



The sun is not setting on Southeast Asian solar

Southeast Asia's solar industry thrives amidst dimming market expectations

Just when everyone thought that the solar boom will start fizzling out due to markets nearing saturation, Southeast Asian countries show they are not yet done harnessing as much as they can from the sun.

When forecasters proclaimed slower solar photovoltaic (PV) installations worldwide this year as developed markets near saturation, it put investors under even more pressure to determine whether Southeast Asia would be the next fountain of solar growth. Analysts see the potential of this region of roughly 600 million people, especially as governments and developers have started to untangle the web of strict regulations, outdated technology, and poor infrastructure that has been constricting investment in Southeast Asian solar projects. But the sheer amount of work to be done puts the region a long way off from reaching a solar renaissance.

"As renewables markets mature, renewables investors are looking to new markets for their next source of growth. Solar PV generation has great potential and has been the most attractive renewable energy source amongst the Southeast Asian nations," said **Eric Ho**, director at Renewable Energie Singapore. "Growth prospects are tremendous in Southeast Asia with a combination of fast-growing economies with resulting investment in manufacturing, transportation and energy infrastructure, rapid growth in electricity demand and good solar resource," he furthered, noting that annual solar radiation levels in the region ranges from 1,460 to 1,900 kWh/m² per year.

FiT to expand

Feed-in tariff (FiT) schemes have been instrumental to solar PV growth in Southeast Asia. In Thailand, which is by far the largest producer of solar energy in the region due to strong government support, solar capacity has leaped in the past three years: from 1,299MW in 2014, and 2,021MW in 2015, to over 2,800MW

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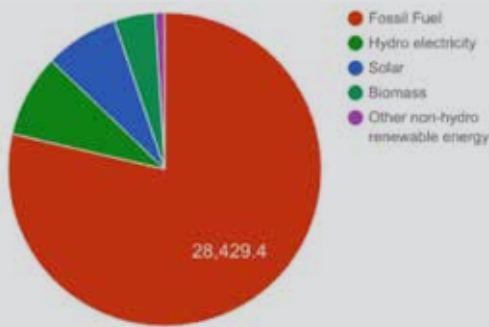
in 2016, which is higher than those of all other Southeast Asian countries combined. Thailand is not looking to slow down its solar PV expansion anytime soon with a target to install 6,000MW by 2036. The country is also becoming a regional role model for Southeast Asian nations that are starting to scale up their programs.

"Because of Thailand's experience with large solar farms and its promoting policies, it forms a hub for PV testing services and a source for information. Solar energy projects are offered the highest feed-in tariff (FiT) subsidies," stated Ho. "In the past years, several FiT programs for smaller solar energy projects were created with very attractive rates. By giving the highest FiTs to the smallest producers, the government aimed to promote green energy communities and small-scale rooftop programs."

Investors are also flocking to the Philippines, which until a few years ago had no solar industry until the country launched its FiT program. Installed solar capacity kicked off at 62MW in 2014, climbed to 108MW in 2015, then soared to 903MW in 2016 as 17 additional projects were awarded that year. This fast pace of expansion made the Philippines one of the the top 10 markets in the world in additions. "The FiT program drove solar PV development in the Philippines into high gear," Ho noted. "Solar PV is expected to reach 3 GW of utility solar by 2022."

Dave Maslin, country manager for OWL Energy, reckoned the FiT process generated investor excitement when it was first unveiled but it was far from perfect. For one, the process had issues in transparency and guidance. After securing a service contract and Department of Energy (DOE) approval on its commerciality, the project developers were caught in a limbo:

Thailand's total installed capacity by source (in MW)



Source: Solar Plaza

It had no obligation to proceed but had the go-signal to begin construction.

“No one knows what’s going in this stage, because during this period you don’t have to tell anyone what is happening,” said Maslin, explaining that whilst listed corporations were bound to tell their shareholders, private firms can wait until the construction is 80% complete before inviting the DOE for inspection. Despite these imperfections, the government was emboldened by the positive turnout of the first FiT program. It raised the target to 500MW and created the second FiT program. “Investors got really excited, but there are a few sticky points in this. There was no clarification on what happens in excess of this new target or whether the target referred to DC power that is constructed in terms of panels or AC that the grid purchases,” said Maslin.

Singapore: No room for growth?

Southeast Asia also benefits from the presence of a solar technology leader in the form of Singapore. With regional cooperation on the rise and Singapore’s significant allocations to renewables research and development — it allocated more than US\$700m to strengthen innovation capacity in clean energy, smart grids and energy storage — technology and knowledge exchange should start to flourish. But on its home turf, Singapore is facing an uphill battle on how to foster solar PV growth amidst land area limitations. The nation has a small land area of 719 sq km, of which only 45 sq km is usable for solar PV installations, according to **Gautam Jindal**, research associate at Energy Studies Institute, National University of Singapore. The country is exploring offshore installations such as multimillion-dollar floating solar projects on its reservoirs. Late last year it debuted the world’s largest floating solar PV cell testbed at Tengah Reservoir in Tuas.

“As a highly dense city state with limited space for solar deployment, Singapore is placing emphasis on building up urban solar capabilities which include floating solar as a key focus area. Singapore is also positioned as a living lab for companies to test and commercialise innovative urban solutions,” noted **Goh Chee Kiong**, executive director for cleantech at EDB, which led the initiative together with the national water agency PUB, was quoted as saying during the project unveiling.

One of these urban solutions is energy storage, which can help incorporate increasing solar output into the grid by addressing its solar energy’s inherent limitation as an intermittent generation source. “It is something that’s been said in the open, and it is going to happen,” said Jindal, noting remarks by the trade and industry minister that Singapore can now incorporate 1GW of solar PV, up from 350MW in 2014. When asked what other moves Singapore can undertake to strengthen its local solar industry, Jindal suggested reducing dispatch intervals to match global best practice to encourage the use of energy



Eric Ho



Gautam Jindal



Dave Maslin

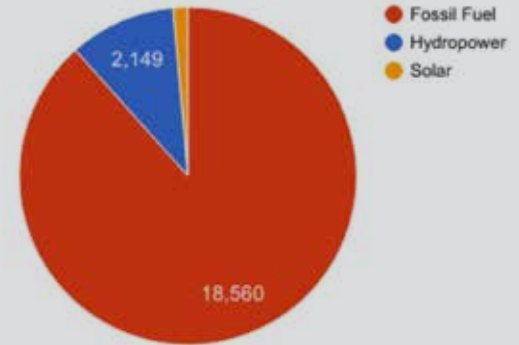


David Harrison



Van Hai Nguyen

Malaysia's total installed capacity by source (in MW)



Source: Solar Plaza

market for low frequency variability rather than having to use regulation or reserves. “Most markets in the US and Australia, for example, go for 5-minute intervals for dispatch rather than having an hourly or half-an-hourly dispatch,” he said. Jindal also recommended pushing for shorter gate closures that can improve forecast accuracy, adopting a more dynamic process to determine regulation, and incentivisation of and improved policy consultation for energy storage systems.

Malaysia: Casting a wider net

In Malaysia, net metering scheme has emerged as a supportive growth complement, and eventual replacement, to FiT. The country introduced the net metering scheme (NEM) last year with 500MW targeted in 2020 in Peninsular Malaysia and Sabah. It then introduced guidelines earlier this year that outlined who would be eligible to apply (registered consumers of distribution licensees that are on good bill payment standing) and what PV systems will be accepted (rooftop and garage panels, car park systems and other similar buildings are accepted, but ground-mounted systems will be assessed individually).

Overall though, the NEM is seen as a smart move to fuel the Malaysian solar market’s ambitious aspirations. The country wants to roughly quadruple the current 338MW solar PV capacity installed to 1,356MW by 2020, which it hopes is enough to make it the second largest producer in the world.

Malaysia is embarking on NEM “as an attractive method to drive solar energy growth” says Datuk Seri Dr Zaini Ujang, secretary general of Malaysia’s Ministry of Energy, Green Technology and Water. “With the NEM in place, consumers can generate their own electricity with one meter installed and sell excess power to the national utilities,” said Ho, adding that Malaysia’s overarching policy framework for clean energy development has provided “a strong foundation for significant deployment of renewable energy and energy efficiency.”

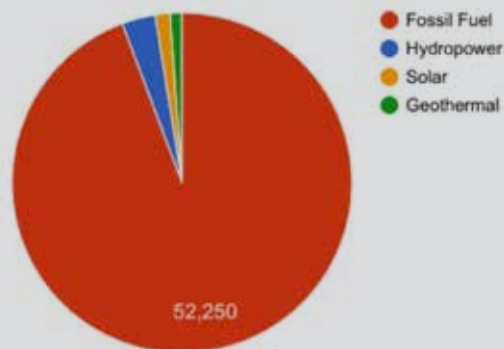
Vietnam and Indonesia: Growing pains

The importance of a sound policy framework, especially in wooing investors and fostering sustainable growth, is coming to the fore in Vietnam and Indonesia. Both countries are experiencing growing pains when it comes to finding the right approach to spurring solar PV to hit their ambitious long-term targets and ensuring cheaper and wider access to electricity for all. In June this year, Vietnam saw the implementation of a critical policy for solar power project development and private investment in the form of Decision No. 11.

The FiT for grid-connected projects at the delivery point was approved at 2,086 VND/kWh or 9.35 US¢/kWh, exclusive of VAT, for solar cells and modules that reach more than 16% and 15% efficiency, respectively. Ho explained that tariff is adjustable for foreign exchange fluctuations in accordance to the standard power purchase agreement, which has a 20- year term with

SECTOR REPORT: SOLAR

Indonesia's total installed capacity by source (in MW)



Source: Solar Plaza

EVN as the sole buyer. For investors, this represents incentives in investment capital mobilisation, import duty exemption and tax reduction.

The Decision also provides for a net-metering scheme for certain rooftop projects, with a scheme that award credits to owners that generate more electricity that they consume, and allowing those credits to be carried over to the next payment cycle or even sold to EVN at the FiT rate at the end of the PPA. Like its Southeast Asian neighbors, Vietnam is looking to build its solar PV industry at a fast and furious pace. It installed approximately 4.5MW of solar PV capacity at end of 2014, 7MW at end of 2015, and a target of 850MW by 2020.

“Decision 11 left many details unaddressed and given the un-bankability of standard PPA for wind and biomass, industry pundits are not expecting much from the solar standard PPA,” said Ho.

“Policy is not that big of a difficulty as the strategic challenge to muster the political will to put policy into practice whilst effectively adapting it to evolving situations. Large scale solar investments are highly FiT sensitive. The challenge is to find an appropriate FiT level which still attract investments whilst maintaining grid stability in a rapidly declining solar price environment,” he added. Meanwhile, Indonesia approved a new renewable energy law that changes the remuneration tariffs for renewable energy projects, and brings hope on higher solar PV adoption, which until has been “slow and uneventful,” said Ho. “Stringent regulations, tariff uncertainty and more lucrative alternatives have left the solar sector grossly underdeveloped,” he added. “Currently only about 27MW solar capacity was installed, with a majority from state-sponsored power plants, the remaining capacity are small projects and home rooftop systems.”

The recent tariff cuts have cast doubts on the prospects of future large-scale solar projects, Ho noted. The new law provides that the FiT cap is introduced based on the average electricity supply costs of the region where the renewable power project is to be developed. Where a region has supply costs above the national average, the FiT will be capped at 85%, but if these supply costs fall lower than the national average, then the renewable energy project will receive a FiT equal to the regional cost.

Taking into consideration the national average supply cost in 2016 was 13,307 IDR/kWh or 7.4 US¢/kWh, Ho says the new decree implies a significant reduction in solar PV technology tariff from the previous FiT. “The new law puts solar power in direct competition with coal-fired power plants being the predominant form of power generation in Indonesia, making it extremely challenging for solar.” For **Kirana D. Sastrawijaya**, partner at Baker McKenzie, the new law seems geared towards supporting more smaller-scale solar PV projects and spreading those in more far-flung areas of the archipelagic nation.

REGULATORY ROUNDUP

What Vietnam's Decision 11 means for solar companies

Decision 11 is the first Vietnamese legal instrument that specifically governs the development of the country's solar power sector. It sets out the general legal framework for developing solar power projects and provides for a feed-in-tariff under which the single offtaker (i.e. Electricity of Vietnam (EVN), a 100% state-owned entity) will purchase solar power from generating companies. The tariff is set at US\$0.0935 per kWh.

Prior to Decision 11, there was no regulatory guidance on how to invest in, and operate, a solar power project in Vietnam, according to **David Harrison**, partner at Mayer Brown JSM. “Prior to its issuance, a few projects were developed on an ad hoc basis. Overall, Decision 11 is a positive development as it sets out a roadmap with expectations and understandings on the tariff, investment incentives, and the regulatory process that will guide sponsors, financiers, and government agencies,” he said. The introduction of a general framework for solar power projects is a welcome and—in the minds of some investors—an overdue legal development.

Is there a loophole in the guidance?

Decision 11 still has certain limitations, said **Van Hai Nguyen**, associate at Mayer Brown JSM, some of which pertain to the Vietnamese power market in general, and others that result from gaps in the legal framework governing this industry. “For example, Decision 11 does not provide for a direct PPA which would have allowed large corporate customers such as industrial parks or manufacturing facilities to purchase solar power directly from independent power producing sellers (IPPs). This structure was once considered in the context of wind power, but all power sales must flow through EVN,” Nguyen explained. Two significant and inter-related hurdles for solar power in Vietnam are lack of clarity about the ability of investors to benefit from a government guarantee of EVN's obligations as the sole offtaker, and the quality of the draft template PPA. Decision 11 requires that the purchase of all grid-connected power must be based on a standard PPA template.

Harrison said that the draft PPA template circulated in June resembles that of Vietnamese IPP wind power projects, as opposed to the more international standard, seller-friendly PPAs that are generally used on larger BOT projects after thorough negotiations. “Whilst local onshore banks may be comfortable with this form of PPA, it will likely raise significant concerns on bankability with offshore financiers as well as international sponsors. Below are some key concerns regarding the draft standard form PPA: Aligning the Standard Form PPA with International Market Practice. The PPA requires changes to the commercial operation date to be announced six to 12 months in advance of the scheduled date,” he added.

Nguyen raised however, that this approach may not be workable in practice as delays are often unforeseeable. It is common practice for scheduled commercial operation dates to be extended after the plant's construction has already been delayed if triggered by factors beyond the seller's control.

The PPA does not adequately address lender step-in rights or provide commitments on the part of EVN or other governmental agencies to enter into direct agreements. The PPA does not include a market standard exclusion of consequential losses that exempts each party from liability to the other for lost profits, revenues and other consequential losses. The PPA does not provide for offshore dispute settlement such as submission to the jurisdiction of an international arbitral forum.

“There is no “take or pay” obligation and the PPA relieves EVN from its payment obligations even where it is unable to take power due to a breakdown of the transmission or distribution grid. Transmission and distribution risk would generally be assumed by the purchaser. Where the purchaser cannot take power due to a breakdown of the transmission or distribution grid, minimum take-or-pay obligations should remain in place as long as the plant exists,” Nguyen further commented.



Vietnam is looking to build its solar PV industry at a fast and furious pace.