

APEC EGNRET 60, APR 23-26th

Policy Making and Technologies Deployment of New and Renewable Energy

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- In October 2020, Prime Minister Suga declared that **Japan aim to reduce greenhouse gas emissions to net-zero by 2050**, that is, to realise a carbon-neutral, decarbonised society.
- At the Leaders Summit on Climate in April 2021, Prime Minister Kishida announced that **Japan aims to reduce its GHG emissions by 46 percent in FY 2030 from its FY 2013 levels**.

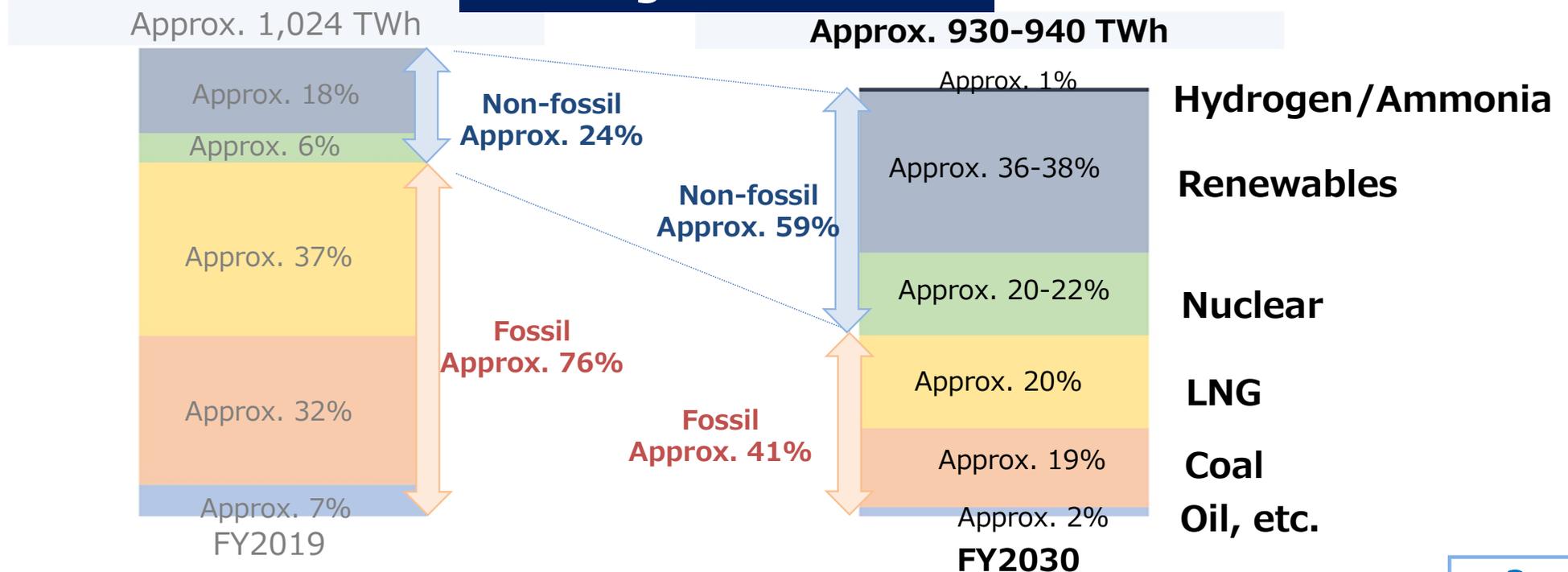
Remarks at Leaders Summit on COP26 (Nov. 2021)

Japan aims to reduce its greenhouse gas emissions by **46 percent** in the fiscal year 2030 from its fiscal year 2013 levels, and that Japan will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by **50 percent** in the fiscal year 2030.

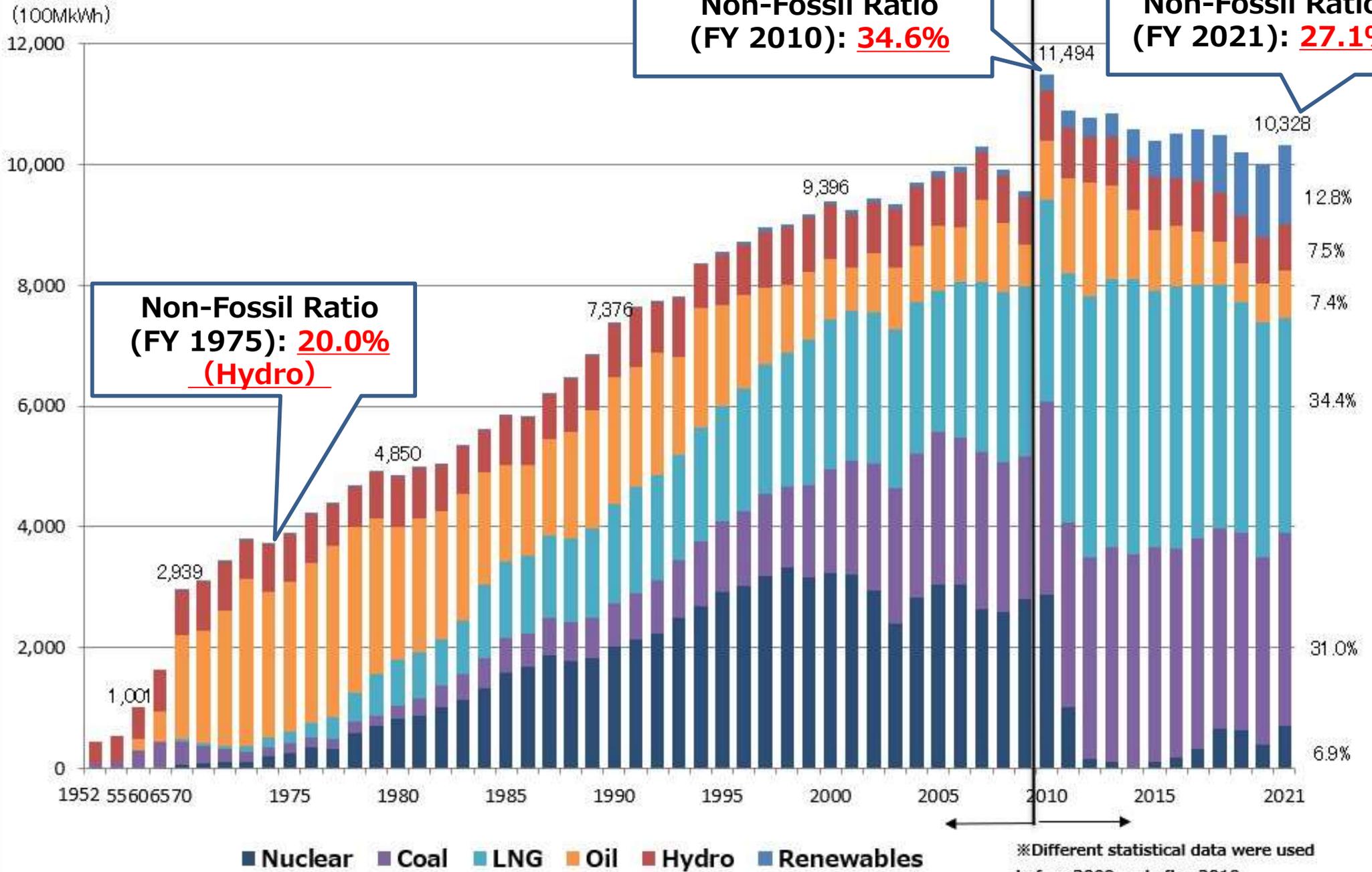


- Maximum introduction of renewable energy as a major power source on the top priority on the major premise of S+3E
- Further pursuit of greater energy efficiency
- Restart nuclear power plants with safety as a top priority.
- Recognizing that securing a **stable supply of energy is a major principle**, Japan will seek to lower the **thermal power ratio** of its power generation mix **to the extent possible**.
- Japan plans to pursue **innovation** in the thermal power mix, etc. by exploring and using **hydrogen / ammonia - fired power generation and CCUS/Carbon Recycling**.

Power generation mix

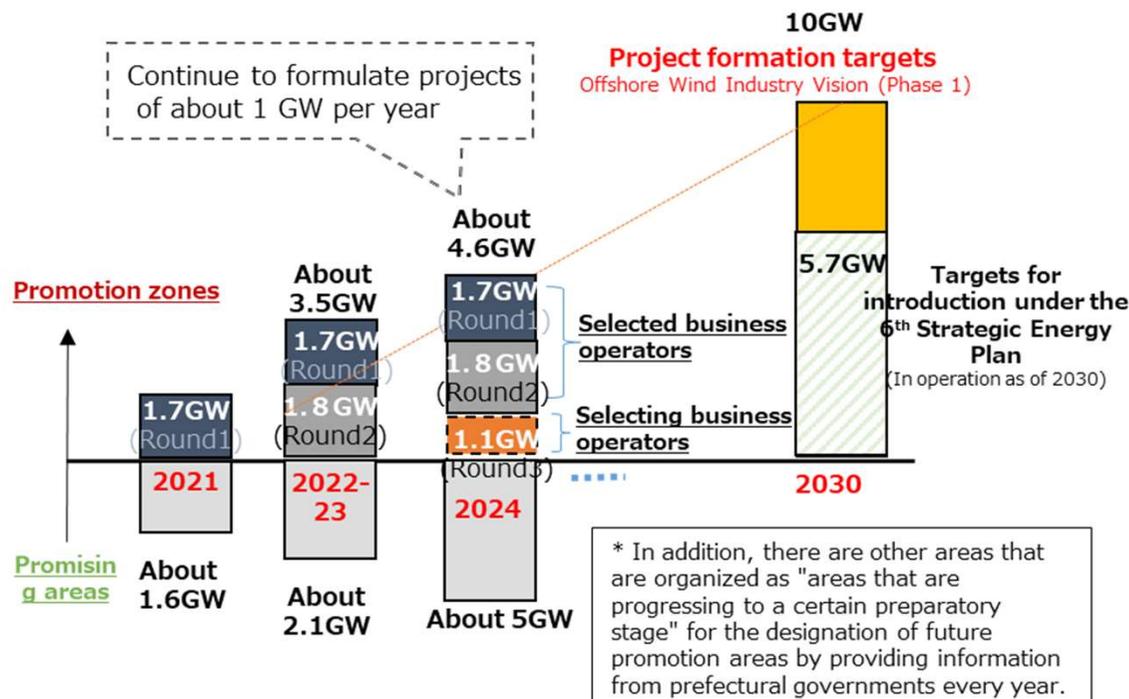


Japan's Power Supply

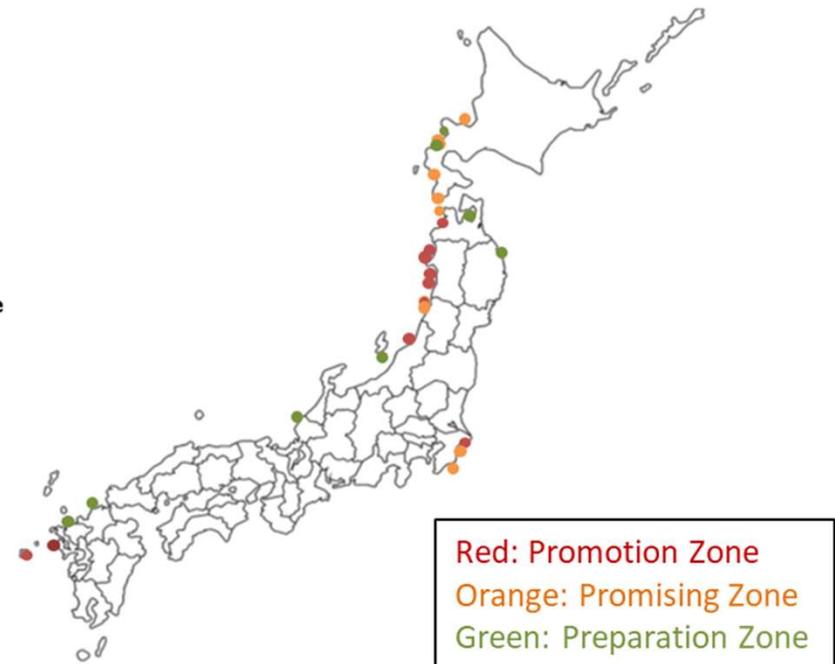


- The Act on Promoting the Utilization of Sea Areas for the Development of Marine Renewable Energy Power Generation Facilities is a law that publicly solicits offshore wind power generation companies and permits them to occupy sea areas for 30 years (enforced on April 1, 2019).
- In December 2020, the "Offshore Wind Industry Vision (Phase 1)" set targets of continuously developing appr. total 10 GW by 2030 and 30~45 GW by 2040.

Image of project formation to achieve goals

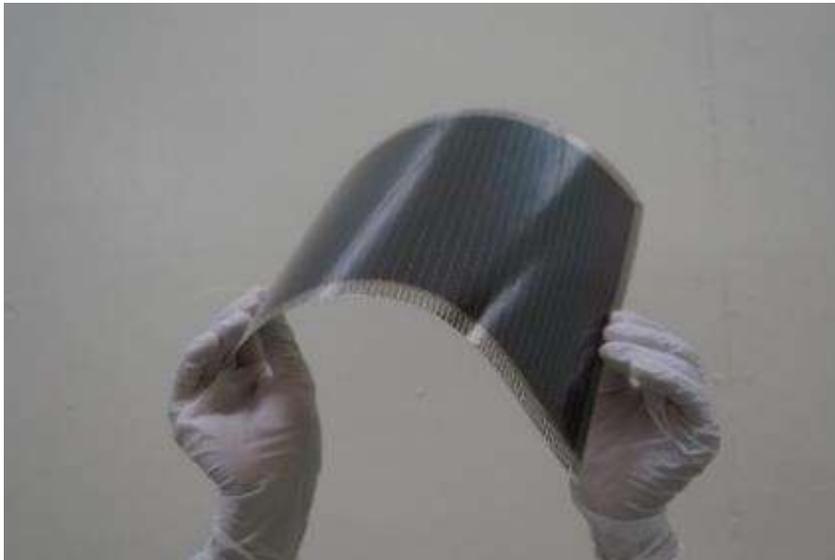


Promotion Zones



- Overcoming location constraints is the key to expanding solar power. Next-generation solar cells (perovskite solar cells) that can be installed on the walls of buildings need to be developed.
- Japan is currently among the top developers of perovskite solar cells (achieving the world's highest conversion efficiency).

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



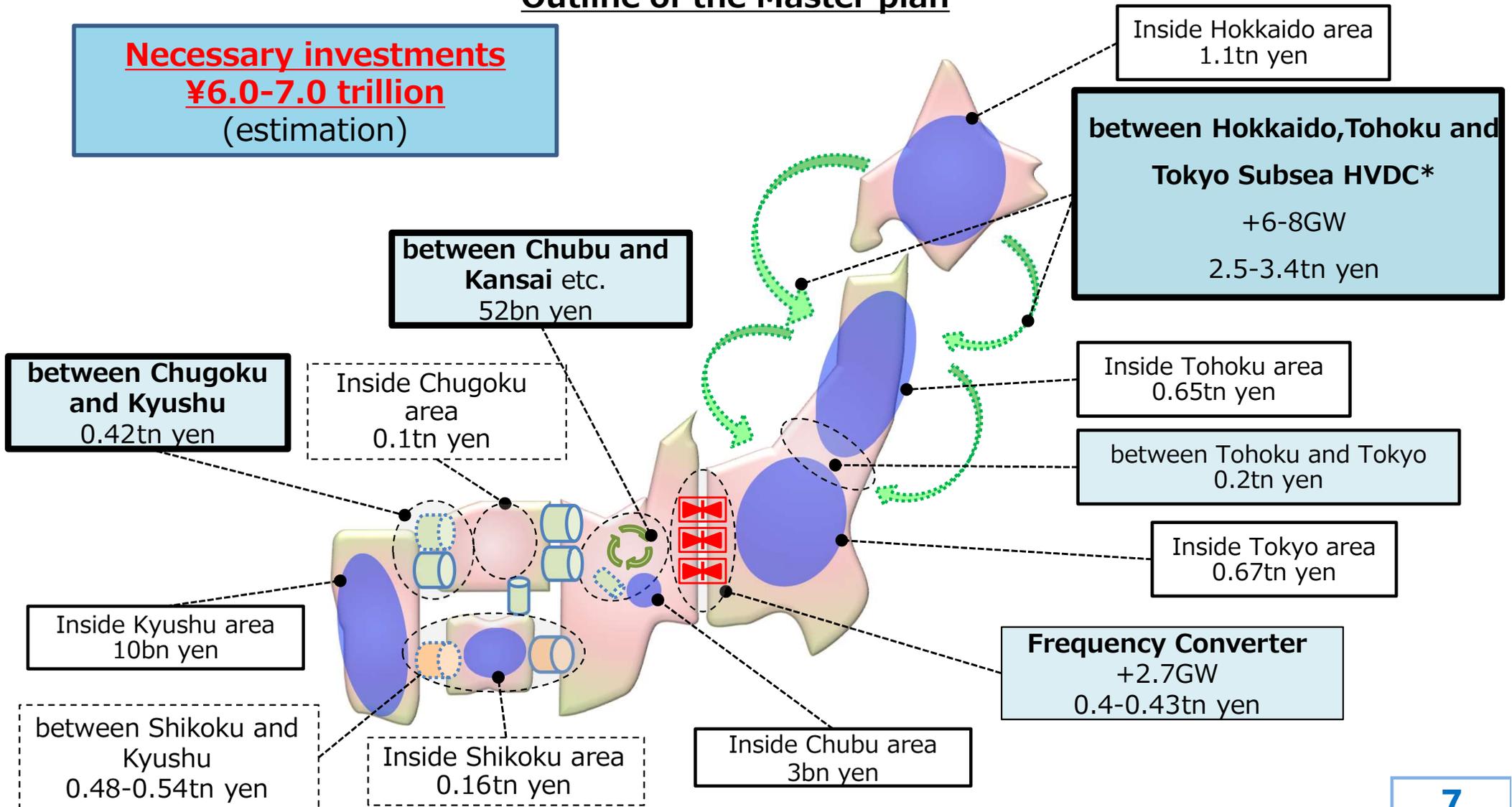
Source: Sekisui chemical Corporation

R&D goal: Achieve a power generation cost of 14 yen/kWh or less under certain conditions (access to direct sunlight, etc.) by FY 2030

Long-term Vision of Cross-regional Network Development

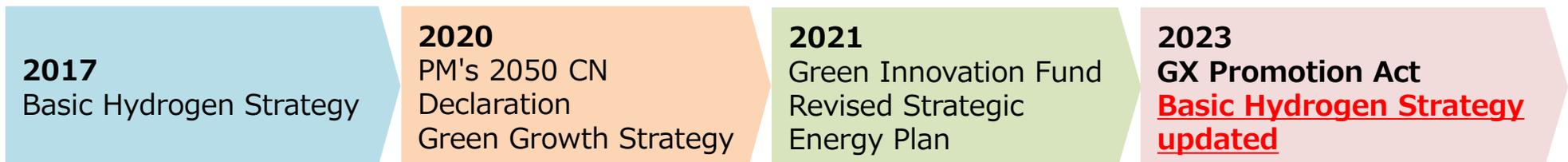
- With a view to achieving carbon-neutral by 2050, a grid development plan (Master plan) was drawn up by OCCTO in March 2023, which shows a concrete picture of the future Trunk Transmission and the actions to realize this vision.

Outline of the Master plan



- Historically Japan started hydrogen/fuel cells R&D back in **1973** (before the oil shock started).
- **The first country to have formulated a national hydrogen strategy (2017).**
- The Prime Minister set **“2050 carbon neutral” declaration (2020).** **\$15bn Green Innovation Fund.**
- Positioned **hydrogen as one of the priority areas** in the Green Growth Strategy.
- **Key part of achieving green transformation economy plan (2023).**

Milestones



Targets (Set in the Basic Hydrogen Strategy on Dec. 26, 2017 – updated in 2023)

□ Supply & Demand volume:

Current (Approx. 2Mt) → 2030 (**Approx. 3Mt**) → **2040 (Approx. 12Mt)** → 2050 (**Approx. 20Mt**)

□ Hydrogen cost:

Current (JPY100/Nm3) → 2030 (**JPY30/Nm3**) → 2050 (**Less than JPY20/Nm3**)
station retail price (=USD2.6/kg-H₂*) (=USD1.7/kg-H₂*) *USD1=JPY130

- To introduce hydrogen having well regard to the **S+3E** principles (**S**afety, **E**nergy security, **E**conomic efficiency, **E**nvironmental compatibility) and industry competitiveness.
- The scope of strategy includes hydrogen and its derivatives such as ammonia, synthetic methane, synthetic fuels, etc., taking into consideration of the challenges and timelines surrounding these products.

Basic Strategy

Expanding Supply

- (a) A new volume target at **12 Mt/p.a. by 2040.**
- (b) Leading to low-carbon hydrogen by introducing:
 - ① **carbon intensity-based criteria**, not “colour” based;
 - ② guiding regulatory requirements.
- (c) Promote domestic production and supply chain. Target share of **electrolysers** (domestic and overseas) that involve Japanese element (including parts and materials) **by 2030 is set around at 15GW.**
- (c) Strengthen relationships with exporting countries, develop transportation technologies and expand financing capabilities.

Creating Demand

- (a) **Power generation**
A wide range of use in power sector, including co-firing and single-firing.
- (b) **Fuel cells**
Deploy FC stack technology in a variety of applications such as commercial vehicles, rolling stocks, vessels, heavy-duties, agri machinery as well as use for decarbonising ports and airports.
- (c) **Industrial use**
Heat use such as boilers and other equipment in the hard-to-abate factories. Develop technologies to utilise as raw material in the fields of steel and chemicals.
- (d) **Home use**
Promote high performance and low-cost residential FC.

To introduce various support schemes with a view to setting up large-scale, resilient supply chains:

- a. **Producer support scheme (price gap subsidy)**
- b. **Cluster development support**

Others:

- ① Promote regional use and consumption and engage local governments
- ② Assist innovative R&D
- ③ Cross-border cooperation for standardisation and other activities
- ④ Raise public awareness and acceptance

The Basic Policy for the Realization of GX(Green Transformation)

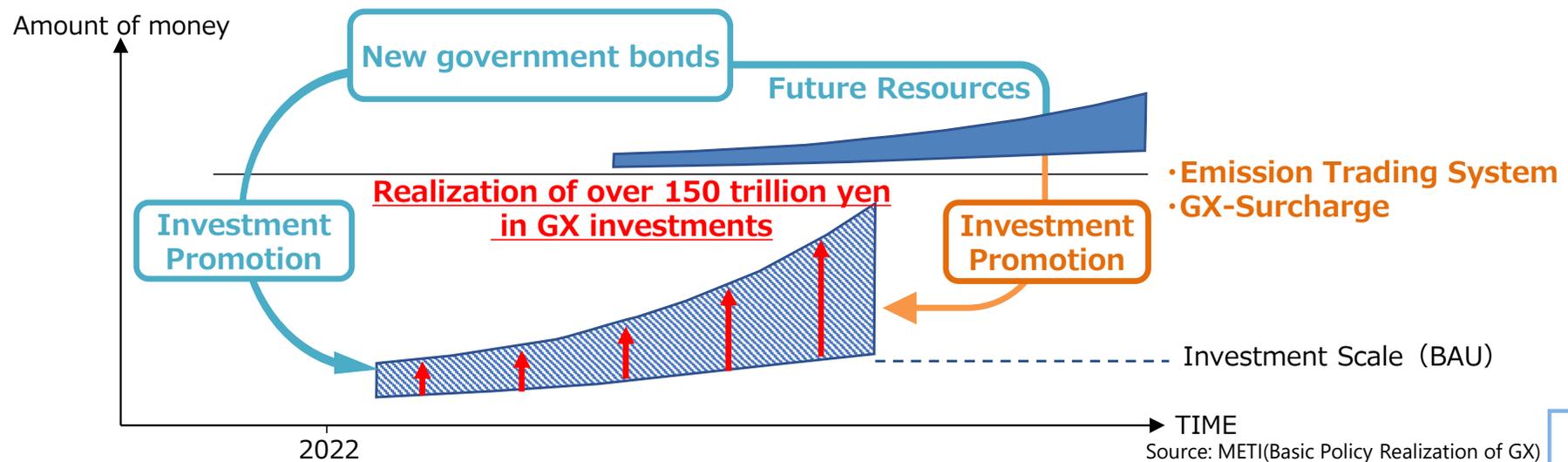
To rebuild a stable supply of energy, measures including promoting drastic shift to decarbonized power Resources will be taken.

- **Promotion of thorough energy efficiency improvement**
- **Renewable Energy:** To expand the introduction of renewable energy, a **grid development plan** has been established. To increase the deployment of offshore wind power, we will establish the Japanese version of centralized system.
- **Nuclear power** : **Replacement** of reactors decided to be decommissioned with next-generation advanced reactors. **Review of operating period** (40 years + 20-year extension + shutdown period such as inspection)

Government support will be provided for **upfront investment of 20 trillion yen** to achieve carbon neutrality by 2050 while strengthening industrial competitiveness and realizing economic growth, **aiming for more than 150 trillion yen of public and private investment for 10 years.**

To promote the GX investment as described above, a "**Pro-Growth Carbon Pricing Concept**" will be embodied and implemented as soon as possible.

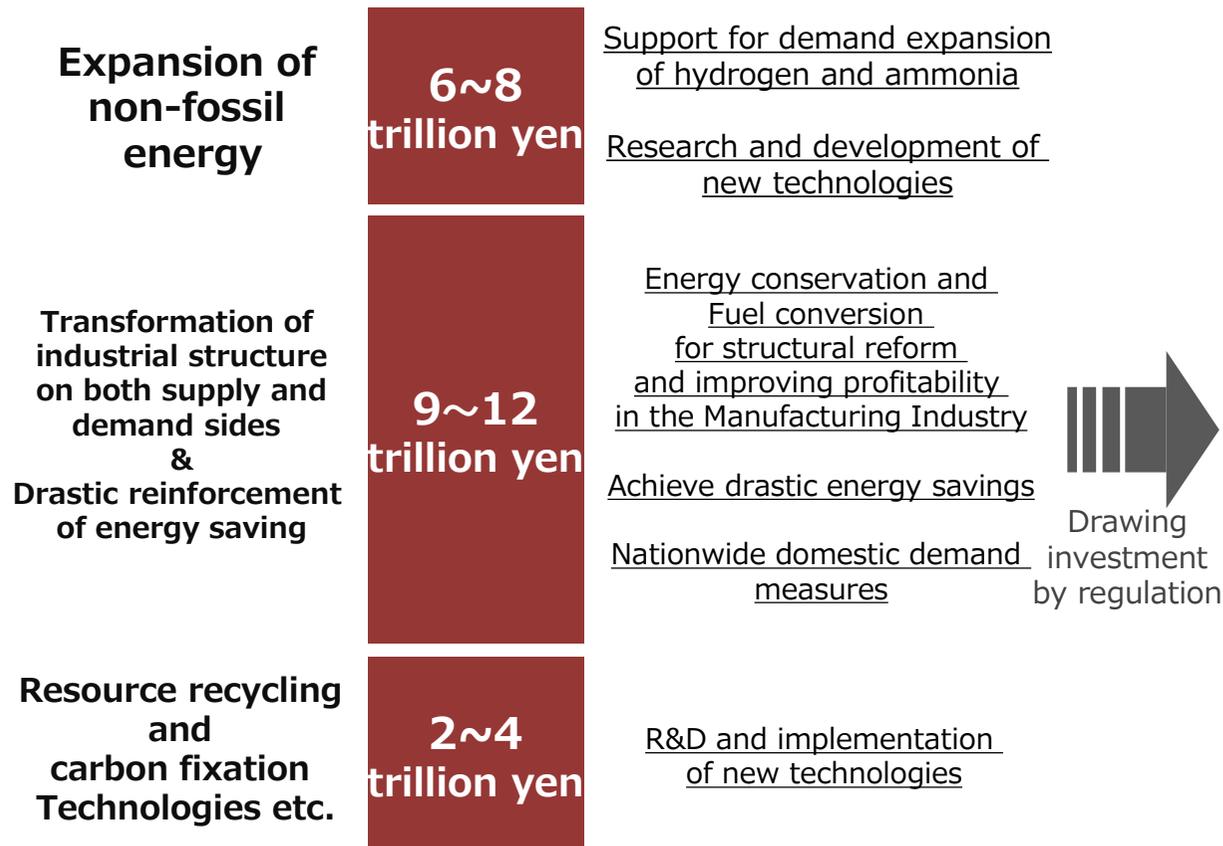
- ① **Government support for advance investment by new government bonds (Japan Climate Transition Bonds)**
- ② **Introduction of carbon pricing to incentivize early for GX investment**
 - (1) Full-scale operation of **emissions trading system** in high emission industries [**from FY2026**].
+ Allowance auctioning to be phased in gradually to **power generation companies** [**from FY2033**]
 - (2) Introduction of a **GX-Surcharge** on fossil fuel supply [**from FY2028**]
- ③ Strengthen financial support through public-private partnership(e.g. blended finance with the GX Promotion Agency)



- By integrating appropriate regulatory and support measures in accordance with the business risks and environment of each sector, Japan aims to attract private-sector investment and achieve public-private investment of over 150 trillion yen.
- In the midst of the global competition for GX investment, Japan will provide government support of sufficient scale and duration, taking into account trends in investment support in other countries and the results of past government support. 20 trillion yen of support will be reviewed as necessary, based on the progress and effects of projects and so on.

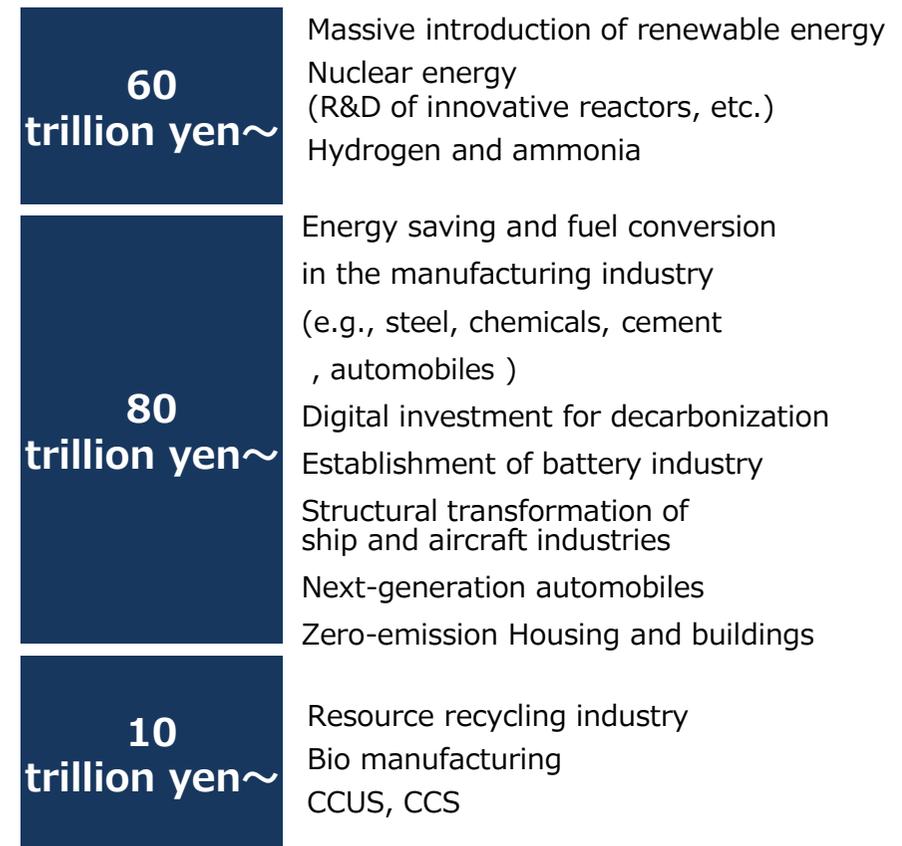
Breakdown of 10-year government support (provisional)

20 trillion yen



Overall public and private investment over 10 years

150 trillion yen



- In January 2022, Prime Minister Kishida proposed that Asian countries share the idea of decarbonization and work together to advance energy transition.
- In March 2023, the AZEC Ministerial Meeting ;

The AZEC joint statement

- Promoting cooperation to ensure Energy Security and Decarbonization
- Transitions in a manner compatible with economic growth in each country
- Diverse and realistic pathways according to each country's circumstances, utilizing diverse energy sources and technologies



- The AZEC Leaders' Meeting was held on December 18th ;

- ① Basic principles for decarbonization

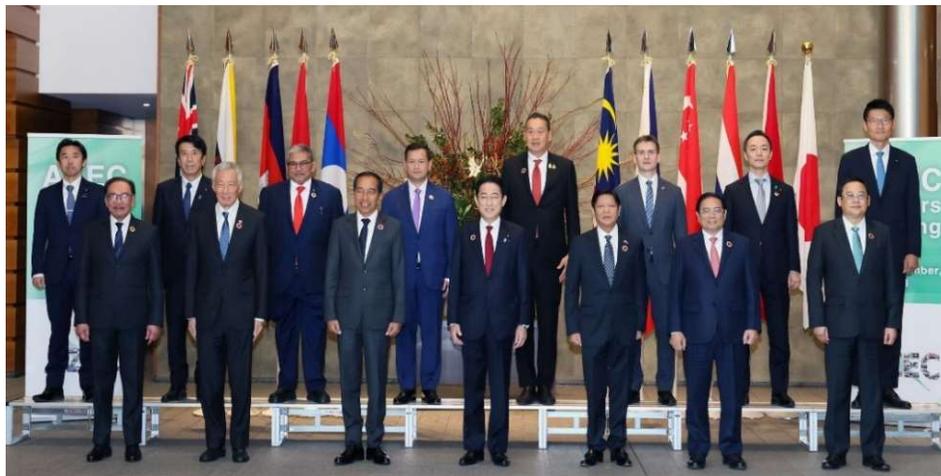
<Triple Breakthrough>

Simultaneous realization of all three (decarbonization, economic growth, and energy security)

<One goal, Various pathways>

- ② The direction of specific cooperation utilizing technology and support
- ③ Cooperation in policy coordination and promotion of specific projects

- The **“AZEC Leaders’ Joint Statement”**
 - ① **AZEC principles towards decarbonization** (Triple breakthrough of simultaneously achieving “decarbonization, economic growth, energy security”; achieving a common goal of “net-zero emissions through various pathways”)
 - ② **Supporting policy development (“Asia Zero Emission Center” to be set up in ERIA), fostering public-private cooperation (AZEC Advocacy Group)**
 - ③ **Strengthening cooperation on decarbonization technologies, establishing green supply chains for manufacturing industries, promoting transition finance**
- **Over 350 tangible cooperation projects ongoing**
- **Broad support to AZEC principles and high expectations for AZEC activities from leaders**
- The **importance of realistic energy transitions reflecting factors such as energy security** highlighted by Dr. Daniel Yergin as a guest



AZEC Leaders Meeting Attendance: (Credit: Cabinet Public Affairs Office)
Australia, Brunei Darussalam, Cambodia, Indonesia, Lao PDR, Malaysia, the Philippines, Singapore, Thailand, Viet Nam, Japan (PM Kishida, METI Minister Saito)
Dr. Daniel Yergin (Guest), ERIA (Observer)

Report on tangible cooperation

- AZEC progress report (P.3,4)

AZEC Advocacy Group

- Joint statement by ASEAN-BAC, Keidanren and ERIA
- Panel discussion by experts including above members at the ASEAN-Japan Economic Co-Creation Forum (Dec 16)



Commemorative photo session on Joint Statement [with witness of PM Kishida, President Joko, METI Minister Saito] (Credit: Cabinet Public Affairs Office)

Panel Discussion

Thank you for your attention!