**JAPANESE INDUSTRY AND POLICY NEWS**
**July 2019**

## LEGISLATION AND POLICY NEWS

### Key Technologies Shown in Energy Efficiency Technology Strategy 2016 Revised

In 2016, the Agency for Natural Resources and Energy (ANRE) and the New Energy and Industrial Technology Development Organization (NEDO) jointly formulated Energy Efficiency Technology Strategy 2016, aiming to effectively promote the research and development of energy efficiency technologies and popularize them. ANRE announced on July18 that it and NEDO revised the key technologies shown in the strategy.

In this revision, ANRE and NEDO further subdivided the 14 key technologies and added new key technologies based on the current circumstances and compiled 39 key technologies as a result.

They added technologies for highly-efficiently converting waste heat into electricity, those for highly-efficient electrical heating and other technologies to the category of key technologies, aiming to encourage industries to make use of waste heat and introduce decarbonization efforts into their thermal systems.

In light of new, emerging business models that take advantage of digital technologies and a recent surge in the volume of data in circulation, they added technologies related to the fourth industrial revolution, such as energy-efficient data centers, traffic-flow control systems and smart logistics management systems, to the category of key technologies.

In light of the national policy for making renewable energy a major power source, they added technologies related to reserve capacities and balancing capacities, for power demand-supply adjustment to the category of key technologies.

https://www.meti.go.jp/english/press/2019/0718_002.html

### Committee on Study of Standardizations for Marine Biodegradable Plastics Inaugurated

The Ministry of Economy, Trade and Industry (METI) announced on July 22 that it inaugurated the Committee on the Study of Standardizations for Marine Biodegradable Plastics, a body to hold deliberations on highly reliable methods

for solving marine plastic waste issues. The committee aims to file a proposal for international standards for marine biodegradable plastics in order to encourage industries to popularize the development and introduction of such plastics as an initiative for solving the issues using innovations.
In May 2019, METI formulated a Roadmap for Popularizing Development and Introduction of Marine Biodegradable Plastics. The roadmap aims to encourage industries to popularize the development and introduction of marine biodegradable plastics by collaborating with the public and private sectors.
As a concrete initiative to achieve the goal of the "implementation of technologies for commercializing such biodegradable plastics," a component of the roadmap, METI inaugurated the Committee on Study of Standardizations for Marine Biodegradable Plastics to hold deliberate common methods of technical assessment based on scientific grounds under the framework of industry-academia-government collaboration. Through its discussions, the committee will aim to file a proposal for international standards for marine biodegradable plastics with the International Organization for Standardization (ISO) and other international standards organizations in the early 2020s.
https://www.meti.go.jp/english/press/2019/0722_001.html

**Promising Sea Areas and Sites Selected for Targeted Promotion**
On July 30, the Agency for Natural Resources and Energy (ANRE) and the Ports and Harbours Bureau of the Ministry of Land, Infrastructure, Transport and Tourism (MLIT) selected 11 sea areas as potential sea areas, from which the target sea areas for certain projects for promoting utilization of such areas will be designated under the Act of Promoting Utilization of Sea Areas in Development of Power Generation Facilities Using Maritime Renewable Energy Resources (the "Act"), since these 11 areas are considered to have progressed to a certain level of preparations for starting such projects.
Based on the information offered by municipalities and other organizations, ANRE and the Ports and Harbours Bureau selected the following 11 sea areas as those considered to have progressed to a certain level of preparations for starting projects.
(1) Sea of Japan offshore Aomori Prefecture (northern side of the prefecture)
(2) Sea of Japan offshore Aomori Prefecture (southern side of the prefecture)
(3) Mutsu Bay, Aomori Prefecture
(4) Sea area offshore Happo Town and Noshiro City, Akita Prefecture

(5) Sea area offshore Noshiro City, Mitane Town and Oga City, Akita Prefecture
(6) Sea area offshore Katagami City, Akita Prefecture
(7) Sea area offshore Yurihonjo City, Akita Prefecture (northern and southern sides of the prefecture)
(8) Sea area offshore Murakami City and Tainai City, Niigata Prefecture
(9) Sea area offshore Choshi City, Chiba Prefecture
(10)Sea area offshore Eno Island, Saikai City, Nagasaki Prefecture
(11)Sea area offshore Goto City, Nagasaki Prefecture

As the following four sea areas out of the 11 have made progress in developing the environment for starting projects, e.g., reaching prior consent with local residents, they were determined to be promising areas. In response, ANRE and the Ports and Harbours Bureau will immediately start preparations for organizing the council under the Act and for government-led wind-conditions and geological research in the four areas.

・Sea area offshore Noshiro City, Mitane Town and Oga City, Akita Prefecture
・Sea area offshore Yurihonjo City, Akita Prefecture (northern and southern sides of the prefecture)
・Sea area offshore Choshi City, Chiba Prefecture
・Sea area offshore Goto City, Nagasaki Prefecture

https://www.meti.go.jp/english/press/2019/0730_001.html

## SURVEY AND BUSINESS DATA

### Japanese Population Has Decreased for 10 Consecutive Years

According to statistics that the Ministry of Internal Affairs and Communications (MIC) published on July 10, total population in Japan was 127,443,563 persons as of January 1, 2019. It is a decrease by 263,696 persons (-0.21%) as compared to the previous year.

While the number of Japanese inhabitants registered a decrease for 10 consecutive years to reach 124,776,364 persons (-0.35%), foreign residents increased by 6.79% to 2,667,199 persons. As a result, ratio of foreign residents in Japan increased to 2.09% of the total population.

http://www.soumu.go.jp/main_sosiki/jichi_gyousei/daityo/jinkou_jinkoudoutai-setaisuu.html (in Japanese)

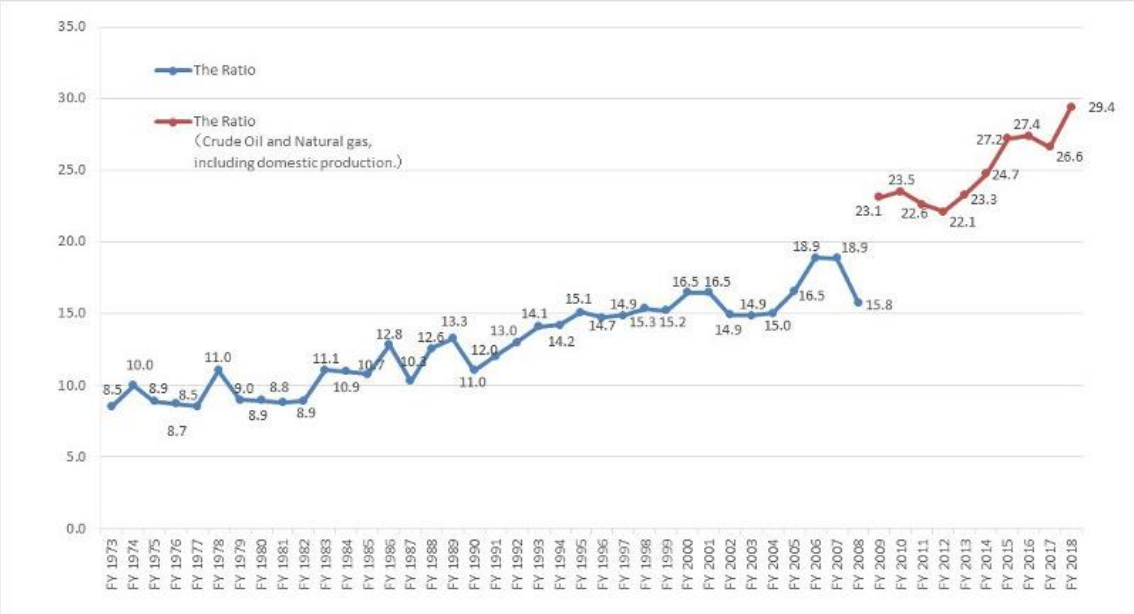
**Japan's Independent Development Ratio of Oil and Natural Gas Showed an Increase in FY2018**

The FY2018 independent development ratio of oil and natural gas in Japan showed an increase by 2.8% point from the previous year. This increase is considered to be derived from the start of production under the LNG project in Australia, a production increase in multiple oil-gas fields and other factors, resulting in an increase in the offtake amount of oil and natural gas by Japanese enterprises.

Japan's independent development ratio of oil and natural gas is defined as the share of the offtake amount of oil and natural gas under the control of Japanese entities, including domestic production, out of the total amount of imported and domestically-produced oil and natural gas.

As Japan is a country largely dependent on imports from abroad for its oil and natural gas, it is vitally important that it secures a diversity of supply channels. To this end, since the formulation of the Fifth Strategic Energy Plan approved by the Cabinet in July 2018, Japan has been supporting Japanese enterprises so as to improve the current independent development ratio in Japan for both oil and natural gas, including domestic production, to over 40% in 2030.

Changes in Japan's Independent Development Ratios of Oil and Natural Gas since FY1973




Note: From FY1973 to FY2008, the independent development ratios were calculated based

on oil amounts alone. Since FY2009, ANRE has been calculating the ratios based on the combined amount of oil and natural gas and releasing the results.
https://www.meti.go.jp/english/press/2019/0729_004.html

**Recent Trends in AI-related Inventions Analyzed**

The Japan Patent Office (JPO) released on July 8 result of a research on recent trends in patent applications for Artificial Intelligence (AI)-related inventions which are gaining significant attention in recent years.

Along with the remarkable development of the AI centering on deep learning, the trends in AI-related patent applications have gained significant attention. Therefore, the JPO analyzed recent trends in patent applications for AI-related inventions* in Japan and other leading countries.

* AI-related inventions include (i)AI-core inventions classified in G06N as International Patent Classification (IPC) and (ii)AI-applied inventions which apply AI to various technical fields.

Recent trends of AI-related inventions can be summarized as follows.

（1） The number of domestic patent applications for AI-related inventions has increased rapidly since 2014 due to the impact of the 3rd AI boom. About 3,100 applications for AI-related inventions were filed in 2017 (＋65％ compared with the previous year), including about 900 applications for AI-core inventions (＋55％ compared with the previous year).

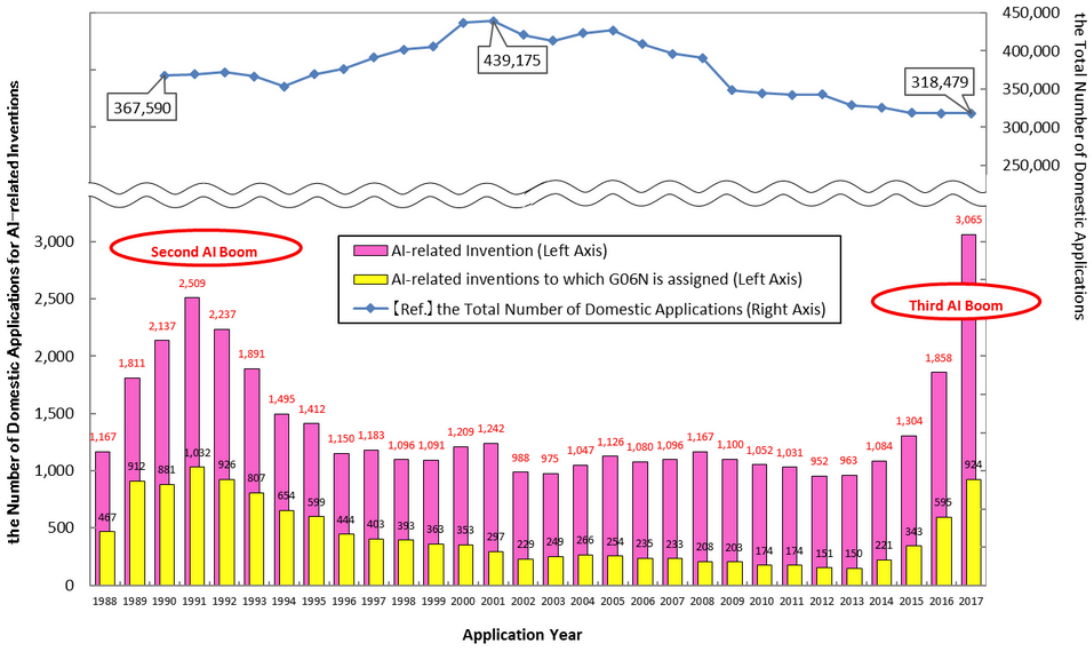



Figure 1　The number of domestic applications for AI-related inventions

（2） The major method used in AI-related inventions is machine learning.

Among these, inventions referring to deep learning are rapidly increasing, and nearly half of AI-related inventions refer to deep learning in the application documents in 2017.

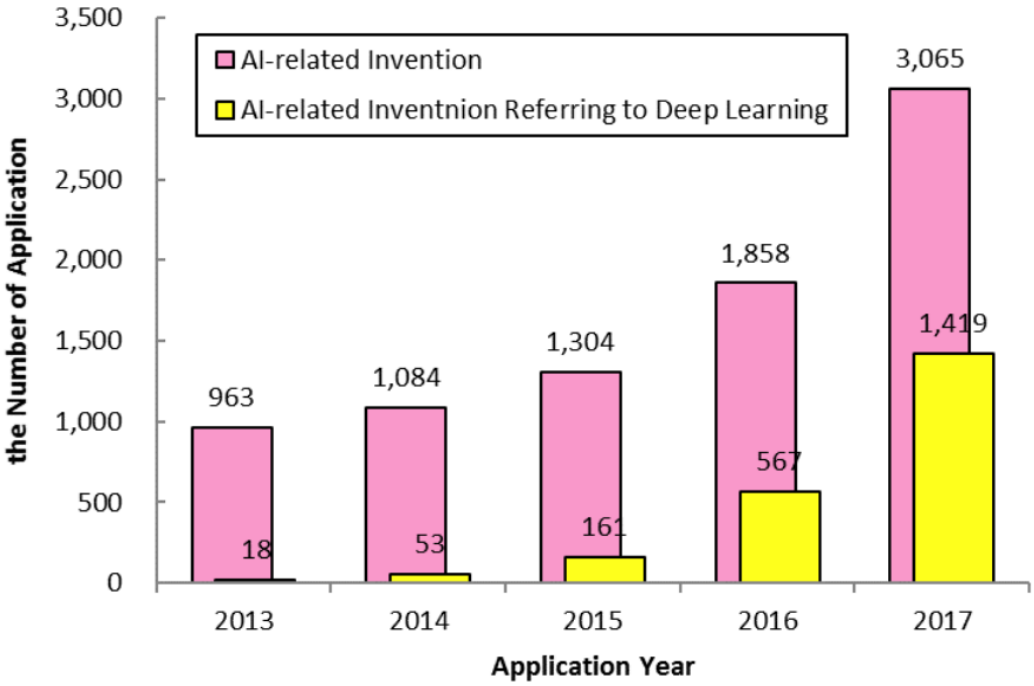



Figure 2 The number of applications for AI-related inventions referring to deep learning in the application documents

（3）As for AI-applied fields, the numbers of applications in the image processing, information retrieval/recommendation, business method and medical diagnosis fields are large, and the growth rate in control / robotics fields is particularly high.

（4）The numbers of applications for AI-core inventions in the Five IP Offices (Japan, US, the EPO, China, and Korea) and PCT applications are both increasing, with the number in US and China leading the way.

https://www.meti.go.jp/english/press/2019/0701_002.html
https://www.jpo.go.jp/e/system/patent/gaiyo/ai/document/ai_shutsugan_chosa/report.pdf

## COMPANY NEWS

### Daikin Facilitates Use of HFC-32 by Pledging Free Access to Its Patents

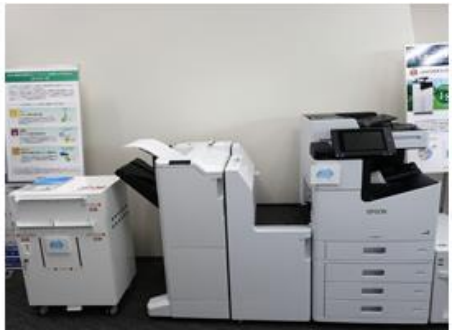
Daikin Industries, Ltd. announced on July 1 the grant of free access to its pledged patents in relation to applicable HVAC-R (heating, ventilation, air

conditioning, and refrigeration) equipment using non-blended, single-component refrigerant HFC-32 (R-32).
HFC-32 is a non-ozone depleting refrigerant with a global warming potential (GWP) one-third of that of current R-410A refrigerant. It also provides excellent system performance and is readily available. As a single-component refrigerant, it is easy to recover, recycle, and reclaim, which helps reduce the need for additional production of refrigerant.
Daikin launched the global first HFC-32 residential equipment in Japan in 2012. Since then, HFC-32 residential and commercial equipment have been offered in more than 60 countries. By providing free access to the pledged patents, all of which have been filed after 2011, Daikin looks to further facilitate the adoption of HFC-32 equipment. Free access to the pledged patents is provided without requiring pre-approval from Daikin. It requires no contracts, as are typically required for patent licensing programs. This eliminates complicated processes and provides quick and easy access to the pledged patents.
https://www.daikin.com/press/2019/190701/index.html

**Epson Starts a Project Turning Used Paper into New One in Localized Cycle**

Seiko Epson Corporation and its sales arm, Epson Sales Japan Corporation announced on July 1 that they would start “Environment-friendly Office Project” which terns used paper into new paper by a combination of the PaperLab, a “dry” type papermaking machine, and a high speed ink-jet printer.
PaperLab involves three processes of defibration, binding and forming. As a first phase, Epson installs this paper recycling system in its own office, seeking possibility to offer this system to outside client in the second phase.

Placing used paper into the PaperLab for recycling, then use recycled paper for new printing

https://www.epson.jp/osirase/2019/190701.htm (in Japanese)
https://www.youtube.com/watch?v=2dogZsV9Ns4

**Fast Retailing to Reduce Single-Use Plastic Up to 85% by End 2020**

Fast Retailing Group announced on July 3 plans to eliminate the use of unnecessary plastic throughout its supply chain and to reduce the amount of single-use plastic handed to customers at its Group stores worldwide, such as shopping bags and product packaging, by 85%, or around 7,800 tons annually, by the end of 2020. All 3,500 stores worldwide including UNIQLOs and GUs to begin switching to eco-friendly paper bags from this September.


New eco-friendly paper bags to be introduced at UNIQLO and GU stores worldwide from September

https://www.fastretailing.com/eng/sustainability/news/1907031100.html

**Partnership Agreement on Plastic Recycling and the Promotion of a Circular Economy Signed**

Marubeni Corporation (“Marubeni”), Marubeni Plax Corporation (“Marubeni Plax”) and Chubu Nihon Plastics Co., Ltd. have signed a partnership agreement on July 26 to jointly undertake a plastic recycling business and work together on the ECONET PROJECT that Chubu Nihon promotes in order to establish a circular economy. Marubeni and its partners will jointly promote a plastic recycling business and expand the conventional 3R (Reduce, Reuse, Recycle) activities of the ECONET PROJECT that Chubu Nihon has been promoting to “4R”. The additional “R” stands for “Return to the Earth”.

Through the ECONET PROJECT, Chubu Nihon collects defective products, called “loss products” or “scrap”, which occur in plastic products production, and return them to raw materials. Additionally, Chubu Nihon conducts eco-consulting to establish a circular economy by handling compostable products and biodegradable materials. Marubeni and Marubeni Plax will use their sales and procurement ability, know-how and experience in sales promotion proposals and their broad network as a sogo shosha to try to establish a circular economy in the plastic industry.
https://www.marubeni.com/en/news/2019/release/20190726E.pdf

**Chinese BYD and Toyota Enter Agreement to Jointly Develop BEVs**

BYD Company Ltd. and Toyota Motor Corporation announced on July 19 that they have signed an agreement for the joint development of battery electric vehicles (BEVs). The two parties will jointly develop sedans and low-floor SUVs as well as the onboard batteries for these vehicles and others with the aim to launch them in the Chinese market under the Toyota brand in the first half of the 2020s.
Going forward, BYD and Toyota will make use of the electrified vehicles, and battery development technologies they have acquired through their market introductions and will work together to further develop BEVs that are attractive to customers and in further promoting their widespread adoption.
https://global.toyota/en/newsroom/corporate/28913709.html

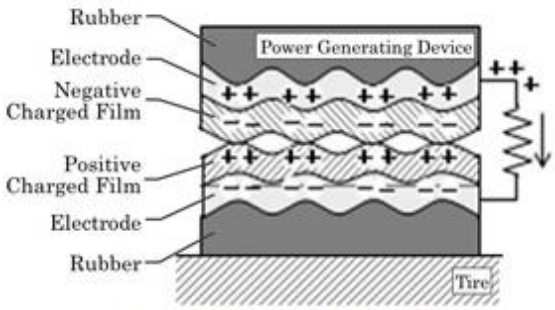
**Toyota Expands Collaboration in MaaS with Didi Chuxing**

Toyota Motor Corporation announced on July 25 that it has concluded an agreement with Didi Chuxing (DiDi) to expand collaboration in Mobility as a Service (MaaS) in China. As part of this agreement, Toyota will invest 600 million U.S. dollars in DiDi and a joint venture, which the two companies will establish with GAC Toyota Motor Co., Ltd. (GTMC) for vehicle-related services for ride-hailing drivers.
Toyota and DiDi announced collaboration on e-Palette in January 2018, and launched vehicle-related services, including a vehicle leasing service and various services for DiDi ride-hailing drivers at a Toyota dealer in May 2018. Those cars are equipped with Toyota's in-vehicle device, TransLog, leveraging intelligent analysis capabilities of Toyota's proprietary Mobility Services Platform (MSPF) to provide quality automobile maintenance support and safe driving

guidance to ride-hailing drivers.
Through this new agreement, Toyota and DiDi plan to shift to full-scale implementation of services that they have been developing in China.
https://global.toyota/en/newsroom/corporate/28993116.html

**Sumitomo Rubber and Kansai University Developed New Technology to Generate Electric Power Using Static Electricity within a Tire**

Sumitomo Rubber Industries, Ltd. announced on July 23 that, through joint research undertaken with Professor Hiroshi Tani of Kansai University, it has developed a new technology to generate electric power from the rotation of a tire, which is accomplished by installing a power generating device (Energy Harvester) inside of a tire to convert static electricity occurring within a tire into clean energy. This new device takes advantage of a type of static electricity called frictional charging to generate electric power efficiently each time a tire's footprint deforms as a tire rotates. They believe that this technology holds great potential for practical applications as a power source for various automotive digital tools.
They are confident that the results of this latest research will lead to practical applications for this new technology as a power source for sensors used in TPMS (Tire Pressure Monitoring System) and other automotive devices, contributing to the creation of future services that make use of various digital tools without any need for batteries.



Frictional Charging Using Deformation of Tire Footprint


Power Generating Device Installed in Tire

http://www.srigroup.co.jp/english/news/2019/sri/2019_060.html

**Daiwa House to Develop “100% Renewable Energy Town”**

Daiwa House Industry Co., Ltd. announced on July 10 that they started construction of “100% Renewable Energy Town” in Funabashi, Chiba

Prefecture. It is a large-scale development project for residential and commercial facilities, extending to 57,456 square meters.
Daiwa House uses renewable energy in construction and provides renewable electricity to residents obtained mainly from its own hydraulic power plant in Gifu Prefecture. Total cost for developing this new town is estimated at 26 billion yen.

Schemes for Developing 100% Renewable Energy Town


https://www.daiwahouse.com/about/release/house/20190710114923.html (in Japanese)

**Shimizu Begins Construction of the World's Largest Self-Propelled SEP Vessel**

Shimizu Corporation announced on July 24 that it would begin construction of a highly efficient self-propelled Self-Elevating Platform (SEP) vessel equipped with the world's largest transporting and crane capacity and capable of installing ultra-large-scale offshore wind turbines. Shimizu is investing roughly 50 billion yen in the project and plans to bring in orders for the construction of offshore windfarms, a market estimated to be over 5 trillion yen. Completion is scheduled for October 2022.
Japan's new Act to Promote Offshore Use by Offshore Renewable Energy Facilities was enacted in April of this year and the offshore wind power market is projected to rapidly expand. Planning is currently underway in Japan for a publicly-disclosed total of 10 million kW of offshore windfarm power generation

capacity. Electric power providers are focusing on economic efficiency and are planning to use large wind turbines of the 8 and 12 MW class, which have not yet been used in Japan.
According to Shimizu, there are currently no SEP vessels in Japan capable of installing wind turbines of the 8 MW class or larger and because of high demand in Europe, it is not easy to charter a large SEP ship. Shimizu therefore decided to build a SEP vessel equipped with the world's largest transporting and crane capacity and will obtain engineering, procurement and construction orders for the construction of offshore windfarms that are being planned in Japan.
Shimizu collaborated with GustoMSC B.V., a European engineering company, for the planning specifications and design of the ship beginning in October 2018. Japan Marine United Corporation will manufacture the ship and Shimizu will collaborate with Fukada Salvage & Marine Works Co., Ltd., which owns numerous working ships, for operation management.

Image of Self-Propelled SEP vessel to be constructed (attaching blades)


https://www.shimz.co.jp/en/company/about/news-release/2019/2019007.html

**Toyobo Accelerates Development of Material for OPV through a Joint Effort with French CEA**

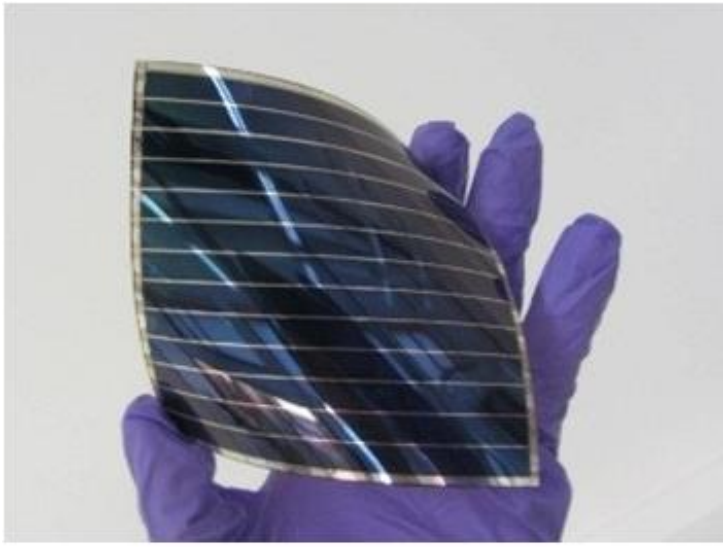
Toyobo Co., Ltd. announced on July 31 that it would seek to accelerate its development of a key material in organic photovoltaics (OPV), which are anticipated to be the next generation of solar cells, through a joint effort with the French government research institute CEA.

OPV uses organic materials made from polymers containing carbon, sulfur and nitrogen, instead of the silicon and other inorganic substances used to make conventional solar cells. A thin, lightweight and flexible solar cell can be made by applying a power-generating material to a plastic surface. The material can also be applied to glass and metals.

OPV can be installed on walls, windows, clothing, curtains and other surfaces that are currently unsuitable for installing solar cells. This makes OPV a promising next-generation solar cell that could serve as a wireless power source for the sensors needed to run Internet of things (IoT) devices.

Toyobo aims to create a novel power-generating material for OPV by optimizing the chemical structure so that relatively large amounts of electricity can be generated via low-illuminance and indoor light sources such as LEDs. The technology is based on Toyobo's organic synthesis technologies that were born out of years of research on fine chemicals.

In collaboration with CEA, Toyobo will strive to develop the technology needed for practical OPV using Toyobo's material with an eye to the European market, which is expected to be among the first to embrace OPV.



Flexible OPV module © P. Avavian/CEA

https://www.toyobo-global.com/news/2019/release_101.html

## ADDITIONAL TOPICS

### White Paper on International Economy and Trade 2019 Released

The Ministry of Economy, Trade and Industry (METI) released the 2019 version of its annual White Paper on International Economy and Trade, which was presented to the Cabinet on July 16.

Highlights of the White Paper are as follows.

As global trade value expands and global value chains (GVC) develop, the global economy continues to become ever more integrated. Simultaneously, in last several years, the world has been facing a surge in protectionism, raising concerns over the potential malfunctioning of the multilateral trading system. The White Paper 2019 examines the current state of affairs regarding globalization and GVCs, and analyzes the history of protectionism, the background to trade restrictive measures, and the negative impacts caused by such measures. Through these steps, the White Paper presents the case for establishing a new rule-based international trade system.

Moreover, the White Paper analyzes the current situation including Japan's economic relationships with other countries and related challenges, and examines the position of Japanese companies in overseas markets, in particular in Asia, and shows future directions toward which they should aim.

https://www.meti.go.jp/english/press/2019/0716_001.html

### English Summary of the "Next Generation Computer Creates New Business" Symposium Published

Next-generation computers are expected to be able to instantly process massive amounts of information and create new businesses amid the dissemination of big data, internet of things (IoT) and artificial intelligence (AI) technology. The state of the art of these computers are known as "annealing machines."

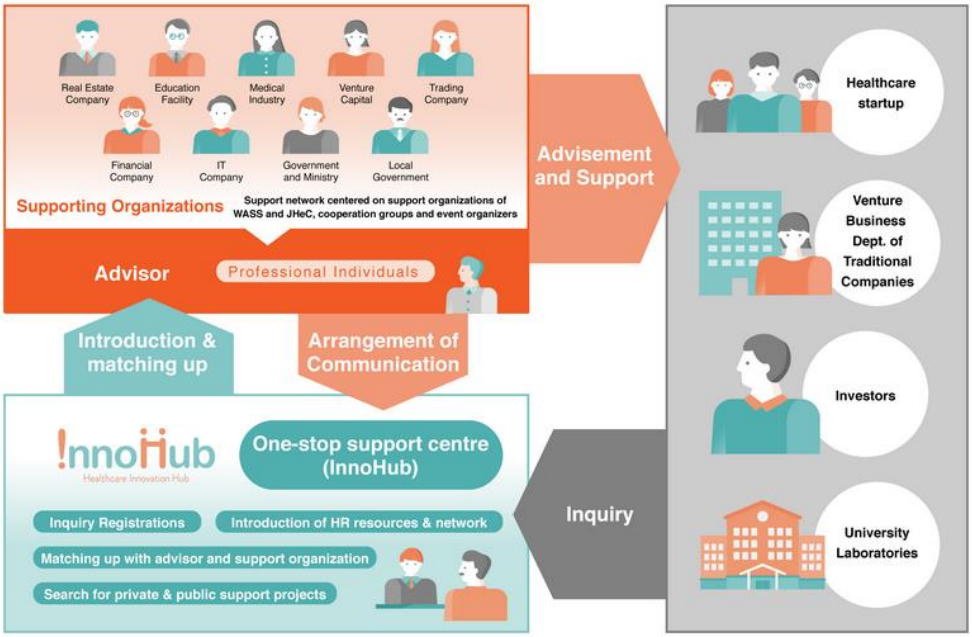
Against this backdrop, on May 20, the Ministry of Economy, Trade and Industry (METI) held a symposium focused on the topic of annealing machines. Bringing together over 500 participants, the symposium focused on quantum annealing machines, which are a type of quantum computer, and experts in the field of annealing machines and representatives of pioneering companies engaging in

development of applications and leading companies overseas held presentations to explain the trends in the most advanced development, domestic and overseas efforts for applying such machines to businesses and the further future potential of such machines.
On July 4. METI published an English summary, together with links to the presentations. The video clips on the details of the symposium have been publicized on the YouTube website.
https://www.meti.go.jp/english/press/2019/0704_001.html

**Healthcare Innovation Hub Opens**

The Ministry of Economy, Trade and Industry (METI) recently took the opportunity of the Japan Healthcare Contest (JHoC), among others, to build networks with associations contributing to providing measures for supporting venture businesses and other companies in the healthcare industry, and encouraging such businesses to revitalize through innovation
As part of this effort, in June, METI opened a one-stop counseling counter called the “Healthcare Innovation Hub (‘InnoHub’)” in the Nihonbashi Life Science Building in Tokyo. The counter aims to support venture businesses and other companies in advancing business in the fields of healthcare and life science.

New One-stop Support Centre Named "Healthcare Innovation Hub (InnoHub)"



METI also opened an official website on which venture businesses and other companies in the healthcare industry are able to send a request for receiving counseling services, retrieve information on measures for supporting them in creating innovations which are provided by the government, municipalities and private companies and receive other services.
Furthermore, as an event for celebrating the opening of InnoHub, METI held a Forum for Celebrating the Opening of Healthcare Innovation Hub on July 5.
https://www.meti.go.jp/english/press/2019/0708_001.html
https://healthcare-innohub.go.jp/?lang=en

**Winners of the Award for Academic Startups 2019 Selected**

Japan Science and Technology Agency (JST) and New Energy and Industrial Technology Development Organization (NEDO) jointly announced on July 29 winners of the Award for Academic Startups 2019.
Outline of principal winners are as follows.
〈Minister of Economy, Trade and Industry Award〉
Startup: Kyulux, Inc. (https://www.kyulux.com/)
Supporting university: Kyushu University
Supporting company: QB Capital, LLC
Outline: Engaging in R&D of next-generation materials used in organic electro-luminescence (EL) displays or lights.
〈Minister of Education, Culture, Sports, Science and Technology Award〉
Startup: Xcoo【ténku:】Inc. (https://xcoo.co.jp/)
Supporting university: The University of Tokyo
Outline: Developing a total solution software “Chrovis” for genomic medicine.

While NEDO Chairman’s Award accorded to Icaria, Inc (https://icariacorp.com/en/about/), JST President’s Award was given to EditForce, Inc. (https://www.editforce.jp/english/).
https://www.meti.go.jp/english/press/2019/0729_002.html
https://www.jst.go.jp/aas/award.html (in Japanese)

**PHV with High Efficiency Solar Cells to be Tested on Road**

New Energy and Industrial Technology Development Organization (NEDO), together with Sharp Corporation and Toyota Motor Corporation announced on July 4 that they would start proving test of an electric car equipped with a world-

class high efficiency solar cells on public road.
For the proving test, Sharp developed solar battery panels having conversion efficiency of more than 34%. Toyota installed these panels on roof, hood and rear doors of a test car of its Prius Plug-in-hybrid (PHV) car. Generated power of test car is estimated at 860 watts.

Prius PHV Test Car with Solar Cell Panels
https://www.nedo.go.jp/news/press/AA5_101150.html (in Japanese)