ICAO / IMO / IRENA Side-Event at COP28

Innovation and clean energy for international aviation and shipping

Saturday, 2 December 2023

Blue zone, SE Room 3, 18:30 to 20:00

Innovation and clean energy for international aviation and shipping

PROGRAMME

1. Opening remarks – ***Salvatore Sciacchitano, President of ICAO Council***
2. IMO Video for COP28 – ***Kitack Lim, IMO Secretary General***
3. Overview of ICAO work – ***Jane Hupe, Envoy of the ICAO Secretary General to the UNFCCC COP***
4. Decarbonising international aviation and shipping with renewable energy, ***Roland Roesch, Director of the IRENA Innovation and Technology Centre***
5. Overview of IMO work – ***Camille Bourgeon, IMO Technical Officer, IMO Secretariat,***
6. Industry perspectives on innovation and clean energy for aviation – ***Haldane Dodd, Executive Director, Air Transport Action Group (ATAG)***
7. Industry perspectives on innovation and clean energy for shipping – ***Guy Platten, Secretary-General of International Chamber of Shipping (ICS)***
8. Civil society perspectives on clean energy for aviation and shipping, ***Dan Rutherford, Director ICCT aviation and marine programs.***

Questions & Answers Session

Opening Remarks by the President of the ICAO Council

Mr. Salvatore Sciacchitano

Special Environment Report

CAAF/3

2023

Video

ICAO

Video

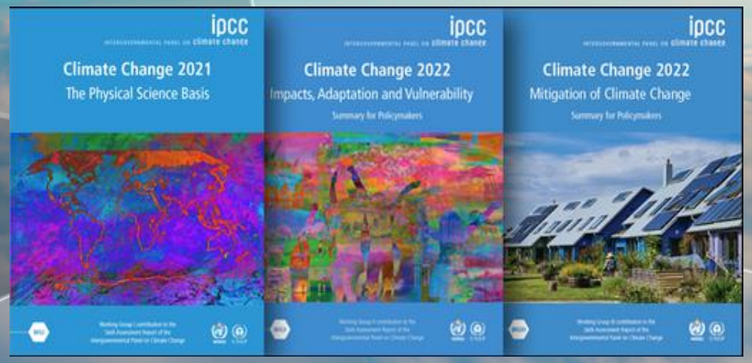
Overview of ICAO work by the Envoy of ICAO Secretary General to the UNFCCC COP

Ms. Jane Hupe

The year 2023 is expected to be the warmest year on record.

ipcc
INTERGOVERNMENTAL PANEL ON climate change

WMO UNEP



AR6 Synthesis Report
Climate Change 2023


To address climate change
global ACTION is key

Aviation Energy Transition is ON

ICAO

LTAG

NET-ZERO 2050

Long-term global aspirational goal for international aviation

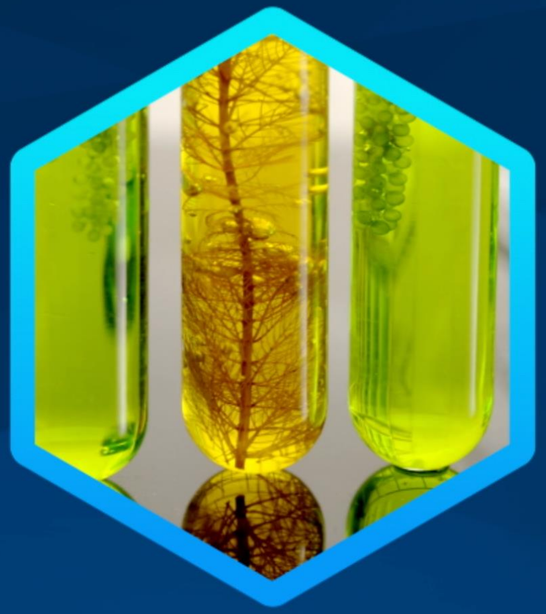
CAAF/3 Dubai

Third ICAO Conference on Aviation and Alternative Fuels

ICAO Global Framework for SAF, LCAF and other Aviation Cleaner Energies

Collective Vision

Regulatory Foundation



Implementation Initiatives

Facilitate Financing

Collective Vision

CAAF/3 Dubai

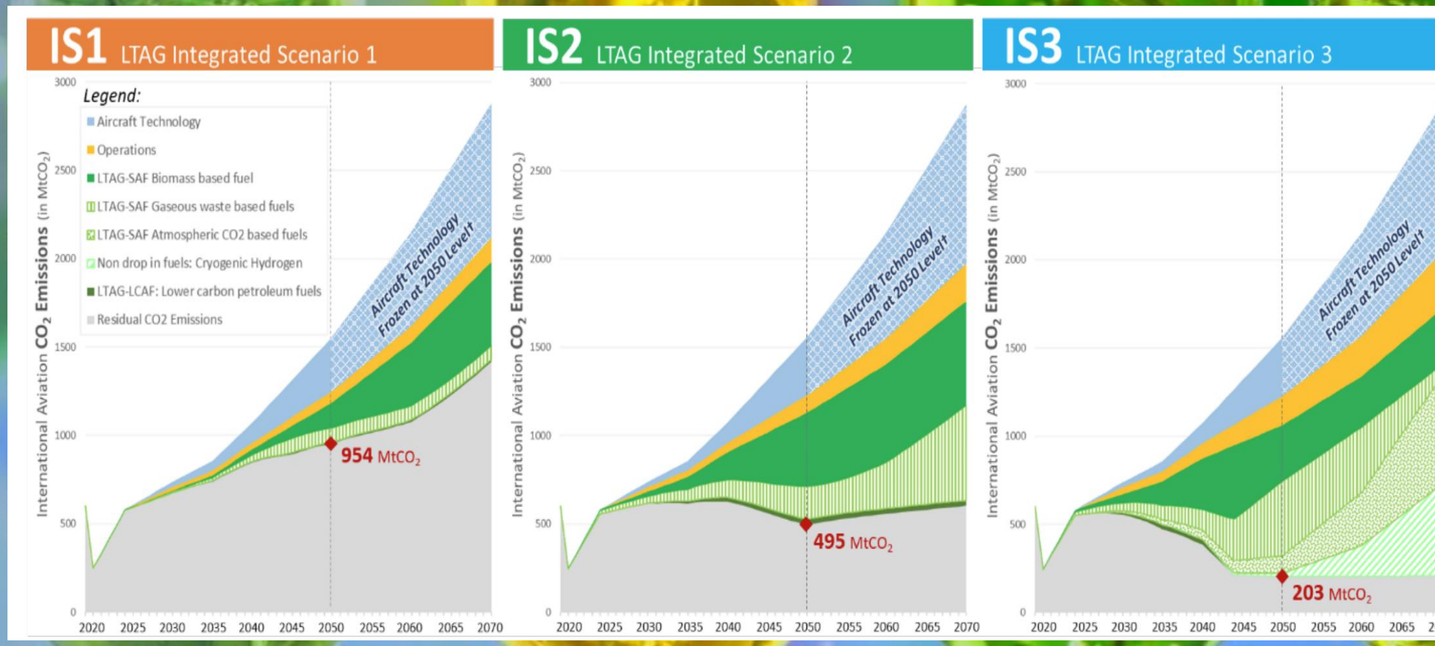
Collective global aspirational Vision to reduce CO2 emissions in international aviation by 5 % by 2030, through aviation cleaner energy use

Each State's special circumstances and respective capability will inform its ability to contribute to the Vision

Collective Vision

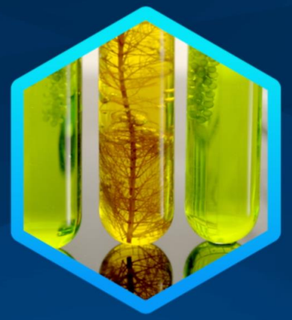
LTAG Report scenarios are clear:

Aviation cleaner energy



Largest potential to reduce CO_2 emissions

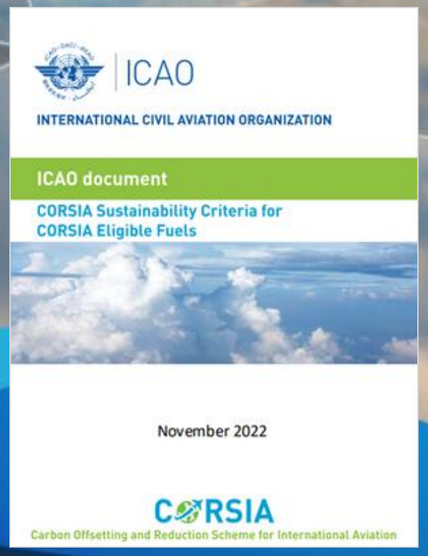
Regulatory Foundation

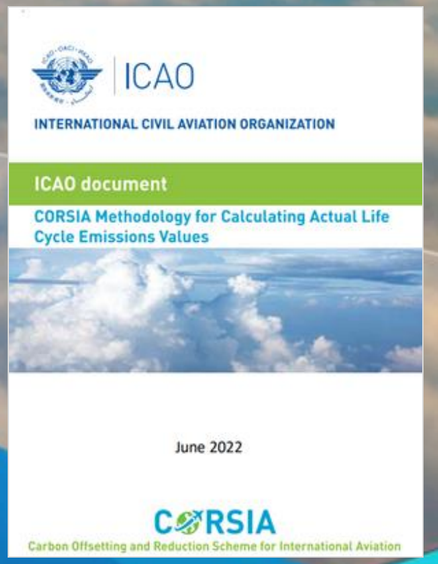


CORSIA

CORSIA sustainability criteria, sustainability certification, and life-cycle assessment methodology for SAF and LCAF, as the accepted basis for the eligibility of aviation cleaner energies

- **Parameters for fuel accounting & reporting methodologies**
- **Study on fuel accounting systems / possible ICAO role**





Implementation Initiatives

ACT SAF

Assistance, Capacity-building and Training for SAF

ACT SAF

- ACT-SAF Platform
- ACT-SAF Training Series
- ACT-SAF Template & Guide for Feasibility Studies

89

States

Name of State
Albania
Argentina
Australia
Austria
Bahamas
Barbados

States

Acceptance to ... Pending Yes

51

Organizations

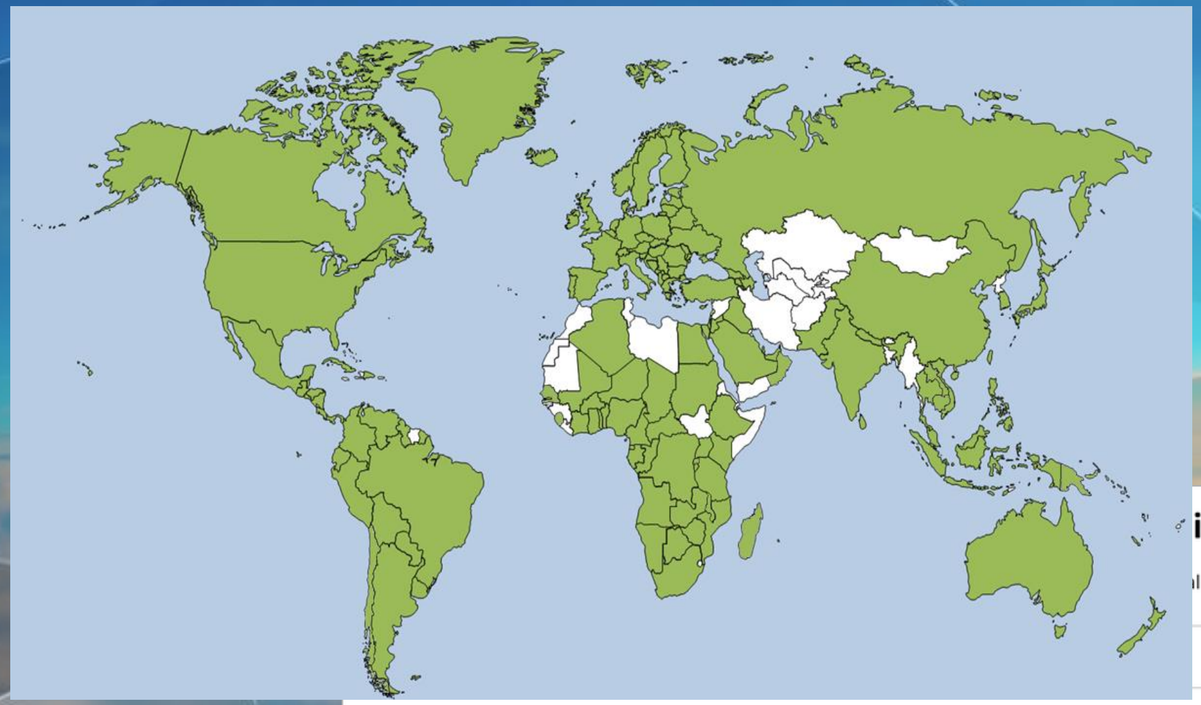
Name of Organization
WORLD TRAVEL & TOURISM COUNCIL
World Bank
WEF - World Economic Forum
Verifavia
T'way Airways
The Boeing Company

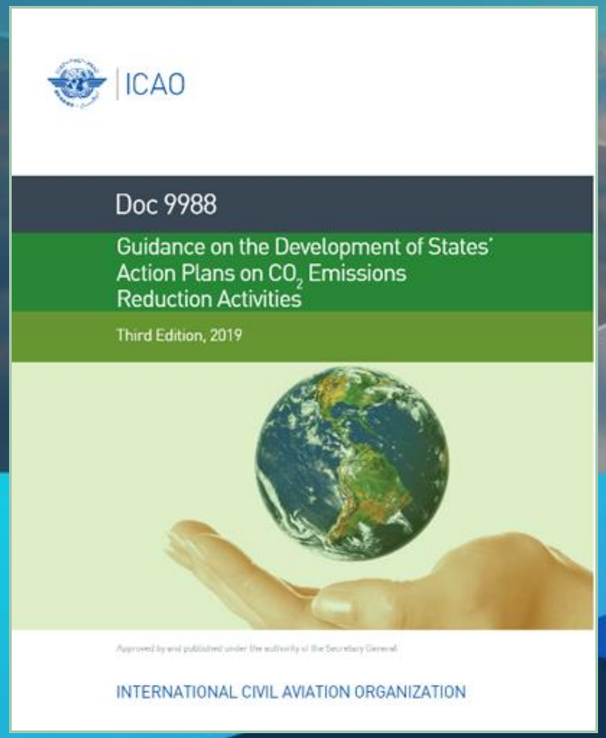
International Organizations

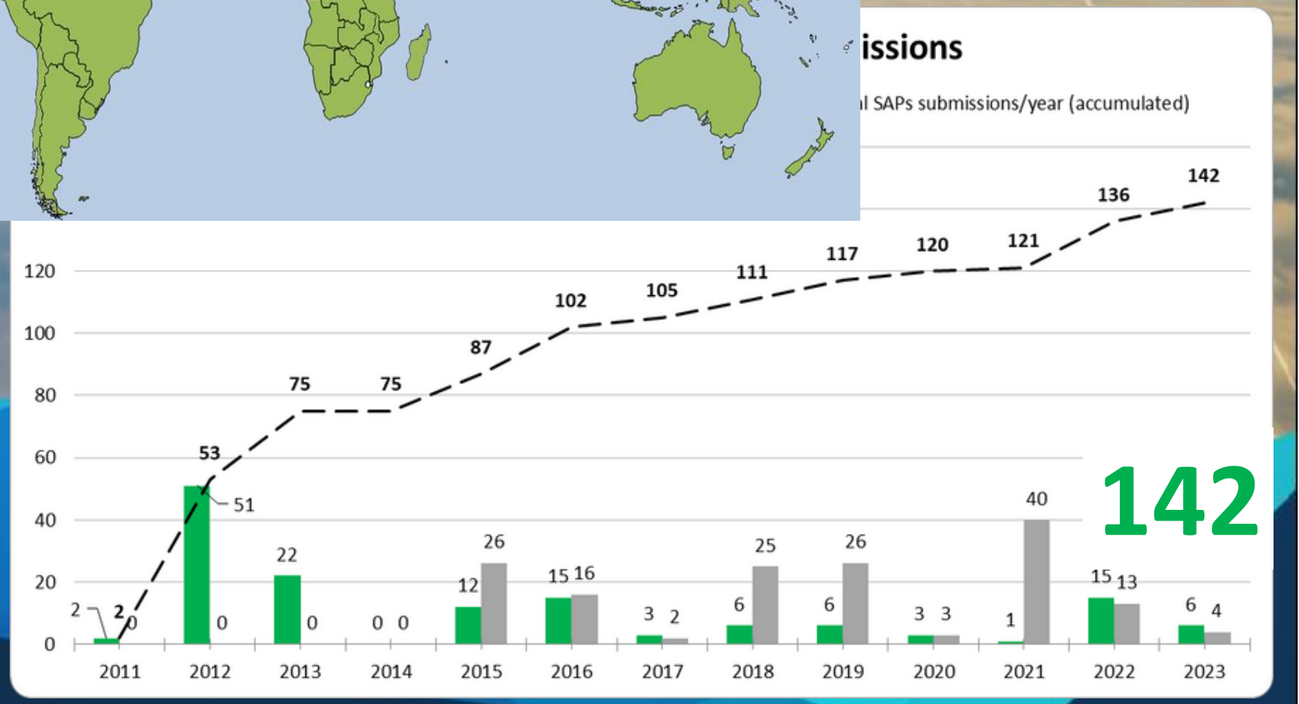
Acceptance T&C (Blank) Pending Yes

Implementation Initiatives

ICAO State Action Plans (SAPs)



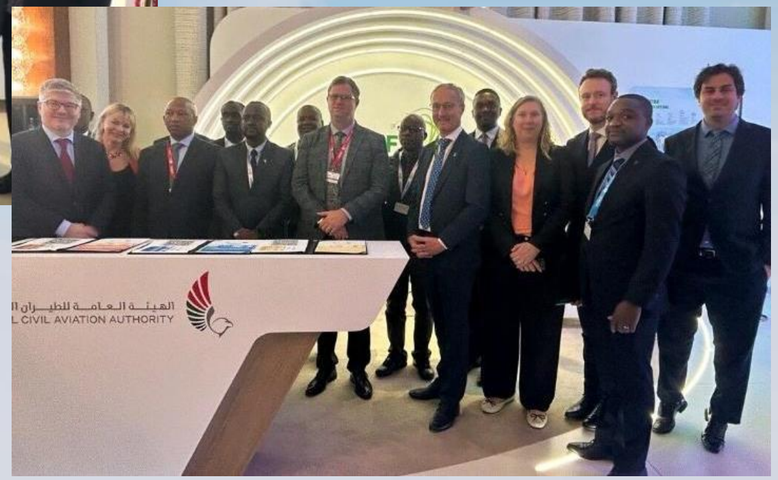




Implementation Initiatives

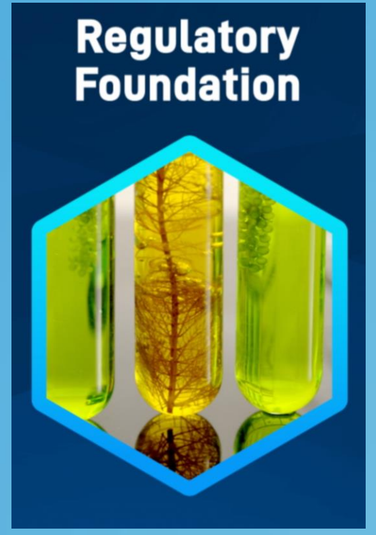
Parentships announcements at CAAF/3

- European Union: SAF Feasibility studies in 10 African States
- France : SAF Business Implementation Project in Ethiopia
- Netherlands : SAF Feasibility Studies in Chile, Jordan
- Airbus : SAF Feasibility Studies in South America



Financing aviation emissions reductions

- Operationalization of ICAO Finvest Hub initiative
- Expedite work to consider the establishment of a climate finance initiative or funding mechanism under ICAO



ICAO Global Framework and Vision – Monitoring and periodic review

- Progress on emissions reductions and means of implementation (e.g. through State Action Plans, ICAO annual Stocktaking)
- Aspiring to have cleaner energy production facilities in all regions
- Convening of CAAF/4 no later than 2028, for updating the ambition on the basis of market developments

- CAAF/3 - ICAO Global Framework, as a landmark decision to support global scale up of aviation cleaner energies
- Provides clarity, consistency and predictability to all stakeholders on policies, regulations, implementation support and investments
- A clear signal on the continued leadership of ICAO
- Over 100 new / additional SAF announcements in 2023 and beyond – ICAO Framework will strongly support their realization

Aviation Energy Transition in ON
Welcome on board!

IRENA
International Renewable Energy Agency

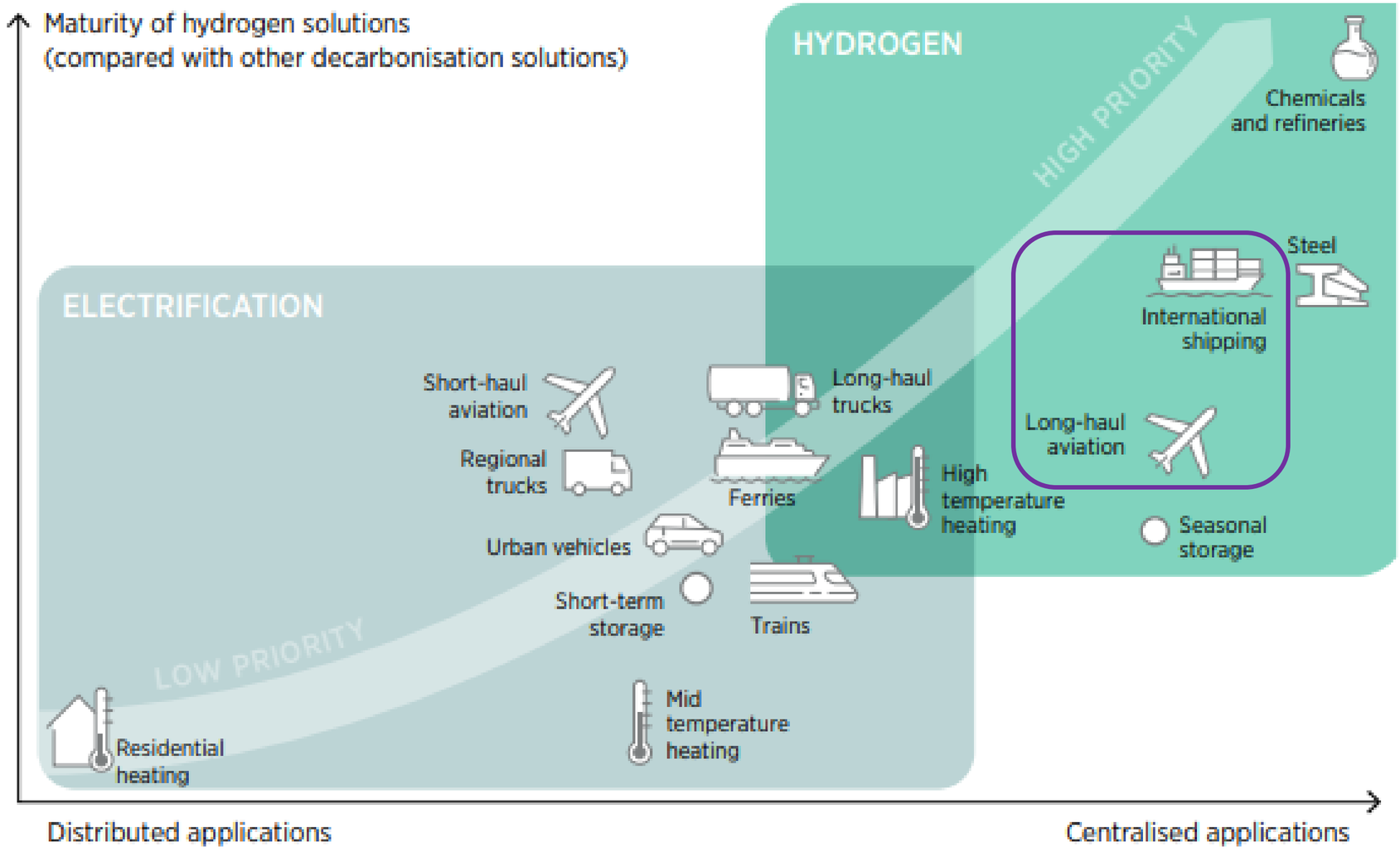
Decarbonising international aviation and shipping with renewable energy

Roland Roesch
Director IRENA Innovation and Technology Centre

2 December 2023

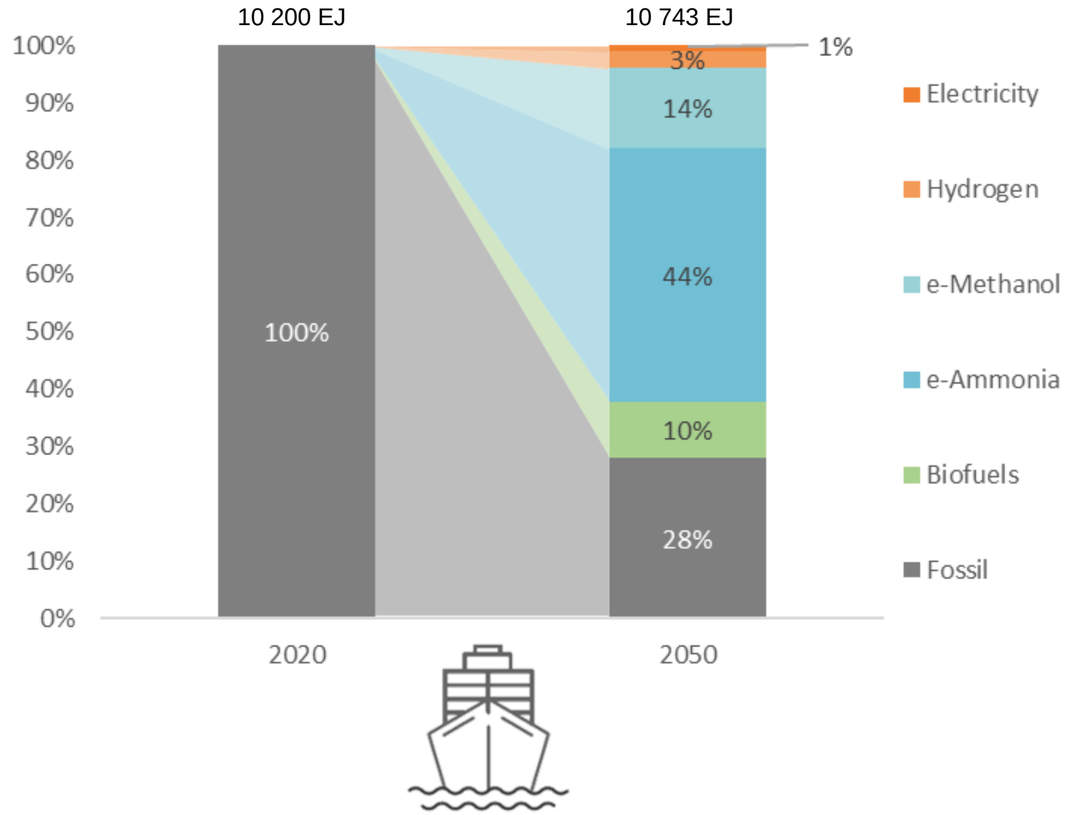
IRENA AT COP28

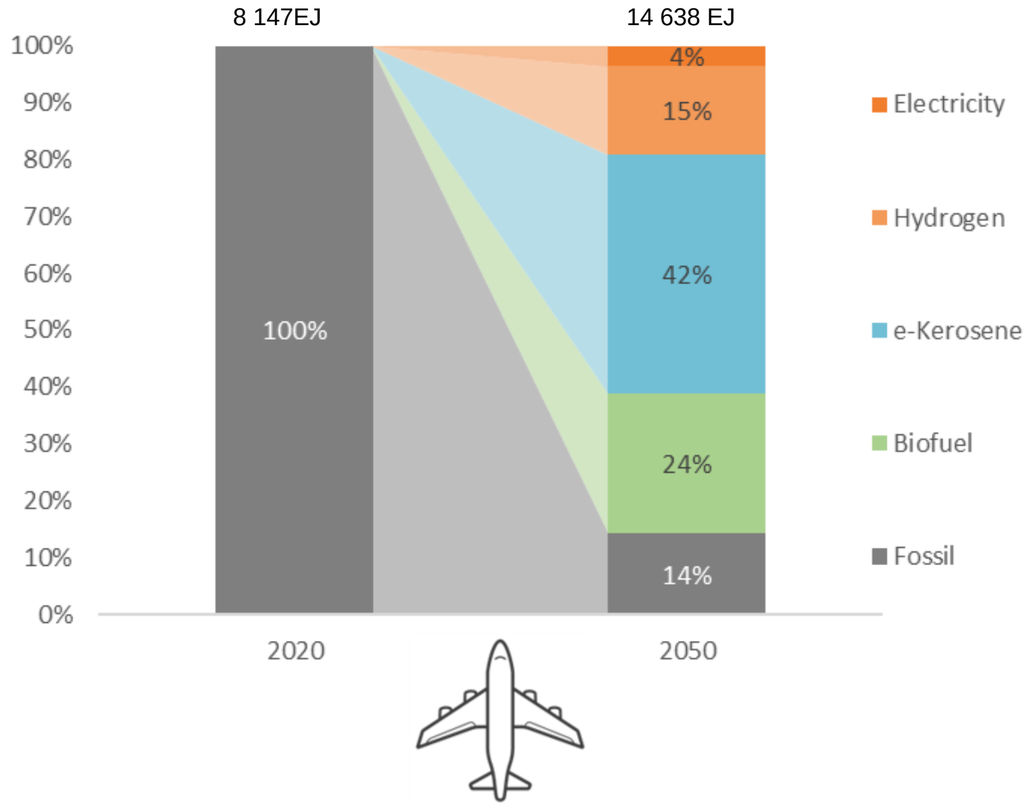
H_2 based fuels are not equally suitable for all sectors



Decarbonisation requires large amounts of renewable energy

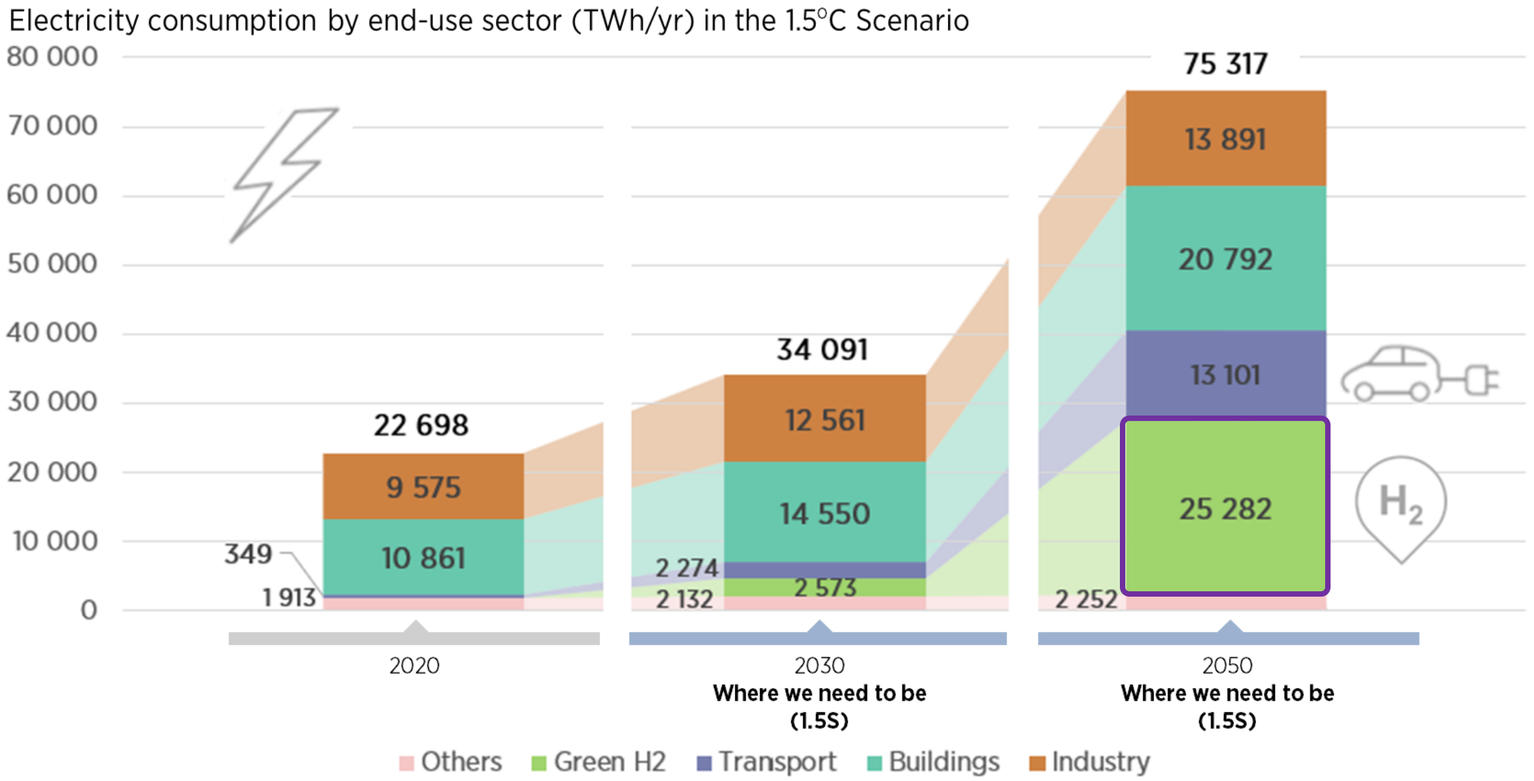
Energy demand decarbonisation pathways for shipping and aviation





1. Reduced demand and improved energy efficiency
2. Direct use of clean electricity
3. Direct use of bioenergy
4. Indirect use of clean electricity via e-fuels

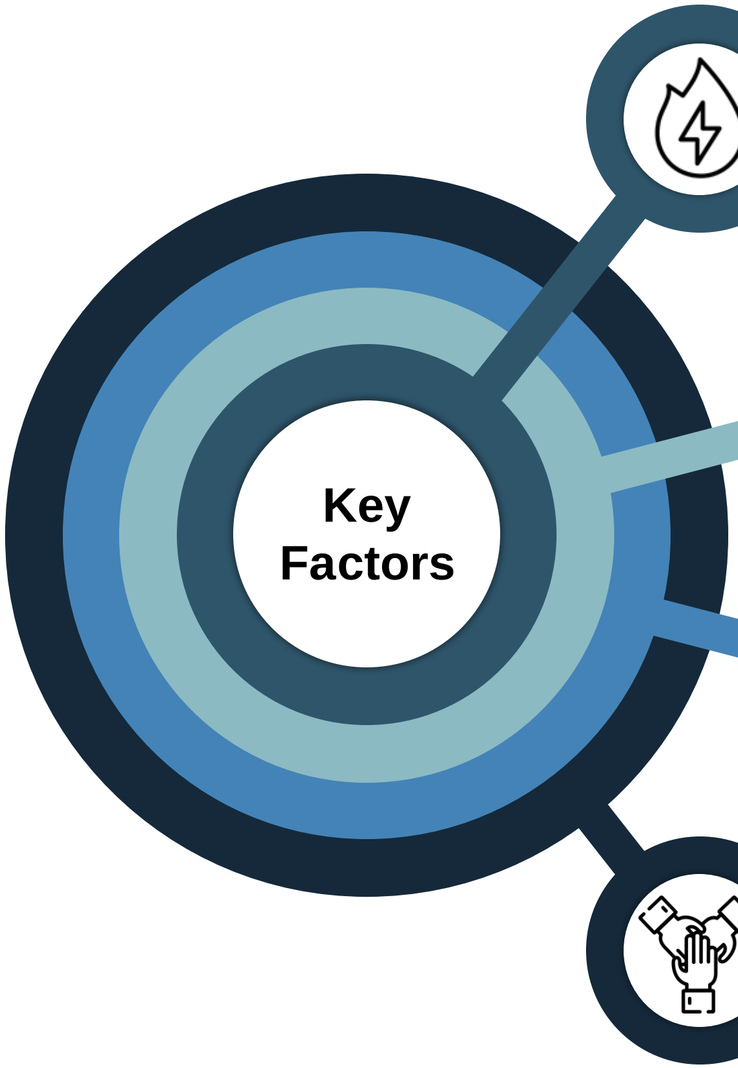
Electricity demand for e-fuel production will grow exponentially



By 2050:

- H_2 supply reaching **530 Mt/yr** (6x growth)
- **Shipping and aviation** expected to consume **~120 Mt/yr**
- Electricity consumption to grow **3.3x**
- **Renewable resources are plentiful**, the key is the timely planning of their deployment.
- For e-fuels to be sustainable, **carbon needs to come from sustainable sources**

Shipping and aviation have similar paths to net-zero



Technology

Multi-fuel solution – biofuels, e-methanol, e-ammonia, e-kerosene

- Carbon for e-fuels needs to be sourced sustainably!
- Ammonia, H2 planes still need development, so does DAC

Supply chain

Simultaneous growth of supply and demand for renewable fuels

- Timely development of infrastructure
- Harmonised certification of green fuels and safety standards

Regulation

Clear and ambitious policies and regulations

- Long term targets with short-term milestones
- Carbon pricing is critcal to close the fuel cost gap.

Cooperation

Cooperation between governments, between public/private sectors and across end-use sectors.

- Collaborative instruments, such as green corridors can demonstrate and scale decarbonisation efforts

IRENA is advancing the decarbonisation agenda with its Members

IRENA AT COP28

IRENA
International Renewable Energy Agency

Thank you!

IRENA at COP28

IRENA AT COP28

IMO action to address GHG emissions from international shipping

Mr. Camille Bourgeon
International Maritime Organization (IMO)

"Innovation and clean energy for international aviation and shipping"
ICAO-IMO-IRENA side event at COP 28
Saturday, 2 December 2023

…in a nutshell

United Nations specialized agency mandated to ensure safe, secure and efficient shipping on cleaner oceans

175 Member States, 3 associated members, 143 observer organizations (IGOs and NGOs)

IMO regulates **> 50,000 ships** trading worldwide

IMO's instruments contain **binding obligations for all ships** (MARPOL Annex VI covers 97% of world's tonnage)

These provisions are **enforced globally** by flag States and port States

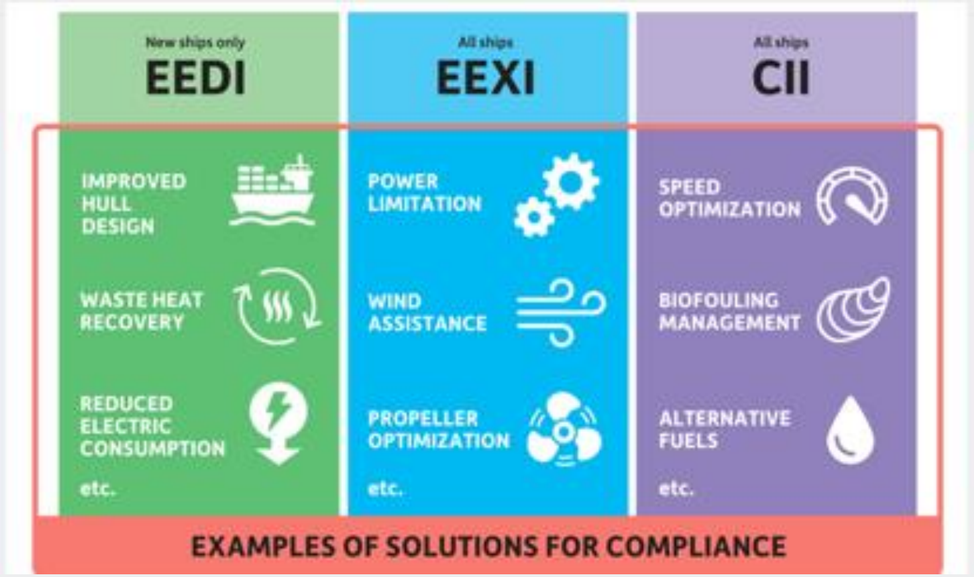
Existing IMO instruments are already driving innovation and energy efficiency improvements to reduce GHG emissions from ships…

Design requirements for new builds (EEDI)

Technical energy efficiency requirements (EEXI)

Operational energy efficiency requirements (CII)

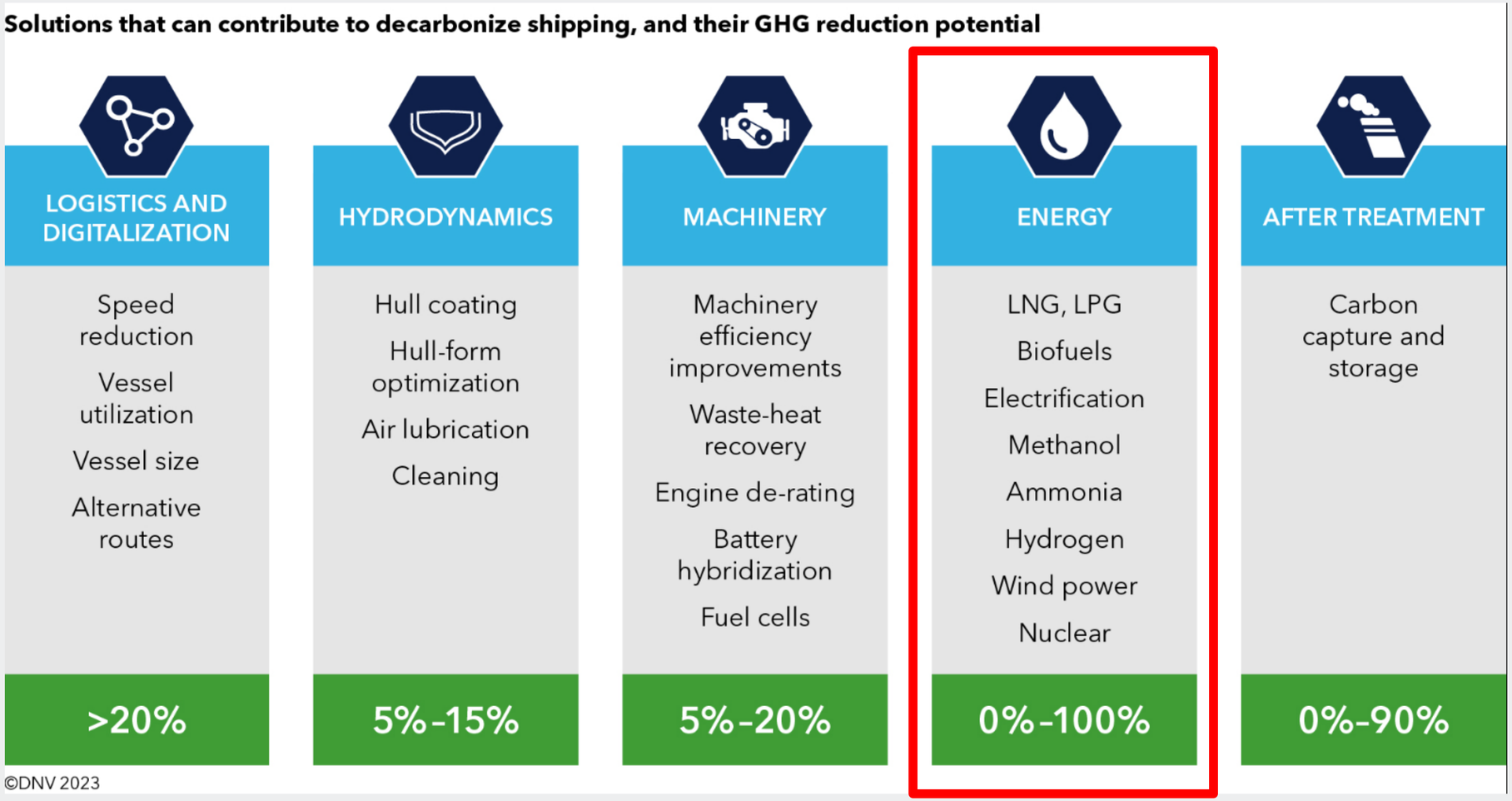
Annual fuel consumption reporting (IMO Data Collection System)



IMO REGULATON DRIVES INNOVATION TO REDUCE THE CARBON INTENSITY OF INTERNATIONAL SHIPPING

IMO regulations are key to driving the decarbonization of shipping

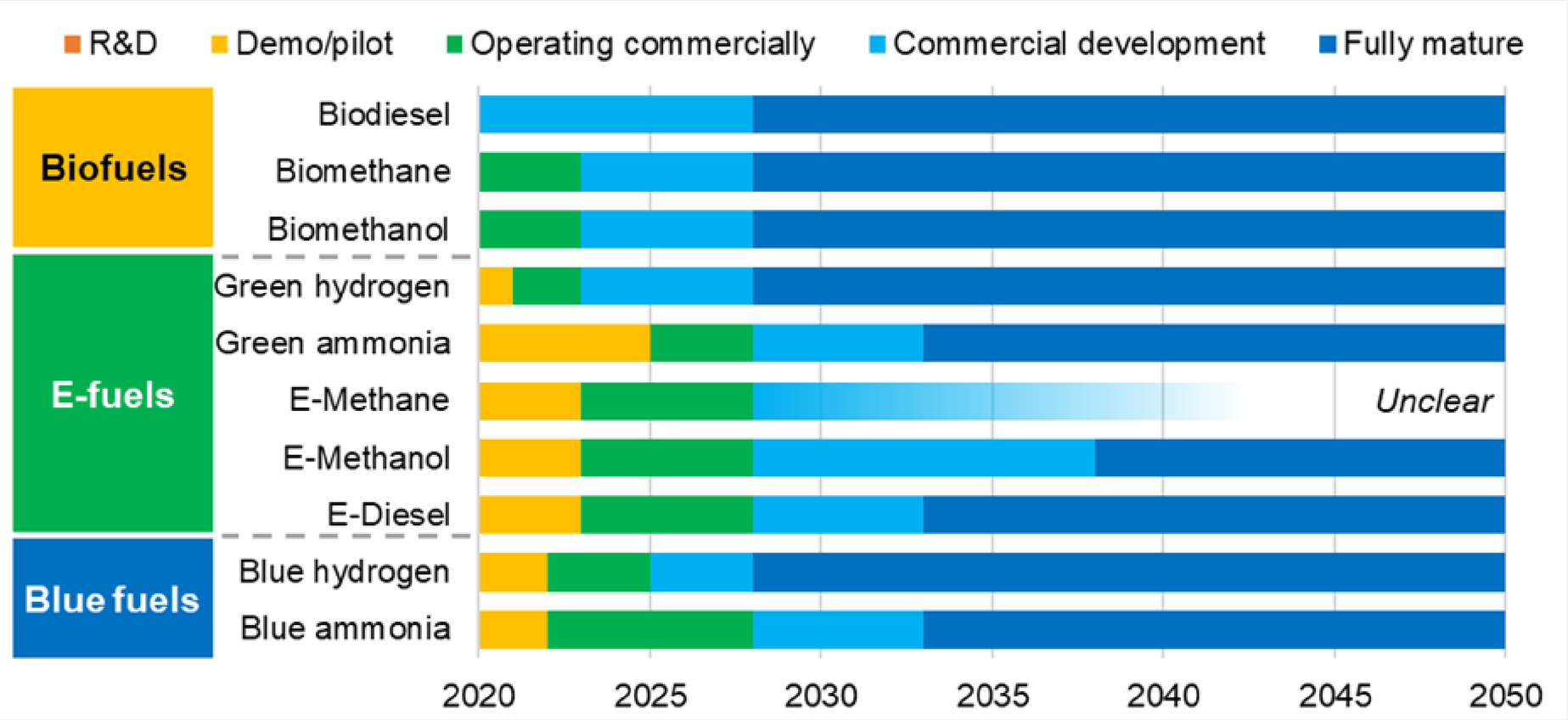
…However, to decarbonize the shipping sector, most of the GHG reduction effort will come from a change in the energy system



Cleaner marine fuels expected to be mature in the coming years

regulatory certainty from global measures expected to drive demand

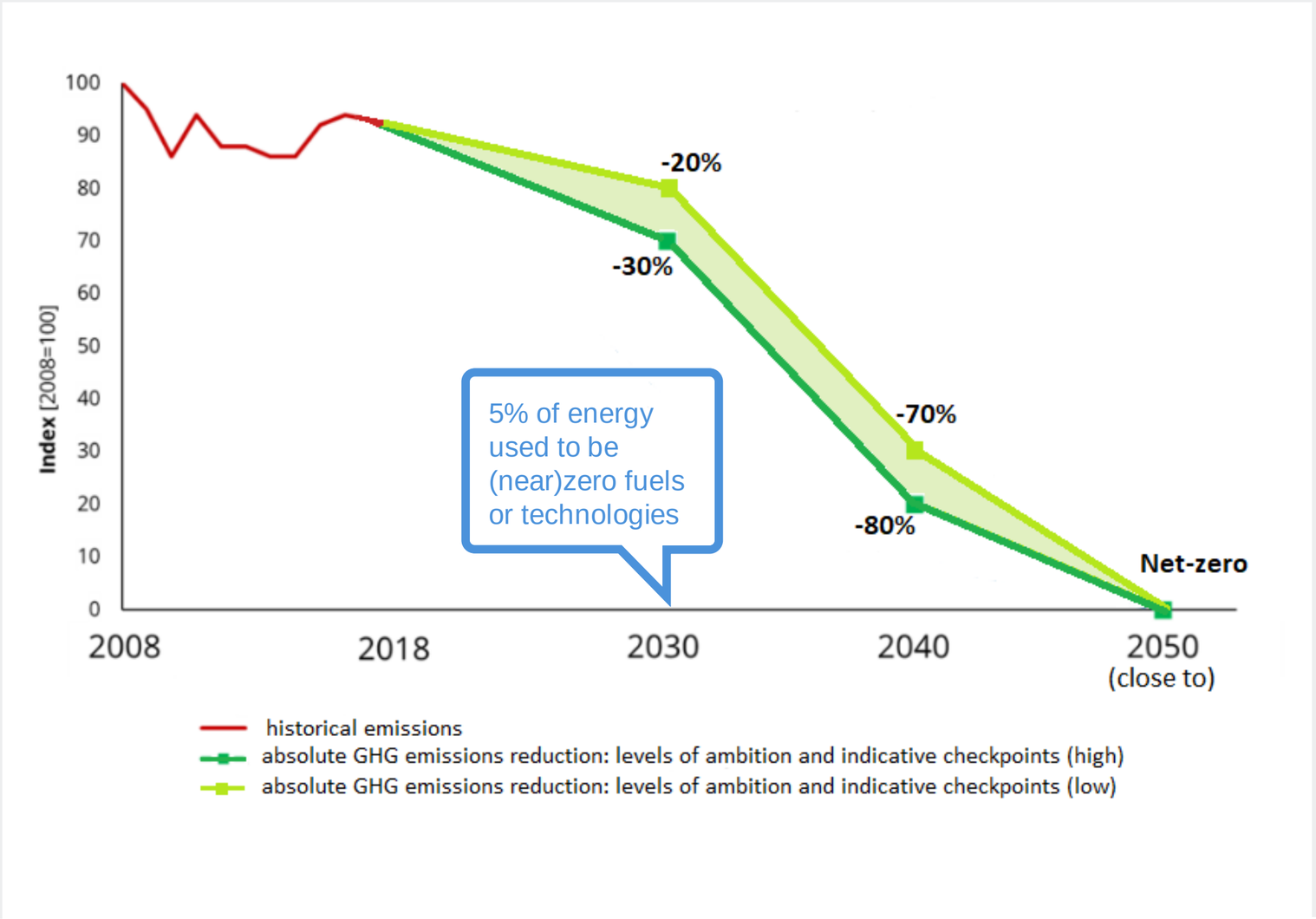
Technical and commercial readiness of alternative marine fuels



Source: IMO Future Fuel and Technology (FFT) Project

2023 IMO Greenhouse Gas Strategy: strengthening IMO's commitment to shipping decarbonization as part of wider global efforts

2023 IMO GHG Strategy: outlining the pathway to net-zero emissions



Development of a basket of mid-term measures

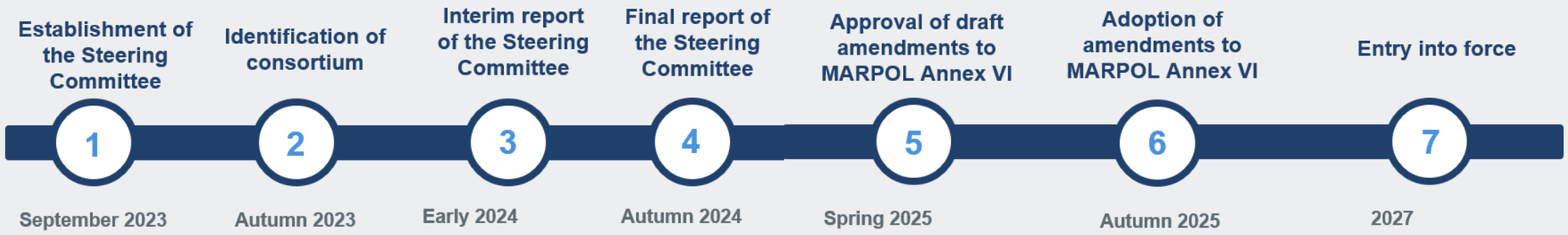
MEPC 80 agreed to develop a basket of candidate measure(s), delivering on the reduction targets, comprised of both:

- a **technical element**, namely a goal-based marine fuel standard regulating the phased reduction of the marine fuel's GHG intensity; and
- an **economic element**, on the basis of a maritime GHG emissions pricing mechanism.

The mid-term GHG reduction measures should:

- effectively promote the energy transition of shipping
- provide the world fleet a needed incentive
- while contributing to a level playing field and a just and equitable transition

Comprehensive impact assessment and measure development timeline:



Ensuring a just and equitable transition to net-zero shipping

The effective implementation of global measures require a significant enhancement of capacity-building and technical cooperation. 2 examples:

GreenVoyage2050

"Flagship project" supporting selected developing countries SIDS and LDCs (~USD 20 million)

Example of action:
Feasibility studies for the production and provision of low- and zero-carbon fuels in South Africa

Maritime Just Transition Task Force

In cooperation with the ICS, ITF, UN Global Compact, and ILO

Example of action:
Supporting the Philippines in upgrading maritime training institutions to address shipping decarbonization

A number of new IMO initiatives and projects are being developed in all regions and we stand ready to support Member States needs

Delivering the IMO net-zero pathway with all hands on deck: joint efforts across the maritime value chain

IMO and Member States

- **Develop and adopt by 2025** a basket of measures to promote the energy transition of shipping
- Put in place the ruleset allowing **safe** bunkering and on-board use of alternative fuels

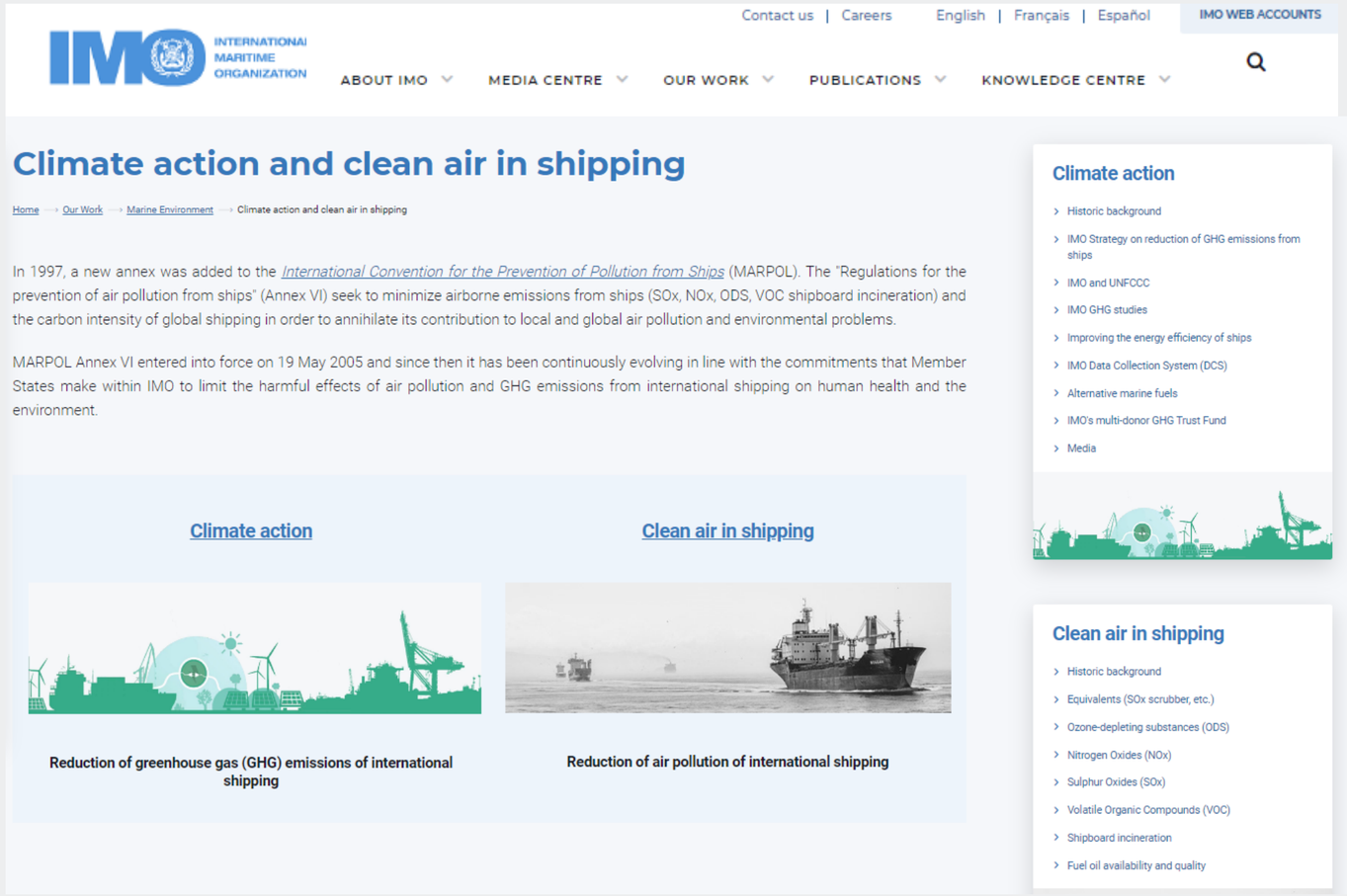
Ensuring a just and equitable transition

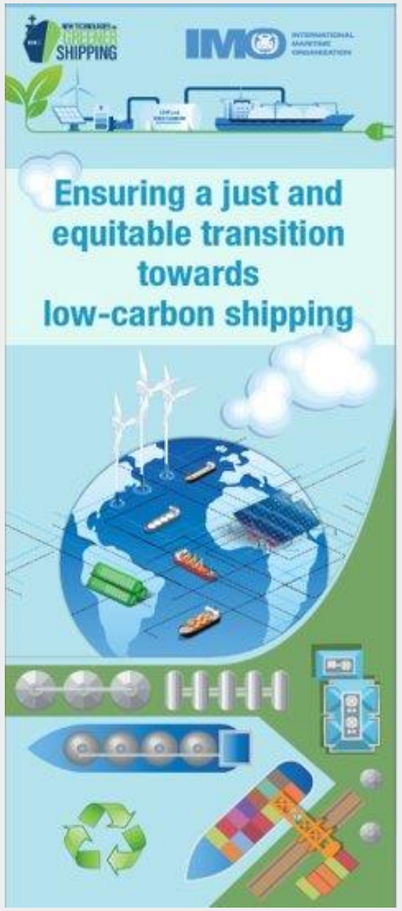
- **Support developing States and seafarers** in exploring opportunities in decarbonization whilst ensuring access to affordable and reliable maritime transport services

Maritime industry

- **Demonstrate leadership and innovation** through early action (new-build orders, first-movers, green corridors, etc.)
- Engage in **partnerships** with ports, fuel producers, financial sector

For further information





www.imo.org - IMO at COP 28

Thank you for your attention

INTERNATIONAL
MARITIME
ORGANIZATION

International Chamber of Shipping

COP28

Dubai, UAE.

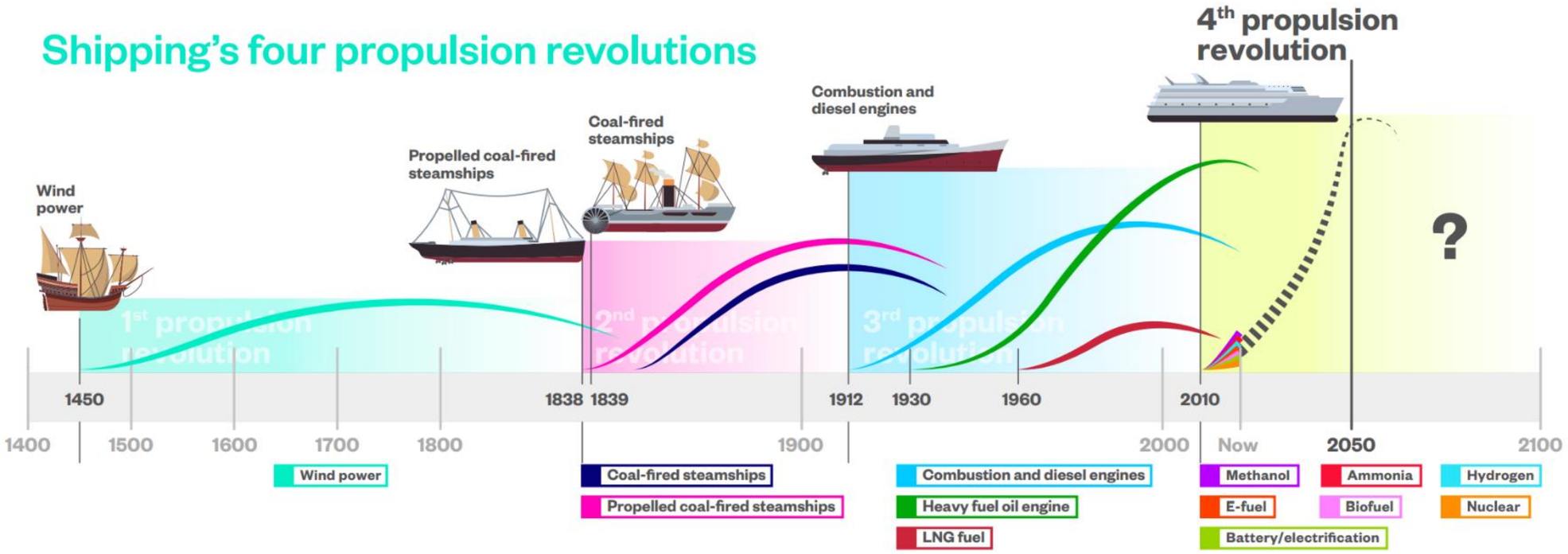

2 Main stories interlinked in this picture
LH2
LH2
LH2
LH2
Hydrogen-powered
H2 HYDROGEN POWER
www.ics-shipping.org

Clean Energy Marine Hubs (**CEM-Hubs**)

The ENERGY-MARITIME high-level global initiative

CLEAN ENERGY MARINE HUBS

AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL



What makes the net-zero transition different?

CLEAN ENERGY MINISTERIAL
Advancing Clean Energy Together

International Chamber of Shipping

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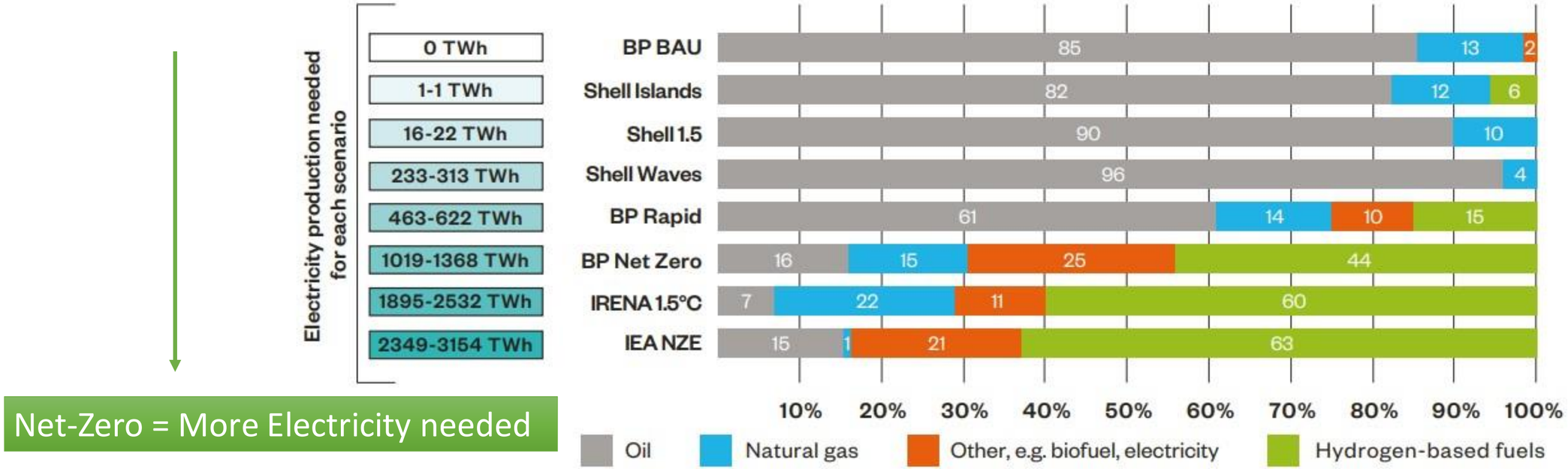
Clean Energy Marine Hubs (**CEM-Hubs**)

CLEAN ENERGY MARINE HUBS

AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

The ENERGY-MARITIME high-level global initiative



How to prioritize access to electricity?

Net-Zero = More Electricity needed

IMO's Strategy and Net-Zero Goals = Net-zero by 2050
Paradigm shift

- Production at scale of low and zero carbon fuels close to ports.
- Global regulation and cross-sectoral collaboration
- Dual-role of Shipping as an ENABLER of the energy transition

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Clean Energy Marine Hubs (**CEM-Hubs**)

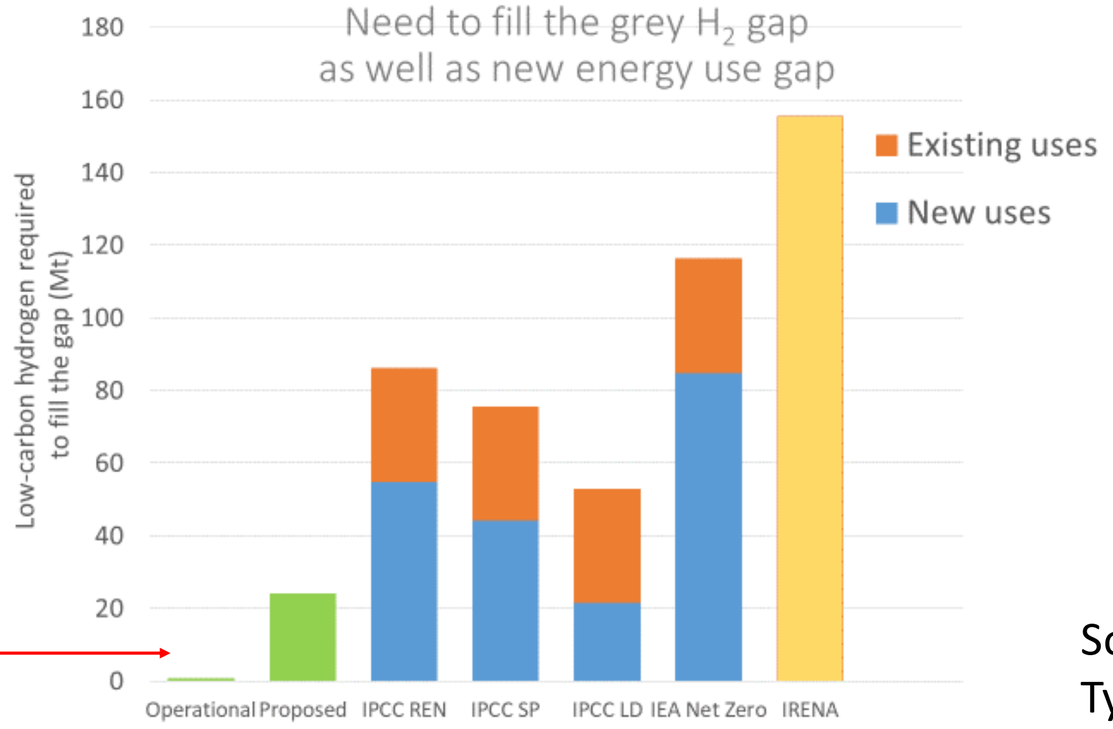
The ENERGY-MARITIME high-level global initiative

CLEAN ENERGY MARINE HUBS

AN INITIATIVE OF THE CLEAN ENERGY MINISTERIAL

GAP between government announcements and real progress (low-carbon hydrogen).

Only 4 % of the projects are operational worldwide. How many close to ports?



Source: Tyndall Centre/ICS

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Clean Energy Marine Hubs (**CEM-Hubs**)

The ENERGY-MARITIME high-level global initiative

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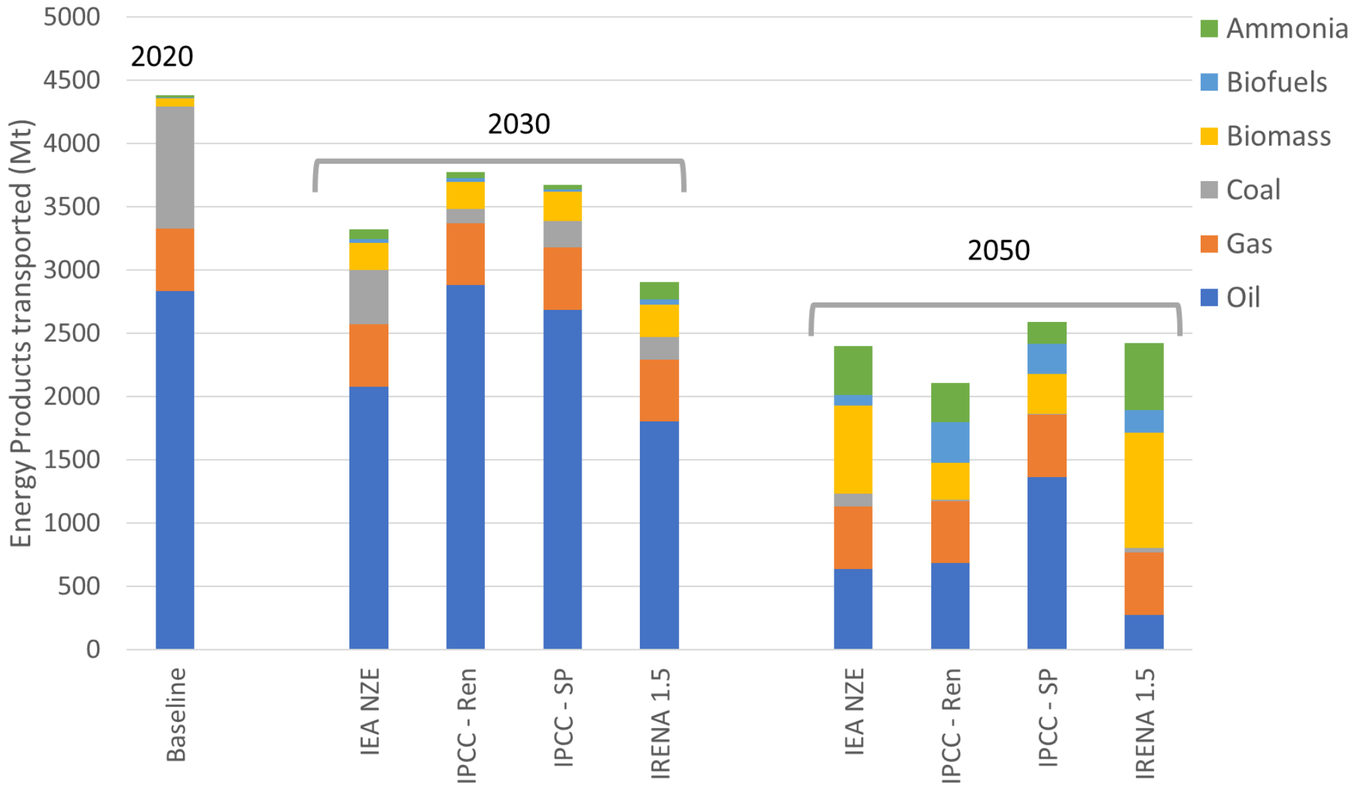
Energy Products Seaborne Trade towards low-carbon fuels 2050. To increase share of clean fuels.



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CLEAN ENERGY MARINE HUBS

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Co-leading Governments

Six supporting governments

Canada

Norway

Panama

UAE

Uruguay

Innovation and clean energy for international aviation and shipping

2 December 2023
ICAO, IMO, and IRENA side event

Dan Rutherford, Ph.D.

icct
THE INTERNATIONAL COUNCIL ON CLEAN TRANSPORTATION

Investment needs for net-zero international aviation, 2020 to 2050

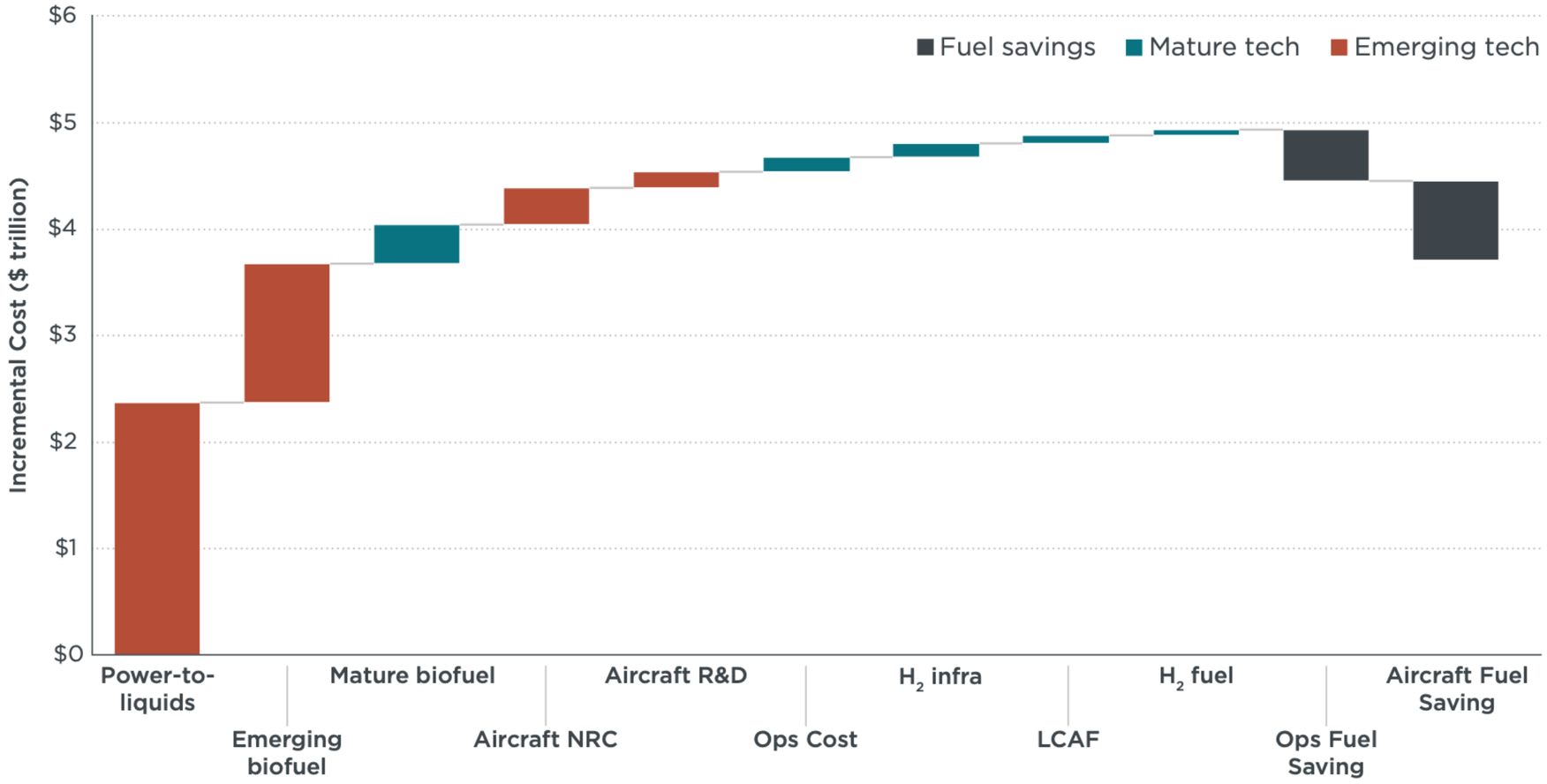
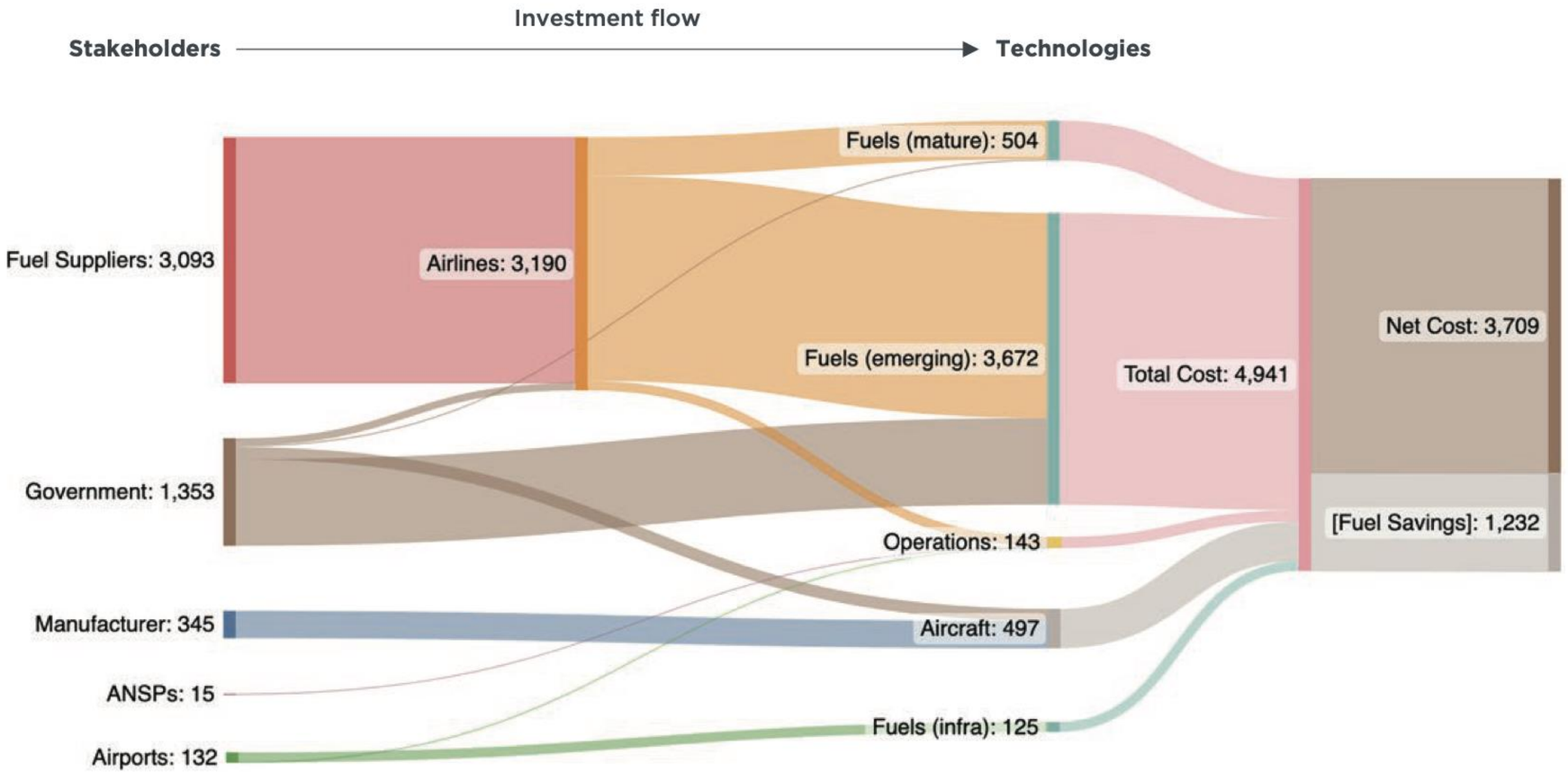


Figure 3. Total investment need (2020–2050) sorted by technology.

https://theicct.org/wp-content/uploads/2023/11/Aviation-government-spending-A4-Working-paper-25-20026-v4.pdf

Modeled financing structure for decarbonizing international aviation from the LTAG report



Values in million USD.
https://theicct.org/wp-content/uploads/2023/11/Aviation-government-spending-A4-Working-paper-25-20026-v4.pdf

Principles for supporting clean energy in international transport

1. Support ***emerging technologies*** that can be brought down the cost curve
2. Do ***discriminate*** between good and bad fuels on a WtW basis
3. Be ***comprehensive*** and cover all GHGs not just CO_2
4. Be ***timely*** in promoting measures that we need now
5. Follow the ***polluter pays principle***
6. Don’t try to ***cut the line***

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