Presentation of the EFTP “Energy efficiency” working group's RTDI recommendations.

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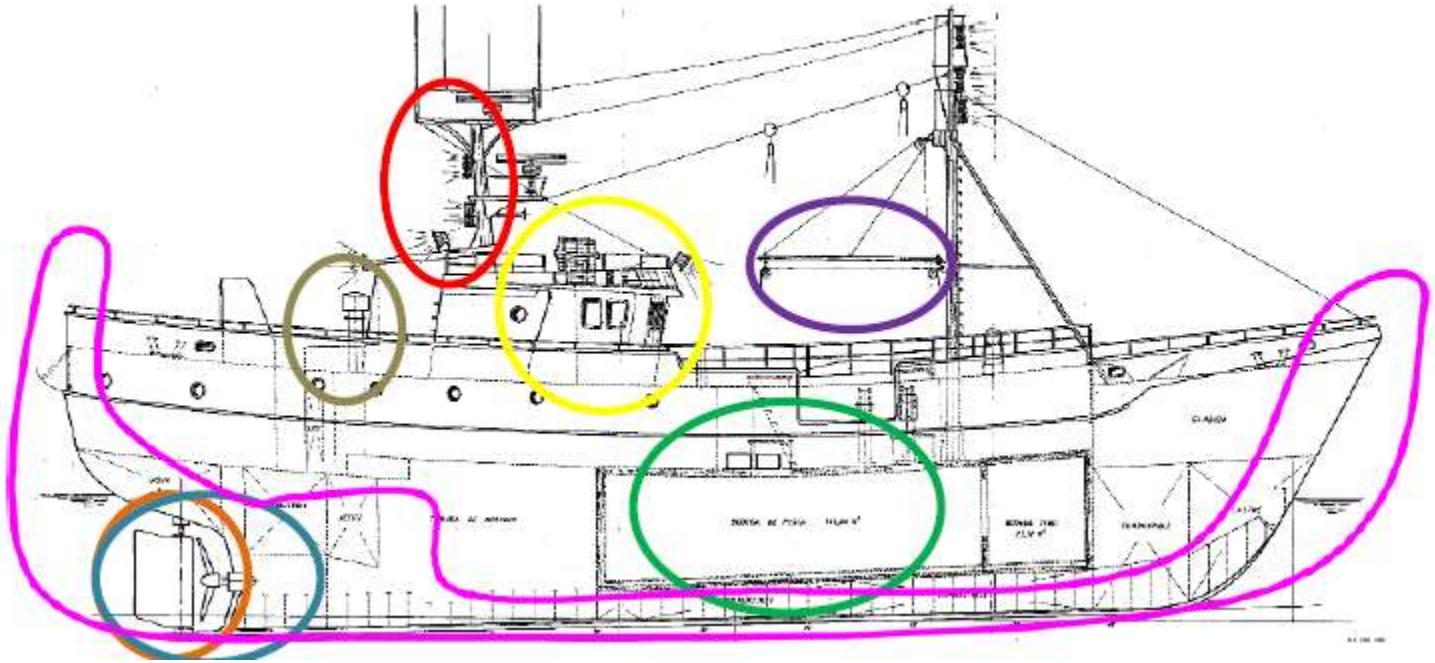
DISCUSSION DOCUMENT

- You have received a **DRAFT** with TOPICS and CHALLENGES.
- Our work plan is:
- TODAY:
  - Add missing challenges (and modify if necessary the proposed ones)
  - Clarify the challenges.
- After:
  - compile & distribute the result of today's work.
  - distribute the new version
  - more feedback by e-mail
  - final version.

Topics

- We are working on a graphic that allows easily explain the classification of topics.



Topic 1. Data acquisition and control systems. Energy audits.

- The goal is to have full information on the generation and use of energy on board.
- Challenge 1: Tools for energy data acquisition.
  - software and hardware (sensors, data loggers, etc.).
- Challenge 2: Energy management and control systems.
  - data collection with some criteria allows implementing energy management systems.
- Challenge 3: Energy audits.
  - It is a necessary step to reduce energy consumption of existing vessels.

Topic 2. Drive train optimization

- *Challenge 1: Propeller selection and new designs.*
  - often on fishing boats the propeller is chosen without an accurate calculation, despite being critical.
- *Challenge 2: Engines selection and configuration.*
  - The correct choice of the engine is critical.
- *Challenge 3: Transfer case (gear box).*
  - In some vessels, the choice of two gear ratios can be a good option.
- *Challenge 4: Integrated design.*
  - Optimized design of the entire drive train from hull data, and the use that the vessel will have.
  - In particular, hybrid diesel-electric propulsion.

Topic 3. Alternative fuels and complementary energies

- Find alternatives to diesel oil in fishing boats.
- *Challenge 1: Alternative fuels*
  - Natural gas, liquid or compressed
  - biofuels
  - hydrogen
  - LPG
  - syngas

consider mixtures!!

- *Challenge 2: Renewable energies:*
  - Solar
  - Wind power: wind turbines / sails
  - Waves

Topic 4. Modifications in the vessels, and new design approaches

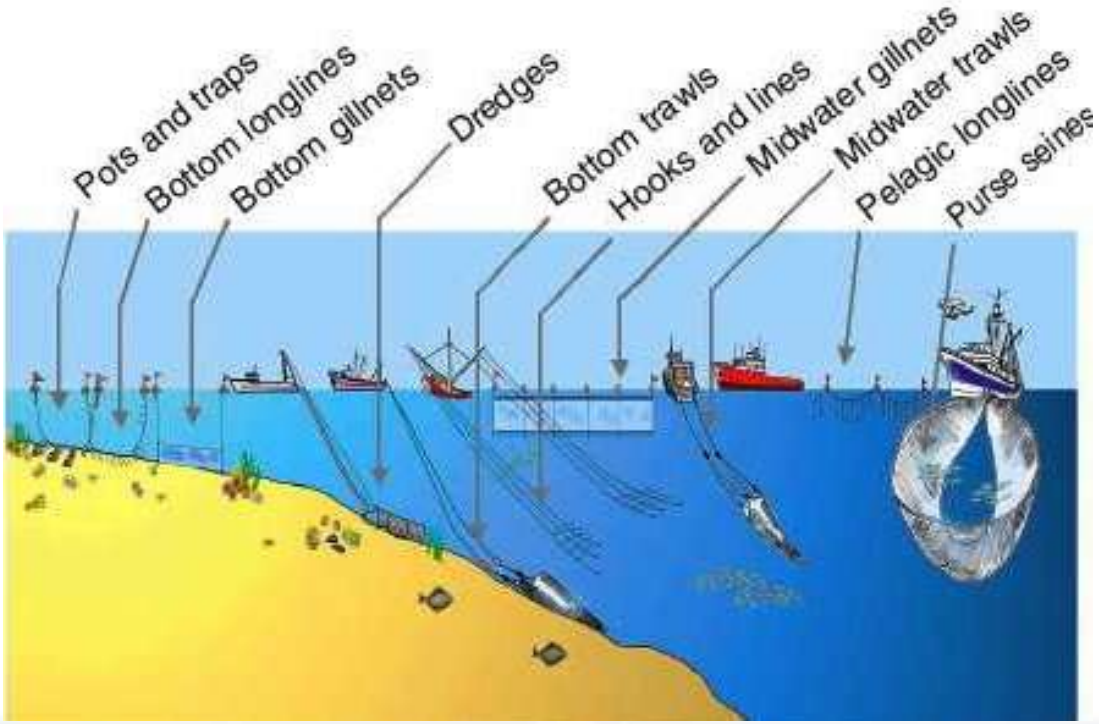
- Objective: the vessels shape.
- *Challenge 1: Shapes and sizes configuration.*
  - Computer simulation methods and marine hydrodynamics tests can be improved, but especially should be more widely used in fishing vessels.
- *Challenge 2: Use of low friction* hull coatings*.*
  - *Maintenance.*
- *Challenge 3: Hydrodynamic modifications: appendices and bulbs.*
  - The design of bulbs and appendices may be an option on ships already constructed.

Topic 5: Energy for uses other than propulsion

- *Challenge 1: Auxiliary engines.*
  - Consumption management. Generating electricity with a part of the propulsion engine.
- *Challenge 2: Heat recovery.*
  - The residual heat from the propulsion engines contains more than 60% of the fuel energy. Some of this energy can be recovered for:
  - Heating, Cooling, it is possible to generate electricity using ORC machines, desalination of sea water.
- *Challenge 3: Electric on board consumers.*

Topic 6. energy-efficient fishing gears optimization

- *Challenge 1: Trawlers (nets, trawl doors…)*
- *Challenge 2: Line vessels*
- *….?*



Topic 7. Efficient steering and navigation

- The main objective of this topic is to achieve lower fuel consumption by introducing variations in the way of fishing, way of storing, way to process and transportation of fishes. Besides, routes optimization represents an interesting option. It is necessary to study the economic cost of implementing the different proposed models to assess their actual implementation capacity.
- Challenges??

Topic 8: Other aspects related with energy efficiency in fishing activity:

- *Challenge 1: Fishing vessel energy consumption at port facilities.*
  - It is frequent keep running a high power auxiliary engine to supply small consumption in a port. This represents great fuel consumption, plus an inadequate environmental impact. Alternative systems should be considered.
- *Challenge 2: Gas emissions reduction (CO2, NOx,…)*
- *Challenge 3: Social and economic effects of increases in fuel costs.*

- Today, starting from 12 o'clock, we will work together to extend and improve this draft proposal.

The window to a different vision of the energy

Thanks for your attention

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