IndustriALL Global Union

Shipbuilding-Shipbreaking Action Group Meeting

Promoting sustainable industry

12-13 November 2013
Jorlunde , DENMARK

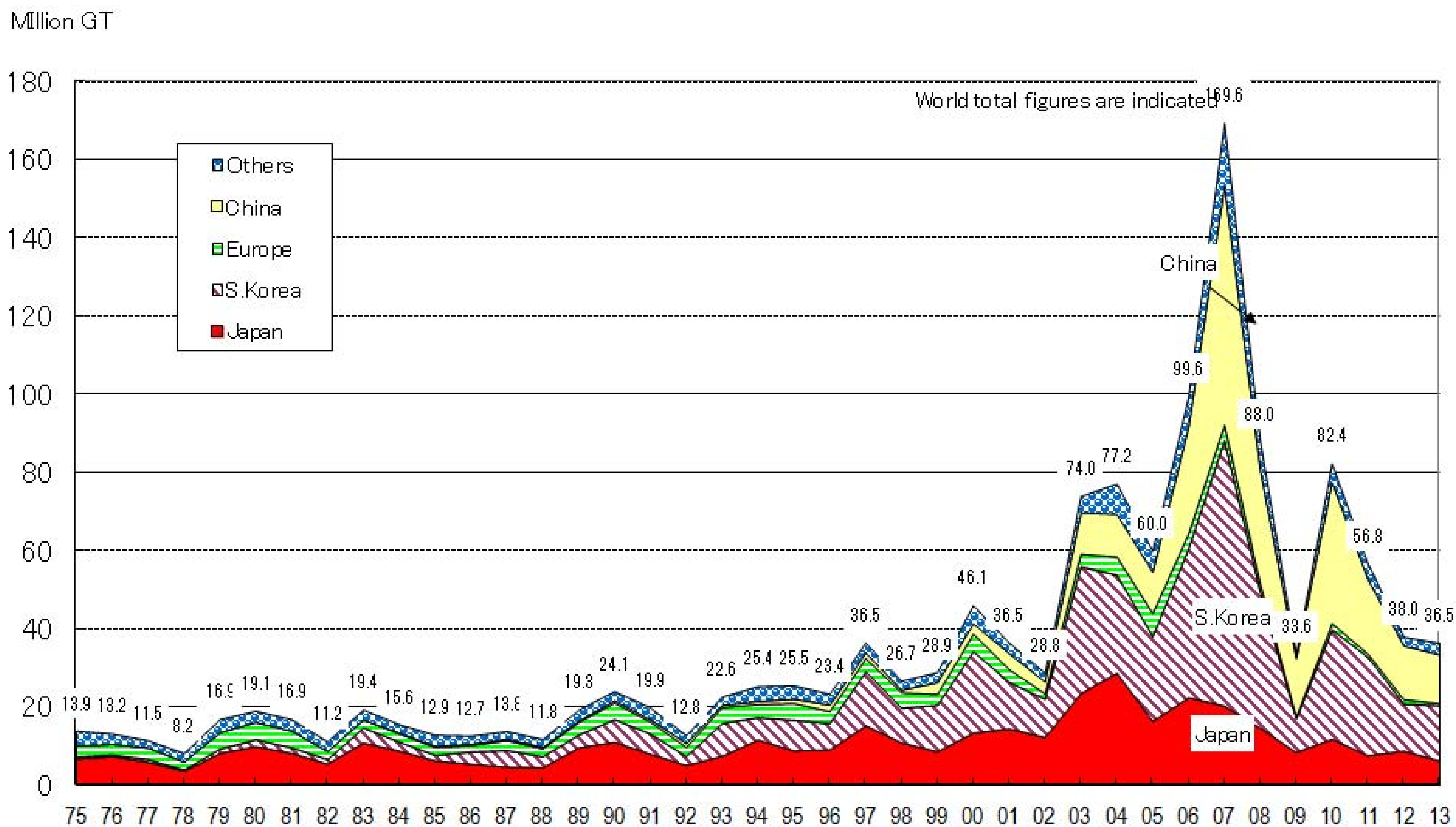
Assistant General Secretary

Akira YAKUSUE

Japan Federation of Basic Industry Workers' Unions (KIKAN-ROREN)

1. Shipbuilding Industry Overview

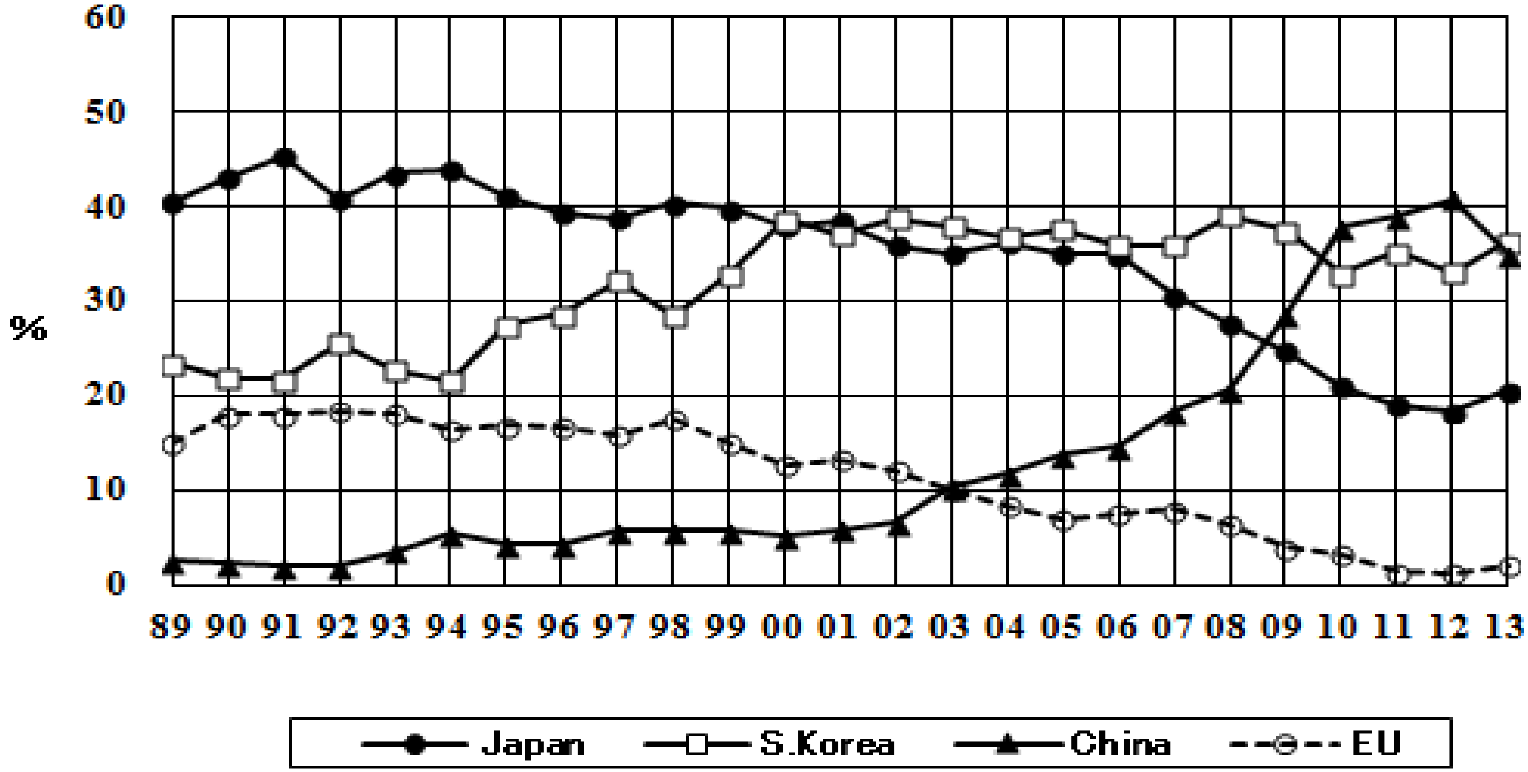
Fig1.WORLD NEW ORDERS



1975~2013 1st Half

Source：The shipbuilders' association of Japan (SAJ)

Fig2.SHARE OF WORLD COMPLETIONS

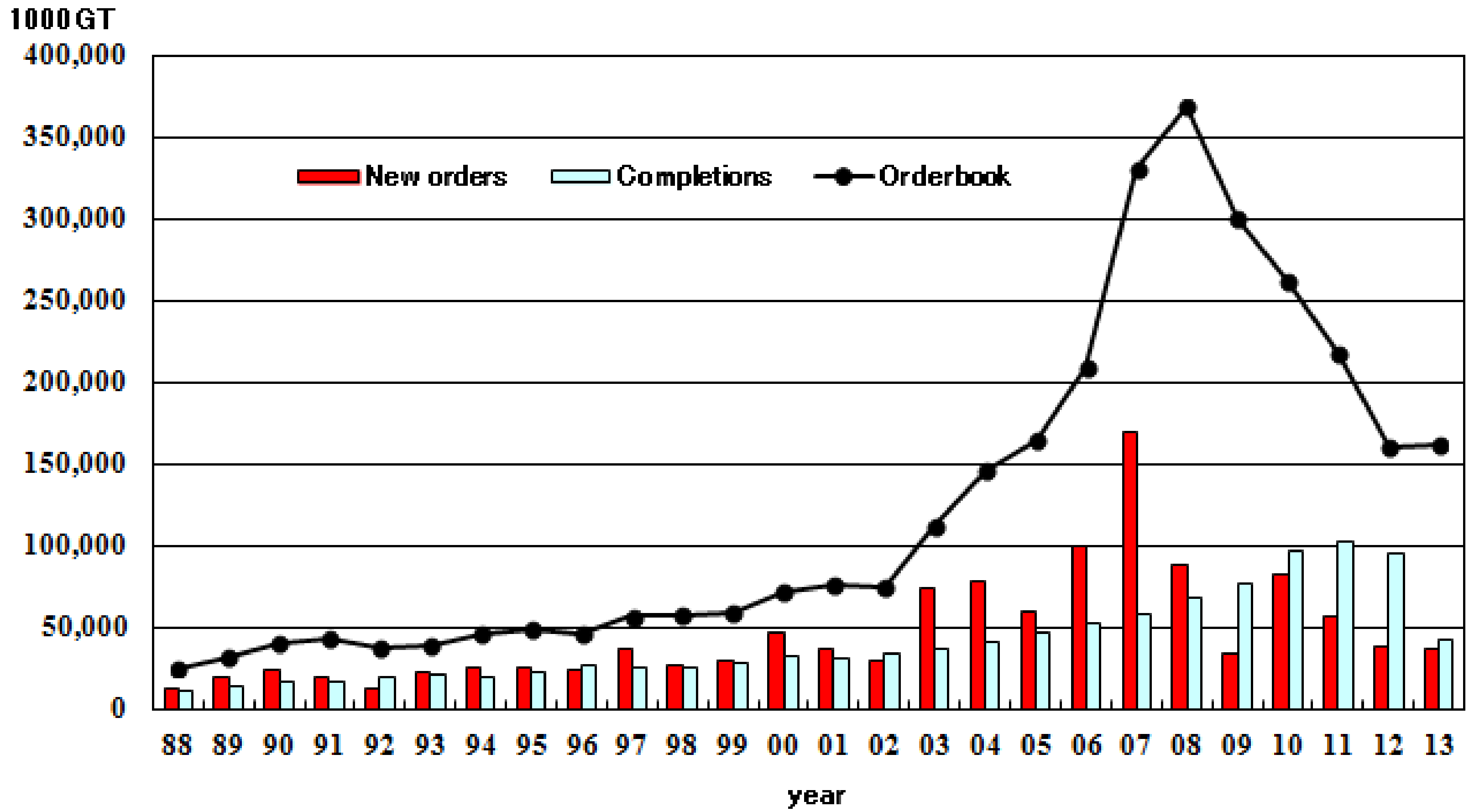


(%)

年	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013.1-6
Japan	38.4	35.8	35.1	36.1	35.0	34.9	30.6	27.6	24.6	21.0	19.0	18.2	20.6
S.Korea	37.1	38.8	37.9	36.8	37.7	35.9	35.9	39.0	37.4	32.9	35.2	33.0	36.4
China	5.8	6.6	10.4	11.6	13.8	14.7	18.4	20.6	28.5	37.8	38.9	40.8	35.0
EU	13.2	12.1	10.2	8.3	6.9	7.6	7.9	6.3	3.9	3.2	1.3	1.3	2.0
Other	5.5	6.6	6.4	7.2	6.7	6.9	7.2	6.5	5.5	5.1	5.6	6.6	6.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source : The shipbuilders' association of Japan (SAJ)

Fig3. NEW ORDERS,COMPLETIONS,ORDERBOOK



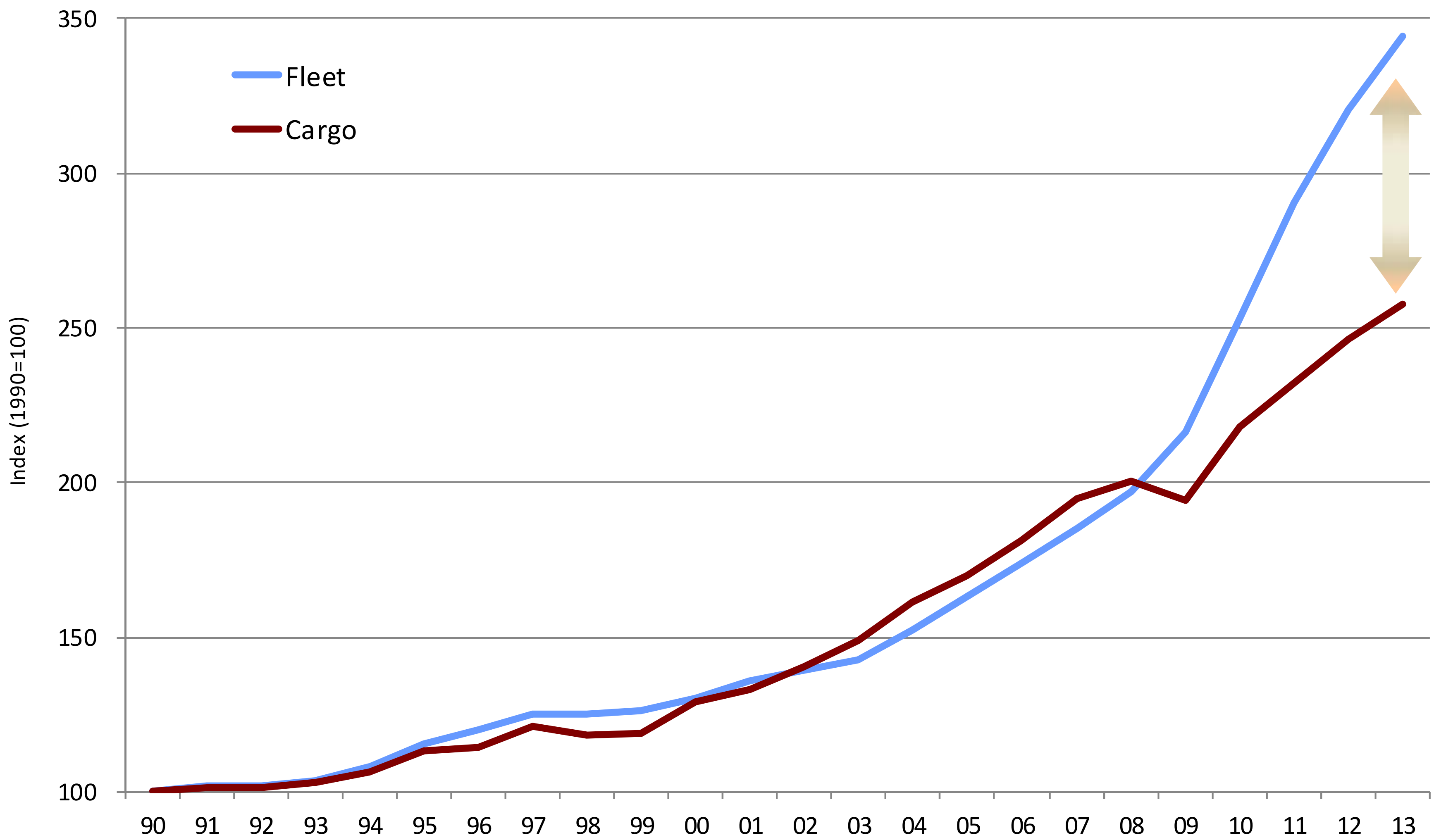
(1000 GT)

年	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013.1-6
New orders	36,499	28,800	74,000	77,200	60,000	99,600	169,600	88,000	33,600	82,400	56,800	38,000	36,453
Completions	31,292	33,383	36,131	40,171	46,970	52,118	57,320	67,690	77,073	96,433	101,845	95,575	41,566
Orderbook	75,786	74,924	112,192	146,213	164,022	208,875	329,732	368,070	300,511	261,016	216,967	160,368	161,243

* Orderbook is at the year end

Source：The shipbuilders' association of Japan (SAJ)

Fig4. WORLD BULK CARRIER AND SEABORNE TRADE
バルカー船腹量と海上荷動量の推移（指数）



Source：The shipbuilders' association of Japan (SAJ)

Fig5. COMPARISON OF GROWTH RATE

	2008	2012	2012/2008 %
Seaborne trade	8,318 million ton	9,468 million ton	114%
Shipping tonnage	831 million GT	1,081 million GT	130%
Shipbuilding capacity	68 million GT	102 million GT	150%

* Shipping tonnage = year end

* Shipbuilding capacity = 2011

Source : The shipbuilders' association of Japan (SAJ)

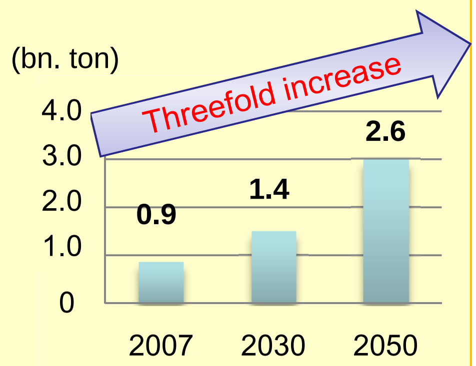
2. Japan’s Shipbuilding Technology

① Green Shipping

CO_2 Emissions Reduction Effort in IMO

Overall snapshot of various bodies in relation to CO_2 emissions reductions from international shipping

CO2 emissions from international shipping



In August 2012, Japan, the US and the EC started informal meetings in IMO on introduction of MRV.

INTERNATIONAL MARITIME ORGANIZATION

1st Policy Package

MARPOL Annex VI amendments

(Entered into force on 1 January 2013)

Technical measure	**Operational measure**
EEDI • CO2 emissions standards required on newly-built ships • Baseline will be lowered in a phased way	**SEEMP** • Develop SEEMP for a ship and a company • Monitor EEOI (Energy Efficiency Operational Indicator)

Intermediate Package

Data collection / MRV (Monitoring, Reporting and Verification)

(Discussion will start in MEPC66)

Proposals

- **Japan : fuel consumption / distance sailed / cargo volume**
- the US : energy (joule) / service hour
- EMSA : fuel consumption / distance sailed
- Germany : fuel consumption

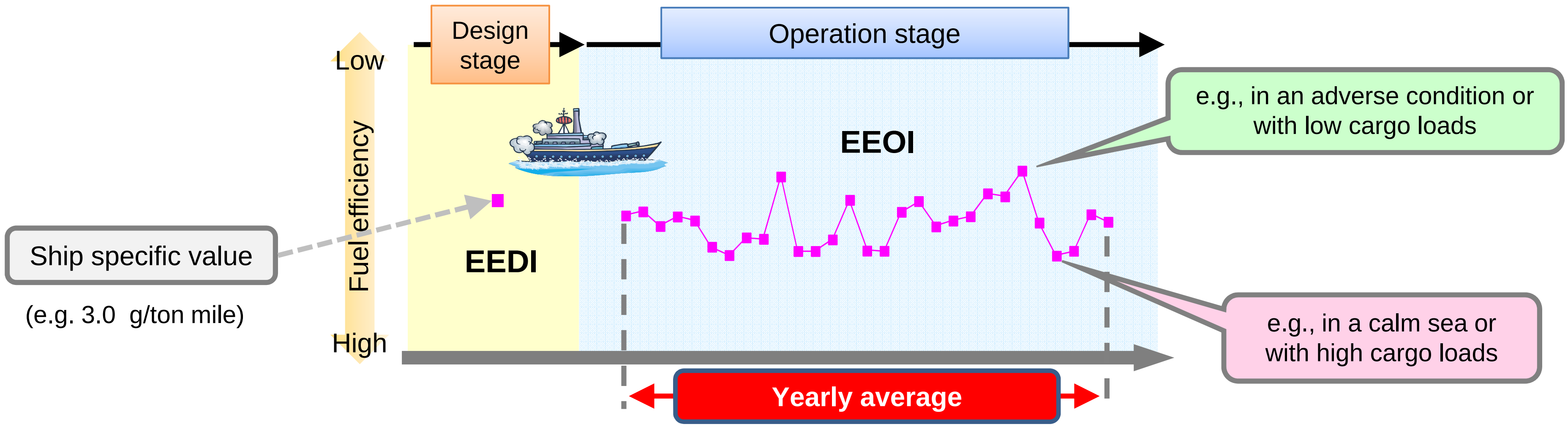
2nd Policy Package

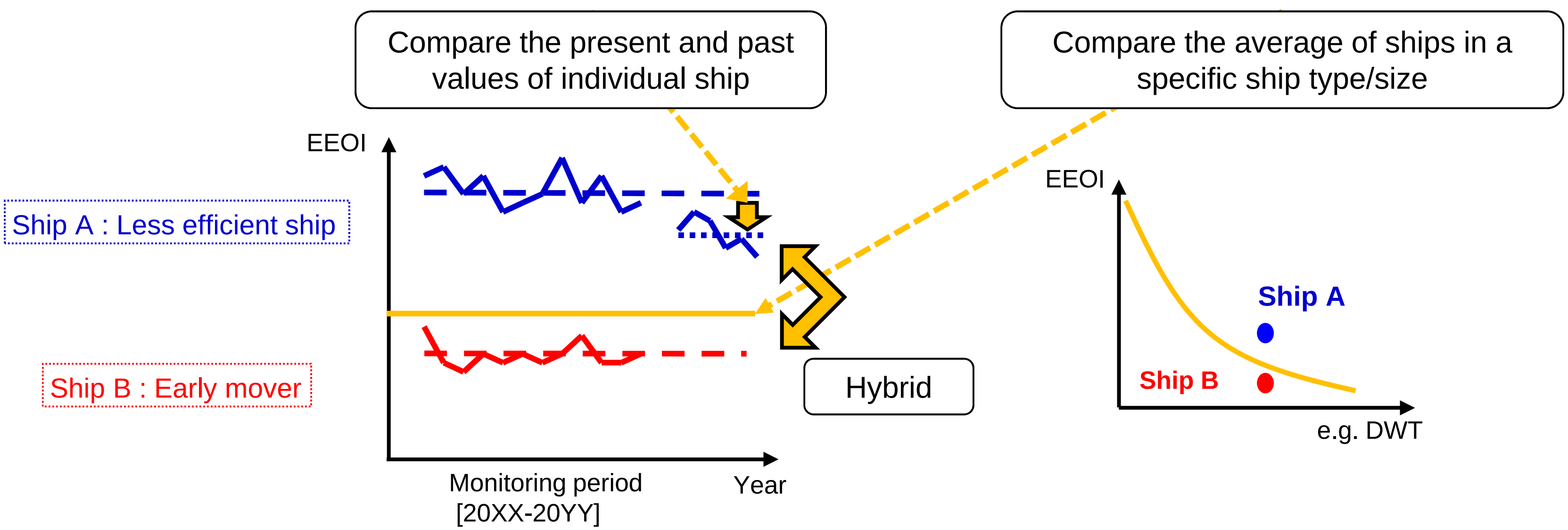
MBM (Market-Based Measures)

- Emission Trading System
- Fuel levy
- Variation in fuel levy (e.g., Japan's proposal)

Japan's Proposal for Data Collection / MRV

Index: **Annual EEOI** (g/ton mile) = Yearly average of $\frac{\text{fuel consumption} \times CO_2 \text{ conversion factor}}{\text{distance sailed} \times \text{cargo volume}}$





Outline of EU Regional Regulation on GHG Emissions from Shipping

◆At the end of 2011, EC started to consider regional regulations specific for shipping sector (e.g., levy, ETS and other economic measures), claiming insufficiency of IMO's regulation on fuel consumption enforced in 2013.

◆In January to April, 2012, EC conducted public consultation to invite opinions from inside and outside EU countries.

Japan's responses

➢ Clarified to EU that measures against GHG emissions from shipping sector should be considered within IMO since global action is necessary to address the problem.

1. Responded to the public consultation.
2. Sent joint letter with Australia, the Bahamas, Canada, Panama, Singapore, and the US.

◆In October 2012, EC's DG CLIMA and MOVE issued the joint statement announcing that they started to consider introduction of MRV (Monitoring, Reporting and Verification) system based on fuel consumption within EU.

◆In November 2012, the DGs replied to our joint letter. It stated that possible introduction of MRV within EU as well as EU countries' willingness to work on establishment of a global framework.

◆In the summer of 2012, Multilateral deliberation on actual fuel consumption-based MRV system started under leadership of DG MOVE as a prior stage of introduction of economic approach by IMO.

◆In February 2013, at meetings between EC and Japan, DG CLIMA indicated that they had considered cargo volume and distance sailed as well as fuel consumption as possible indices for EU MRV.

◆In June 2013, EC submitted proposed regulation of EU MRV to EU Council and Parliament. EC's impact assessment estimated that the regulation would reduce emissions by 2 % compared with BAU in 2030.

Japan's responses

➢ Continue to encourage EC to work on discussion in IMO, not on regional regulation.

➢ Work on discussion on MRV in IMO and advocate that IMO's MRV should be based on energy efficiency which takes account of cargo volume and distance sailed in addition to fuel consumption.

② Clean Energy

- Green Shipping

- Renewable Energy Generation in Japan

MV SOYO, Energy-efficient Bulk Carrier

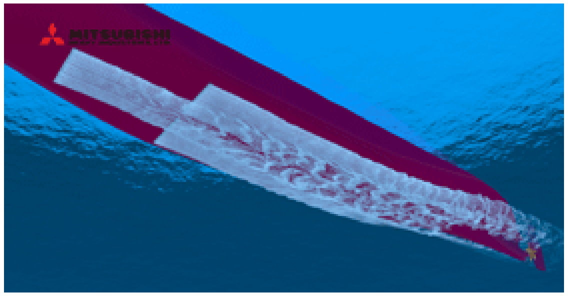
- Innovative air-lubrication system reduces friction between the vessel's bottom and the seawater and contributes to energy efficiency improvement.
- The system utilizes some of the main engine's scavenging air (combustion air) from the engine's turbocharger to lead it into the underwater from the vessel's bottom.
- The ship boasts CO_2 emissions reduction of 4 % with a large draft and 8 % with a small draft.
- The ship was honored "2012 Ship of the Year" by the Japan Society of Naval Architects and Ocean Engineers (JASNAOE), thanks to its advanced technology, well design, and social consciousness.

General characteristics

- Tonnage: 50,872 tons
- Capacity: 91,443 DWT
- Length: 235 m

Eco-friendly Ships

- Mitsubishi Heavy Industries' air-lubrication technique, MALS (Mitsubishi Air Lubrication System), was first installed on the coastal ferry in 2012, achieving over 5% of fuel saving.



MALS

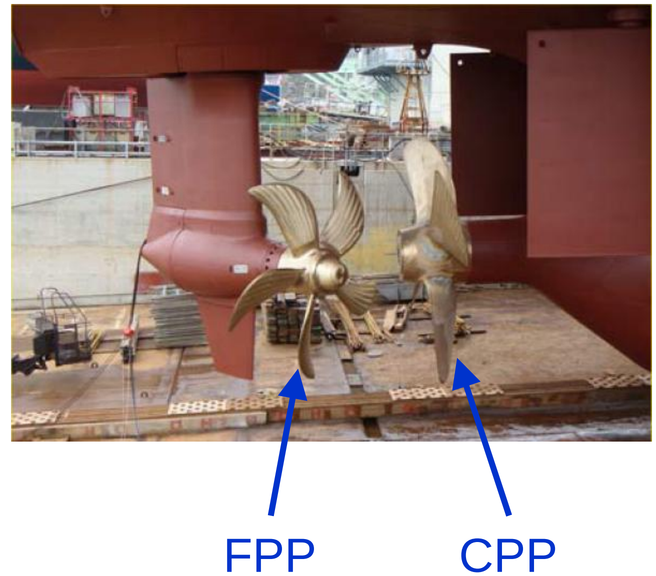
Ferry NAMINOUE
- Tonnage: 8,072 tons
- Length: 145 m

- MALS will be installed on a cruise ship as well, which is now being constructed by Mitsubishi Heavy Industries.
- The system on the cruise ship will improve fuel efficiency by 7%.
- The cruise ship is planned to be delivered to German cruise line AIDA Cruises in March 2015.

General characteristics
- Tonnage: 125,000 tons
- Capacity: 3,250 people

MV KOZAN-MARU, Energy-efficient coastal cement carrier

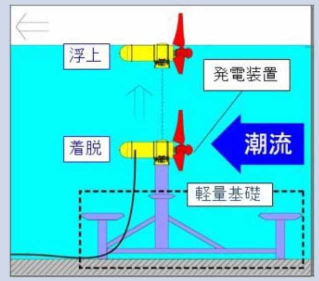
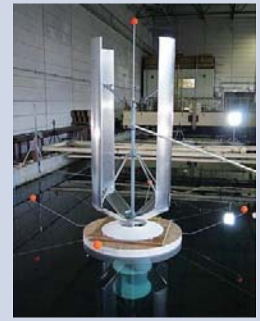
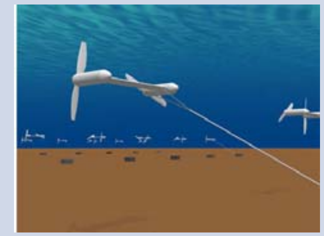
- The ship is equipped with tandem hybrid propulsion system.
- The system combines a controllable pitch propeller (CPP) and a azimuth fixed pitch propeller (FPP).
- The CPP is driven by a diesel engine while the FPP is driven by a motor.
- It achieves fuel saving by 5-20%.



General characteristics

- Tonnage: 14,902 tons
- Capacity: 22,053 DWT
- Length: 161m

Offshore Power Generation Methods

	Wave power	Wave power (gyrocompass)	Tidal current power	Hybrid (wind and tidal power)	Ocean current power
Figure					
Operator	• MES • Tokyo University	• Hitachi Zosen • Gyrodynamics	• KHI • Okinawa Electric Power • Okinawa New Energy Development	• MODEC	• IHI • Toshiba • Mitsui Global Strategic Studies Institute • Tokyo University
Location	Offshore Kouzu Island, Tokyo	Offshore Minami-Izu, Shizuoka	Offshore Tarama Island, Okinawa	Offshore Kabe Island, Saga	TBD
Generation Capacity	80 kW	100 kW	250 kW	500 kW (wind) 50 kW (tide)	2.2 kW
Specs	Diameter: 10m Length: 30m Water depth: 50-100m	Float: 15m * 9m * 1m Diameter (gyrocompass): 1.2m Water depth: 20-100m	Diameter: 18m Length (nacelle): 18m Weight: 350t Water depth: 30-50m	Diameter (rotor): 15m Length (rotor): 20m Diameter (float): 25m Length (float): 7m Water depth: 18m-	Diameter(Blades)：1-1.5m Length(Body)：1.5m×0.3m Weight(Sinker)：4t Length(mooring)：500m Water depth：50m

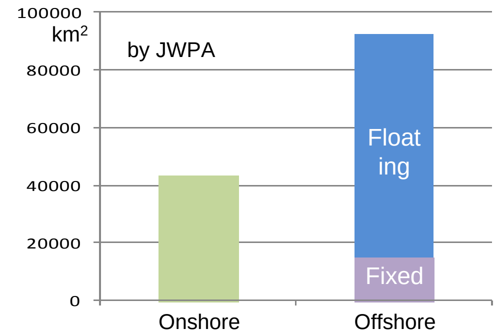
Toward Promotion of Floating Offshore Wind Turbine

Background

- Japan is promoting wind turbines as a promising renewable energy based on New Growth Strategy, Energy Basic Plan, etc.
- Because of limited national land and shallow sea area,

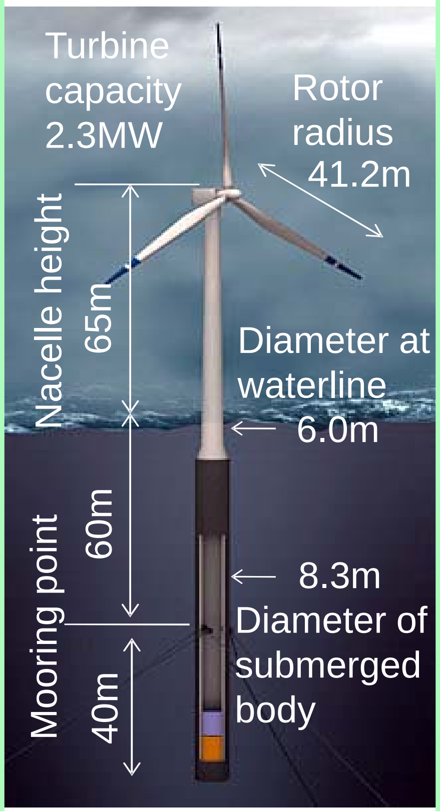
Floating Offshore Wind Turbine (FOWT) is necessary in Japan.

- After the Great East Japan Earthquake, renewable energy, i.e. solar power, wind power, etc., is expected to grow further.



Potential area for wind turbine

Example of FOWT (Hywind)

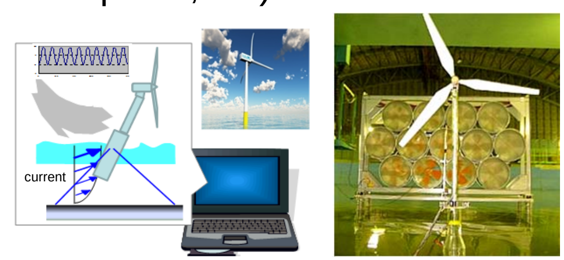


Technical research on floating structures and anchorage

Followings are examined in consideration of geotechnical, meteorological and hydrographic conditions in Japan (e.g. typhoon, earthquake, etc).

✓ Safety of FOWT itself
(structural integrity and stability of FOWT itself, etc)

✓ Safety in cases of wind farm with many FOWT
(possible interference of mooring of many units, etc)



✓ Emergency preparedness and response
(Assessment of the behavior in case of a ship collision, cut of mooring lines and drifting, etc)

Established “Standards for Safety of FOWT” (23/04/2012)

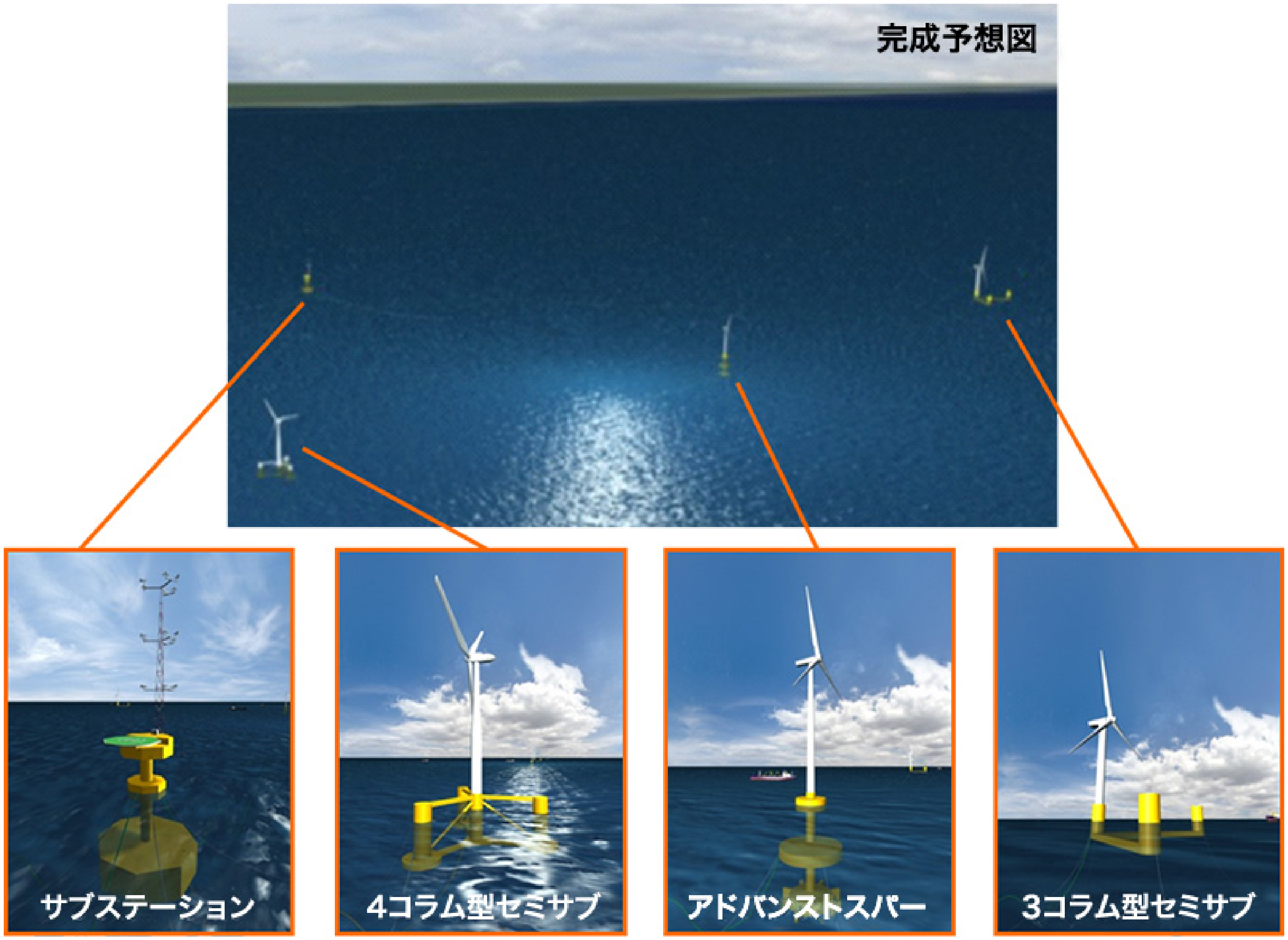
Develop “Guideline for Safety of FOWT”

Lead international standardization

Support practical use of FOWT with METI and MOE

Promote FOWT &
Strengthen international competitiveness of relevant industries

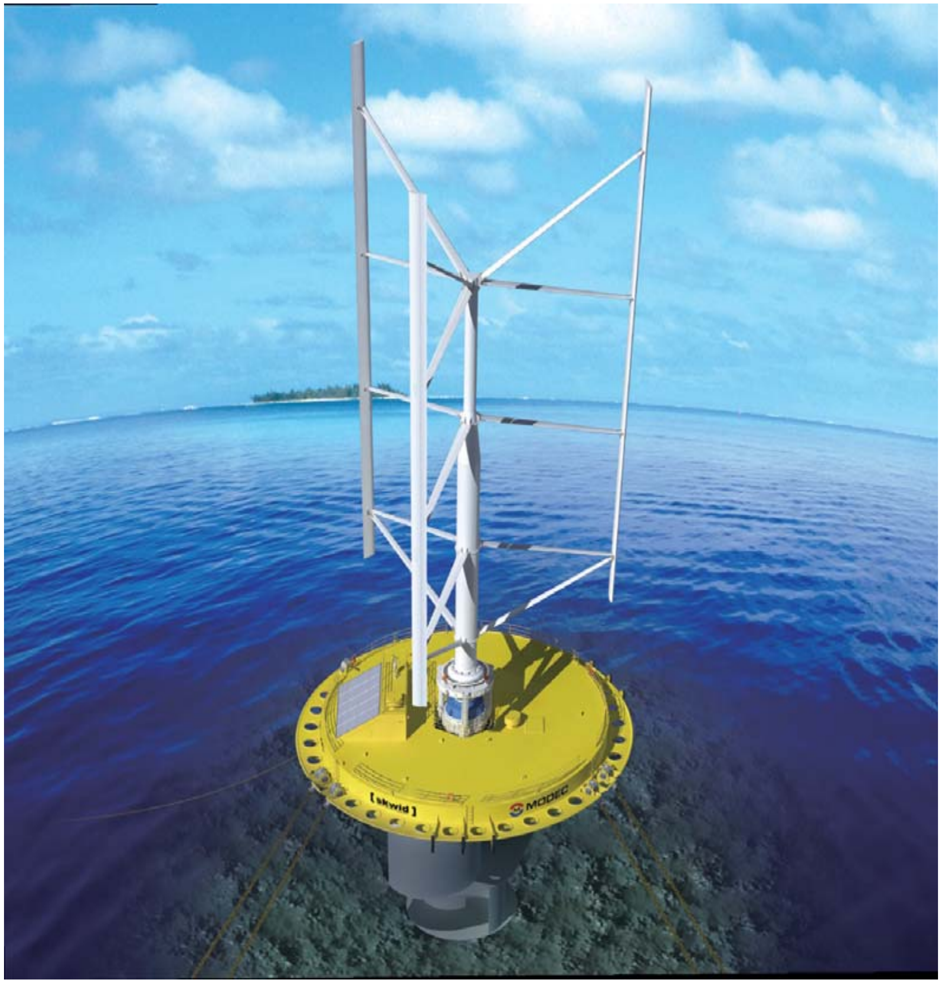
Project in Japan (1): Fukushima Floating Offshore Wind Farm



Substation | 4-column semi-submersible | Advanced spar | 3-column semi-submersible

METI (Ministry of Economy, Trade and Industry) is conducting a practical operation test during 2013-2015, by setting afloat three offshore wind turbines (2 MW * 1, 7MW * 2) and a transformer station off Fukushima, Japan. JMU, MES and MHI are the constructors off the floating structures.

Project in Japan (2): Floating Wind & Current Hybrid Power Generation by MODEC



MODEC **[skwíd]**
(Savonius Keel & Wind Turbine Darrieus)

- World's first hybrid turbine capable of hybrid generation from both wind and current energy.

- Savonius keel is driven by the ocean current while Darrieus wind turbine is revolved by the wind.

- Generation capacity:
  - 500 KW (wind turbine)
  - 50 KW (tidal turbine)

- Especially suitable for installation near isolated islands as an emergency power source as well as a broad range of other applications.

Thank you for your attention