経済産業省

Japan's Strategic Energy Plan & Regional Zero Emission Efforts

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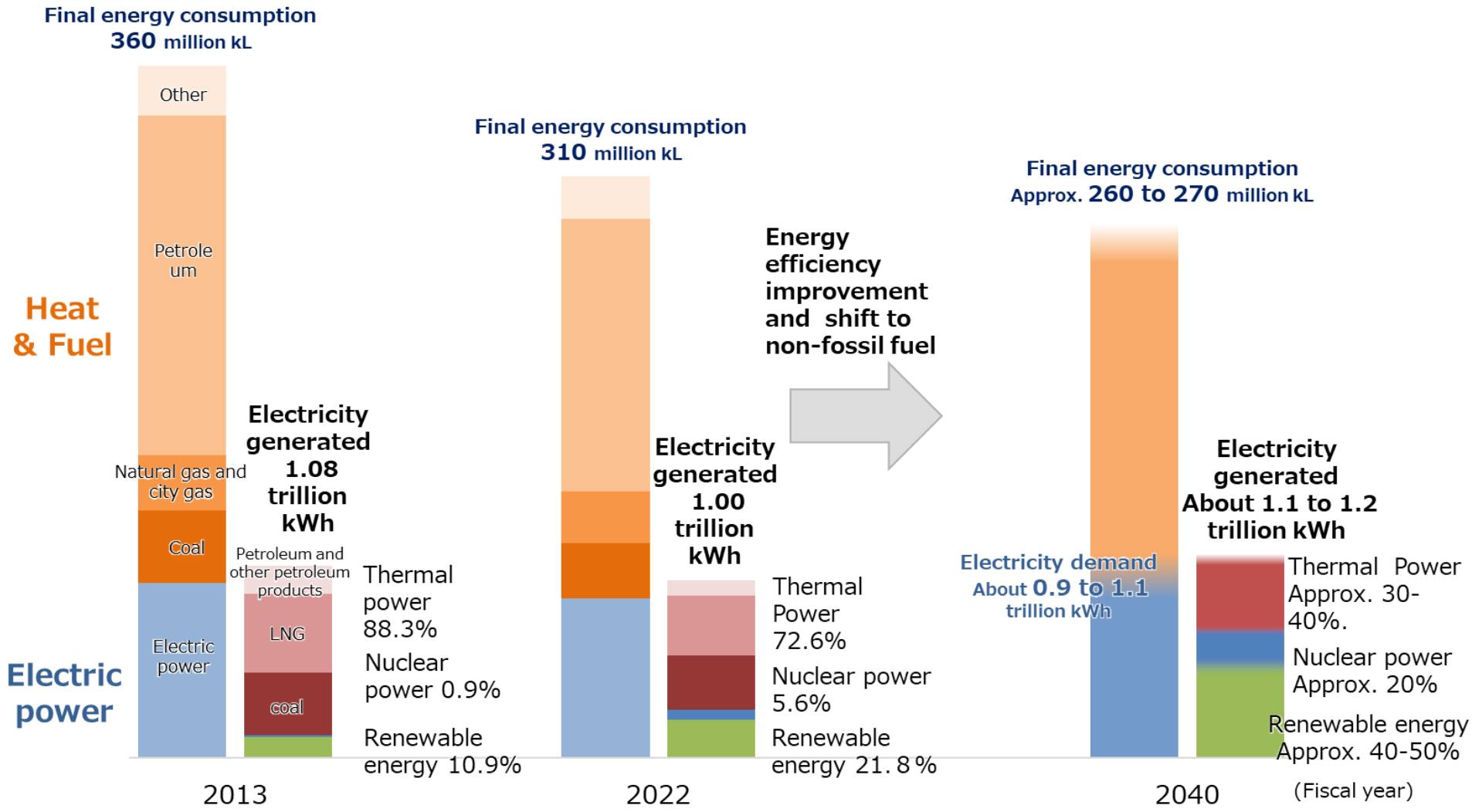
Outlook for Energy Supply and Demand in FY2040

		Fiscal Year 2023 (Preliminary Report)	Fiscal Year 2040 (Outlook)
Energy self-sufficiency rate		**15.2%**	**Approx. 30-40%.**
Amount of electricity generated		**985.4 Twh**	**Approx. 1100 to 1200 TWh**
Power generation mix	**Renewable energy**	**22.9%**	**Approx.-40-50%**
	Solar PV power	9.8% (9.8%)	Approx. 23% to 29%
	Wind power	1.1% (1.1%)	Approx. 4-8%
	Hydro power	7.6% (7.6%)	Approx. 8-10%
	Geothermal power	0.3% (0.3%)	Approx. 1-2%.
	Biomass	4.1% (4.1%)	Approx. 5-6%
	Nuclear power	**8.5%**	**Approx. 20%**
	Thermal power	**68.6%**	**Approx. 30-40%.**
Final energy consumption		**300 million kL**	**Approx. 260 to 270 million kL**
GHG reduction rate (compared to FY2013)		**22.9% (%)** (Actual results for FY2022)	**73%**

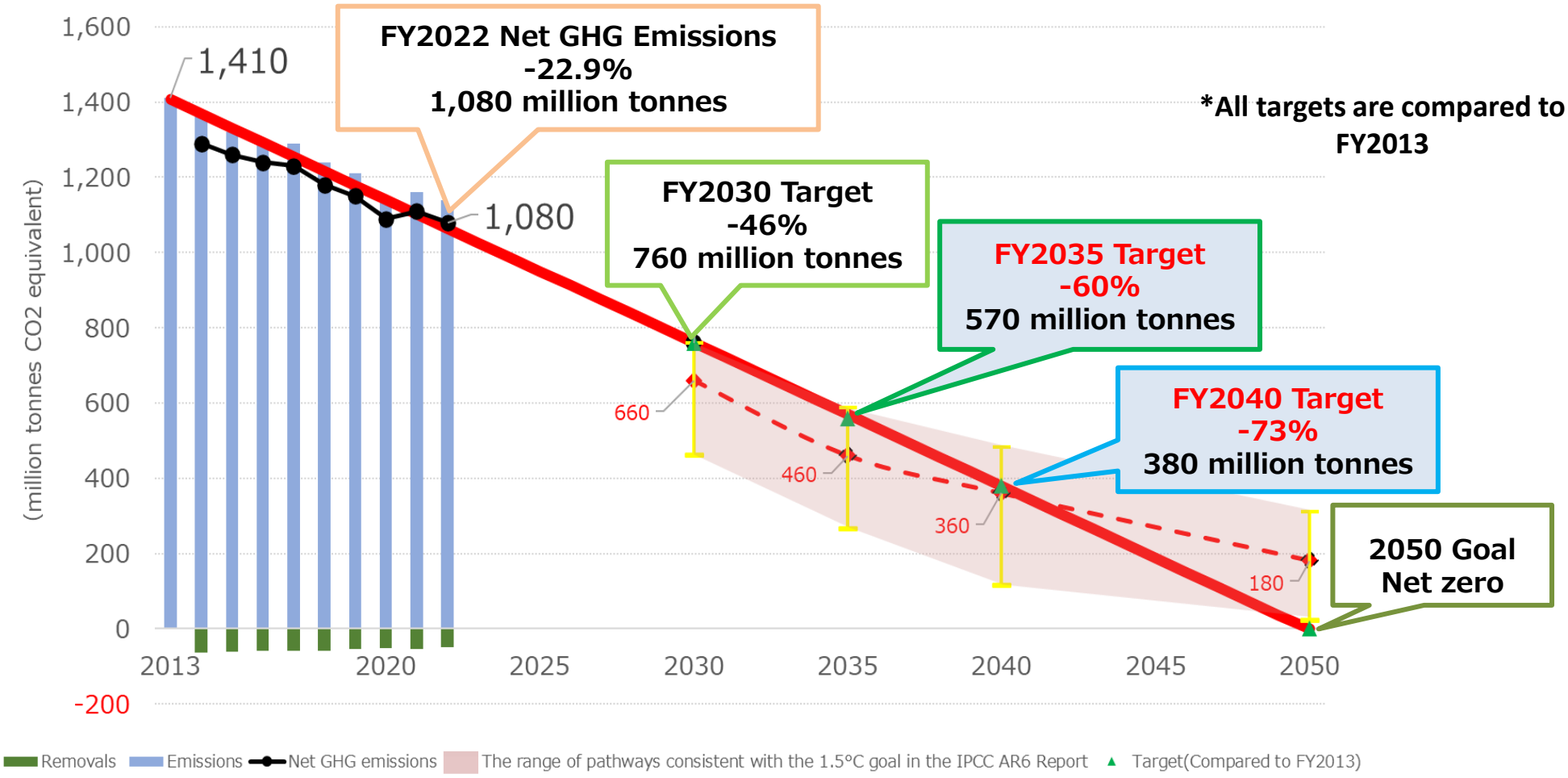
(Reference) In the new Outlook for Energy Supply and Demand, in addition to the case where a 73% reduction is achieved in FY2040, a-alternative scenario where a 61% reduction is not achieved is also presented as a reference value. In the case of the 73% reduction, the primary energy supply of natural gas in FY2040 is estimated to be 53-61 million tons, but in the alternative scenario, it is estimated to be 74 million tons.

Outlook for Energy Supply and Demand (Illustrative)

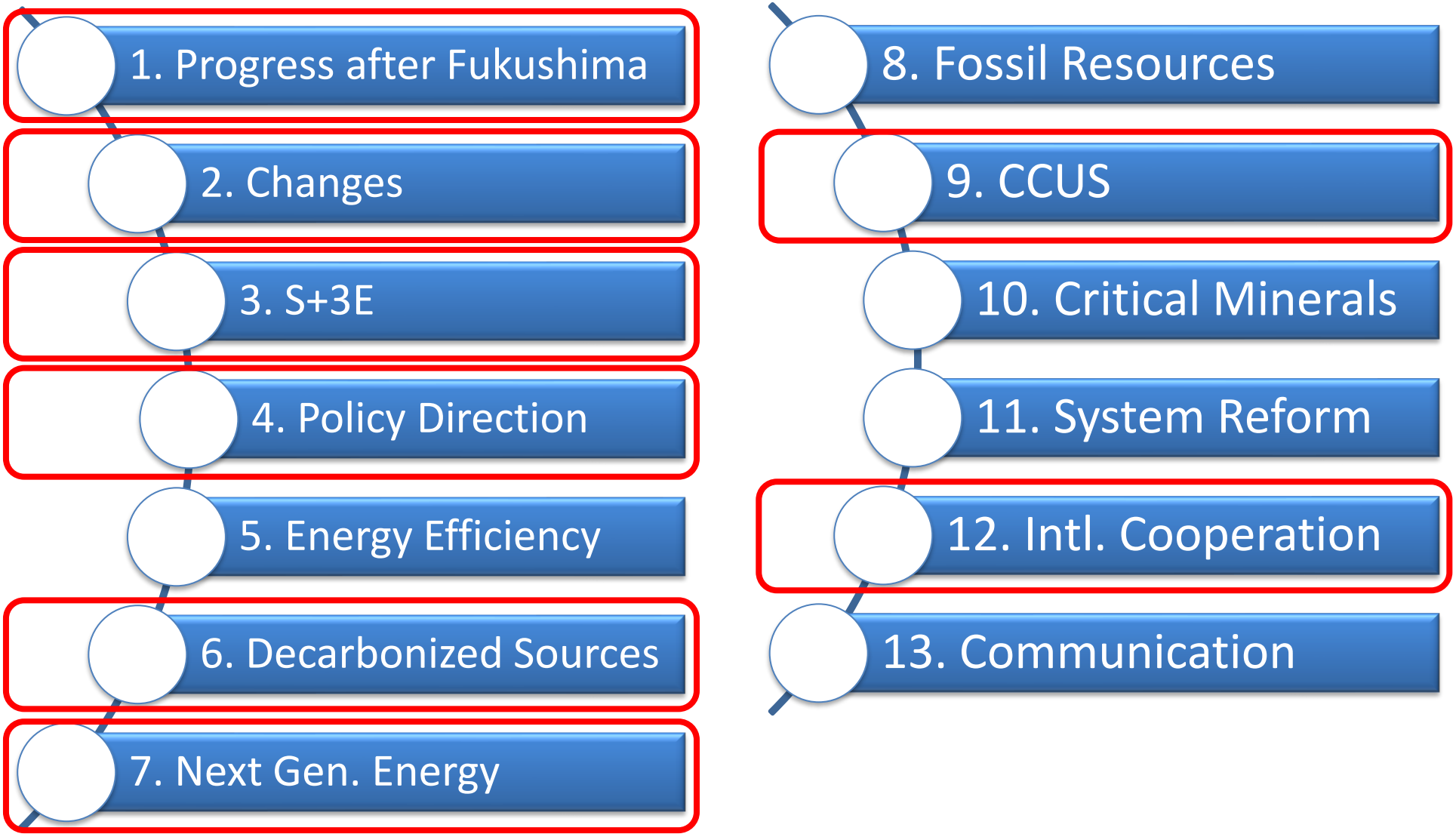


(Note) The left graph shows final energy consumption and the right graph shows the amount of electricity generated; electricity demand is calculated by subtracting the amount of transmission and distribution losses and the amount of electricity generated on site.

Japan's New GHG Emission Reduction Targets (NDC)



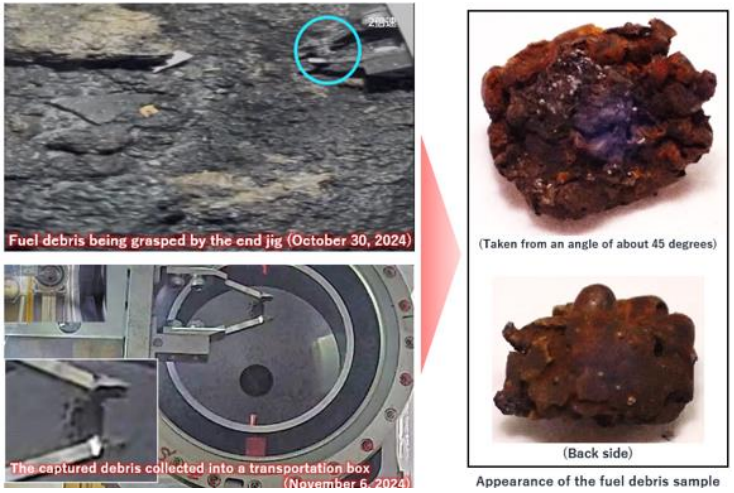
Structure of 7th Strategic Energy Plan



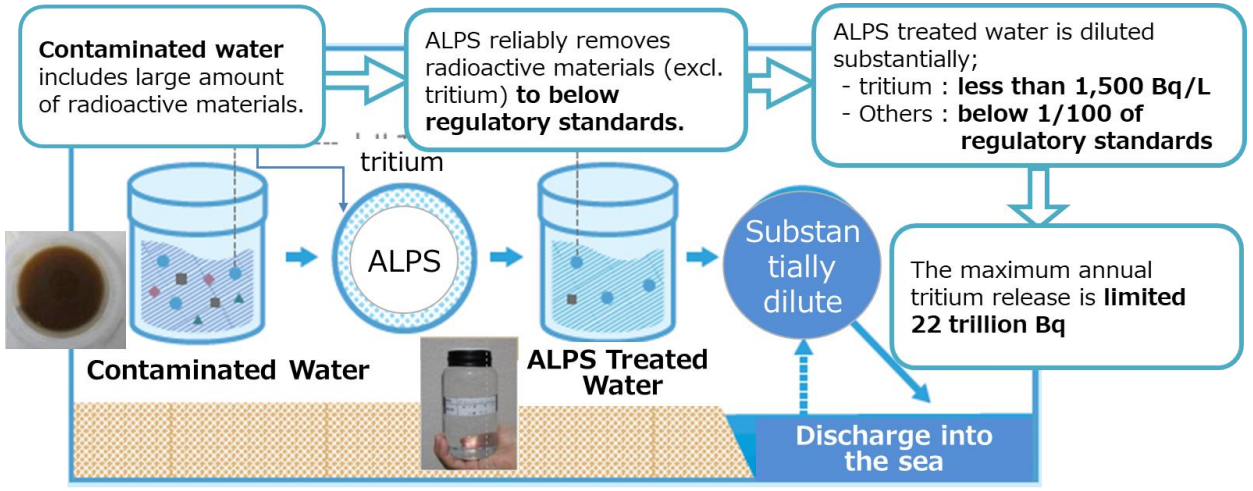

1. Progress after Fukushima

Fukushima: "Starting Point"

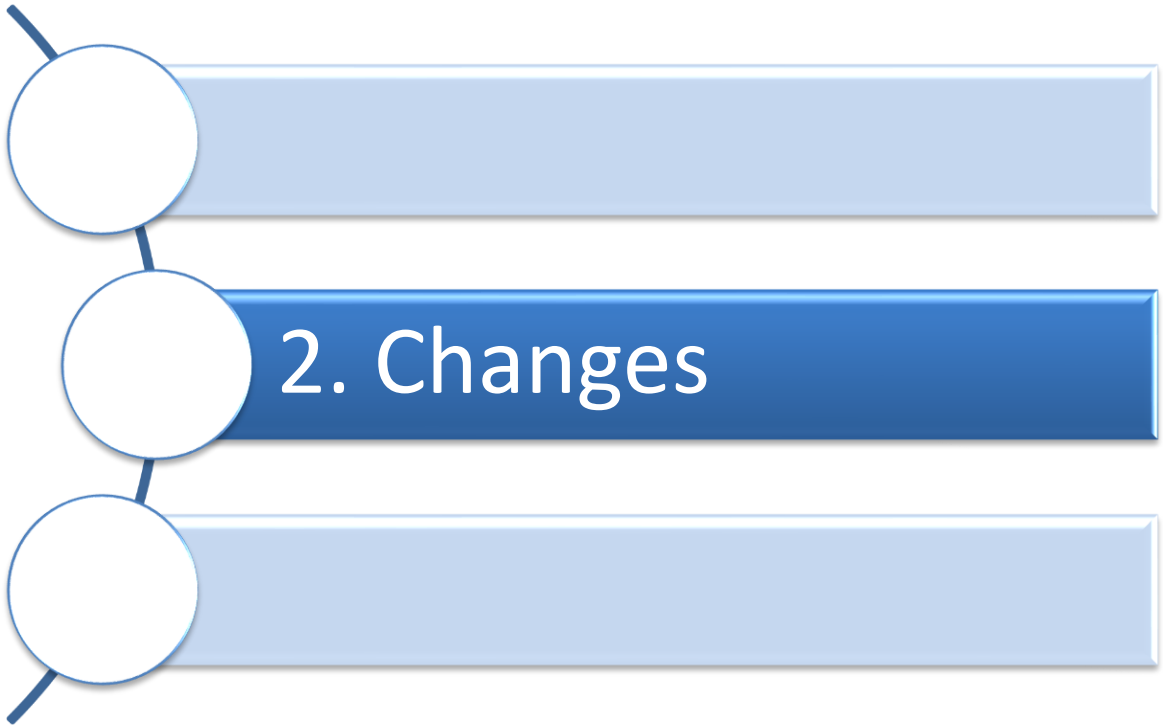
- **The experiences, reflections and lessons** learned from this accident remain **the starting point for Japan's energy policy.**
- Currently, **we are making efforts in both on-site and offsite**, including the progress of the discharge of ALPS treated water into the sea, the successful trial retrieval of fuel debris, and the Fukushima Innovation Coast Framework. Working toward reconstruction and restoration of Fukushima to the end remains **the gravest responsibility of and a top priority for the Government of Japan.**



(Trial retrieval of fuel debris completed on Nov. 7, 2024)



(Controlled Discharge of ALPS Treated Water)


2. Changes

Encountering new challenges

1. Energy security challenge

- **Renewed awareness to energy security,** triggered by a number of geopolitical events.

2. Rising demand for decarbonized power

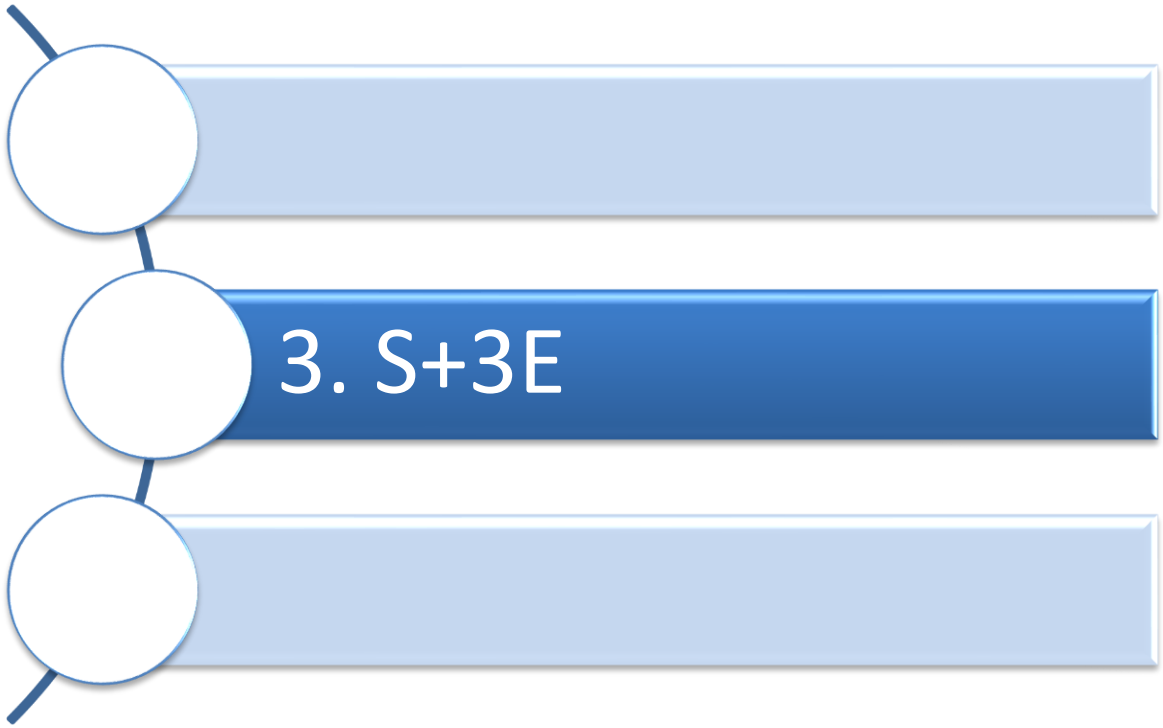
- **Unprecedented increase expected in electricity demand**, led by the progress in DX and GX.

3. Delivering the ambition of carbon neutrality

- **Ambitious goals** of many countries toward carbon neutrality, **with more diversified and realistic approaches.**

4. Industrial policies and energy policies

- More attention to **synergize between industrial competitiveness, energy transition and economic security**


3. S+3E

Key principles: S+3E

Safety (top priority)

Energy Security

Self-sufficiency: About 30%, higher than before the great east Japan earthquake (about 20%)

Economic Efficiency

Electricity cost: To lower from the current level (9.7 trillion yen in FY2013 to 8.8 trillion yen in FY2030)

Environment

Greenhouse gas emission reduction target: (reduction of 46.0% in FY 2030 compared to FY 2013)


4. Policy Direction

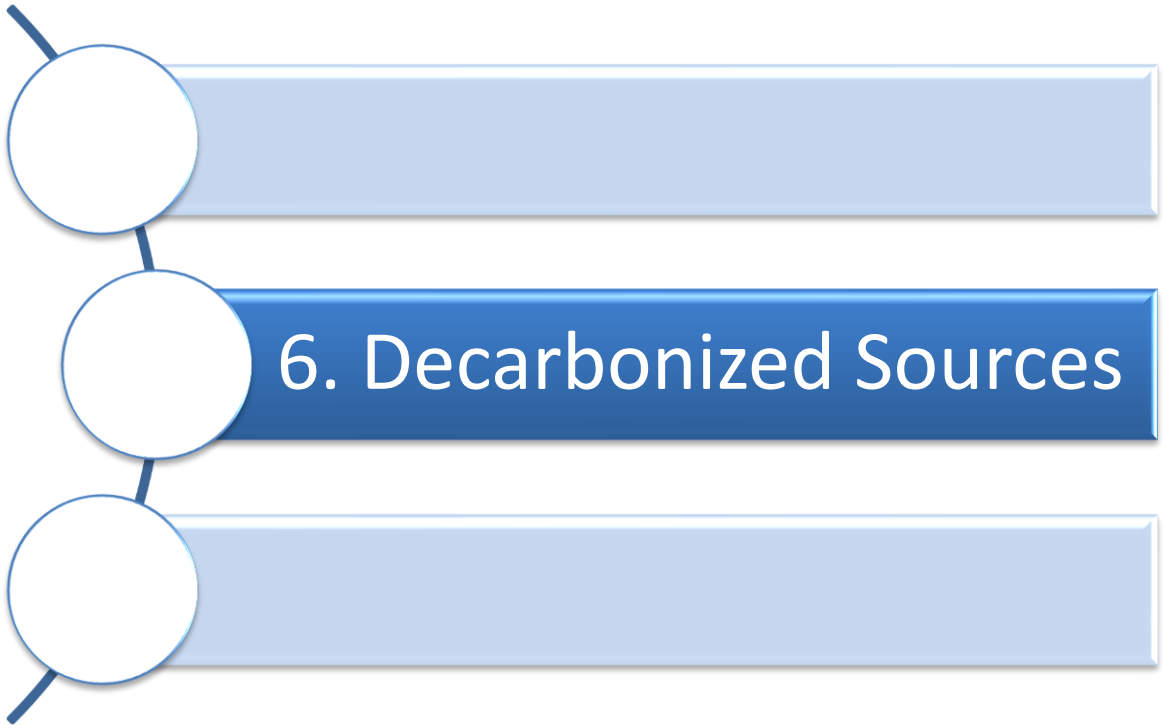
Directions (Overall)

- Japan's industries and economy depend on **whether or not we can provide enough decarbonized electricity that matches the demand at competitive prices.**

- **we will maximize the use of renewable energy as our major power source** and we will aim for **a balanced power generation mix** that does not excessively depend on specific power sources or fuel sources.

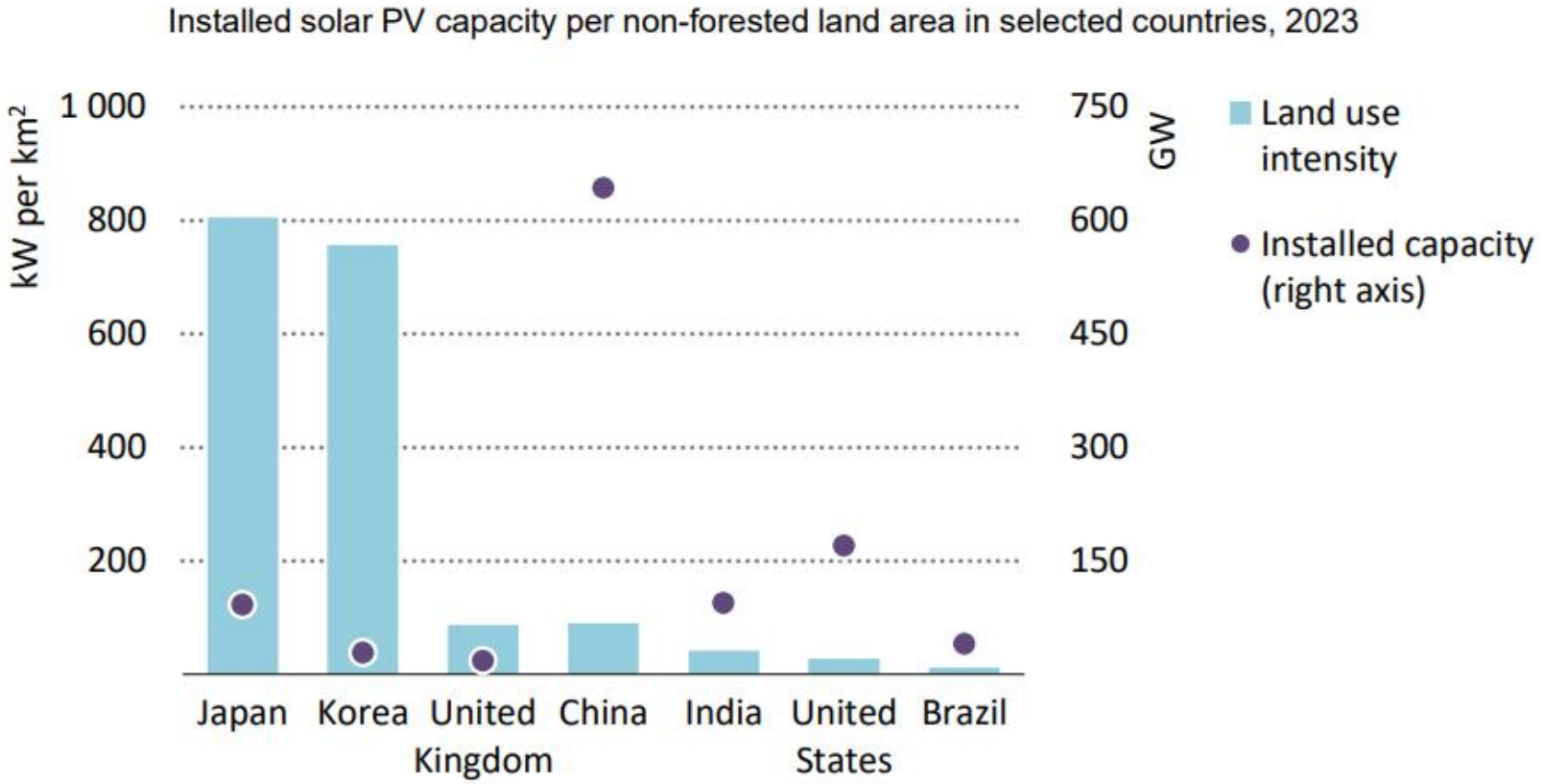
- we will promote thorough **energy efficiency improvement** and **fuel switching** within the manufacturing, while **maximizing the use of decarbonized power sources such as renewables and nuclear power**, both of which contribute to energy security.

- It is essential to take a viewpoint that prioritizes economically rational measures. Based on the principle of S+3E, we will work to **minimize cost increases associated with decarbonization** to the greatest extent possible.


6. Decarbonized Sources

Japan with one of the largest PV capacity in the world

Japan has installed significant solar PV in its non-forested land area

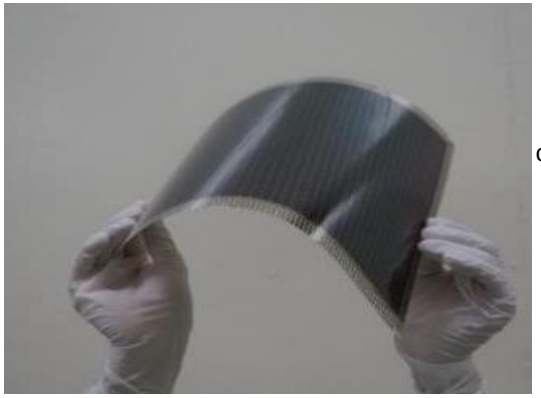


Despite its geographical characteristics as an island nation with a mountainous terrain, Japan is one of the world's leading countries for the introduction of solar PV

NEXT-generation solar cell(Perovskite solar cells)

- Japan has faced serious **location constraints on solar panels** in the fields.
- To expand the potential for installing solar panels, Japan is committed to advancing technological development and social implementation of next-generation solar cells (**perovskite solar cells**) , which have excellent features as follows:
  - Lightweight and flexibility: it can be installed on the walls of houses and buildings
  - Reliable supply-chain: Main material is iodine
  - Fewer manufacturing processes :Manufacturing cost reductions will be expected
  - Resource-saving and easier to recycle

Example of next-generation solar cells of practical-use size



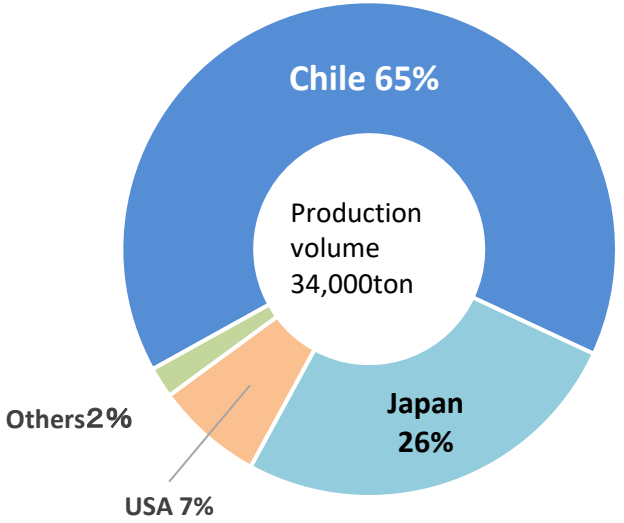
Source: Toshiba

Scaling up for commercialization

Example of solar panels installed on the walls of buildings

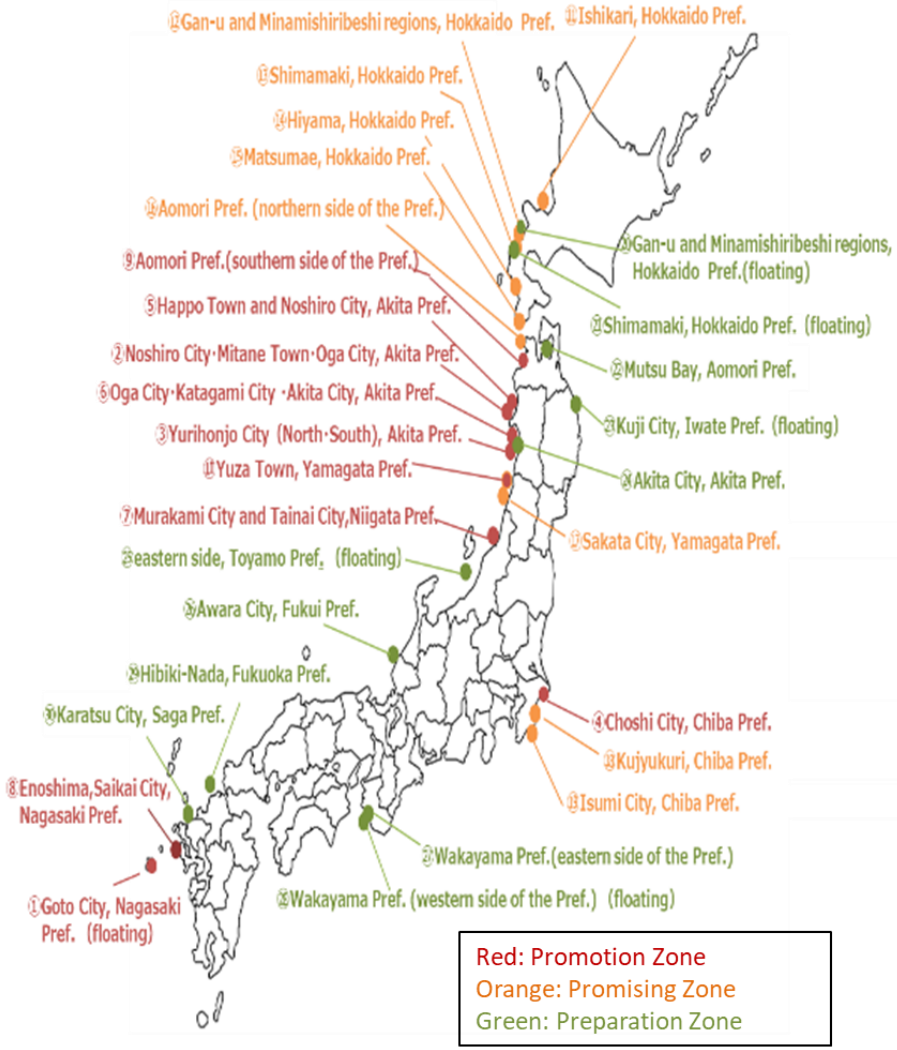
Source: Taisei Corporation

Production of iodine (the raw material of perovskite)



Offshore wind power

Status of Project Formation Based on the Offshore Wind Promotion Act



Designation and arrangement status of promotion areas and promising areas (As of March 2025)

	Area name (off the coast of)	Unit: 10,000 kW
Promotion Zones (Business operator selected)	① Goto City (Nagasaki Pref.) (floating)	1.7
	② Noshiro City, Mitane Town, and Oga City (Akita Pref.)	49.4
	③ Yurihonjo City (north and south) (Akita Pref.)	84.5
	④ Choshi City (Chiba Pref.)	40.3
	⑤ Happo Town and Noshiro City (Akita Pref.)	36
	⑥ Oga City, Katagami City, and Akita City (Akita Pref.)	31.5
	⑦ Murakami City and Tainai City (Niigata Pref.)	68.4
	⑧ Enoshima, Saikai City (Nagasaki Pref.)	42
	⑨ Aomori Pref. (southern part of the Sea of Japan)	61.5
	⑩ Yuza Town (Yamagata Pref.)	45.0
Promising Zones	⑪ Ishikari (Hokkaido Pref.)	91-114
	⑫ Gan-u and Minamishiribeshi regions (Hokkaido Pref.)	56-71
	⑬ Shimamaki (Hokkaido Pref.)	44-56
	⑭ Hiyama (Hokkaido Pref.)	91-114
	⑮ Matsumae (Hokkaido Pref.)	25-32
	⑯ Aomori Pref. (northern part of the Sea of Japan)	30
	⑰ Sakata City (Yamagata Pref.)	50
	⑱ Kujyukuri (Chiba Pref.)	40
	⑲ Isumi City (Chiba Pref.)	41

Nuclear power plants in Japan

Restarted 14 reactors (Date of Restart)

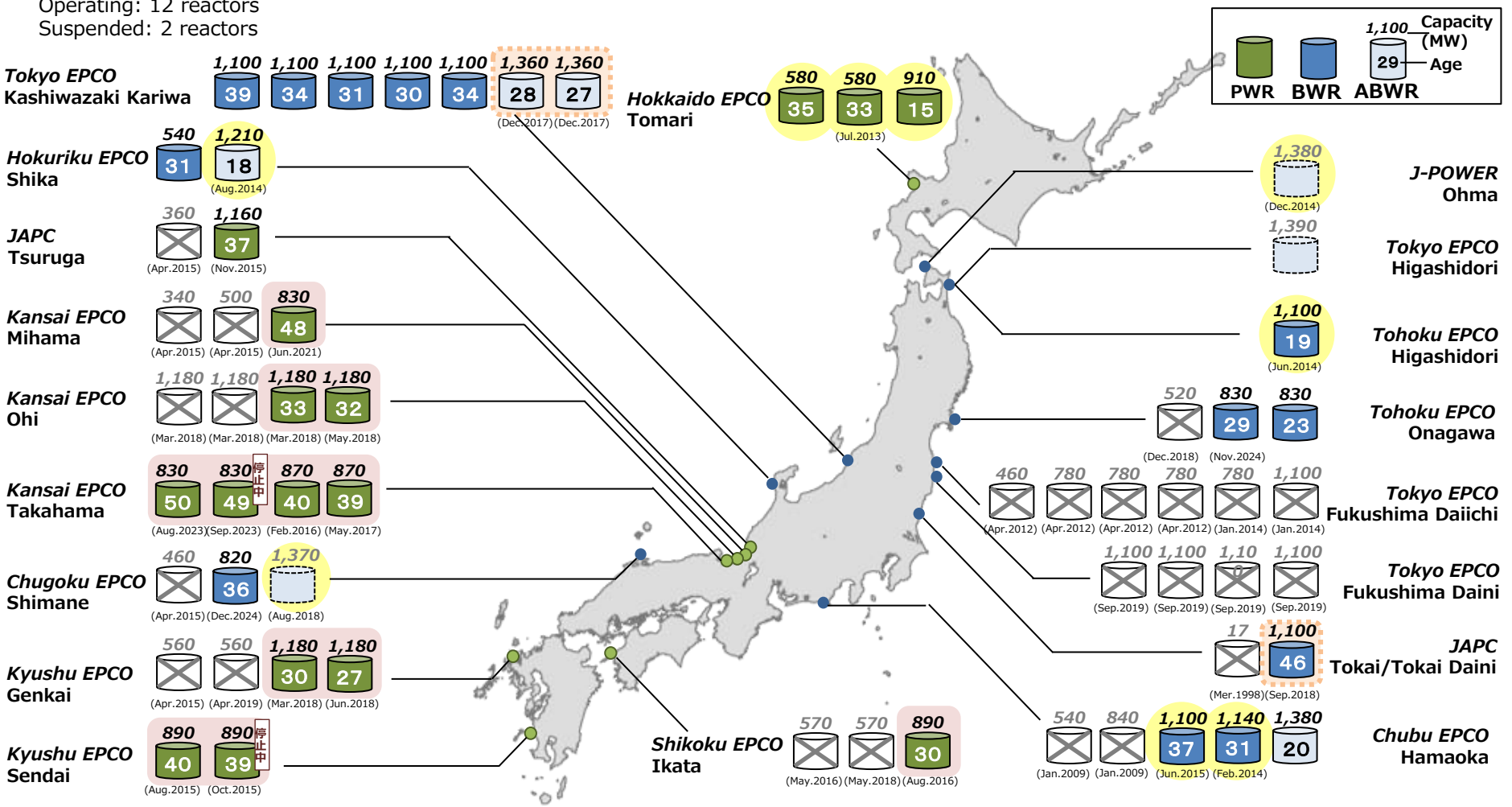
Passed NRA Review for the Permission for Changes in Reactor Installation 3 reactors (Date of Approval)

Under NRA Review 10 reactors (Date of Application)

Not yet Applied 9 reactors

Decommission 24 reactors

Operating: 12 reactors
Suspended: 2 reactors



Thermal power

Important roles

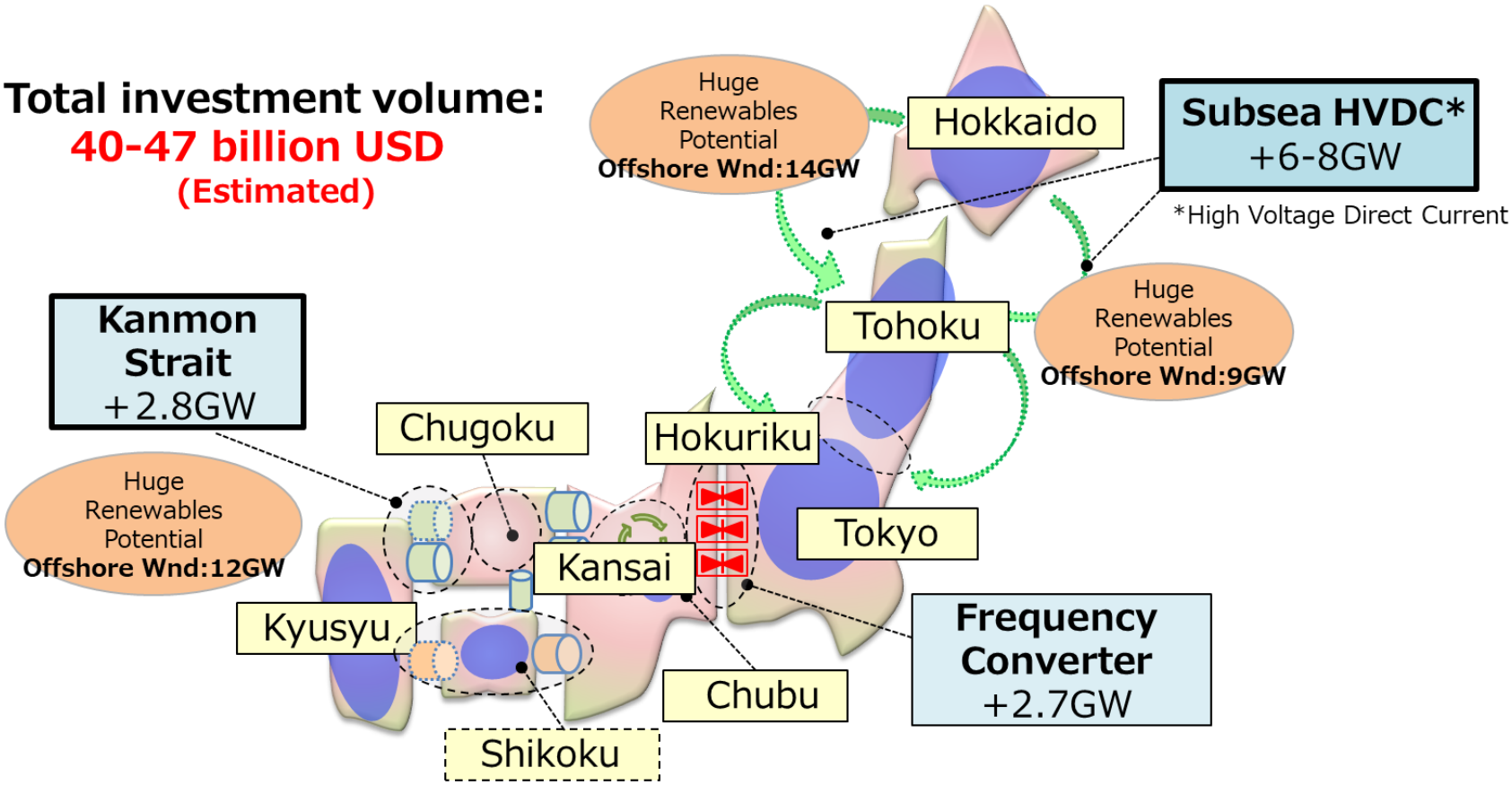
- 70% of current supply
- Regulating power
- Inertial and synchronous power

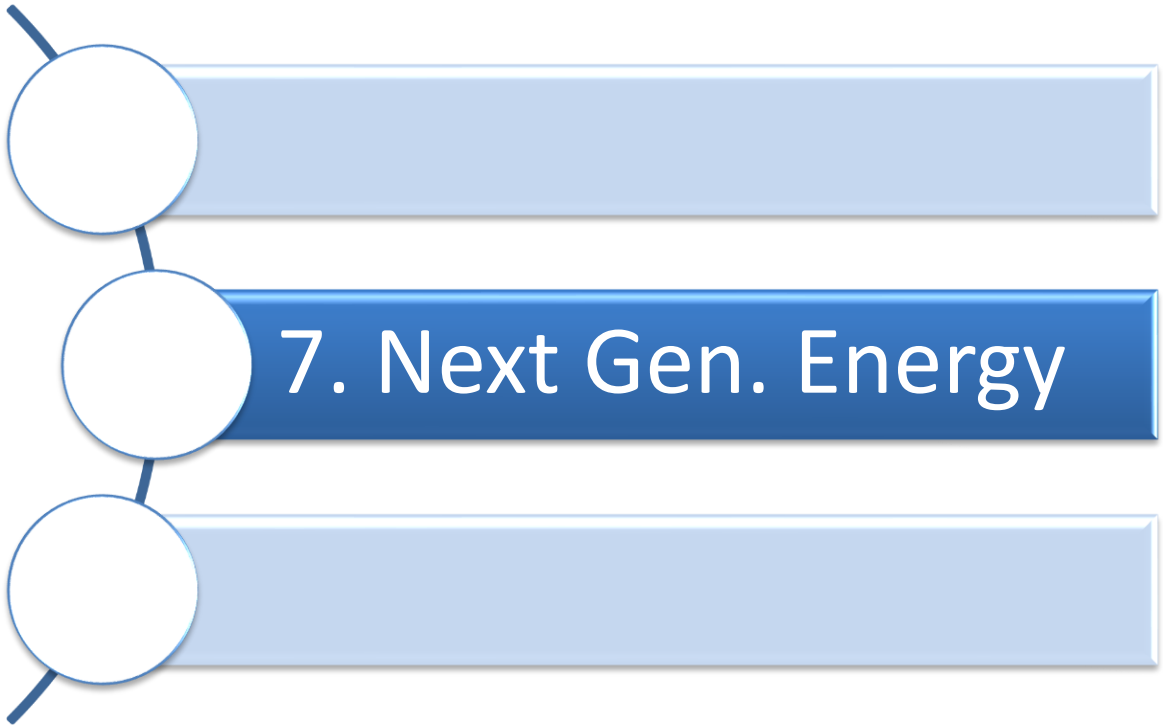
Way forward

- Maintain and secure the capacity necessary for stable supply
- Reduce the amount, especially inefficient coal-fired power
- Secure LNG-fired power as a means of transition
- Promote the decarbonization of thermal power (*e.g.* hydrogen, ammonia, CCUS)

Power grid development

- With a view to expanding renewable energy introduction towards 2050 and secure electric power resilience, **the Grid Development Master Plan was created in March 2023.**
- **Investments of 40-47 billion USD** to be needed.




7. Next Gen. Energy

Hydrogen and its derivatives

Hydrogen Supply

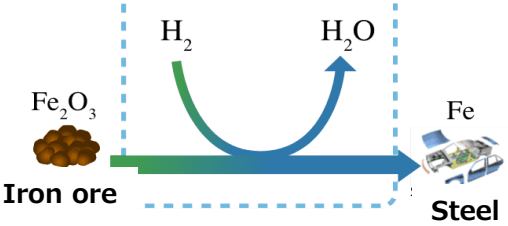
Hydrogen Production

Hydrogen supply Chain

Decarbonized Power Generation

Fuel Cell

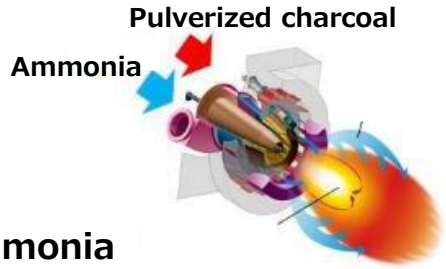
Direct Use of Hydrogen



Decarbonized steel
Decarbonized Chemical Products

Hydrogen Fueled Vessels

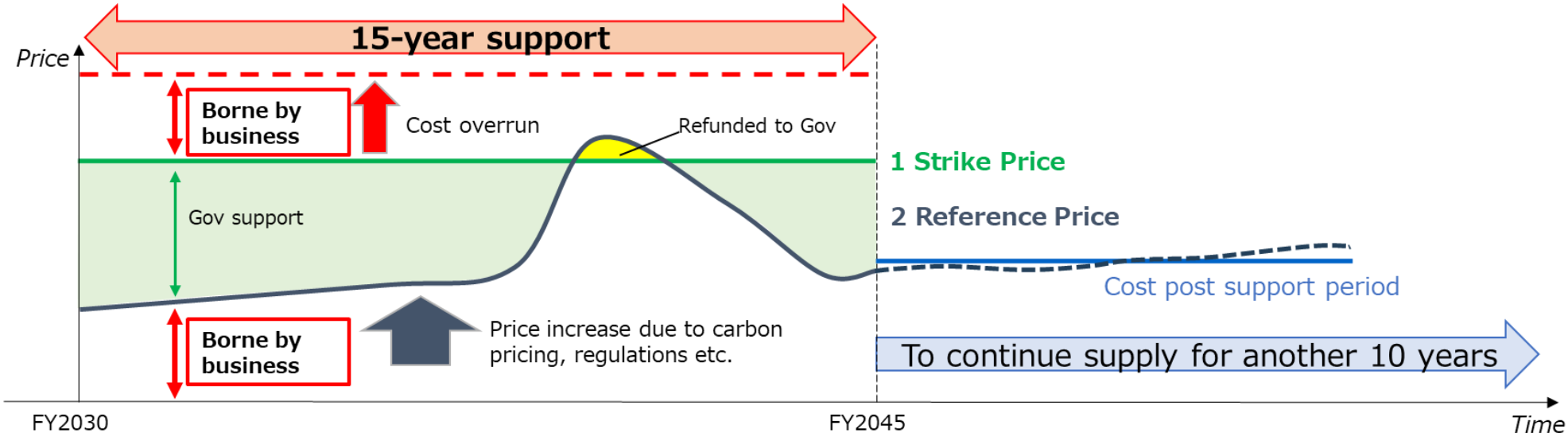
Utilization of Hydrogen Derivatives



Fuel Ammonia

Support focusing on price gap

- The government plans to provide **a 15-year support to suppliers who aim to develop a commercial-scale supply chain of low-carbon hydrogen and its derivatives** which meets Japan's primary energy policy.



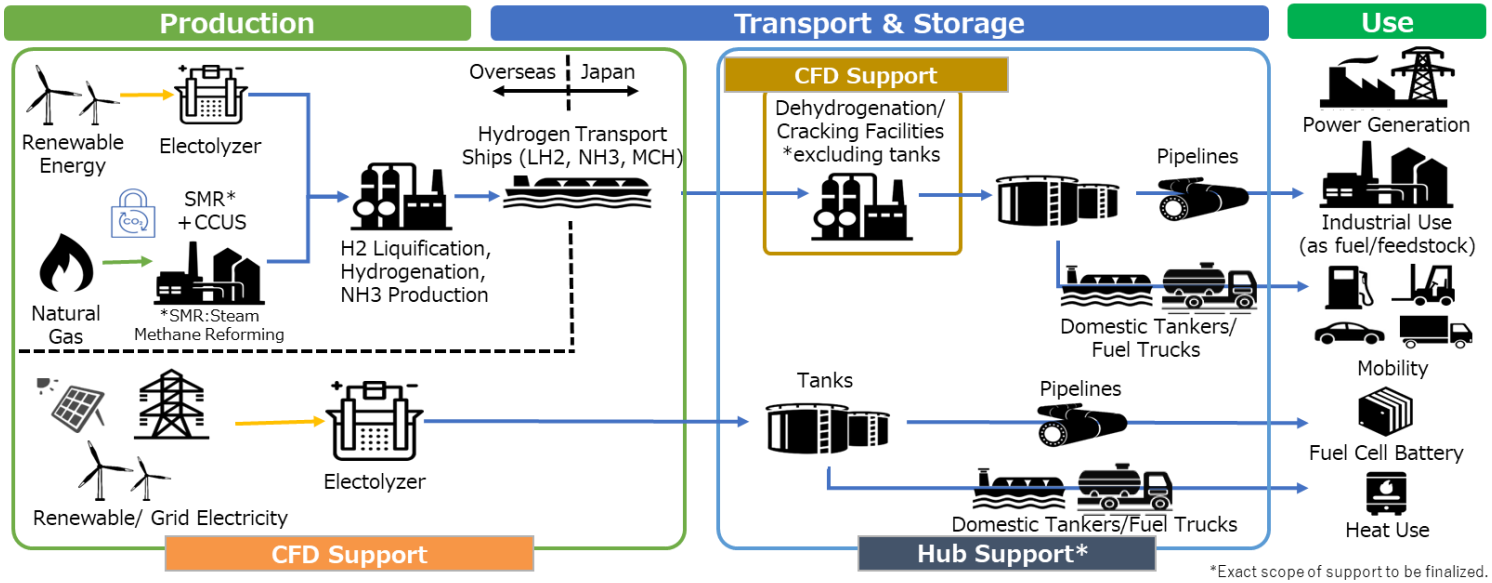
Key requirements

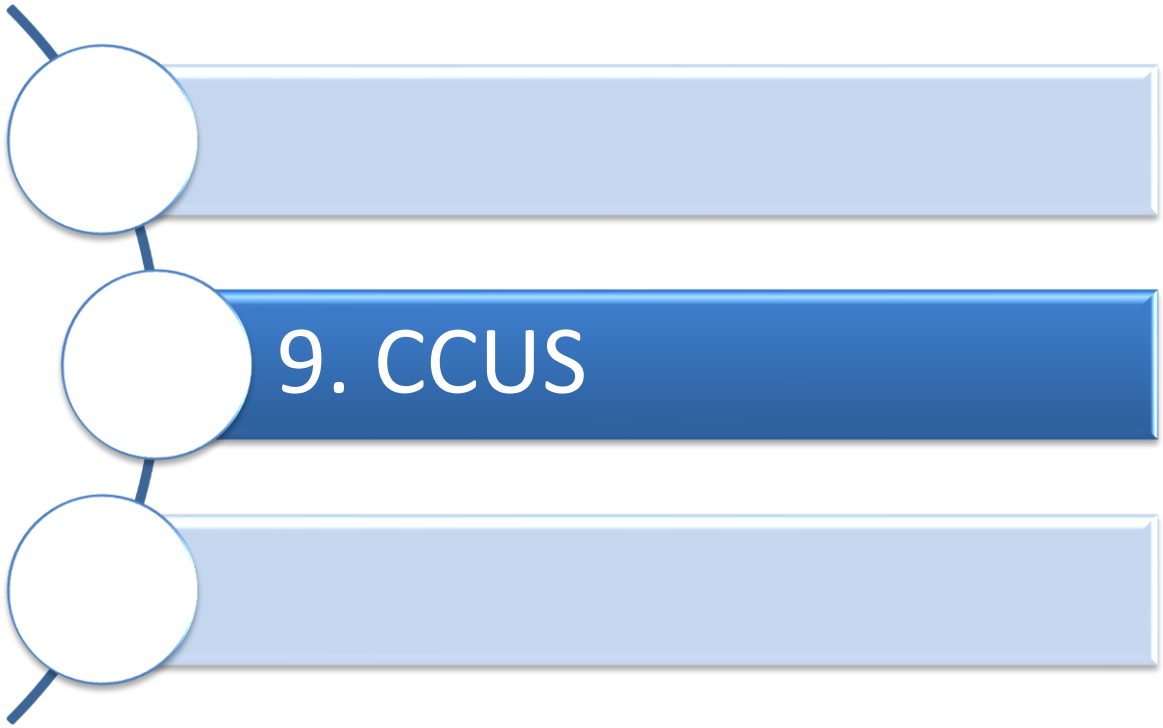
- **Supply to hard-to-abate sectors**, such as steel, chemical and transportation industries
- **Start supply by FY2030 and must continue for another 10 years** following the support period

* In the approval process, business plans are to be reviewed holistically from Japan's energy and GX policy perspectives

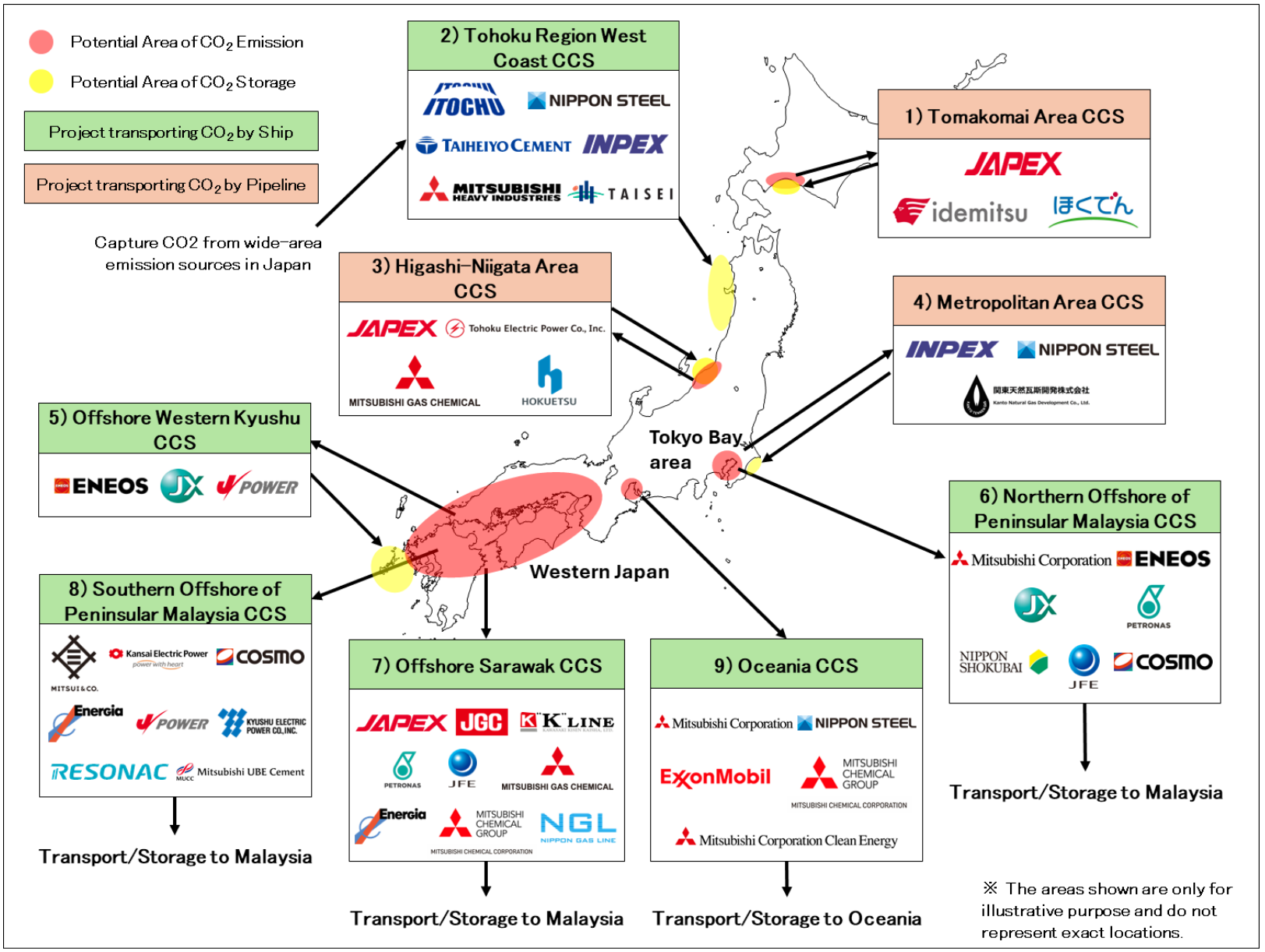
Hydrogen hub development program

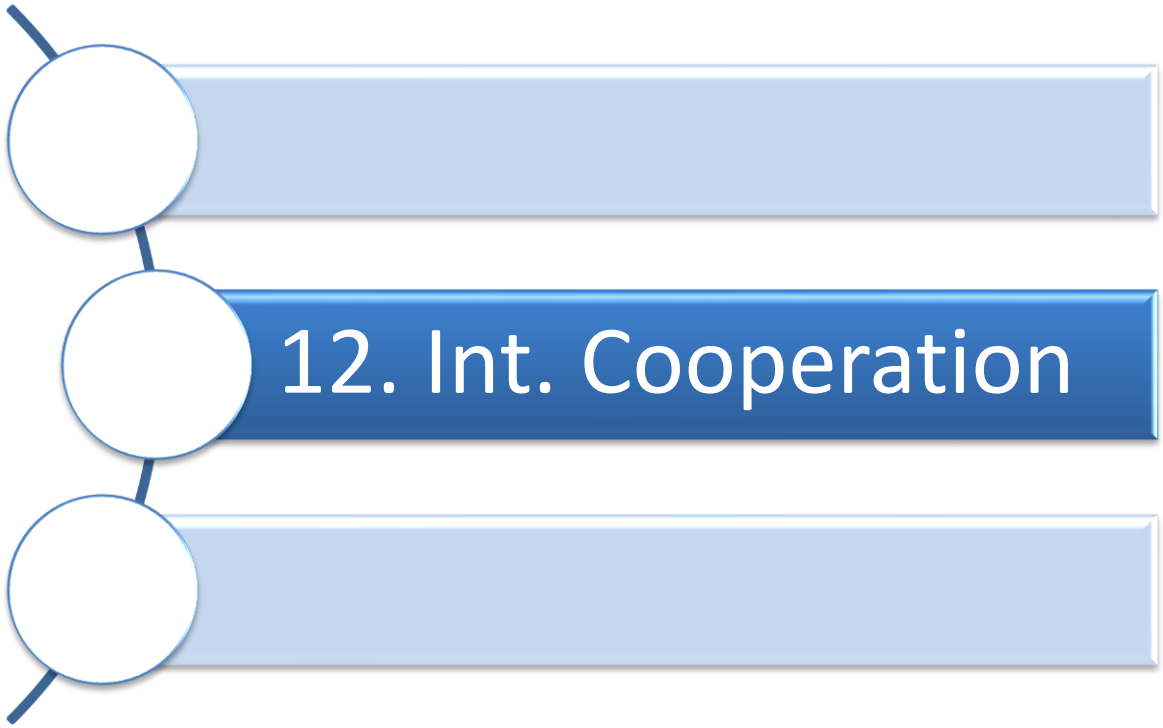
- **The Hydrogen Hub Development Program** supports the establishment of infrastructure which leads to large-scale expansion of the use of low-carbon hydrogen and its derivatives and widely benefits a variety of companies, with an aim to stimulate demand creation and the efficient buildout of hydrogen supply chains.
- **The Program will subsidize a portion of the CAPEX** for developing "facilities necessary to transport low-carbon hydrogen from the receiving terminal to the point of actual use by consumers and used by multiple companies (*e.g.* shared pipelines and tanks)".




9. CCUS

Advanced CCS projects



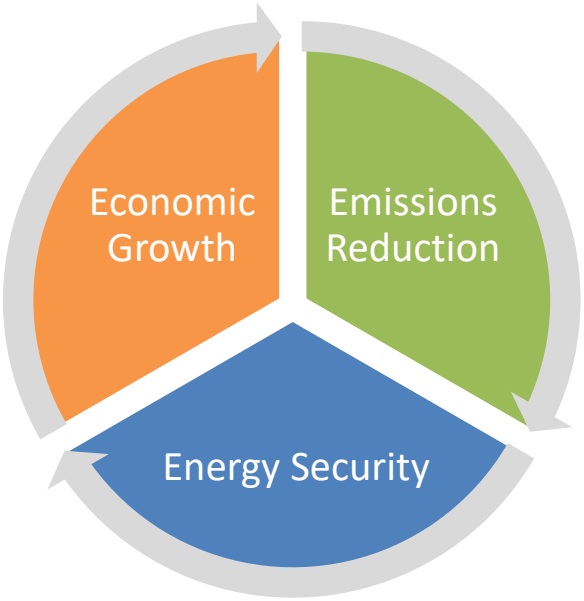

12. Int. Cooperation

Three principles in Japan's energy cooperation

Triple breakthrough

Japan aims to simultaneously achieve

- Energy Security
- Economic Growth
- Emissions Reduction

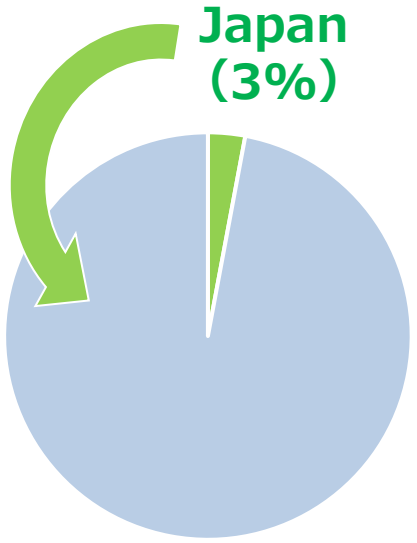


Various pathways

We will make practical energy transitions through various pathways depending on the circumstances of each country.

Solution to the world

Japan will decarbonize itself, but also contribute to global decarbonization by providing solutions outside Japan.



Asia Zero Emission Community (AZEC)

- **11 AZEC partner countries** have been working for their practical energy transition based on "**triple breakthrough**" and "**one goal, various pathways**."
- "**Action Plan for the Next Decade**" was adopted at the 2nd AZEC Leaders Meeting in October 2024.

<Key points of the Joint Statement at the 2nd AZEC Leaders Meeting (held in Vientiane on October 11, 2024) >

"Action Plan for the Next Decade"

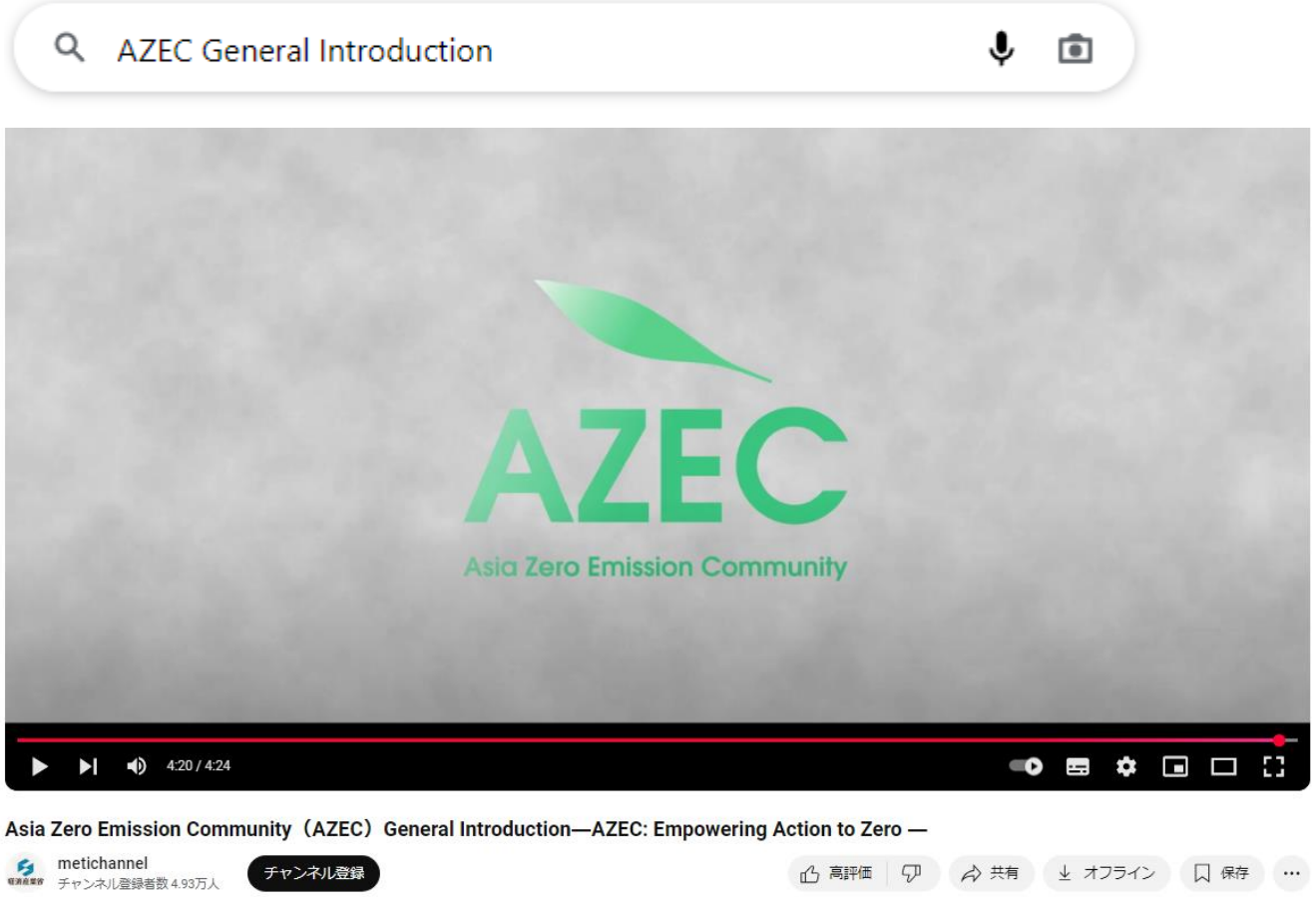
Key1 : Develop a short- to medium-term action plan to facilitate AZEC solutions (*e.g.* visualization of GHG emissions throughout supply chain)

Key2 : Sectoral initiatives
- power
- sustainable fuel
- next-generation industry

Key3 : Promoting tangible projects

MUST SEE!!!

AZEC: Empowering Action to Zero



https://www.youtube.com/watch?v=HGfbuHg94Ww

Thank you for your kind attention.