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# **Japan Energy Newsletter**

**Japan Electric Power  
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## Table of Contents

<b><i>1 The Ministry of Economy, Trade, and Industry Issued its Interim Clean Energy Strategy Report .....</i></b>	<b><i>1</i></b>
<b><i>1.1 The Clean Energy Strategy .....</i></b>	<b><i>1</i></b>
<b><i>1.2 Highlights of the Interim Report .....</i></b>	<b><i>2</i></b>
<b><i>2 Japan's Ministry of Economy, Trade, and Industry Issued an Interim Summary of its Carbon Capture and Storage Long-Term Roadmap.....</i></b>	<b><i>5</i></b>
<b><i>2.1 General Overview of the Interim Summary.....</i></b>	<b><i>5</i></b>



# 1 The Ministry of Economy, Trade, and Industry Issued its Interim Clean Energy Strategy Report

On May 13, 2022, Japan's Ministry of Economy, Trade and Industry (METI) issued an interim report of its Clean Energy Strategy<sup>1</sup>, which provides the path forward for the realization of a decarbonized society. According to the report, the public and private sectors will need to invest 1.12 trillion USD into decarbonization efforts by the mid-2030s. The report highlighted a range of important actions that the government will need to undertake as part of its clean energy strategy, such as expanding the introduction of hydrogen and ammonia fuel, enhancing the domestic production capacity of storage batteries, and improving the electricity transmission network. METI plans to release a final Clean Energy Strategy Report by the end of this year.

## 1.1 The Clean Energy Strategy

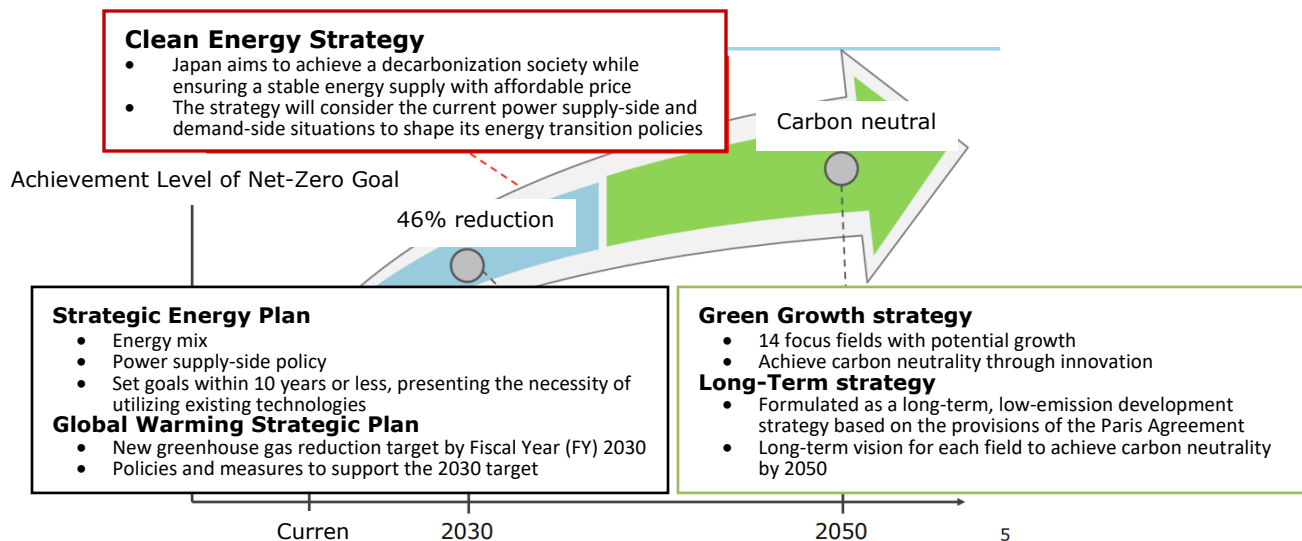
The Japanese government announced its commitment to become carbon neutral by 2050 in October 2020. In April 2021, the government announced that it would reduce Japan's greenhouse gas emissions by 46% by 2030. To achieve these goals, Japan has developed the Green Growth Strategy, published by METI in December 2020. The cabinet also issued multiple supporting plans issued in October 2021, including the Sixth Strategic Energy Plan, the Global Warming Strategic Plan, and the Long-Term Strategy Plan based on the Paris Agreement. To fulfill these plans, METI is formulating a Clean Energy Strategy, which will lay out the necessary activities to ensure a stable energy supply at an affordable price, supporting future economic growth. The strategy focuses on the following targets:

- Ensuring that utility operators and citizens have a concrete path to change their work style and lifestyle, moving towards a carbon-neutral society;
- Facilitating the energy transition across various industries while considering the current power supply-side and demand-side situations;
- Creating a path to promote innovative businesses and industries through investments; and
- Reducing additional costs as much as possible and promoting economic behavior changes that can be accessible to the public.

Based on the discussions since last year, the Clean Energy Strategy will also specify a path to create innovative decarbonization-focused technologies and solutions to build an industrial structure centered on clean energy. Specific examples include hydrogen and ammonia fuel, identifying the needs of the energy transitions on the power demand side, and summarizing the policy measures necessary for the transformation of the economic society.

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<sup>1</sup>[https://www.meti.go.jp/shingikai/sankoshin/sangyo\\_gijutsu/green\\_transformation/pdf/008\\_01\\_00.pdf](https://www.meti.go.jp/shingikai/sankoshin/sangyo_gijutsu/green_transformation/pdf/008_01_00.pdf)



Source: METI

The interim report also emphasized the significance of energy security, noting that a stable energy supply is a key foundation for the economic and social activities to progress toward a carbon-neutral society. Energy security is an especially important topic right now due to the impacts of the Russian invasion of Ukraine in February this year and the recent tight power supply condition.

## 1.2 Highlights of the Interim Report

According to the report, Japan’s minimum annual clean energy investment in Fiscal Year (FY) 2030 will be approximately 125.66 billion USD, reaching a total of 1.12 trillion USD over the next ten years. In order to build a system that supports the adoption of hydrogen and ammonia fuel, the strategy has set a goal to reduce the hydrogen price to one-third of the current level by 2030. Additionally, the production capacity of domestic companies in electricity storage areas is set to be expanded to 10 times the current level by 2030, and a transmission line development plan will be formulated by the end of FY 2022. The main outline for each focus area is described below.

### Investment Amount

Of the approximately 125.66 billion USD of planned annual clean energy investments for FY 2030, the largest portion of the budget (about 36.96 billion USD) would go towards decarbonizing power sources and converting fossil fuel power generation to renewable energy, hydrogen, and ammonia. Investments on the end-user side, such as energy efficiency and electric vehicles (EVs), as well as infrastructure improvement, are expected to be 29.57 billion USD. The breakdown of the annual investment amount in FY 2030 is as follows:

<b>Investment Field</b>	<b>Investment Amount by FY 2030 (USD)</b>
<b>Decarbonization of power sources and fuel conversion:</b> Introducing renewable energy; improving infrastructure for hydrogen and ammonia fuel; manufacturing storage batteries, etc.	36.96 billion
<b>Decarbonization in the manufacturing sector:</b> Energy saving and decarbonization of the manufacturing process, introducing the decarbonization of industrial equipment, etc.	14.78 billion
<b>End-users:</b> Introducing energy-saving innovations for housing and buildings, next-generation automobiles, etc.	29.57 billion
<b>Infrastructure improvement:</b> Enhancing infrastructure systems; improving the EV infrastructure (charging and hydrogen stations); and focusing on digital responses (semiconductor manufacturing bases and data centers), etc.	29.57 billion
<b>Research and Development (R&amp;D):</b> Promoting R&D activities for technologies such as carbon cycle (CO <sub>2</sub> separation and recovery, synthetic methane, synthetic fuel, and SAF), the manufacturing process (hydrogen iron making), nuclear power, and carbon capture and storage (CCS), etc.	14.78 billion
<b>Total</b>	125.66 billion

## Hydrogen and Ammonia Fuel

It is expected that there will be global growth in ammonia fuel manufacturing and purchasing and that the use of ammonia fuel will expand in the future. Foreign countries are contributing to the adoption of hydrogen by developing national hydrogen strategies and promoting hydrogen manufacturing and purchasing.

For Japan to promote the widespread adoption of hydrogen and ammonia fuel, it is essential to reduce their costs compared with existing conventional fuels; expand the infrastructure network, such as storage tanks and transportation; and implement measures to assist with the commercialization of ammonia fuel projects. Japan is also seeking to advance technologies through pilot projects in the fields of synthesis technology, hydrogen power generation, ammonia co-firing, and ammonia burners.

## Storage Batteries

The global storage battery market is expected to continue to grow in the future. Japanese manufacturers, which were previously dominant in the worldwide market due to their investments in advanced battery technologies, have seen their market share decline over time. Japan will therefore promote expanded investments in the storage battery industry based on three main goals: (1) to build a domestic manufacturing base of 150 GWh by 2030, (2) to secure a production capacity of 600 GWh by all Japanese companies (achieving 20% of the global market share) by 2030, and (3) to facilitate the full-scale commercialization of all-solid-state batteries by around 2030.

## **Electricity Transmission Network**

To introduce a large amount of renewable energy and improve energy resilience, it will be necessary to update the electricity transmission network. The Japanese government plans to complete its master plan for the network sometime in FY 2022. The plan will provide a vision for the long-term electricity system in Japan, considering the necessity of infrastructure upgrades. The plan will also evaluate the potential opportunities to integrate renewable energy with data centers and how to enhance regional coordination in the event of a disaster or in response to a tight power supply.

## 2 Japan's Ministry of Economy, Trade, and Industry Issued an Interim Summary of its Carbon Capture and Storage Long-Term Roadmap

On May 11, 2022, the Ministry of Economy, Trade and Industry (METI) issued an interim summary of its long-term roadmap for carbon capture and storage (CCS)<sup>2</sup>. The roadmap sets a goal of an annual 120-240 million tons of domestic CO<sub>2</sub> storage by 2050 based on the International Energy Agency (IEA)'s estimates. Under the roadmap, Japan will conduct feasibility studies and begin the equipment procurement process by 2023, finalize investment decisions by 2026, and start CCS business operations by 2030. The roadmap noted an urgent need to improve the business environment and regulatory activities. Two working groups (WGs) will be set up in mid-June this year to develop the necessary legislation, cost reduction measures, and government support mechanisms.

Japan has been steadily exploring and developing CCS technologies through a large-scale domestic CCS demonstration test in Tomakomai City and other projects focused on liquefied CO<sub>2</sub> transport technology. CCS and carbon capture, utilization, and storage (CCUS) will play a central role in achieving the Japanese government's 2050 carbon-neutral target, especially in certain sectors which are difficult to decarbonize, such as thermal power plants, the materials industry, and the oil refining sector. The interim summary also proposes some approaches to promote CCS adoption, such as enhancing CCS technologies, reducing costs, improving the business environment, and finding suitable CCS development sites. The summary notes that Japan will also consider ongoing developments in overseas CCUS projects.

### 2.1 General Overview of the Interim Summary

According to the summary, the basic principle for the promotion of CCS is to minimize social costs while ensuring a stable power supply that supports Japan's economic activities and industrial development. The long-term roadmap was developed in a series of meetings by the CCS Long-Term Roadmap Committee starting in January 2022. It will set out the policy measures to achieve the commercialization of the CCS by 2030. The final roadmap will estimate an annual CCS storage capacity by 2050, based on expectations that the energy mix and the development of decarbonization technologies will enable the start of CCS business operations by 2030.

The CCS Long-Term Road Map Committee will soon establish two new working groups (WGs): the CCS Business and Legislation Review Working Group and the CCS Business Cost and Scheme Review Working Group. The two WGs will study and evaluate factors affecting CCS business operations and finalize the CCS long-term roadmap within the year.

The CCS Business and Legislation Review Working Group will identify the key legislative issues for the CCS industry by 2022, with priorities such as:

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<sup>2</sup> [https://www.meti.go.jp/shingikai/energy\\_environment/ccs\\_choki\\_roadmap/pdf/005\\_03\\_00.pdf](https://www.meti.go.jp/shingikai/energy_environment/ccs_choki_roadmap/pdf/005_03_00.pdf)

- (1) Ensuring CCS operators' rights to use underground spaces;
- (2) Clarifying the legal liability borne by business operators;
- (3) Appropriate management of reservoirs in Japan's exclusive economic zone (EEZ), etc.; and
- (4) Securing the domestic laws for the entry into force of the London Protocol concerning the export of CO<sub>2</sub>.

Separately, the CCS Business Cost and Scheme Review Working Group will support the R&D of carbon separation, recovery, transportation, and storage. The research will focus on methods that can achieve cost reductions for the entire CCS supply chain and will set cost targets for the public and private sectors.

The WG will develop measures for the Japanese government to support various CCS business sectors, including utilities and industrial sector companies carrying out carbon separation and recovery, as well as the upstream companies that are in charge of carbon transportation and storage. The WG aims to minimize the social costs of implementing CCS and provide businesses with incentives to adopt CCS while ensuring stable business operations. The interim summary noted that early adopters, such as European countries, the United States, and Australia, have almost completely subsidized their CCS projects to fully support CCS development.