



# Energy Transition of Fishing Fleets: Opportunities and Challenges

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David Vivas Eugui, Chief of Section a.i. TEDB  
UNCTAD



# The context

## **The Fishing Sector plays a Vital Role:**

- Food security, jobs & livelihoods, especially in developing nations (+40 millions jobs)

## **Urgent Need for a Just Energy Transition**

- All sectors need to contribute to Paris agreement objectives
- With agriculture and tourism, the fisheries is one of the most vulnerable sectors to climate change.
- Motorized vessels depend today in its entirely on marine diesel and other fossil fuels

## **Challenges for Artisanal Fishers**

- Unmotorized vessels face climate change effects, lack support, and technological limitations.



# Fisheries and CO2 emissions

**Global fisheries trade is significant (\$179 billion in 2021)**

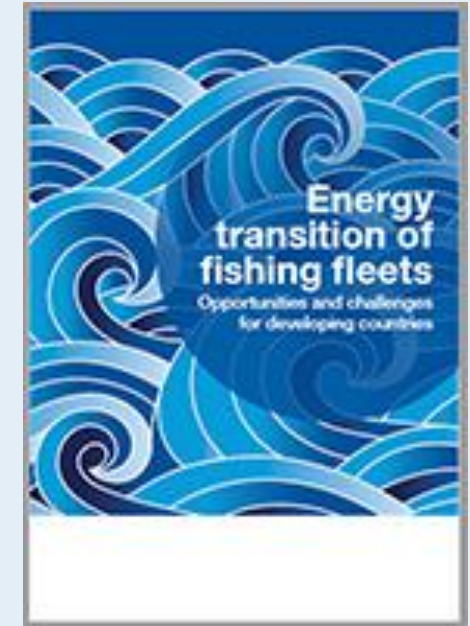
**Fishing vessels contribute to between 0.1 % and 0.5 % of global GHG emissions, representing about 4 % of GHG emissions from global food production.**

**Emissions estimates range between CO2 40 to 179 million tonnes annually**

- IMO Bottom-up (AIS data): 37.8 to 40 million tonnes of CO2 (2012-2018)
- Under Annex I Kyoto protocol notifications: 21.3 to 12.9 million tonnes (1990-2021)
- Academic sources on global estimates (Greer et al): 179 million tonnes annually (2019)

**Fisheries subsidies for fuel:**

- At least \$2.1 billion was given in fuel subsidies by 30 OECD Members and ten emerging economies during the period 2018 to 2020 (OECD, 2022).



# Some challenges to consider

## Economic

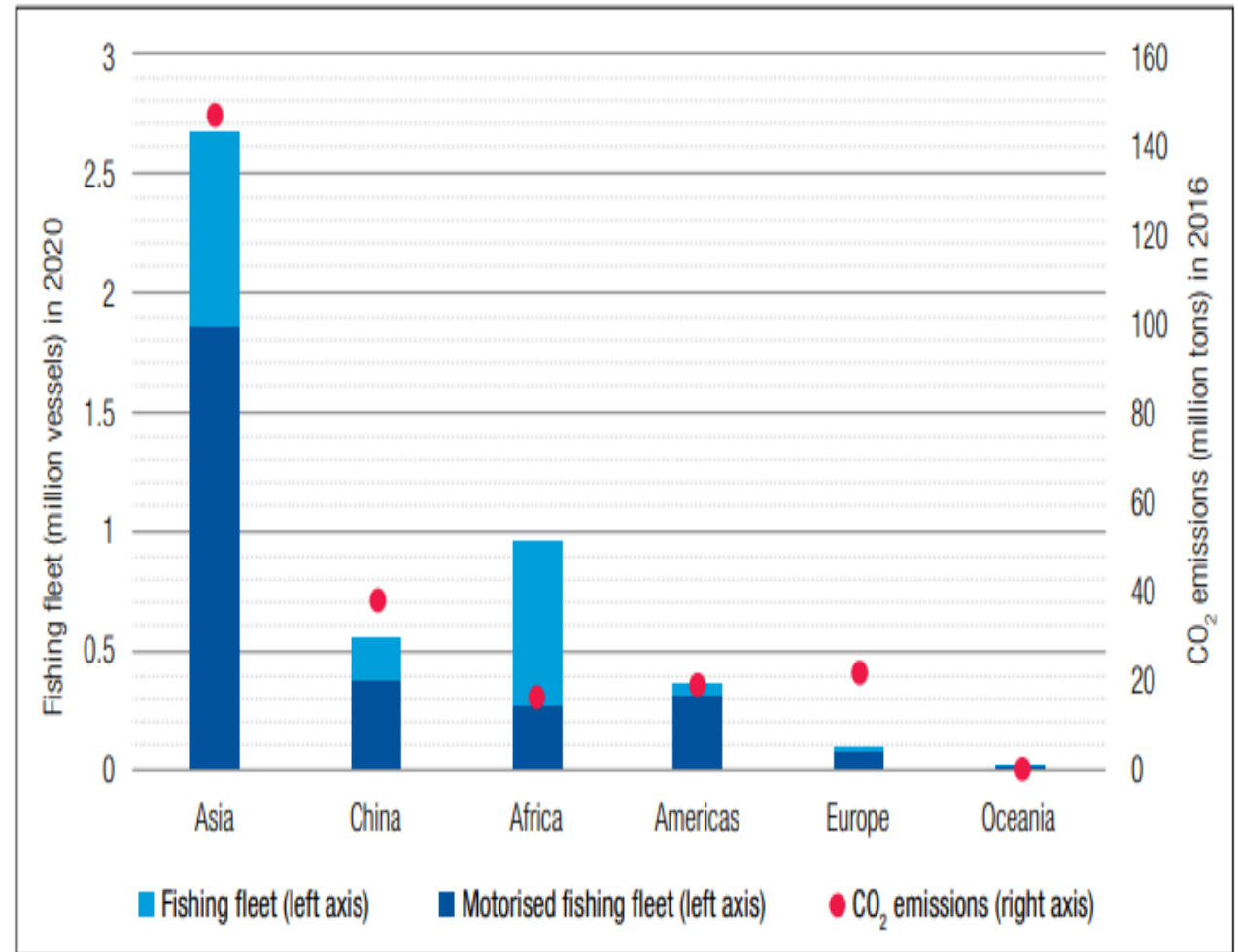
- **Asia** has the largest fishing fleet, producing most CO<sub>2</sub> emissions, followed by **Europe & Africa**
- **Technological solutions are not mature enough**

## Environmental

- All CO<sub>2</sub> emissions measuring systems for the fisheries sector **only cover a partial view of the reality**
- Increasing energy efficiency may not improve fuel efficiency vs ton of catch if **overfishing** continues

## Regulation

- No specify decarbonization plan for the fisheries sector globally but an IMO Revised GHG Strategy for shipping (2023) + Medium term measures (e.g., levy & fuel standards)
- Subsidies to fossil fuels by fishing vessels are not regulated

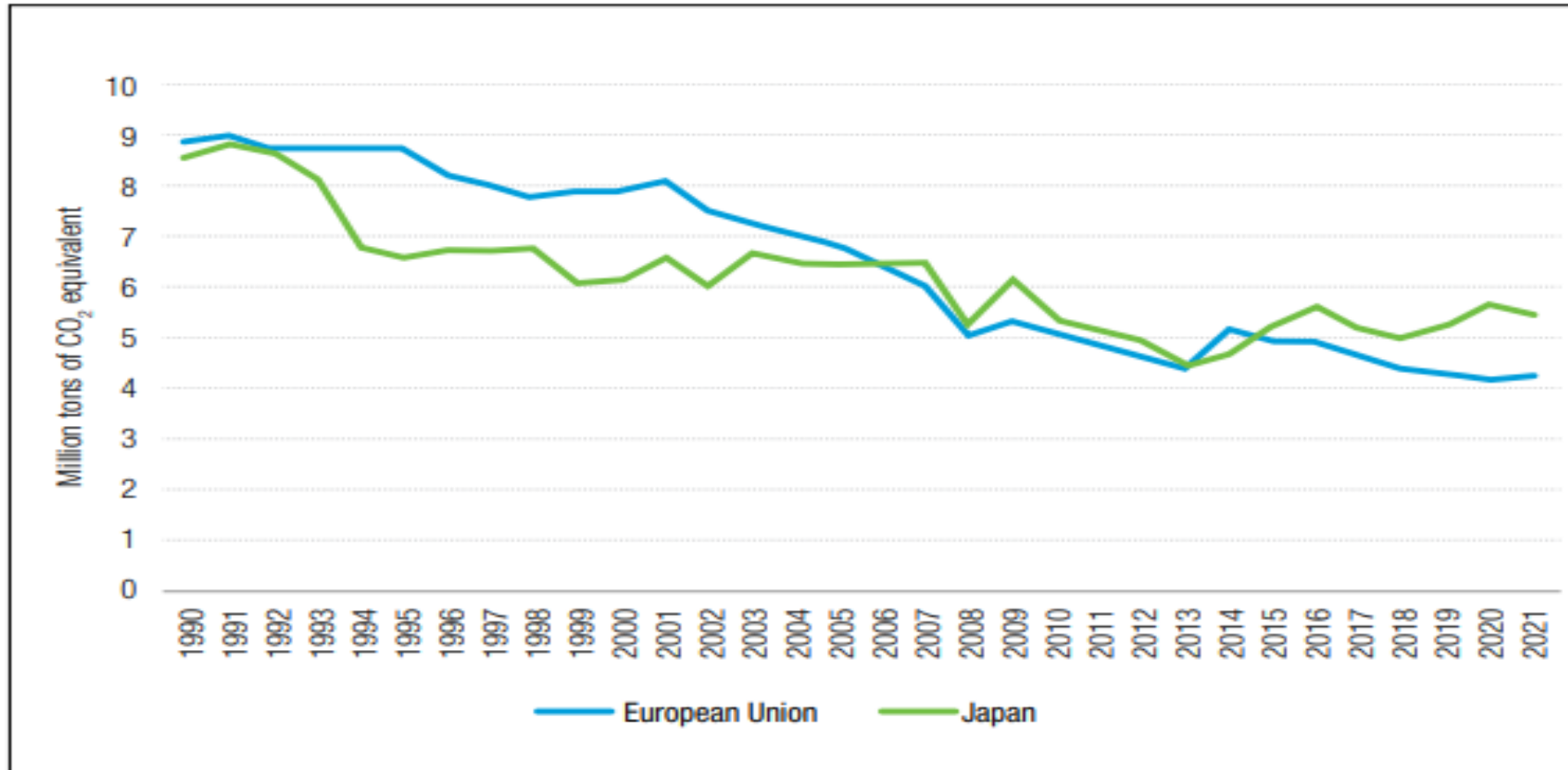


Source: UNCTAD based on data from FAO (2022a) and Greer (2019).



# Fisheries CO2 emissions by Annex I Kyoto Protocol Parties (1990-2021)

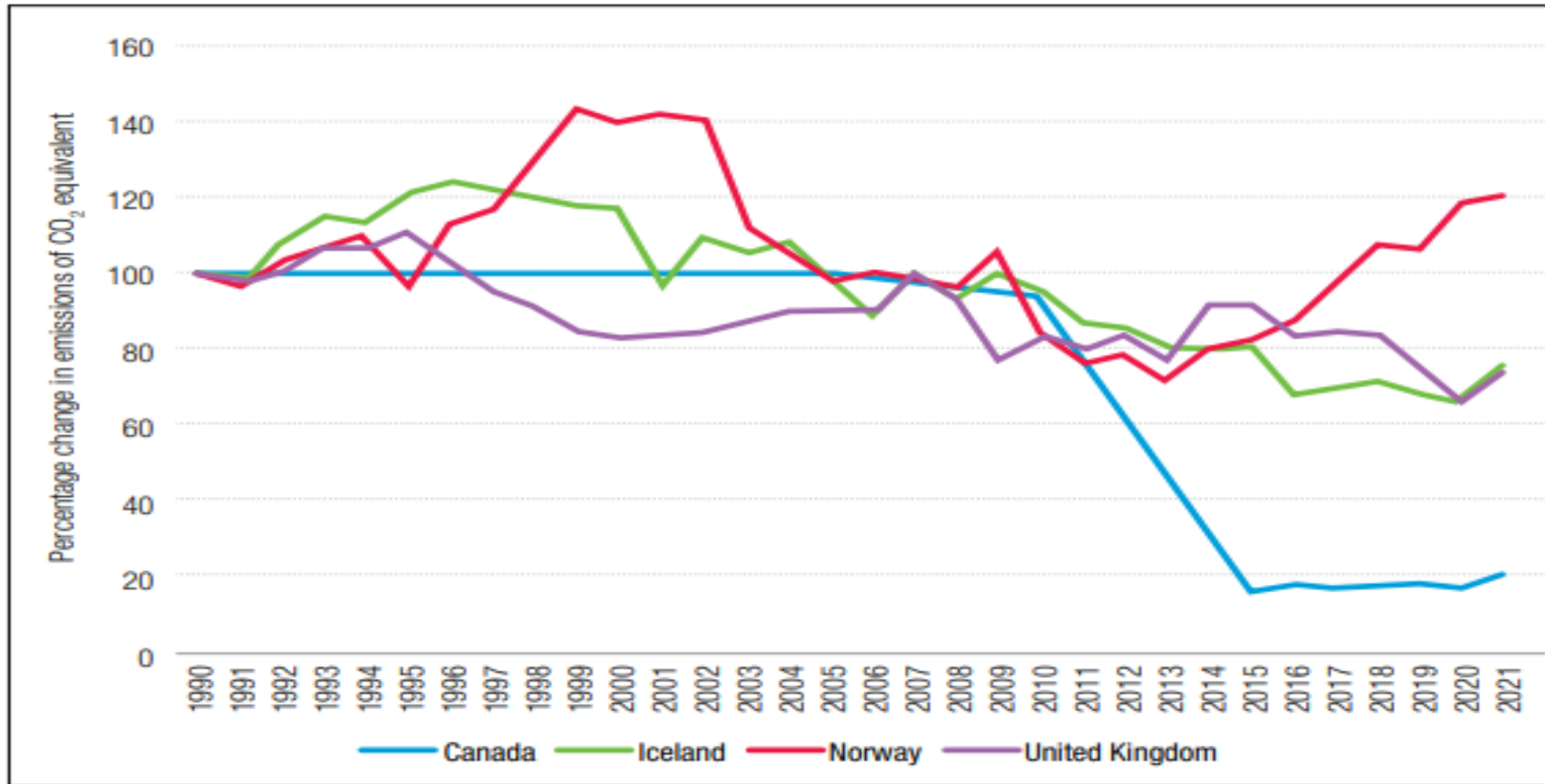
Figure 1. Carbon dioxide emissions (in million tons) of the fishing fleets of the European Union and Japan (1990–2021)



Source: UNCTAD based on data from UNFCCC (2023).

# Fisheries CO2 emissions by Annex I Kyoto Protocol Parties (1990-2021)

Figure 2. Percentage change in the carbon dioxide emissions of the fishing fleets of selected countries (1990–2021)



Source: UNCTAD based on data from UNFCCC (2023).

# NDCs by main seafood traders under the Paris Agreement



**Direct** (energy-saving & emission reduction) measures

**China:** Energy-saving and emission-reduction technology and equipment in fishery

**Vietnam:** Improve energy efficiency and conversion rates in fisheries.

**Ecuador :** National Climate Change Strategy (2012-2025) lists **fisheries and aquaculture as a priority**

**(In)direct** (ocean-prioritizing) measures

**The Russian Federation:** adapt economic sectors to climate change including in **fishing, nature management and activities in the Arctic zone.**

**Chile:** Adaptation Plans for the Fisheries and Aquaculture sectors (2022 & 2027).

**Canada:** protecting **25% of their oceans** by 2025 and working towards 30% of each by 2030.

Absence of ocean-related commitments

Thailand: **First National Adaptation Plan** provides a framework for a climate-resilient society with focus on **water management, agriculture and food security.**

Others, showing **no specific reference**, include:

India, the Netherlands, and Norway.

# Regulatory Frameworks

<p><b>IMO Revised GHG Strategy (2023)</b></p>	<ul style="list-style-type: none"><li>• <b>The IMO recently adopted a revised GHG strategy for global shipping (2023)</b> that seeks to reach net-zero GHG emissions from international shipping close to 2050 and a commitment to ensure an uptake of alternative zero and near-zero GHG fuels by 2030.</li><li>• Their <b>application to fishing vessels is rather limited as the IMO policies mainly apply to vessels with very large tonnage (+500GT) and engaging in international shipping routes.</b></li></ul>
<p><b>The European Union</b></p>	<ul style="list-style-type: none"><li>• The inclusion of <b>shipping activities in the monitoring, reporting and verification of CO2 emissions from maritime transport (MRV) Regulation</b> and the <b>EU Emission Trading System (ETS)</b> may have some implications for the fishing industry, albeit <b>indirectly.</b></li></ul>
<p><b>WTO's Fisheries Subsidies Agreement (2022)</b></p>	<ul style="list-style-type: none"><li>• <b>It prohibits</b> subsidies that contribute to <b>illegal unregulated and unreported (IUU) fishing, and fishing on overfished stocks.</b></li><li>• Negotiations are still ongoing for additional provisions on <b>overcapacity and overfishing</b> under a comprehensive agreement including specific fuel subsidies in the illustrative list of prohibitions. Non-specific fuel subsidies would need to be notified. Current text should include the term <b>“fossil” fuels</b> to allow support for a just energy transition.</li></ul>



# Alternative fuels and engines

- **Green biofuels and energy efficient measures** stands out as the most readily available and mature fuel option for fishing vessels
- **Green methanol and LNG** still face challenges in terms of retrofitting, storage capacity, safety and limited potential to fully decarbonize.
- **Green hydrogen and green ammonia** show promise but require further R&D to address safety, scalability, cost-effectiveness, storage capabilities & delivery
- **Alternative engines** such as electric and hybrid ones and wind propulsion offer potential solutions to reduce GHG emissions for fishing only in prototype phase
- **Port infrastructure for alternative fuel storage and delivery** will be key for a smooth and just transition
- **Each alternative has its challenges and limitations, requiring continuous R&D to fully realize their potential in the fishing industry.**



# Policy considerations

- 1) Develop **specific & measurable global emission reduction goal** for fishing fleets & Include objectives for emission reduction and adaptation goals for the fisheries sector in next NDC iteration (2025)
- 2) Establish a **globally harmonized data collection system for fishing fleet emissions**, accommodating the needs of artisanal fisheries
- 3) Explore and adopt **energy efficiency measures and sustainable fuel options**. Products from non-motorized vessels need to be considered as **zero carbon**.
- 4) Introduce **available technological options** for retrofits, new engines, vessel design, efficient fishing practices, and adequate port infrastructure
- 5) Phase out **fossil fuel-based subsidies** to the fisheries sector & shift public support to accelerating the energy transition of fishing fleets, particularly to support small scale fisheries
- 6) **Avoid decoupling** decarbonization efforts from current actions to improve stock management.



# UNCTAD/UNDESA Project on Evidence-based Climate Action through AI and Data Innovation for Caribbean SIDS

Objective: *to enhance the statistical and analytical capacities of selected Caribbean nations in utilizing data science and AI in combination national sources for the monitoring of maritime trade, tourism, trade, fisheries and ecosystem services related to the coastal areas and the analysis of their CO2 emissions, as well as the associated environmental-economic accounts, to formulate and promote evidence-based national and regional climate change and trade policies.*

The project will also provide *analytical diagnostic studies on sources and levels of CO2 and other GHG emissions, and feed the main findings into a cross-country roadmap listing most relevant policy options and recommendations for the decarbonisation of the transport sector and fisheries value chains* (with support from IMO)

**Time frame:** 2025-29

**Budget:** USD 1 million

**Beneficiary countries:** Barbados, Belize, Guyana and Trinidad and Tobago.

**Donnor:** UN Development Account



# Thank you!

LINKS:

[Energy transition of fishing fleets: Opportunities and challenges for developing countries | UNCTAD](#)

[Oceans Economy and Fisheries | UNCTAD](#)

