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Japan's feed-in tariff sparks solar PV boom

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Japans 2011 earthquake and tsunami prompted the country to cut the countrys dependence on nuclear power. Government offered a generous a feed-in-tariff, FiT, for renewable energy and solar has been the big winner.

Unsustainable feed-in tariffs turned Europes renewable energy boom to bust, but Japan insists that its model, which builds a FiT into power purchase agreements (PPAs) and funds the additional tariffs with small surcharges on consumers rather than from government budgets, will work. Japan has scrapped targets under which nuclear power would account for 50% of its electricity consumption by 2030. Now solar, wind and even geothermal energy, between them responsible for just 1% of energy production in 2009, have moved to centre stage.

Solar has led the charge, accounting for around 90% of Japans total renewable energy projects, because it receives the most generous FiT and solar is exempt from producing environmental impact assessments, which have delayed wind development.

Japan's feed-in tariff progress

	Before introducing the feed-in tariff	After introducing the feed-in tariff	
Renewable energy generating facilities (type of source)	Combined total capacity of facilities before July 1, 2012	Combined total capacity of facilities in FY2012 (from July 1, 2012, to March 31, 2013)	Combined total capacity of facilities in FY2013 (from April 1 to July 31, 2013)
Photovoltaic power (for households)	About 4,700,000 kW	969,000 kW	552,000 kW
Photovoltaic power (other than households)	About 900,000 kW	704,000 kW	1,691,000 kW
Wind power	About 2,600,000 kW	63,000 kW	3,000 kW
Small and medium hydropower	About 9,600,000 kW	2,000 kW	1,000 kW
Biomass power	About 2,300,000 kW	30,000 kW*	71,000 kW
Geothermal power	About 500,000 kW	1,000 kW	0 kW
Total	About 20,600,000 kW	1,769,000 kW	2,317,000 kW

Source: METI

Local banks respond

Projects that have reached financial close to date have used local bank debt with long tenors and flexible terms, and have been most supportive of projects of greater than 10MW of capacity and with six-month payment histories. It is relatively easy to mobilise finance and participants are mostly Japanese banks, explains Tomofumi Fukuda, a deputy general manager at Japanese trading house Marubeni.

Marubeni recently closed ¥16.5 billion ($174 million) financing for an 81.85MW solar photovoltaic (PV) plant in Oita. The debt consists of a ¥15.5 billion 14-year loan and a ¥1 billion two-year-and-seven-month facility. Tenors usually stretch out to 15 years and banks arent requesting rigid covenants, says Fukuda.

As the market develops, deal structures are evolving from basic corporate finance to project finance. Shinsei Banks ¥1.6 billion loan in April this year to JAG Energy was one of the first true non-recourse deals in Japanese solar. JAG is a consortium building five mega solar power facilities in Kushiro, Hokkaido and plans eventually develop 5.5MW of capacity.

Banks have begun shifting from lending based on sponsor creditworthiness to properly assessing project cashflows. We like this kind of structure, enthuses Joseph Kim, a partner at law firm Paul Hastings in Tokyo. Deals are analysed on the credit risk of the project, not banks relationship with the sponsor. Hokkaido Electric Power will be the offtaker for the JAG plants under a 20-year PPA.

Japan doesnt particularly need sources of technology or debt financing to develop its renewable energy sector. The gap in the market comes with the absence of risk equity and the fact that solar projects are a new asset class. This is where foreign investors and lenders have a place, in financing the construction phases of projects, says Arthur Mitchell, senior counsel at White & Case in Tokyo.

Foreign developers that enter the Japanese market may do so in conjunction with foreign lenders. New entrants include Germanys Wirsol and US group GreenPower Capitals Ichinoseki joint venture in Marunouchi, as well as SunEdison, part of of MEMC Electronic Materials, which has formed a joint venture with Toshiba. Deutsche, UBS and Standard Chartered are understood to be increasingly active, and export credit agencies like Kexim are beginning to take an interest.

Goldman Sachs renewables unit Japan Renewable Energy recently signed a ¥13 billion ($127 million) financing to fund the development of 40MW of PV in the city of Mito. The financing comprised a ¥10 billion loan from Shinsei Bank and roughly ¥3 billion in equity. Goldman Sachs says it has set aside ¥50 billion for the development of renewable projects in Japan over the next five years.

FiTs not forever

But Japans solar fever may yet cool. As the market takes off the government will start reducing solar tariffs. The tariffs first stood at ¥40 per kWh but are now ¥36 per kWh and could fall to as much as ¥30/kWh by 2014.

But despite the forecast falls in the FiT, solar projects will still be profitable and bankable because input costs are dropping. The returns can be very high, says White & Cases Mitchell. The system was designed so that on an unleveraged basis an investor could get a 6-8% internal rate of return. If you leverage that with debt, than it can be obviously much higher. He adds: Even if the FiT is reduced next year the costs are coming down with EPC [engineering, procurement and contractor] contract costs dramatically reduced, as well as more realistic land prices.

One way developers can cut costs is by using imported panels from China, which are half the price of Japanese panels. But anecdotal evidence suggests that Japanese banks are reluctant to lend to projects that do not use local content. Although the FiT does not require local content, domestic lenders can request backup insurance if developers opt for

foreign components, and this will add back onto project costs. Similarly, market participants report incidences of local authorities holding up approvals for new solar farms that do not work with local equipment manufacturers.

But the reduction in the FiT could help deflate the speculative land price bubble that has accompanied the solar boom. Flat land in Japan is comparatively scarce, and demand for suitable areas with grid connection has led to a sharp spike in prices. The real estate guys are jamming the system with applications. Its a real-estate play for them they just flip the projects, says Paul Hastings Joseph Kim. A fall in the FiT should make it less attractive for speculators and lead to significant players only.

The market has also flourished because the FiT programme had not imposed any minimum capital or experience requirements on solar developers. But Japans Ministry of Economy, Trade and Industry, METI, wants to stop operators locking in high FiT prices, but delaying construction, while they wait for component costs to fall.

The Ministry plans to introduce specific time limits for starting construction on projects, explains Naoaki Eguchi, a partner at Baker & McKenzie in Tokyo. It is understood that those operators who do not have concrete plans to construct, and are unable to provide satisfactory evidence of their ability to construct in the near future, will put their current feed in tariff price in jeopardy, he says.

Restructuring and revitalisation

The scramble for land suitable for solar projects is heightened because many rural areas have poor grid connections. Despite a 2011 law that requires electricity utility companies purchase renewable energy, Hokkaido power companies have said they cannot absorb any more solar power until the grid connection between Hokkaido and Honshu, the main island, is improved.

Similarly Kyushu, Japans southernmost island, has too many solar projects unless connectivity is strengthened, says Marubenis Fukuda, adding: Many potential projects face a real risk of rejection of being connected to the local electricity grid. Utilities have considerable influence over developers chances of success. They own and operate Japans electricity and transmission network and have an obligation to reliably serve customers in their territory. Recent government figures (see table above) show that although 23GW of renewable power has now been approved only 4GW is in commercial operation.

Relief may come when new power storage systems in Hokkaido and Kyushu come online, and when a planned grid expansion in Hokkaido is complete. Japans Revitalization Strategy, which was released last June, also included plans to unbundle the utility monopolies to separate generation, retail and transmission entities, allowing independent power producers and other service providers to compete in the Japanese market.

The reduction in the solar FiT could spur development in other areas. Offshore wind received a boost in recent months with the successful launch of Marubeni and Mitsubishis first floating turbine, 20km off the coast of Fukushima. The group plans to install three turbines by March 2014, with plans for the farm to feature 143 turbines and 1GW of capacity in the future.

Japans offshore wind market has been slow to develop because the depth of Japans coast forces developers to use floating technology, which is not yet commercialised. The government will set the FiT for offshore wind in March 2014, and it is expected to be much higher than the rate for onshore wind. The onshore wind power FiT is ¥23.1 per kWh for 20 years and ¥57.75 per kWh for 20 years for those projects producing less than 20kW. Geothermal rates are ¥27.3 per kWh for 15 years and ¥42 per kWh for plants producing less than 15MW.

Investors will have to navigate other challenges, including working out how much nuclear capacity Japan will bring back online in coming years. Government deducts consumption taxes from the FiT, and these will increase from 5% to 8% in April 2014, and may rise again in 2105 to up to 10%, says White & Cases Mitchell.

Sponsors and offtakers will also need to make some tweaks to PPA risk allocation. At present, offtakers can curtail power purchases, without compensating the supplier, for up to 30 days. But sponsors and offtakers should be able to find a

compromise.