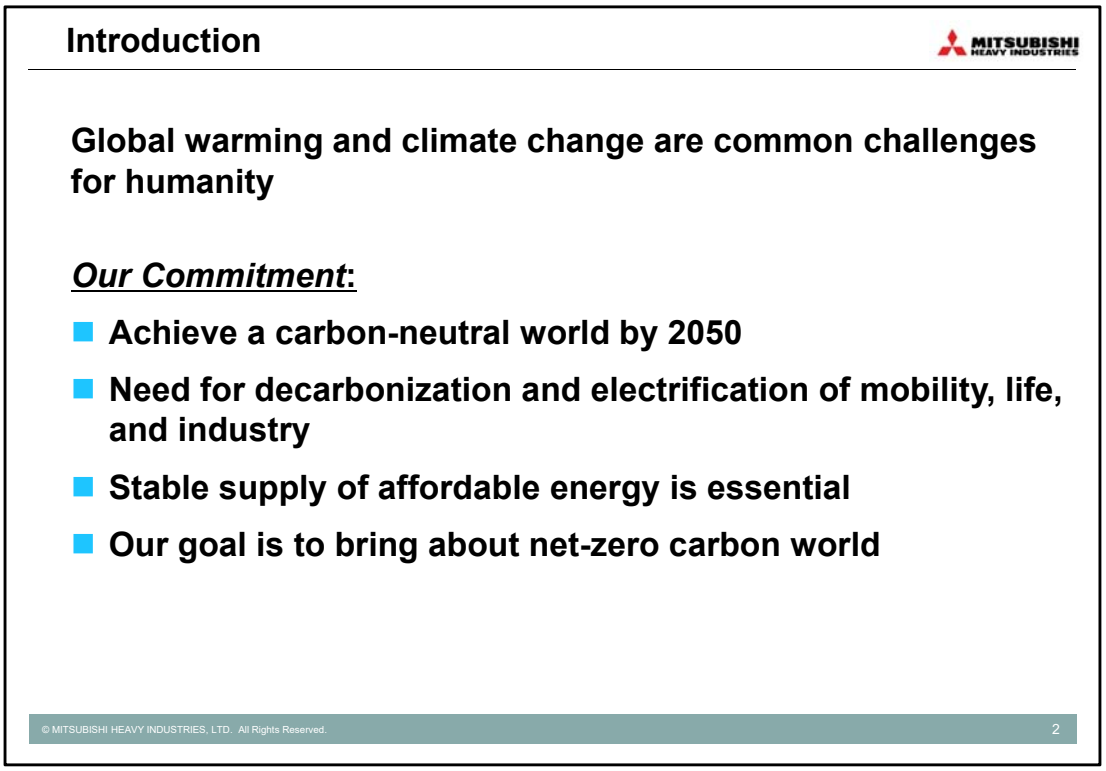
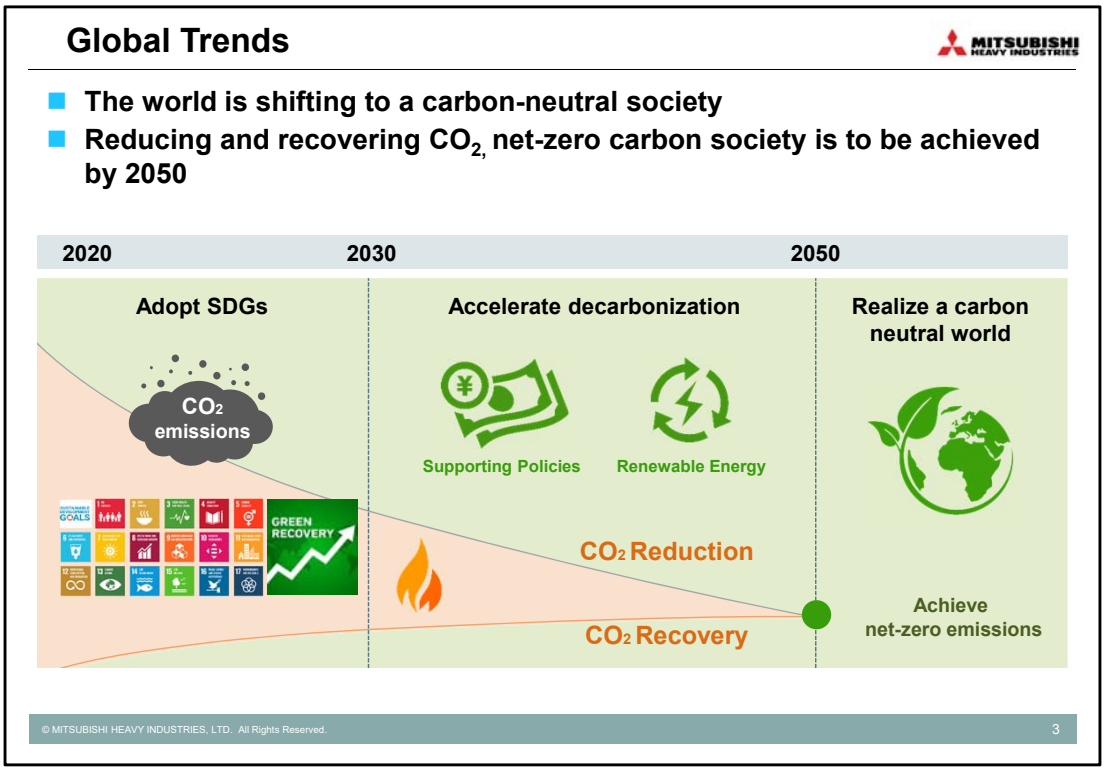
My name is Kentaro Hosomi, and I'm in charge of the Energy Systems business.

Last month, President Izumisawa introduced the Energy Transition as a growth area to be developed by Mitsubishi Heavy Industries Group. Today, let me share our approach in the areas that we will focus on in the future, and explain how we are going to use our core competencies and technologies to solve new social issues.



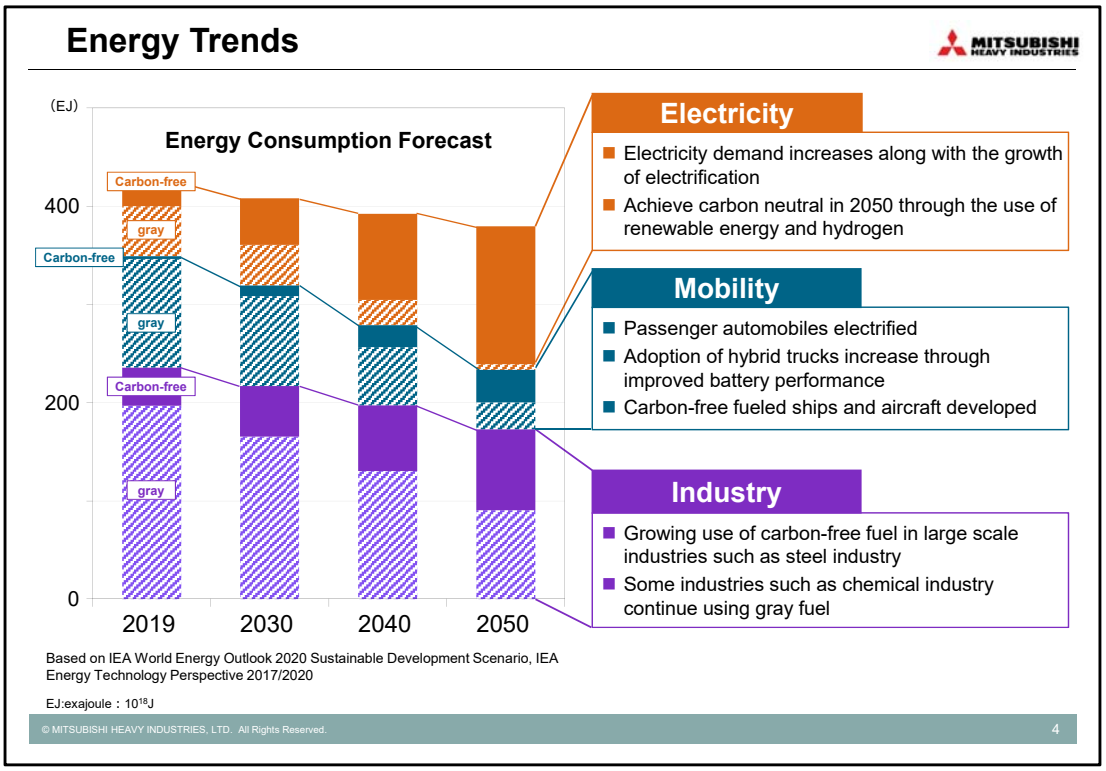
With the recognition that global warming and climate change are common human issues, society is entering a period of great change. As Prime Minister Yoshihide Suga recently announced, Japan would aim to realize a carbon-neutral society by 2050, affirming the need for decarbonization as policy, aligning with the social consensus in countries around the world.

In order to achieve this goal, we need to decarbonize and electrify mobility, life, and industry. This is the foundation that supports our society. Today, there are still many people in the world who need economic development and improvement of their livelihoods, and the stable and affordable supply of energy is essential. It is difficult to resolve a variety of social issues in a flash, but to achieve sustainable prosperity, we must confront these issues earnestly and realize a carbon-neutral society. This is our energy transition goal.



Even before the impact of COVID-19, there had been calls for the reduction of greenhouse gas emissions through the use of SDGs as drivers. However, the decarbonization of society is expected to accelerate further in the future, supported by policy measures such as the EU's measures to support economic recovery from a pandemic, the declaration by Prime Minister Suga to aim for a carbon-neutral society, and the transition to an eco-friendly Biden administration in the United States.

In order to realize a carbon-neutral society while meeting the demand for energy that supports economic development, it is necessary to promote both the reduction and recovery of CO2 and achieve net-zero carbon. To achieve this, it is important not only to expand renewable energy, but also to accelerate various technological innovations. It is expected that policy measures will be introduced to encourage innovation while leveling the burden of social costs.



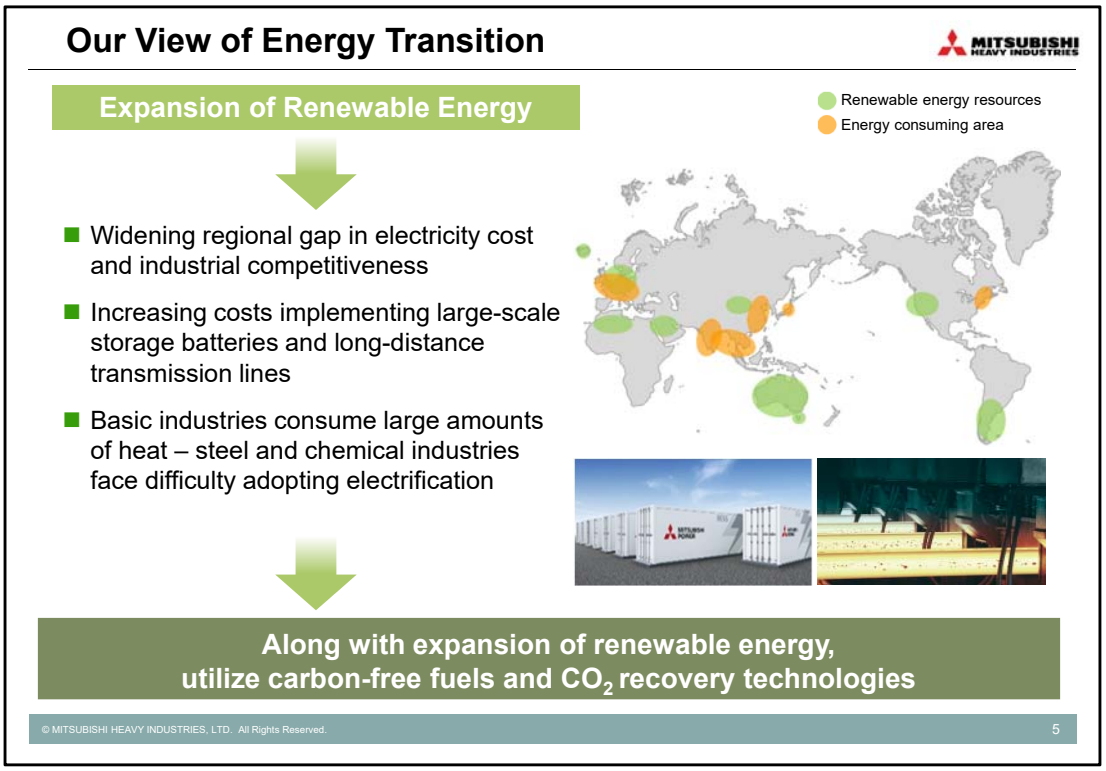
How will the actual energy demand reflect such social trends?

Shown here are the IEA's sectoral energy consumption projections, which show carbon-free energy and gray energy that emits CO2 from fossil fuels. In the keywords mentioned above, the electric power sector can be read as "Electricity", the transport sector as "Mobility" and the industrial sector as "Industry".

Due to the impact of the pandemic, it is expected that the energy consumption of society as a whole will decrease in the long term due to the promotion of energy conservation and significant improvement of energy efficiency. However, demand for Electricity will increase as society promotes electrification. Decarbonization is expected to proceed most rapidly through the use of renewable energy, nuclear power, hydrogen, etc., and to be nearly carbon-free by 2050.

As for "Mobility", EVs will become the mainstream for short-distance transportation, but it will be difficult to completely electrify long-distance transportation, and hybrids will be promoted along with improvements in battery performance. Ships and airplanes between continents are expected to gradually shift to carbon-free alternative fuels.

As for "Industry" it will be a challenge to electrify all of them because many processes utilize not only electric power but also a large amount of heat obtained by burning fossil fuels. Therefore, the IEA also predicts that while there will be a partial shift to carbon-free fuels, fossil fuels cannot be completely eliminated.

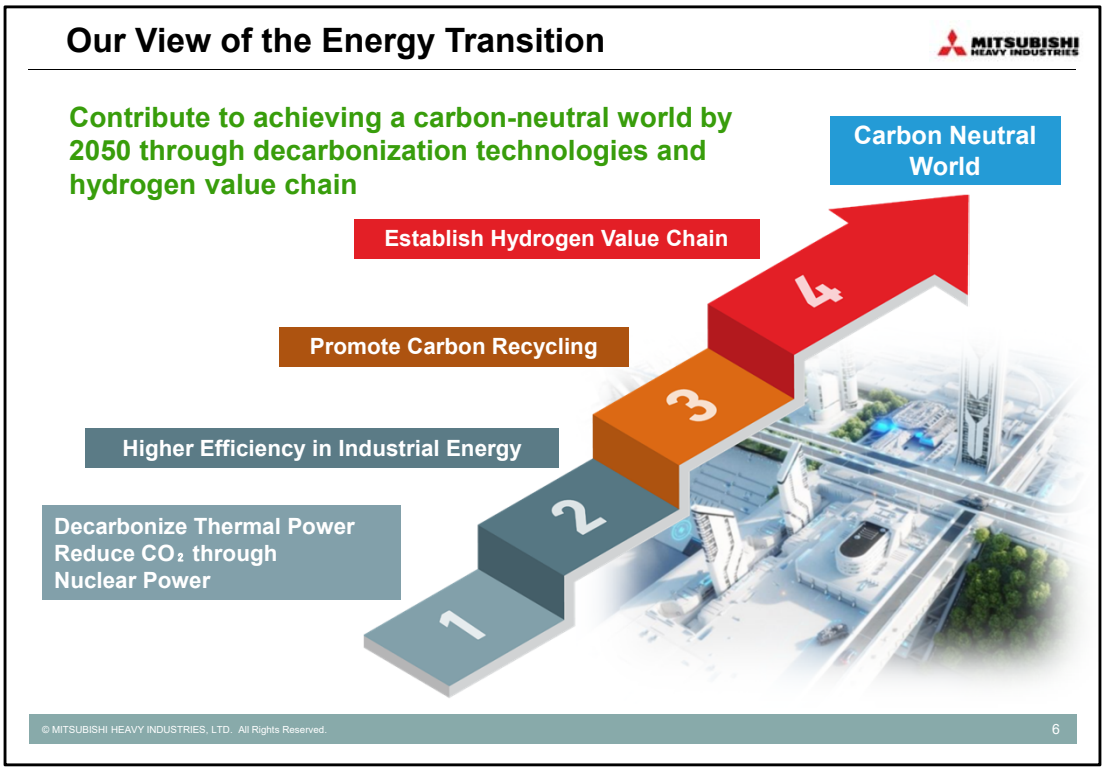


In light of these energy trends in society, what scenario would it be to shift to a decarbonized society while maintaining economic efficiency, minimizing the increase in social costs?

It is true that we need to expand renewable energy as society becomes more electrified. On the other hand, from an economic point of view, the power generation cost of renewable energy varies depending on the duration of sunlight and wind strength, and therefore the power generation cost per unit also varies. Globally, regions that consume large amounts of energy are not necessarily blessed with such natural conditions. Depending on the conditions, there are differences in power generation costs, which can lead to differences in industrial competitiveness between regions.

In order to use renewable energy in consuming areas, it is necessary to stabilize supply through large-scale power storage facilities and to transmit electricity over long distances, which may lead to significant increases in social costs. In addition, geographic regions that require large amounts of energy for their key industries such as steelmaking and chemicals, which consume large amounts of heat, cannot use electrification to address their energy needs.

In view of this, in order to promote electrification of society through the expansion of renewable energy while achieving economic efficiency, low-carbon power generation solutions that complement energy storage and long-distance transportation are essential. In order to promote decarbonization in areas where electrification is difficult, it is effective to switch to carbon-free fuels and recover CO2. Yet, how this can be achieved without compromising economic efficiency is extremely important for the transition to a carbon-neutral world.



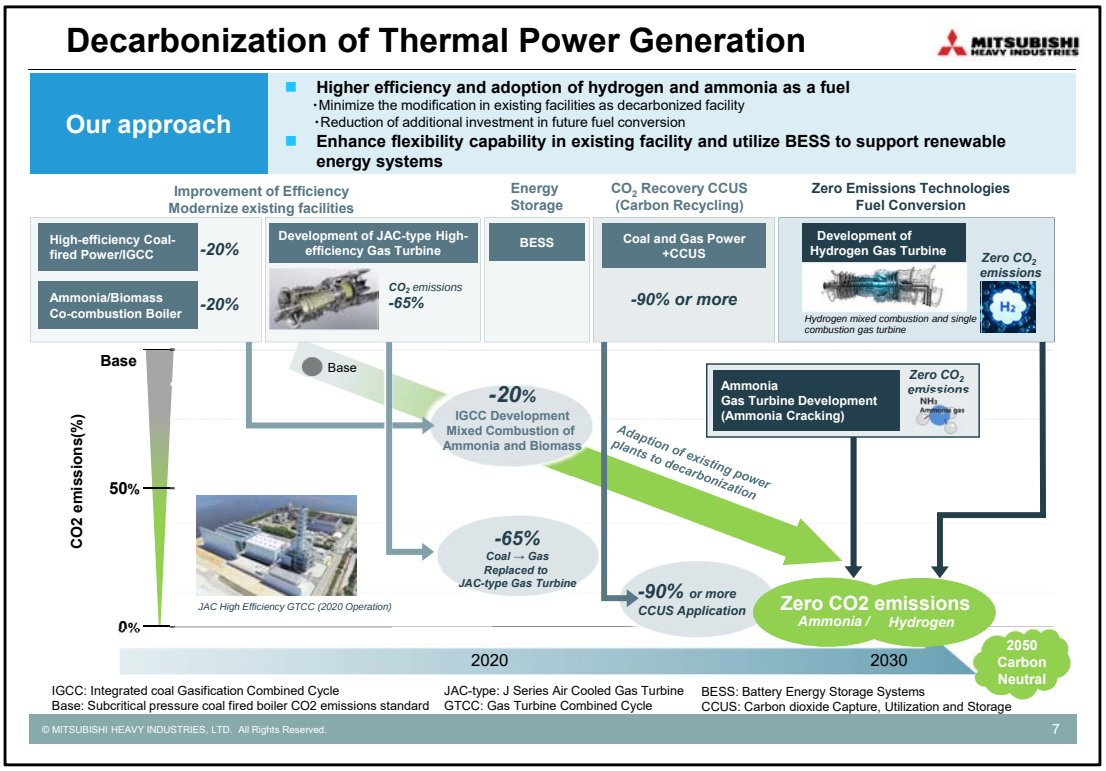
Mitsubishi Heavy Industries Group developed its own strategy on how it could contribute to the transition to a carbon-neutral society while curbing increases in social costs and developed an energy transition strategy based on the challenge to new decarbonization technologies in parallel with the development of existing decarbonization solutions.

The first step is decarbonization of coal and gas power plants and utilization of nuclear power generation systems. Our Group's greatest strength lies in its advanced next generation technological development capabilities. We have already put into practical use our technology that optimizes facility operations and controls overall emissions through digitization and expanded use of AI.

We will expand the application of this AI technology to support customers in the industrial sector, where efficient use of assets, improvement of production efficiency, and promotion of decarbonization are being pursued. We believe that contributing to the growth of our customers' business will expand Our Group's new businesses, including supporting customers’ asset operations, maintenance support, and facility upgrades.

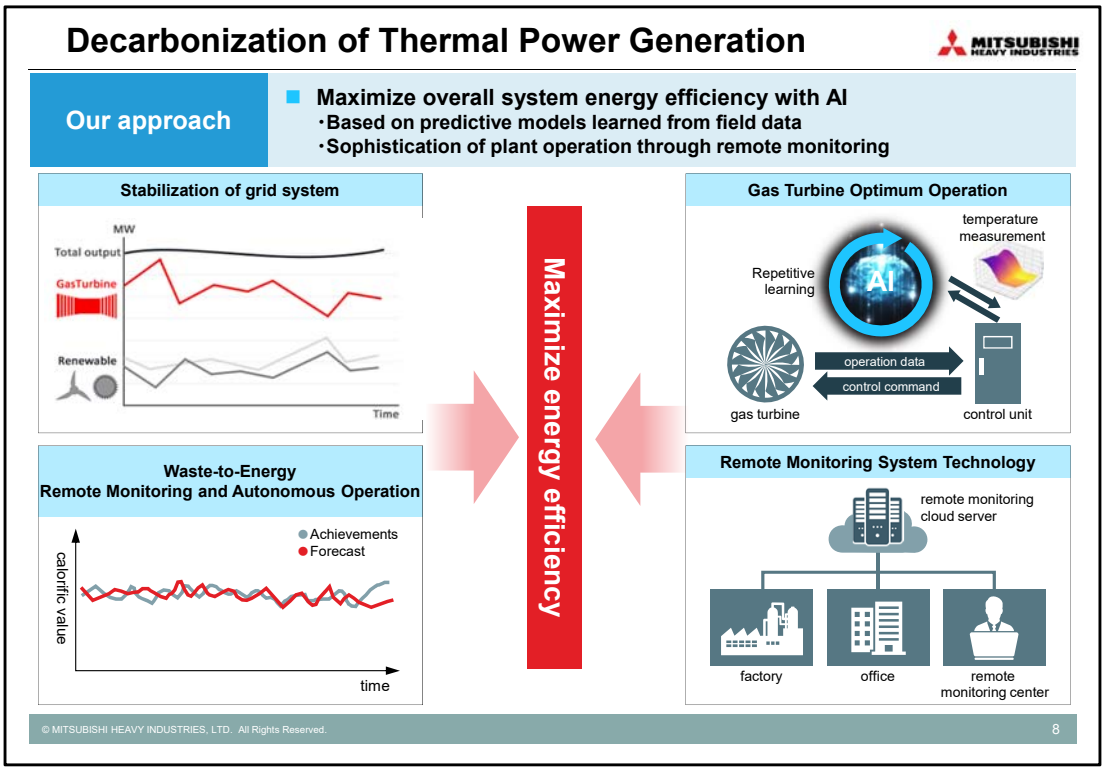
Reducing CO2 emissions alone is not enough to achieve carbon neutrality. In areas where CO2 emissions are unavoidable, the importance of technologies for recovering and using CO2 will increase. Our Group already has a track record in CO2 recovery, and we will continue to promote carbon recycling.

We will also work to build a hydrogen value chain that meets the decarbonization needs of society by applying technologies that we have put into practice and developed in various fields. Today, there are several challenges such as economic efficiency, but the achievement of net-zero carbon by 2050 can be realistic by establishing long-term vision and making efforts for technological innovation and business development through our accumulated resources.



Mitsubishi Power has achieved the world's most high efficiency product-lines such as the development of JAC-type gas turbines and IGCCs. To further reduce CO2 emissions, we are introducing hydrogen, ammonia, and other fuels that do not emit CO2.

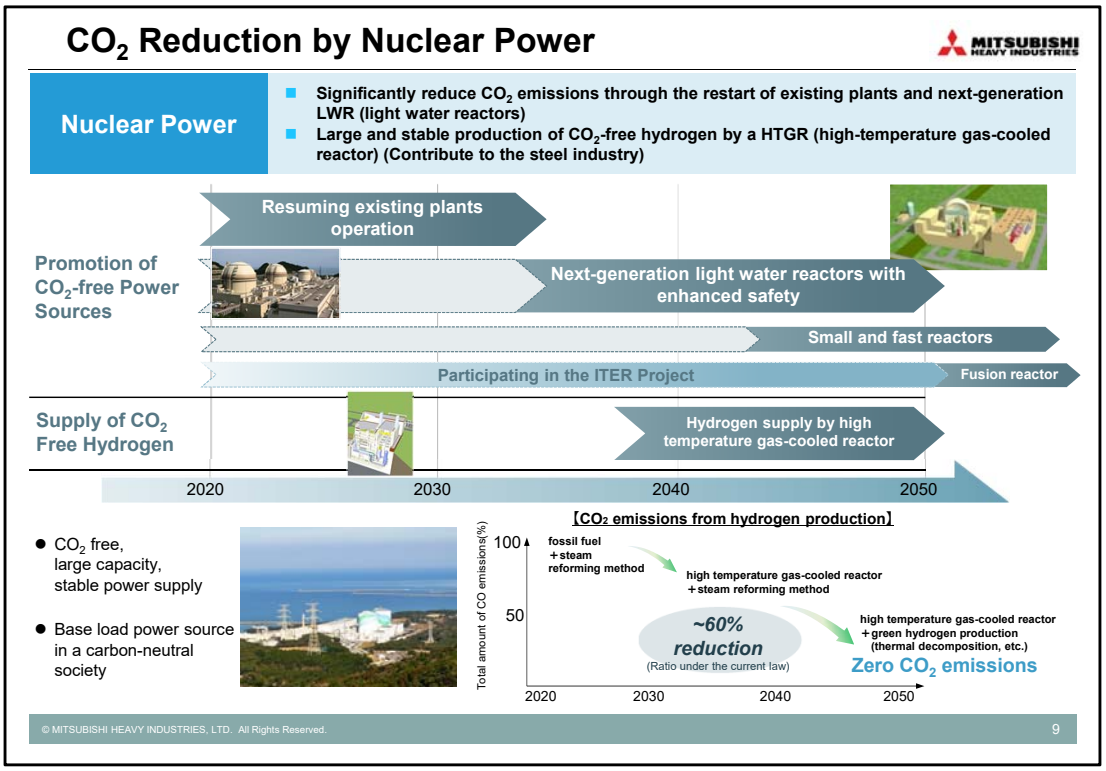
We have already established a target for co-firing hydrogen or ammonia with fuels such as gas and coal. This will minimize the modification of existing facilities towards decarbonization.
In addition, by making the same type of gas turbine compatible with both hydrogen and ammonia firing capability only by changing the minimum of components at our customers' existing power plants, investment in future fuel conversion can be minimized.



The use of AI is also effective in decarbonizing gas and coal power generation.

Our Group's large-scale power generation facilities already have flexible operation capabilities that enable them to respond quickly to load fluctuations during the use of renewable energy. In addition, a Battery and Energy Storage System can be added to the system, integrating these capabilities to realize optimum operation of the entire system.

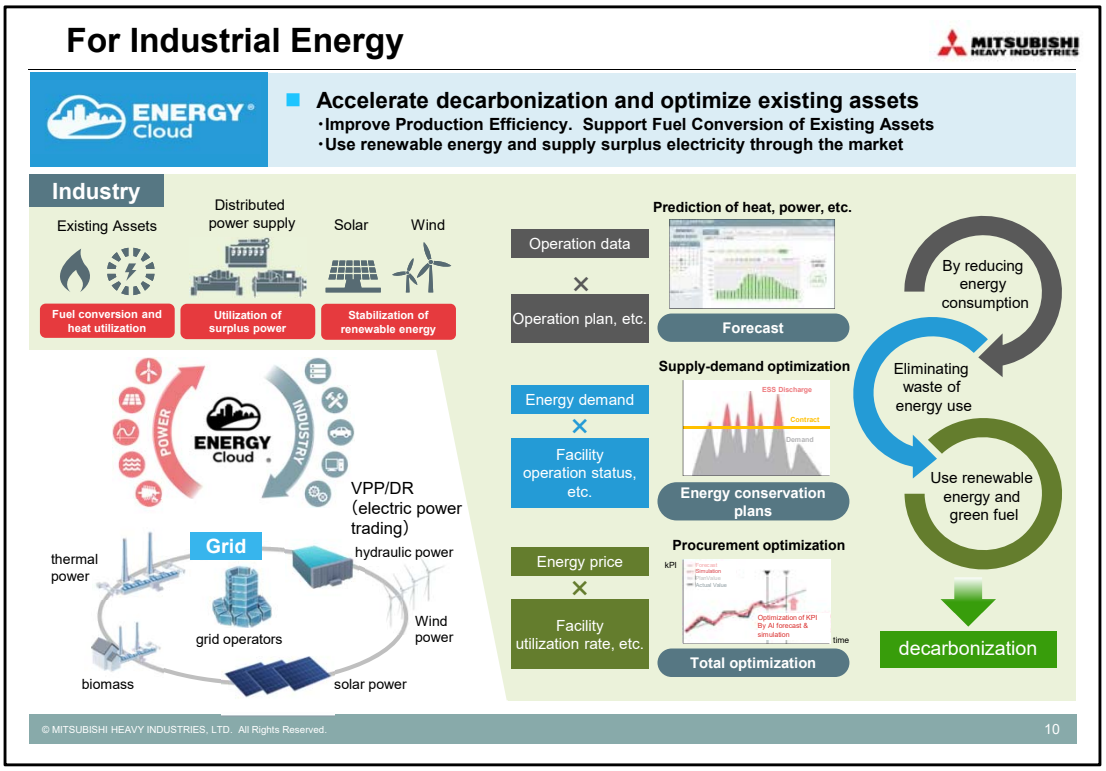
Further, our development continues to expand by adding functions into our remote monitoring and operation system, such as AI learning the accumulated operating data and controlling the gas turbine based on the predictive model. This is leading to more intelligent plants that can increase plant flexibility and availability, lower operating costs, improve profitability while providing positive environmental benefits.



Nuclear power is a stable, carbon-free power source that will play an extremely important role in achieving carbon neutrality.

We continue to seek the decarbonization of electricity through the restart of existing plants and the most advanced safety measures, increasing the understanding of the safety of nuclear power.

As a new initiative, we have also started the development of a high-temperature gas furnace for hydrogen production. This has the potential to greatly contribute to decarbonization in industries that require large amounts of hydrogen, such as hydrogen-reducing iron making.

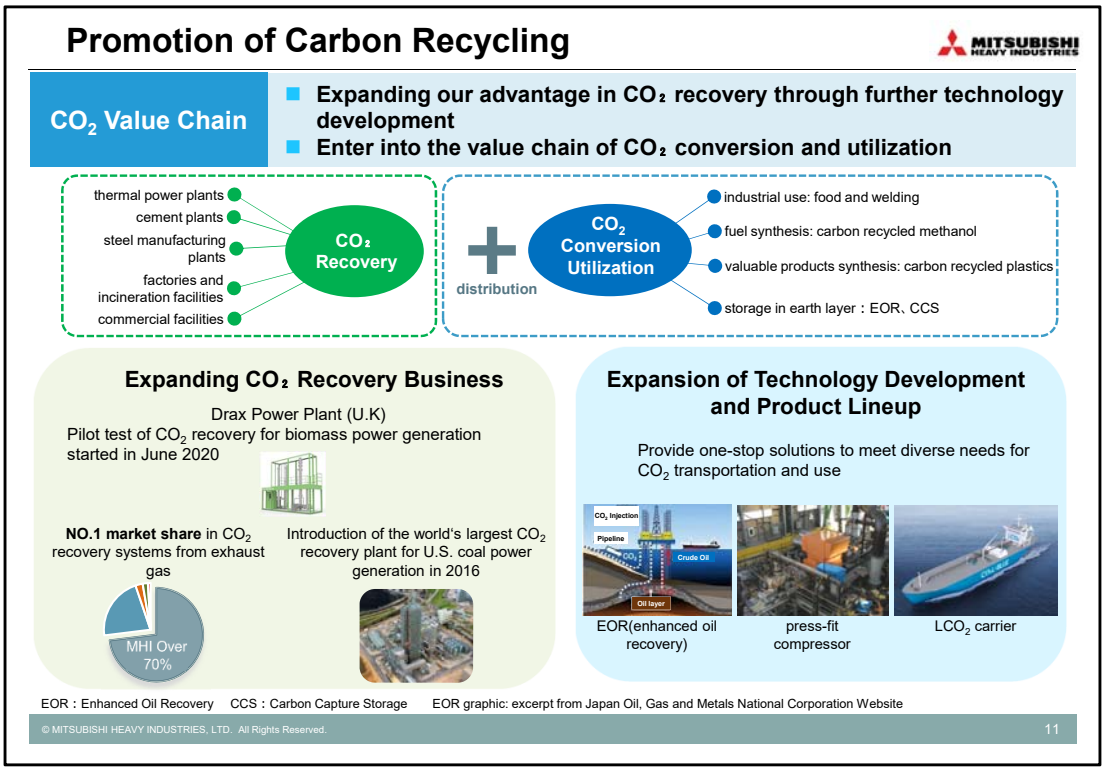


As mentioned earlier, it is difficult to electrify all key industries such as steel and chemical plants because they also use heat. Therefore, in order to achieve net-zero carbon, it is necessary to take a different approach.

As Our Group supports customers with not only power generation facilities but also various manufacturing facilities, we have accumulated knowledge of the entire industry not only power, but also in a heat utilization space. The application of proprietary AI technologies such as ENERGY CLOUD makes it possible to predict market demand as well as heat and electric power, making it possible to propose optimal management of the entire plant, including improvements in production efficiency, from the perspective of both supply and demand.

For customers who have their own power generation facilities that use steam in addition to electricity, we will support decarbonization of existing assets, such as support for fuel conversion, and introduce renewable energy through the electric power market, as well as supply excess electricity to customers.

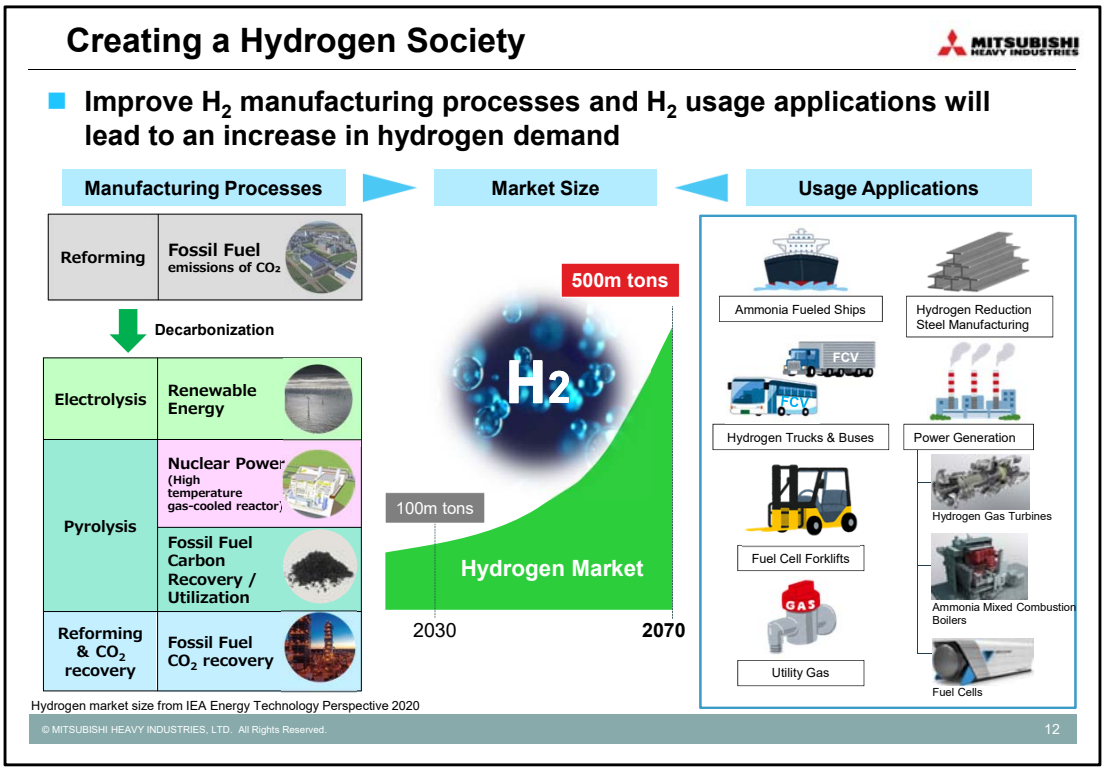
These solutions help minimize energy consumption, help decarbonize, and improve your bottom line.



To achieve carbon neutrality, it is essential not only to reduce CO2 emissions, but also to apply technologies to recover and further utilize CO2.

Our Group has built the world's largest CO2 recovery plant in the United States and holds the world's top share in CO2 recovery from exhaust gas.

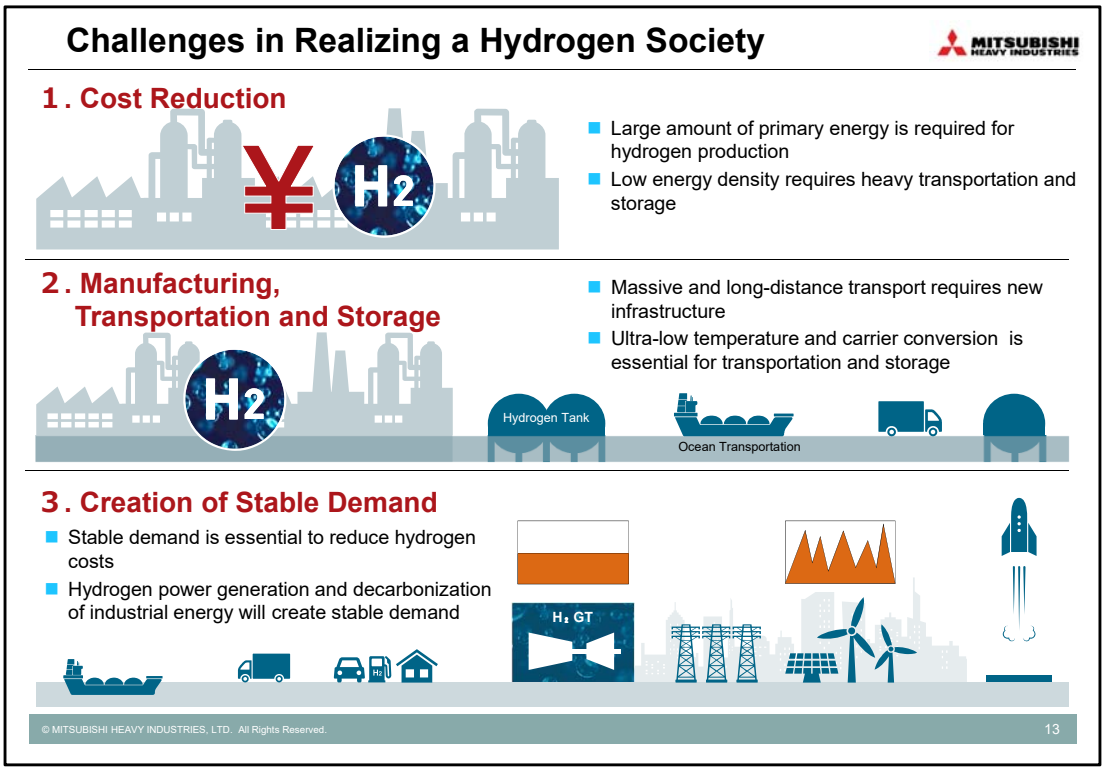
We are working on further technological innovation and development in order to expand our product lineup to support the recovery of CO2 emissions in areas where such emissions are unavoidable. To this end, a specialized organization "Decarbonization Promotion Office" was established within our group company, MHI Engineering. We already have established a wide range of solutions to meet the needs of transporting and storing recovered CO2. In addition, we are working to promote carbon recycling, including the conversion of CO2 and the production of carbon-free fuels.



Now that we have introduced how Our Group can contribute to society's energy transition with technology that has already been put into practical use, we will explain how it can be used with hydrogen and ammonia, carbon-free fuels.

We believe that hydrogen is the most effective carbon-free fuel to replace or supplement fossil fuels. This is because in the field where fossil fuels are currently used, there is a high possibility that they can be converted to carbon-free fuels while utilizing the equipment and systems used. The expansion of these applications will greatly expand the size of the hydrogen market, making a carbon-neutral society a reality.

At present, hydrogen production is largely based on reforming and decomposing fossil fuels, but decarbonization of this production process is an essential foundation for expanding the use of hydrogen.

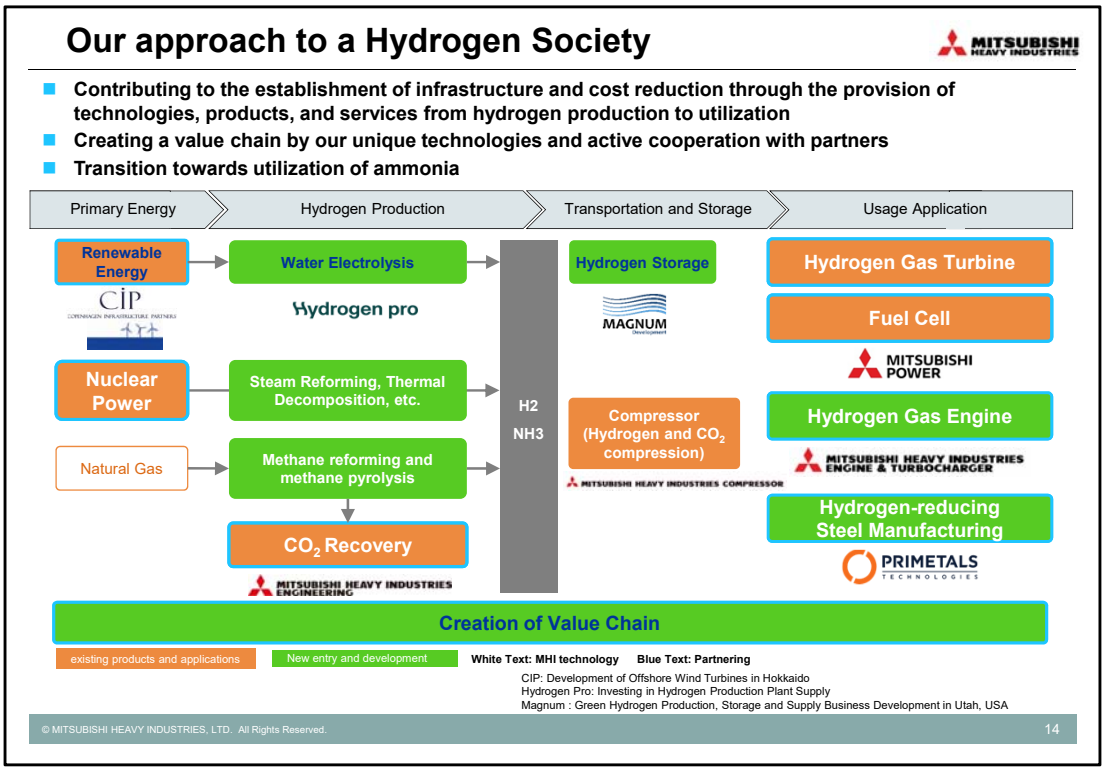


However, it is also true that there are challenges in realizing a hydrogen society.

The first challenge to realize a hydrogen society is the cost. Because hydrogen does not exist in nature and uses a large amount of energy to produce it, the production cost is inevitably high. Currently, if hydrogen is produced by water electrolysis, it will cost more than US$1 per normal cubic meter, but it will have to be lowered to 30 cents.

Next, in order to establish a hydrogen society, it is necessary to establish transportation and storage infrastructure in addition to manufacturing facilities. In some cases, existing gas pipelines can be used on continents, but in remote areas, storage infrastructure is also required along with the establishment of transportation methods. Hydrogen is highly flammable and difficult to transport, so it is effective to use ammonia as a carrier.

It is also necessary to secure stable demand in order to utilize hydrogen. Without increased demand and cost reductions through economies of scale, a hydrogen society could become a pie in the sky.



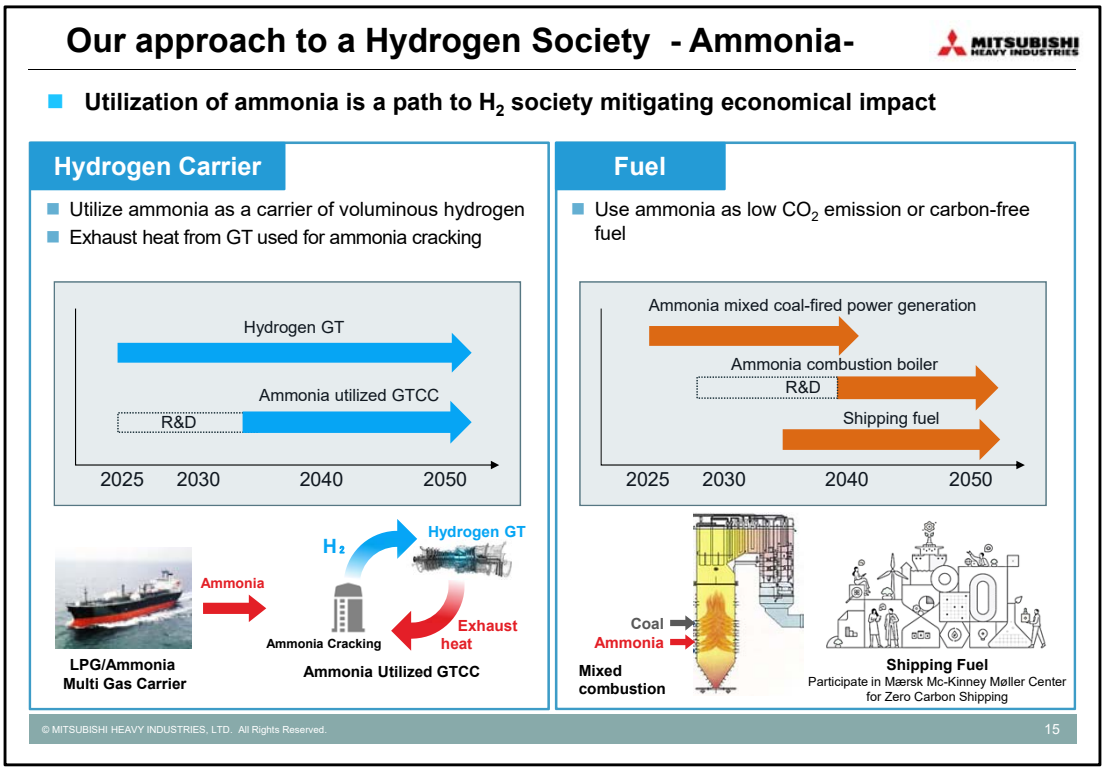
It is difficult to solve these problems in a single phase, such as reducing manufacturing costs, and we believe it is necessary to address these issues throughout the entire value chain, including the supply, transportation, storage, and use of primary energy necessary for manufacturing.

Our Group has been conducting research and development on the use of hydrogen as a fuel and has developed various technologies. We can also supply the CO2 recovery equipment and compressors for transportation and storage that we have already introduced.

Another new initiative is the equity participation in a Norwegian water electrolysis equipment manufacturer called Hydrogen Pro. Together with this company, we aim to increase the scale and efficiency of hydrogen production plants.

In the U.S., State of Utah, we are collaborating with Magnum America to develop a business that aims to produce and store hydrogen for use as fuel in the hydrogen gas turbines supplied by Mitsubishi Power.

To make the most of Our Group's technologies, we need to expand our cooperative relationship with these partners and build a new value chain of carbon-free hydrogen.



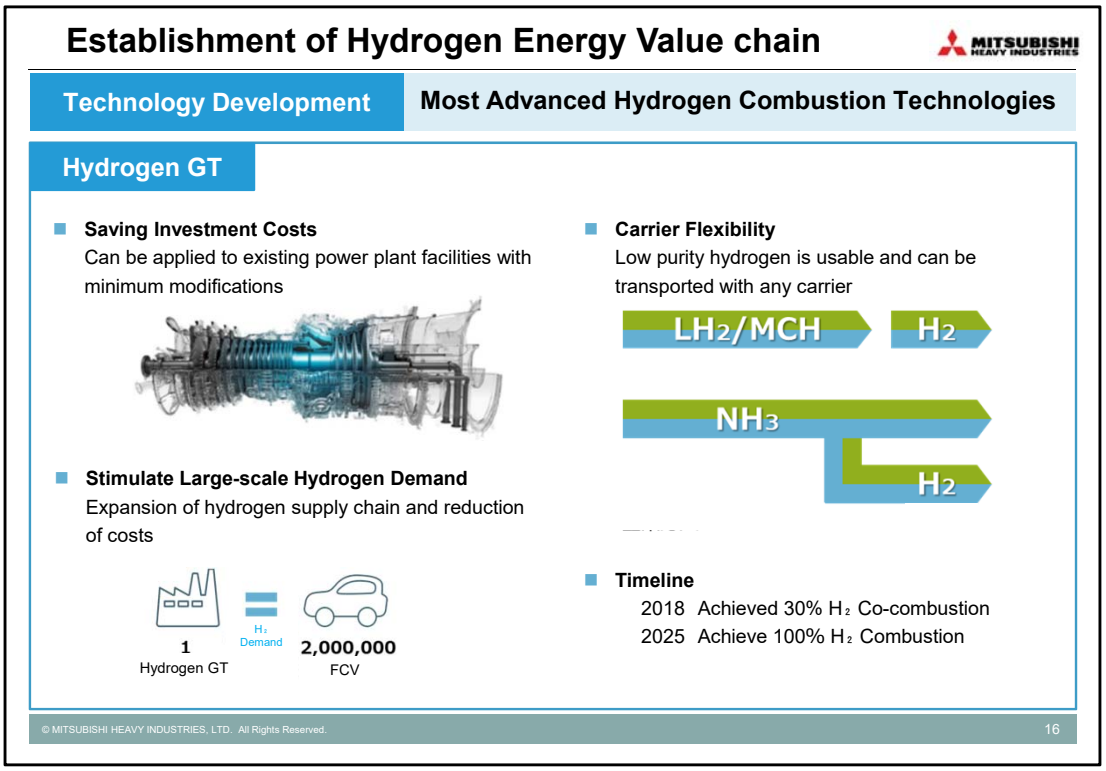
As we have just introduced, we have started our hydrogen value chain activities.

Practical application on mass transportation and storage of hydrogen need to be resolved. Certain regions such as Europe and the United States may move ahead where gas infrastructure such as pipelines are available.

Our Group also sees that the use of ammonia is an effective first step toward a hydrogen society especially in countries like Japan.
When hydrogen H2 is converted to ammonia NH3, it liquefies with only a little pressure during transportation, and this liquefied ammonia can be transported even in existing LPG tankers, making it a very promising means as a carrier for transporting hydrogen.

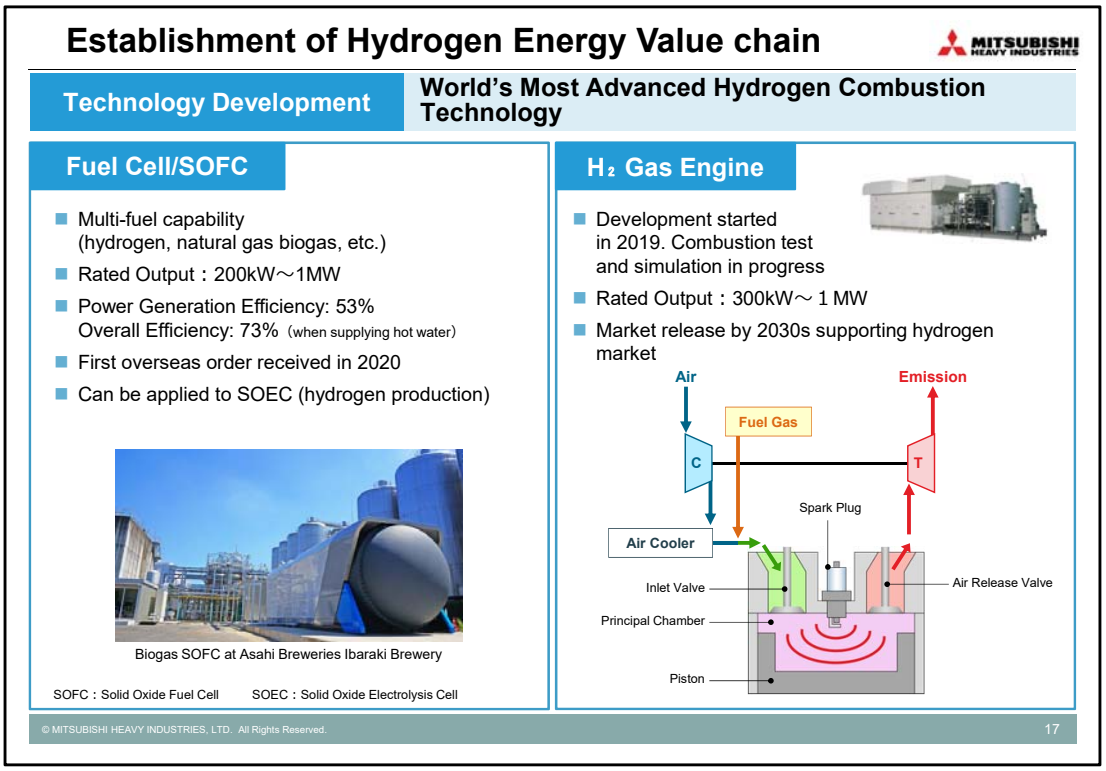
We are also developing ammonia cracking technology to separate hydrogen from ammonia, by using the exhaust heat of a gas turbine, and aim to supply hydrogen efficiently. Ammonia is also expected to be used as a fuel to decarbonize coal-fired thermal power plants and as a fuel for ships, and we are working to achieve this.

By utilizing ammonia, which can be used as a hydrogen carrier and can be burned directly as a carbon-free fuel, we believe that a hydrogen society can be established while reducing costs.



I would like to introduce our Group technologies and ongoing projects through which we are building the hydrogen value chain.First is the hydrogen gas turbine.

Mitsubishi Power's hydrogen gas turbines are characterized by their ability to reduce investment costs by converting existing power generation facilities that use conventional natural gas-fired gas turbines to hydrogen burning with minimal modification. In addition, hydrogen can be used in the large-capacity gas turbine, which Our Group has a track record in, thus stimulating large-scale hydrogen demand. We have already achieved 30% hydrogen co-firing in 2018 and are proceeding with technological development in preparation for 100% hydrogen firing by 2025.

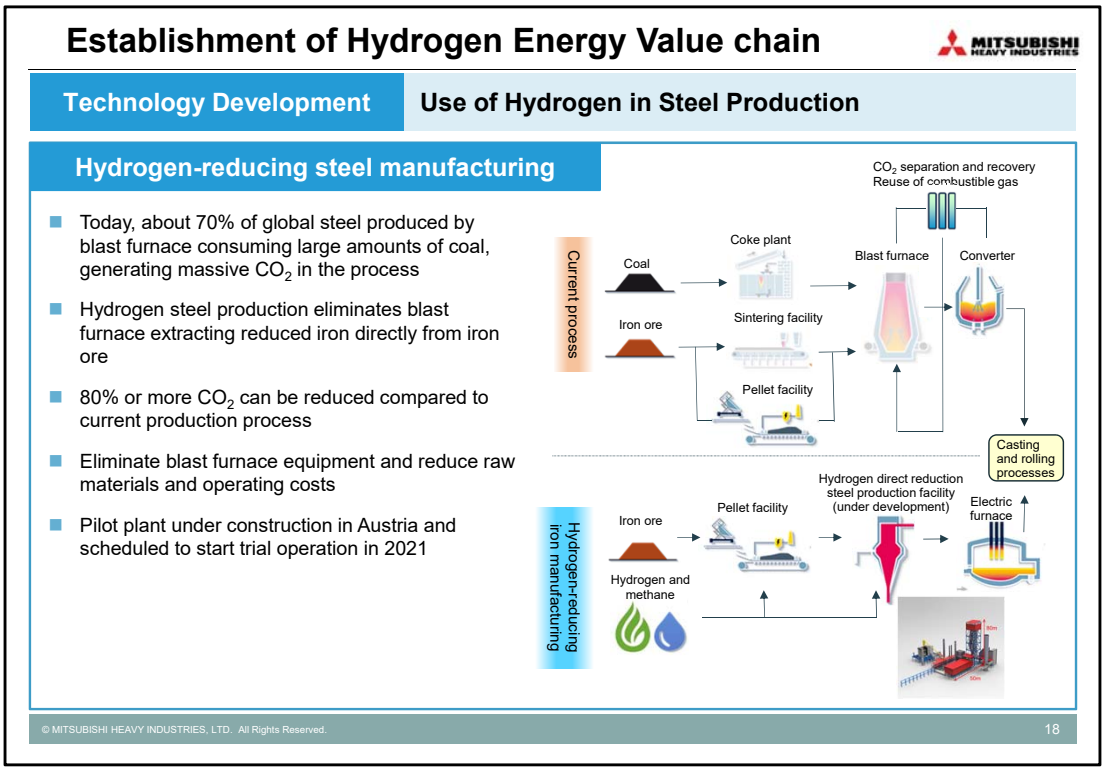


Our Group is also working on fuel cells and hydrogen gas engines to make carbon-free fuel available to distributed power and small and medium-sized energy users.

Mitsubishi Power's fuel cells are highly efficient and can use multiple fuels such as hydrogen, natural gas and biogas. We have built up a track record in Japan and received our first overseas order in 2020.

As for fuel cells, it is possible to apply the technology to an SOEC, which is solid oxide electrolyzer cell, that can produce hydrogen, and I believe that their applications will continue to expand.

Mitsubishi Heavy Industries Engine & Turbocharger began developing hydrogen gas engines last year. Their products are technically viable and will be launched in the 2030s.



In the steel production industry, reduction of CO2 while reducing production cost has been a challenge.

Primetals Technologies, an MHI Group company, is currently developing a “Hydrogen Steel Production” system, which will reduce CO2 emissions by 80% or more compared to existing blast furnaces. A Pilot plant in Austria is expected to be commissioned in 2021.

Establishment of Hydrogen Energy Value chain

Partnership **Energy Decarbonization Project in the US**

- Entergy and Mitsubishi Power started collaboration in September, 2020
- Package agreement for decarbonizing Entergy's utility business in 4 southern states

Entergy and Mitsubishi Power signed Agreement

- Collaborative Area
  1) Hydrogen GTCC
  2) Production, storage, and transportation of hydrogen using renewable electricity
  3) Production and storage of hydrogen by nuclear power generation
  4) Energy storage system by large capacity battery

4 Southern States: Arkansas, Louisiana, Mississippi and Texas

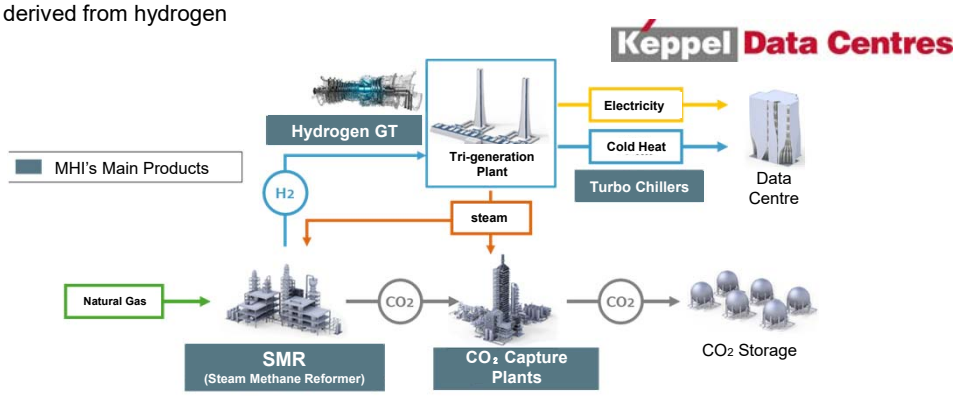
In September of this year, Mitsubishi Power signed an MOU with Entergy, a southern U.S. based utility serving nearly three million customers to help decarbonize their fleet.

In addition to the development of a hydrogen gas turbine combined cycle power plant in cooperation with Entergy, the Company will undertake comprehensive business activities, including the production, storage and transportation of hydrogen using carbon-free electricity from both renewable and nuclear power, and the study of a storage system using a large-capacity battery.

Establishment of Hydrogen Energy Value chain

Partnership **Tri-generation in Data Centers**

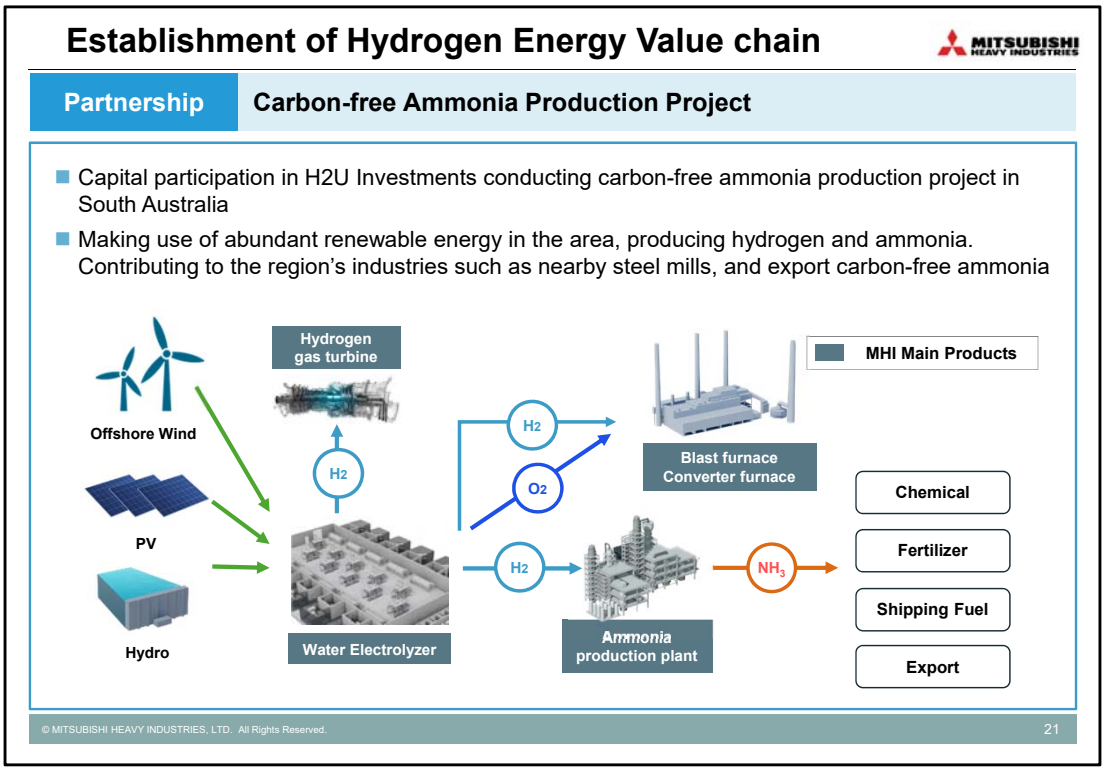
- In Singapore, MHI-AP and Keppel Data Centres commenced a joint study in June 2020
- Study the whole process from production of carbon-free hydrogen to supply of electricity, cooling/heat and steam
- Aiming for carbon neutrality of data centers, to supply electricity, cooling/heat and steam derived from hydrogen



MHI-AP：Mitsubishi Heavy Industries Asia Pacific Pte. Ltd.

Earlier this year, the Singapore's Keppel Data Centres and MHI agreed to jointly study the possibility of using carbon-free hydrogen to supply electricity, cooling and steam to a data center planned for Singapore.

In the future, it is expected that market for carbon-free data centers will increase, while in Singapore, it will be a challenge to supply the necessary energy only with renewable energy. Our solution to supply the necessary electricity, cooling, and steam energy in a carbon-free manner using Singapore's main energy source, natural gas with carbon capture and utilization systems. By participating from the feasibility study stage, we are jointly studying solutions that can meet our needs.



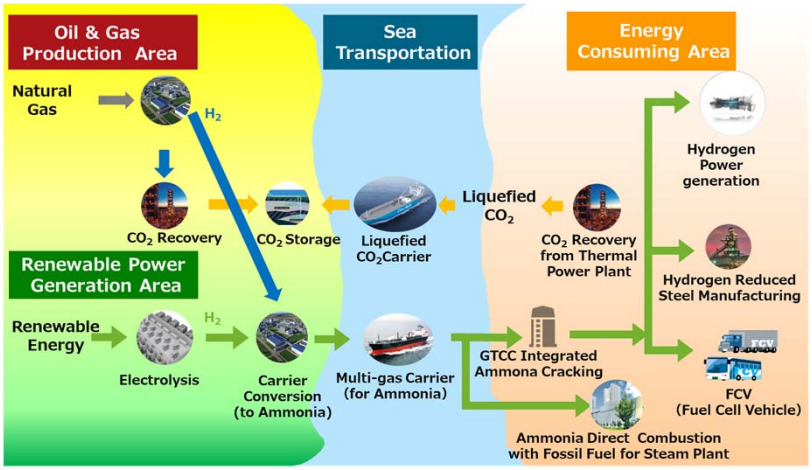
We have recently made a decision to invest in H2U Investments, an Australian company promoting the Green Ammonia business.

Green ammonia will be produced using the abundant renewable energy in region to supply for fertilizer and fuel providers. Through this process, oxygen will be produced as a byproduct which can be supplied to steel mills in the region also assisting further decarbonization. The aim is to increase the scale of this project and export Green Ammonia outside of Australia.

Establishment of Hydrogen Energy Value chain

Partnership **Entering into the Fuel Business**

- Participate in fuel business from production, storage through supply to promote the introduction of carbon-free hydrogen and ammonia in accordance with local needs



As mentioned above, we have introduced some of Our Group's partnership projects. In addition to supplying technology and products, we will work with appropriate partners to meet local needs in the entire fuel value chain, from production, transportation and storage to the use of carbon-free hydrogen and ammonia.

Establishment of Hydrogen Energy Value chain

MITSUBISHI HEAVY INDUSTRIES

Partnership **Strengthening Partnership in Offshore Wind Power Business**

Strengthening the relationship with Vestas

- Strengthening competitiveness by integrating offshore and onshore wind turbine manufacturing business
- Strategic investment in Vestas as an industrial partner
- Consistent efforts to expand the Japanese offshore wind turbine market

©MHI VESTAS OFFSHORE WIND A/S

Participation in the development of wind power generation business

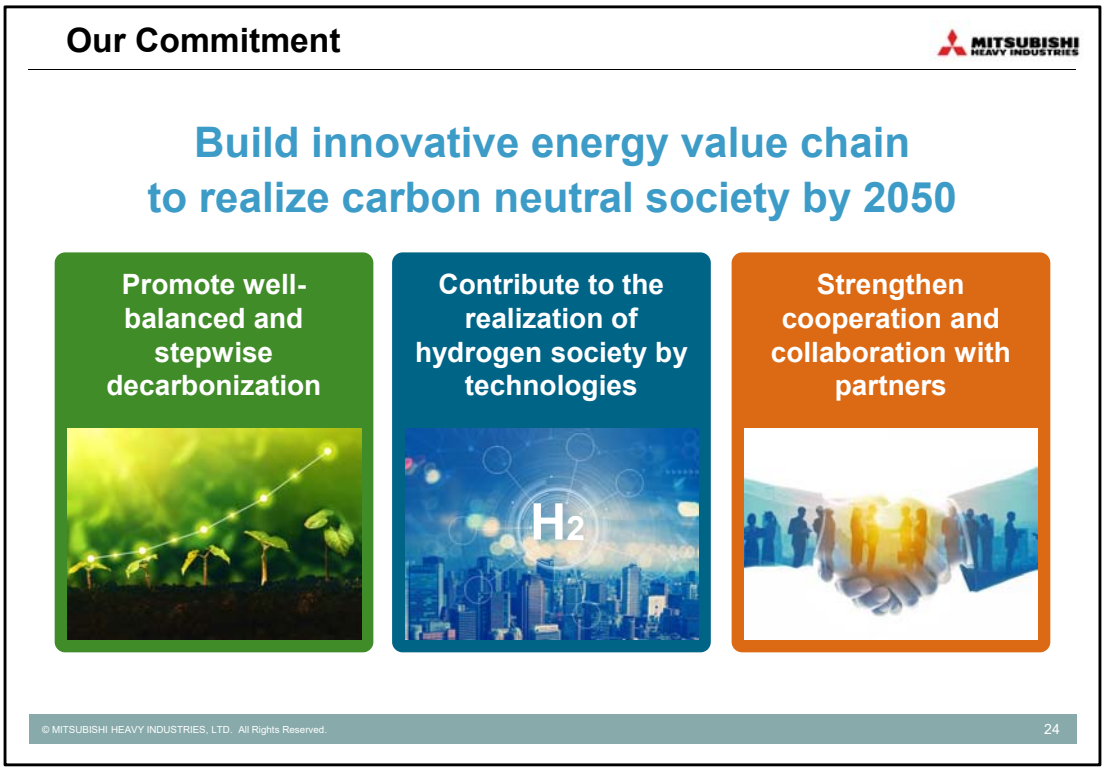
- Agreement signed with Danish company CIP for cooperation in the development of offshore wind power projects in Hokkaido in July, 2020
- Contributing to the growth of offshore wind power generation in Japan through joint development projects in Hokkaido, where it is blessed with favorable wind conditions

CIP
COPENHAGEN INFRASTRUCTURE PARTNERS

CIP: Danish fund management company specializing in investment in the renewable energy infrastructure sector

As we recently announced, our company and Vestas are further strengthening their partnership in the renewable energy sector. Our company acquired a stake in Vestas and decided to become involved in the management of Vestas as an industrial partner and to strengthen its competitiveness by integrating offshore and onshore wind turbines. In the Japanese market, we will continue to focus on expanding the wind power market by establishing a joint venture company with the majority in our company to fully support Vestas' sales of wind turbines.

We have also reached an agreement with Danish company CIP to jointly develop an offshore wind power business in Hokkaido and will work on the expansion of the Japanese offshore wind power market.



There is no single path to carbon neutrality.
At Our Group, our mission is to realize a carbon-neutral society while ensuring we protect the environment and increasing the economic efficiency, stable supply, and safety of Energy.

Mitsubishi Heavy Industries Group aims to achieve carbon neutrality by 2050 by promoting a balanced, staged decarbonization process. Hydrogen is expected to play a major role in a carbon-neutral society, and we will continue to refine our technologies to meet all of the challenges facing society.

In addition, while strengthening cooperation and coordination with partners, we will build innovative carbon-free fuel value chains and ensure the realization of a carbon-neutral society.

MHI is determined to be a leader in contributing to a better future for society and recognizes the critical importance of achieving our goal of net zero carbon emissions by 2050.

Thank you very much.

MOVE THE WORLD FORWARD

MITSUBISHI
HEAVY
INDUSTRIES
GROUP