JAPAN'S FIT: FLYING TOO CLOSE TO THE SUN?

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BACKGROUND
Spurred to action by the 2011 Fukushima nuclear meltdown, Japan's Parliament seized on popular anti-nuclear sentiment and passed sweeping legislation to encourage the development of the nation's renewable energy resources. The Act on Purchase of Renewable Energy Sourced Electricity by Electric Utilities ("Renewable Energy Act") came into effect on 1 July 2012 and was designed to make the business of generating energy from renewable sources easier and more profitable. Over two years later, it is clear that the Renewable Energy Act has succeeded in attracting more investment in solar PV than Japan's grid can handle. Looking ahead, however, Japan's 2014 Strategic Energy Plan, approved on 11 April 2014, fails to set renewable energy targets and backs the reinstatement of nuclear power as an "important baseload power source as a low carbon and quasi domestic energy source, contributing to stability of energy-demand structure". Wavering political commitment to renewable energy, infrastructure limitations, industry pressures and consideration of other renewable energy sources may result in revision of policy to reduce the incentives for solar projects. The gold rush in Japanese solar PV development may already be coming to an end.

Before the Renewable Energy Act
Intense industrialisation, a dense population and limited fossil fuel resources have forced Japan to rely on a combination of imported fuels and domestic nuclear power generation to meet its energy needs. According to the U.S. Energy Information Administration ("EIA"), Japan is the third largest net oil importer, second largest coal importer and largest importer of liquefied natural gas in the world. The EIA reports that, prior to the Fukushima disaster in March 2011, 26% of Japan's electricity was generated by approximately 50 nuclear reactors. By comparison, nuclear power generates around 19% of the electricity in the United States, and none of Australia's electricity (despite Australia's rich uranium resources), according to the International Atomic Energy Agency and the EIA.

The Fukushima nuclear meltdown shocked the Japanese energy industry. Responding to fears regarding the safety of nuclear power, the country's nuclear reactors were taken offline over the course of 2011 and 2012 and Japan increased oil and natural gas imports to fill the energy gap. It is against this backdrop that a new incentive for renewable energy came into effect. However the decision to take nuclear reactors offline has now been reversed by
the 2014 Strategic Energy Plan and the Nuclear Regulation Authority of Japan is reviewing 18 reactors for restart, with indications that some are likely to return online in the near future. It has already deemed two reactors at Kyushu’s Sendai plant as ready to restart, following improved safety measures. The plant operator will also need permission from local authorities to restart, which includes consideration of evacuation in the case of an accident (currently estimated to take 28 hours for 90% of residents within a 30 km radius).

How the Renewable Energy Act encourages investment

The Renewable Energy Act seeks to ease the regulatory burden and increase the profitability of renewable power development. The law:

- introduces the feed-in-tariff (“FiT”) regime which requires energy utilities to purchase set amounts of solar, wind, geothermal, hydropower and biomass energy at elevated rates;
- aims to shorten the time required to conduct environmental impact assessments for wind farms;
- deregulates the process of setting up small hydropower plants; and
- exempts solar power stations from regulations under the Factory Location Act, which otherwise imposes a three month requirement prior to construction.

When the Renewable Energy Act came into effect in July 2012, the guaranteed rates mandated by the FiT were among the world’s highest. The favourable rate of 40 JPY/kWh (excluding tax) for solar power was an enticing invitation to private sector investment. However, with the understanding that artificially maintained prices could result in an unsustainable industry, the Renewable Energy Act allows the Ministry of Economy, Trade and Industry (“METI”) to set new tariff rates each financial year. In principle, this acts as a throttle on investment and development and allows the regulators to manage development. METI reduced the solar tariff twice: to 36 JPY/kWh (excluding tax) in April 2013 and again to 32/kWh (excluding tax) in April 2014. Other changes for the 2014 financial year include the introduction of new purchase categories for offshore wind power and small and medium hydropower plants utilising existing headrace tunnels (electricity facilities and hydroelectric water pipes which have been upgraded by utilising currently installed headrace tunnels). Purchase prices have otherwise remained the same for other energy sources. Revised tariffs are expected to be released prior to April 2015.

EFFECTS OF THE FIT

Dominance of solar PV

Prior to the introduction of the FiT, Japan’s renewable energy capacity was 20,600 MW. By December 2013, this increased by 7,044 MW, largely due to a staggering increase in solar PV of 5,172 MW.

As at September 2014, Japan ranks fourth in the global Renewable Energy Country Attractiveness Index. According to the European Photovoltaic Industry Association, as at 2013 Japan is the world’s second largest solar PV market, behind China. METI data indicates that Japan installed a record 7.04 GW of solar PV capacity in the fiscal year ending 31 March 2014.

The dominance of solar PV has attracted investors outside of the traditional energy industry: convenience store giant Lawson announced plans in July 2012 to install solar panels at up to 2,000 of its stores and is actively involved in solar power generation activities within local communities. Real estate developer Mitsui Fudosan constructed three mega solar plants in the Yamaguchi prefecture, Oita prefecture and Tomokomai city, with a combined capacity of 56 million kWh of electricity per year.

In addition to very favourable tariff rates, factors contributing to the dominance of solar PV include reduced development times and faster regulatory approval processes (compared with technologies such as wind and geothermal) and falling supply costs. This honeymoon period may be coming to an end however, due to recent decisions of electricity utilities.

Electricity utilities drawing the line

In a move that undermines Japan’s push to expand renewable energy supply, five of Japan’s ten electricity utilities (serving Kyushu, Shikoku, Hokkaido, Tohoku and Okinawa) made the dramatic decision in September 2014 to suspend reviewing proposals by and/or signing contracts with renewable energy producers until further notice. Under the Renewable Energy Act, an electricity utility can refuse to sign a power purchase agreement on the basis that it unjustly harms the utility’s profits or other justifiable grounds (including that transmission is likely to exceed the capacity of the interconnection point or utility) (Article 4 (1)) or refuse to accept a connection request if it is likely to disturb the stable supply of electricity by the utility (Article 5 (1)(ii)).

Factors contributing to this move include:

- Japan’s grid will reportedly face blackouts if all approved renewable energy is brought online due to capacity limitations.
Japan’s energy utilities are organised to serve 10 distinct distribution areas which are not integrated by a robust transmission system (including different power frequencies in the East and West of Japan). The grid is unable to move power from where it is produced to where it is needed. The FiT pricing is based on technology type, and does not account for areas of electricity need, with the result that developers select projects based on profit. Some individual utilities are taking action to remedy this, such as Tokyo Electric Power Co.’s priority project to build a 100 km transmission line in central Japan, but this is not due for completion until 2020.

The fluctuating nature of renewable energy creates difficulties. Variations that are not properly managed could cause power failures and equipment damage, threatening the ability of utilities to meet their obligations to maintain grid stability.

Japan’s electricity prices are already amongst Asia’s highest, with surcharges for standard households becoming unaffordable. METI has expressed concerns that if all approved renewable energy is brought online, annual renewable energy surcharges will reach ¥2.7 trillion, resulting in monthly surcharges for standard households increasing from ¥225 to ¥935. Utilities are already facing financial constraints post the 2011 Fukushima disaster, having been forced to import expensive financial fuels, with Kyushu Electric reaching out to the Development Bank of Japan to purchase ¥100bn yen of its preferred stock.

**Sources of finance for renewable energy projects**

The FiT has been embraced by Japan’s banks despite recognition that the solar boom may be temporary and the entrance of renewable energy investors with little experience and knowledge. Banks have competed for a share of the solar PV market, following the market entry of backers such as Goldman Sachs Japan Co. and IBM Japan Ltd. Key local players include Mizuho Corporate Bank, Sumitomo Mitsui Banking Corp and Marubeni Corporation.

Mizuho acted as project financier for the 70 MW Kagoshima Nanatsujima Mega Solar Power Plant, which went live on 1 November 2013. The project is being operated by a six-member SPV and involves an investment of approximately JPY 27 billion (approx. USD 275.5 million). Sumitomo Mitsui announced in April 2014 that it and four other banks will provide a 6.6 billion yen syndicated loan for a 20 MW solar power station in the Iwate prefecture in Northern Japan. The project is part of reconstruction efforts following the 2011 Tohoku earthquake and tsunami. Marubeni Corporation is financing an 82.02 MW capacity plant (Japan’s largest) in the Oita prefecture, with construction costs estimated at JPY 24 billion (USD 303 million).

The FiT has also attracted the attention of foreign investors. US GE Energy Financial Services announced in June 2014 its investment in the 32 MW solar PV Kumenan project in the Okayama prefecture, supported by non-recourse finance of JPY 11 billion from the Bank of Tokyo–Mitsubishi UFJ and the Chugoku Bank Ltd. There is speculation that GE is discussing a further contribution in the order of JPY 10-20 billion towards the development of a 230 MW solar PV plant in Setouchi, which will overtake Marubeni Corporation’s Oita plant as the largest in Japan. In January 2014 Singapore-based Equis Funds Group raised USD 250 million to fund solar developer Nippon Renewable Energy.

**FUTURE OF THE FIT**

While the FiT has undoubtedly brought new investment to Japan’s solar sector, consideration of the current political and economic climate could pause investors before they rush to take advantage of the solar tariffs. Firstly, despite the Fukushima nuclear meltdown, nuclear energy is formally backed by Japan’s 2014 Strategic Energy Plan and Prime Minister Abe, and remains an established cost-effective, if publically unpopular, way for Japan to meet its energy needs. Secondly, an upcoming review of the FiT, spurred by the decision of utilities to suspend bringing renewable energy online until further notice, may result in tighter control of the solar PV approval process. Thirdly, considerations about how the FiT is funded may lead to fiscal or political pressure for tariff reductions. Finally, the success of the solar FiT has left other renewable technologies in the dark, with only small increases in investment. If Japan decides that diversification in energy generation should be encouraged, one could expect the tariffs on renewable energy to be normalised so as not to prioritise solar.

**Energy targets not so clean**

Japan’s government continues to struggle with articulating its commitment to renewable energy in a meaningful way. Drafted in a pre-Fukushima era, the first release of Japan’s 2010 Basic Energy Plan set a 21% target for clean energy by 2030, with nuclear power to contribute more than half of the nation’s energy supply. These targets were put on hold after the Tohoku earthquake and are completely absent from the most recent 2014 revision, renamed the Strategic Energy Plan, which provides that Japan aims to surpass the 20% renewable energy targets in past plans. The Strategic Energy Plan refers to renewable energy as "a promising, multi-characteristic and important energy source". However it may not go far enough in addressing public criticism that the draft plan was too nuclear-heavy.
and validating Prime Minister Abe's intention to mobilise "all necessary policies" to utilise the FiT. It certainly does not answer the calls of Japan's Environment and Trade Ministers to set a renewable energy target.

**Upcoming reviews**

The decision by electricity utilities to suspend bringing projects online until further notice has prompted the Government of Japan to review the FiT scheme, with the stated aim of spreading the use of renewable energy but keeping the public burden at an appropriate level. This includes the creation of two working groups.

METI will set up a working group at the end of 2014 to review the FiT. There are suggestions that the working group recommends that METI review FiT purchase prices more frequently than once a year, to moderate project applications; under the current regime, developers rush for approvals at the end of Japan's fiscal year, with Kyushu Electric receiving an astonishing 70,000 applications in March 2014 (equalling the amount received in the previous 11 months). There are also reports that METI will change the timing for the calculation of the FiT for PV installations larger than 1 MW, so that the price is fixed when a project begins operation (rather than when it receives approval) in order to discourage the alleged behaviour of some developers of delaying construction in the hope that component prices fall.

There are underlying concerns that the FiT review may halt the expansion of renewable energy and promote nuclear power, particularly in the absence of a clear renewable energy target in the Strategic Energy Plan.

METI will form a separate working group of experts and industry observers, due to meet in October 2014, to discuss grid connection and capacity problems. There are existing plants to create a national authority to improve grid infrastructure and integrate transmission lines between utilities (with the business of power generation being left to individual utilities), although it is unclear how the costs of this will be allocated and how long the upgrade will take.

**Funding the FiT**

Commentators have expressed concern that Japan's high level of government borrowings relative to GDP could mean a fiscal imperative for tariffs to be reduced further. Comparisons have been made to the reduction of previously agreed feed-in tariffs and other renewable energy subsidies in countries such as Spain. However, other commentators have highlighted that Japan's FiT is closer to that of Germany's. Like Germany, the cost of the FiT is funded by surcharges paid by energy users. This contrasts with Spain where the cost is paid for by the government. On this basis, Japan's FiT is said to be more sustainable in the long-term as a user-based charge. Shifting the FiT costs to the private sector, however, can result in considerable political pressure from influential industries that consume large amounts of electricity, such as manufacturing, to bring down tariffs.

**Diversification of renewable energy sources**

Despite the extensive take-up of solar PV projects under Japan's FiT, wind, hydroelectric, biomass, and geothermal projects have not enjoyed the same success.

For example, Japan's Wind Association has expressed concern that wind development is being held up by requirements to conduct environmental impact assessments, despite Japan's potential resources of 144 GW for onshore wind and 608 GW for offshore wind. According to the Global Wind Energy Council, Japan had only 1/34 of the wind generation capacity of China at the end of 2013. There are signs of life, however: the June 2014 Renewable Energy Country Attractiveness Index predicts that Japan is poised to overtake Germany and the UK on the Index. It may be that wind energy has a role to play in this, with early movers such as General Electric, which has not undertaken sales of wind turbines to Japan in eight years, announcing in 2014 a new wind turbine specifically developed to suit Japanese weather conditions and meet Japanese regulatory requirements. Geothermal energy also has room to grow; it supplies only 0.2% of Japan's electricity but has the potential to produce 23,000 MW of capacity, according to a 2012 report by the Geothermal Energy Association in Washington D.C. Despite Japan in March 2012 easing rules allowing geothermal developments in protected national parks, a meagre 1,000 kW of geothermal capacity has been added as at 31 December 2013. Although Mitsubishi Heavy Industries Ltd. signed a memorandum of understanding in 2010 with Iceland's Reykjavik Energy to cooperate on the global development of geothermal energy, this has not had significant impact on Japan.

Considering the feasibility of other renewable energy sources and the almost-sole reliance on solar for the increase in renewable energy over the past several years, METI has already decreased solar tariffs in April 2013 and 2014 while holding the other renewable energy tariffs stable, demonstrating that it is considering each energy source separately. It is clear that METI has not yet seen the growth that it wants in these other renewable energy sectors and could take further measures to encourage development including through the ministerial level group set up by the Government to boost renewable energy. The Strategic Energy Plan does not heavily promote solar renewable energy, with statements such as "the power generation cost of solar power is high, and power output is
unstable. Therefore, further technological innovation is necessary”. At the moment it appears that the sun may have set on Japan formalising support for renewable energy through its 2014 Strategic Energy Plan. In the words of the Japan Renewable Energy Foundation, Japan may have “given up” on any major policy shift from nuclear power.

CONCLUSION

The goal of the Renewable Energy Act has been to develop Japan’s renewable energy sector. For solar PV, it has certainly done so. The question remains, however: what will be the impact of the 2014 Strategic Energy Plan and its silence on renewable energy targets on the future of the FiT, coupled with the decision by electricity utilities to suspend bringing renewable energy projects online until further notice? Will we gradually see an end to Japan’s commitment to renewables? Political and fiscal pressures may cast a growing shadow over solar PV development; so for now, new investors may want to closely consider their time in the sun.

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