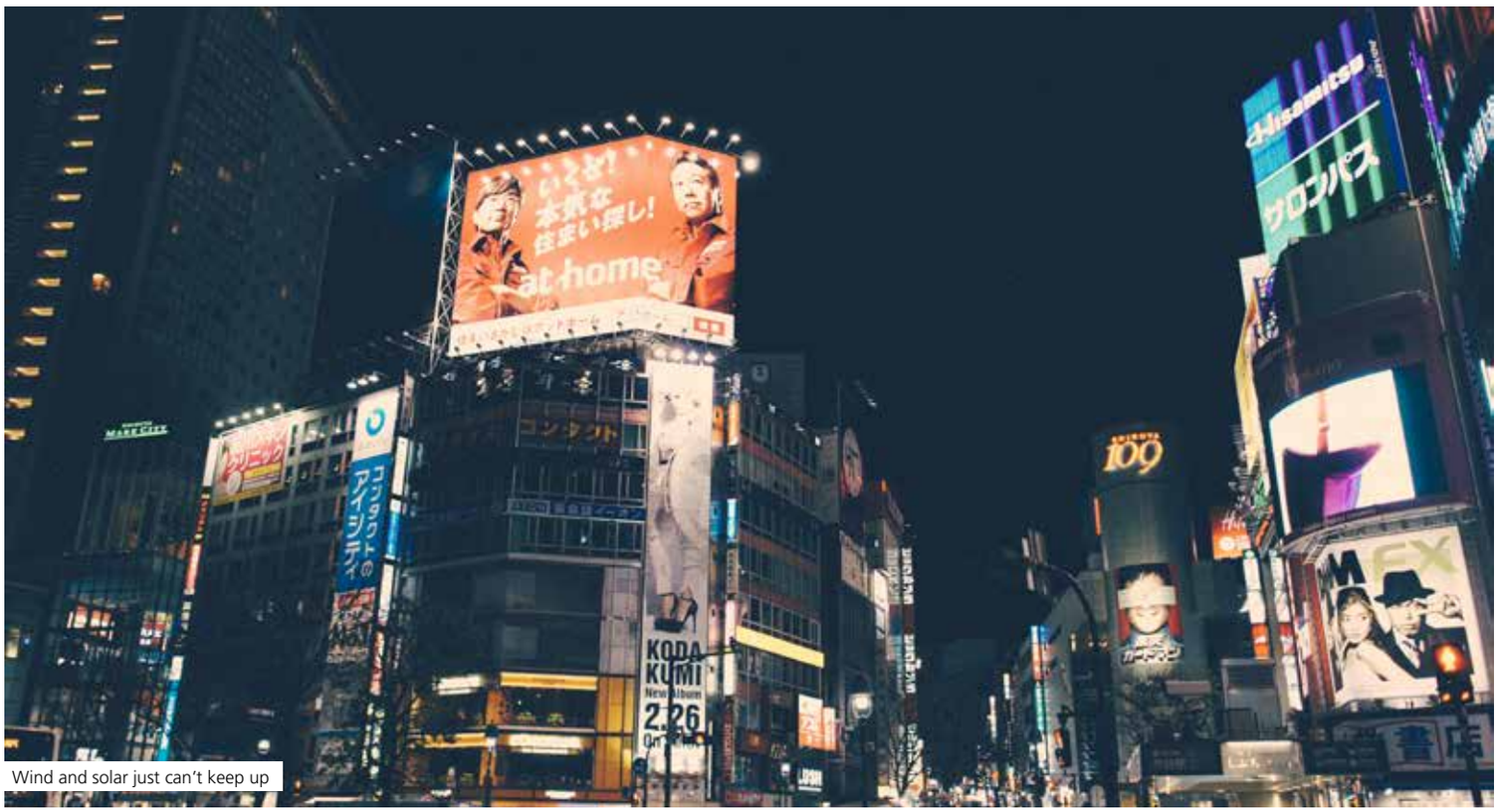


Wind and solar just can't keep up

It's closing time: Japan's solar firms quit

Both solar and wind sectors are struggling as insufficient capital, poor sales, and poor cost competitiveness plague

When the Fukushima Daiichi disaster forced Japan to shy away from nuclear power, there was hope that solar and wind would gather momentum and become the nation's strong energy pillars. But both renewables seem to be wobbling as of late, with a record number of solar photovoltaic (PV) firms declaring bankruptcy and critics sounding the alarm on wind power's inability to achieve grid parity anytime soon. Scarce capital, plunging sales, and high system costs also pose risks to solar and wind growth in Japan, although recent developments like market liberalisation and virtual power plant subsidies will ensure a smoother road ahead for renewables expansion, according to analysts.

Scarce capital, plunging sales, and high system costs also pose risks to solar and wind growth in Japan.

One of the most battered sectors in renewables is the solar PV sector. Intense financial pressure has resulted in 65 solar PV firms shuttering last year, up by 20.4% from 2015, according to Tokyo Shoko Research. This was the highest number of closures reported since the survey began. In December 2016 alone, 10 PV companies went bankrupt, marking the highest count in a single month. Bankruptcies have become more widespread among Japanese solar industry players due to vague business strategies, poor sales, and insufficient capital, the research firm explains.

Japan's wind energy development is likewise going through a rough phase, already falling behind other nations, says **Masao Masuda**, general manager for overseas business, transportation and energy at the Development Bank of Japan. In 2015, global wind power capacity hit 432GW, of which Japan's contribution stood at a measly 3GW.

Wind power's cost competitiveness remains below global standards as well due to high system costs, which reached US$156 per MWh for over 20MW projects. India's and Germany's system costs are only around half that of Japan's, at US$77 per MWh and US$79 per MWh, respectively, for almost the same capacity. Unless lowered, Japan's high systems costs will make it hard for wind power to reach grid parity.

"With regards to cost competitiveness of wind power in Japan, system costs in the country is much higher than in other countries. Japan is still behind the US and European countries in terms of cost competitiveness of renewable energy, and grid parity is unlikely to be achieved in the short term," says Masuda.

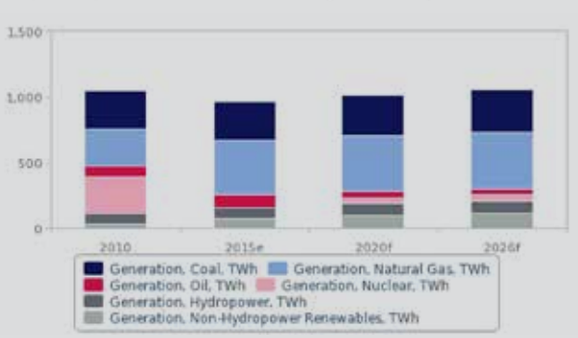
Costs flying through the roof

Meanwhile, **Masuo Kuremura,** assistant director for new and renewable energy division at the Ministry of Economy, Trade, and Industry, reckons Japan's high costs for wind power is one of three key challenges it has to overcome. He reckons that developers keep shifting their focus to relatively cheaper solar energy projects instead of wind energy projects to produce inexpensive power.

Second, Japan's wind sector must work around the "very limited" number of areas suitable for wind projects in the country, and many of the viable ones are far-flung, making them more difficult to connect to the grid. "We need to have good connection to get the power from there to high-demand areas, and we have to increase the network gradually so as not to stress it," says Kuremura.

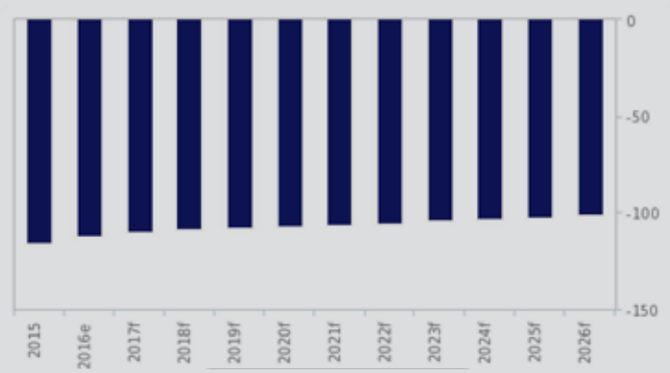
A third challenge for Japan is the long

Japan's power mix to remain gas-heavy



Source: BMI Research

LNG demand to see long-term decline



Source: BMI Research

assessment time for wind power projects. Kuremura argues that some wind power projects cannot be commissioned when the assessment process drags on. "Shorten it and make it succinct so that, eventually, massive wind power can come to the grid. In three years, wind power share will increase significantly, both onshore and offshore," he says. "But for now, Japanese wind power market is admittedly still in infancy."

Sanguine demand outlook

Despite the worrisome string of closures in the solar PV industry and the robust headwinds of wind power, some analysts hold a sanguine outlook for both renewables. **Atsushi Ito**, president and CEO of solar IPP Next Energy & Resources Co., says cheaper PV-based electricity is coming as he expects a decline in equipment costs and an increase in operational efficiency, which could help more solar PV firms stay afloat financially. Ito adds that the solar industry will benefit when the renewable energy levy likely doubles in the coming decade from JPY2.25(US$0.0206) per kWh in 2016 to JPY4-5(US$0.0367 to US$0.0459) per kWh in 2030.

Global demand for solar PV is also expected to grow at a healthy rate. Citing a GTM Research forecast, Jesse Pichel, managing director for investment banking at Roth Capital Partner, said global PV demand will grow at an 8% compounded annual growth rate from 2016-2021. But he warns that Japan must prepare the sector by ensuring stronger financing mechanisms are put in place.

The government will also be pushing for more wind energy projects, but this will require significantly higher investment capital. Masuda estimates Japan will need to invest JPY2.19b (US$20.1b) to achieve its 10,000 MW wind power target in 2030, and a total of JPY19.8b (US$181m) to JPY20.7b (US$190m) investment capital to reach the 131,510 MW target for all renewables in 2030. Given wind power's large capital needs, the finance sector will need to step up and allocate a larger amount of available capital by inviting more long-term investors for renewables, and making the capital market open for renewable energy. Masuda warns that there is no room for complacency in the wind energy sector, especially with many operators standing on shaky financial ground. "The feed-in tariff (FiT) introduced in 2012 helped Japanese wind power operators survive financially, but the fundamentals of Japanese wind power market is still caught in a vicious cycle of high generation cost and slow growth," he says.

To help improve the operating environment, Masuda recommends reducing generation cost to grid parity and increasing wind's share in generated electricity. Wind power operators, for their part, must become flexible enough to change business models, whenever necessary, and learn to cooperate to increase their competitiveness and bargaining power. Prospects for solar and wind remain optimistic as well considering substantial public disapproval of nuclear and coal-fired power.

"We do not expect a major uptick in nuclear power or coal-fired power in the country, given the strong public opposition to restarting nuclear reactors and environmental opposition facing new coal-fired power projects," says **Georgina Hayden**, head of power & renewables at BMI Research.

"In terms of nuclear restarts, concerns over the safety of currently idled facilities that have applied to restart have already culminated in a string of court injunctions and wavering support from prefecture governors. We believe this makes the restart of these facilities in a timely manner highly uncertain and we only expect nuclear to contribute 4.7% to total power generation by 2026," she adds.

Hayden reckons the coal sector will see some growth in coal-fired power generation with annual average growth rates of 0.9% between 2017 and 2026, but there is increasing risk of project cancellations on environmental grounds. She cites international efforts to reduce emissions following the signing of the Paris Agreement in December 2015, which will cap growth in the sector. In January, KEPCO's planned Ako coal-fired power plant has been cancelled — the first major cancellation since the new wave of projects were announced in 2016.

Masao Masuda

Atsushi Ito

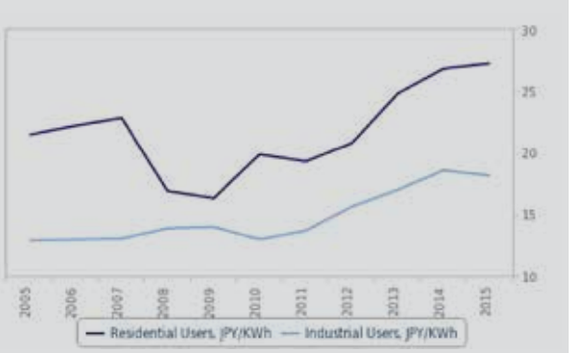
Georgina Hayden

Virtual power plants

Another emerging concern for solar and wind, as their share of supply increases further in the future, is to ensure power supply stability. The government has started exploring virtual power plants (VPP), with 7 VPP construction subsidised projects adopted last year, enabled by a reported subsidy amount of JPY4b(US$36m) in FY2017. **Fumiaki Ishida**, general manager, advanced grid strategy group community energy division at The Kansai Electric Power, says VPP resources are operated through Internet of Things, and basically assist in controlling the supply-demand balance given increased solar and wind energy generation.

"There has been a marked increase in proportion of solar and wind during light load period. During daytime, supply-demand balance is maintained by the pump-up of pumped-storage power generation. Net load sharply drops in the morning and rises sharply in the evening, making supply-demand balance difficult," he says. "There is an expansion of opportunities to use VPP service due to progress in electric power system reform and further increase in renewable energy. We have been working on demonstration projects such as demand response and negative watts as measures to deal with various problems of the electric power system. We are also aiming to establish a system that integrates and controls various resources and establishing bulk control technology," he adds.

Policy to focus on reversing retail price spike



Source: BMI Research