

Energy Highlights

Listening to Key
Persons
FY2023

Achieving Carbon Neutrality

Mr. Hiroki Kudo

Director, Institute of Energy Economics,
Japan, in charge of Electric Power Industry
Unit

× Tatsuya Yamada

Division General Manager, Energy Business Administration Division and
Business Planning & Management Division, Hitachi, Ltd.
Vice President, Institute of Electrical Engineers of Japan, and Regular
Member, The Japan Society of Public Utility Economics

Part 2

Initiatives for the Achievement of Carbon Neutrality

—The Future Being Unlocked by Power Supply-Demand Scenarios

In this series of articles, under the theme of achieving carbon neutrality, we invite experts who are working on energy issues in various fields to engage in a discussion with Tatsuya Yamada—Division General Manager of Hitachi, which is working on policy proposals relating to electric power and energy—and introduce trends in each industry. Through these discussions, we consider carbon neutrality from various angles, such as the formulation of a process and vision for achieving carbon neutrality, initiatives aimed at achieving it, and environmental development.

■ The similar but different issues of energy and climate change

Yamada: Today we are faced with a host of unpredictable changes, ranging from a series of natural disasters to regional conflicts and the rapid advance of generative AI. Of particular concern are rising geopolitical risks, chief among which are the conflict between the US and China, Russia's invasion of Ukraine, and fighting between Israel and the Islamic group Hamas. As a specialist in environmental issues, how do you see these international developments impacting initiatives and progress on the issue of global climate change?

Kudo: As you noted, with the international community currently becoming increasingly fragmented, there are rising geopolitical risks. Particularly for Japan, which is an energy

importing nation, these circumstances pose extremely difficult challenges in terms of how to align energy policy with climate change goals. That's because even if we achieve our climate change goals, we don't want to make it more difficult to use energy and impede economic activity as a result. That is why the concept of "energy security" is attracting attention, as you are aware. We need to pay close attention to both climate change issues and energy security while working to ensure that neither is disadvantaged.

There have always been aspects to these two concepts that make them similar, yet different. To that point, in the case of energy, top priority is given to protecting the interests of one's own country, such as through proper procurement and cost reductions. The actions of European countries are illustrative of this; as the supply of natural gas was cut off from Russia, they scavenged supplies from other countries. They didn't

consider what effects that would have on other countries as a result. In fact, as a result of these countries purchasing large volumes of natural gas from the market, prices rose sharply, the impact of which also spread to Japan.

However, when it comes to the climate change issue, the ultimate goal is to avoid climate change at the global scale. In other words, if each country is only concerned with its own goals, we may never achieve a true solution. With the world becoming fragmented at an increasing rate as each country strives to safeguard its own energy security in response to rising geopolitical risks, the question is whether the world's nations can truly find common ground toward the shared global goal of action on climate change. How as a species we will separate and balance energy and climate change issues — in other words balance the interests of individual countries against the interests of the entire planet — stands as a major challenge for humanity as a whole.

Each year the World Economic Forum issues a report on global risks, and in the latest report observed that “cooperation on urgent global issues ... could be in increasingly short supply, requiring new approaches to addressing global risks.” The top risk cited in the report was none other than “extreme weather.” This suggests they share the concern that rising geopolitical risks may manifest negative effects on global initiatives to address climate change. Therefore to answer Mr. Yamada's question, I believe that geopolitical risks will indeed have a substantially negative impact on global initiatives and progress to address the issue of climate change.

Yamada: It seems you are saying that while the issue of climate change is far from an economic one, with the world becoming increasingly fragmented, it is extremely difficult to strike a balance between action on climate change and securing energy. I also think that while securing energy is an urgent issue, global environmental issues need to be tackled over the long term, and those differing time scales also make it difficult to balance the two.

Kudo: Working within that framework, what holes a vital key for Japan is the development of innovative technologies that are internationally competitive, and their marketization. But with the world becoming increasingly fragmented, it's uncertain whether markets or mechanisms can be established to enable those technologies to be shared as a single asset. In the end, as was the case with the COVID-19 pandemic, when a country's own interests are prioritized, consideration for



Hiroki Kudo

Director, In charge of Electric Power Industry Unit

Areas of expertise: Energy supply/demand analysis and forecasting, policy on global warming, new and renewable energy policy, energy conservation policy, international standardization of greenhouse gas inventory and verification, etc.

March 1984 Graduated from the Faculty of Environmental Health, Azabu University (B.A. of Environmental Health)

March 1991 Graduated from the School of Life and Environmental Sciences, University of Tsukuba (M.A.)

April 1984 Joined the development division of Pigeon Corporation (responsible for production evaluation and product development)

April 1991 Joined the Institute of Energy Economics, Japan (IEEJ)

July 1997 - June 1999 Worked at Resources for the Future (United States) as a visiting researcher

July 1999 Manager of the Environmental Group, General Research Division, IEEJ

April 2005 General Manager of the Global Environment Unit and Manager of the Global Warming Policy Group, IEEJ

April 2008 Senior Researcher, General Manager of the Global Environment Unit, Deputy Director of the Green Energy Certification Center, IEEJ

April 2012 Research Director, Assistant Director of the Global Environment Unit, Deputy Director of the Green Energy Certification Center, IEEJ

July 2015 Research Director, Manager of the Electric Power and Smart Community Sub-Unit, Fossil Energy and Electric Power Unit, manager of the Smart Community Group, and Director of the Green Energy Certification Center, IEEJ

June 2017 - March 2022 Outside Director at Street Media

April 2018 Research Director, Manager of the Electric Power and Smart Community Sub-Unit, Fossil Energy and Electric Power Unit, manager of the Smart Community Group, IEEJ

June 2018 Manager of the Fossil Energy and Electric Power Unit, IEEJ

July 2018 Manager of the Electric Power and New Energy Unit, IEEJ

July 2023 Director, Manager of the Electric Power Industry Unit, IEEJ

other countries, particularly developing nations, is diminished, and arguably the issue of climate change bears a similar structure.

■ Outlook for the Seventh Basic Energy Plan

Yamada: Grappling with those difficult aspects, this year the Japanese government looks set to formulate its Seventh Basic Energy Plan in anticipation of the 30th Conference of the Parties (COP30) to the United Nations Framework Convention on Climate Change to be held in 2026. What is your outlook for this plan?

Kudo: The fundamental purpose of the Basic Energy Plan is to outline the direction of the country's energy policy considering current challenges, but it is by its nature linked with the reduction targets of the Paris Agreement and Nationally De-

Energy Highlights: Listening to Key Persons

terminated Contributions (NDCs). In that sense, while we may refer to the Basic Energy Plan, in practice we cannot avoid considering it in tandem with initiatives to address the issue of climate change. At COP29, there were discussions that the 2035 reduction targets would need to be a reduction of up to around 60% from the base year, but I think one important point is how Japan, as a member of the international community, should commit to these discussions.

One other thing as I mentioned before is the essential perspective of properly paying attention to energy security against the backdrop of heightened geopolitical risks. I think there needs to be a proper discussion about policies that can contribute to energy security, including our energy self-sufficiency rate.

From the perspective of the energy self-sufficient rate, measures that strengthen efforts to make renewable energy a main source of energy will be another key point. The utilization of nuclear power generation will also feature in discussions in relation to that. While future hopes are pinned on next-generation nuclear reactors, for the time being it is vital that we pursue the restarting of existing nuclear power plants. As public approval is also a key factor in the resumption of nuclear power generation, this will likely attract a lot of attention.

At this time it will be essential to consider electricity supply and demand forecasts, and I think discussions in the Study Group on Future Power Supply-Demand Scenarios which is currently operating under the Organization for Cross-regional Coordination of Transmission Operators, Japan (OCCTO) will serve as a reference in this regard. I'll touch on what that entails in more detail later, but the discussions have yielded some viewpoints suggesting that the current situation does not show the true supply and demand of electricity. In recent years, the demand for electricity from the grid has been decreasing so rapidly that it appears as if actual demand is decreasing, but it has been pointed out that in fact demand itself may not be decreasing but only appear to be so due to the effects of private power generation such as roof-mounted solar power generation. In crafting the Basic Energy Plan, I think ascertaining total electricity demand will be an extremely important perspective.

I also believe that the Seventh Basic Energy Plan will involve creating greenhouse gas reduction target for 2035, but as it will be tough to achieve this by bolstering renewable energy alone, I think questions of how policies can be strengthened toward this target, including through energy conservation, will be a point of focus.



Tatsuya Yamada

Division General Manager, Energy Business Planning & Management Division, Energy Business Division, Hitachi, Ltd.

Vice President, Institute of Electrical Engineers of Japan, and Regular Member, The Japan Society of Public Utility Economics.

Tatsuya Yamada joined Hokuriku Electric Power Company in 1987, and was seconded to The Institute of Energy Economics, Japan in 1998 before joining Hitachi, Ltd in 2002.

He has engaged in tasks involved in the planning of strategies for energy-related businesses, and became Director of the Management Planning Office, the Strategy Planning Division in 2014, Senior Manager of the Business Planning Division, the Energy Solution Business Unit in 2016, General Manager of the Business Planning Division, the New Age Energy Business Co-create Division in 2019, and assumed his present positions in 2020.

■ Will 2035 also be a challenging reduction target?

Yamada: What about specific figures for the greenhouse gas reduction targets? The current target is a 46% reduction by 2030.

Kudo: Of course it's possible that a 46% reduction could be plotted on a straight line going from the current situation to carbon neutrality in 2050, with a further 2035 target indicated on that line. But the current target itself has always been challenging, and I don't think anyone believes that CO₂ emissions will decrease in a linear fashion. At present, we don't have CO₂ reduction options that represent a savior, something where we could say if we just do these things, it will turn out alright. That's why we have no choice but to engage in more in-depth discussions on how we should tackle this challenging plan.

Yamada: I suppose that is because it is hard to predict that technological innovation will rapidly advance and costs will decline.

Kudo: That's right. It's difficult to predict what technologies will emerge and at what time, but on the other hand, if the goal of achieving carbon neutrality by 2050 is not going to be shifted, then perhaps the story is that there is no way to paint a picture that deviates significantly from a linear decrease. Meanwhile, another key point will be how to express our degree of seriousness toward the targets. It becomes a question of whether we build upon various measures and then go



all out trying to meet our targets with additional regulations and public policy aimed at making up the shortfall, or whether we give our plans more flexibility, adopting a somewhat more long-term roadmap while anticipating future technological innovation and other factors. That will of course be dependent on what direction is taken with policy. That's because the carbon neutrality by 2050 goal was originally formulated back in 2020, and we can't say that any significant technological innovations have emerged since then. However, support measures for the market adoption of technologies are already underway. For instance two trillion yen has been invested in the Green Innovation Fund for carbon neutrality-focused R&D and social implementation, and Green Transformation (GX) Economic Transition Bonds (20 trillion yen over ten years) to finance decarbonization funds are being issued. I think a picture of the future will be drawn while making predictions about the success of these kinds of measures.

Yamada: It's important to keep on pushing. Because these are very ambitious targets, if we give up we might not achieve them by half. Instead of that, government, the private sector and individuals all need to come together as Team Japan, and even if we can only set our sights on 75 or 80 out of a 100, we must keep challenging ourselves and working toward the target.

■ Positioning carbon neutrality initiatives as a growth strategy

Kudo: As you noted, to build up that kind of momentum, I think we need to link carbon neutrality efforts with Japan's growth strategy. For example, it's vital that we promote mar-

ket formation to get Asian countries to use Japanese environmental technologies that can be competitive. To that end, I think dialogue and understanding through entities such as the Asia Zero Emission Community (AZEC) will be essential.

Yamada: That is a very important initiative. Rather than framing things like carbon pricing and regulations in a negative light, I think it will be really important to link things in a positive direction that contributes to economic growth, together with actions such as support measures for decarbonization investment that will lead to improvements to Japan's industrial competitiveness.

However, even if there are the seeds of a good technology, from the standpoint of a private sector company, whether or not it can continue to be pursued as a business when cost factors are taken into account is a decision made by its top management. Initial investment is always essential for the development of technologies, because there is a time lag up until a new technology debuts on the market, starts to sell at a certain volume and generates profits. To put a technology on track as a growth strategy, corporate strategy and corporate efforts are of course important, but I believe support from policy and the creation of demand will also be very important. If you look at the past, Japanese companies have the capabilities to develop new technologies but tend to stumble when it comes to commercializing them. That's why not just in energy but in healthcare, services and other areas, they are often overtaken by Western companies and others.

Kudo: Indeed, I think it is very important to provide support through policy while also paying attention to overseas markets. For example, in the case of renewable energies where the running costs are not as large, if we provide supplement-

Energy Highlights: Listening to Key Persons

tary support in the operational side while continuing to place an emphasis on support for CAPEX (capital expenditures), I think progress will be made on the adoption front.

One more thing: I think everyone is under the illusion that “zero emission” is a keyword that needs to be applied to every technology and service. This is a point the world will reach two decades or more in the future, and we need to think about what to do during the transitional phase leading up to that point.

Once I assisted China when it was promoting energy savings based on a national plan, but I saw a situation where Japanese companies were trying to sell high-priced products with high added value and were having difficulty growing their market share. In other words, at the time what China needed was reasonably priced products that contributed to energy savings to a certain degree. In this way, since each country differs in terms of its development stage and public policy, it’s not always possible to bring shiny new zero emission-capable technologies to market immediately. Of course I am well aware that it is difficult for Japan to compete on price, but we do need to take a good look at what technologies will be needed during this transitional phase.

In other words, as Mr. Yamada noted earlier, we need to consider within what timeframe will we add which technologies into our growth strategy, and consider those aspects together with market strategies. I think the key question is whether

that will truly function within an economic system. In that sense, it also raises the point about ESG investment which, having attracted all that attention, doesn’t currently seem to be functioning all that well. The E in ESG refers to the environment, and directly relates to initiatives contributing to carbon neutrality, but if those efforts don’t function well, it could lead to changes to the metrics used by financial markets to evaluate them. There may be something inherently impractical in trying to comprehensively evaluate companies in terms of environment, social and governance, a mishmash of elements that are each vast and disparate in nature. What indicators should be adopted is of vital importance when considering social persuasiveness and transparency, but as a practical matter, it is equally important to tackle the activities underlying these indicators as a strategy, in order to motivate investors and companies. Instead of merely setting numerical targets and diligently adhering to them, I think future initiatives will truly depend on how well we manage to make carbon neutrality a source of competitive strength as a growth strategy.

■ What is the significance of creating electricity supply-demand scenarios?

Yamada: Mr. Kudo, you serve as a member of the Study Group on Future Power Supply-Demand Scenarios being run



by the Organization for Cross-regional Coordination of Transmission Operators, Japan (OCCTO). Can you tell us about what kinds of things the study group discusses?

Kudo: The main purpose of this study group is to create various scenarios that will serve as a reference when considering medium- to long-term electricity supply plans. Within that purview, the study group's role is to indicate what risks apply to various uncertainties including decarbonization, and present various pictures that will make it easier for electricity providers to formulate future predictions. That is why the study group is independent from the formulation of the Basic Energy Plan and is solely focused on electric power.

However, with respect to decarbonization, in the industrial and transportation sectors for example, an important perspective is electrification, where energy demand that was previously covered with combustion and heat is being replaced with heat pumps, EVs and so on. When considering power scenarios, the outlook for competition with fuel and other interrelationships are also items we consider.

Yamada: What does the study group currently have under consideration?

Kudo: We are working with key industry figures and experts to verify simulation results produced by separate models maintained by three research or consulting organizations. We are now at the stage of running a series of simulations while incorporating factors that affect the scenario as appropriate. Of course we have already produced various forecasts, but we are not able to determine which one is correct. As part of that, we are in the process of identifying potential changes that would have a major impact on future electricity supply and demand, in a manner that will help companies with their corporate strategies, and help the national government with policy considerations.

Yamada: The significance in creating electricity supply-demand scenarios lies not in making predictions and guesses about the future, but in offering clues as to what factors need to be recognized as risks.

Kudo: That's quite right. Right now, the study group is exploring the future outlook for demand. For example, things like the increase in data centers due to the advance of digital transformation (DX) is one of the risks. Data centers consume a large amount of electricity, and depending on the extent of

their proliferation, could have a significant impact on per-unit energy consumption. To what extent this is considered reasonable is precisely what is on the table for discussion.

The way energy is used also tends to be difficult to quantify. It is hard to predict how much progress will be made with energy savings and efficiency improvements, and how consumer-side initiatives will change by involving regular households and industry to transform their structures and mindsets. But I think that if we identify in advance that if a certain thing happens, it will have a certain degree of impact, and share those risks, then it will be easier to come up with a response should it come to pass.

■ Challenges in ascertaining total electricity demand

Kudo: And as we work through those discussions, sometimes we find new issues as well. As I touched on briefly earlier, the other day the study group took up the topic of private consumption through roof-mounted solar power generation. As you are aware, from around 2013 the demand for grid electricity fell dramatically, and that makes it appear as if total demand for electricity across Japan has fallen, but we posit that this may not be the case. That's because if private consumption through household solar power generation increases, the demand for grid power from electricity utilities will decrease accordingly. Given these circumstances, if small-scale distributed solar power generation were to increase in the future, leading to a rise in electricity demand not reliant on the grid, I think we have to consider how formulate the right balance in the overall electricity portfolio, ultimately considering this as one of the risks.

Yamada: As you pointed out, the statistics don't cover the amount of private electricity consumed by households. That's because while it is technically possible to collect this data, consumers are not obligated to report how much they used. On the other hand, more than a tenth of large-scale consumers maintain private power generating facilities at plants and other facilities, and that portion of private consumption is reflected in statistics for electricity demand. Considering the expected expansion of the adoption of distributed power sources that do not rely on the grid in the future, I think we need to accurately quantify private electricity consumption, and incorporate that data into the evaluation and analysis of total electricity demand.

Kudo: For people purchasing less grid power because they



privately generate and consume electricity, and therefore face a reduced financial burden from electricity bills, there is a risk that their willingness to conserve electricity could suffer due to the notion that “since I’m generating my own electricity, I might as well use more of it.” In that case total electricity consumption across Japan could steadily increase. From a carbon neutrality perspective, this could diminish the impact of introducing renewable energies. Given that meters are already becoming digitized, leveraging this data on electricity generation and demand could provide insight into the actual situation and facilitate a stronger connection to energy conservation efforts.

Yamada: As you noted, the data itself is already being collected and utilized through smart meters. However the challenge, as I perceive it, lies in the lack of a system to handle this information as statistical data.

Kudo: There is concern that a large influx of renewable energy could lead to grid instability. However, discussions are already taking place in the market on how to mitigate those risks. For example, new business models have emerged, such as the idea of bundling small-scale power producers that are independent of the grid to facilitate their interaction with it. Were that to happen, I think we would need to properly ascertain the actual state of consumers and draw a picture of future mechanisms that would contribute to electricity demand adjustments through demand response. To accomplish that, the real-time monitoring of actual data would be

extremely important.

The current Study Group on Future Power Supply-Demand Scenarios is focused on grid power, but I have been saying within the study group that in the future it will be important to take a comprehensive look at everything together, including outside the grid. Otherwise, it could give rise to misunderstandings, such as that a rapid decoupling is developing because GDP is expanding but electricity usage is declining. That’s because the apparent decoupling may have been caused by private consumption. It’s difficult with the lack of public data, but in the future, I think we need to perform analyses that also take into account this private consumption.

Yamada: The amount of electricity sold by electric power utilities and the amount of electricity demand from private power generation used to be disclosed by industry and region, but that data stopped being released after the deregulation of the electric power market. I think electricity demand data with attribute information such as region, industry and scale updated every 30 minutes would be valuable information for forecasting future electricity demand. In the context of exploring ways to utilize data from smart meters, there has been some progress in developing solutions and services, but I think this data should be utilized in the formulation of energy policies. This would enable so-called evidence-based policy making (EBPM). And I think the information would be very useful when considering pricing schemes given that demand curves are undergoing significant changes due to the expanded adoption of solar power generation. There also ap-

pears to be a lot of discussion going on about how to utilize data in the US electricity market, but as the notion “Garbage in, Garbage out” suggests, we must find ways to prevent flawed, incomplete and inaccurate data from leading people toward bad decision making.

Kudo: The problem we face now is like having a comb whose teeth have broken off—the data we need for statistical analysis is no longer available. However, I do understand that utilizing data that is close to personal information poses difficulties.

■ Renewable energies becoming mainstream and energy conservation taking root hold the keys

Yamada: What do you personally believe is the most vital key to achieving carbon neutrality.

Kudo: I think it would be establishing renewable energy as the main source of power. With the share of renewable energy on the rise, we face the mammoth task of determining whether electric power systems can be operated in a stable manner. However, if our goal is to raise our emission reduction targets in pursuit of carbon neutrality, we have only two viable options for contributing to decarbonization: renewable energy or the restarting of nuclear power plants. As long as the current cautious tone about nuclear power persists, renewable energy is the only feasible option to meet any heightened emission reduction targets. To achieve this, we also need to consider adjustment capabilities that can facili-

tate the stable operation of electric power systems. That is because the greater the rise in the share of renewable energy, known for its unstable supply, the more complex the equation needed to make these adjustments becomes.

I think this situation may also put renewed attention on energy conservation. However, the energy conservation targets set forth in the Sixth Basic Energy Plan were already quite stringent, and envisioning a scenario where those targets are further stepped up could be quite challenging. Even if we pursue further energy conservation through technology, there’s no doubt that it will be quite tough. Having said that, we can never afford to halt economic growth, right?

Yamada: I think there are inherent limitations to how much energy conservation we can achieve through changes in human behavior and thinking alone. That’s why I invariably think it is essential to leverage sensors in smart ways and make technical progress on energy conservation through automation and digitalization. Mechanisms linked to market pricing might also be effective, such as automatically adjusting the operation of equipment such as lighting and air conditioning when the price of electricity is low or high.

Kudo: It may be contradictory in terms of the circular economy that Europe is currently pursuing, but I think switching to more energy-efficient products and rebuilding homes with improved environmental performance are also effective measures.

Yamada: That’s quite true. There are many products today



Energy Highlights: Listening to Key Persons

that you could replace with an equivalent product that consumes less than half the electricity.

■ The motivation of companies and workers is important

Kudo: Another important consideration is international standardization. Not only ISO but various other standardization bodies are now moving to incorporate carbon neutrality. This is a given considering the worldwide trend toward carbon neutrality, but I think it is somewhat misguided to go in the direction of limiting what can and cannot be done in the form of do's and don'ts.

This is similar to the carbon credits approach that involves companies trading greenhouse gas emission reductions between themselves. There have been some moves to reject the practice as outrageous, and the views of different standardization bodies vary. Indeed, if the goal is zero emissions, it will be difficult through the credit trading framework we have now, and the only credits that will be usable in the future will be negative emission credits, in other words credits for technologies that capture and remove greenhouse gases from the atmosphere. But since negative emission initiatives will not become widespread without credit trading in the first place, I think rejecting credit trading outright is the wrong way to go.

What I want to say is that from a corporate management perspective, being able to reflect action on emissions economically and flexibly in your initiatives will drive the appetite for corporate decarbonization, and that is why I don't think we should implement measures that would impede the willingness of companies to do so. Particularly in the case of Japan, once a reduction target has been set, there is a tendency to take achieving so seriously that it ends up compromising competitiveness. On that point, as I mentioned that the beginning, I think the EU is tackling this in very flexible and strategic ways. I believe we are at a critical juncture where steering the direction of the country in this way is extremely important.

Yamada: It's vital that we pursue carbon neutrality as a growth strategy without demotivating companies and individuals.

Kudo: And to do that we have to examine the details of these growth strategies. The first consideration is whether we can change Japan's economic structure of creating goods and

selling them overseas to generate profits. If that can't be changed, that question will be how to maintain the motivation to create good products and sell them. In terms of various regulations and taxation, we also need measures aimed at reducing the burden on industry from an international competitiveness perspective. If companies lose their competitiveness and become discouraged as a result, it will impact the collective fate of Japan. To prevent that eventuality, rather than simply raising wages, it is crucial that we build an attractive labor market in which young people want to work.

Yamada: I agree. However, the question of how to cultivate the literacy and mindset needed from every citizen is also an important proposition.

Kudo: For that to happen, I think it needs to be accompanied by something perceived as real. Far away from Japan, Antarctica's glaciers are breaking away and causing sea levels to rise. When you hear that, it's hard to get a sense of it as something real. On the other hand, the Noto Earthquake demonstrated the catastrophic damage that disasters can inflict on energy infrastructure, forcing many people into extremely uncomfortable situations. These scenes may have made many people realize the extent of what can happen in such emergencies. I got the sense that it is only by connecting emotionally with events in this way that people gain the ability take action toward solving issues.

But I think current policies are all about mitigation, in other words lessening the impact that human activities have on the environment. With that narrow focus, it could give people the impression that even if they don't take action, someone else will. Instead, I think we should be drawing on the lessons learned from disasters while working to develop distributed energy sources, strengthen buildings, build compact cities and otherwise enhance the resiliency or attractiveness of urban systems, including energy. I believe that by drawing people's attention to these endeavors, we can cultivate a mindset in every citizen that supports the move towards carbon neutrality.

In that sense, I have high hopes for what the Hitachi Group can accomplish, given its activities spanning the globe in energy security, action on climate change, and the development of environmental technologies.

Yamada: We will do our best to meet your expectations. Thank you very much for your time today.



• This article is published on Hitachi, Ltd.'s energy portal site.

■ Chapter 1

https://www.hitachi.com/products/energy/portal/case_studies/case_027.html



■ Chapter 2

https://www.hitachi.com/products/energy/portal/case_studies/case_028.html

An advertisement for Hitachi's energy solutions. It features a background image of a power transmission tower and wind turbines under a blue sky. The text includes the Hitachi logo and tagline 'Inspire the Next', a main headline 'If we change the start, we can start the change.', and several paragraphs of text discussing the company's commitment to innovation and carbon neutrality in power grids, energy solutions, and nuclear energy.

HITACHI
Inspire the Next

If we change the start,
we can start the change.

SILENT INNOVATION.

Every day, transmission lines supply the world's energy. From our daily lives to global manufacturing, it all starts here.

That's why our Power Grids, Energy Solutions, and Nuclear Energy business units are committed to innovation. And now, it's why we strive to make our energy systems carbon neutral.

It may be a quiet change. But it's a big change, because it brings us closer to our goal: A sustainable future for all.

Hitachi, Ltd. Green Energy & Mobility



www.hitachi.com/energy



Published in March 2023 (not for sale)
Publisher: Energy Business Administration Division
© Hitachi, Ltd. 1994, 2024. All rights reserved.