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JAPAN

The H_2 Handbook

Legal, Regulatory, Policy, and Commercial Issues Impacting the Future of Hydrogen

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PART I - POLICY OVERVIEW

I. Introduction

Japan has been a global leader in developing hydrogen-energy projects and steadily pushing for a noncarbon fuel economy.

Since the 2011 earthquake and resulting tsunami that triggered the Fukushima Daiichi nuclear disaster, Japan's ability to generate electric power domestically was significantly reduced and its reliance on imported energy increased dramatically. Pre-2011, nuclear energy accounted for 30% of electricity generated in Japan, but the figure dropped to zero in the following years before returning to the mix as several nuclear facilities came back online.[1] Across Japan, only 10 nuclear reactors (out of 33 operable reactors) were operating as of March 2023, compared to the 54 reactors operating across the country before the Fukushima Daiichi nuclear disaster.[2] Nuclear plants have slowly restarted, however, and by 2023, nuclear energy accounted for 6.9% of electrical power production.[3] The Kishida administration proposed to continue restoring nuclear energy to around 20-22% of electricity production by 2030.[4] The use of nuclear energy faces many challenges, such as public opposition, re-licensing of nuclear reactors, and compliance with new safety standards.[5] Even if nuclear energy production does reach 22%, at least 25-30% of Japan's domestic energy production continues to rely on coal, oil, and other fossil fuels.[6]

Japan's transportation sector is a large contributor to Japan's overall CO_2 emissions.[7] As such, the 2017 Basic Hydrogen Strategy plan also included goals for hydrogen fuel cell private passenger and public transport vehicles (specifically, buses).[8] While emissions from the transportation sector have been declining since 2001,[9] studies showed that the transportation sector in 2019 was still producing high levels of CO_2 emissions—reaching 18.6% of Japan's total emissions[10] and of that, 30% of the transportation sector emissions were from private passenger cars.[11] The rate of uptake for fuel cells and fuel cell vehicles (FCV) has been slower than initially planned.[12] The slower uptake may be due in part to Japan being a global leader on the supply of gasoline-fueled cars and parts, including hybrids, resulting in concerns and resistance from participants in the automobile parts supply chain. A switch from gasoline-fueled cars to fuel-cell cars would lead to a decrease in demand for engine parts, as fuel-cell (electric) vehicles require half as many engine components as combustion engine vehicles.[13] This has sparked further concern from the Tokyo-based think tank, Renewable Energy Institute (REI).[14] REI believes that the focus of Japan's hydrogen strategy on private passenger cars within the transportation sector, even after 2019 and 2021 updates, will not make a significant impact on decreasing overall CO_2 emissions as the strategy largely ignores industrial or heavier transport solutions.[15]

In 2014, Japan announced its fourth Strategic Energy Plan to kick start its move towards decarbonization and a "hydrogen-based society." In 2017, the Basic Hydrogen Strategy was issued, setting forth both broad objectives and specific numerical targets to be met by 2030. In 2023, the Basic Hydrogen Strategy was revised for the first time[16] with plans to increase Japan's hydrogen supply from the then-current level of two million tons to around 12 million tons by 2040,[17] and a pledge from the government that Japan would invest around JPY¥15 trillion (approximately US$107 billion) in the hydrogen supply chain.[18]

In 2023, Japan's carbon emissions rose by 2%[19] from the year before. This was the first time since 2015 that emissions rose in Japan and was most likely a result of post-COVID-19 economic recovery.[20] The most notable increased emissions occurred in the industrial sector with a 5.4% expansion, and in the commercial sector with a 3.3% expansion.[21] However, the overall 2023 figure was still lower by 3% than the pre-pandemic years of 2019 and 2020[22] and represented an overall 20% reduction over 2013 levels.[23] Japan has taken some pivotal steps to establishing a hydrogen economy in Japan. Here are some recent highlights:

- In June 2023, the Japanese government announced that Japan would invest JPY¥15 trillion (approximately US$107 billion) over the next 15 years in the hydrogen supply to speed up Japan's goal of decarbonization.[24]

- In March 2023, three Japanese companies teamed up with a California aerospace company to develop a hydrogen infrastructure solution for aviation in Japan.[25]

- In January 2023, the Ministry of Economy, Trade and Industry (METI) set a roadmap for carbon capture and storage (CCS) with the goal of attaining 6-12 million tons of CO_2 storage capacity by 2030.[26]

- In November 2022, at the request of METI, the Japan Hydrogen Association proposed defining "low carbon hydrogen" as hydrogen with well-to-gate[27] emissions at or below 34kg of CO_2 equivalent per kilogram of hydrogen.[28]

- In April 2022, Japan began testing its first hydrogen-powered two-car train, called the "Hybari," with the goal of making the trains commercially available by sometime in 2030.[29]

- In February 2022, JERA Co., Inc. (JERA), a fifty-fifty joint venture between TEPCO Fuel & Power and Chubu Electric Power, announced it was taking bids for the supply of ammonia and that it needed up to 500,000 tons a year, from 2027 into the 2040s.[30,31]

- In January 2022, the demonstration sea transport for liquefied hydrogen, the Suiso Frontier, finally arrived at Victoria, Australia. On 25 February 2022, Suiso Frontier returned to Kobe, Japan, marking its debut as the world's first liquefied hydrogen carrier. While an incorrectly fitted electrical solenoid valve led to a yellow gas flame from the gas combustion unit's vent, the malfunction was quickly discovered and no subsequent fire or explosion occurred.[32,33]

- One of the Basic Hydrogen Strategy targets, to increase the number of hydrogen stations to 160 by FY2020,[34] was met in March 2022. As of March 2022, there were 166 hydrogen stations.[35]

- In June 2021, the Basic Hydrogen Strategy's long-term target of having 320 hydrogen stations in operation by FY 2025 was revised to having 1000 hydrogen stations in operation by FY 2030 instead.[36]

- In October 2021, METI released the Sixth Strategic Energy Plan, and there was a significant increase in the share of power generation from renewable energy sources from that of the Fifth Strategic Energy Plan: the ratio in FY2030 will be 36-38%, up from 22-24% in the Fifth Strategic Energy Plan.[37]

II. Hydrogen Supply Chain

In December 2020, Japan introduced the Green Growth Strategy Through Achieving Carbon Neutrality in 2050 industrial policy as part of Japan's efforts in reducing the cost of supplying, storing, and transporting hydrogen.[38] A stable and cost-efficient source of hydrogen supply is a key focus for Japan as the country has net energy deficits and has been looking towards countries in the Asia-Pacific region, such as Australia, to become a part of Japan's hydrogen supply chain.[39] In June 2021, METI issued an updated version that restated the action plan for the following 14 key areas and industries, which also addressed areas such as budgets, taxes, regulation reforms, standardization, and international collaboration:[40,41]

- Offshore wind power, solar power, and geothermal power
- Hydrogen, fuel ammonia
- Next-generation thermal energy
- Nuclear power
- Automobiles and storage batteries
- Semiconductors and information technology
- Marine vessels
- Physical distribution, flows of people, and civil engineering infrastructure
- Foods, agriculture, forestry, and fisheries
- Aircraft
- Carbon recycling, materials
- Housing, structures, and next-generation electric power management
- Resource recycling
- Lifestyles

Under the policy, hydrogen is considered to be a key technology for achieving a noncarbon fuel society and therefore, the policy emphasizes focusing on initiatives that either support or are centered around hydrogen utilization, transportation and storage of hydrogen (such as liquefied hydrogen carriers), and hydrogen production.[42]

Currently, the development, storage, and transportation of hydrogen are still in their early stages and do not have the same level of demand or as extensive a supply chain as other noncarbon fuel technology, such as ammonia.[43] In June 2023, to increase the domestic demand and supply of hydrogen, the Japanese government proposed a hydrogen supply chain plan that would result in the commercial production of hydrogen, with a cost reduced from the current JPY¥100 per cubic meter of liquefied hydrogen to JPY¥30 per cubic meter by or around 2030—with the goal of 20 by 2050.[44,45]

Still, the process of storing hydrogen requires significant amounts of energy and typically high-pressure tanks. The storage and delivery of liquid hydrogen present another set of technical challenges as well.[46] For example, while the Suiso Frontier[47] successfully completed delivery of the world's first liquefied hydrogen cargo by sea to an international market, from Australia to Japan, Suiso Frontier has a storage capacity of only around 100 tons and is the first and currently, only, prototype carrier, while ammonia's seaborne trade is currently at 20 million tons per annum.[48] The main technical challenge in transporting liquid hydrogen is that the carrier needs to be well insulated to maintain the hydrogen at a very low constant temperature, so that it remains in liquid form while still allowing the carrier to vent a limited quantity of gaseous hydrogen to avoid excessive pressure build-up in the carrier.[49] Further, there are challenges with loading and unloading liquid hydrogen (recall, liquid hydrogen must remain below minus 253°C) as there are no pumps currently built at the scale that are able to refill a ship's fuel tank in an efficient manner.[50] Although equipment already exists that can be used to transport and store liquefied natural gas (LNG), including pumps, this equipment could not be used for liquid hydrogen because higher performance insulation is required for liquid hydrogen.[51] Transporting liquid hydrogen would require a combination of drastic increases in the number of marine vessels, storage units, equipment to cool hydrogen, equipment to load and unload liquid hydrogen, and pumps that are able to service the scale of marine vessels, to reach the same volumes of ammonia as are currently traded. To address this, Kawasaki Heavy Industries, Ltd. (Kawasaki Heavy) designed a long-distance hydrogen carrier vessel (the Vessel) that is able to store 160,000m3 of liquefied hydrogen (equivalent to 11,200 tons), which is about 100 times more capacity than the Suiso Frontier has.[52] The Japanese shipping classification society, Nippon Kaiji Kyokai, otherwise known as ClassNK[53] issued a technical approval for the Vessel to be powered by "boil-off" hydrogen that naturally evaporates in the storage tanks carrying the liquefied hydrogen.[54] Ammonia, however, is less costly to produce than liquefied hydrogen and during transport, liquefied ammonia only requires a minus 33°C environment to remain in a liquid state.[55]

Despite the challenges, there has been a steady increase of public and private investments and support towards building a hydrogen supply chain. On 3 March 2022, the Japan Bank for International Cooperation (JBIC) entered into an agreement to invest up to EUR€100 million in the Clean H2 Infra Fund S.L.P. (the Fund).[56] The Fund is managed by investment manager Hy24[57] and invests in various clean hydrogen investments worldwide.[58] JBIC hopes that by contributing to the Fund it can assist with the Fund's efforts in the scaling up of hydrogen markets, which will help to reinforce the hydrogen supply chain.[59]

In March 2022, the Japan International Cooperation Agency (JICA) announced that it aims to fund US$3 billion in Indian infrastructure projects for the year 2022-2023.[60] While the funding is not limited to hydrogen-specific projects, many of India's infrastructure projects focus on renewables, including some using hydrogen as a power source and producing both green and blue hydrogen.[61] India plans to produce five million tons of green hydrogen per annum by 2030, aiming to become a production and export hub for green hydrogen.[62] This commitment was reinforced in March 2022, when the Japanese and Indian governments agreed to extend their clean energy partnership to specifically include the development of electric vehicles, battery storage, and green hydrogen.[63]

In April 2022, Osaka Gas Co., Ltd. (Osaka Gas) and Australian company Aqua Aerem, entered into a joint venture project that may ultimately be valued at over US$10 billion, to produce low-cost green hydrogen in Australia's Northern Territory.[64] The project will be in Australia's Northern Territory, with the goal of producing 410,000 tons of green hydrogen annually, slated for both domestic consumption and export, and available for export at less than US$2 per kg, within five years.[65]

In February 2023, the Japanese government approved the Basic Policy for the Realization of Green Transformation (GX), a METI initiative to shift fossil fuel-intensive industries to clean energy, including considering hydrogen as a fuel.[66] GX's overall goal is to reach net-zero greenhouse gas emissions by 2050[67] by transforming Japan's current fossil fuel economy into an economy powered by clean and stable energy.[68] While GX is not solely focused on hydrogen, GX promotes hydrogen as one resource that will contribute to a stable energy supply and will help Japan reach its net-zero goal.[69] METI Minister Yasutoshi Nishimura has further reinforced the importance of hydrogen under GX, "We would like to steadily build a supply chain for hydrogen in Asia and the Indo-Pacific region by further expanding Japan's (hydrogen) technology, which has been world-leading."[70]

In June 2023, Japan announced that it would invest JPY¥15 trillion over the next 15 years in the hydrogen supply chain[71] and that the Japanese government would provide about JPY¥6 to 8 trillion out of JPY¥15 trillion while the remainder would be generated from investments from the private sector.[72] In the same month, JERA and ENEOS Corporation (ENEOS) announced that they have partnered together on a research and development project commissioned by New Energy and Industrial Technology Organization (NEDO), the "Research and Development for Hydrogen Quality related to Establishment of a large-scale CO_2-free hydrogen supply chain." [73]

III. Hydrogen Utilization

In February 2021, Toyota Motor Corporation (Toyota) began construction of Woven City at the former Higashi-Fuji Plant site of Toyota Motor East Japan.[74] Toyota's goal in relation to Woven City is to create a small town entirely run on hydrogen.[75] Woven City will serve as a testing ground for building sustainable communities using hydrogen,[76] for example, utilities can eliminate emissions by using hydrogen as a fuel.[77] Construction for phase 1 is underway and is on schedule to for completion by the summer of 2024—with initial trials using hydrogen energy to power the city and its advanced technologies, such as autonomous driving, to start in 2025.[78]

In March 2021, Toyota released a fuel cell module that packages individual fuel cell systems into a compact module that can be easily used and adapted by companies in a variety of industries who are looking to develop and manufacture fuel cell based products.[79] The compact module is available in horizontal or vertical models, which allows for more flexibility with installation space.[80] Almost exactly a year later, on 15 March 2022, Toyota announced that it had successfully developed a hydrogen storage module in an effort to help promote the use of large hydrogen fuel tanks to be used in trucks and buses, port cargo handling, and fuel cell generators.[81]

Toyota was also a sponsor of the 2020 Tokyo Olympic and Paralympic Games (held during the summer of 2021 due to COVID-19-related delays; the Games) and as such, hydrogen power and fuel cell power were very much a part of the Games. Toyota, together in a joint venture with ENEOS, created a hydrogen-powered Olympic torch for the Games.[82] Toyota also provided a fleet of its electric car, the Mirai, to the Games,[83] which appeared regularly on the streets of Tokyo during the Games. The Mirai's power is produced by electrochemical reactions between hydrogen and oxygen.[84]

In a separate project, Toyota, along with Hitachi Ltd. (Hitachi), entered into an agreement with East Japan Railway Company to develop a two-car train, the Hybari, powered by high-pressure hydrogen using technology supplied by Toyota and Hitachi, which [began testing] in Tokyo in April 2022.[85] The high-pressure hydrogen is fed into a fuel cell system developed by Toyota to generate electricity and the electricity is then sent to storage batteries developed by Hitachi, which then power the two-car train.[86]

Another Japanese automobile giant, Honda Motor, has also focused on phasing out internal combustion engine vehicles by 2040 and aims to focus on battery electric powered vehicles and fuel cell-based vehicles going forward.[87] In January 2022, Honda Motor and Isuzu Motors announced that they were planning to test their jointly developed hydrogen-fueled, fuel-cell truck on public roads in the Tokyo metropolitan area in the fall of 2022.[88] If successful, this could be considered a viable replacement product for petrol trucks as an alternative to electric-powered trucks. An electric-powered truck requires 2.5 tons of battery to power it and even then, an electric-powered truck can only run for 300km. By contrast, an Class 8 fuel-cell truck has a cruising range of around 600km before needing to refuel,[89] a greater driving range than electric-powered trucks.[90] An electric powered truck can also carry less cargo than a fuel-cell truck since electric powered trucks must accommodate the additional battery weight.[91]

IV. Technological Innovation and Public Buy-In

In October 2021, Panasonic Corporation (Panasonic) launched a pure hydrogen fuel generator in Japan that can generate up to 5kW of power for commercial use.[92] The generator uses technology developed based on Panasonic's ENE-FARM technologies, which allow it to efficiently convert hydrogen into electric power—resulting in the best electrical efficiency in the industry, achieving 56% lower heating value when the generator is used.[93] In addition, if the generator is used with a resister unit and a startup power supply unit, the generator can generate 2.5 kW of power for up to 120 hours even during a power outage.[94] Panasonic designed this generator so that the power can be easily scaled up for use not only by retail stores but also by larger commercial, industrial, and farming facilities. Panasonic began using the generator in testing facilities to showcase its ability and potential of the technology.[95] For example, in 2022 Panasonic began operating the H2 KIBOU FIELD facility (KIBOU) in Kusatsu, Shiga Prefecture, as the world's first demonstration facility making full-scale use of hydrogen fuel cells at a 100% renewable energy manufacturing site.[96] At KIBOU, the renewable resources were a combination of solar sources and pure hydrogen.[97] Panasonic aims to power KIBOU with pure hydrogen, but, for the demonstration, Panasonic used hydrogen that was not derived from renewable resources.[98]

A survey of patent applications relating to hydrogen technologies in 2021 provides insight into the development of hydrogen energy in Japan. An overwhelming number of recent hydrogen related patent applications involved fuel cell technology, indicating that companies are aggressively pursuing fuel cell technology.[99] Further, a second look at fuel cell patent applications revealed that it was not only automotive industry players who are interested in developing fuel cell technologies, but also the Japan aviation industry.[100] Both Boeing and Airbus have filed patent applications related to fuel cell technologies with the Japan Patent Office (JPO).[101] The largest number of hydrogen technology-related patent applications submitted by non-Japanese companies, however, was for hydrogen power generation patents. Examples of new hydrogen power generation technologies involve using waste heat to generate hydrogen power, as well as the practical implementation and logistical support for such technologies.[102]

V. International Collaboration

IRENA, the International Renewable Energy Agency, estimates that over 30% of manufactured hydrogen could be traded across borders by 2050.[103] Japan would be heavily reliant on imported hydrogen in the future because of the limited land space available to build the facilities it would need to produce hydrogen domestically at the levels required to be fully self-reliant[104] and as a result, Japan has been at the forefront of hydrogen diplomacy.[105]

On 10 January 2022, Japan and Indonesia entered into an agreement to cooperate on developing decarbonization technology to transition towards clean energy, such as hydrogen, ammonia as a fuel, CCS, and carbon capture utilization and storage (CCUS).[106] This agreement aims to allow the parties and their industries to develop and deploy technologies that will help to generate alternative energy sources, and if successful, the developments will contribute toward Japan building its global carbon-free fuel supply-chain.[107]

In June 2022, an Australian delegation comprised of Queensland's then-deputy premier and state development minister along with the executives from Stanwell Corporation, a Queensland-based government-owned energy company, met with around 100 Japanese investors, including those from the hydrogen, renewable energy, resources, and Olympics infrastructure sectors.[108] The meetings aimed at creating partnerships between Australia and the Japanese government and private sector to develop a renewable energy future. This could include investment in Queensland state-owned companies to produce green hydrogen that will in turn form part of the global supply chain, supplying green hydrogen to Japan.[109]

In addition to government level partnerships, Japanese companies and overseas companies, especially those from the energy sectors are also collaborating. At the beginning of 2022, it was announced that Hydrogen Utopia International PLC (HUI), a European company specializing in turning nonrecyclable mixed waste plastics into carbon-free fuels, entered into an agreement with Mitsubishi Heavy Industries Ltd. (MHI),[110] a key member of the Mitsubishi Group.[111] HUI developed pioneering plastic waste regeneration technology, essentially using nonrecyclable waste plastics and converting such waste plastics into road fuel-quality hydrogen.[112] Under the agreement, MHI will review HUI's plastic waste regeneration technology and conclude whether it would be commercially feasible to establish similar facilities in Japan to transform waste plastic into usable hydrogen energy.[113] If the collaboration between HUI and MHI is successful, then the technology to transform plastic waste into usable hydrogen energy may become another source of carbon-free fuel that Japan can harness.[114]

In May 2022, NYK Line, a Mitsubishi group shipping and transport company[115] entered into an agreement with ACME Cleantech Solutions Pvt. Ltd., an Indian renewable energy company (ACME).[116] The agreement is centered on ACME's green ammonia projects and NYK Line becoming a shipping partner with the aim of supporting ACME in becoming a global green ammonia supplier.[117] NYK Line is part of the world's first international demonstration operation to transport hydrogen, a project started by the Advanced Hydrogen Energy Chain Association of Technology Development (AHEAD) and subsidized by NEDO.[118] NYK Line already owns and operates large fleets of ships that include crude oil carriers and LNG carriers and has the technology and know-how to expand into hydrogen transportation and would also have the ability to transport green ammonia.[119]

On 10 June 2022, the European aircraft manufacturer Airbus announced a partnership between Airbus and Kansai Airports[120] who entered into an MOU to explore the use of hydrogen for aviation. The partnership is the first of its kind in Japan.[121] Under the MOU, Airbus would provide information on aircraft characteristics, fleet energy usage, and insight on how hydrogen energy is used to power aircraft and for airport-associated ground operations. In exchange, Kansai Airports will research the type of infrastructure required at airports to be able to introduce and support hydrogen-fueled aircraft.[122]

In early 2022, Sojitz Corporation announced a three-year collaboration with CS Energy, an Australian state-owned utility, on a project to transport Australian produced-green hydrogen to Palau.[123] This three-year collaboration by Sojitz Corporation is supported by Japan's Ministry of the Environment, who hopes that this can help assess the potential that green hydrogen has for power generation and for fueling sea vessels.[124]

From June 2023, Sojitz Corporation, Mitsubishi HC Capital, an undisclosed Japanese corporation, and Universal Hydrogen,[125] a California-based aerospace company, began collaborating to research a green hydrogen solution for Japanese airlines. The companies aim to eventually develop a green hydrogen supply delivery solution that can be harnessed in the future.

PART II - REGULATIONS

Hydrogen is primarily regulated by the High Pressure Gas Safety Act (Safety Act) and the Gas Business Act (Business Act), managed by METI. The Safety and Business Acts may overlap at times, and therefore, jurisdiction of the Ministries may overlap with regard to the application of hydrogen and the use of hydrogen and hydrogen by-products as a new energy source for Japan.

The Safety Act is the primary law that regulates nonpipeline supply of hydrogen.[126] When the Safety Act applies, the operator must follow the regulatory procedures outlined in the Safety Act. The Safety Act classifies hydrogen as a type-2 gas, but if a manufacturer's daily hydrogen production capacity exceeds 100 normal cubic meters (Nm^3),[127] the manufacturer is treated as if it were producing a type-1 gas (such as helium or carbon dioxide) and therefore must obtain prior approval from the Prefectural Governor to produce hydrogen. If a manufacturer's daily hydrogen production capacity is less than $100Nm^3$, approval is not required, but the manufacturer must still notify the Prefectural Governor of its hydrogen production. Similar reporting and approval requirements exist for the storage of hydrogen, where a daily hydrogen storage capacity of over $1000Nm^3$ requires approval from the Prefectural Governor, a capacity of 300-$1000Nm^3$ requires notification but no approval, and a capacity of less than $300Nm^3$ requires neither approval nor notification.[128]

The Safety Act also requires a Hydrogen Refueling Station (HRS) to dedicate a minimum eight-meter distance between a hydrogen fuel dispenser and a public road, between a high-pressure gas facility and any flammable substance, and between a high-pressure gas facility and the property boundary of the HRS.[129] The minimum distance is reduced to six meters if the pressure of the dispenser is less than 40MPa. The higher land cost resulting from this regulation may be problematic in urban areas where land prices are high, which is one of the areas that MHI will need to evaluate in developing HUI's plastic waste regeneration facility (*see above,* v. International Collaboration). As of June 2023, the Safety Act had not been updated, although there have been discussions to address areas where the Act overlaps with other laws, particularly those administered by Ministries other than METI.

To enhance the introduction of eco-friendly technologies, in particular, technologies that use hydrogen fuel, the American Chamber of Commerce in Japan is urging Japan to accept US rules such as FMVSS 304[130] governing these products by amending the Safety Act.

> "Japan's High-Pressure Gas Safety Law restricts the import of several components and devices used for FCVs, such as the hydrogen tanks. In fact, the importation of the hydrogen tanks is virtually impossible in practice due to strict import inspections and the fact that the Japanese law governing high-pressure gas tanks is unique. The US FMVSS 304 test conditions covers up to 10,000 psi (700 bar). Those tanks that comply with FMVSS 304 should be deemed to have complied with Japan's unique high pressure gas tank requirements.[131] The current certification scheme consists of two separate laws. To simplify this scheme, automobile high pressure gas storage requirements should be included and covered by the Road Transport Vehicle Act and removed from the High-Pressure Gas Safety Law."[132]

The Business Act applies when hydrogen is supplied through pipelines, and the pipeline must adhere to supply capacity levels as specified by METI.[133] Under this Business Act, a business supplying hydrogen to consumers by hydrogen distribution pipelines is required to register with METI as a “Gas Retail Business Operator.”[134] Additionally, as with LNG terminals, a business operating a hydrogen terminal to receive, store, and re-gasify imported hydrogen must register as a “Gas Manufacturing Business” with METI (apply and receive approval to operate), although it is unclear whether hydrogen terminals will be subject to the same regulations as LNG terminals are.[135] Business operators of hydrogen pipelines that supply only hydrogen will not be required to be licensed as a “General Gas Pipeline Service Business Owner” nor as a “Specified Gas Pipeline Service Business Operator.”[136] Under current regulations, only businesses whose pipelines supply gas are required to be licensed. However, business operators exempted from licensure are still required to meet the safety requirements under the Business Act, such as the gas facility meeting the relevant technical standards, appointment of a chief gas engineer, and notification to METI of construction plans.[137]

In June 2021, METI issued an Interim Report on an Appropriate Form for the Regulations on Fuel Cell Vehicles (the Interim Report). [138] The Interim Report was to consider how to streamline FCVs, as they are currently regulated under regulatory schemes developed under two separate acts (the Road Transport Vehicle Act and the Safety Act), which are administered by two separate Ministries; the Ministry of Land, Infrastructure, Transport, and Tourism (MLIT) and METI.[139] METI limited the scope of the Interim Report to fuel cell powered standard-sized cars, small cars, and light vehicles with three wheels or more.[140] The Interim Report proposed that compressed hydrogen, compressed natural gas and LNG that are used to power vehicles can be exempted from the Safety Act.[141] The Interim Report also indicated that safety inspection for fuel cell powered vehicles will be regulated under the Road Transport Vehicle Act and exempted from a further safety inspection from the Safety Act.[142] It should be noted that exemption for vehicles with a large capacity of gas as fuel (300m^3 or more) will be based on the safety verification report from the Road Transport Vehicle Act.[143]

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