

JAPANESE INDUSTRY AND POLICY NEWS

November - December, 2021

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Legislation and Policy News

Mitsubishi Corporation / Chubu Electric Power Coalition wins bid, all three locations in Akita & Chiba Offshore wind power generation

On December 24, the Ministry of Economy, Trade and Industry and the Ministry of Land, Infrastructure, Transport and Tourism announced based on the Renewable Energy Sea Area Utilization Law, they have selected a consortium with Mitsubishi Corporation Energy Solutions as the representative company for the landing-type offshore wind power generation business in 3 locations (4 areas) off the coast of Akita and Chiba prefecture; "Noshiro-Mitane-Oga Offshore in Akita prefecture", "Yurihonjo Offshore (North / South) in Akita prefecture" and "Choshi Offshore in Chiba prefecture".

At these 3 locations (4 areas) designated as promotion areas based on the Renewable Energy Area Utilization Law, public offerings were made with a maximum supply price of JP¥ 29 / kWh and a procurement period of 20 years, respectively. Public offering occupancy plans were submitted by 5, 5 and 2 businesses, respectively.

Of these, the selected businesses (consortium) offered JP¥ 13.26 / kWh (off the coast of Noshiro-Mitane-Oga in Akita prefecture), JP¥ 11.99 / kWh (off the coast of Yurihonjo in Akita Prefecture) and JP¥ 16.49 / kWh (off the coast of Choshi in Chiba Prefecture). The perfect score was obtained in terms of price.

All landing-type offshore wind power generation facilities are made by GE. In addition, the selected consortium shall jointly implement regional symbiosis measures with cooperating companies such as Amazon com, NTT Aden Energy and Kirin Holdings when applying. It is said that they have agreed and proposed specific implementation details in the publicly-offered occupancy plan.

The consortium members and cooperating companies are one of the largest offshore wind power generation companies in Japan that will greatly contribute to the conversion of renewable energy into a main power source for the realization of a carbon-neutral society in 2050.

Mitsubishi corporation website:



<https://www.mitsubishicorp.com/jp/en/pr/archive/2021/html/0000048361.html>

<https://www.mitsubishicorp.com/jp/en/pr/archive/2021/html/0000048357.html>

<https://www.mitsubishicorp.com/jp/en/pr/archive/2021/html/0000048353.html>



Image from GE website

2010 growth rate revised upward to 3.2%, Government economic outlook

On December 23, the government approved an economic outlook for FY 2022 GDP growth of 3.2% in real terms. It has been revised upward from 2.2% in the mid-year estimate shown in July. In addition to the effects of large-scale economic measures, it will draw a scenario in which the economy will recover led by private demand, centered on personal consumption. It has been delayed due to the spread of the COVID-19.

The government prepares an economic outlook every December for estimating tax revenues and the budget in the next year. The government outlook is higher than the forecast of 18 private institutes, which expect an average of 3.0%. The nominal growth rate, which is close to the feeling of life, was set at 3.6%.

It is expected that the Covid-19 will settle down in FY 2020, and the recovery of personal consumption, which accounts for more than 50% of GDP, will become clear. While private demand accounts for the majority of domestic demand at 3.0 points, public demand such as public investment remains almost unchanged at 0.0 points due to economic measures taken in the previous fiscal year.

External demand, which is exports minus imports, is expected to be 0.2 points. Looking at the breakdown of private demand, personal consumption is expected to increase by 4.0% in reaction to the sharp drop in FY 2021. The shortage of supply of semiconductors and automobile parts procured from overseas will be resolved, and the capital investment of private companies is expected to increase by 5.1%.

It is analyzed that the economic measures decided in November, whose fiscal spending amounted to JP¥ 55.7 trillion, will also support the economy. It is estimated that measures such as a benefit of JP¥ 100,000 per person for children under the age of 18 will increase GDP by 5.6% compared to the case without measures. Of these, it is explained that there is an effect of about 3.6% in FY2022

On the other hand, the growth rate forecast for FY2021 has been revised downward from 3.7% in the mid-year estimate to 2.6%. A state of emergency was issued until the end of September due to the spread of the Covid-19, and the real GDP for the July-September period fell sharply by 3.6% on an annualized basis due to the effects of refraining from going out and shortening the business hours of restaurants.

When the government formulated a mid-year estimate in July, it set a goal of recovering GDP to the level of October-December FY 2019 before the Covid-19 by the end of 2021. In this economic outlook, the time to recover the pre-Covid level has been postponed to the January-March period of 2022. Of course, there is also a risk that the spread of the mutant "Omicron type" and the slowdown of overseas economies such as the United States and China, and the growth rate may be lower than the government forecast.

Cabinet office website (in Japanese):

<https://www5.cao.go.jp/keizai-shimon/kaiqi/minutes/2021/1223/agenda.html>

GDP growth rate (%)

	FY 2021		FY2022	
	Government	Private sector	Government	Private sector
GDP	2.6	2.7	3.2	3.0
Personal consumption	2.5	2.6	4.0	3.2
Housing investment	-0.5	-0.2	0.9	0.4
Capital investment	2.5	2.6	5.1	4.4

Private sector: average of 18 private institutes

Data source: Nikkei

Assists up to JP¥ 800,000 for EVs, JP¥ 500,000 for micro EVs, etc. support for purchasing EVs and infrastructure development

The subsidies for purchasing electric vehicles (EVs), plug-in hybrid vehicles (PHVs), and fuel cell vehicles (FCVs) were introduced in the supplementary budget for 2021 decided by the Cabinet on November 26. The subsidies for charging and hydrogen filling infrastructure that are indispensable for their widespread use were included. The budget is JP¥ 37.5 billion. The Ministry of Economy, Trade and Industry has compiled and published an outline of this subsidy and points to keep in mind.

In the case of electric vehicles, a maximum of JP¥ 800,000 will be subsidized if certain conditions are met. These purchase subsidies are for vehicles that have been newly registered (registered vehicles) or have been notified of new vehicle inspections (micro vehicles) after November 26, 2021. Targets are individuals, corporations, local public organizations, etc.

In order to actually implement the subsidy project, it is necessary for the Diet to approve the supplementary budget. After the supplementary budget is established, the application will be accepted after the private organizations (project implementers) who will implement this project. Details of the project and procedures necessary for applying for subsidies will be announced by the project implementer. In addition, as soon as the total amount of application exceeds the budget amount, the recruitment will be terminated.

(When to start subsidizing)

Vehicles newly registered (registered vehicles) or new vehicle inspection notifications (micro vehicles) after November 26, 2021

(Subsidy upper limit)

Vehicle subsidy upper limit for vehicles that meet conditions A or B as below.

Subsidies by type of vehicles

Vehicles	Subsidy upper limit	Subsidy upper limit for vehicles that meet conditions A or B as below.
EV(except micro EV)	JP ¥ 600,000	JP ¥ 800,000
Micro EV	JP ¥ 400,000	JP ¥ 500,000
PHV	JP ¥ 400,000	JP ¥ 500,000
FCV	JP ¥ 2,250,000	JP ¥ 2,500,000
Ultra-small mobility (Individual use)	Fixed JP ¥ 200,000	Fixed JP ¥ ¥300,000
Ultra-small mobility (Fleet)	Fixed JP ¥ 300,000	Fixed JP ¥ 400,000

(Conditions)

- A) A car with a power supply function that can extract power from an in-vehicle outlet (1,500W / AC100V).
- B) Vehicles that can extract power via an external power supply or V2H charging / discharging equipment

If an electric vehicle or fuel cell vehicle has an external power supply function, it can be used as an emergency power source in the event of a disaster. In the event of a disaster in the area, there is a possibility that users will cooperate with power supply activities to the extent possible.

METI Website (in Japanese):

<https://www.meti.go.jp/press/2021/11/20211126004/20211126004.html>

International shipping GHG reduction target, revised in 2023 to "more ambitious setting"

The 77th Marine Environment Protection Committee (Chair: Hideaki Saito, Counselor of the Ministry of Land, Infrastructure, Transport and Tourism) of the International Maritime Organization (IMO) was held on November 22-26 in Web format. Regarding the greenhouse gas (GHG) emission reduction target of international shipping, it was agreed that the revision in the spring of 2023 would set a more ambitious target than the current target. Proposals by Japan and others to set a new goal of "zero GHG emissions as a whole by 2050" were not adopted at this meeting.

IMO adopted the "GHG Reduction Strategy" in 2018; Under this strategy, (1) CO₂ emissions will be reduced by 40% or more by 2030 (compared to 2008), (2) GHG emissions will be reduced by 50% or more by 2050 (compared to 2008) and (3). Setting a goal of zero emissions as early as possible during this century. At the same time, it was agreed to revise the strategy in the spring of 2023.

At this meeting, Japan and the United States, the United Kingdom, Norway, and Costa Rica set a new goal of "zero GHG emissions as a whole by 2050" when revising the "GHG reduction strategy." In addition, Kiribati and others have requested a resolution to recognize that it is necessary to reduce GHG emissions to zero by 2050, and Japan also supported this with the United States and others.

At the chamber, several countries, including Japan, insisted on a new goal of "zero (overall) GHG emissions by 2050." On the other hand, developing countries argued that the impact of new GHG reduction measures on trade and the economy and support measures should be discussed together. As a result of deliberation, the above resolution was not adopted, but it was agreed to set more ambitious targets than the current targets in the revision of the "GHG Reduction Strategy" agreed in the spring of 2023.

International shipping is responsible for international transportation, and the relationship between flag states, real rulers, operators, shippers, etc. is complicated. As GHG emission reduction measures are not compatible with the framework of the United Nations Framework Convention on Climate Change (UNFCCC), the IMO is entrusted with the examination.

MLIT website (in Japanese):

https://www.mlit.go.jp/report/press/kaiji07_hh_000221.html



From MLIT website

Company & Organization News

Toshiba develops world's most efficient transmissive Cu₂O solar cell, power generation efficiency is 8.4%

Toshiba announced on December 22 that it has achieved the world's highest power generation efficiency of 8.4% for transmissive cuprous oxide (Cu₂O) solar cells, which are expected to be used. In the future, it will start supplying samples for external evaluation by 2023, and aim to complete the manufacturing technology for practical size Cu₂O / Si tandem solar cells by 2025.

The company has applied the newly developed transmission-type Cu₂O with a power generation efficiency of 8.4% to the top cell and a high-efficiency silicon (Si) solar cell with a power generation efficiency of 25% to the bottom cell. The power generation efficiency of the Cu₂O / Si tandem solar cell is estimated 27.4%. This predicted value exceeds the world's highest efficiency of 26.7% for Si solar cells, and when this Cu₂O / Si tandem solar cell is installed in an electric vehicle (EV), the cruising range without charging is about 35 km per day.

In addition, the company said that this development will lead to the realization of high-efficiency tandem solar cells that can supply the necessary power in a

limited installation area, and will move to EVs and trains without charging for the realization of a carbon-neutral society. It is expected to be applied to mobility such as the stratospheric communication platform (HAPS).

The tandem solar cell stacks two solar cells (cells) as a bottom cell and a top cell, and generates electricity in both cells, thereby increasing the overall power generation efficiency. Development of low-cost, high-efficiency top cells that can be used by stacking on existing Si solar cells (bottom cells) will be promoted.

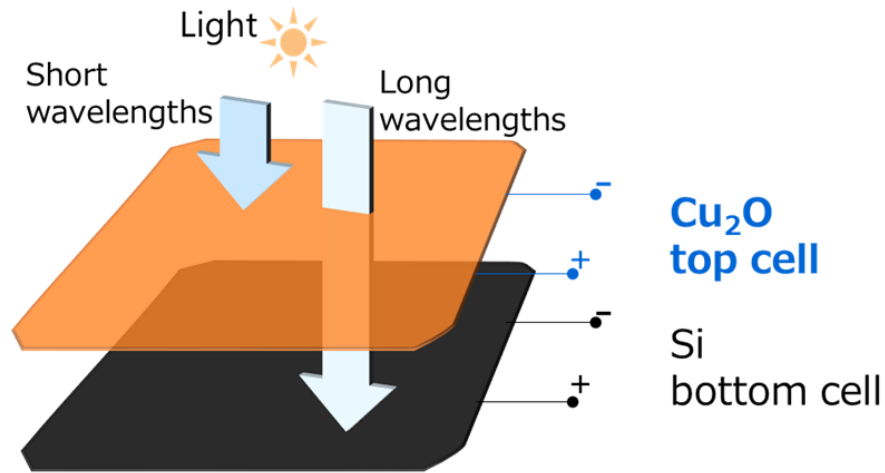
A tandem solar cell laminated with III-V solar cells such as gallium arsenide semiconductor (GaAs) has been reported to have a power generation efficiency in the 30% range, which is higher than that of a Si solar cell, but the manufacturing cost is hundreds to thousands of times higher than a Si solar cell.

The main material of transmissive Cu₂O solar cells is Cu₂O, which is a compound of copper and oxygen that is abundant on the earth. Compared to III-V semiconductors, substrates (glass), raw materials (mainly copper and oxygen) and manufacturing equipment (sputtering equipment used in semiconductors and liquid crystals) are inexpensive and can be expected to significantly reduce costs.

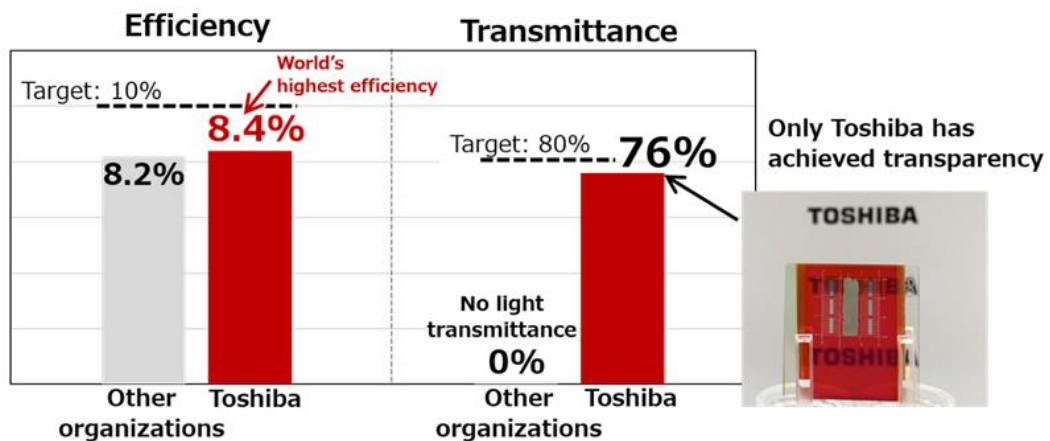
Transmissive Cu₂O solar cells absorb short-wavelength light to generate electricity and transmit long-wavelength light. By using a Si solar cell that generates electricity with long wavelength light for the bottom cell, it is possible to convert light with a wide range of wavelengths from short wavelength to long wavelength into energy, and supply the necessary power even in a limited installation area. It is expected as a low-cost and high-efficiency solar cell that can be used. Toshiba is the only company that develops optical transparent Cu₂O solar cells.

Toshiba website:

<https://www.global.toshiba/ww/technology/corporate/rdc/rd/topics/21/2112-02.html>



Schematic diagram of Cu_2O -Si tandem solar cell
from Toshiba website



Transparent Cu_2O cell development progress.
from Toshiba website

Itochu acquires a British waste tire remanufacturing company to promote rubber and tire sustainability

On December 17, ITOCHU corporation made a basic agreement to acquire all shares of Murfitts Group, a major UK waste tire collection and processing company. The shares will be acquired through Kwik Fit, the UK's largest tire retailer, which is a business investment destination of ITOCHU Corporation, and

EUROPEAN TYRE ENTERPRISE LIMITED (ETEL), which operates the UK's largest tire wholesaler, Stapleton's Tyre Services.

ITOCHU Corporation announced on December 1 that it will start "PROJECT TREE" aiming to realize traceability and sustainability of natural rubber, which is the main raw material for tires. Following this, by adding Murfitts under the umbrella of ETEL, it aims to contribute to the sustainability of the entire tire supply chain through the sale of recycled products as well as the reduction of waste by collecting waste tires.

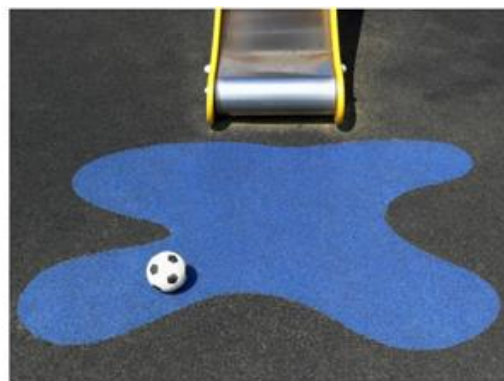
Murfitts collects and processes 20 million waste tires (passenger car tire equivalent) annually in the UK and sells recycled products. It is used for various industrial purposes such as the surface of stadiums, pavements and playgrounds, carpet underlays and asphalt substitutes, and is said to be exported all over the world. With the acquisition of Murfitts shares by ETEL, which has a tire distribution network throughout the UK, it aims to further expand collection and processing.

In addition, Murfitts has a unique pyrolysis technology that heats granular waste tires under vacuum to decompose them into high value-added recycled materials such as carbon black (CB) and recycled fuel without emitting CO2.

The initiative is to promote sustainability in tire manufacturing by using recycled CB generated by thermal decomposition from waste tires.

ITOCHU Corporation website:

<https://www.itochu.co.jp/en/news/press/2021/211220.html>



Recycled Crumb Rubber / Children's playground covered by Recycled Crumb Rubber from ITOCHU Corporation website:

Toshiba develops "electricity market trading strategy AI" for re-energy aggregator

Toshiba announced on December 15 that it has developed "Electricity Market Trading Strategy AI" to support the strategic transactions of operators in electricity market transactions for renewable energy aggregation. The AI avoids imbalances, which are the difference between the demand and supply of electricity, for re-energy aggregates that bundle renewable energy sources such as solar power, wind power and trade in the electricity market. It also supports strategic transaction decision-making aimed at securing profits from transactions.

The algorithm developed this time is suitable for the spot market and the pre-hour market of the Japan Electric Power Exchange (JEPX), and the optimum amount of bids to be sold to both markets at the timing of the spot market bid on the day before the actual supply and demand. This allows aggregators to make strategic trading decisions that change the percentage of bids to sell to both markets based on the calculated results.

The FIP system for using renewable energy as the main power source will be introduced in April 2022. This system is a market-linked system that adds a certain premium (subsidy amount) to the price when selling electricity at the market price in the wholesale market. With the introduction of the FIP system, in electricity market transactions, there is an increasing need for renewable energy power generation companies to manage imbalance risk due to fluctuations in power generation and market risks such as price fluctuations in the market to secure profits.

In order to secure profits, the role of a re-energy aggregator that bundles re-energy power sources from multiple small-scale re-energy power generation companies and executes optimal power sales plans in the electricity market is indispensable. The market size of the energy resource aggregation business is expected to grow from the current JP¥ 4.4 billion yen to JP¥ 73 billion in 2030.

Toshiba website (in Japanese):

<https://www.global.toshiba/jp/technology/corporate/rdc/rd/topics/21/2112-02.html>

Toyota to sell 3.5 million EVs worldwide in 2030

Toyota Motor Corp. announced on December 14 a new target for worldwide sales of electric vehicles (battery EVs) to 3.5 million units a year in 2030. Akio Toyoda, president of Toyota said, "By 2030, we will develop 30 types of battery EVs and have a full line of battery EVs in each of the passenger and commercial segments globally."

So far, Toyota has indicated that it will sell 2 million units of battery EVs globally in 2030, including fuel cell vehicles (FCEVs), but has significantly increased it. For the luxury car brand "Lexus," battery EVs will be introduced in all categories by 2030, with the aim of selling 100% battery EVs in Europe, North America and China. Furthermore, it aims to make all models battery EVs by 2035.

In September, Toyota announced that it would invest about JP¥ 1.5 trillion by 2030 to improve the battery supply system and conduct research and development, but also announced that it would increase the investment amount to JP¥ 2 trillion

President Toyoda believes that all electric vehicles can be divided into two types, "carbon reduce vehicles" that reduce CO2 emissions and "carbon neutral vehicles" that use clean energy to reduce CO2 emissions, depending on the energy used. "Toyota will do its utmost to achieve this," he said.

TOYOTA website:

<https://global.toyota/en/newsroom/corporate/36428993.html>



Akio Toyoda, President of TOYOTA from TOYOTA website

No need for rare metals, light bulb emission with "wooden battery"

Nippon Paper Industries, Ltd. announced on December 8 that it has succeeded in lighting a light bulb using a "wooden battery". It is characterized by using wood-derived raw materials and not using rare metals (rare metals) whose supply and demand are tight. The lighting time is as short as about 7 seconds, but it will increase the capacity and aim to use it for drones in 2023 and for smartphones in 2030, with a view to applying it to electric vehicles (EV) in the future.

The true identity of a wooden battery is a storage body that uses "cellulose nanofiber (CNF)", a fiber with a diameter of 3 nanometers (nano is one billionth) meter, taken from the papermaking raw material "pulp". It is processed into a thin film and sandwiched between aluminum foils to provide electrodes.

It charges and discharges using the property that electrons can be attached to the unevenness of the CNF surface and can store electricity, which was discovered with Mikio Fukuhara of Tohoku University in March 2021. It is the same principle as a "capacitor" that does not deteriorate even if it is charged and discharged millions of times.

The battery using the 20 square centimeter CNF used in this lighting experiment is 0.05 mm thick and weighs 0.15 g. Since the miniature bulb (voltage 3 volts, current 0.025 amps) was lit for about 7 seconds, the weight energy density, which indicates storage performance, was about 1.0 watt hour per kilogram. It is said that the value of 10 watt hours has come out. A simple calculation is 1/200 and 1/20 of lithium-ion batteries, respectively.

Lithium-ion batteries use rare metals such as cobalt and nickel. Lithium has more than doubled in one kilogram to about \$ 30 (about JP¥ 3,400) against the backdrop of growing demand for EVs. Cobalt is also about double, at the \$ 60,000 level per ton.

The Democratic Republic of the Congo accounts for 70% of the world's production of cobalt, and China accounts for more than 20% of nickel. Reducing the amount of rare metals used was an issue from the perspective of economic security for the spread of EVs. Nippon Paper Industries' batteries do not use rare metals at the heart, and can make use of the forest that covers two-thirds of Japan's land. The main use of CNF was mainly for additives such as sweets and

shampoo, and the amount used was limited.

Nippon Paper Industries website (in Japanese):

<https://www.nipponpapergroup.com/news/year/2021/news211208005076.html>



Miniature bulb with a voltage of 3 volts was lit for about 7 seconds

From Nippon Paper Industries website

Amazing technology to recover high-purity lithium from waste batteries, less than half the import price

The National Institutes for Quantum Science and Technology (QST) announced on December 7 that it has developed a technology to recover 99.99% high-purity lithium from waste lithium-ion secondary batteries (LIBs) at a price below the current import price.

The battery ash obtained by roasting the waste LIB is immersed in water, and the dissolved lithium ions are purified by a separation membrane. The test equipment was able to recover about 24 grams of lithium after 14 days of operation. If a high-concentration lithium stock solution is made, it can be expected to be recovered at less than half the import price.

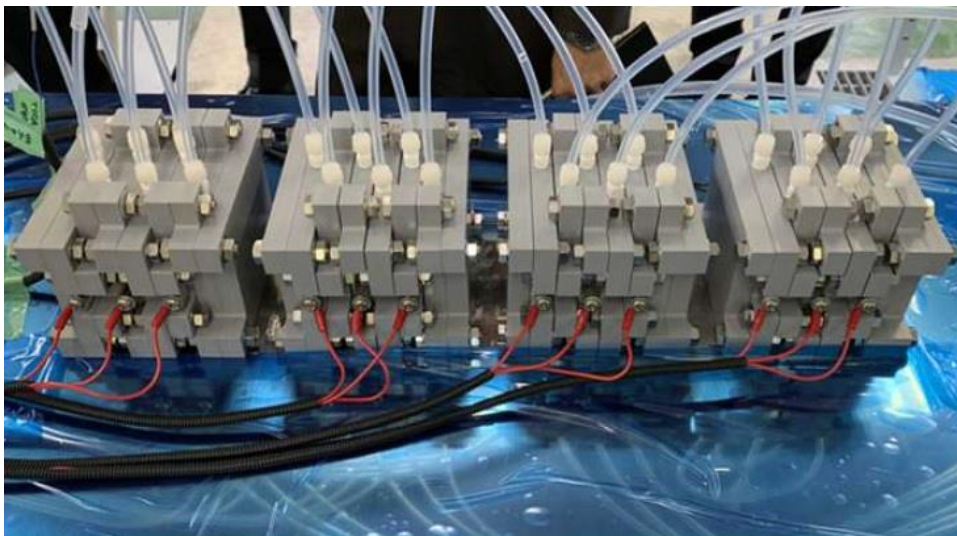
A lithium ion conductive film is made of lithium, lanthanum, and titanium oxide (LLT), which are ceramics. When a battery ash leachate solution is passed through this conductive film and a voltage is applied, lithium ions move to the pure water side. If the recovered liquid is dried, it is recovered as lithium hydroxide, and if carbon dioxide is blown into the recovered liquid, it is recovered as lithium carbonate.

With the test equipment, 80% of about 30 grams of lithium contained in the battery ash leaching solution could be recovered in 14 days. A trial calculation of the manufacturing cost of lithium showed that it was below the average import price of JP¥ 1,287 in 2020. Half price can be expected if a high-concentration stock solution is used.

80-90% of the electric power supplied for the permeation of lithium ions into the membrane is used for the movement of ions, and hydrogen for electrolysis is also generated in this process. By accumulating added values such as hydrogen utilization and carbon dioxide fixation, there is a possibility that lithium can be recycled at a lower cost.

National Institutes for Quantum Science and Technology (QST) website:

<https://www.qst.go.jp/site/press/20211207.html>



A part of Lithium recovery device from QST website

GE Hitachi receives an order for "small nuclear reactor" in Canada

GE Hitachi Nuclear Energy (North Carolina), a nuclear joint venture between Hitachi and General Electric (GE), announced on December 7 that they have received an order for the reactor "BWRX-300", a small nuclear reactor from the Canadian power company Ontario Power Generation (OPG). It will be completed in 2028 at the earliest. This is the first time that a Japanese manufacturer has been involved in receiving an order for a small nuclear reactor.

This time, it was selected as a technical partner for the Darlington New Nuclear Power Plant project near Toronto, an eastern city. OPG and others apply for a construction permit in 2028 and plan to build up to four small reactors. Hitachi-GE Nuclear Energy, a joint venture on the Japanese side, has also dispatched personnel to North America to support technological development and business negotiations.

It is said that small nuclear reactors are highly safe and can be constructed and operated at low cost. Interest in the BWRX-300 is increasing in line with the global carbon-neutral (greenhouse gas emission virtually zero) trend. In addition to Canada, GE Hitachi has contracts with local companies in the United States, Poland, Estonia, and the Czech Republic to consider introduction. The United States, Britain, Canada, etc. are supporting research and development by investing government budgets for commercialization around 2030.

The Japanese government also supported the development of innovative technologies by advocating the use of nuclear power as a "decarbonized" power source in the basic energy plan decided by the Cabinet in October. After developing the first small nuclear reactor overseas at the end of the 2020s under the green growth strategy, the future goal was to establish a global expansion and mass production system in collaboration with overseas companies.

Hitachi-GE Nuclear Energy website:

<https://www.hitachi-hgne.co.jp/en/news/2021/2021news07.html>

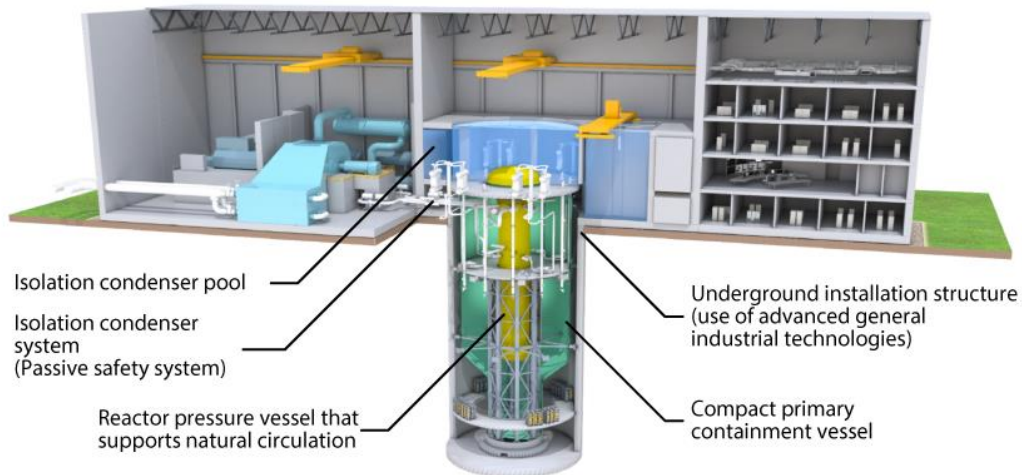


Image of small nuclear reactor BWRX-300
from Hitachi-GE Nuclear Energy website

Marubeni introduces solar power generation in Ajinomoto, Vietnam with PPA model

Marubeni announced on December 6 that it will introduce a third-party (PPA) model solar power generation system to Vietnam's Ajinomoto Co., Inc. in Vietnam. Marubeni Green Power Vietnam (MAGPOV), a wholly owned subsidiary of Marubeni, signed a long-term power sale contract with Vietnam Ajinomoto on November 30 using a roof-mounted solar power generation system.

Marubeni installs, owns, and operates a solar power generation system on the roofs of factories and warehouses of commercial and industrial consumers, and supplies renewable-derived power to consumers without the need for initial investment by consumers.

It is developing a solar power generation business based on a privately owned model in Vietnam, Mexico, and Thailand. Under this power sale agreement, MAGPOVE will install a solar power generation system on the roof of Vietnam's Ajinomoto's Longtan Plant in Dong Nai Province, southern Vietnam, to supply electricity derived from renewable energy. Through this, it aims to contribute to the decarbonization of Ajinomoto Vietnam Co., Ltd.

This project is planned to utilize the Ministry of the Environment's "Bilateral Credit System (JCM) Funding Support Project, Equipment Subsidy Project" (JCM Equipment Subsidy Project), with the cooperation of the Vietnamese and Japanese governments. The JCM equipment subsidy project is for a project that uses excellent decarbonization technology to reduce GHG emissions in developing countries under the conditions of conducts measurement, reporting and verification (MRV). Assistance is provided up to 50% of the initial investment.

Marubeni developed this business in Mexico, establishing Kiwapower, S.A.P.I de C.V. in January 2020, and Marubeni Green Power Asset (Thailand) in June 2021 in Thailand. It has already signed power sales contracts with local companies and several Japanese companies, and plans to continue expanding this business in the future.

Marubeni owns and operates power generation assets with an equity capacity of approximately 12 GW in 19 countries including Japan. Based on the knowledge and experience gained in these businesses, it will strengthen and expand their efforts in the power service business field by expanding the distributed power generation business, and achieve net zero greenhouse gas emission by 2050.

Marubeni website:

<https://www.marubeni.com/en/news/2021/release/00101.html>

Image from Marubeni website



the United Mexican States, Mexico



Sing Buri Province, Thailand

