

# Is Japan's new feed-in tariff strong enough?

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On 26 August, 2011 the Japanese Diet enacted a law that requires electric utility companies to purchase renewable energy. While the laws passage marks a significant milestone in the effort to increase the integration of renewable resources into Japans nuclear and conventionally powered grid, the law does not guarantee renewable energy adoption. The law is better viewed as the establishment of the playing field boundary lines within which the renewable energy industry and its constituents will battle the regional electric utilities and cost-sensitive industrial consumers for a role in Japans strategy to maintain economic growth while reducing both dependence on imported fuels and carbon emissions.

## Current installation

Japan has the third largest electricity market in the world (behind the United States and China). An island nation, Japan does not import or export electrical power. But short on domestic energy resources, Japan imports more than 80% of its primary energy supply/feedstock.

To reduce its dependency on imported oil, in the 1970s Japan made a deliberate policy shift to increase its reliance on nuclear power. The result of this policy increased nuclear generation to more than 30% of total electricity production. Yet despite Japans well-deserved reputation as a highly energy-efficient and low carbon-intensity economy, it has surprisingly low integration of renewables in its electrical grid.

In 2009, hydropower produced 8.3% of the total power generated from the ten utilities and wholesale providers, while geothermal, wind and solar produced merely 1% combined (data from the Federation of Electric Power Companies of Japan, 2011). Most of Japans installed hydropower is pumped storage serving load-balancing functions; therefore the Japanese grid arguably has plenty of unused opportunity to absorb more intermittent resources such as wind and solar. The majority of Japans solar capacity is installed in small residential systems. Japan recently inaugurated a net-metering program that requires utilities to purchase unused electricity produced by residential photovoltaic systems at favorable rates.

## Recent energy policy

At the turn of the millennium, Japans consensus policy position was that nuclear energy would play an ever-increasing role in the nations energy supply because of the technologys ability to score high points on energy self-sufficiency, near-zero carbon emissions, and as a viable baseload alternative to thermal generation. Targets released by Japans Ministry of Economy, Trade and Industry (METI) showed that by 2030 as much as 50% of electrical supply would be nuclear-generated. The increase in nuclear generation from 30% to 50% was to be met with new construction and increases in the capacity factor of plants in operation today. But on 11 March, 2011 Japans energy policy foundations were shaken.

## Earthquake

The east Japan earthquake and tsunami carried immense and tragic consequences. In addition to more than 20,000 dead or missing and tens of billions of dollars of property damage in north-east Japan, the catastrophe overwhelmed the

Fukushima Dai-chi nuclear power plant complex resulting in multiple explosions and releases of radiation. Six months after the crisis began, the owner and operator of the plant, The Tokyo Electric Power Company (TEPCO), appears to have steered clear of the greatest dangers; but there will be lasting impacts.

About 5GW of capacity (Fukushima Dai-ichi) was permanently lost from the Japanese electricity grid and there may be accelerated decommissioning of even more nuclear capacity. In addition, there has been a widespread change in Japanese attitudes to nuclear power. During the crisis, then-serving prime minister Naoto Kan publicly voiced his view that Japan should phase out nuclear power and immediately shut down plants where safety is in question. The Chubu Electric Power Company had little alternative but to adhere to prime minister Kans extraordinary order to suspend operation of the Hamaoka nuclear plant until it can be retrofit and confirmed as capable of being safely operated in its seismically precarious location (official estimates of probable earthquake magnitude exceed the plants original design). Kans final act as prime minister was leadership over the passage of the FIT law and his successor, Yoshihiko Noda, publicly confirmed in his inaugural address the governments intention to reduce Japans dependence on nuclear energy.

However, it is too early to determine whether the change in attitude towards nuclear is temporary or lasting. For it to be lasting, a more acceptable alternative must be chosen.

#### Implications of nuclear phase-out

Unlike jurisdictions with neighbours capable of selling excess capacity (such as Germany, where in reaction to the Fukushima Dai-chi incident nuclear power capacity was shut down, only to be replaced with electricity imports), in Japan growth in demand or reductions in generating capacity at home must be offset with new generation or reductions in demand. Eastern Japan survived an electricity demand-supply imbalance this summer only with costly mandatory reductions on industrial electricity consumption and a high degree of voluntary demand reduction that history in other markets suggests will not be sustained. Japan is already highly energy efficient and does not have the same low-hanging fruit opportunities in demand-reducing efficiency investments that exist in other markets such as the United States. Absent a radical downturn in industrial activity or policy-driven reductions to consumption patterns, Japan is in need of replacement generating capacity.

In 2009, Japans then-prime minister Yukio Hatoyama announced Japans commitment to reduce carbon emissions by 25% by 2020. The loss of nuclear capacity has caused many to view this policy as unrealistic but assuming the spirit of such commitment is maintained, natural gas is not the sole solution for the lost nuclear capacity. If the pricing is attractive, the FIT law will enable renewables to help fill the demand-supply gap.

#### Industry organisation

Japan is served by 10 geographically divided and vertically integrated companies, which exclusively serve their captive customers and are regulated by METI. TEPCO is the largest of the electric utilities. In the 1990s, there was a movement to de-monopolise, deregulate, and liberalise power markets in Japan, but the efforts fell short when the Enron bankruptcy and California power crisis shifted the balance of policy opinion in favor of the status quo. In the wake of the earthquake and unimaginable consequences to TEPCOs Fukushima Dai-ichi nuclear plant, a movement to separate transmission functions from the utilities has reawakened. This time the movement is driven by the need to organise the industry with a structure that will provide greater grid access to renewable generators and in the context of a possible reorganisation of TEPCO, which some in Japan argue is necessary or inevitable in consideration of its decommissioning and third party compensation liabilities related to the Fukushima complex.

#### And the field of play is...

The new law, which will become effective 1 July, 2012, is a fixed-price policy measure that should be understood as a feed-in-tariff (FIT), but important details are still to be determined. The law requires utilities to contract with renewable energy generators at a price and for a duration that will be determined by a third party independent commission and approved by the Minister of Economy, Trade and Industry later this year. Eligible renewable energy sources under the regime include solar, wind, hydro, geothermal and biomass, and may include other resources if approved by METI.

Technical standards for renewable energy facilities eligible for the program will be determined by METI.

The obligation of the electric utilities to purchase renewables is not limited to a fixed percentage of total generation capacity or other quantitative limits. Instead, the obligation to purchase renewables at the fixed price will be subject to the ability to maintain stability of supply in the grid and to avoid any unduly burdensome rate increases. The first limiting criterion, stability in the grid, will be a technical battle where the utilities have the upper hand due to their ownership and operation of the transmission network and their obligation to reliably serve customers in their territory. But Japan's low integration of intermittent resources combined with diminished public trust in the electric utilities suggests that this criterion should not be a limiting factor for some time.

The second limiting criterion, no unduly burdensome rate increase, will be a political struggle that will test the resolve of renewable energy proponents. This August it became known that TEPCO would seek a 10% rate increase to cover the increased fuel expenses that became necessary after the loss of nuclear capacity following the earthquake, and further rate increases related to the unexpected costs of Fukushima may follow. For TEPCO customers, the surcharge for renewables will be an additional financial burden.

The arbiter and interpreter of the purchase obligation limitations will be METI. METI is a powerful and influential bureaucracy largely credited for Japan's remarkable post-war economic success story, but has suffered a decline in prestige after the collapse of the bubble economy in the early 1990s and has been criticised as being captured by the electric utilities and nuclear industry it is supposed to regulate.

The new appointment of Yukio Edano as trade minister is interesting, even for weary observers of Japanese politics. A member of former prime minister Kan's cabinet, Edano was the government's tireless point of responsibility for post-earthquake crisis management and has a high degree of public recognition and credibility.

Like his former boss Kan, Edano is reputed to have a strong distrust of the trade ministry and the electric power industry and he is expected to follow Kan's lead on energy policy. Immediately after his appointment, a senior official asked Edano if he needed to be briefed on energy policy by bureaucrats in METI. Edano reportedly replied, I don't need it as I know almost everything (about energy policies).

But METI is too powerful to be singularly directed by one individual and the exercise of the broad discretion it has been given under the new law will be influenced by battles in progress, and which are soon to intensify among the various interest groups, including would-be renewable energy generators, equipment manufacturers (which in some cases have a stake in the new opportunities, as well as in the technologies that may be phased out), the electric utilities, industrial consumers of electricity, other ratepayers and the public at large, which has recently experienced a dramatic shift in attitude about the appropriateness of Japan's reliance on nuclear energy as a pillar of its energy strategy.

### **Power purchase agreements**

Those bored with lengthy contracts and those who are inclined to rely on relationships for management of unanticipated events may find the typical Japanese commercial contract refreshingly short. But for those who must report to risk management or credit committees, the typical Japanese commercial contract may be uncomfortably vague and uncertain. We can safely expect that the electrical utilities will push for acceptance of a uniform short form agreement that they have used in the past.

In contrast, developers which do not have personal relationships with the utility or the regulator that could be used to manage unanticipated events, or developers that seek to leverage their investments with lower-cost project debt, may require more detail in contracting than the utilities are presently accustomed to provide on their domestic transactions. The new law provides little guidance on the process for generator selection, but the implication of a FIT is that generators will have more bargaining power in the contracting process than they would under a renewable portfolio standard. We anticipate that the absolute nature of the utility's purchase obligation may be a point of contention between generator and utility. As described above, under the new law the utility's obligation to purchase qualified renewable energy is subject to the ability to maintain stability of supply in the grid. Utilities may expect that such relief is maintained in the

power purchase agreement, but generators may expect the utility to assume that risk upon contracting.

## Reaction

Renewable industry leaders view the new law with guarded optimism. The chairman of the Japan Photovoltaic Energy Association, Sharp Corporation president Mikio Katayama, remarked that the law will help strengthen the competitiveness of the Japanese solar power industry and jump-start regional industries and job creation.

Non-profit civil society observers view the new law as a significant step in the transition to a low-carbon economy and to correct for Japan's relatively low penetration of renewable-sourced electricity into the grid. The authors of this article spoke with Noriaki Yamashita of the Institute for Sustainable Energy Policies (ISEP), a non-profit organisation that has been an influential advocate for policies promoting adoption of renewable generation in Japan. ISEP enthusiastically welcomes the passage of the FIT framework law. However, Yamashita noted that the previously mentioned third party independent commission must establish pricing that is sufficient to encourage renewable generators to develop projects in order to convert the promise of this first step to an appreciable change. Additionally, he noted that separation of transmission from generation is an important second step that must be taken to ensure truly open access to the grid is granted to renewable energy generators.

## Positioned for gains

Solar is viewed by many to be the immediate beneficiary of the FIT scheme. In August, then-METI minister Banri Kaieda told a parliament committee that the bill was expected to help solar capacity in Japan expand to 10GW, from the almost 4GW of present capacity. The numbers indicated by Kaieda imply an installation of 2GW of capacity per year over the next three years, which is more than twice Japan's current internal manufacturing capability for PV panels.

Some in Japan have complained that the new law will result in a flood of imports and fail to nurture Japanese companies. But regulation of the electricity sector is only one of METI's mandates. METI is responsible for fostering the health and expansion of Japanese companies that can compete globally in growth industries. Low-carbon energy technology is viewed to be an area where Japan must maintain competitiveness; and one may therefore reasonably doubt whether Japan is likely to see the level of turbine and panel import penetration that the United States and Germany have seen in response to those countries' general policy incentives. It is within METI's control to approve of technologies, guide procurement processes, and set timetables that would favour domestic interests without formally violating international trade obligations.

On the other hand, those Japanese players that want to see the domestic and global renewable energy market flourish may wisely take the view that foreign participation could increase the size of the Japanese market to a greater extent than any opportunity lost and that an open market would facilitate the development of international partnerships that may prove essential for competitiveness at the global level.

Experience with business models and contracting structures that have been tested in other markets could help the Japanese renewable energy industry avoid dead-ends and accelerate the realisation of a commercial structure that works best for Japan. Moreover, Japanese developers that have a big-picture view may conclude that certain political contests, such as over the separation of transmission functions from the regional utilities to remove structural barriers to open grid access, are more likely to be won with the support of outside pressure. Clean energy newcomer Masayoshi Son of Softbank said he is looking for partners to develop Japanese opportunities; perhaps he is on to something.

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