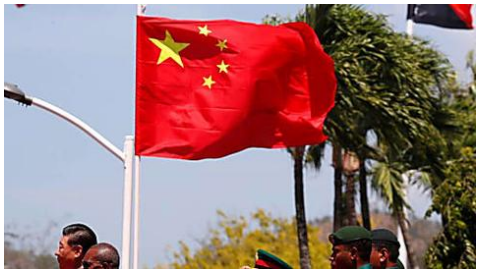
WE RECOMMEND

JD.com chief withdraws from day-to-day duties after arrest



US and China ruin Asian cooperation with their battle for supremacy

South Korea strives to beat Japan and China to UK trade deal

A coal depot at Sakata Kyodo Coal Power Plant in Sakata, Yamagata Prefecture: Coal could make up more than half of Japan's energy

COVER STORY

Why Japan finds coal har quit

Addiction to coal-fired power undermines Tokyo's greer

ERI SUGIURA and AKANE OKUTSU, Nikkei staff writers
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TOKYO/KOBE, Japan -- In Japan's port city of Kobe, a pair of 150-meter high white chimneys tower over the bay. Located just beside a residential area only 15 minutes by car from the city center, the chimneys belong to a giant 1.4-gigawatt coal-fired power plant that is about to loom even larger over residents' lives.

Brushing aside protests from environmentalists and locals, plant owner **Kobe Steel** started construction last month on a huge expansion project that will double the size -- and the emissions -- of the Kobe Power Plant. More than 14 million tons of carbon dioxide and other pollutants are expected to belch each year from the enlarged plant's chimneys by 2022 -- more than the entire CO_2 emissions of the 1.5 million-strong city of Kobe.

Residents are fighting back with lawsuits, the first of which was filed in September. "My son and I have had asthma since we moved here more than 20 years ago," said Hideko Kondo, who lives in a fume-filled block of flats just 400 meters from the power plant. "Some neighbors have moved away after hearing about the expansion plans."

Kondo and 39 other residents are seeking an injunction against Kobe Steel to halt construction and operation of the new plant, citing the "infringement of the right to live sustainably with clean air in a healthy and peaceful environment." It is only the second lawsuit in Japan to target carbon dioxide emissions. Kobe Steel declined to comment for this article.

Protesters look out over the Kobe Steel power plant from an apartment balcony in Kobe on Nov. 2. (Photo by Ken Kobayashi)

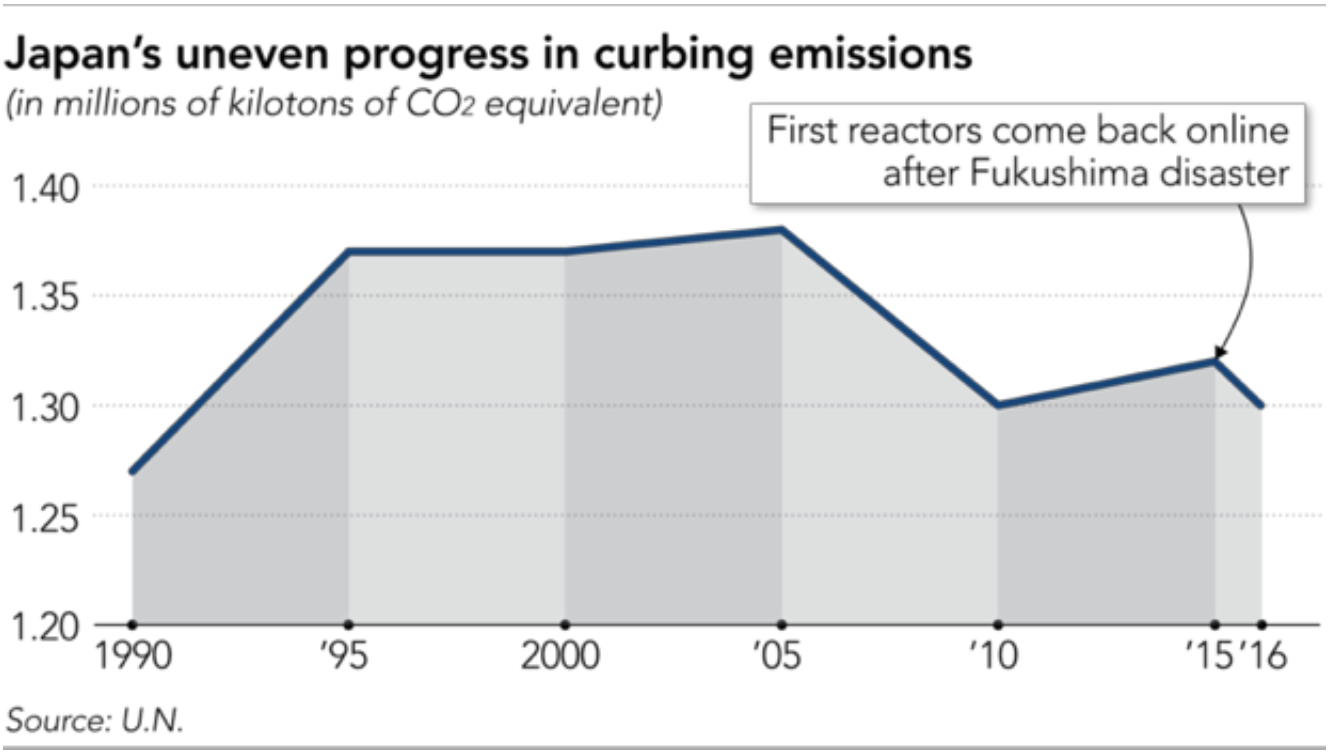
The Kobe project is one of more than 30 new power stations being planned or built by Japan that burn coal -- the dirtiest and most polluting fossil fuel and one which is being phased out by some 30 governments around the world.

"Coal goes directly against the global trend because it is the worst fuel, based on its volume of carbon dioxide emission," said Takeshi Shimamura, a professor at Kobe University who supports the residents' group.

Japan is the only G-7 country still planning new coal-fired power stations. Its continued love affair with the black, sooty fuel sits ill with the green rhetoric of Prime Minister Shinzo Abe's government and with the country's status as host of the landmark 1997 Kyoto Protocol, which committed nearly 200 nations to cutting greenhouse gas emissions.

"We must save both the green of the earth and the blue of its oceans," Abe wrote in an op-ed for the Financial Times in September bearing the headline "Join Japan and act now to save our planet."

"All countries must engage with the same level of urgency," Abe wrote. "We must simultaneously boost economic growth and reduce the use of fossil fuels."



Kimiko Hirata, international director of the Kiko Network, an environmental group, said that while Abe's words were welcome, his actions told a different story. "I was shocked by his expression 'join Japan,' given that the prime minister has not shown leadership in environmental policies domestically," Hirata told the Nikkei Asian Review, "and that Japan is severely criticized by experts overseas for not putting enough effort toward reducing CO2 emission."

Japan's pro-coal power policies are not just a domestic issue. Through its banks and international development agencies, Japan is funding a wave of huge coal-fired power plants from Vietnam to Indonesia. The Japan Bank for International Cooperation in the last three years has announced plans to provide up to $5.2 billion in financing for six coal-related projects.

Environmentalists worry that the extra CO_2 generated by these new coal plants in Asia could more than wipe out any reductions made by other nations, jeopardizing progress toward meeting U.N. global targets. According to the International Energy Agency, Asia accounted for two-thirds of the 1.4% global growth in energy-related CO_2 emissions in 2017, owing to rising fossil fuel demand.

Under the Kyoto Protocol, Japan pledged to cut greenhouse gas emissions by 6% between 2008 and 2012, but they began rising in around 2011. This is due, in part, to the Fukushima disaster, when three nuclear reactors melted down after being badly damaged in a tsunami.

Halting the country's nuclear reactors has led to an increased reliance on fossil fuels, which rose to 84% of Japan's energy mix in 2016 from 65% in 2010. Greenhouse emissions increased by about 7% between 2010 and 2012, according to data from the Ministry of Economy, Trade and Industry.

Protesters arrive at the Osaka District Court on Nov. 19 to sue the Japanese government over its policy on coal-fired power plants. (Photo by Ken Kobayashi)

Japanese government officials justify their reliance on coal by citing cost, security of supply concerns and the need for a diverse energy mix. Coal power plants are "necessary" because "the resource is cheap and more economical with scale," Shogo Tanaka, director of the Energy Strategy Office at METI, told the Nikkei Asian Review.

One alternative is to increase the use of liquefied natural gas, which emits less carbon and noxious exhaust, but Tanaka said this is not desirable because LNG prices may rise due to higher demand from China and India.

In 2015, Japan set a goal of reducing coal's share of electricity generation to 26% by 2030, down from 32% in 2016. To achieve this, renewables such as solar and wind power would produce 22-24% of the country's electricity, compared with 15% in 2016.

But even this relatively unambitious green energy target depends on restarting most of Japan's 18 nuclear power plants, which have been halted since the Fukushima disaster. Many experts question whether the restart program is realistic, given the technical, cost and safety hurdles involved.

Environmental NGO Greenpeace Japan said METI's plan "lacks ambition and urgency" because "its coal ratio is far too high, and the ratio for nuclear power is wholly unrealistic." Greenpeace noted that Japan's target for renewable energy is low compared to many EU nations, whose individual targets exceed 50% by 2030. The EU as a whole recently announced a goal of increasing the share of renewables to 32% by 2030 from the previous target of 27%.

Japan would need about 30 operating reactors by 2030 to achieve its goal of generating 22% of power from nuclear, but only nine are currently working. If nuclear power generation fails to reach the target, "it is not certain if renewable energy can make up for it," Tanaka said.

As a result, experts say coal's share of Japan's energy mix may actually rise over the next decade. According to one unpublished study by an international group and seen by the Nikkei Asian Review, coal's share of Japanese power would increase to 46% by 2030 if pure market forces prevail. Should nuclear only account for half of its planned capacity, coal's share would be even greater, at 56%.

Japan is unusual among developed countries for still planning new coal plants. Since the 2015 Paris Agreement, an international commitment to keep the global rise in temperatures below 2 C from preindustrial levels, opposition to the use of coal has become the norm in many advanced economies.

French President Emmanuel Macron pledged to eliminate coal-fired power by 2021, a step the UK has said it will take by 2025. While Germany is a coal producer and relies on coal power for about 40% of its energy -- largely because it phased out nuclear power after the Fukushima disaster -- it is still aiming to increase the contribution of renewables to 65% of its energy mix by 2030.

Kobe Steel is expanding its coal-fired power plant in Kobe, which is expected to double the plant's emissions. (Photo by Ken Kobayashi)

In such company, Japan is increasingly seen as a laggard. At the U.N. climate change conference in Bonn, Germany, last year, Japan was one of the recipients of the Fossil of the Day award, given to the country judged to have done the most to block progress during the negotiations by the Climate Action Network, a network of environmental nongovernment organizations.

Criticism has come from inside the country, too, with Foreign Minister Taro Kono calling Japan's energy policy "lamentable" last January. "For too long, Japan has turned a blind eye to global trends, such as the dramatic decrease in the price of renewables and the inevitable shift to decarbonization in the face of climate change," the minister said.

Gridlock

To be fair, Japan faces some formidable obstacles in pursuing clean, sustainable power, not least from its geography -- a largely mountainous interior with the population heavily concentrated along relatively small and narrow coastal strips of flat land.

METI's Tanaka said these factors make renewable energy more costly in Japan than in other countries. Solar generation, for example, is twice as expensive per kilowatt hour in Japan as it is in Europe because of the limited amount of suitable land and the cost of construction for solar farms.

Japan also lacks a national electricity grid. The nation's power supply is generally divided into 10 service areas, each with its own transmission network, which means there is limited capability, for example, to send solar energy produced in the south of the country to the north. There are plans for building a few connections between the networks, but one line would cost more than 100 billion yen and take 5 to 10 years to complete.

Wind power, which has rapidly caught on in Europe, is limited to just 1.7% of Japan's planned total renewable energy supply. The government says that viable locations for offshore wind farms in Japan tend to be far from areas where there is demand for electricity, and construction costs are high because of how far the wind turbines would have to be built from the shore. Opposition from the powerful fishing lobby is another problem.

A JRE wind farm in Sakata: Japan's industry ministry says high costs are a hurdle to expanding renewable energy. (Photo by Ken Kobayashi)

With an uncertain outlook for renewables, some Japanese power companies prefer to work on minimizing the environmental damage from burning coal. Coal-fired power plant operator **Electric Power Development**, better known as J-Power, is investing in carbon capture and storage technology, which collects and buries carbon dioxide to keep it out of the atmosphere.

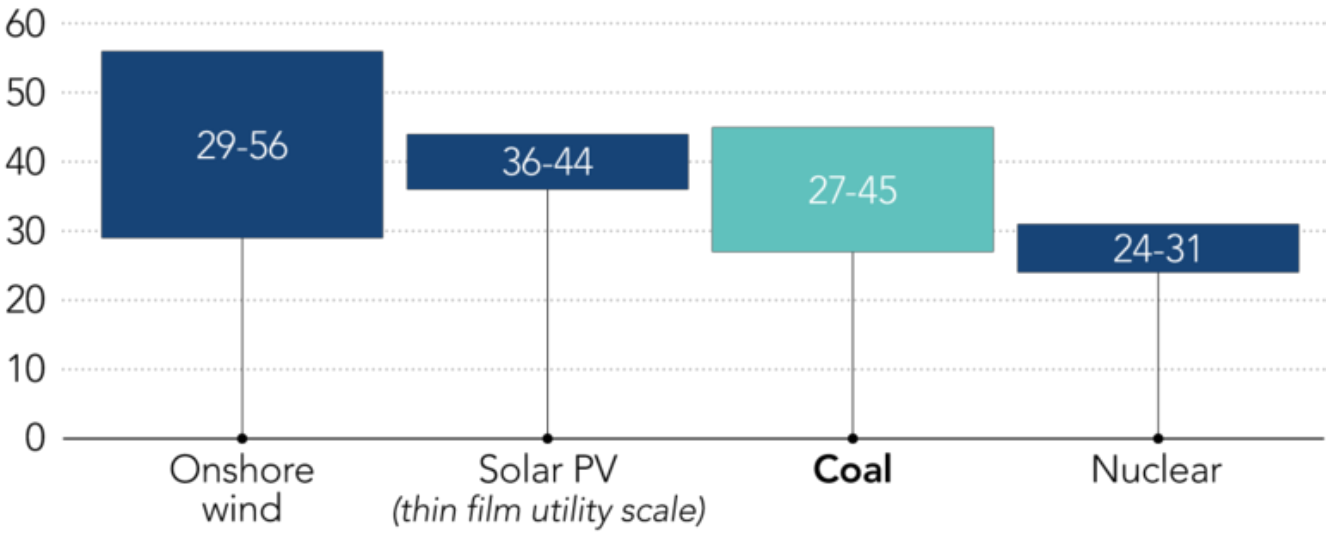
According to a 2014 estimate by the Environment Ministry, it cost would cost 10,500 yen [$93] to capture and sequester 1 ton of greenhouse gas emissions. This is likely cheaper than reducing emissions via renewable energy sources, a ministry official said.

J-Power has plans to build three new coal-fired plants, one of which will replace an old plant. The company also set up this year a joint venture with Sumitomo Forestry to manufacture and sell wood pellets, creating a source of biomass fuel to mix with coal in J-Power's thermal plants. "It is important that Japan has diverse sources of energy," a J-Power corporate planning executive said.

Experts like Hiroshi Segawa, a professor of energy and environment at the University of Tokyo, are unimpressed by such arguments. "There is a complete lack of sustainability and of a national strategy to realize the [planned] energy mix in the long term," Segawa said. "The dependence on coal-fired plants might increase further, going in the opposite direction to the global trend."

Segawa believes several factors have been hindering Japan's shift toward renewables. "The government is probably giving priority to heavy industrial firms who manufacture nuclear plants," he said.

Cost of renewables closing in on coal *(in dollars per megawatt-hour)*



Levelized cost for unsubsidized new-build wind, solar; marginal cost of generation for coal, nuclear

Source: Lazard

That view is echoed by executives at Japan Renewable Energy, a solar, wind and biomass power operator backed by Goldman Sachs Group. The company has only limited access to the power transmission network, making it harder to pursue new renewable projects.

"Major power companies are still securing power grids to prepare for re-operation of nuclear plants at some future time," said Koki Yoshino, executive officer of the firm. The result, he said, is that power plant projects for JRE and other solar and wind power generators have stalled.

A study by Kyoto University professor Yoh Yasuda found that only 19.4% of power grids are actually used nationwide, while the rest are empty.

"We would prefer regulations on the use of existing network to open the market for renewable energy industry," said Yoshino from JRE.

Cutting at home, building abroad

While the government is sticking with coal, some Japanese companies -- including **Konica Minolta**, **Mitsubishi Electric** and **Sony** -- are pledging to reduce emissions. And some of Japan's power firms are also planning to shift away from coal.

Tokyo Electric Power Co. Holdings President Tomoaki Kobayakawa said this year that the company -- which owns the crippled Fukushima plant -- aims to increase the size of its renewable business over the long term to a level equivalent to that of its thermal power subsidiary, JERA. Tepco has several renewable energy projects, including a plan to build a new offshore wind farm in Chiba, east of Tokyo, where it is conducting a ground survey to determine its viability.

The ventilation stacks of Kobe Steel's coal-fired power plant loom over a residential area in Kobe, Hyogo Prefecture. (Photo by Ken Kobayashi)

Yet at the same time, a number of Japanese companies are still pushing coal overseas -- particularly in the fast-developing economies of Southeast Asia. The IEA predicts that coal power generation will grow through 2022 in India and Southeast Asia, fueled by billions of dollars of funding and technical support from Japan and China. J-Power is among them: it is building a 2 GW coal-fired plant in Indonesia in a joint venture with local player **Adaro Energy**.

Back in Kobe, residents are gearing up for a long fight against the coal power plant. Some have filed a second lawsuit, this time against the Japanese government for letting Kobe Steel construct the plant after an impact assessment "which lacks environmental consideration." Litigation in the first case is scheduled to begin in mid-December.

Kondo, like other residents, says she has no plans to back down. "As long as this violence continues, I want to raise my voice to stop it," she said.