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MEDAC ADVICE ON ENERGY TRANSITION

The MEDAC acknowledges that energy independence has emerged as an absolute priority in the EU in recent times. This issue is challenging the fisheries sector and threatens its overall profitability, sustainability and resilience. There is certainly a need to move away as soon as possible from fossil fuels and become more energy efficient, in line with the aims for a Sustainable Blue Economy and in turn the European Green Deal.

Practical technological solutions and adaptation of fishing vessels, their operativity, and the management of fishing resources, should be discussed while the EMFAF and other financial resources such as RePower Strategy (Reducing fossil fuel dependence by 2027) should provide support for the transition. In the short to medium term, this strategy supports massive upscale of renewable energy and hydrogen, energy saving and efficiency.

The following critical issues need to be taken into consideration and addressed:
- the best way of supplying energy differs between types of fishery operations. It is not possible to use one source of energy for all types of fishing, it would be necessary to combine different sources.
- currently the prototypes showed limited autonomy, not sufficient for vessels that need to work at sea for 12-14 hours. The 5-6 hours that currently alternative sources of energy can provide, would be insufficient for a fishing day.
- at first the transition should come from the Member States, not from the fishers, to provide the services needed for the efficient use of alternative energies (i.e. the availability of infrastructures for the supply).
- the deadline for reducing energy consumption is 2026-2027, therefore the prototypes mentioned before will no longer be useful.

The best transition should respond to economic, ecological and social requirements. For example, the proposal for lighter otter boards, would have a positive impact both on the ecosystem and in terms of energy savings. Energy independence would need support from the EMFAF, as this topic was discussed and approved in the Operational Programmes for the next implementation phase to come. Investments for the transition should not have a major impact on the profits of the sector.

During the MEDAC WG3 meeting held in Rome on 18 October, the DG MARE representative presented a list of viable options to be adopted to address the energy crisis and

- the MEDAC members deem appropriate to give priority to the following solutions in the **short term** for the following fishing gears:
The option 1) MDV-1 Immanuel (Netherlands) is the most plausible for the current fleet (without the need for new constructions) to the transition period (10 years), adapting the hybridisation % needs to the needs of each vessel according to its size, type of gear and duration of fishing trips. Moreover, the special shape of this ship and the diesel electric propulsion provide 60% saving in fuel and CO_2 reduction compared to similar fishing vessels. MEDAC also suggests including as much as possible fishers to test innovative fishing vessels.

- the MEDAC members deem appropriate to give priority to the following solutions in the **medium-long term** for the following fishing gears:

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The optimal one would be a fishing boat that with green energy produces green hydrogen, not generated by diesel engines, but obtained through electrolysers and produced practically by water, without greenhouse gas emissions. Accumulators and energy distributors would be needed in the various ports.
Once the unavoidable technical problems of obtaining and storing hydrogen will be solved and the electrical storage system (batteries) will be improved, it will be possible to evaluate plausible alternatives in the medium to long term (10 years) which we cannot evaluate today.

In the short and in the medium-long term, technologies to reduce the fossil hydrocarbons consumption should be preferable. The scope would be to gradually enable the use of accumulators that can improve the performance of boats in terms of power and durability (the first 3 solutions reported below: hybrid diesel-electric, MDV-1 Immanuel - NL, Karoline – NO - and alternative fuels Loran – NO -). Several concerns still remain, especially related to power and durability.
EMFAF should change its orientation to become more flexible for testing and developing innovative solutions for the use of renewable energy, rather than only for compensation and allowances, especially for vessels longer than 24 m, i.e. the most energy-intensive ones.

Hybrid diesel-electric

1) MDV-1 Immanuel (NL)

The special shape of the ship and the diesel electric propulsion provide 60% fuel and CO2 savings compared to comparable fishing vessels. https://masterplanduurzamevisserij.nl/

2) Karoline (NO)

Equipped with **two battery packs** of **195kWh** plus **500-litre diesel engine**. Diesel is used to and from the fishing grounds, then electric for fishing, loading and unloading.
https://corvusenergy.com/projects/karoline-2/

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Alternative fuels

3) Loran (NO)

This 70m Norwegian longliner will have two **185-kW hydrogen fuel cells and a 2,000-kWh battery bank**, as well as conventional diesel engines.

https://www.nationalfisherman.com/boats-gear/-we-are-the-pioneers-building-a-hydrogen-powered-fishing-vessel

4) Endeavour (NZ)

Constructed to run on biofuel. It is claimed that, for **every tonne of cooking oil** used to produce the biofuel, there is a corresponding **two tonne reduction in CO_2** emissions.

https://www.rina.org.uk/biofuel.html

Wind Power

As a complementary propulsion / power source

5) Project Sailfish, *M. Penna Engineering* **Catalonia, Spain**
https://mpeng.eu/projects/sailfish-1700/

6) Balueiro Segundo with eSAIL® system*, co-funded via EU Aspiring Wingsails project* **Vigo, Spain** https://bound4blue.com

Changing fishing gear

7) Chioggia port trawl fleet (IT)

Some now use **otter doors with a metal frame and wood panels**. The lighter equipment **reduces** seabed **friction** and **fuel consumption.** *DG MARE meeting with Chioggia fleet, July 2022*

8) Resolute (UK)

Trawl doors made partly from **recycled plastic** (weight 95kg), **reduction** in **fuel** consumption by as much as **30%**.
https://mag.hookandnet.com/2022/09/06/2022-09plutoeng/content.html

9) Mazara Fleet (IT)

Lighter fishing gear material in trawlers (e.g. polypropylene instead of nylon), **with decreased fuel consumption,** from 1,2T daily to 0,8T

Hull modifications

10) T-foil in longliners and purse seiners -25% of fuel consumption
Martinez Constructions Navales **Sète, France**
https://martinez-constructions-navales.fr/foil-navire-de-peche

11) Retrofitting bulbous bow

Reduces total resistance or required power, also helps to increase speed, decrease fuel consumption, improve stability.
http://www.commodoresboats.com/past-projects/mystic-era-new-bulbous-bow-and-paint/

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12) Air Lubrication

Reduces ship drag, acts also as a barrier between water and hull thereby reducing fuel consumption.

https://www.marineinsight.com/tech/7-technologies-to-reduce-fuel-consumption-of-ships/

Some other innovations

13) Propellor and/or Rudder adaptations like **Controllable Pitch propeller** system (e.g. https://www.wartsila.com/docs/default-source/marine-documents/segment/brochure-fishing-vessels.pdf) and/or **Gate Rudder System** (https://cordis.europa.eu/project/id/860337).

14) Amarrée programme ***(https://amarree.fr)*** **fuel economy** observatory; **econometers**; and **training** in energy-efficient vessels. **Savings** are **at least 5%, up to 15%** in the best cases.

15) Using Apps to optimise arrival and delivery **to market**, e.g. Rooser (Rooser.eu) & Irish iFISH (https://www.i-fish.org/) and/or **Route Optimisation**, see, e.g. https://www.inmarsat.com/en/insights/maritime/2022/optimal-route.html.

16) Eco-Friendly Fishing Vessel (ECOFIVE) To **utilise 100%** of the **catch**, **minimise** quality **losses** during handling and **reduce energy** consumption, https://ulstein.com/news/the-ecofive-concept-for-sustainable-fishing