

Introduction of Japan's Offshore Wind Policy

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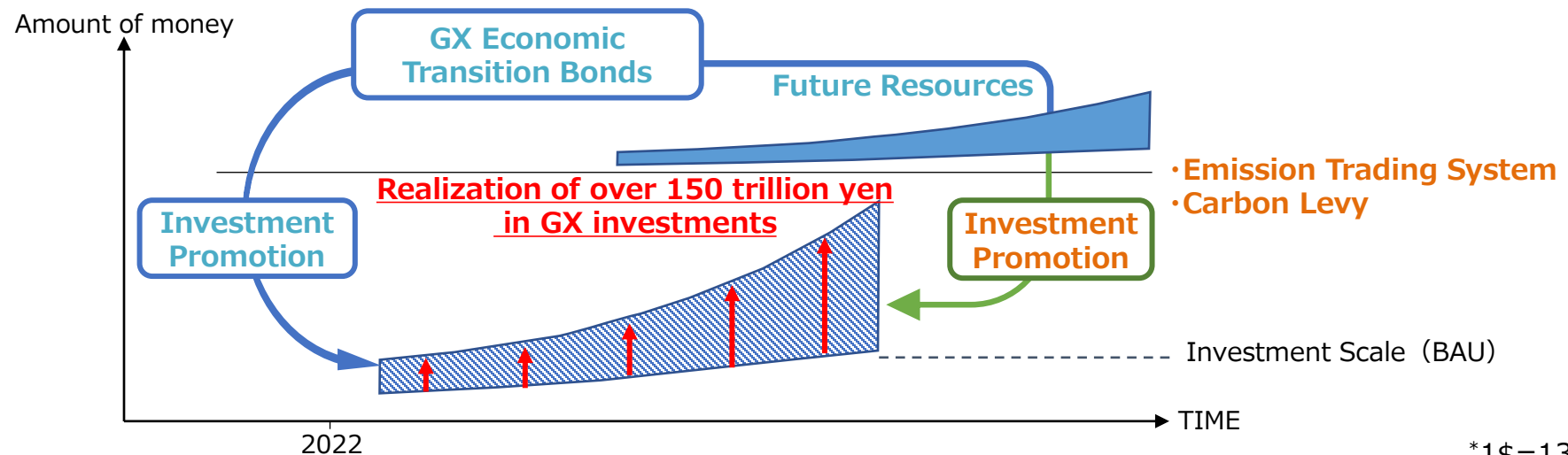
Basic Policy for Realization of Green Transformation (GX)

(Adopted at GX Implementation Council on Dec. 12)

Government support will be provided for **upfront investment of 20 trillion yen (= \$153.8 billions*)** (such as in **hydrogen/ammonia, renewable energy, and energy efficiency improvement**) with a view to achieving carbon neutrality by 2050, while strengthening industrial competitiveness and realizing economic growth, **aiming for more than 150 trillion yen (= \$1.2 trillions*)** of public and private investment over the next 10 years.

To promote the GX investment as described above, a **"Growth Oriented Carbon Pricing Concept"** is to be embodied and implemented as soon as possible.

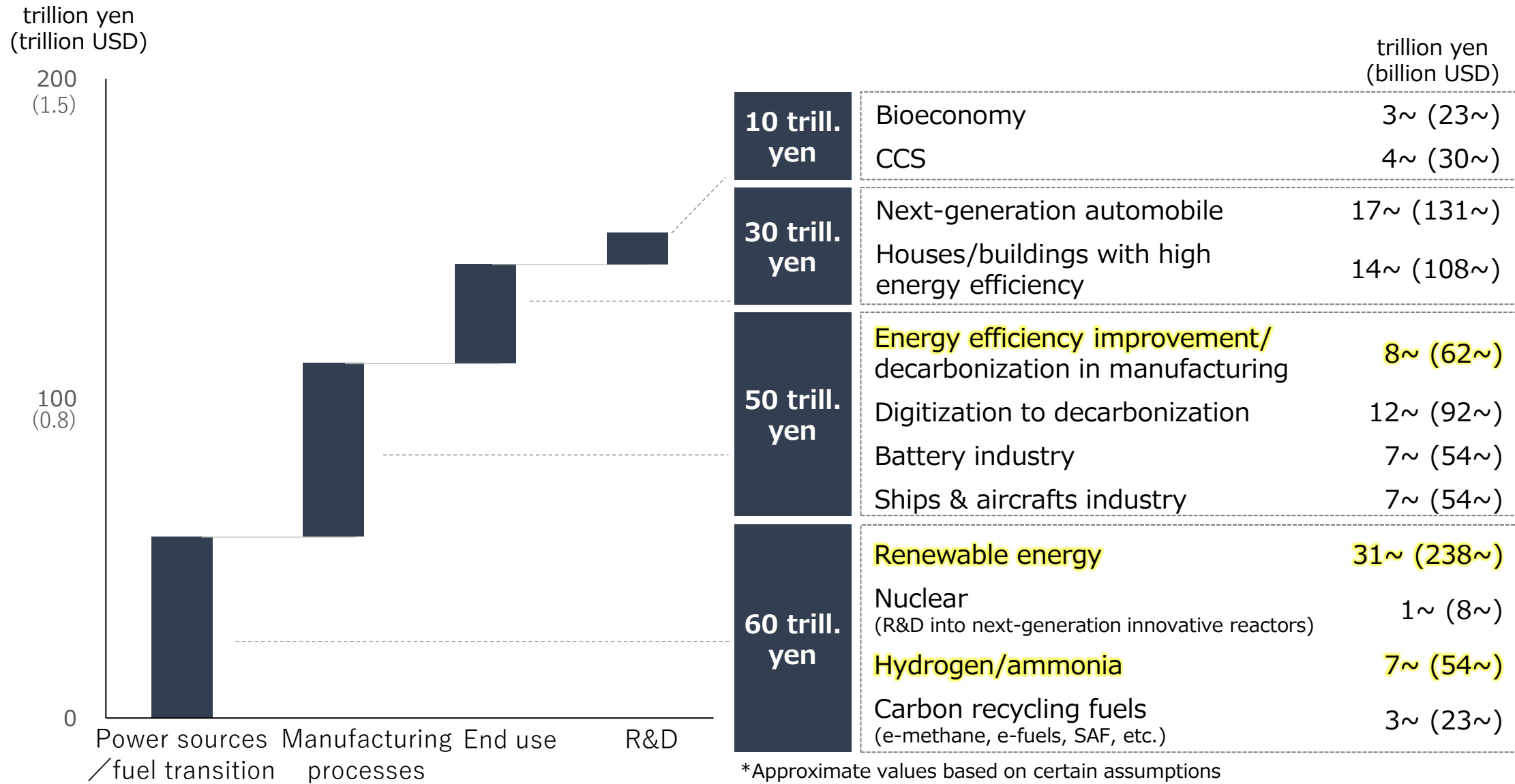
- ① **Government support for bold upfront investment** by issuing **"GX Economic Transition Bonds"** (20 trillion yen over the next 10 years)
- ② **Introduction of carbon pricing to give incentives for GX investment**
 - (1) Full-scale operation of **emissions trading system** in high emission industries [from FY2026].
+ Allowance auctioning is phased in gradually to **power generation companies** [from FY2033]
 - (2) Introduction of a **carbon levy** on fossil fuel importers [from FY2028]
- ③ Strengthen financial support through public-private partnership



*1\$=130yen

Image of public/private investment to realize Green Transformation (GX)

(GX Implementation Council on Dec. 12)



Basic Policy for Realization of Green Transformation (GX)

(Adopted at GX Implementation Council on Dec. 12)

To rebuild a stable energy supply, various measures (including maximum use of clean power sources) are to be taken.

- **Renewable Energy:** To expand the introduction of renewable energy, a **grid development plan** has been set.
Investment in the next 10 years will be 8 times as much as that in the past 10 years.
- **Nuclear power** : **Replacement** of to-be decommissioned reactors with next generation innovative reactors.
Review of operating period (40 years + 20-year extension + shutdown period such as inspection)

~2023(Spring)

~2025

2030

2050

[Construction of next-generation grid networks]

- HVDC undersea cable from Hokkaido to Honshu(~2030)
- Grid development based on the master plan (2023~)
- Improvement of financing environment to grid investment (6~7 trillion-yen scale)

[Securing balancing power]

- Accelerating introduction of stationary storage batteries
- Long-Term Decarbonized Energy Auction scheme to start
- Utilization of hydrogen and ammonia

[Accelerating innovation]

- Next-generation solar cells (perovskite solar cells)
- Floating offshore wind power generation

① **Construction of grid networks and securing balancing power toward the maximum introduction of renewable energy**

H₂ / NH₃
2030: 3 mil. tons/3 mil. tons
2050: 20 mil. tons/30 mil. tons

Solar cells
2030: 104-118GW

Offshore Wind
2030: 10GW
2040: 30-45GW

② Maximum introduction of renewable energy

Realization of 36-38% introduction in 2030

(Cabinet approval in October 2021)

[Maximum introduction of domestic renewable energy]

- Expansion of renewable energy with understanding from local communities
(Rule to reinforce business discipline to comply with regulations on safety, land development etc.)
- Transformation from Feed-in-Tariff to Feed-in-Premium scheme (FY2022~)
- Maximum use of existing renewables (PV ~60GW)
- R&D on recycling technology of solar power panels

Annual introduction targets

Outlook for Energy mix in FY2030 (The 6th Energy Strategic Plan)

-Points of outlook for energy supply and demand in FY2030-

- The 6th Energy Strategic Plan was approved by the Cabinet in October 2021.
 - Further pursuit of thorough energy efficiency improvement by 62 million kl* by FY2030.
 - Raise the percentage of renewable energy to 36-38% by FY2030.
 → solar - 14-16%; wind power - 5% of that total.
 *Reduction in energy consumption from 2013. (Crude oil equivalent)
 - A new goal of hydrogen/ammonia to 1% (as power use) by FY2030.

	Current energy mix (in FY2019)	Energy mix in FY2030 (ambitious outlook)
① Energy efficiency improvement (ratio to final energy consumption)	16.55 million kl (4.7%)	62 million kl (17.7%)
Final energy consumption (without energy conservation)	350 million kl	350 million kl
② Renewable energy	18% { solar 6.7% wind 0.7% geothermal 0.3% hydropower 7.8% biomass 2.6%	36-38%*1 { solar 14~16% wind 5% geothermal 1% hydropower 11% biomass 5%
③ Hydrogen/Ammonia	0%	1%
Power generation mix		
Electricity generated :	Nuclear 6%	20-22%
Approx. 934 TWh (2030)	LNG 37%	20%
	Coal 32%	19%
	Oil, etc. 7%	2%
(+ non-energy related gases/sinks)		
GHG reduction rate (ref. 2013)	14%	46%*2

*1If progress is made in utilization and implementation of R&D of renewable energy currently underway, 38% or higher will be aimed at.

*2Continuing strenuous efforts in its challenge to meet the lofty goal of cutting its emission

Primary energy dependency on Russia

- Disturbance of oil and gas market caused by Russian aggression against Ukraine has provoked abrupt change in global energy security.
- Japan has the lowest self-sufficiency rate of primary energy among the G7 countries.

Country	Self-sufficiency rate of primary energy (2020)	Dependency on Russia (Percentage of import from Russia) (2020) ※The data of Japan is quoted from Trade Statistics of Japan 2021		
		Oil	LNG	Coal
Japan	11% (Oil:0% LNG:3% Coal:0%)	4% (Share of Russia :5th)	9% (Share of Russia: 5th)	11% (Share of Russia:3rd)
USA	106% (Oil:103% LNG:110% Coal:115%)	1 %	0%	0%
Canada	179% (Oil:276% LNG:13% Coal:232%)	0%	0%	0%
UK	75% (Oil:101% LNG:53% Coal:20%)	11% (Share of Russia:3rd)	5% (Share of Russia:4th)	36% (Share of Russia:1st)
France	55% (Oil:1% LNG:0% Coal:5%)	0%	27% (Share of Russia:2nd)	29% (Share of Russia:2nd)
Germany	35% (Oil:3% LNG:5% Coal:54%)	34% (Share of Russia:1st)	43% (Share of Russia:1st)	48% (Share of Russia:1st)
Italy	25% (Oil:13% LNG:6% Coal:0%)	11% (Share of Russia: 4th)	31% (Share of Russia:1st)	56% (Share of Russia:1st)

(Source) World Energy Balances 2020 (自給率)、BP統計、EIA、Oil Information、Cedigaz統計、Coal Information (依存度)

Remarks at Expert Panel on a “Clean Energy Strategy” 2022 December22

- Today, the members of the GX Executive Council have compiled the “Basic Policy for the Realization of GX”. I would like to express my gratitude to the experts from the relevant ministries and agencies, the LDP’s GX Implementation Headquarters, and Komeito’s Joint Conference on Energy and Economy, and to the experts for their active discussions, which led to the compilation of the Basic Policy.
- The Government of Japan will proceed with the process of listening to a wide range of opinions in order to submit a bill for the realization of GX to the next ordinary Diet session, in order to give concrete shape to the "Basic Policy".
- GX is a major transformation of the entire economy and society, and the situation will change depending on technological progress and the efforts of each country. The U.S. has launched a massive energy investment support program, and the EU agreed last week on border adjustment measures for carbon pricing. Japan will implement bold upfront investment support of 20 trillion yen in order to realize GX investment of over 150 trillion yen (=\$1.1 trillion)^{※1} in the public and private sectors. We need to be flexible and agile, taking into account technology and the policies of each country. We will review the progress of each project and continuously upgrade the "Basic Policy".

※1 1\$=135yen



Measures to introduce offshore wind power

- **Japan's Vision for Offshore Wind Power Industry (December 2020)**
 - ✓ Target by Government
 - ◆ Introduction Target ; **10GW by 2030, 30-45GW by 2040**
 - ✓ Targets by Industry
 - ◆ Cost reduction target ; 8-9 yen/kwh by 2030-2035
- **Current Status of Offshore Wind Promotion Act (April 2019~) and our strategy**
 - ✓ Round 1 auctions are finalized(Mitsubishi won 1.7GW)
 - ✓ Many pipelines; 8 promotion zones, 5 promising zones, 11 preparation zones
 - ✓ Round 2 auctions (around 1,8GW) are started from December 2022.
 - ✓ **Japan's EEZ is the sixth largest in the world and has great potential, and we will promote large-scale floating offshore wind power projects offshore, including in the EEZ.** Currently, the Green Innovation Fund accelerating technological development and conducting large-scale demonstrations.
 - ✓ **Targets for the introduction of floating offshore wind power set soon.**

Results of Round1 auctions

- The results of Round1 auctions were published in December 2021.

(1) Sea area offshore Noshiro City·Mitane Town·Oga City, Akita Pref.

Selected companies: Mitsubishi etc.(0.48GW【GE turbines:12.6MW×38】)

Supply price: 13.26yen/kWh

(2) Sea area offshore Yurihonjo City (North·South), Akita Pref.

Selected companies: Mitsubishi etc.(0.82GW【GE turbines:12.6MW×65】)

Supply price: 11.99yen/kWh

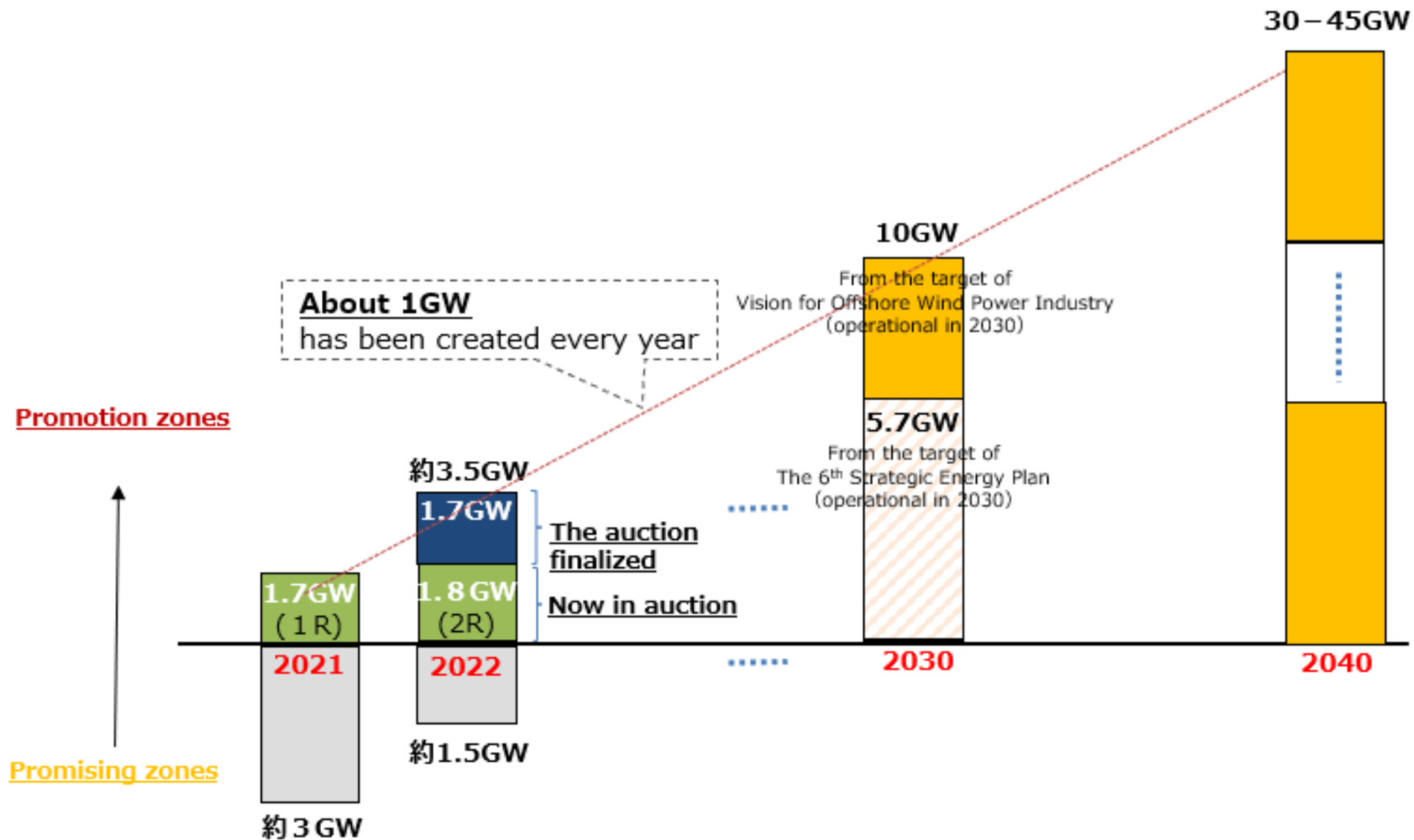
(3) Sea area offshore Choshi City, Chiba Pref.

Selected companies: Mitsubishi etc.(0.4GW【GE turbines :12.6MW×31】)

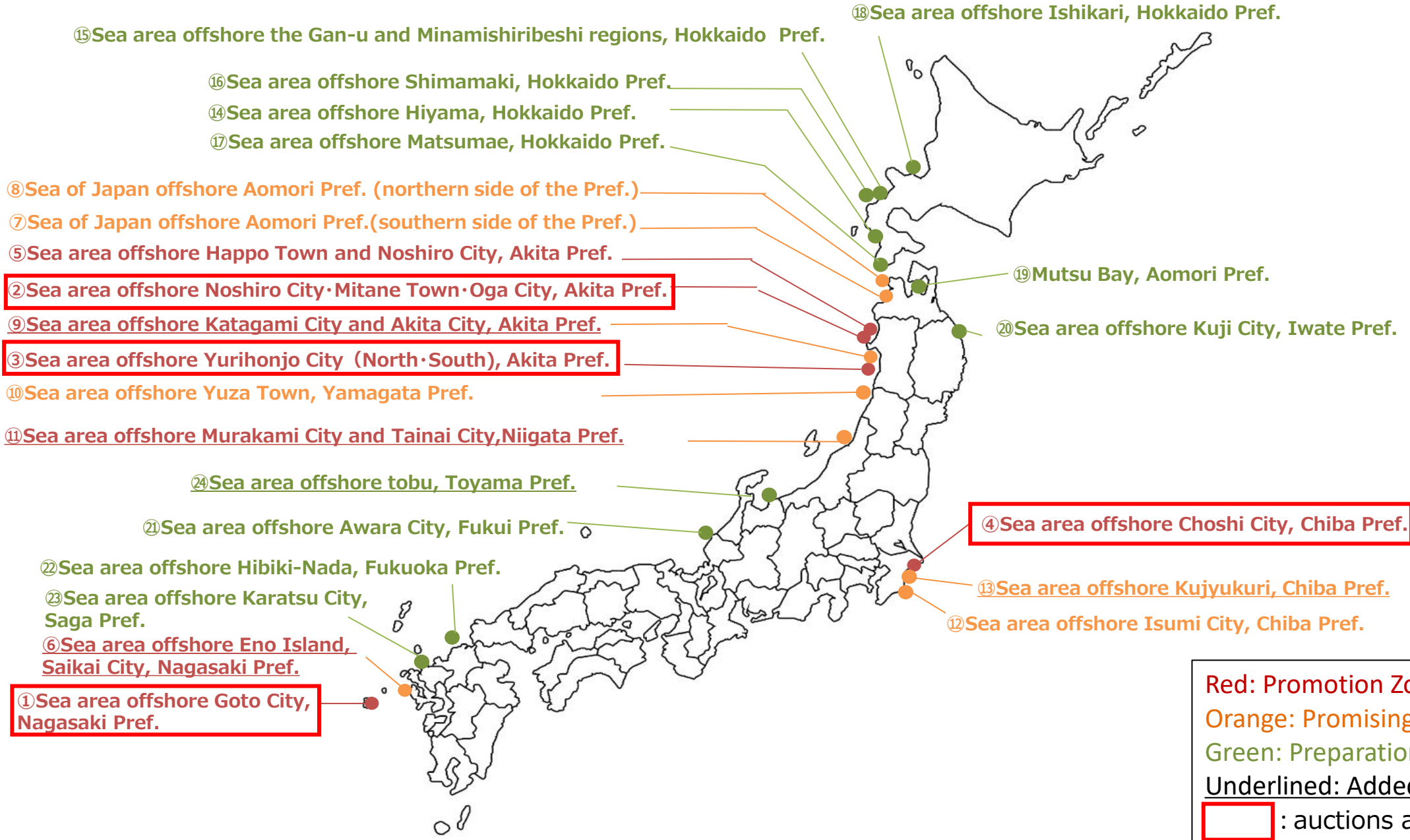
Supply price: 16.49yen/kWh

※GE plans to work with TOSHIBA to assemble nacells to be installed on a total of these 134 wind turbines at Keihin Plant in Japan.

Our strategy of achieving target of 30-45GW in 2040



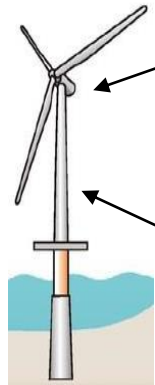
Current Status



Green Innovation Fund (Floating Offshore Wind)

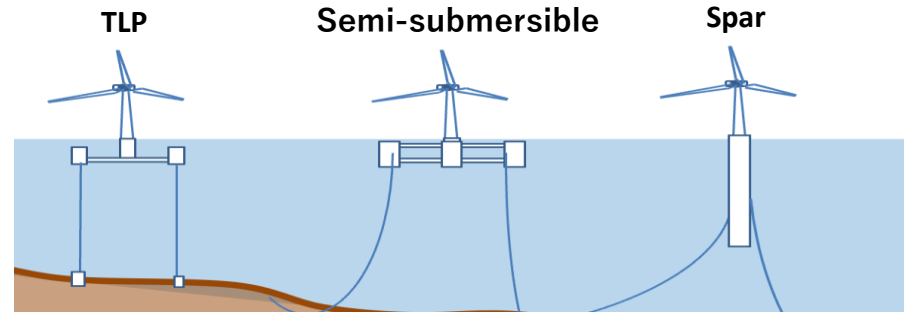
Phase 1: Development of elemental technologies [Budget amount: up to 34.5 billion yen]

① Wind Turbine Technology



- Nacelle internal components
【Daido Metal】: Bearing
【Ishibashi】: Accelerator
【NTN】: Bearing
- Tower
【Komai Haltech】

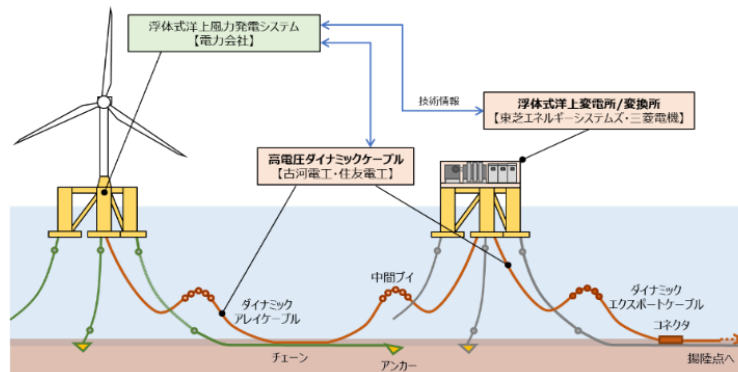
② Manufacturing and Installing Floating Foundations



- ① Modec etc.
- ② Hitachi Zosen etc.
- ③ Japan Marin United etc.
- ④ Tokyo Gas
- ⑤ TEPCO RP etc.
- ⑥ Toda Corporation

③ Wind-Related Electrical System Technology

【TEPCO RP etc.】
Dynamic Cable Offshore Substation



Source :
HP of TEPCO RP

④ Operation and Maintenance Technology

【Kansai Electric Power etc.】
Drone Inspection
【Furukawa Electric etc.】
Cable Laying Vessel (CLV)
【Tokyo Kisen etc.】
Service Operations Vessel (SOV)
【TEPCO RP, Toshiba】 【Hokutaku】 【NTN】 【Toda Corporation】
Digital Platform

Phase 2: Demonstration of floating system [Budget amount: up to 85 billion yen]

Conduct demonstrations of the integrated use of related technologies in the overall system while also utilizing these elemental technologies

Efforts to establish domestic and regional supply chains

- In the first round of three sea areas, collaboration with global companies and the use of local companies are being promoted, including wind turbine and foundation manufacturing and construction. In Akita Prefecture, for example, the economic ripple effect is estimated to total 382.1 billion yen.
- In particular, Akita Prefecture has seen progress in the participation of local companies in the supply chain and in local production.
- ✓ TDK Akita Plant produces magnets.
- ✓ Wenty Japan, a maintenance company in Akita Prefecture, is participating in the project.
- ✓ Mitsubishi Corporation (MC), selected company, also participated in the project, holding four matching events for a total of 160 local businesses.



←"Business Seminar" held at the Akita Offshore Wind Power Related Industry Forum

Thank you



Ministry of Economy, Trade and Industry