

Maritime Green Frontier

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I. Why Green Growth in the Maritime Sector

Why Green Growth in the Maritime Sector

Declaration on Green Growth

Adopted at the Meeting of the Council at Ministerial Level on 25 June 2009



Towards Green Growth report (2011)

“Green growth” means fostering economic growth and development while ensuring that natural assets continue to provide the resources and environmental services on which our well-being relies.

- Air and water pollution
 - Climate change
 - Water scarcity
 - Resource bottlenecks
 - Biodiversity loss
- etc...

What is Green Growth in Maritime Sector

Towards Green Growth report (2011)

Sources of green growth

(an excerpt from Towards Green Growth report (2011))

- Productivity

Incentives for greater efficiency in the use of resources and natural assets: enhancing productivity, reducing waste and energy consumption and making resources available to highest value use.

- Innovation

Opportunities for innovation, spurred by policies and framework conditions that allow for new ways of addressing environmental problems.

- New markets

Creation of new markets by stimulating demand for green technologies, goods, and services; creating potential for new job opportunities.

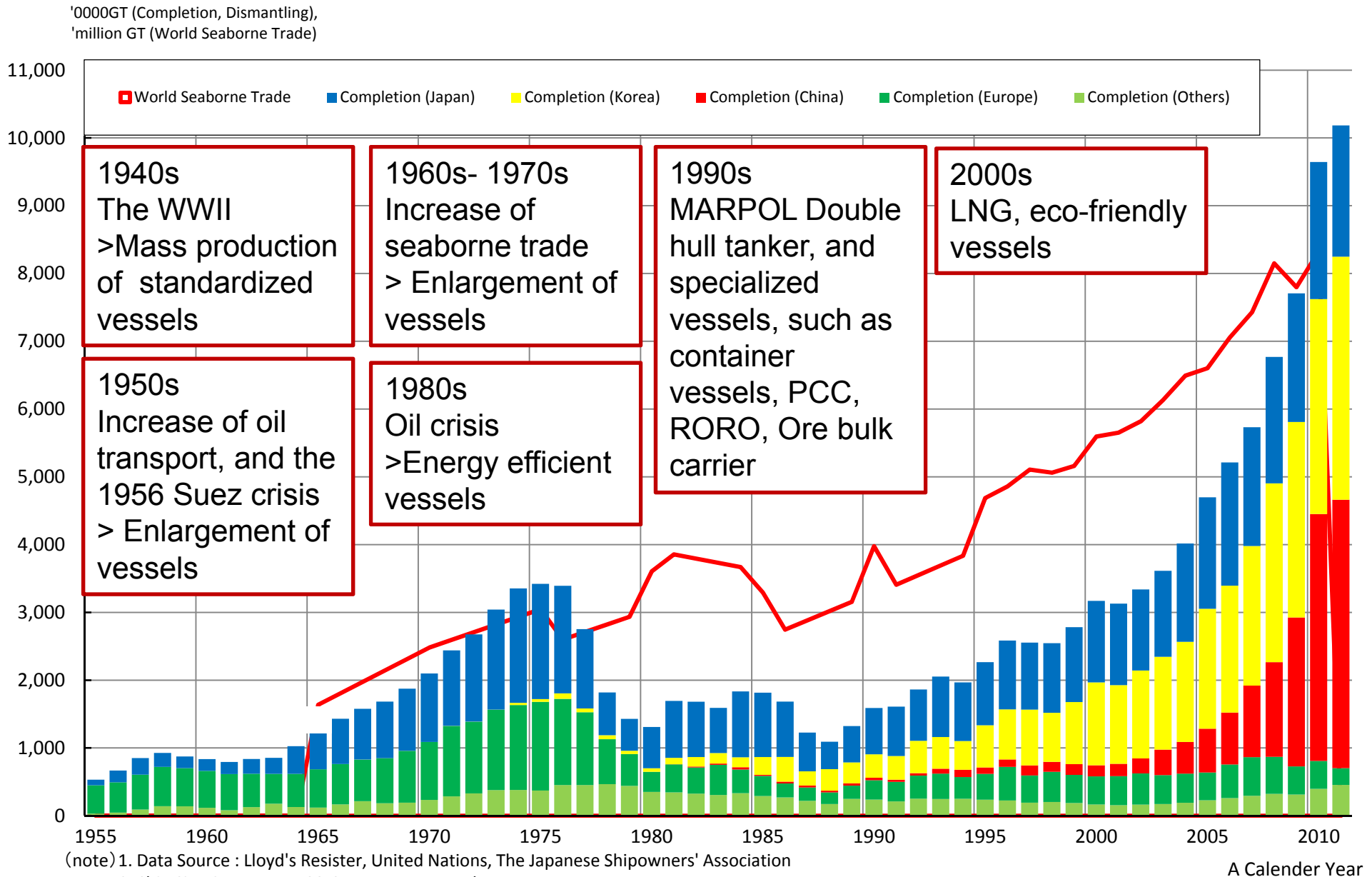
Towards Green Growth





I. How productivity, innovation, new market has been fostered in maritime sector

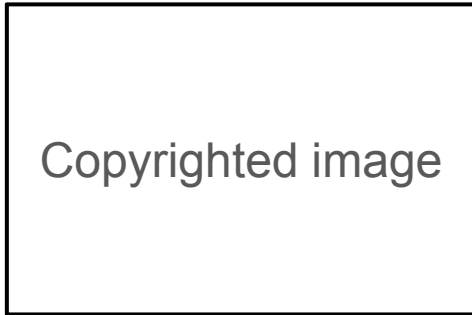
Historical impacts on shipping and shipbuilding industry (1940s-)



Evolution of ships and its factor 1

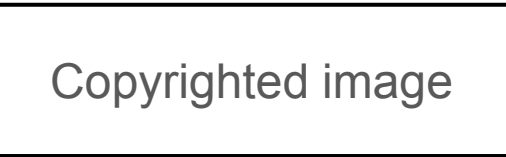
Sailing vessel to Steam powered ship

The first steam-powered ship was built in France in 1783



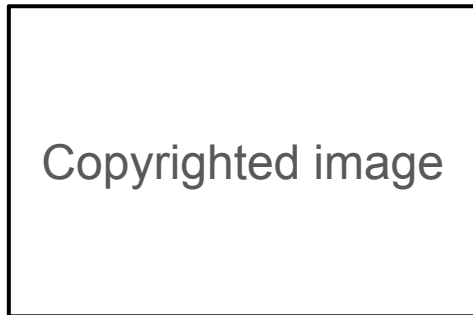
Italian full-rigged ship
Amerigo Vespucci

Model of **steamship**, built in 1784, by Claude de Jouffroy

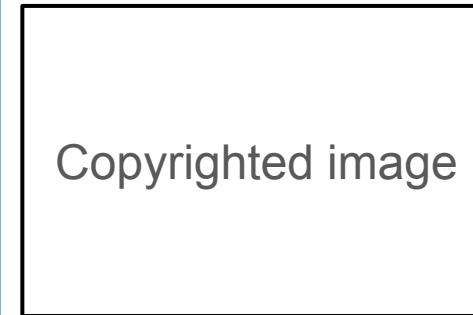


From wooden hull to iron and steel hull

Aaron Manby, built in 1822 at UK shipyard, was the first **iron steamship** to go to sea.



WWII and Mass production of standardized vessels

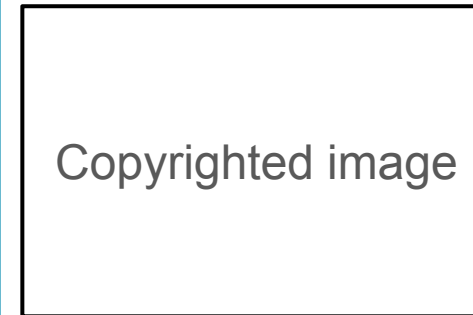
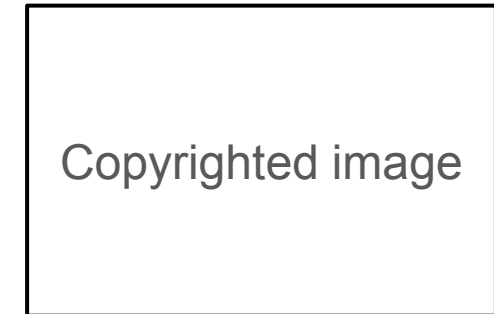


Liberty ships

Eighteen US shipyards built 2,710 Liberty cargo ships between 1941 and 1945

Block construction

Prefabrication of deckhouses, double-bottom sections, stern-frame assemblies and bow units.



Welding

Grinding welding bead, SS George Washington Carver at the Kaiser shipyards

Evolution of ships and its factor 2

Increase of oil transport

Nearly 500 **T2 tankers** (mainly **T2-SE-A1**) had been built in the US from 1940 to 1945, and after WWII they were used for commercial purpose.

Length 162m
16,600 DWT
33-70 days per
Ship for building

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Increase of seaborne trade

Due to the enlarged world trade volume, the size of vessels became larger and the fleet number had been increased.

In 1979, Sea wise Giant, a ULCC supertanker, the longest and the greatest DWT ship ever built, was delivered.

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The 1956 Suez crisis and the larger scale of transportation

The Suez Crisis of 1956 forced to move oil around the Cape of Good Hope, and larger tankers were more favorable for owners.

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In 1958, *S.S. Universe Apollo*, the worlds first 100,000 ton oil tanker, built in the NBC Kure, Japan

Oil crisis

Due to the oil crisis in 1973 and 1979, more energy efficient ships had been increased.

In 1983, on *Harietmaru*, a very energy efficient engine which achieved 50% thermal efficiency, and an advanced exhaust heat recovery system were installed.

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Evolution of ships and its factor 3

MARPOL Double hull tanker, and specialized vessels, such as container vessels, Pure Car Carrier(PCC), Roll on Roll off(RORO), LNG carrier

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In 1989, Exxon Valdez oil spill happened and IMO/MARPOL was amended to make it mandatory for new oil tankers to have double hulls and brought in a phase-in schedule for existing tankers to fit double hulls.

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Other factors

the first practical steamboat was built in 1802, the major engine have been shifted, reciprocating steam engines, steam turbine, and diesel engine.

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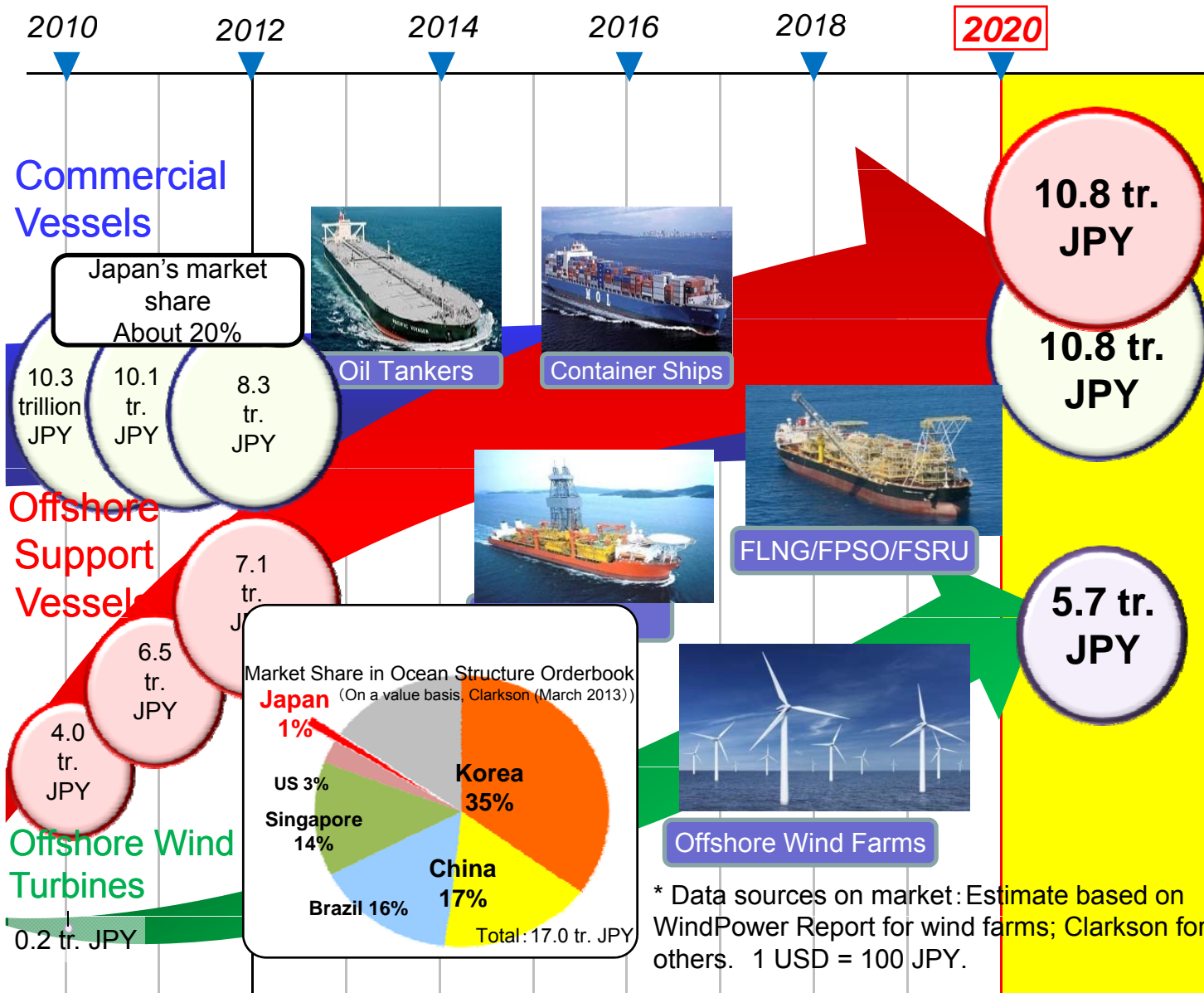
Container

- ISO standards for containers were published between 1968 and 1970.
- Cargo carrying capacity has been increased rapidly in 2000s.
- The steadily rising expense of fuel oil has prompted most container lines to adapt a slower, more economical voyage speed of about 21 knots, compared to earlier top speeds of 25 or more knots.



III. Possible seeds of Green Growth

Growth in Offshore Industry



Strategic Development of Offshore Industry



FLNG*
Logistic Hub
 Boost Japan's share in offshore industrial market to 20% in 2020

*FLNG: Floating facilities for LNG production, storage, and offloading

R&D of Cutting-edge Ocean & Environment Technologies



Maintain 20% share in 2020 by developing next-generation green ships

Promotion of Offshore Wind Power

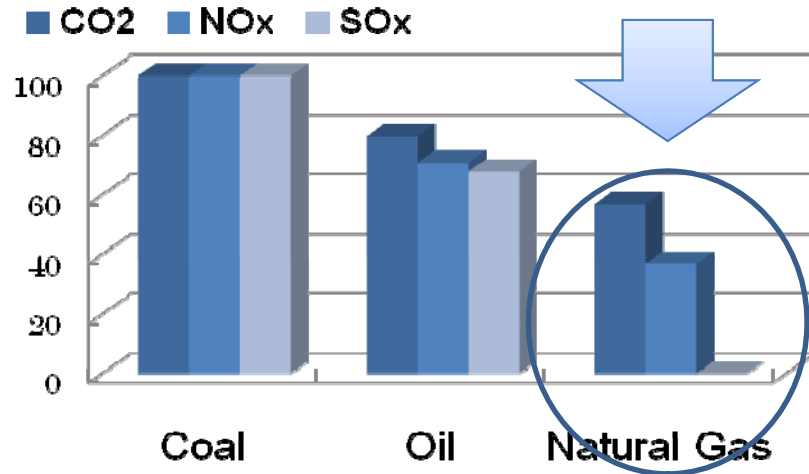


Promote global standardization of floating wind turbines and development of work ships for wind farms

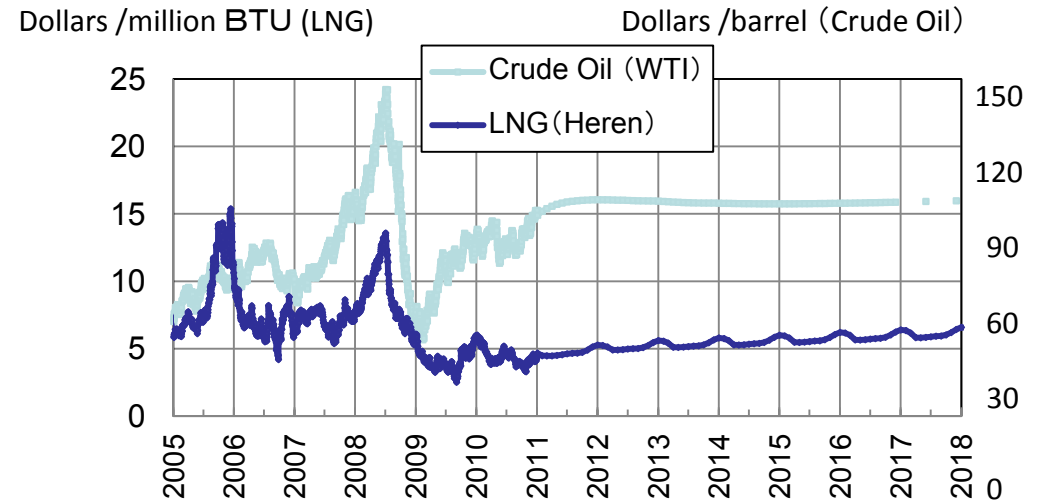
* Data sources on market: Estimate based on WindPower Report for wind farms; Clarkson for others. 1 USD = 100 JPY.

Productivity: LNG-fueled ships

Natural Gas fuel emits low CO₂, NO_x, and SO_x



Natural Gas prices are expected to remain low



LNG-fueled ships: Remarkable technology

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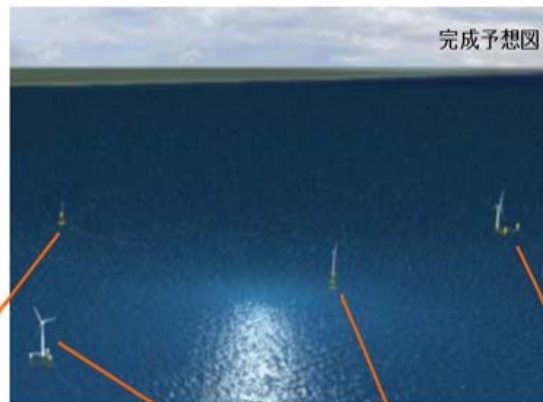
Innovation: Floating wind turbine

Shipbuilding industry can provide critical technologies:
floating position control, stability, etc.

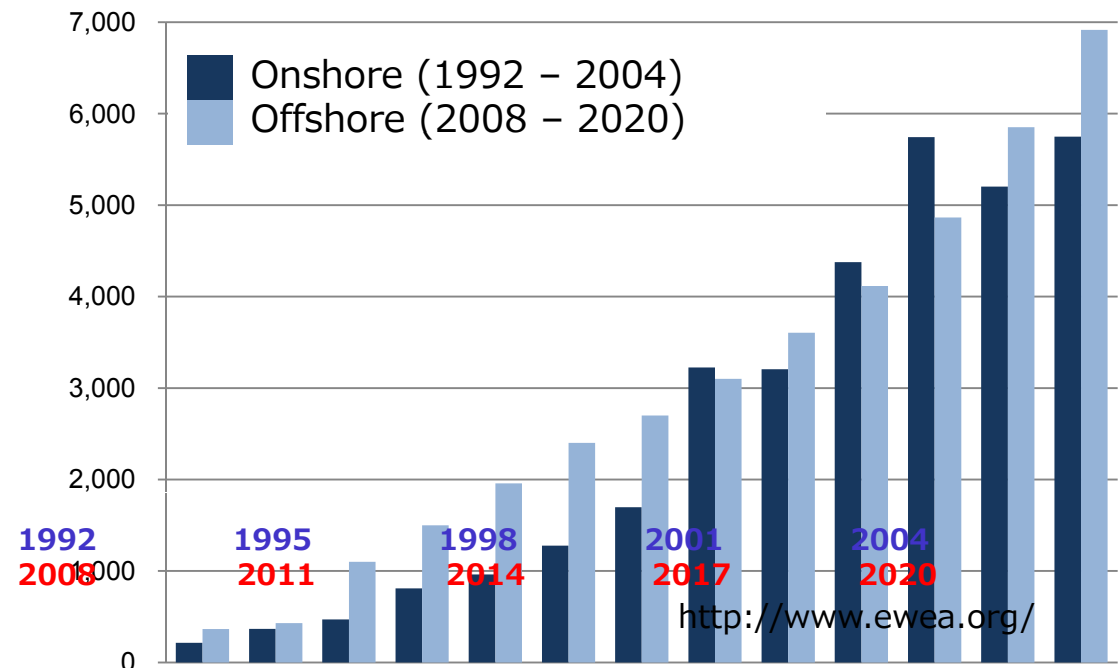
□ Clean and renewable energy

□ Growing market

Fukushima project



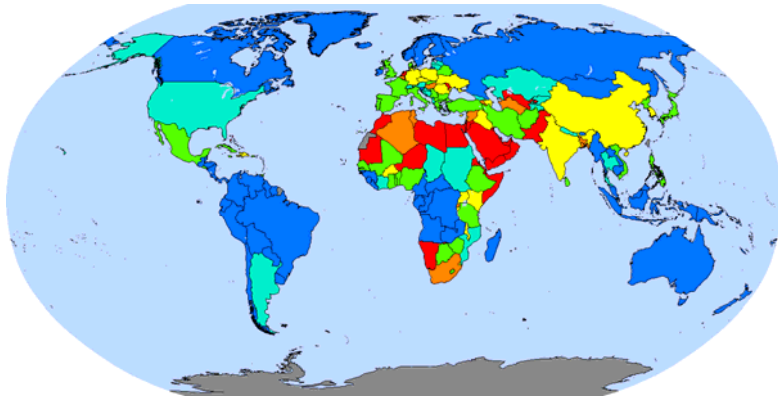
Wind turbine



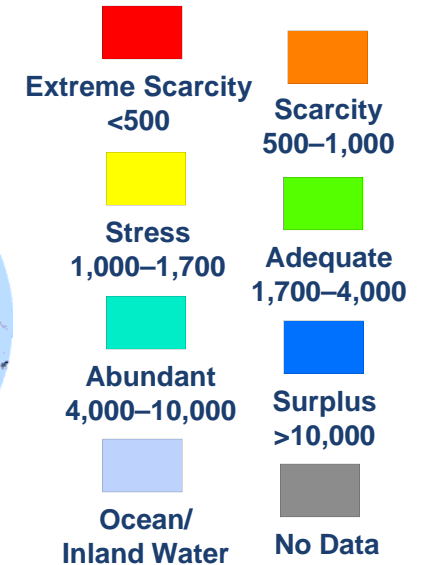
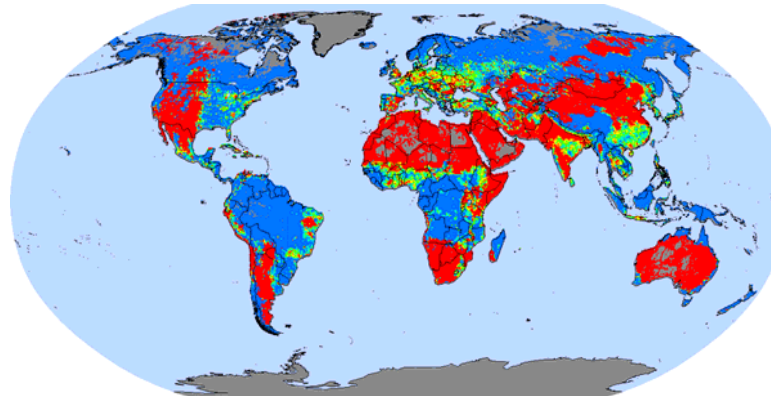
New Market: Floating Desalination Plant

The world water shortage crisis will become more and more severe problem all over the world

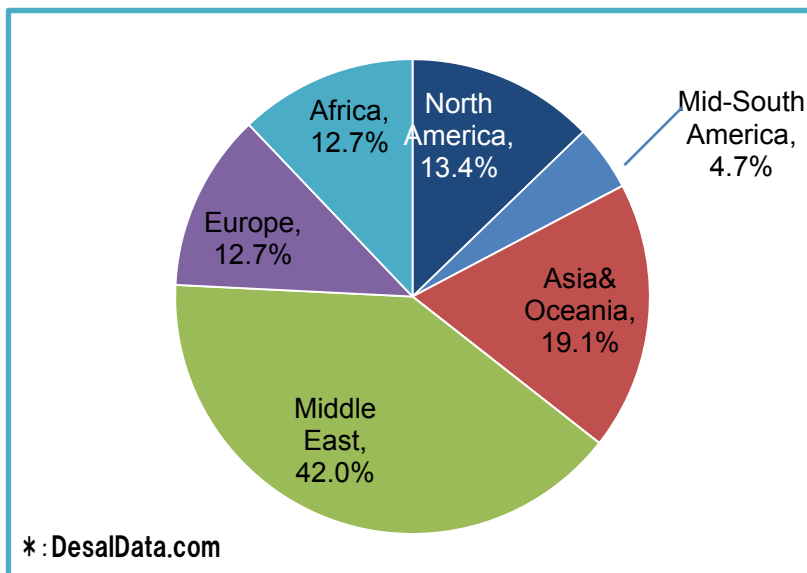
Water Availability: 2000



Water Availability: 2025



Current market share by region*2



Floating Desalination Plant (Images)





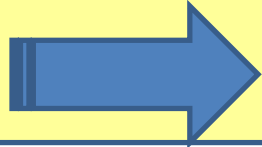
II. How to promote Green Growth?

IMO activities for environment protection

□ Measures to reduce GHG emissions from ships

➤ **Technical measures:**

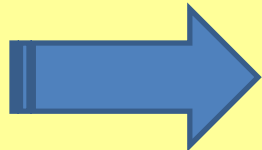
- ✓ Energy Efficiency Design Index (EEDI)



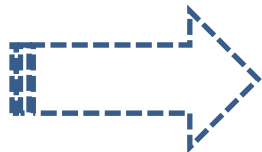
- First step: focus on new ships

➤ **Further technical and operational measures:**

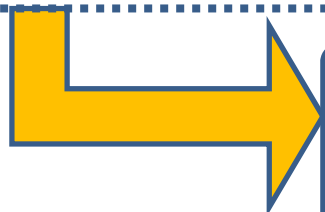
- ✓ Data Collection System: Monitoring, reporting and verification of energy efficiency



- Second step: focus on operational phase of all ships



- Possible Third step: Market-based measures (MBM)



Combined effect of regulation and incentives for green growth

Promotion of “Green Ships”

At the **OECD Working Party on Shipbuilding (WP6)**, Japan proposed to modify the **SSU*** in view of allowing **more flexible export credit financings** for ships that have superior environmental performance (**Green Ships**), and the concept was generally accepted. Currently, the definition of the Green Ships to which more favorable financial terms and conditions are applied is under the discussion in the OECD WP6.

Proposal by Japan

Scope of the Green Ships

20% improvement from EEDI*¹ requirement AND 20% improvement from NOx Tier II Control*² level

*1) Energy Efficiency Design Index to be certified in accordance with MARPOL Annex VI

*2) NOx emission to be certified in accordance with MARPOL Annex VI and NOX Technical Code

Terms & conditions

Max. repayment term

12years → **18years**

Min. down payment

20% → **15%**

Sector Understanding on Export Credits for Ships (SSU)

- The SSU is an annex to the “*Arrangement on Officially Supported Export Credits*”, which provides **financial terms and conditions** to be applied to export credit financings. The SSU is applied to export credits for ships.
- The export credits in accordance with the SSU are considered to be complying with the WTO Agreement on Subsidies and Countervailing Measures. (**Safe Haven of the WTO ASCM**)

Conclusion

- **Higher Demands for Green Growth**

Economic recovery and environmentally and socially sustainable economic growth are key challenges that all countries are facing today.



- **Productivity, Innovation and New markets are the important factor for Green Growth**

- **Finding and fostering the seeds of productivity, Innovation and New Markets in Maritime sector is the key.**

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