

Japan's Energy Policy Amid Rising Geopolitical Tensions

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Policy Targets in Japan's Energy Policy

- Based on the Strategic Energy Plan, Japan sets up the energy policy targets, **①Safety**, **②Energy security**, **③Economic efficiency**, and **④Environment** simultaneously. (**S+3E**)

Policy target for 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)

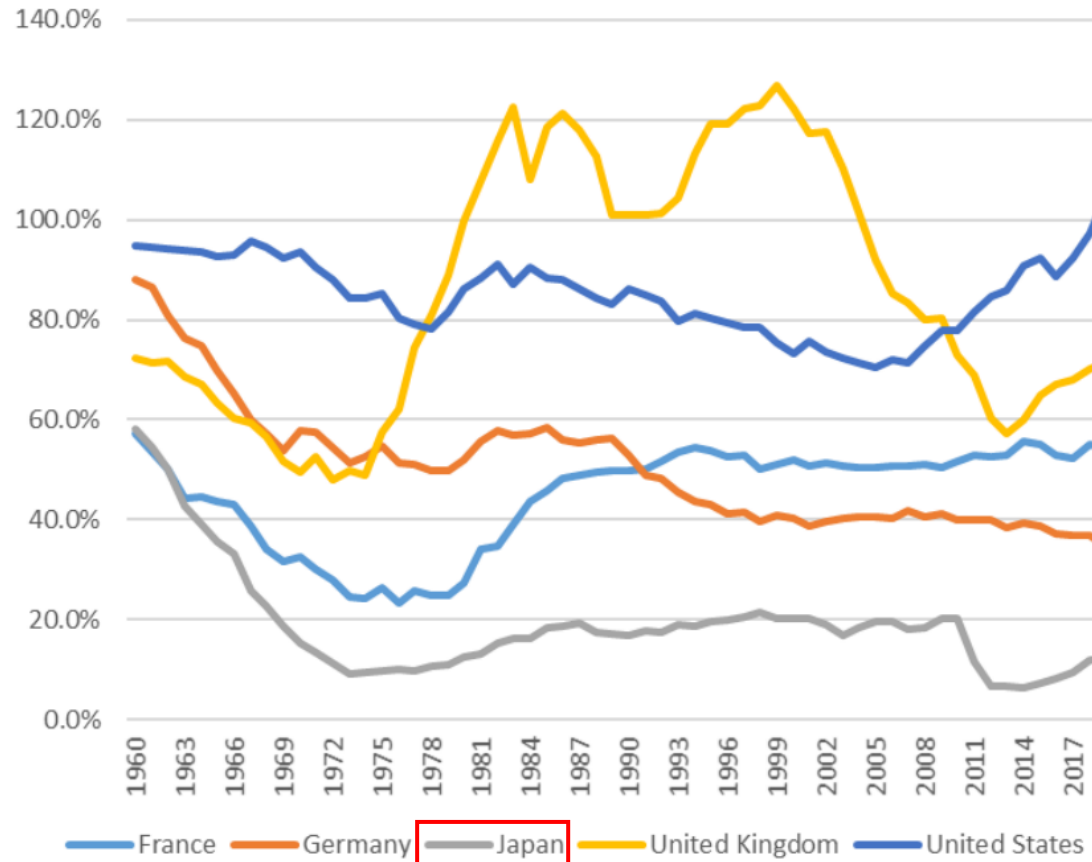
Environment

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

Japan's Energy Self-sufficiency Rate

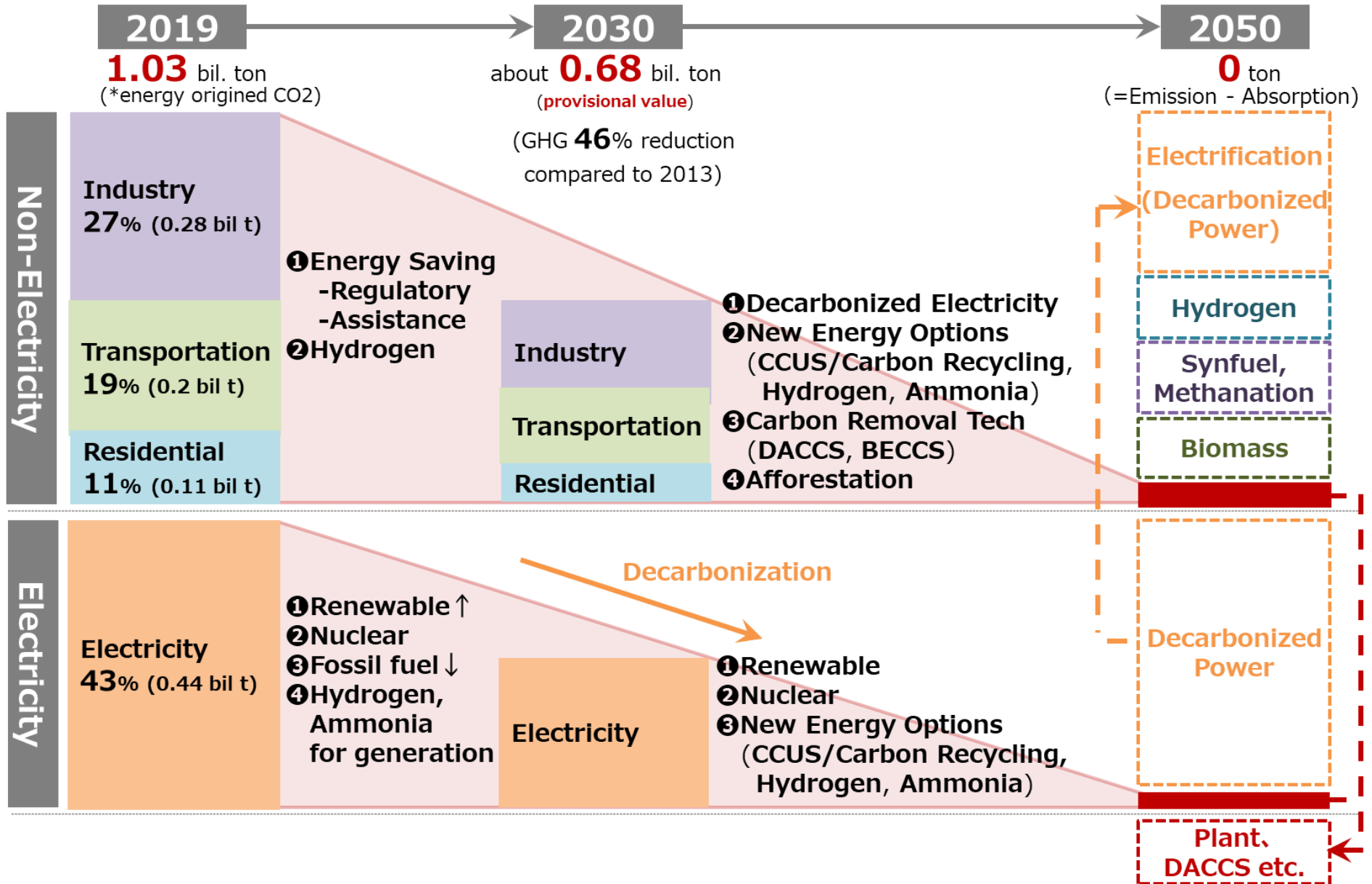
- Japan's energy self-sufficiency rate is on the increasing trend due to the increased introduction of renewable energy and the restart of nuclear power plants, but **it remains low compared to other countries.**

Trends in the primary energy self-sufficiency rate of various countries



Source: METI based on IEA Database

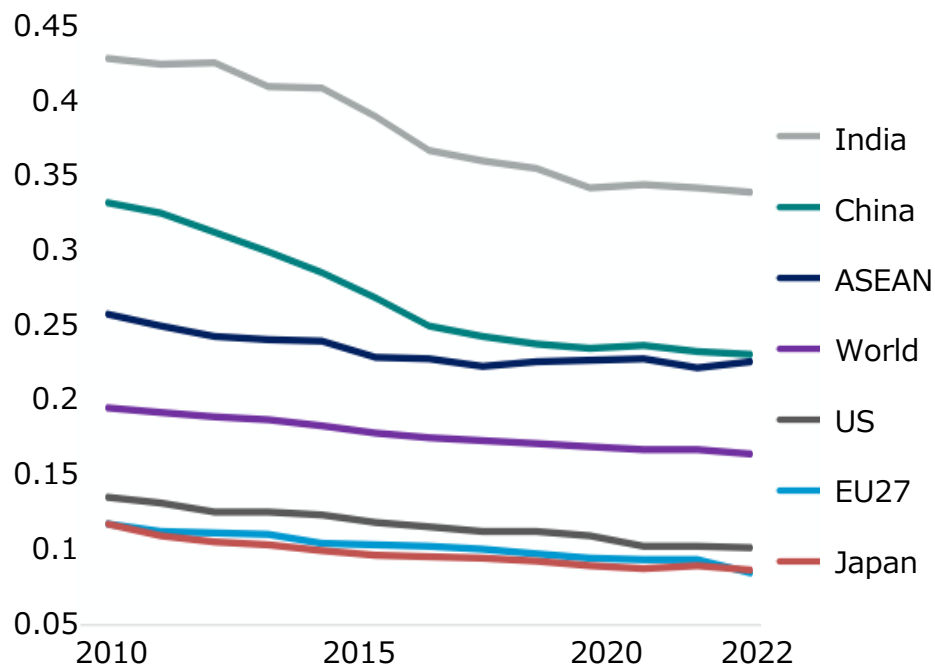
Japan's pathway toward Carbon Neutrality by 2050



Energy Saving: (1) Energy Efficiency and Energy Consumption

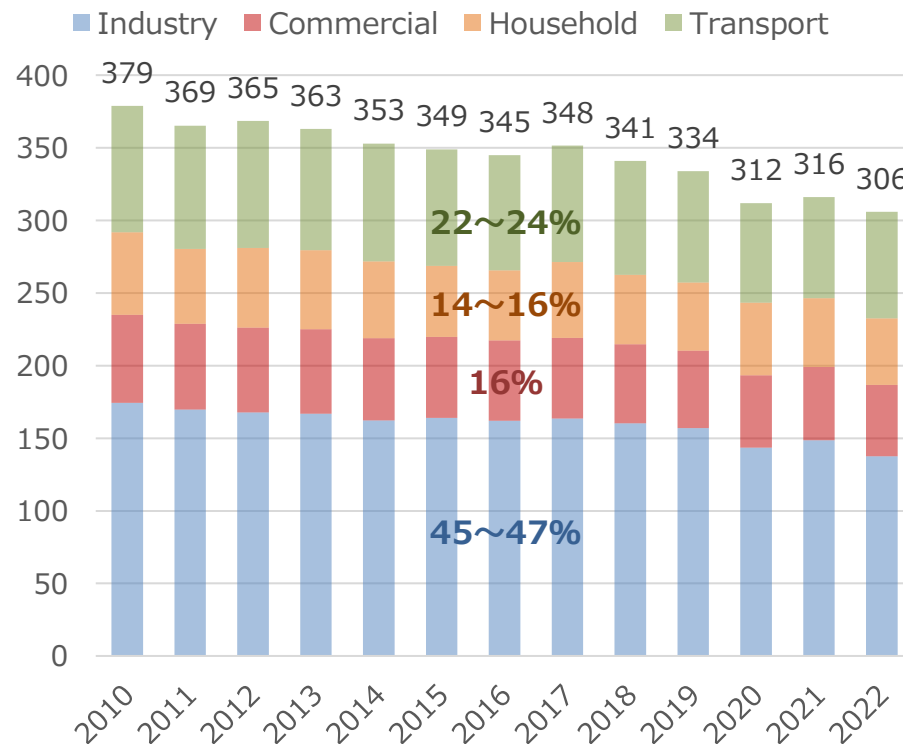
- Japan's energy efficiency is among the highest in the world and continues to improve, and its final energy consumption is also declining in all sectors.
- Japan will continue to support the development and introduction of high-efficiency equipment and promote non-linear technological innovation.

Primary Energy Consumption Rate per GDP
(Petroleum equivalent tons/1000 dollars, 2015 prices, exchange rate basis)



Source: IEEJ based on IEA (2024)

Primary Energy Consumption in Japan
(crude oil equivalent Million kL)

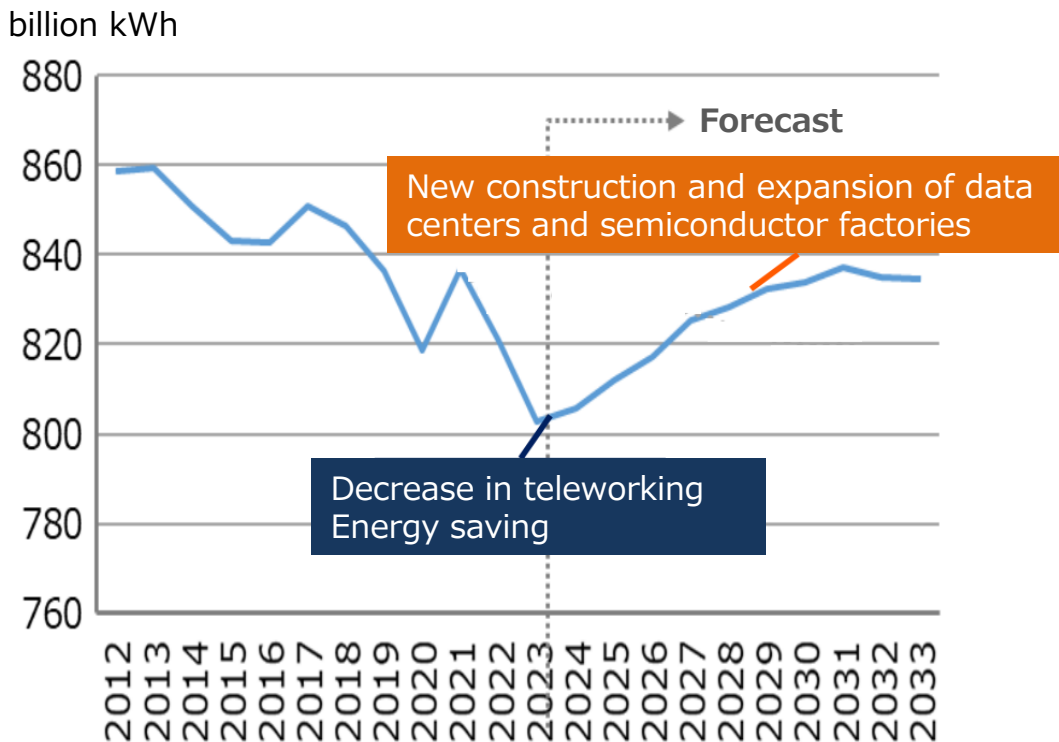


Source: METI

Energy Saving: (2) Potential Increase in Electricity Demand

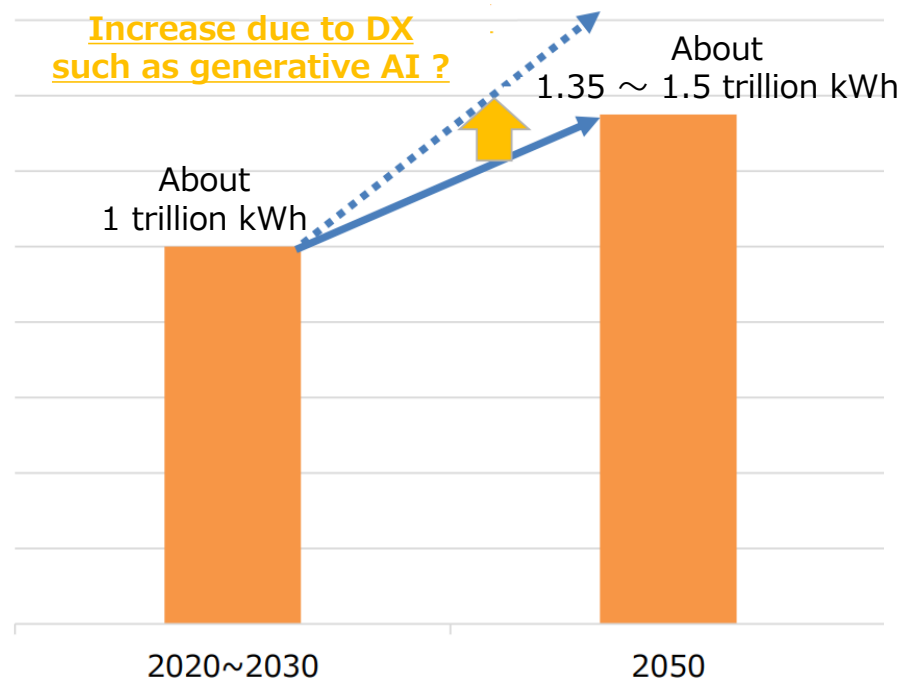
- As the use of generative AI expands, the power consumption of computational resources may begin to increase.
- While promoting the development of semiconductor technologies that contribute significantly to reducing power consumption, it is necessary to respond by assuming a scenario in which power consumption increases rapidly.

Forecast of Japan's Electricity Demand



Source: METI

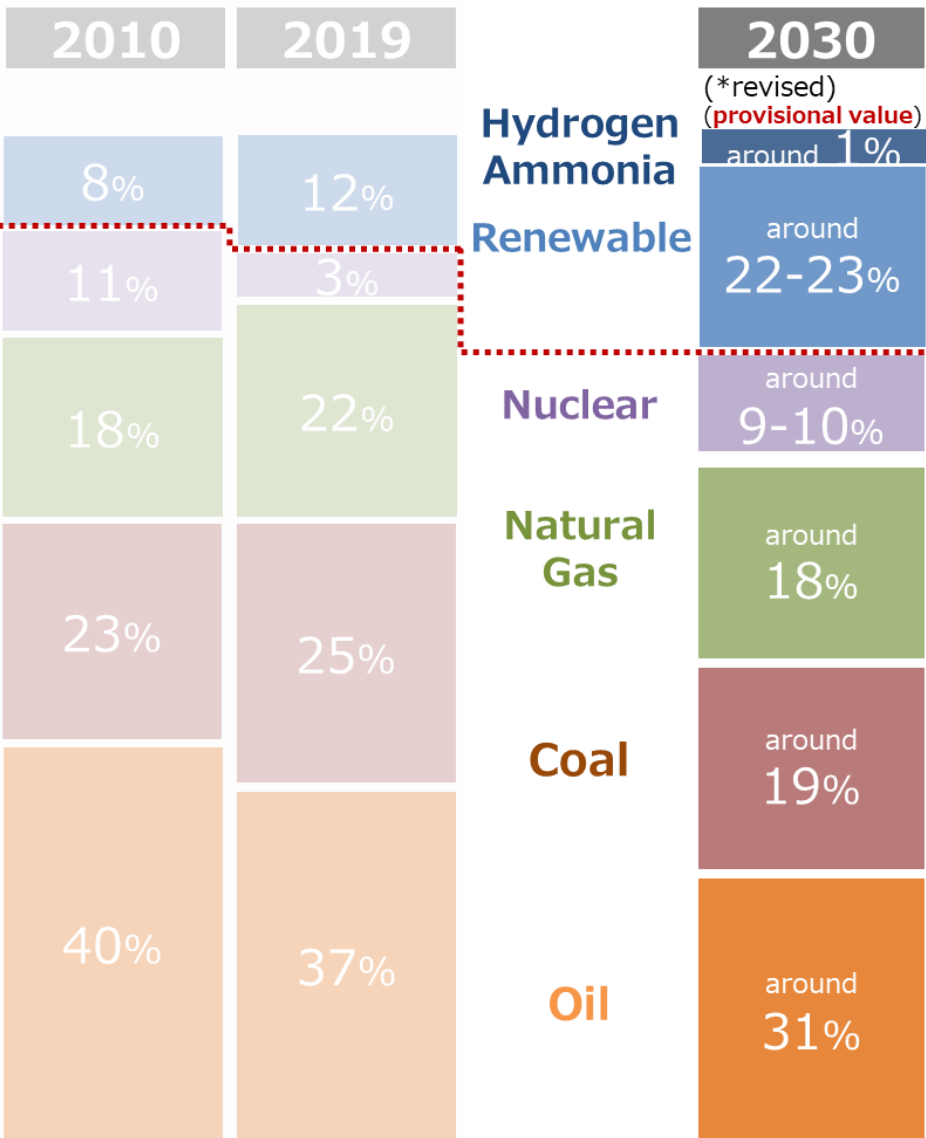
Image of Amount of Electricity Needed in Japan



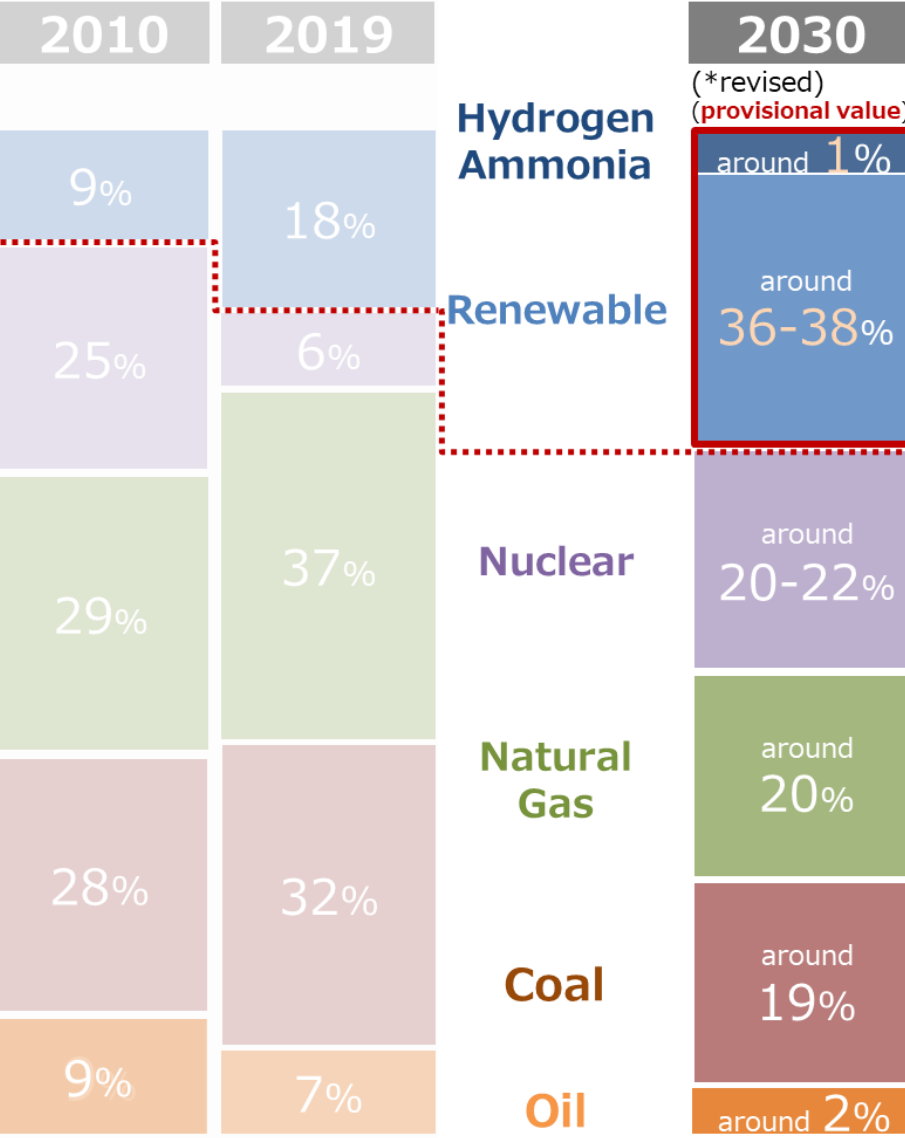
Source: METI

Japan's Energy Mix (2030)

① Primary Energy

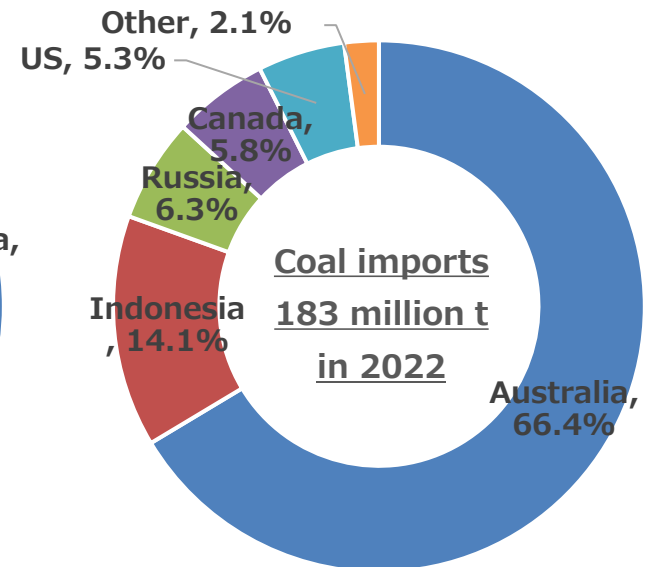
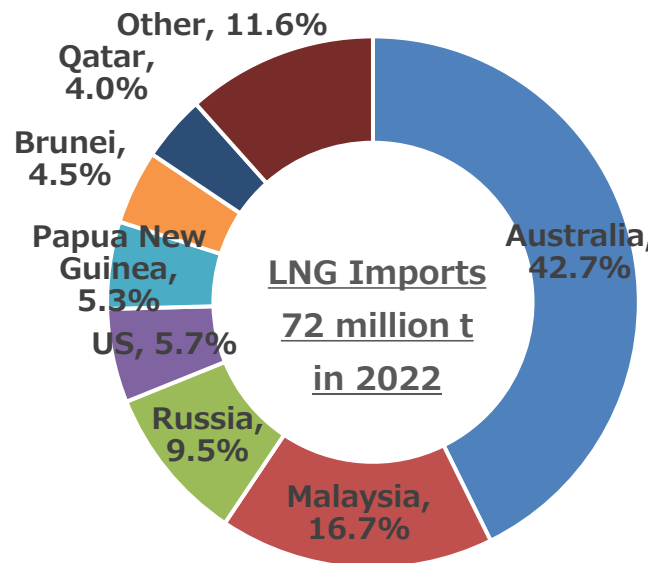
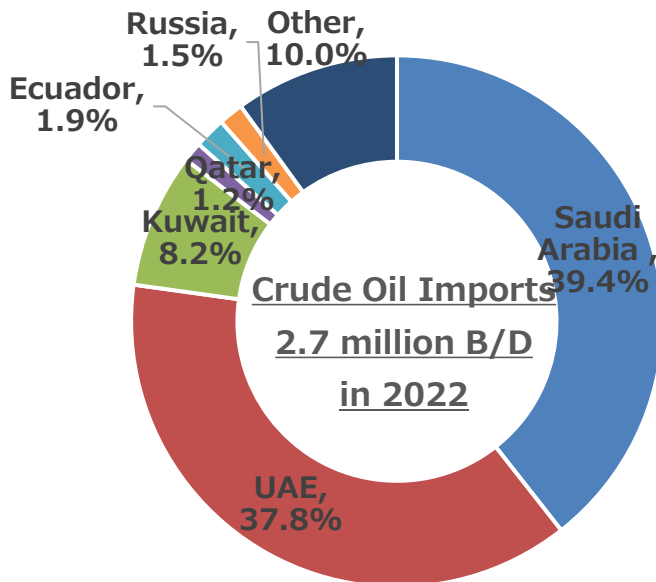


② Secondary Energy (Electricity) *kwh



Fossil Fuels: (1) Japan's Dependence on Foreign Fossil Fuels

- **Japan imports almost all of its fossil fuels from abroad.** It is about 90% dependent on the Middle East for crude oil.
- In comparison to crude oil, LNG is more diversified in terms of countries of origin, with the dependence on the Middle East of about 10%.
- Japan's dependence on the Middle East for coal is zero. It can be imported from countries with low geopolitical risk and geographic proximity, such as Australia.

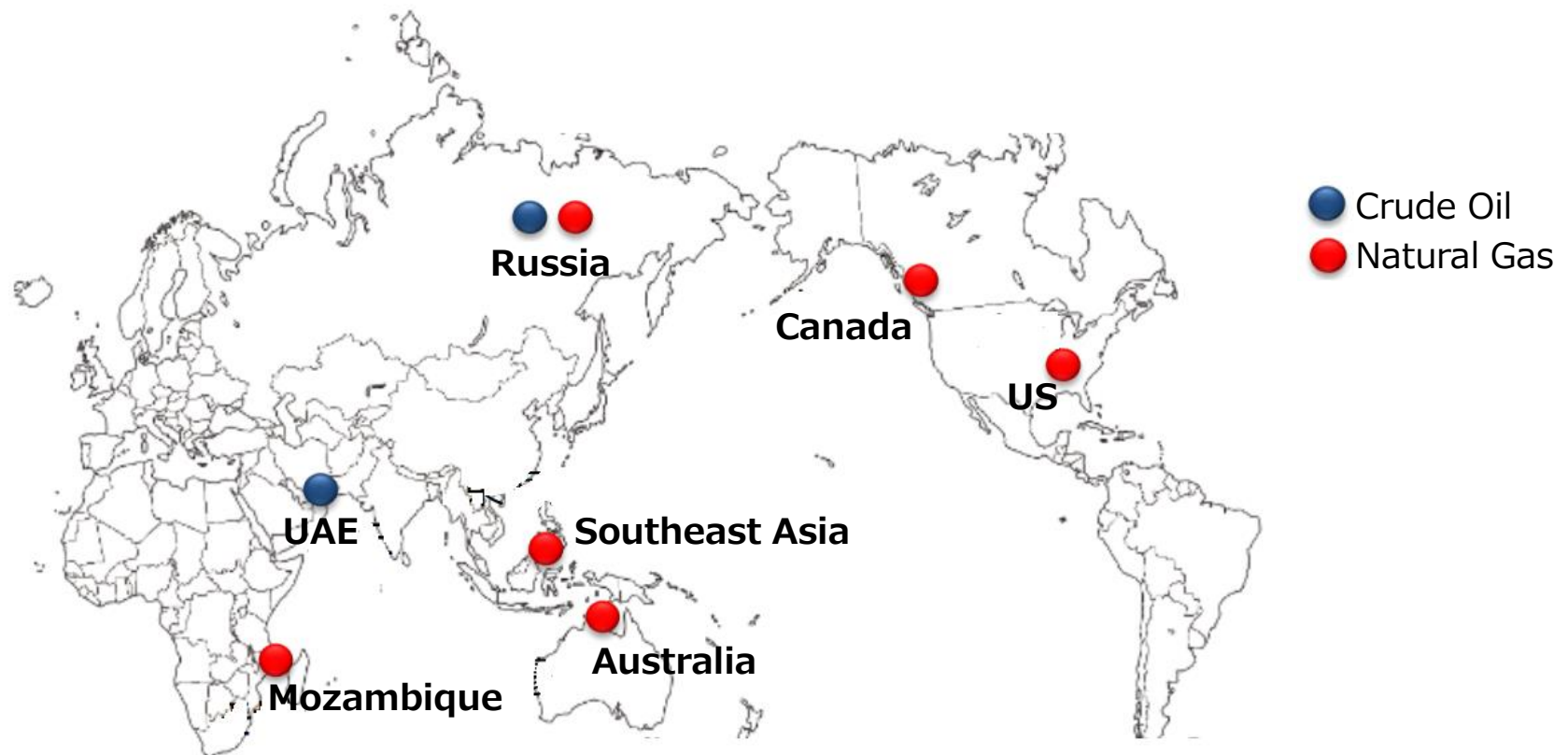


Source: METI based on Trade Statistics of MOF

Fossil Fuels: (2) Diversification of Fossil Fuel Sourcing Countries

- In order to secure a stable supply of fossil fuels, it is essential for Japan to diversify its sourcing countries.
- Therefore, it is important for Japan to secure interests in overseas projects in addition to concluding fossil fuel purchase agreements.

Major oil and gas projects involving Japan



GX: (1) 2050 Carbon Neutral and 2030 Climate Goal in Japan

- In October 2020, Prime Minister Suga declared that by 2050 Japan will aim to reduce greenhouse gas emissions to net-zero, that is, to realise a carbon-neutral, decarbonised society.
- At Leaders Summit on Climate in April 2021, Prime Minister Suga 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)



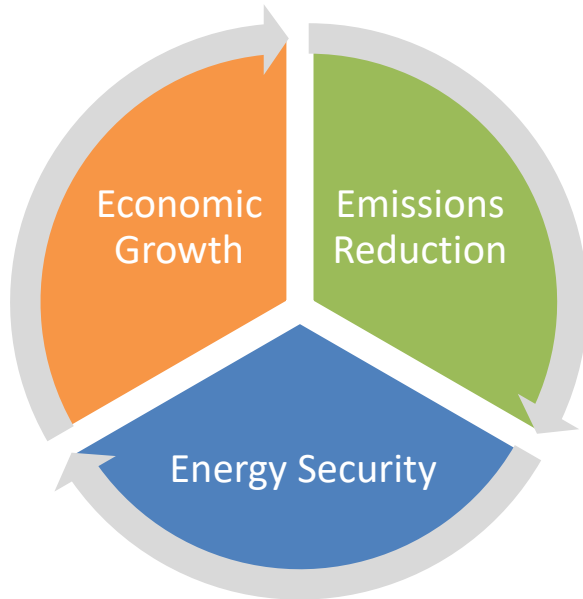
Japan aims to reduce its greenhouse gas emissions by 46 percent in the fiscal year 2030 from its fiscal year 2013 levels, and that Japan will continue strenuous efforts in its challenge to meet the lofty goal of cutting its emissions by 50 percent.

GX: (2) Green Transformation's Three Principals

Triple breakthrough

Japan aims to simultaneously achieve

- Emissions Reduction
- Economic Growth
- Energy Security



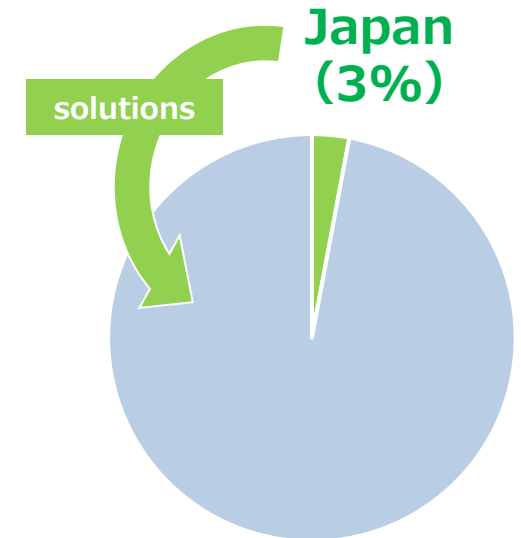
One goal, various pathways

Toward our common goal of achieving net zero, we will make practical energy transitions through various pathways depending on the circumstances of each country.



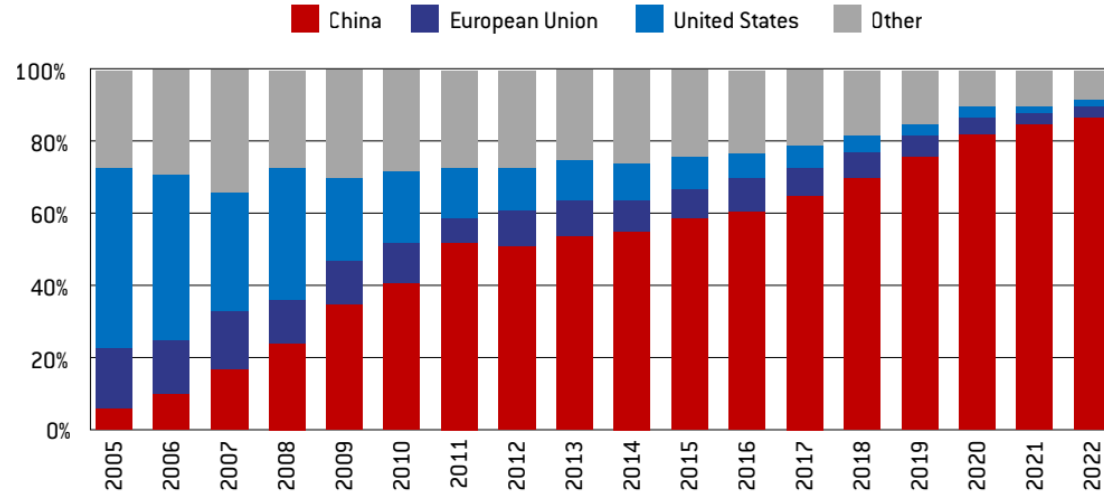
Solution to the world

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

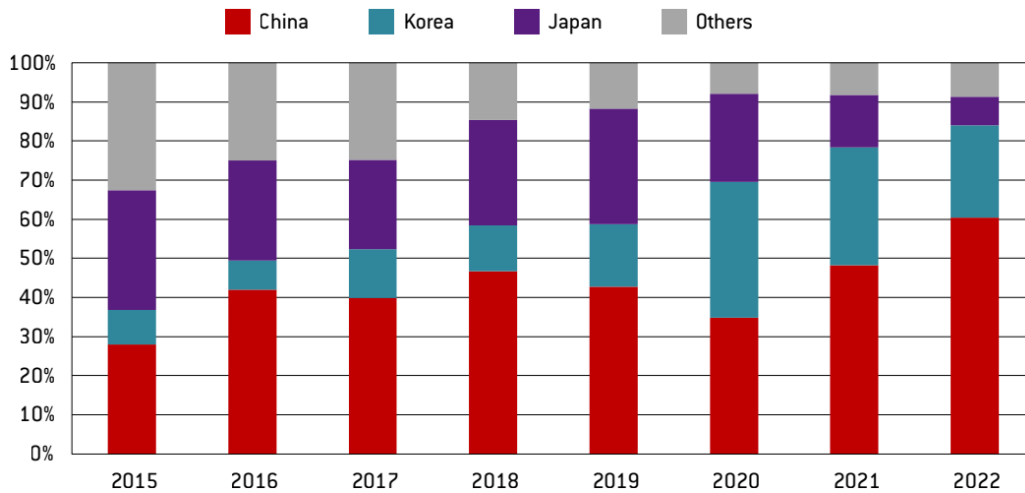


GX: (3) Challenges ① Excessive Dependence for GX Technologies

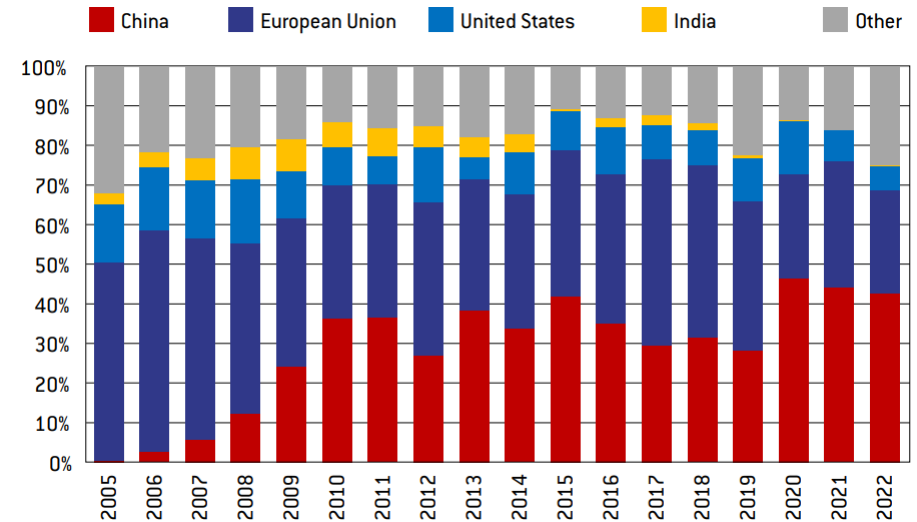
Solar Panels



Lithium-ion EV Battery



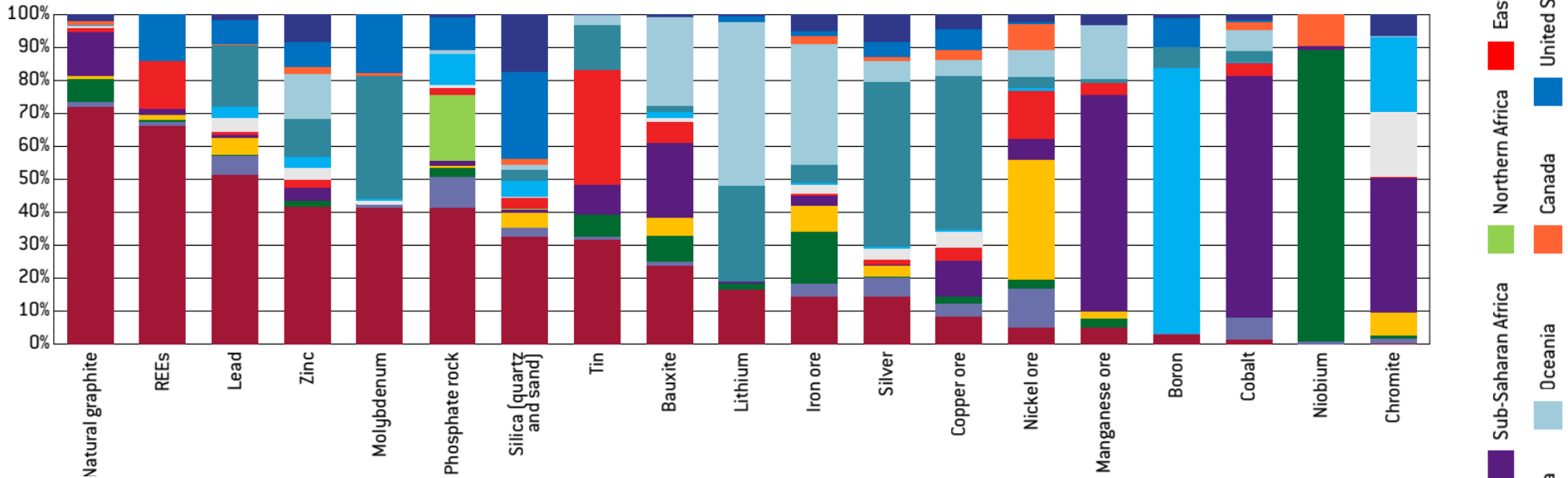
Wind Turbine



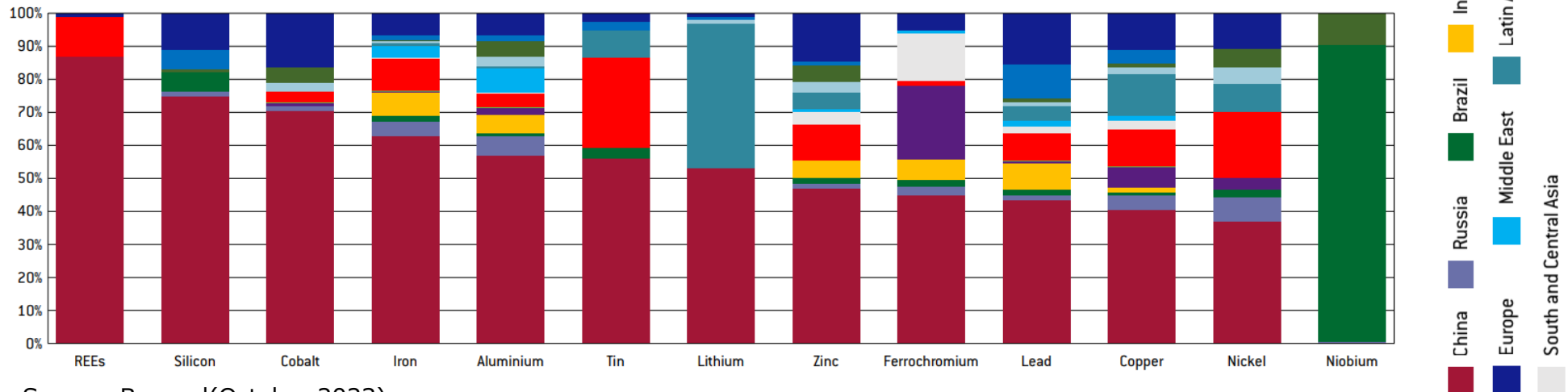
Source: Bruegel(October 2023)

GX: (3) Challenges ① Excessive Dependence for GX Technologies

Extraction of Renewable Energy Minerals



Refining of renewable energy minerals



Source: Bruegel(October 2023)

Reference: Sustainability Criteria

Joint Press Statement of Japan-EU High Level Economic Dialogue (May 2, 2024)

2. They expressed **deep concern about the weaponisation of economic dependencies** on certain supply sources for strategic goods, resulting from a wide range of non-market policies and practices such as market-distortive industrial subsidies. They recognise the need to address systemic vulnerabilities, stemming from such strategic dependencies and overcapacities, and to **promote level playing field** through coordinated efforts.
3. Ministers concurred on a Transparent, Resilient and Sustainable Supply Chains Initiative to coordinate and advance their efforts on policies for building more transparent, resilient and sustainable supply chains. ... Ministers raised the need to work together on the following issues, ensuring consistency with international rules including WTO Agreements:
 - a. Addressing strategic dependencies and systemic vulnerabilities and ensuring resilient and reliable global supply chains through the application of the **principles of transparency, diversification, security, sustainability, trustworthiness and reliability**, in the efforts to address, among others, climate change, energy security, cyber security and the stability of supply.
 - b. Continuing their coordinated efforts with the view to identifying requirements based on such principles including in the **procuring and auctioning of goods and services**, and in **other demand-side policies such as consumer subsidies**.
 - c. Encouraging businesses to enhance transparency, resiliency, and sustainability **in the market**.
 - d. Building and enhancing transparent, resilient, and sustainable supply chains as broadly as possible **in coordination with like-minded countries**.

Reference: Sustainability Criteria

Apulia G7 Leaders' Communiqué
(June 15, 2024)

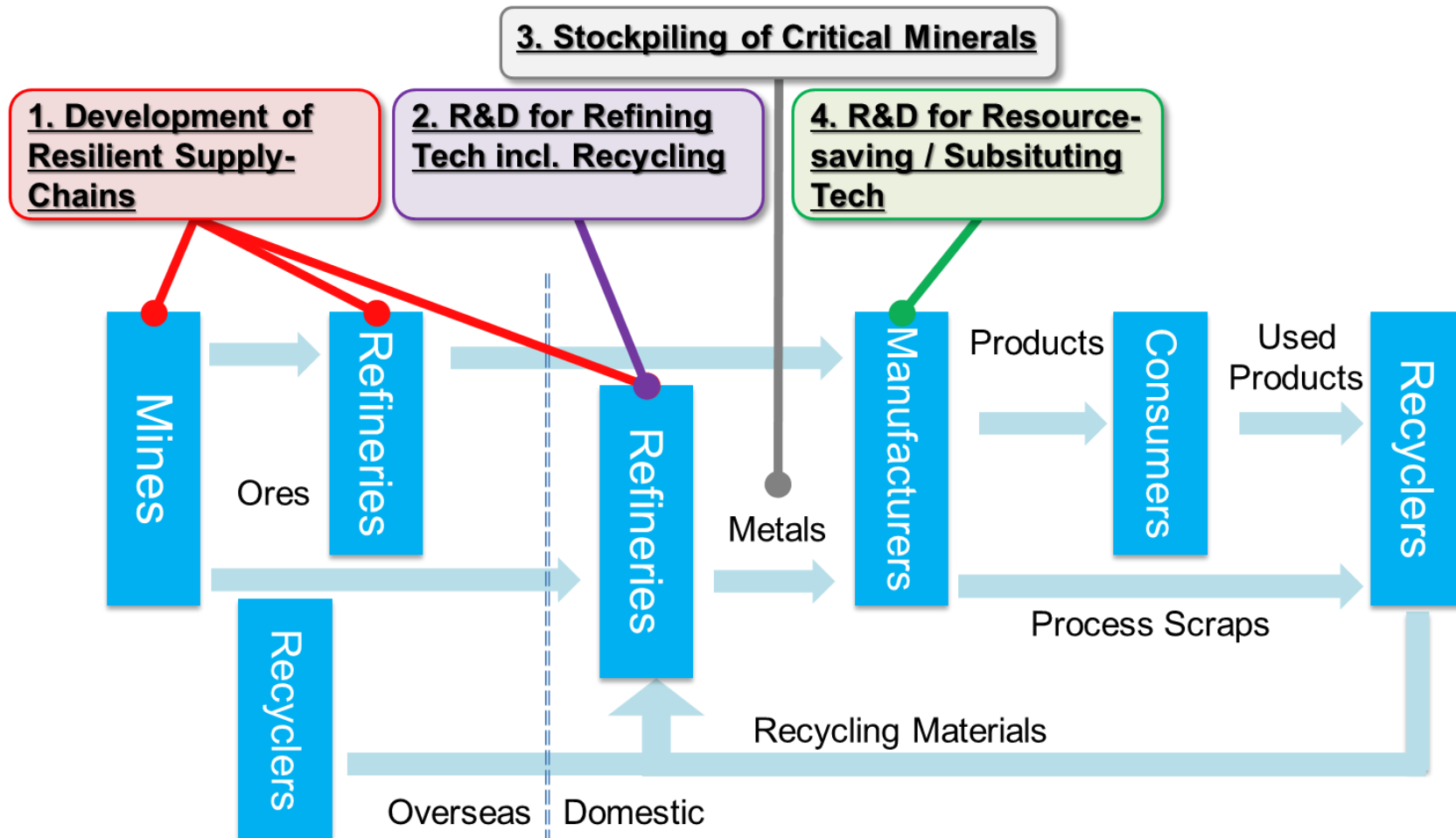
Economic Resilience and Economic Security

Building on the progress we made on our strategic coordination since Hiroshima, we reinforce our commitment to promote economic resilience and economic security, in partnership and cooperation within and beyond the G7. In particular, we are building resilient economies and supply chains, ensuring our toolkits to respond to harmful practices are fit for purpose, and safeguarding critical and emerging technology that could be used to threaten international peace and security.

Recognizing that economic resilience requires de-risking through diversification and reduction of critical dependencies, including those resulting from overcapacity, **we will implement the principles on resilient and reliable supply chains, namely transparency, diversification, security, sustainability, trustworthiness and reliability**. We will do so by actively engaging with partners and the private sector, within and beyond the G7, while preserving economic dynamism and openness. We encourage the public and private sectors to make coordinated efforts to strengthen the supply chains resilience of strategic goods, in terms of both supply and demand. This will include **seeking to collectively identify critical goods, strategic sectors, and supply chains, for future coordination within the G7 on relevant criteria that take into account not only economic factors, but also factors linked to the principles above**.

Reference: Japan's Mineral Resources Policy

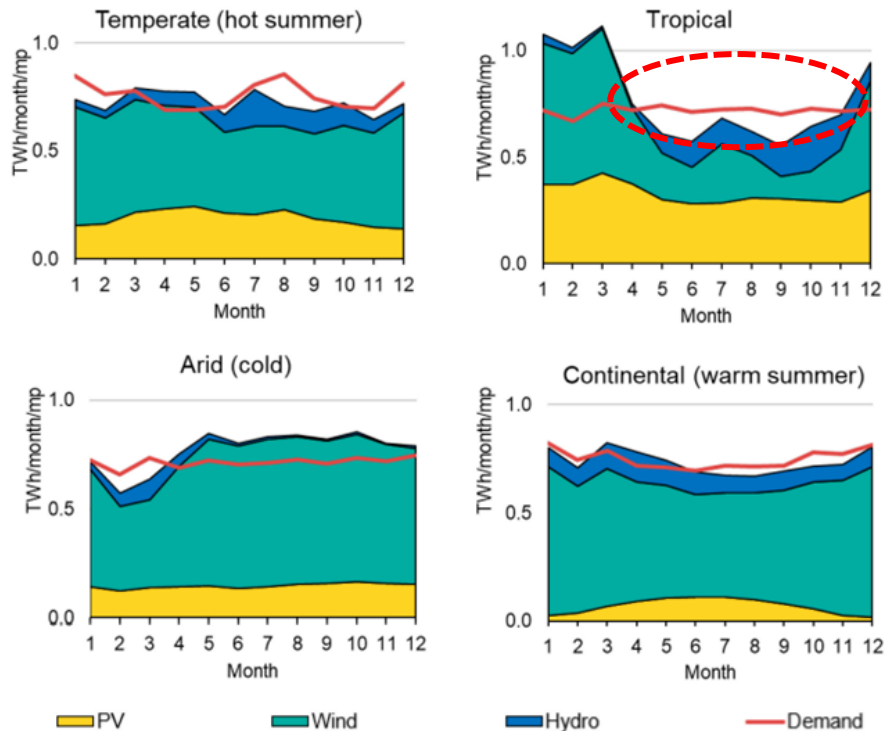
- To secure the stable supply of mineral resources, the Japanese government promotes policies shown below and conducts diplomatic approaches to resource-rich countries and other like-minded countries.



GX: (3) Challenges ② Managing Variability

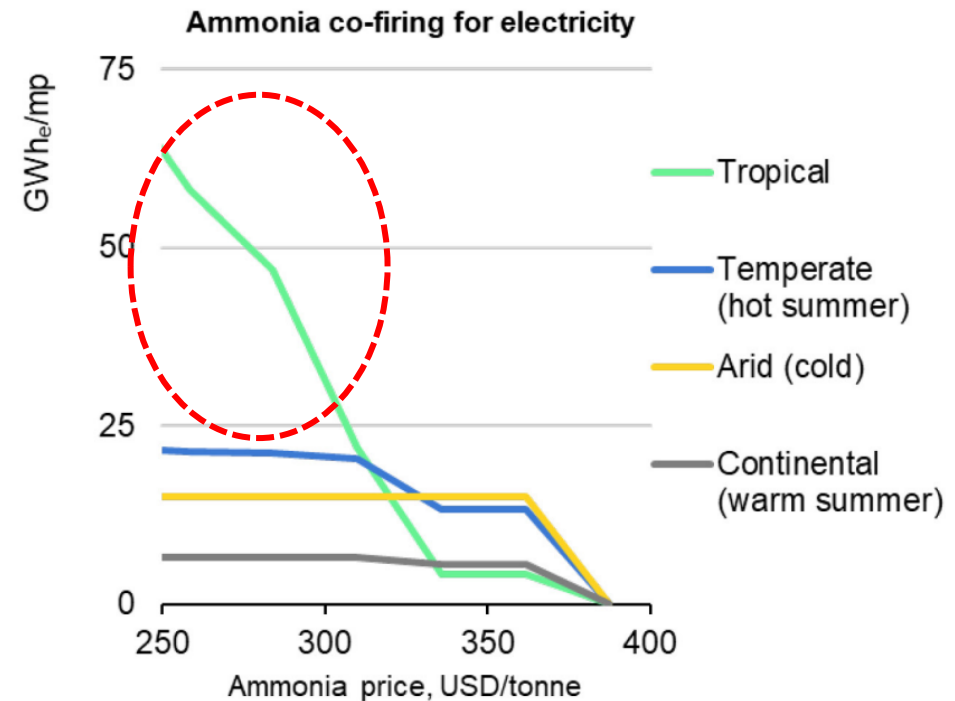
- The IEA report analyzes the impact on the energy system due to its seasonal and interannual variations in each of the four climate categories, which is an issue that will arise as the introduction of renewable energy expands.
- Especially in tropical regions such as Southeast Asia, the need for adjustability to the impact is high, and zero-emission thermal power generation.

Monthly Demand and Generation Potential from Renewables based on an hourly optimisation model



Source: IEA

Impact of Import Cost on the Use of Low-emission Ammonia for Power Generation by Example System



Source: IEA

Reference: Hydrogen and Ammonia Power Generation

- Japan is a world leader in hydrogen power generation technology. Demonstration projects are underway for both large and small turbines.
- In addition, Japan is also developing ammonia power generation technology. Stable combustion and reduced NOx emissions with 20% of ammonia co-firing have already been achieved. Demonstration with actual large-scale equipment (1GW power plant) is expected to be completed in FY2024.

Hydrogen Power Generation

<1MW class>

Achieving combined heat and power supply to urban areas using hydrogen exclusively in 2018.



Hydrogen CGS on Port Island in Kobe City

<500MW class>

Achieving hydrogen co-firing rate of 30%vol in 2018.

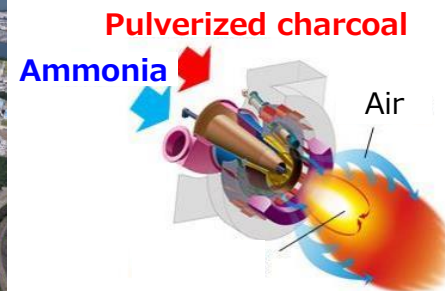
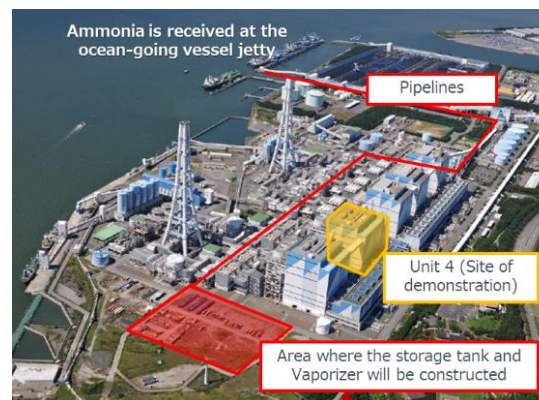
The image of gas turbine



Combustor

Ammonia Power Generation

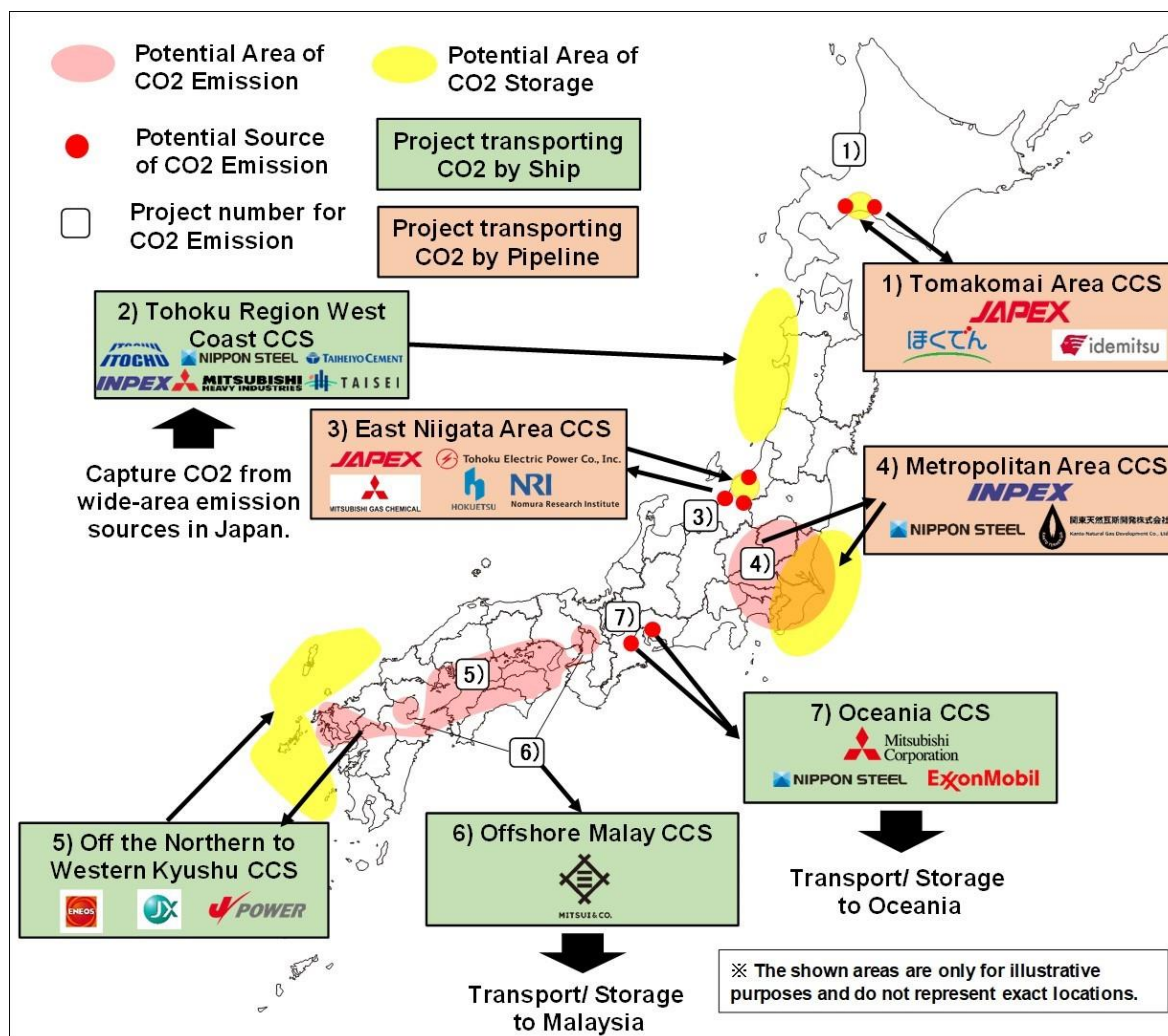
JERA Hekinan Thermal Power Station



Ammonia Storage Tank

Reference: Advanced CCS Program projects

- Program aims to **establish CCS business models by supporting projects** with different combinations of CO2 source, transportation methods and CO2 storage areas. It aims to **secure 6-12 million tons of CO2 storage per year by 2030**.



Key Elements of G7' Communiqué

Various pathways according to each country's situation

- highlight various pathways according to each country's energy situation, industrial and social structures, and geographical conditions should lead to our common goal of net zero

Energy security and clean energy transitions (Para 49),
G7 Sapporo Climate, Energy and Environment Ministers' Communiqué

Engagement with other developing and emerging countries

- We reaffirm the critical importance of collective action, and engagement with other developing and emerging countries, particularly within the G20, to accelerate emission reduction, including by supporting their transition to net-zero GHG emissions through various and practical pathways taking into account national circumstances

Collective action (Para 58),
G7 Sapporo Climate, Energy and Environment Ministers' Communiqué

Importance of countering geopolitical risks

- emphasize the importance of countering geopolitical risks, including with respect to critical minerals, for the clean energy transition.

Energy security and clean energy transitions (Para 49),
G7 Sapporo Climate, Energy and Environment Ministers' Communiqué

Thank you for your attention!

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