

Tokyo Zero-emission Innovation Bay

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< Keynote Lecture “Japan’s Approach to Carbon Neutrality by 2050”>

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Good afternoon. I am KIHARA Shinichi from the Ministry of Economy, Trade and Industry. Thank you for giving me this opportunity today. I would like to talk about recent policy trends such as the Clean Energy Strategy Interim Report, and international movement of the First Movers Coalition, and the G7 Summit held last week.

Slide 2 please.

The Japanese government issued an interim report on its “Clean Energy Strategy” in May. The Japanese government has formulated the Green Growth Strategy, with the aim of achieving carbon neutrality by 2050, and the Strategic Energy Plan aiming at a 46% reduction by 2030. However, traditional plans alone have not paved the way for a demand side energy transition, nor have concrete actions to transition the entire economic, social and industrial structure to clean energy.

For this reason, the Clean Energy Strategy, firstly, identifies specific pathways for each industry that is expected to grow. Secondly, how to promote demand side energy conversion. Thirdly, we examine concrete policies to transform the economic, social and industrial structure centered on clean energy. As you can see on the slide, we draw a path that can be realized by lines, not dots.

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This is the overall picture. Chapter 1, in consideration of the crisis in Ukraine and the tight supply and demand of electricity, on the major premise of ensuring energy security, we are organizing policies to accelerate decarbonization. Chapter 2 is the main body and is divided into 4 sections.

Section 1, Green Transformation (GX) is for each industry to link decarbonization with economic growth and development. Section 2, the concrete ways and directions for the energy transition in the industry. Section 3, the compilation of concrete actions to decarbonize communities and lifestyles. Finally in section 4, we summarize the political directions needed to realize GX.

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Considering Russia’s invasion of Ukraine, ensuring energy security has emerged as an important issue in other countries. The EU and Japan, in particular, will need a near-term shift away from Russia to reduce

their dependency on Russia, unlike the US, Canada and the United Kingdom, which have their own fossil fuels. This new transition precedes the previous medium to long term transition to decarbonization. We may need to be more aware of rising energy costs. We are making every effort to consider measures to mitigate this. Maximizing the use of all potential energy sources, including renewables and nuclear energy, which are highly effective at decarbonization, the idea is to drive decarbonization while ensuring a stable energy supply.

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The core of Chapter 2. This is an important concept in the transition to a carbon neutral society. It is important to drastically change economic society and industrial structure towards a carbon neutral society. As Japan aims to become carbon neutrality, it is necessary to realize the growth and development of the Japanese economy as well as the realization of decarbonization. Achieving these goals, a shift in the structure of energy supply, and demand and a shift in the structure of industry are essential.

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Green Transformation (GX) of industries is, a detailed examination of which areas to invest in and how to invest in them. Overviewing, the energy chain, the material chain, and the CO2 chain are multidimensionally connected. Therefore, when considering which areas to focus policy resources on, it is important to assess the supply-demand balance of decarbonization measures, and changes in competitive and complementary relationships, thinking about the business environment in Japan and overseas, and the market size of each industry is to be considered. Using this overhead view will be important to consider future decarbonization efforts.

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We carry out detailed analysis by industry and area, and summarize the direction of GX's successful initiatives. Creating supply chains and reducing costs are major challenges for ammonia. This roadmap summarizes the necessary guidelines for each topic in chronological order, and shows the necessary investments.

It shows hydrogen on Page 8, offshore wind power on Page 9, storage batteries on Page 10, nuclear power on Page 11, etc. Regarding these latest technologies, the current problems and the direction of future efforts both in technology and business are summarized.

Go to Slide 12 please.

The CO2 separation and recovery technology is shown here. It is important to establish natural gas fired thermal power, and CO2 separation and recovery technology from low-concentration exhaust gas, which is expected to expand rapidly in the future. In terms of the business environment, at the regional level of industrial complexes transport, supply and demand have to be adjusted between a large number of CO2

emitters and CO2 users. Building a CO2 grid will also be an important aspect. This is really related to the project currently under consideration by the Zero Emission Vision Working Group. Slides 13 to 18 are an interim report of the "New Material Industries Vision" by METI in April. This report summarizes how industries with high CO2 emissions such as steel and chemicals are expanding their business.

Go to the Slide 21 please.

We analyze the technology of the CO2 user side. Slides 21 to 23 analyze not only METI, but also business expansion and investments in cooperation.

Go to the Slide 24 please. This section summarizes the efforts of CCS, a cross-cutting technology indispensable for carbon neutralization, and the issues and directions of negative emission technology on Slide 25. So far, we've focused on GX by industry.

Slide 26 summarizes the transformation of industries' energy supply and demand structures. The direction of pursuing thorough energy conservation toward decarbonization of energy, and a shift to CO2-free consumption is a common idea in all industries.

On the other hand, there is no single path to carbon neutrality. Appropriate judgment by companies is required, according to energy consumption, equipment conditions. For example, a factory using a coal or fossil fuel boiler, can immediately switch to hydrogen/ammonia or electrification, But, if it is not possible to convert immediately due to cost or facilities, there is a transition period that uses low carbon such as natural gas. As technology advances, then fossil fuel plus CS or hydrogen/ammonia can be used. The path is different by industry, and there are also such medium to long-term transformation methods.

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As for the direction of transition for each business attribute, we need to divide it by the difficulty of decarbonization or the export quota and consider what kind of response is required. The horizontal axis of the graph on the right shows international competition. Industry categories with a high export ratio are listed on the right, it means being exposed to competition. The longitudinal axis is the heat demand ratio. The higher the ratio, means being a field with a higher demand than electricity, and the less easy it is to decarbonize. Each company needs to draw the right transition, based on the environment in which it is placed.

In this section, I will talk about the development of social systems and infrastructure to realize GX. This is an important point of this strategy and summarizes the political measures that should be addressed in the future. Mobilize all necessary actions, elicit private sector investment and create fund flows into new investment areas.

It is called the "Five Pillars of Policy."

1. Budgetary measures,
2. Regulations and systems,
3. Financial packages,
4. Gradual development of the GX League,
5. Global strategy.

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Here, I would like to talk about the budgetary measures. The global race for carbon neutrality has begun, and Europe and the US have announced large-scale government support. Japan established a 2 trillion yen Green Innovation Fund for 10 years of R&D. But achieving this transformation requires pushing initiatives where we can, including existing technologies. It is therefore necessary to take support measures that go beyond R&D funding. For this reason, it is crucial that the government provides support measures on an unprecedented scale and timeframe, and establishes a mechanism that allows private companies to make investment decisions with predictability.

Slide 30 shows the estimated level of investments related to decarbonization. The number was widely reported in newspapers and became a topic of conversation. If the amount of investment related to decarbonization is accumulated in each key area under certain assumptions, at least about 17 trillion yen per year will be required in 2030 for public and private sectors. This means that an investment of about 150 trillion yen is required over a 10-year period. While securing financial resources for this purpose in the future, we announced that about 20 trillion yen out of 150 trillion yen will be procured in advance as government funds for GX Transition Bonds, and we will promptly provide investment support. To bring this initiative to fruition, further discussions will take place at a GX Implementation Meeting, which will be newly established at the Prime Minister's Office this summer.

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Let me talk about the direction of Green Innovation Fund. The Green Innovation Fund supports key areas from R&D to the demonstration phase, and about 80% has already been implemented. The gray bottom left section is the current situation. Our future direction is to expand the scope of existing technologies and add storage technologies. We will also expand our support for R&D in new areas. An integrated demonstration in industrial complexes is also important to us.

The CO2 grid was issued at the Zero-emission Bay, and we believe that a broad vision of integrating plants in these regions and connecting CO2 emissions and use will become important. We will continue to support startups responsible for social implementation. Referring to the "First Movers Coalition" which will be

introduced later, we will be working on a framework to create initial demand in Japan and overseas. These are the latest developments in the “Clean Energy Strategy”.

Although time is limited, I would like to introduce two points regarding international trends. One is the First Movers Coalition (FMC). The slide shows "Fast", but "First" is the correct spelling.

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The US proposed the FMC initiative at the COP26 to decarbonize and create a market for the industrial sector. It was launched as a platform for major global companies to buy the technologies needed to achieve net zero emissions by 2050 and start creating a market for them. The idea is to create a market as quickly as possible by finding and actively sourcing the value of green products on the demand side. Founding members are global US companies such as Apple and Amazon. They focus on steel, cement and concrete, aluminum, chemicals, shipping, aviation, trucking, and carbon dioxide removal. FMC also concluded a partnership with Breakthrough Energy founded by Bill Gates. This framework naturally supports market creation and funding.

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FMC's movement is very compatible with the direction of the GX League that Japan is currently pursuing, and the Japanese government intends to participate in the FMC and actively participate in setting up the framework. At a Japan-U.S. summit meeting in May, it was announced that the Japanese government would participate as board member. At the Davos meeting, it was announced that Japan will join other countries as a new partner. Since FMC is still in its infancy, only one Japanese company is participating. However, we believe that all Zero-emission Bay companies are very interested in the latest world trends. If so, please contact METI.

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And the next slide please.

Lastly, I would like to explain the G7 Summit held last week. The summit reaffirmed the importance of energy security, rising prices and gradually reducing our dependence on Russian energy, particularly LNG, in light of the Russian invasion of Ukraine. In the area of carbon neutrality, we continue to emphasize the importance of combating climate change in the medium to long term. And we work towards establishing a Climate Club by the end of 2022. It was confirmed that decarbonization will be promoted in the power sector, including coal-fired power, public support for foreign fuels, and in the industrial sector. In addition, it is noteworthy that the communiqué addressed the issue of zero-emission thermal power generation, which Japan is promoting. It was not often reported in newspapers. They state the importance and contribution of advanced nuclear technologies including Small Modular Reactors.

Japan is the Chair of the 2023 G7 Summit. We would like to deepen discussions on how to achieve the coexistence of energy security and decarbonization, and the common goal of carbon neutrality.

That is all.

I talked about recent developments including the interim Clean Energy Strategy, and international trends. As Chairperson KASHIWAGI told us, Zero-emission Bay is actively engaged in the study of its vision to make Tokyo Bay the world's leading innovation hub for zero emission technologies. I very much hope that these activities will lead to the emergence of new collaborations and new projects and will continue to develop.

And METI will continue to support your program. Thank you very much.