



Outlook for Offshore Wind development in Japan



October 26th 2021

Japan Wind Power Association (JWPA)

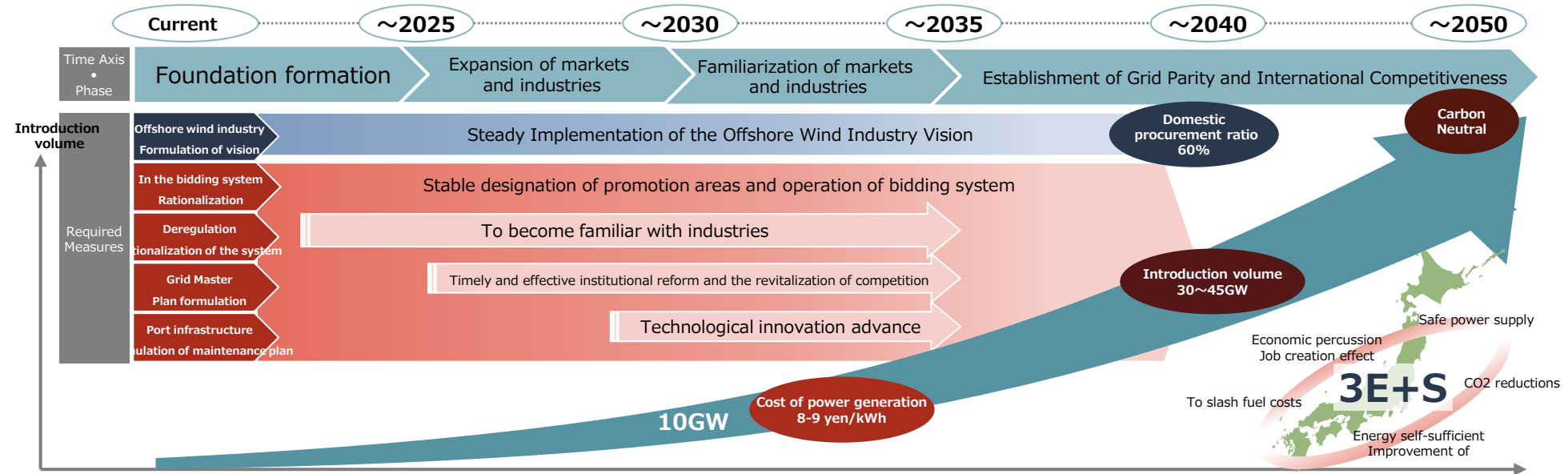
Jin Kato

President

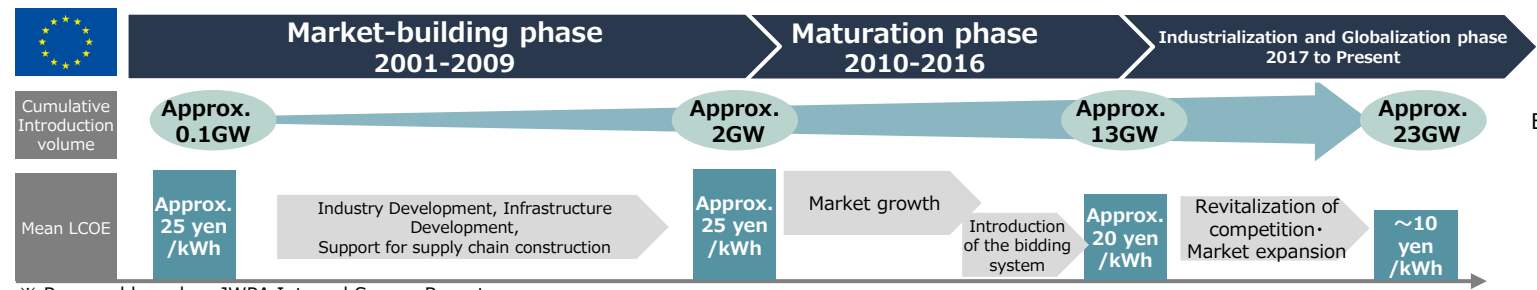
Path toward the transition to offshore wind power as a mainstay power source



- It is extremely important to implement necessary measures in an appropriate order and in a timely manner in order to achieve both cost reduction and domestic industry development, and to achieve the introduction targets.
- It aims to form the foundation of the industry in the next 10 years, foster domestic industries with international competitiveness early after 2030, and realize three targets (introduction quantity, cost, and domestic procurement ratio).**



Comparison * with the European History

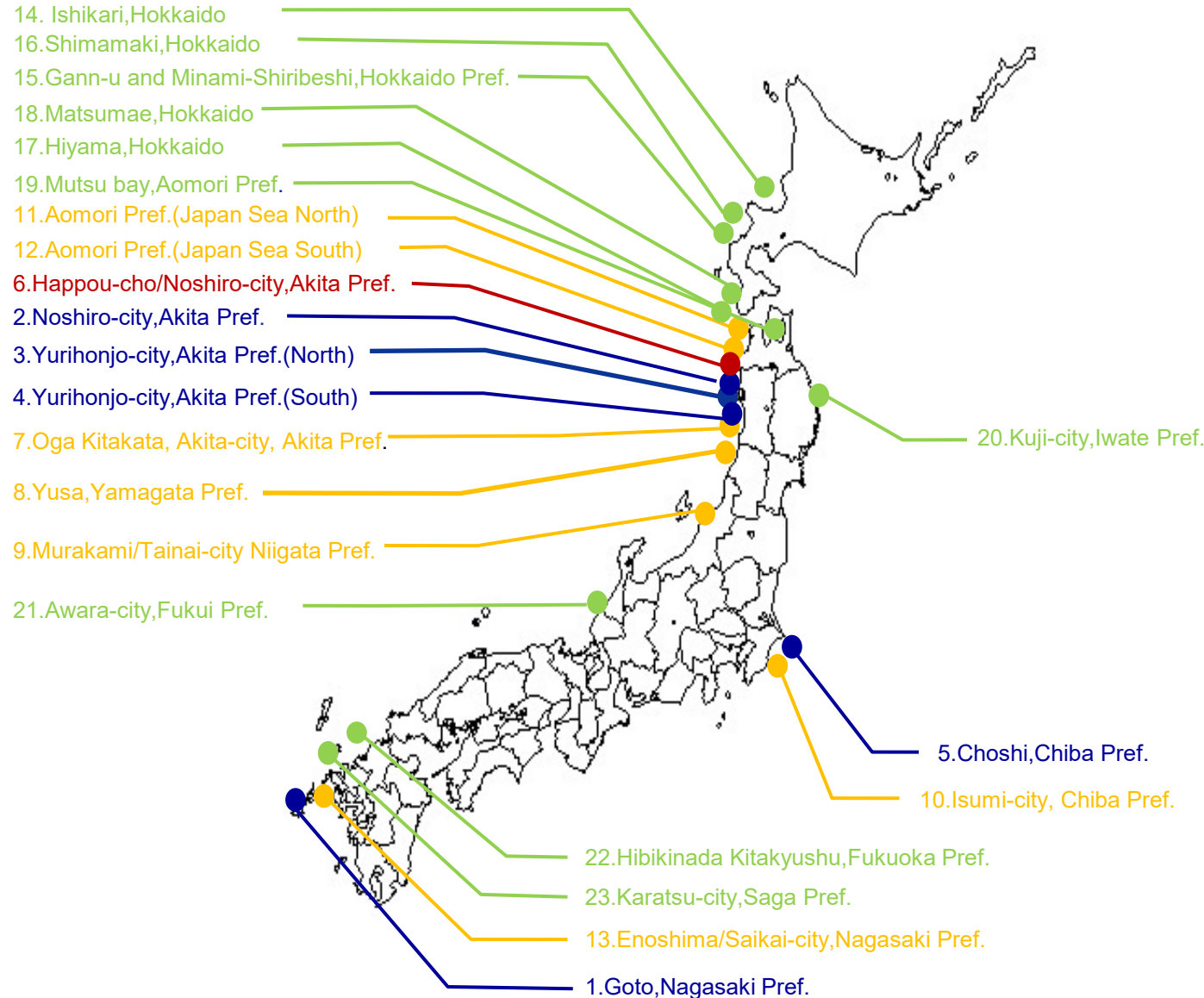


Europe spent 20 years to build a supply chain and timely implement measures such as bidding system and industrial vision to achieve grid parity.

* Prepared based on JWPA Internal Survey Report

Present Status of Designation of Sea Areas

(12 Sea Areas were newly designated this year)



Auction already launched

1. Goto, Nagasaki Pref.
2. Noshiro-city, Akita Pref.
3. Yurihonjo-city, Akita Pref. (North)
4. Yurihonjo-city, Akita Pref. (South)
5. Choshi-city, Chiba Pref.

Promoting Area

6. Happou-cho/Noshiro-city, Akita Pref.

Promising Area

7. Oga Kitakata, Akita-city, Akita Pref.
8. Yusa, Yamagata Pref.
9. Murakami&Tainai-city Niigata Pref.
10. Isumi-city, Chiba Pref.
11. Aomori Pref. (Japan Sea North)
12. Aomori Pref. (Japan Sea South)
13. Enoshima/Saikai-city, Nagasaki Pref.

Upcoming Area (In preparation)

14. Ishikari, Hokkaido
15. Gann-u and Minami-Shiribeshi, Hokkaido
16. Shimamaki, Hokkaido
17. Hiyama, Hokkaido
18. Matsumae, Hokkaido
19. Mutsu bay, Aomori Pref.
20. Kuji-city, Iwate Pref.
21. Awara-city, Fukui Pref.
22. Hibikinada Kitakyushu, Fukuoka Pref.
23. Karatsu-city, Saga Pref.

Japan Version Centralized Bidding system



- GOJ※ will introduce a **GOJ-led push-type project scheme (Japan version centralized model)**. in order to accelerate project development by developers, and has just launched **Demonstration Projects**. * GOJ : Government of Japan
- Under new scheme, GOJ is expected to be involved in projects from an early stage, and to **more quickly and efficiently conduct wind condition and other surveys and secure power grids in a timely manner.**

Current Development Scheme

▪ Developers conducts various surveys (wind conditions, geological conditions etc.), secures grid connections, EIA and local social acceptance etc.
⇒ Inefficiency as a result of overlap works by developers
▪ Local government provide GOJ with information on local maturity such as situation of social acceptance etc.

Promising Areas

GOJ conducts relatively simple surveys of wind conditions and geological conditions and establish councils for regional coordination.

Promotion Area

Selection of Developer through public competitive tender for 30 years sea-area occupancy permit.

New Scheme (Centralized Model)

Establishment of **GOJ-led centralized model through demonstration projects**

Accelerating the **timing of start of surveys**

Operational Improvements will be made on relevant Act for accelerating project implementation **such as new scheme for temporary securement of grid connection right by GOJ** on behalf of developers etc.

Outline of Demonstration Projects

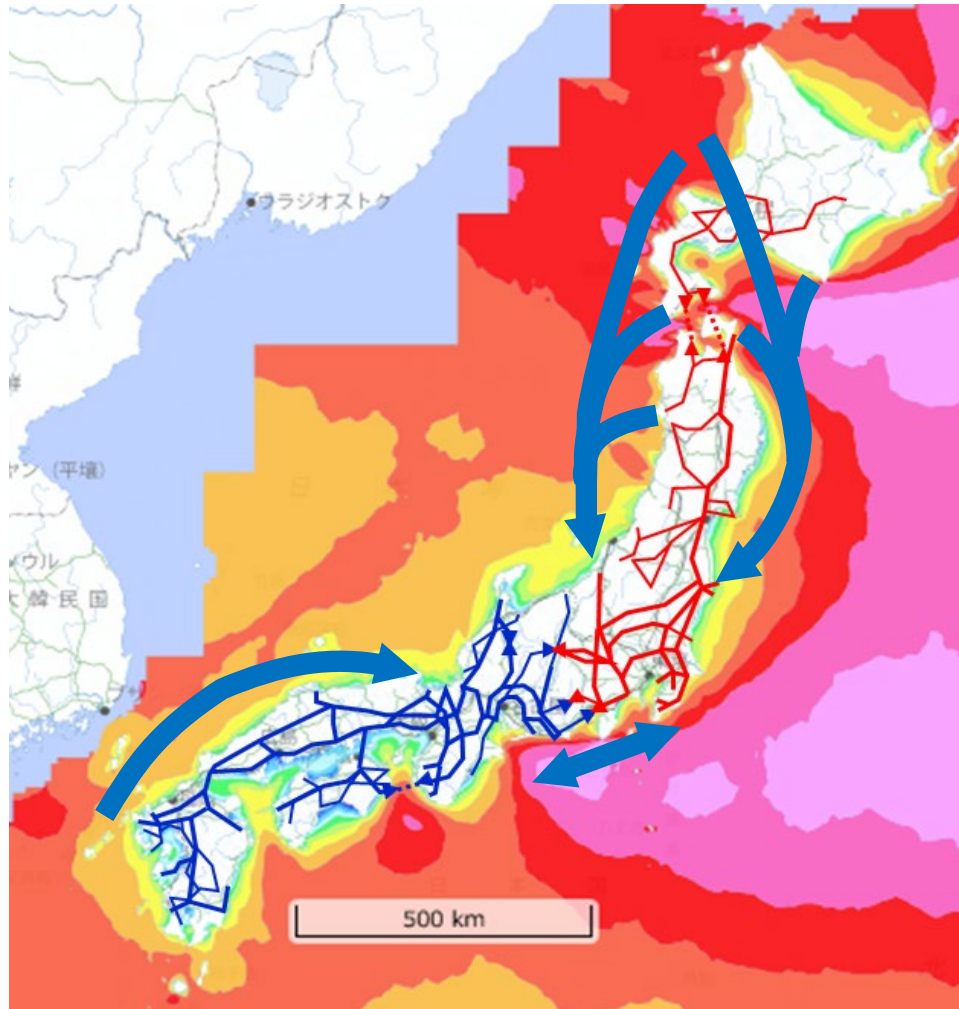
(3 sea-areas nominated for Demonstration Project)



Image of Japan Super Grid (HVDC)



Large-scale power supply
= Wide area consumption



Dam



Nuclear power



Offshore wind power



- Quick construction by using submarine cables
- Ideal for long distances with fewer losses due to DC power transmission
- Enable integrated operation of grids nationwide

* Overview of the main power system (275 kV or more) overlaid on the NEDO offshore wind condition map (http://app10.infoc.nedo.go.jp/Nedo_Webgis/index.html)

Overview of 1st Draft of Master Plan [updated]

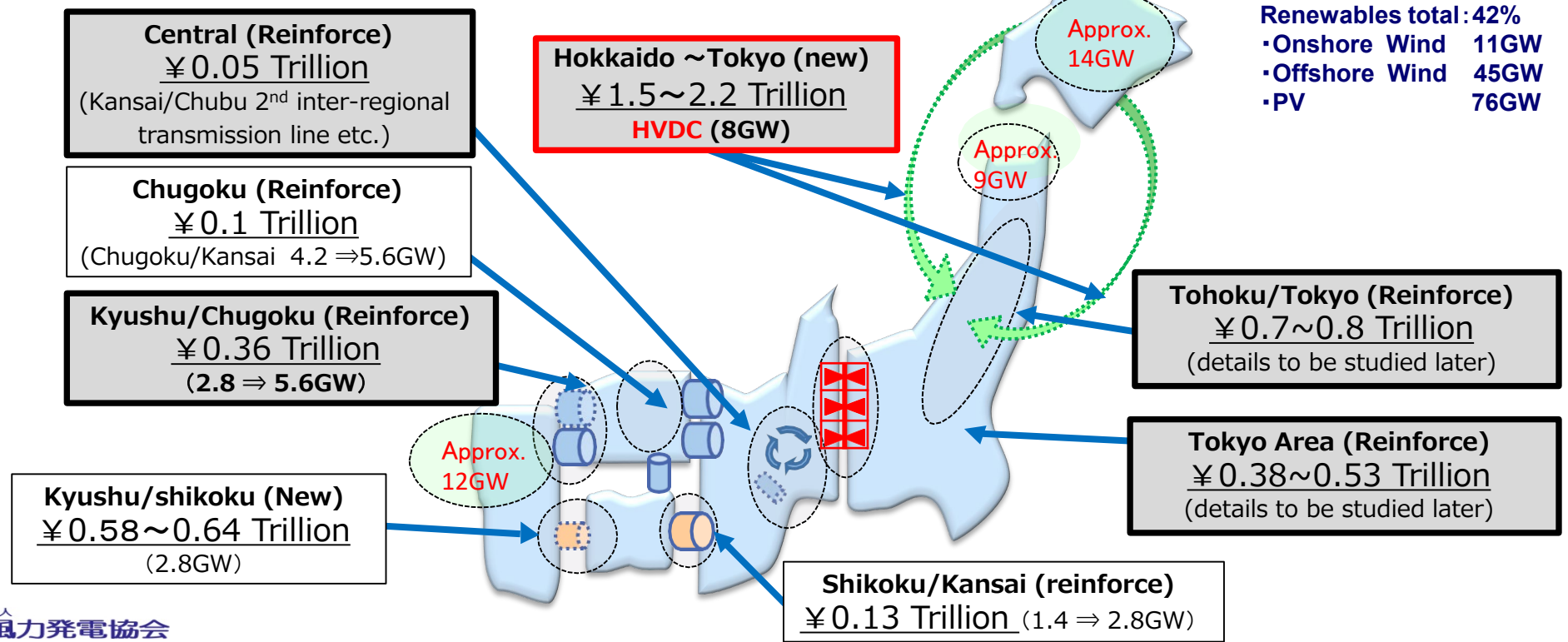
(May 20, 2021 by OCCTO)



- **50Hz area (eastern Japan):** Expecting **23GW of Offshore in Hokkaido+Tohoku.**
HVDC is preferable because of its **better economy and stability of grids.**
- **60Hz area (western Japan):** Capacity of Inter-regional **transmission lines to be doubled.**
- The **plans indicated with thick lines** are **commonly recommended in different scenarios** and detail studies are expected to be started **with high priority.** All cases of B/C is confirmed as ≥ 1 .

Scenario : Offshore wind (45GW)
 * Potential is unevenly located in windy areas such as Hokkaido, Tohoku, Kyushu.

Expected Total Investment : ¥3.8 ~ 4.8 Trillion



Establishment of port infrastructure

- Base port construction is underway at four locations throughout Japan to strengthen Quay's bearing capacity necessary for handling of large wind turbines.
(Akita Port is scheduled to be completed before end of current fiscal year : Mar./2022)
- Reviewing future base ports reinforcement, keeping pace with Power grid development and Designation of promotion zones, as well as trend toward larger wind turbines.

○Noshiro port

【Business overview】

- Constructed facilities: Quaywall (Water depth 10m (Preliminary)), (Strengthening of soil bearing capacity), mooring (Water depth 10m (Preliminary))
- Project duration: 2019-2023 (Fiscal year)



○Akita port

【Business overview】

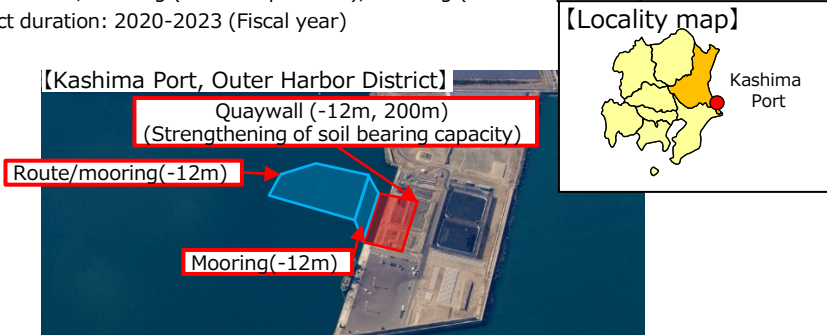
- Constructed facilities: Quaywall (Strengthening of soil bearing capacity)
- Project duration: 2019-2020 (Fiscal year)



○Kashima port

【Business overview】

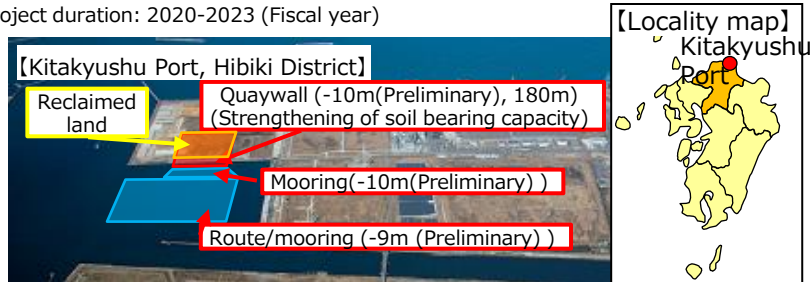
- Constructed facilities: Quaywall (Water depth 12m), (Strengthening of soil bearing capacity), Route/mooring (Water depth 12m), mooring (Water depth 12m)
- Project duration: 2020-2023 (Fiscal year)



○Kitakyushu port

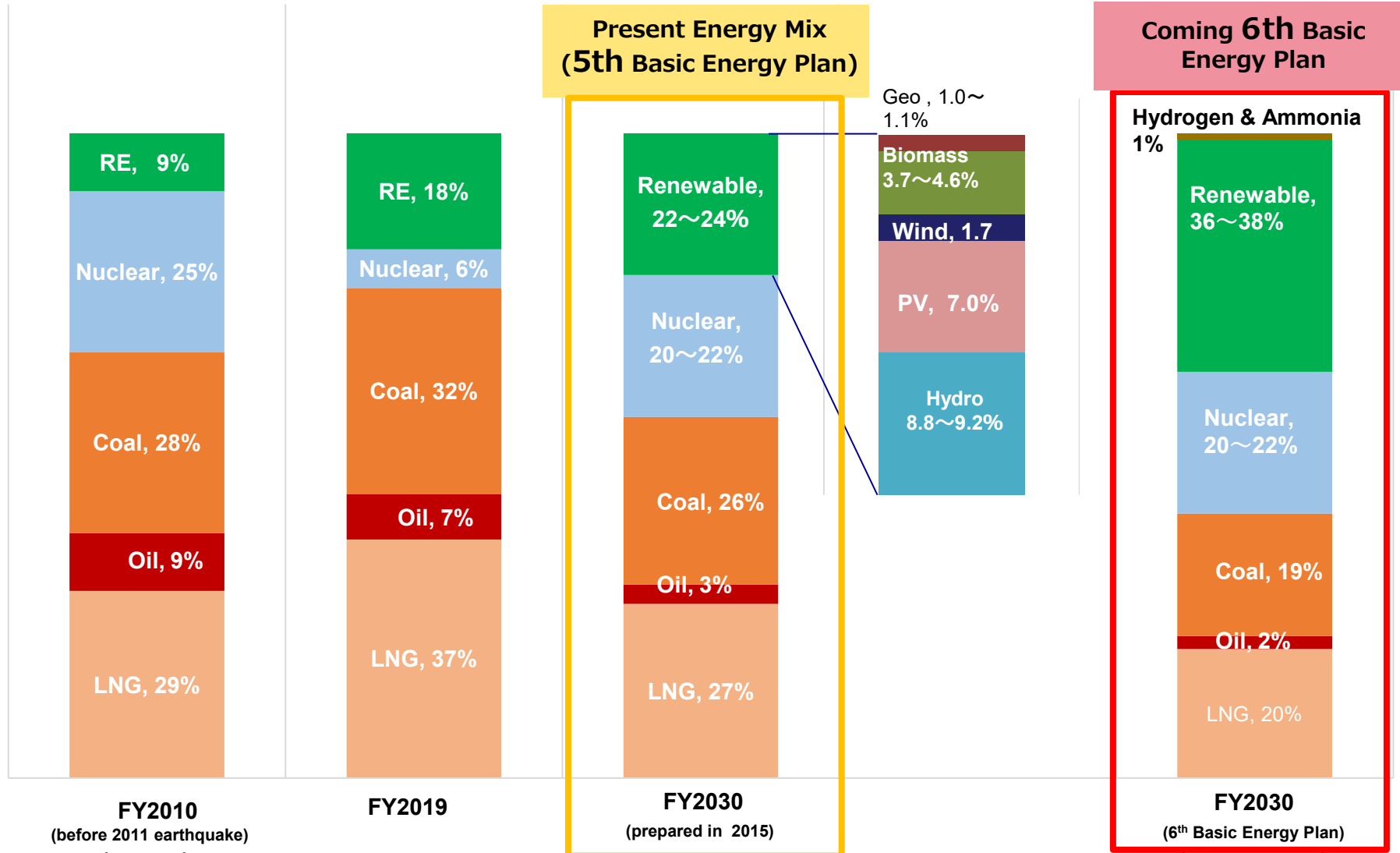
【Business overview】

- Constructed facilities: Quaywall(Water depth 10m(Preliminary)), (Strengthening of soil bearing capacity), mooring(Water depth 10m(Preliminary)), Route/mooring (Water depth 9m (Preliminary)), reclaimed land
- Project duration: 2020-2023 (Fiscal year)



Present 5th Basic Energy Plan ⇒ Coming 6th Plan

(Japan's Energy Mix for the year 2030 is provided as hereunder)



Source: edited by JWPA based on the materials of METI Basic policy Subcommittee and METI Home Page on 6th Basic Energy Plan

Details of Renewable / 6th Basic Energy Plan

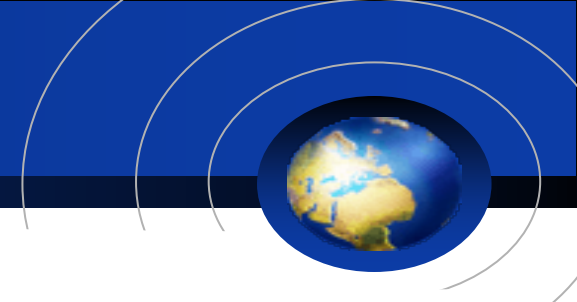


- * The share of Wind (on shore + offshore) accounts for about 5% of total electricity supply.
- * It is clearly written that the top priority is given to “maximizing the introduction of renewable energy.”

	Proposed 6 th Basic Energy Plan	Present 5 th Basic Energy Plan (prepared in 2015)
Photovoltaic	103.5 ~ 117.6GW (129~146GWh)	64GW (74.9GWh)
Wind (on shore)	17.9GW (34GWh)	9.2GW (16.1GWh)
Wind (offshore)	5.7GW (17GWh)	0.8GW (2.2GWh)
Geothermal	1.5GW (11GWh)	1.4~1.6GW (10.2~11.3GWh)
Hydropower	50.7GW (98GWh)	48.5~49.3GW (93.9~98.1GWh)
Biomass	8.0GW (47GWh)	6~7GW (39.4~49.0GWh)
Electric Power to be generated	336.0 ~ 353.0GWh	236.6~251.5GWh

Note: The figure for offshore wind (5.7GW) represents an expected installed capacity. Our target (10GW for 2030) is defined as auction awarded basis in the Vision for Offshore Wind Power Industry (1st).

Our next major challenges



1) Centralized Bidding

Establishment of Japan Version centralized auction system to materialize the fair and transparent bidding system asap.

2) Visualization of project pipeline

Acceleration of designating promotion areas are quite essential to make our goal (45GW) happen on schedule.

3) Nationwide integrated grid operation

Nationwide integrated grid operation is inevitable for further smooth introduction of renewable energy and avoiding unnecessary curtailment .

4) OCCTO (Organization for Cross-regional Coordination of Transmission)

Materialize construction of the 1st HVD(Hokkaido/Tokyo:2GW) is the top priority for further grid reinforcement under the Master Plan.



Thank you for your attention !