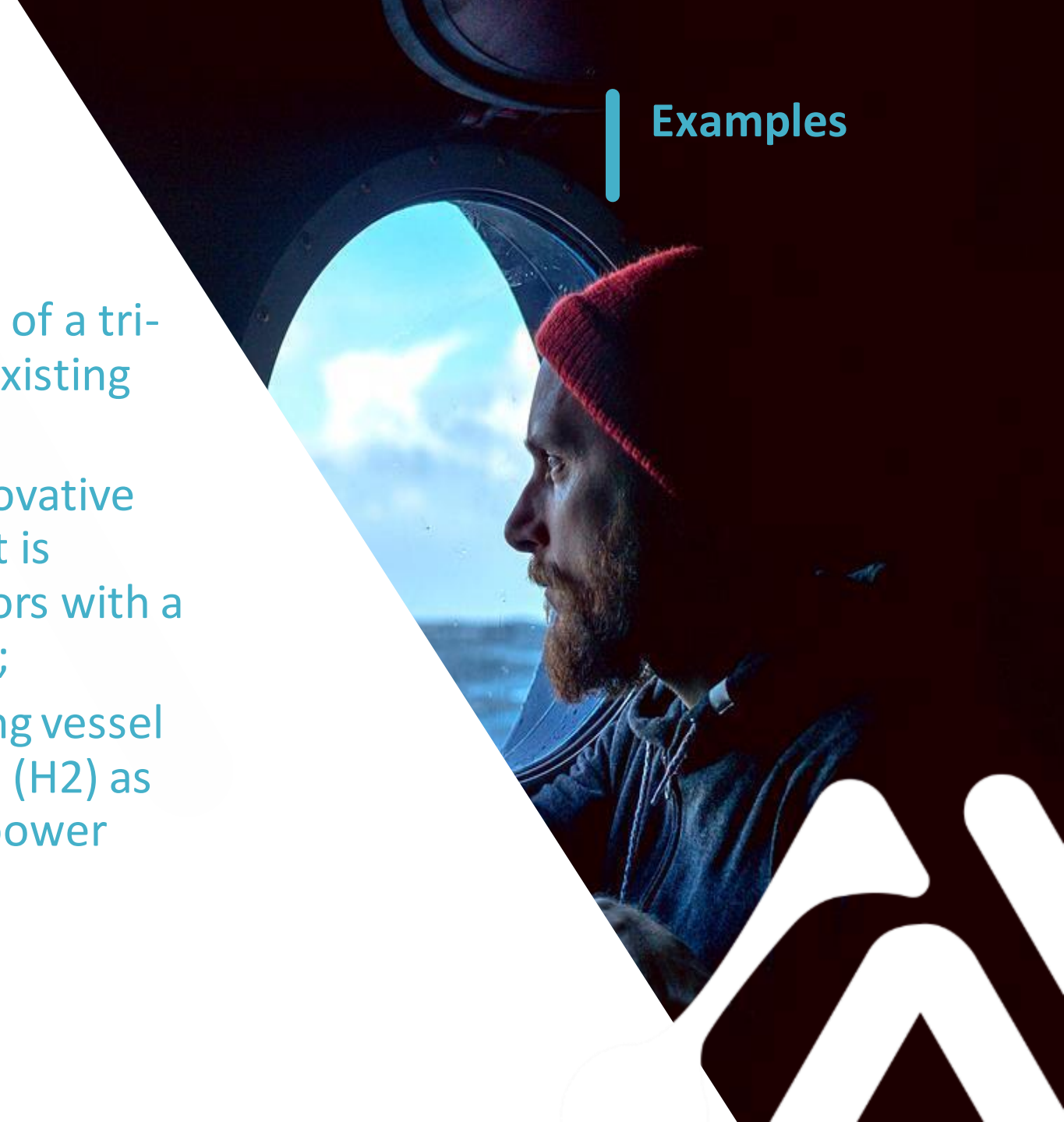
- Simplification of fleet into 6 ship types
  - ❑ Long distance ships
  - ❑ Cruise ships
  - ❑ Ferries
  - ❑ Inland vessels
  - ❑ Short-sea ships
  - ❑ Offshore ships
- Distinction made in trade
  - ❑ Liner or tramp service
- Both newbuilt as well as retrofitting

Activities


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

Examples

- large-scale demonstration of the use of a tri-fuel (ammonia-based) engine in an existing vessel;
- retrofit a bulk carrier with highly innovative technologies and demonstrate that it is possible to replace auxiliary generators with a new fuel system that runs on e-fuels;
- Capesize vessels as the demonstrating vessel will be retrofitted to utilize hydrogen (H2) as the main energy source for electric power generation;
- Wind assisted propulsion



WATERBORNE

Thank you!

Jaap Gebraad
Jaap.Gebraad@waterborne.eu

ECORYS 90 Years Answering tomorrow's challenges today

Sustainable Blue Economy Partnership

Setting sails:

The Partnership's new R&I projects

Introduction to the Suite of Projects

Contribution from
Marta Norton
FCT, Portugal

Co-funded by the European Union

EUROPEAN PARTNERSHIP

«The Way forward: A thriving sustainable Blue Economy for a Brighter future»

Five Priority Areas

The first call, launched on 13 February 2023, aimed to support transnational R&I projects addressing the following priority areas:

(1) Planning and managing sea-uses at the regional level
(2) Development of offshore marine multi-use infrastructures to support the blue economy
(3) Climate neutral, environmentally sustainable, and resource-efficient blue food and feed
(4) Green transition of Blue Food production
(5) Digital Twins of the Ocean (DTOs) test use cases at EU sea-basins and the Atlantic Ocean

19 selected proposals

General information

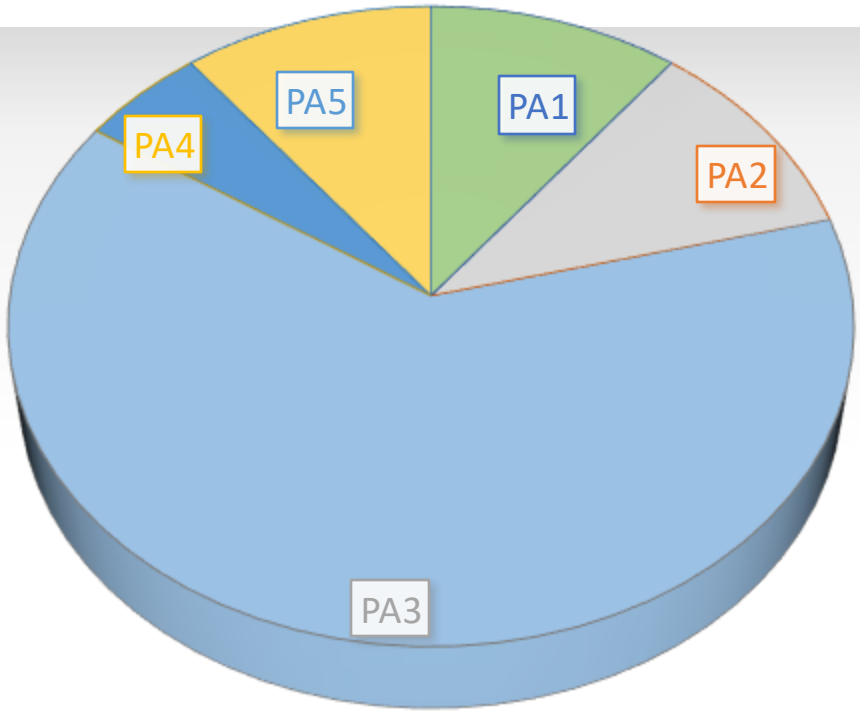
- 19 selected proposals for a total requested budget of 27,314,215 €
- On average, the requested budget per proposal was 1,437,590 €
- Project partners come from 21 different countries, including EU Member States, Associated Countries, and third countries.
- 89 participating organisations have declared a public status (55,6%) and 71 have declared a private status (44.4%), among them 41 SMEs

19 Selected proposals
General information

Priority Areas

The 19 selected projects address all five Priority Areas of the call.

PA3 mobilised the strongest response (12 of the 19 selected projects).



Priority Area	No. Proposals	Percentage
PA1 - Planning and managing sea uses at the regional level	2	10,5
PA2 - Development of offshore marine multi-use infrastructures to support the blue economy	2	10,5
PA3 - Climate-neutral, environmentally sustainable and resource-efficient blue food and feed	12	63,2
PA4 - Green transition of Blue Food production	1	5,3
PA5 - Digital Twin of the Ocean (DTO) test use cases at EU sea-basins and the Atlantic Ocean	2	10,5

Sea-Basins

The majority of the selected proposals **address more than one sea-basin;** Mediterranean Sea, Atlantic Ocean, Baltic Sea and North Sea are equally covered. Black Sea is only addressed in 2 proposals.

Sea-Basin	No. Proposals
Atlantic Ocean	13
Baltic Sea	11
Black Sea	2
Mediterranean Sea	12
North Sea	13
Other sea-basins (e.g, Norwegian, Barents, Polar oceans, etc.)	4

SBEP joint transnational call 1
Examples from each of the priority areas

- ***AQUABALANCE*** *(PA4 Green transition of Blue Food production)*

Balancing economic, environmental, and social sustainability in the European aquaculture industry

- ***DTO-Track*** *(PA5 Digital Twin)*

Digital Twin of the Ocean: Animal Tracking

- ***FAMOS*** *(PA2 Offshore marine multi-use infrastructures)*

Sustainable, Reliable and Socially Acceptable Modular Floating IslAnds for Multi-use Offshore Spaces

- ***MEDSEAPLAN*** *(PA1 Planning and managing sea-uses)*

Data and Scenarios for a Sustainable Mediterranean Blue Economy

- ***SEAREFINERY*** *(PA3 Blue Food & Feed)*

Improved valorization of marine sources and processing waste for resource efficient blue food/ feed and environmentally sustainable materials development

SBEP joint transnational call 1
Selected Projects

PA1 Planning and managing sea-uses

BlueEcho
aims to improve **the shipping and wind-farm industries sustainability** and conserve species biodiversity by **assessing noise impacts on marine fauna** and **evaluating the efficiency** of various **mitigation acoustic measures to reduce noise levels.**

PA2 Offshore marine multi-use infrastructures

INSPIRE
Aims **to combine marine renewable energy constructions with hydrogen production**, to develop multi-use structures and materials to reduce, recycle, reuse while being resistant to extreme environmental conditions.

PA5 Digital Twin

ARCFISH
Develop a pilot Digital Twin of the Ocean (DTO) **Platform delivering new data products and services** in **support of sustainable Arctic Fisheries**

SBEP joint transnational call 1

Selected Projects

AquaUP

Aims to investigate **seaweed-modified functional compounds in aquatic feed** to improve growth, immune response, and disease resistance in **aquaculture**

Blue Boost

Aims to demonstrate that **co-culture of a wide range of low trophic species with established species can boost current European aquaculture** of blue foods and feeds while **reducing the environmental footprint** and moving towards a carbon-neutral aquaculture blue economy

PA3 Blue Food & Feed

Blue Bio Boost

Aims for a **sustainable economic development of the macroalgae industry** by (1)suitable selection of genotypes, (2)better exploiting genetic variation, (3) actively involving stakeholders in creating a plan for future macroalgae breeding in Europe

SBEP joint transnational call 1

Selected Projects

BLUEWAYSE

Proposes a **significant cut in the CO2 emissions of the food and feed sectors**, creating synergies and exploiting opportunities to achieve environmental and health benefits via economic sustainability

PA3 Blue Food & Feed

FOODIMAR

Aims to develop **new industry-relevant solutions from fisheries and aquaculture side-streams** for climate-friendly, cost-effective, sustainable, and high-quality food market applications

CliN-BlueFeed

Ambitions to develop and **use a low-CO2 smart autonomous multiplatform system** to monitor and forecast *Calanus finmarchicus* stock which is a new sustainable climate neutral blue fish feed **for the growing aquaculture industry**

SBEP joint transnational call 1

Selected Projects

PA3 Blue Food & Feed

RE-BLUE

Explore **new scalable food value chains from the large parts of the herring/sprat catches that are currently discarded**

SEAFOODTURE

Aims to contribute towards an **integral valorisation of seaweeds** for the production of sustainable, high nutritional quality **food products.**

FunSea

Aims to enhance **nutritional quality, safety and functional properties of cultivated brown and green algae as food ingredients**, through development of new sustainable processing technologies and utilization of side streams and residual biomass from related industries.

Selected Projects

PA3 Blue Food & Feed

SHELLFISHBOOST

The long-term goal is to **mitigate the effects of climate change on the bivalve production** to protect and develop a vital blue bioeconomic sector in Europe, **through genetic selection and selective breeding best practices for target species**

WASTE2TASTE

Aims to **valorize post harvest fish losses**, showing potential applications in a circular economy and an eco-friendly vision by **developing protocols for sustainable exploitation** of **underused and/or wasted marine resources**, to obtain high-value products for food applications.

- ***More information about each project:***
  - Priority Area, consortium members, Coordination, Partners Institutions/countries, keywords and abstract, **available on the SBEP website** / news

    https://bluepartnership.eu/news/partnership-decides-first-batch-co-funded-projects

    with the leaflet presenting each project
  - digital poster gallery

- E-mail: sbep@mur.gov.it
- https://bluepartnership.eu
- SBEP's following social media channels :
  - Twitter - @BlueEconomyEU
  - Facebook
  - Linkedin
  - Instagram

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Sustainable Blue Economy Partnership

Thank you for your attention

Contact info: sbep@mur.gov.it

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& TECHNOLOGY ALLIANCE
www.azti.es
DECARBONISING
THE FISHING FLEET
SINCE 2008

AZTI

EXPERTS IN MARINE AND FOOD RESEARCH

Research area: Sustainable Fishing Technologies

More than 290 professionals in 3 Centers

Team: 15 people (~75% PhD)

Background: engineering, environmental sciences, oceanography, marine biology, marine science, cartography, computer science, fishing master

Experience in vessels and fishing operations (boarding and work on board, ports) and laboratory - computational

Research/Focus: Fishing operations

1. Fishing Gear Selectivity
2. Fleet Digititalisation
3. **Fleet Decarbonisation**
4. Marine Litter and Circular Economy
5. Process Innovation on Board

FISHING VESSELS ARE DIVERSE: ONE-FITS-ALL SOLUTIONS DO NOT EXIST

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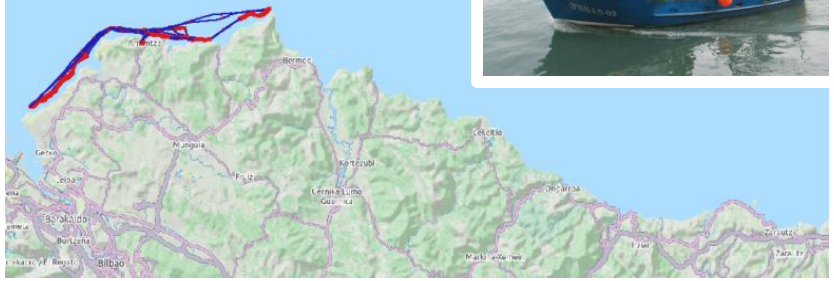
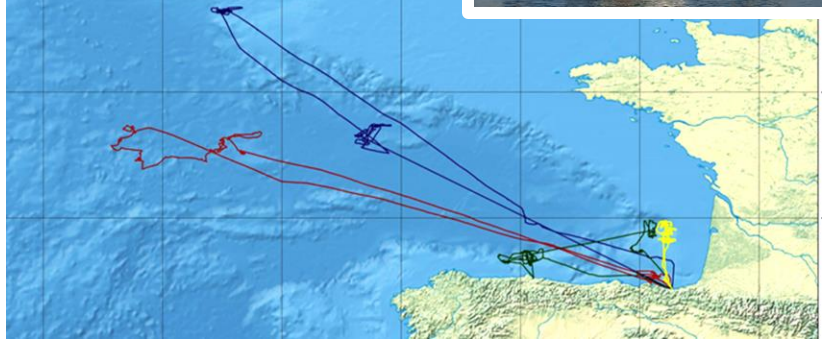
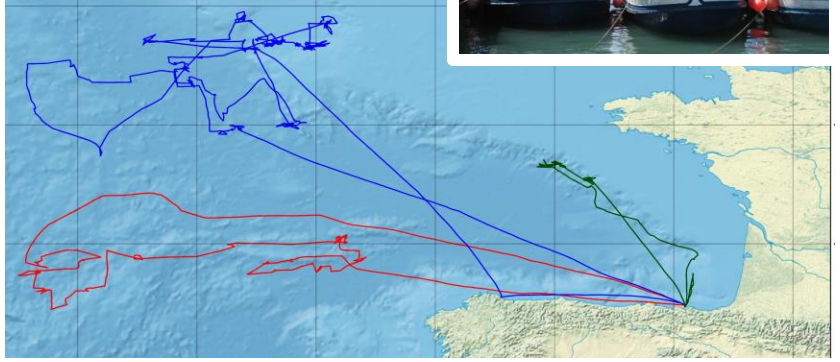
Artisanal (<15m)
20-30 t fuel / year



Purse seiners and Pole & line (30-35m)
250-300 t fuel / year



Trolling vessels
(20-25m)
80-125 t fuel / year



Trawler
(35-40m)
1.000 – 1.250 t fuel / year

Tropical tuna purse seiner
(80-100m)
3.000 – 7.000 t fuel / year

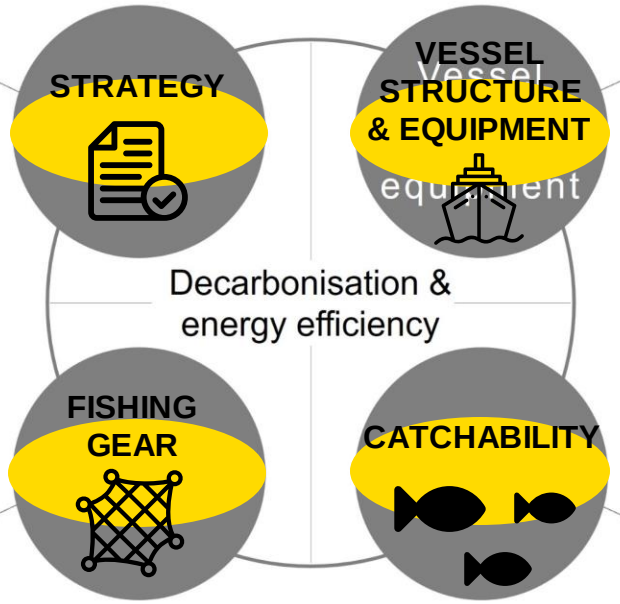
DESCARBONISATION SOLUTIONS FOR FISHERIES

Solutions to improve the onboard strategy

- Energy audits
- Energy monitoring devices
- Slow steaming
- Route optimisation

Solutions linked to fishing gears

- Lighter ground-gears
- Floating trawl sweeps
- Rolling wheels for trawl shoes
- Pulse trawling
- Remotely controlled trawl doors
- Fishing nets made of alternative materials



Solutions applied to the vessel's structure and onboard equipment

- Low emission engines and innovative propulsion plants
- Alternative fuels
- Heat recovery systems
- Ducted propellers
- Bulbous bow
- Alternative antifouling coatings
- LED lighting
- …

Increase catch

- Improvement of fish stocks to MSY, increase catch per unit effort, fishing capacity, etc.

Basurko O.C. eta al, Workshop on the European Green Deal − Challenges and opportunities for EU fisheries and aquaculture, Part I: Decarbonisation & circular economy aspects for fisheries, Presentation for the Committee on Fisheries (PECH), 2023.

AZTI & ENERGY EFFIENCY IN FISHERIES

AZTI
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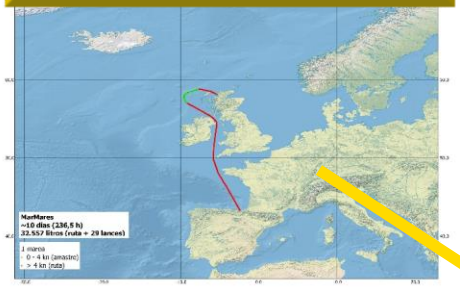
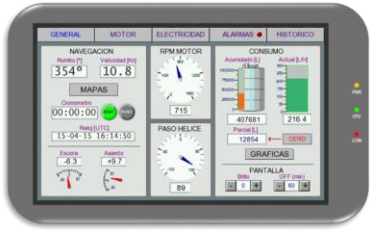
FISHING OPERATION MONITORING



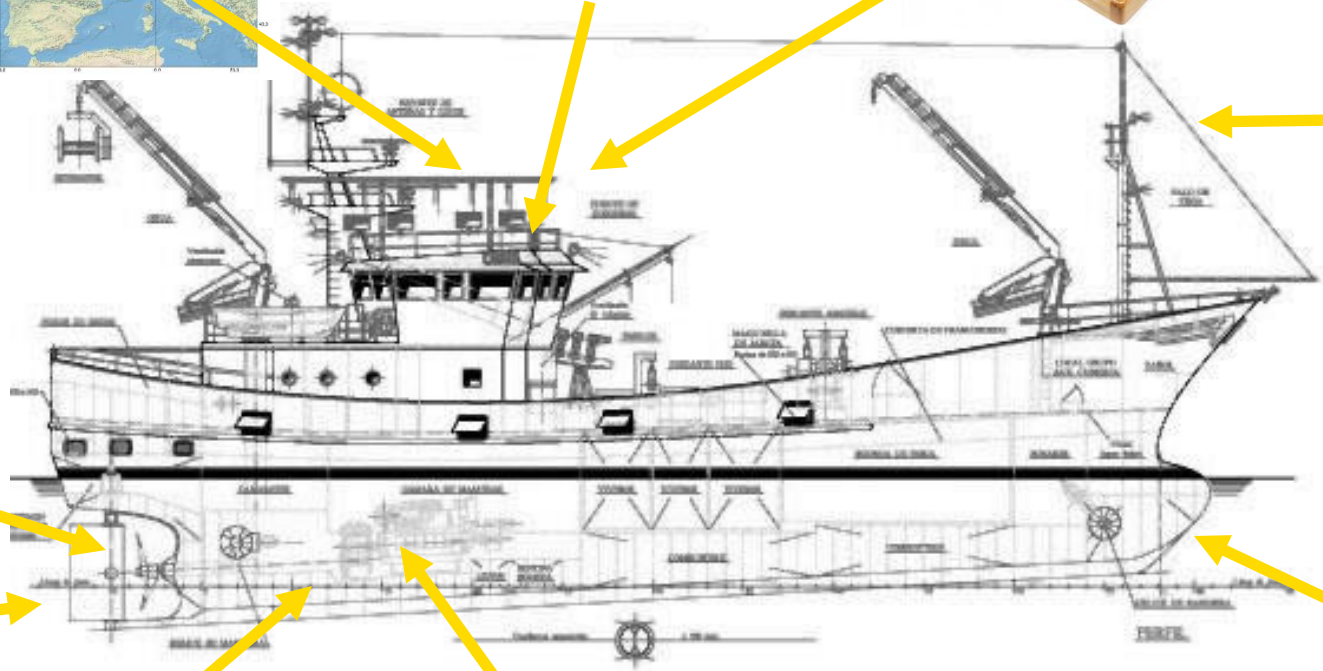
FUEL CONSUMPTION MONITORING



MARINEVIEW – EFFICIENT FISHING

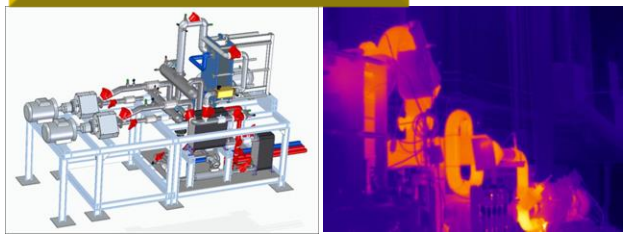
SAIL PROPULSION TESTS

PROPULSION

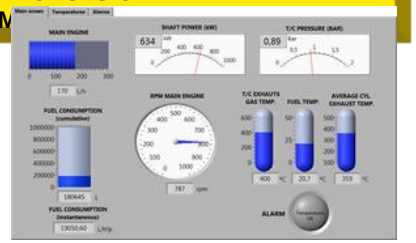


DRAG REDUCTION FROM FISHING GEAR

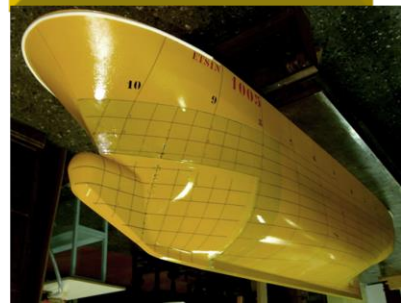
WASTE ENERGY RECOVERY



PROPULSION PLANT M

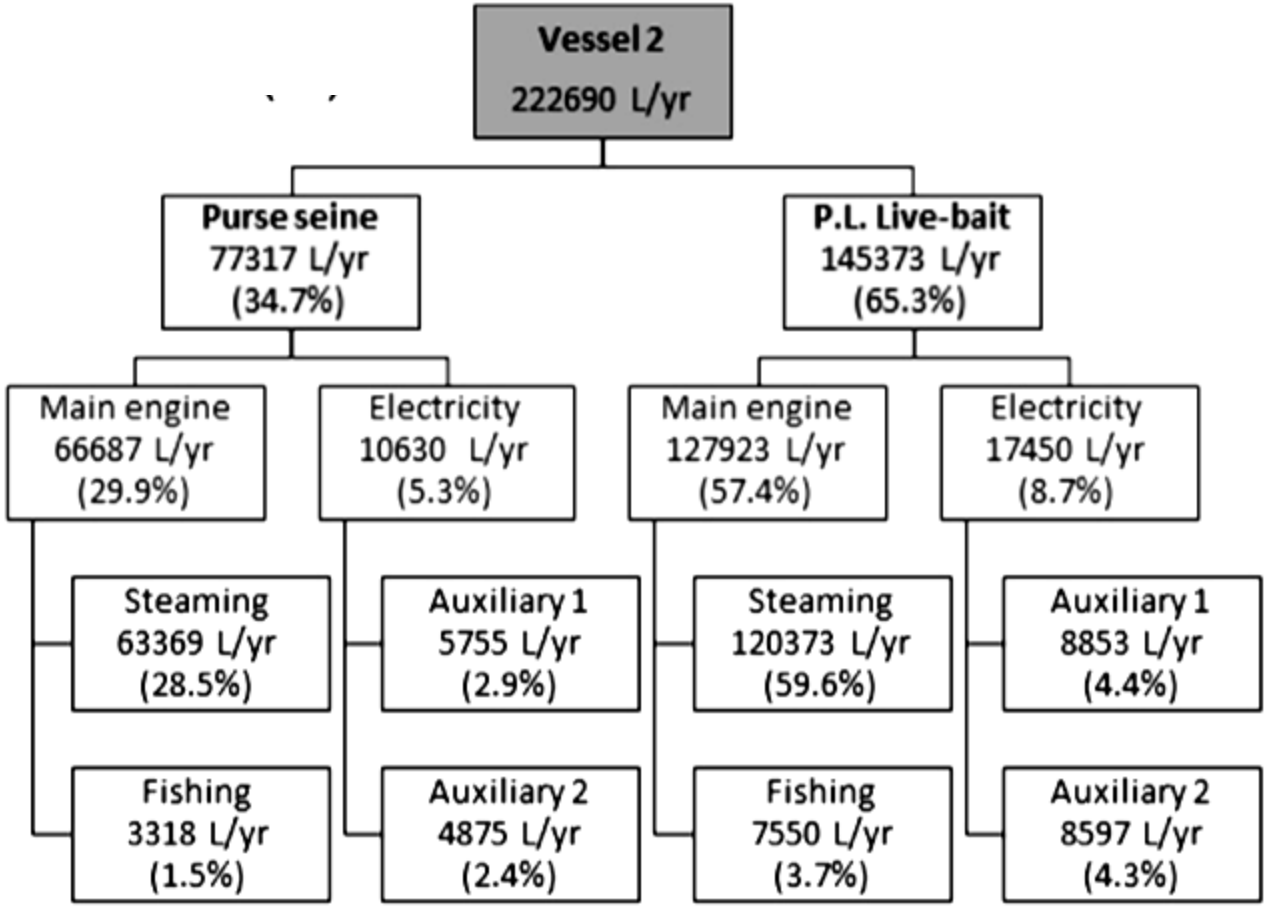


STRUCTURAL – DRAG FORCE REDUCTION



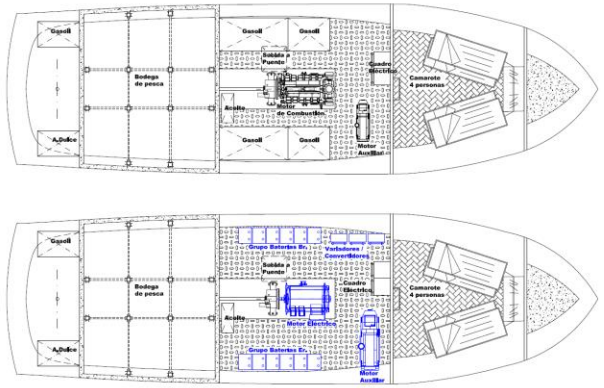
FIRST STEP: monitoring is key for descarbonisation

- **KNOWLEDGE** on fuel consumption and operational patterns
- Use of adecuated **EQUIPMENT** and development of **ENERGY AUDITS**
- Evaluation of different fuel saving **STRATEGIES**: research and pilot projects, test on board, test benches,…



Oihane C. Basurko, Gorka Gabiña, Zigor Uriondo, Energy performance of fishing vessels and potential savings, Journal of Cleaner Production, Volume 54, 2013, Pages 30-40, ISSN 0959-6526, https://doi.org/10.1016/j.jclepro.2013.05.024.

APPLIED PROJECTS
Key examples

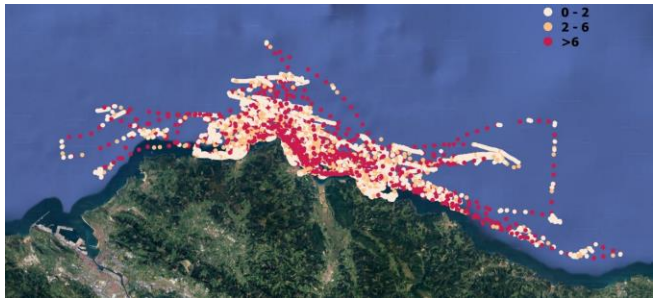


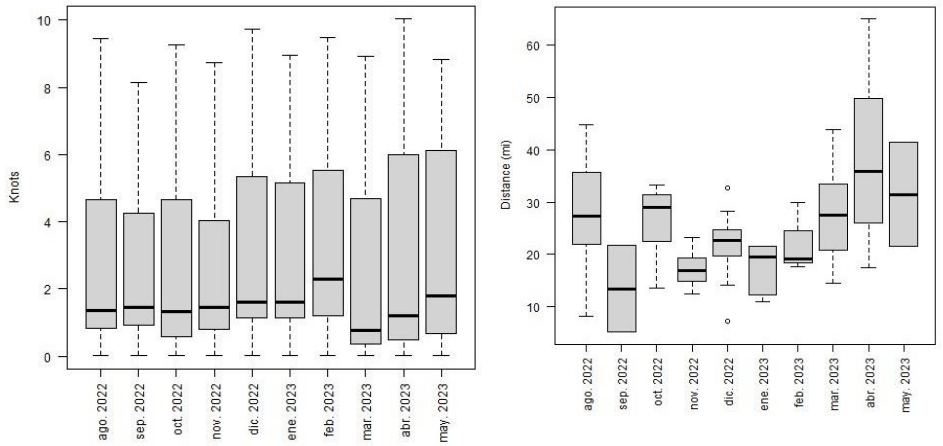
Basque small scale fleet – green transition

Operational activity and energy demand assessment for fuel saving strategies:

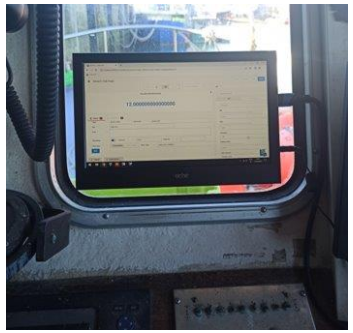
“Feasiblility of new power plant: **Hybrid-Electric**?”

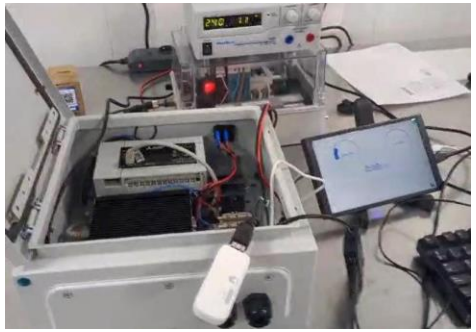
Fishing activity **monitoring: GPS**

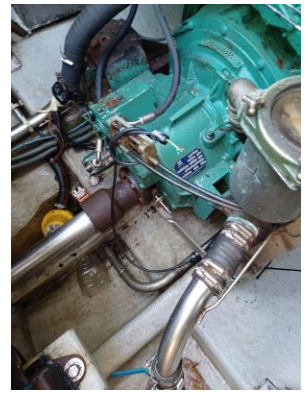


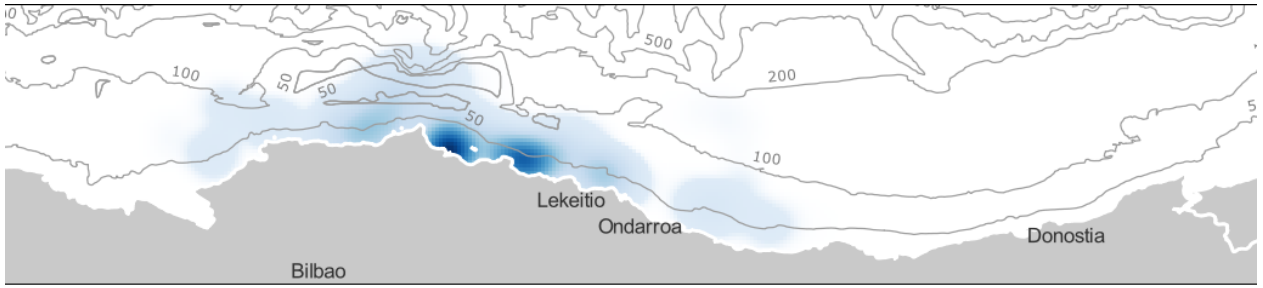


Fuel monitoring: SIMUL (fuel calc system)









APPLIED PROJECTS
Key examples

		Fuel consumption (L/trip)			Duration time (h/trip)			Vessel speed (kn)			Distance (nm/trip)		
		Trip	Steaming	Fishing	Trip	Steaming	Fishing	Trip	Steaming	Fishing	Trip	Steaming	Fishing
Gillnet	Average	37.31	26.50	10.81	7.18	1.42	5.76	3.22	7.34	2.11	21.43	10.58	10.85
	SD	22.53	20.82	5.34	3.34	0.96	2.92	1.12	0.68	0.75	9.93	7.45	5.01
	Min	4.28	0.00	1.77	1.00	0.00	0.67	1.25	2.15	0.75	3.49	0.00	1.85
	Max	116.36	111.08	43.36	18.77	5.09	15.07	6.71	8.66	4.22	54.13	39.06	29.25
Trammel net	Average	25.90	15.39	10.51	6.95	1.28	5.67	3.08	6.72	2.28	20.16	8.61	11.55
	SD	11.47	9.57	2.87	2.80	0.74	2.23	0.82	0.13	0.78	6.95	5.08	2.68
	Min	14.40	5.39	7.41	2.50	0.42	1.75	2.19	6.50	1.29	12.04	2.88	6.93
	Max	54.06	40.46	15.90	13.58	3.13	10.45	4.82	6.91	3.98	34.96	21.53	15.83
Vertical lines	Average	46.87	36.58	10.29	9.45	2.52	6.92	2.92	6.73	1.54	27.49	17.25	10.24
	SD	34.38	32.08	5.55	4.01	1.72	3.09	0.86	1.00	0.60	15.47	12.75	5.38
	Min	4.09	2.64	0.79	1.58	0.33	0.53	1.35	4.44	0.57	3.93	2.17	0.90
	Max	190.70	174.94	27.39	21.55	11.52	11.57	6.09	8.15	3.60	99.40	82.27	24.94
Long-line / Conger	Average	20.66	12.69	7.97	7.22	0.92	6.29	2.54	7.21	1.80	14.10	6.46	7.64
	SD	15.03	9.19	5.84	7.14	0.84	6.31	1.19	0.51	1.17	9.57	5.56	4.00
	Min	10.03	6.19	3.84	2.17	0.33	1.83	1.70	6.85	0.97	7.33	2.52	4.81
	Max	31.29	19.18	12.10	12.27	1.52	10.75	3.38	7.57	2.62	20.86	10.39	10.47
Long-line / Hake	Average	40.13	27.00	13.13	11.26	2.82	8.44	2.60	6.31	1.21	27.63	17.59	10.03
	SD	10.33	10.47	7.83	2.47	0.61	2.56	0.80	0.70	0.54	5.52	3.27	6.05
	Min	20.51	0.54	0.69	3.27	1.91	0.44	1.57	4.82	0.37	16.08	13.04	0.78
	Max	49.03	42.10	26.96	12.92	3.94	10.26	4.91	6.90	1.83	32.00	23.80	18.26
Trolling	Average	130.09	114.67	15.42	13.00	9.65	3.35	6.00	6.71	3.77	77.98	64.83	13.15
	SD	25.17	32.16	11.39	1.57	2.47	2.39	0.47	0.08	0.51	11.72	17.08	10.22
	Min	107.66	87.26	4.55	11.17	7.60	0.92	5.43	6.60	3.09	67.12	50.55	3.61
	Max	172.90	168.35	31.18	14.75	13.83	6.83	6.59	6.78	4.36	97.25	93.64	27.79

APPLIED PROJECTS
Key examples

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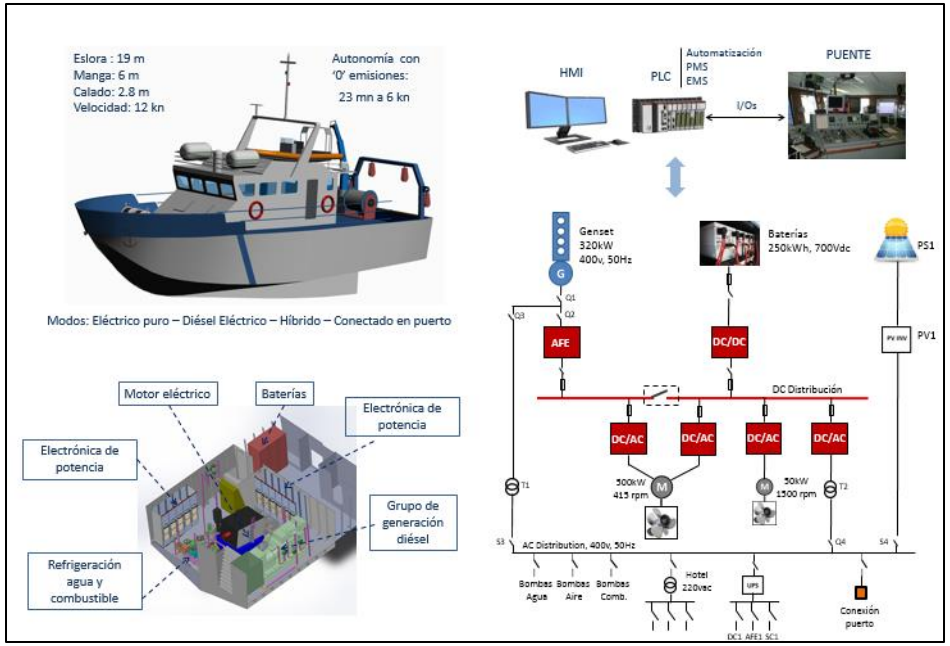
MEMBER OF BASQUE RESEARCH & TECHNOLOGY ALLIANCE

ELECTRIFICATION

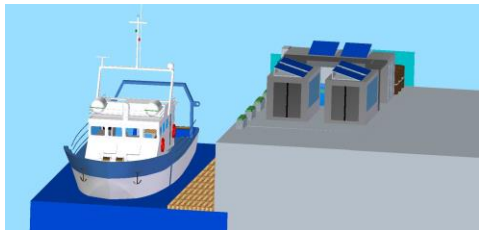
Retrofit: from diesel propulsión to hybrid/electric propulsion (near zero emission vessel)

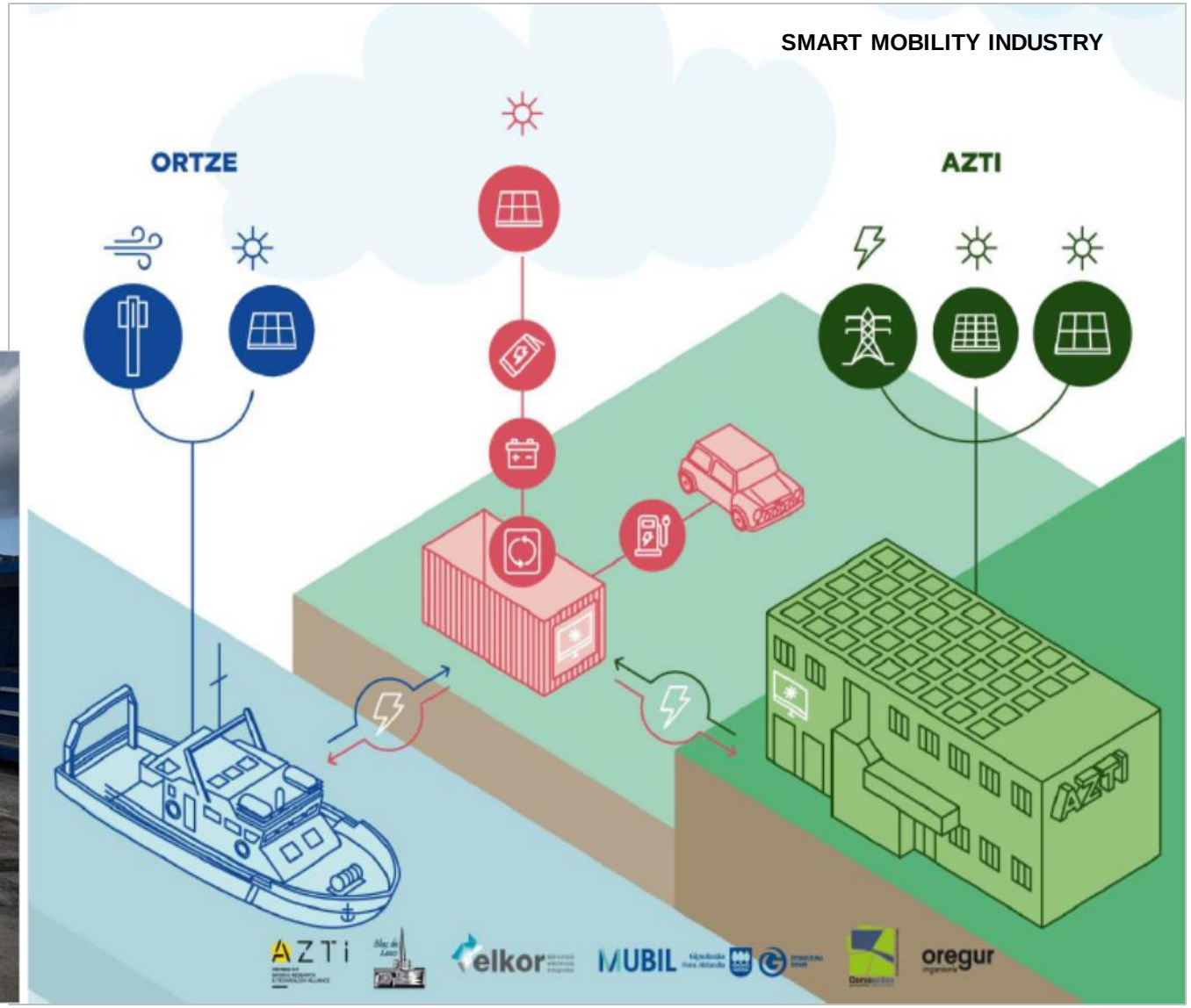


APPLIED PROJECTS
Key examples

KAINDAR Project

Smart grids in ports with renewable energy for charging

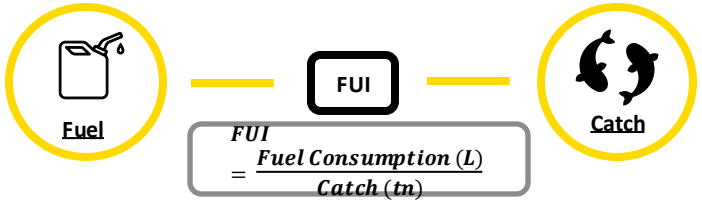


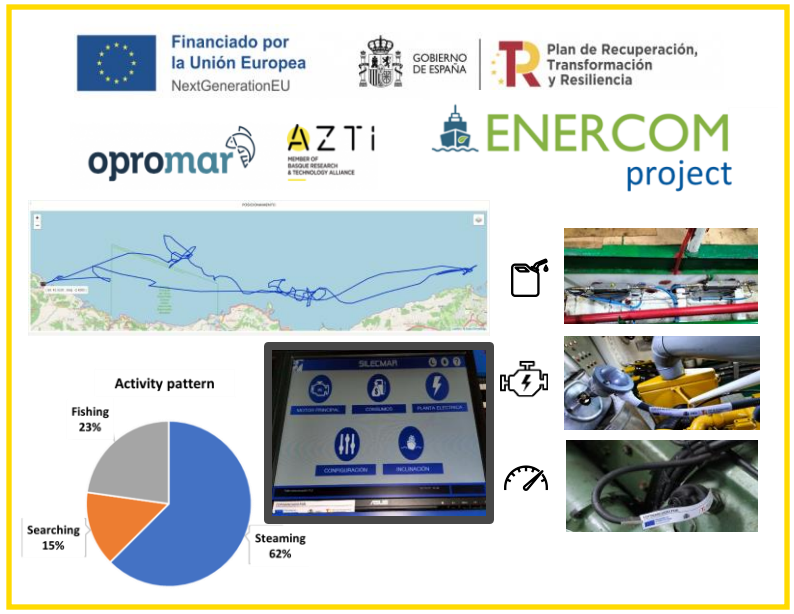


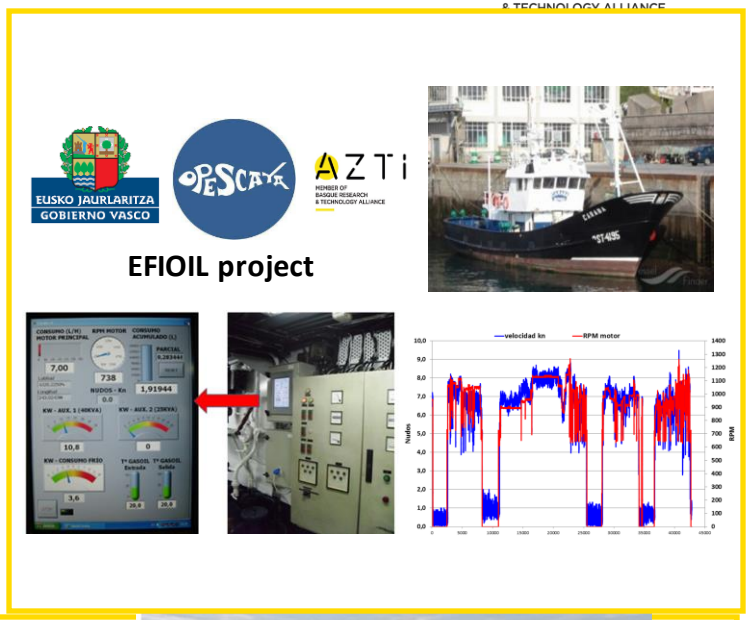
RESULTS & FEEDBACK FROM FISHERS COMMUNITY

Fuel consumption monitoring devices (operational activity)

- **10-25% of fuel saving** mainly in long trips and coastal fisheries where the skipper are the shipowner are the same person.
- **5-7% of fuel saving** in artesanal fishing vessels (short trips).
- The sector is **quite receptive** to these initiatives due to short periods of return on investment.
- These fuel monitoring devices have been used also to evaluate different actions onboard in order to **quantify the saving** and also compare with other fletes in terms of **fuel efficiency**:



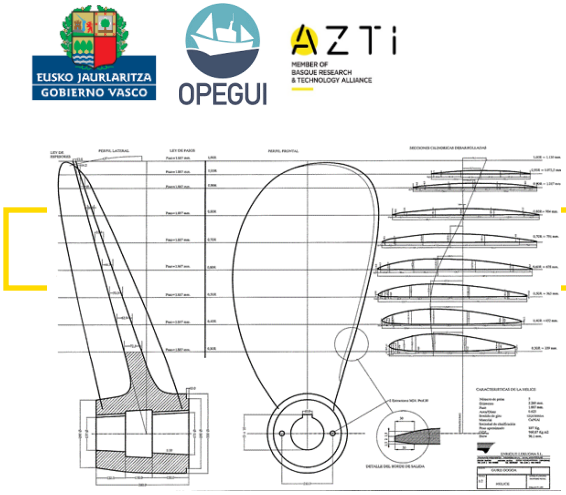


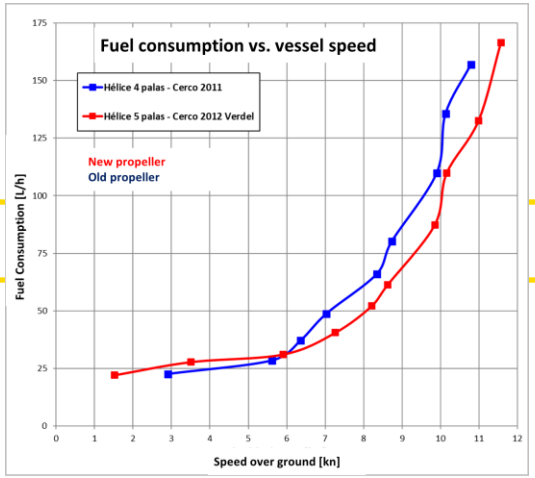


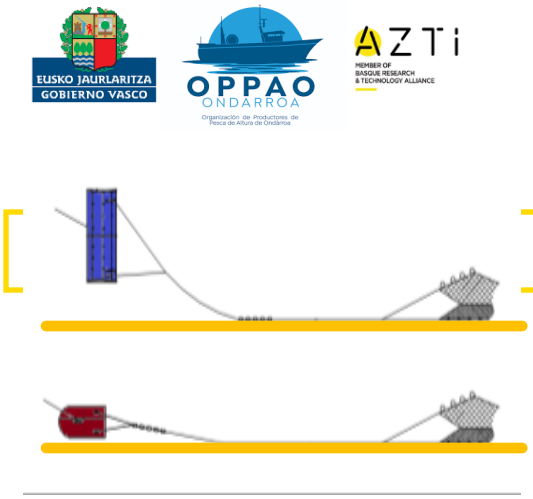
RESULTS & FEEDBACK FROM FISHERS COMMUNITY

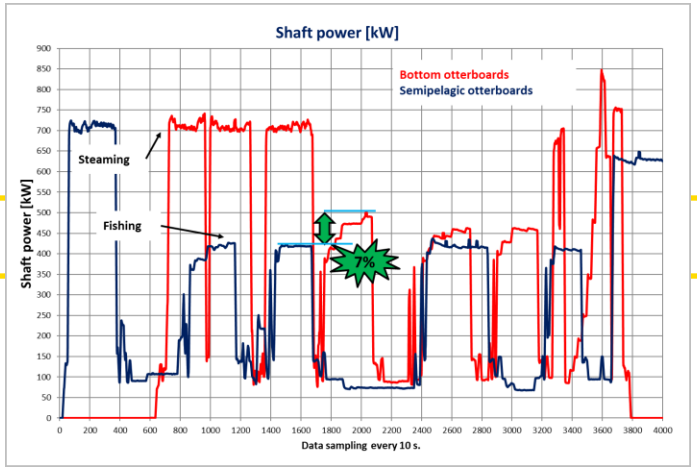
Structural retrofits

- **5-10% of energy saving** tested
- The **sector is not very receptive** because it involves operational and structural changes. **“What works is best left untouched”**
- The fuel monitoring devices have been used also to evaluate different actions onboard in order to quantify the saving









THE PROCESS, FINANCIAL SUPPORTING & THE IMPORTANCE OF STAKEHOLDERS

The ideas come from **different backgrounds**: auxiliary companies, the fishing sector, public administration and AZTI.

At AZTI, we have a **network of contacts with all the stakeholders** in the sector and we try to identify the key agents to participate in different studies or developments.

There are various public aids with different focuses:

- **Research** or applied research, where we work mainly with the sector or with other research institutes.
- **Product development,** where we work mainly with companies in the sector or even with research institutes.
- **Innovation of the sector,** for a first phase we work with the sector (producer organizations, ship owners,…).

Grants for project development:

- **Local:** EMFAF, industrial developments, subcontracting companies, etc.
- **National:** national programmes in collaboration with other regions, producer organizations, etc.
- **International/Europe:** Tenders, Horizon 2020/Europe, Ocean Mission,...

CONCLUSIONS
KEY RECOMMEDATIONS

Decarbonisation of fishing fleets will help the sector to have **a more profitable activity** and less energy-dependency.

Monitoring of energy consumption and operational profiles of vessels is key:

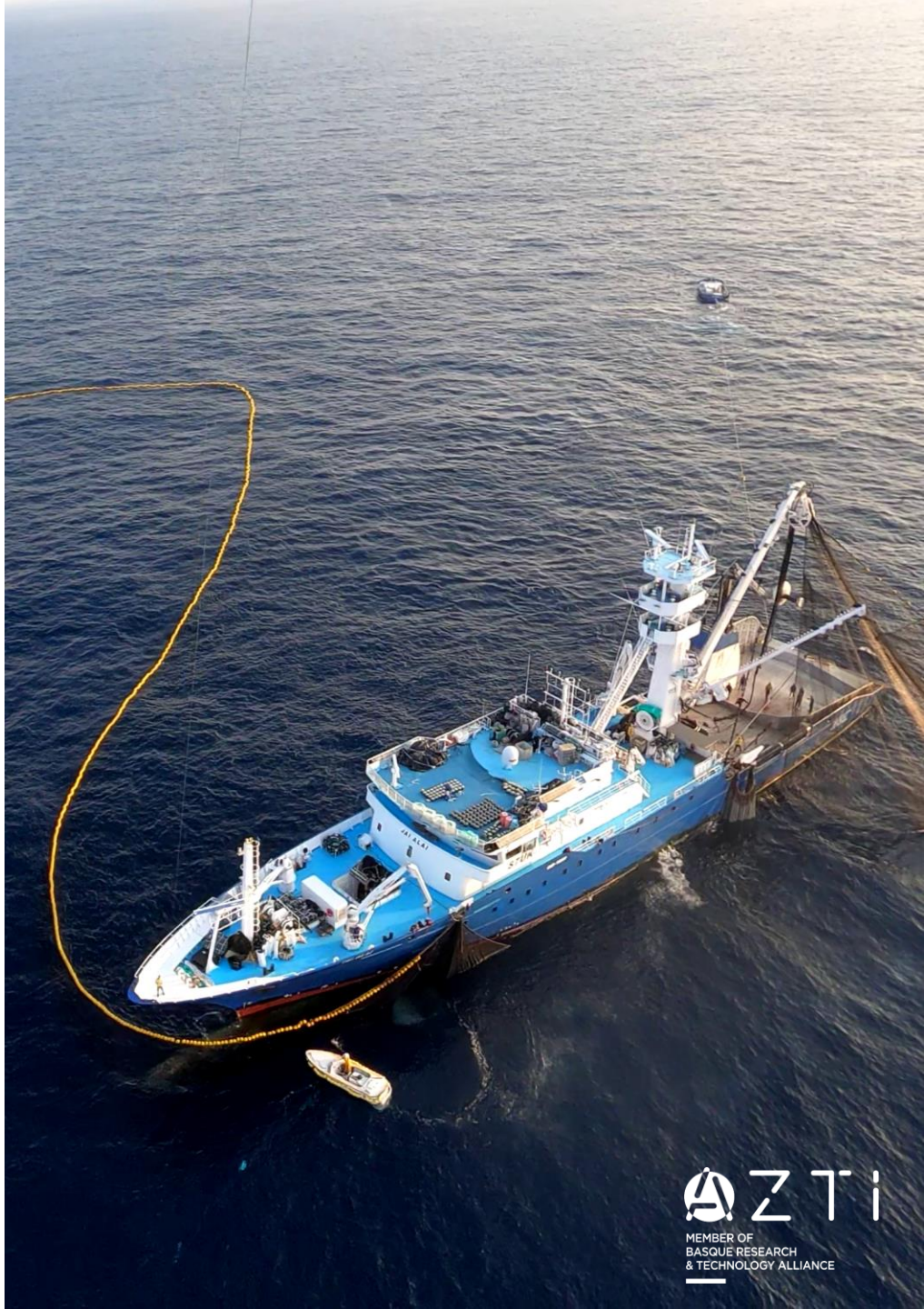
- One-fits-all solutions do not exist → promote mixture of solutions
- Energy activity and activity pattern are key
- Energy monitoring devices are needed
- Reporting to the Commission can be improved: European Data Collection Framework include energy consumption of fisheries reported by energy devices.

Fishers need to be **incentivized or motivated** to adopt solutions

- Skippers and shipowners have different objectives
- **Better communication** is needed amongst stakeholders

Energy transition requires funding and **funds should be simpler, flexible** and inclusive

Barriers: the term “fishing capacity”, we believe that adding more GT or KW does not necessarily increase the vessel’s ability to fish…and it is critical to adopt some of the energy efficient solutions, such as, alternative fuels, which needs more space (fuel tanks), so new vessel designs are needed.



THANK YOU!
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JOINING FORCES for the ENERGY TRANSITION in EU FISHERIES and AQUACULTURE

Coffee break

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Breakout sessions question #2

What word or phrase best describes for you the main technological and innovation challenge and/or research gap and/or solution and/or action needed?

[Multiple answers are possible!]

ⓘ Start presenting to display the poll results on this slide.

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Review Breakout sessions housekeeping rules

- Search your group! Participants with the same colour of your badge
- Each group will have max 15 participants
- There will be a facilitator from the organization team to each group
- Each group appoints 1 rapporteur. The rapporteur's role is to make sure it takes all the comments of the group and at the end of the day presents the 3 main conclusions from the group (in 2 minutes)
- Group discussion: 10h50 – 12h15
- Resume in plenary: 12h15 – 13h00

Breakout session I: Problem definition and Challenges and research gaps – Guiding questions

1. How do you judge the **availability of technology/innovation** for the energy transition in your sector? For **fisheries**, how do you assess the **different technologies according to the type of fleet and the type of vessel**? In **aquaculture**, for which activities do you see a need for **more technology/innovation**?

2. In which innovation area do you find is **the lowest amount of relevant technology and innovation** available taking place (e.g. alternative fuels, gears, engines, hull design, infrastructure)?

3. From your experience, what are the **main challenges** (e.g. availability, economical risk, uncertainty, infrastructure needed like ports, etc) you encounter in accessing and using new technology opportunities, according to your sector/industry (e.g. fisheries, aquaculture, shipping, gear manufacturer, ports,)?

Breakout session II: Technological and innovation solutions & possible actions – Guiding questions

1. Regarding the current state of the transition in your sector, where do you believe is the **most potential for innovation and research** for accelerating the energy transition in the sector (e.g. alternative fuels, gears, engines, hull design, infrastructure)? What are the **most feasible technologies to be implemented** in your sector? Please take into account your business type (fisheries or aquaculture), the type of vessels used, etc.
2. What are the **most important actions to be taken in the short term** by the different group of actors in the energy transition, to overcome the current challenges in the availability and accessibility of innovation and technology? And what are the **actions on the medium to long term**?
3. How can the sector **use synergies from other sectors on innovation and technology** and how can this help advance the energy transition in the EU fisheries and aquaculture sector?

Breakout sessions wrap up: Presentations of Conclusions and recommendations

- ✓ Let's recap Breakout session I and Breakout session II !
- ✓ By Group Rapporteurs (in the room and online)
- ✓ Can you tell us, in 2 minutes, what are the 3 main ideas that have emerged within your group discussions?

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Workshop appreciation question #3

What word or phrase best describes the main takeaway from this workshop?

ⓘ Start presenting to display the poll results on this slide.

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Closing

- Online evaluation survey where you can provide also your feedback to the questions (within the next 2 weeks)
- Study on technologies publish
- Call for the ETP support group: stay tuned!
- Update of the compendium (online)
- Next ETP workshop:
  - Skills: 19 April 2024

Thank you very much

for your active participation !

Useful links

Energy Transition

https://blue-economy-observatory.ec.europa.eu/energy-transition-partnership_en

Contact us

MARE-ENERGY-TRANSITION@ec.europa.eu

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Thank you

Enjoy your lunch

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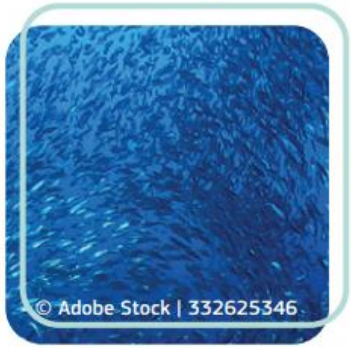
- **BACKGROUND SLIDES**

Main objectives

#EUGreenDeal



Continue rebuilding fish stocks to sustainable levels → long-term fish availability and prosperity for fishers and communities.

Reduce environmental and climate impacts of fisheries and aquaculture activities → protecting 30% of the EU's seas, with 10% being strictly protected by 2030 as defined by the EU Biodiversity Strategy.

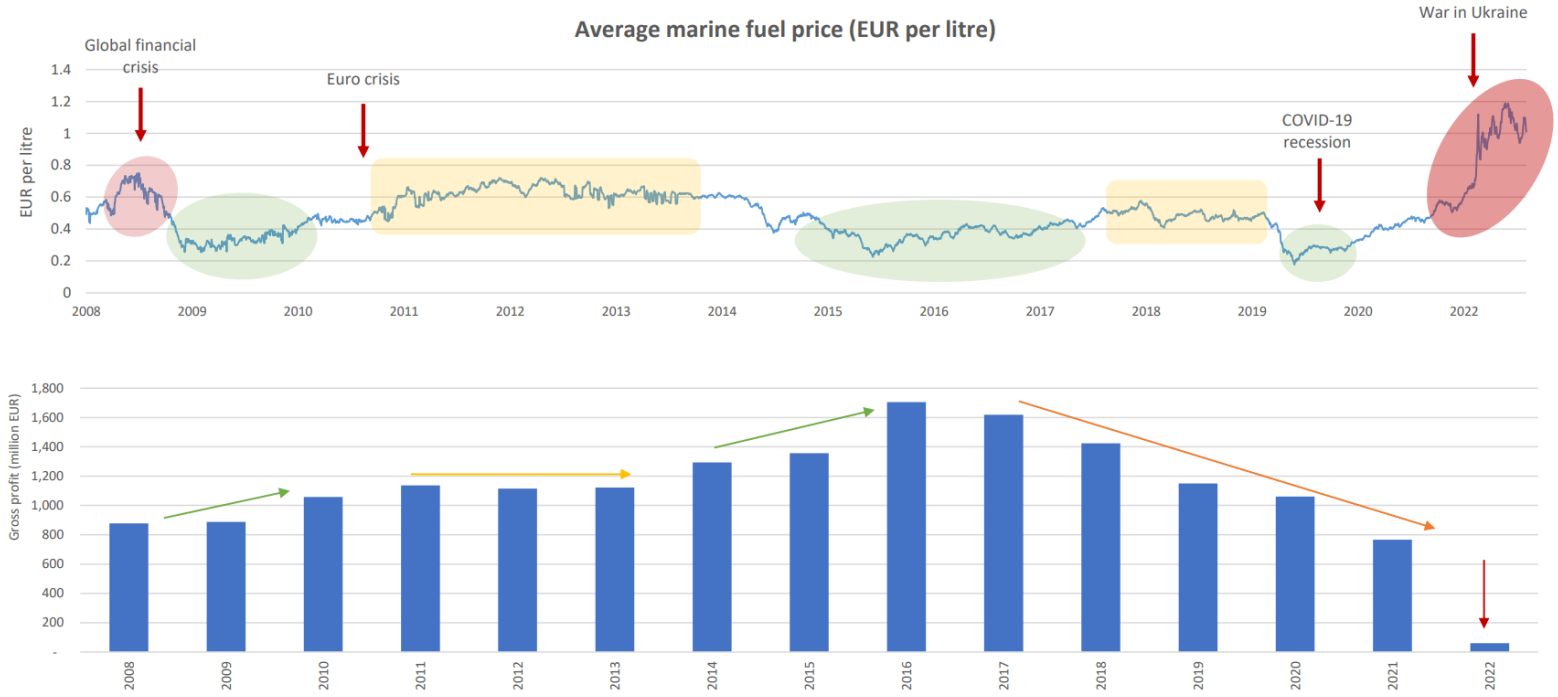
Increase the sector's energy efficiency to become more resilient, less dependent on fossil fuels and climate-neutral by 2050.

Make the fishing profession more attractive.

Why this Communication on Energy Transition in the EU Fisheries and Aquaculture sector?

https://europa.eu/!WjCTHj

Energy transition in EU fisheries and aquaculture
Why an action plan?

- 

*Energy prices

*Economic viability of the sector

Why this Communication on Energy Transition in the EU Fisheries and Aquaculture sector?

European Commission

- The recent **increased energy prices** from fossil fuels are a threat to the profitability and viability of the sector

- Need to **break away** from the **fossil fuel dependency**

- February 2023, **Communication on the energy transition in the fisheries and aquaculture sector** (https://oceans-and-fisheries.ec.europa.eu/system/files/2023-02/COM-2023-100_en.pdf), as part of the "Fisheries and Ocean Package".

- **Dual objective of the Communication** :

  (i) Increase the future **resilience of the sector**

  (ii) Reducing carbon footprint of fisheries and aquaculture products

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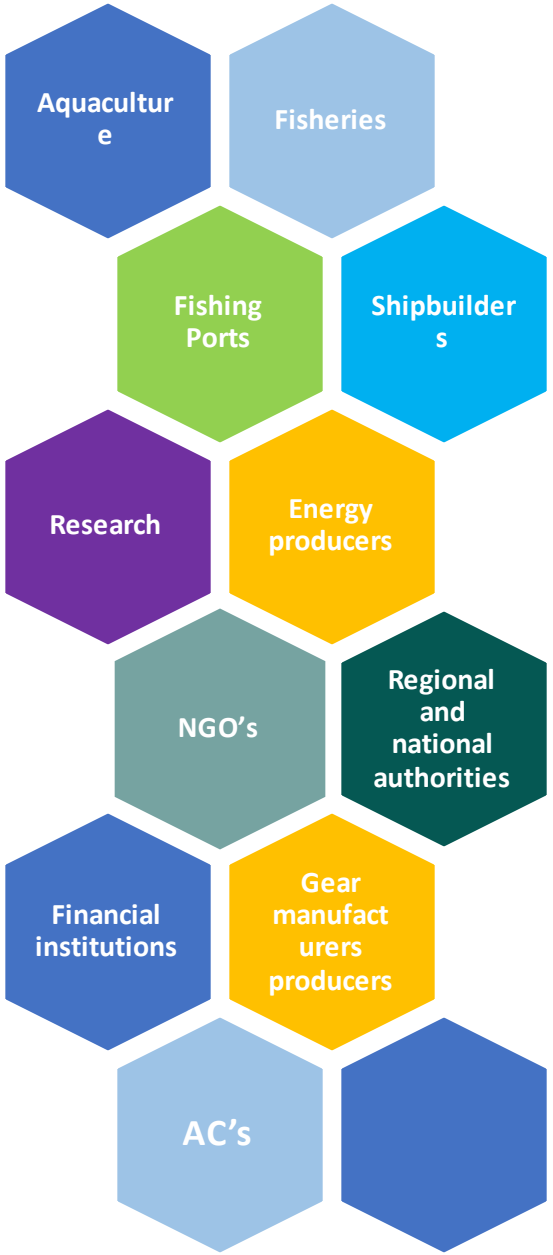
Energy Transition Partnership

ETP: Governance and Stakeholders



- Voluntary network of stakeholders
- Collaboration and knowldege sharing
- Align intentions with other partners
- Develop activities to deliver on the objectives of the Partnership
- Work on Common strategies and milestones
- Contribute to the Roadmap

- *Workshops*
- *Voluntary Team work & ETP support group*
- *Stakeholder groups*

Timeline and Next steps

Jun/2023 – Launch of ETP

30 Sep 2023 - **Consulting stakeholders**

11 Oct 2023 **Workshop in EURegions week**

28 Nov 2023 – 1st **Workshop on financing of energy transition**

Q1+Q2 2024 – **Workshops**

End of 2024 – **Roadmap**

Jun /2023 - **User-friendly web tool to assess the impacts of fuel prices**

Oct 2023 – **ETP Website**

Nov/2023 - **Guide & database on EU funding and financing instruments**

Dec 2023 - **EU-wide study on the available technologies for the energy transition**

Q1+Q2 2024 – **Working with the Community**

- Exploring options with EIB/EIF;
- Living labs;
- Interregional cooperation;
- Promote grants;
- Blue Invest
- Virtual academy