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Japan Energy Newsletter

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1 Japanese Cabinet Approves the GX Basic Policy, GX Promotion Bill, and GX Decarbonization Power Supply Bill

On February 10, 2023, the Japanese Cabinet approved the “GX Basic Policy” to simultaneously achieve decarbonization, stable energy supply, and economic growth through GX (Green Transformation). The Cabinet also approved the GX Promotion Bill on the same day. The GX Promotion Bill stipulates the issuance of new GX economy transition bonds and carbon pricing to help undertake the GX Basic Policy. Furthermore, on February 28, the Cabinet approved the GX Decarbonization Power Supply Bill, which promotes introducing renewable energy and using nuclear power.

GX Basic Policy

“The Basic Policy for the Realization of GX – A Roadmap for the Next 10 Years¹” (GX Basic Policy) was compiled at the end of 2022. The policy was developed based on several discussions from July 2022 onwards by the GX Implementation Council, chaired by Prime Minister Fumio Kishida, and by deliberative councils in each ministry. In their meetings, the councils paid close attention to the need for a stable supply of energy, which has been a significant concern for Japan in the past year due to the destabilizing impact of Russia’s invasion of Ukraine on the global energy supply. The GX Basic Policy aims to simultaneously achieve decarbonization, a stable energy supply, and economic growth through GX and was approved by the Cabinet after reviewing public comments.

Assuming a stable energy supply is secured, the GX basic policy also includes targets for promoting energy conservation, deploying renewable energy as the main power source, and using nuclear power. In addition, it includes support for the construction of hydrogen and ammonia production and supply networks as well as the introduction of a reserve power system and long-term decarbonized power auctions. The policy also promotes research and development, capital investment, and demand creation for GX in various fields. The main focus of the policy is to raise approximately 150 billion USD over the next ten years through the issuance of GX Economic Transition Bonds and to raise over 1.13 trillion USD in public and private investment. From FY 2028, a carbon pricing system will be implemented, imposing a levy on fossil fuel importers. Separately, regarding nuclear power policy, the policy promotes the restart of existing nuclear power plants through changes such as building next-generation advanced reactors on the premises of nuclear power plants scheduled for decommissioning and extending the current operating period for plants to over 60 years.²

GX Promotion Bill

“The Bill for Promoting a Smooth Transition to a Decarbonized Growth-type Economic Structure” (GX Promotion Bill) was drafted based on the GX basic policy to achieve the following: 1) Formulation and execution of a GX promotion strategy, 2) Issuance of GX economic transition bonds, 3) Introduction of growth-oriented carbon pricing, 4) Establishing a GX promotion organization, and 5) Assessing the progress and any necessary revisions.³ The bill stipulates the issuance of the new government “GX

¹ https://www.meti.go.jp/press/2022/02/20230210002/20230210002_1.pdf

² https://www.meti.go.jp/press/2022/02/20230210002/20230210002_2.pdf

³ <https://www.meti.go.jp/press/2022/02/20230210004/20230210004.html>

Economic Transition Bonds” for ten years from FY 2023 to support the upfront investments in realizing the GX promotion strategy. The GX Economic Transition Bonds will be redeemed by FY 2050 through fossil fuel levies and specified business operator contributions. The fossil fuel levy will be collected from fossil fuel importers from FY 2028 onwards and levied based on the amount of CO2 derived from imported fossil fuels. From FY 2033 onwards, contributions will be collected from power producers under the emissions trading system, and CO2 emission allowances will be allocated through auctions. The GX Promotion Organization, newly established through the GX Promotion Bill, will support GX investment by providing debt guarantees to private companies. In addition, the organization will be in charge of collecting fossil fuel levies and specified business operator charges and operating the emissions trading system.⁴

GX Power Supply Bill

“The Bill for Partial Revision of the Electricity Business Act to Establish an Electricity Supply System toward the Realization of a Decarbonized Society” (GX Power Supply Bill) is based on the GX Basic Policy. It aims to promote the maximum possible introduction of renewable energy that can coexist with local communities, and utilize nuclear power while ensuring safety through amending the relevant laws.

The following five laws are subject to revisions in the bill: 1) “Electricity Business Act”, 2) “Act on Special Measures Concerning Promotion of Use of Renewable Energy Electricity” (Renewable Energy Special Measures Act), 3) “Atomic Energy Basic Act”, 4) “Law Concerning Regulation of Nuclear Source Materials, Nuclear Fuel Materials and Nuclear Reactors” (Reactor Regulation Law) and 5) “Law Concerning Reprocessing of Spent Fuel in Nuclear Power Generation” (the Reprocessing Law). The GX Power Supply Bill will establish a system in which the Minister of Economy, Trade and Industry certifies transmission development plans that are particularly essential in ensuring a stable electricity supply. Moreover, to maximize the use of existing renewable energy assets, the bill will establish a new scheme to apply for a purchase price separately from the existing pricing structure, which will be included in the additional investments in solar power generation facilities.

The operating period for nuclear power plants, which was originally part of the Reactor Regulation Law, will be deleted from the GX Power Supply Bill. It will instead be included in the Electricity Business Act, which is under the jurisdiction of the Ministry of Economy, Trade and Industry, as a policy provision for utilizing nuclear power. The operating period, which is currently set at “40 years in principle and 60 years at the longest,” will ultimately be extended to over 60 years. In addition, the new law will exclude the non-operational periods due to safety reviews by the Nuclear Regulation Authority and/or temporary suspension orders by the court, which will make it possible for plants to operate for more than 60 years when taking into account those non-operational periods.

⁴ <https://www.meti.go.jp/press/2022/02/20230210004/20230210004-1.pdf>

2 NEDO Releases Two Roadmaps for Fuel Cells and Documents Discussing Technical Issues for Water Electrolysis⁵

On February 9, 2023, NEDO (the New Energy and Industrial Technology Development Organization) announced that it has created roadmaps for two fields: 1) fuel cells for FCV (Fuel Cell Vehicles)/HDV (Heavy-Duty Vehicles) and 2) stationary fuel cells. NEDO also released a document that organizes the technical issues for creating a roadmap in the field of water electrolysis. These roadmaps present the technical goals, deployment scenarios, and technical issues to consider from the present up to 2040.

For stakeholders from industry, academia, and government to share their long-term perspectives and work together on technology development, NEDO first released a fuel cell and hydrogen technology development roadmap in 2005, which has been revised and developed since then. In March 2022, in response to accelerating global discussions on the practical applications of fuel cells for trucks, trains, and ships, NEDO released a roadmap for large commercial mobility (HDV) based on its accomplishments in 2021. In addition, NEDO has compiled a document that organizes the technical issues for creating a roadmap for water electrolysis related to hydrogen production using renewable energy.⁶

Roadmap of “Fuel Cell Technology Development for FCV/HDV” and “Stationary fuel cells”

The “HDV Fuel Cell Technology Development Roadmap” released in FY 2021 set a target for system specifications by 2030. Plans were made to specify the target for 2040, along with the target value and technological development issues.⁷ This update set new product targets for HDV fuel cells (such as a fuel cell system output density of 0.8 kW/L). Several technology development issues in technology areas such as fuel cell materials, production, hydrogen storage, and digital transformation (DX), will need to be addressed to achieve this goal.

The fuel cell system target for 2040 is an advanced target that will require new breakthroughs in materials. However, if this target can be achieved, it will be possible to further enhance FC’s superior capabilities as a clean energy source, especially for hydrogen engines and batteries. To achieve these goals, NEDO carefully considered the funding areas that need significant support to overcome the limitations of current technologies. These areas include advanced analysis/computational science and technology, DX technology, and how to develop the necessary human resources.⁸ From the next fiscal year onwards, NEDO plans to expand its production targets for fuel cells for FCVs, create a detailed cost analysis, develop cost targets based on life cycle assessment (LCA) evaluations, and identify targets and technical issues related to hydrogen storage technology, such as liquid hydrogen.

⁵ https://www.nedo.go.jp/news/press/AA5_101608.html

⁶ https://www.nedo.go.jp/library/battery_hydrogen.html

⁷ <https://www.nedo.go.jp/content/100944010.pdf>

⁸ <https://www.nedo.go.jp/content/100956711.pdf>

The new stationary fuel cell technology development roadmap is a revision of two prior technology development roadmaps (for residential and for commercial/industrial fuel cells) that were originally released in 2017. The roadmap considers the expected spread of stationary fuel cells and includes potential spread scenarios, product development issues, and technology development issues. In addition, new technical challenges to enhance resilience and utilize renewable energy as an adjustment power have been identified. The latest technology issues to achieve ultra-high efficiency after 2030 have also been incorporated into the roadmap.

Identifying issues while drafting the “Water Electrolysis Technology Development Roadmap”

To achieve carbon neutrality by 2050, NEDO has identified several high-priority issues that will need to be resolved through discussions and various demonstrations in the industrial and academic world. To prioritize research in these areas, NEDO plans to create a roadmap for spreading and expanding water electrolysis technology in hydrogen production. The roadmap will focus on four major electrolysis methods, including alkaline water electrolysis (AWE) and proton exchange membrane water electrolysis (PEMWE), and five areas of system control and ancillary facilities.⁹ In the future, NEDO will examine the specific cost and performance targets, the conditions that each element will need to meet to achieve the targets, and the revisions to technological development issues. NEDO will then incorporate those findings into the upcoming water electrolysis technology development roadmap.

⁹ <https://www.nedo.go.jp/content/100956714.pdf>

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