

Star 2

# Power up - cleanly

The Feed-in Tariff scheme has propelled the generation of clean energy to new heights, but teething problems persist. >2

By **TAN CHENG LI**  
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**T**HE current dry spell may be driving many crazy, but Michael Chou is unperturbed. He welcomes it, in fact, for the solar cells atop his house in Shah Alam, Selangor, are chalking up plenty of kilowatts under the sunny, cloudless sky.

"The solar power generation is at an all-time high, over 40kWh a day. These are the biggest numbers I have seen since I installed the system almost four months ago," said Chou.

He is among the 1,900 people generating solar energy in their homes. After years of slow progress, growth of the solar energy sector is finally seeing a healthy spurt; more roofs are sporting solar cells while sprawling solar farms are taking over idle spaces like closed landfills as well as the roofs of malls and car parks.

It is all due to the Government's Feed-in Tariff (FIT) scheme to promote generation of green energy, under which companies and house-owners can produce renewable energy for the national grid from four sources (solar, biogas, biomass and hydro) and get paid favourable rates for it. When the quota of 1.5MW for non-commercial solar PV projects (residences and buildings) was released last September for applicants, it was snapped up within an hour.

Growing demand has seen the cost of solar panels dropping and becoming more affordable. The smallest system of 4kWp now costs around RM40,000 compared with RM50,000 to RM60,000 two years ago. So, installing solar cells to produce energy in your home is now a reality, as in Chou's case. He is still awaiting payment for the sale of energy from the 12kWp system installed in his home in October, but estimates that he has earned some RM5,000 so far.

"Installing the PV system is not just for investment. Equally important is that I'm producing green energy. I would prefer to use the solar energy myself as it will reduce my carbon footprint, but under the present FIT system, it has to go to the grid," says the simulator flight instructor.

### Tapping sunlight

Another solar energy producer is Datuk Dr Abu Bakar Jaafar, who has a 4.75kWp system in his home in Bukit Jelutong, Shah Alam. He had installed the system in 2009 under the Suria 1000 project, whereby the Government subsidised the PV system. The former Department of Environment director-general had paid half of the total cost of RM120,000.

His earnings from the solar power vary between months depending on the weather and cloud cover; it ranges from RM620 (the rainy season in December and January) to RM720 (in the warm months of February and March). Most months, he generates more than what he uses. He estimates earnings of about RM20,000 to date.

"I'm about one-third of the way to getting a return on my investment."

He does not use the green energy himself as it is fed into the grid. This is a better system, he reckons, for if he were to be totally independent of the grid, the cost will be higher due to the battery for energy storage and other supporting systems.

Dr Abu Bakar believes small power producers like himself should be encouraged.

# Energised by the sun

Under the Feed-in Tariff scheme, anybody can be a solar power producer.



**A bright harvest:** The roof of Suria KLCC no longer sits idle. The 685kWp photovoltaic system installed there can supply 30% of the mall's energy needs or power 250 typical Malaysian households for a month. It saves emission of 360 tonnes of carbon dioxide annually. — Suria KLCC



A closed landfill in Pajam, Negri Sembilan, gets a new lease of life — as a 8MW solar farm by Cypark Resources.

"We're generating surplus power that's taken up by others who need it. So we won't need big power generators. If the Government is serious about renewable energy, we should expand this programme. If home-owners don't want to pay for the PV system, we can have an organisation which installs the systems on their roofs, sort of like renting their roofs for solar power generation."

Aside from residential roofs, large PV installations are also boosting the local power supply with solar energy. Driving towards KL International Airport (KLIA) in Sepang, Selangor, one will pass by rows of glinting solar panels amidst oil palms. And when your aircraft lands, look out the window and you might catch a glimpse of solar panels on the roof of the airport satellite building

and a nearby car park. All three projects, by Sunedison, are the latest commercial solar energy schemes here.

The 5MW solar farm sits on oil palm land leased from Malaysia Airports Holdings Bhd (MAHB).

"It is a good site as solar farms should be away from tall buildings to avoid shading," says Sunedison business development director Naresh Kumar Govindan. What makes this project unique, he adds, is the tracker system which enables the panels to follow the sun's path in order to tap maximum sunlight. So the 17,000 solar panels in the farm will face either East or West, depending on the time of the day, and will sit horizontally when the sun is directly overhead.

Naresh says the 4MW system on the KLIA roof is one of the largest such facilities in the world and will be a case study for other airports. Likewise, the 10MW installation on the parking canopy is among the world's biggest "solar car parks" and will supply power to KLIA2, the new low-cost carrier terminal.

"Rooftops, parking lots and buffer areas at airports are traditionally not multi-purpose facilities, but we've turned them into a clean energy generation facility," says MAHB man-



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aging director Tan Sri Bashir Ahmad during the launch of the solar farms last month.

For the Malaysian Photovoltaic Industry Association, generating solar energy is a no-brainer.

"Solar will buffer against the impact of future fluctuations in fossil fuel prices. It improves energy security as it reduces dependence on gas and coal. Solar power will be produced during peak demand hours, thus benefiting TNB, which need not run expensive gas-fired power plants to meet the daily maximum demand. It will also save on foreign exchange on imported gas," says president Ahmad Shadzli Abdul Wahab.

### Fuelling growth

To further boost the solar energy sector, the association has two suggestions: implement "net metering" and establish utility-scale solar farms outside of the FIT programme. In the net metering approach, the solar energy generator uses the power first and feeds the unused power to the grid. This differs from the present FIT scheme where all generated power goes to the grid.

Ahmad Shazli says with electricity prices foreseen to hike in the future (the Government is gradually withdrawing gas subsidy until 2015), commercial and industrial premises will want to install PV systems to produce energy for their own use. The sector now consumes 70% of our electricity supply (40,000GWh by commercial premises and 30,000GWh by industrial premises in 2010).

The industry group also suggests the installation of large-scale solar utilities of over 30MW as only such sizeable facilities can divert the current dependence on fossil fuel power plants. Currently, the largest solar farm in the country is of 10MW capacity; Thailand, on the other hand, already has a 84MW solar farm.

The association urges for fiscal incentives to make PV systems cheaper, such as expanding the current exemption on import duty and sales tax for solar modules and inverters (which convert the direct current output of a solar panel into alternating current) to all PV system equipment and components.

"This will encourage more people and businesses to invest in PV systems. With these incentives, the industrial and commercial sector will be able to get a return on their investment in under 10 years," says association vice-president Chin Soo Mau. "The tax exemptions will also make installation of PV systems more attractive for holiday chalets and small-scale food processing industries in

PRODUCING energy from renewable sources generally costs more than from petroleum, gas and coal because the fossil fuels are highly subsidised. Which is why clean power producers under the Feed-in Tariff scheme get paid rates that are higher than normal electricity tariffs.

The money for this comes from the Renewable Energy (RE) Fund which is contributed by consumers through the surcharge in their monthly electricity - 1% since December 2011, and raised to 1.6% in January.

The surcharge is below those implemented by other countries: 3% in China and Japan, 18% in Germany, and 2% to 3% in Britain. Many, however, still question why consumers should foot this surcharge.

"The 1.6% is not fair," says former Department of Environment director-general Datuk Dr Abu Bakar Jaafar.

"Why should consumers pay for it? It should be the beneficiaries of RE, which are TNB (Tenaga Nasional Bhd) and the Treasury. You are producing power during peak demand and selling it to TNB, thus reducing its need to invest in more energy infrastructure. And the Government saves on the foreign exchange incurred in the imports of coal and natural gas. These savings by TNB and Treasury should be shared with RE generators. Or go by the 'polluter pays principle' ... charge the 1.6% to fossil fuel-power generators."

The surcharge is based on the "polluter pays principle" - we all are carbon emitters, after all, because we all use electricity. And the more electricity one uses, the more one

The 5MW Fortune 11 solar farm in Sepang, Selangor, sits on oil palm land leased from Malaysia Airports Holdings Bhd. The panels move with the sun so as to tap maximum solar radiation.



Residential roofs can be transformed into mini solar power plants.

remote areas, many of which now rely on diesel generators."

Chin says current tax incentives assist companies, not house-owners. For instance, the waiver on sales tax for solar cells and inverters benefits only operators of big solar installations. It will be tedious for home-owners to fill numerous forms to obtain the waiver. There is also financial support for companies under the Green Technology Financing Scheme whereby the Government subsidises 2% of the interest on loans taken to finance green projects.

Keen to see more houses with PV systems, the association disagrees with Sustainable

Energy Development Authority's (SEDA, the statutory body that administers the FIT scheme) current approach of emphasising commercial projects.

"In Germany, 80% of the quota goes to residential but in Malaysia, it goes to commercial set-ups. With a higher quota for residential, more people will get the opportunity to produce solar power. Since the money is from the people (collected from home-owners for the Renewable Energy Fund to pay for the green power), they should be given the chance to install solar panels. More households will benefit instead of just one company."

## Paying for clean power

has to contribute to RE development through the RE Fund. Sustainable Energy Development Authority (SEDA) chief executive officer Datin Badriyah Abdul Malik says this will compel Malaysians and local companies to conserve energy and use it efficiently.

"The RE Fund is vital to ensure sustainable growth of renewable energy which has been identified as the alternative source of energy for the country in its effort to reduce over-reliance on fossil fuel. The key to successful implementation of the FIT mechanism is the creation of the RE Fund. It enables RE power producers to be paid premium tariff for the electricity generated," says Badriyah.

She says Seda - which has been accused of a lack of transparency in its management of the fund - publishes the audited financial figures in its annual reports (available at [www.seda.gov.my](http://www.seda.gov.my)).

As of December, the (unaudited) RE fund totals RM776.5mil (this includes the initial RM300mil government grant); RM73mil has been paid to FIT power producers and RM3.65mil as administrative fees to Seda (which gets 3%) and TNB (2%). Between RM8bil and RM9bil under the RE Fund is needed to pay FIT power producers over the tenure of their power purchase agreements with TNB (21 years for solar and hydropower, and 16 years for biogas and biomass).

Malaysian Green Technology Corporation chief executive officer Ahmad Hadri Haris

says one initial plan was to get TNB and independent power producers (IPP) which now generate electricity from fossil fuels, to contribute to the RE Fund. "But there was fear that they might pass on the cost to consumers ... so we may end up paying our contribution and theirs, too."

He says one promising method that is employed in some countries to encourage generation of RE is the Renewable Portfolio Standard, whereby the Government mandates that power generators (TNB and IPPs) generate a certain percentage of their energy from renewable sources.

The Malaysian Photovoltaic Industry Association says "carbon tax" can be a source of funding for renewable energy. It says taxing carbon polluters, which include coal power plants, the transport sector and industries, will compel these sectors to curtail their carbon emissions.

It says in 2011, TNB and IPPs generated 45,160,000MWh of electricity from their combined 7,000MW coal-powered stations, and emitted 40.6 million tonnes of carbon dioxide in the process (assuming that every MWh emits 0.9 tonnes of carbon dioxide). Imposing a carbon tax of RM70 per tonne on emissions (using the Australian benchmark figure of AUD\$23/tonne), the Government could collect RM2.85bil annually to fund renewable energy installations. - **Tan Cheng Li**

## Understanding FIT

> LAUNCHED in December 2011, the Feed-in Tariff (FIT) scheme enables companies and house-owners to produce renewable energy from four sources - solar photovoltaic, biogas (organic waste, landfill, sewage sludge), biomass (agricultural waste, garbage) and small hydropower - and sell it to the grid.

> The power producers sign power purchase agreements with Tenaga Nasional Bhd and Sabah Electricity Sdn Bhd (distribution licensees) for tenures of 21 years for solar and hydropower, and 16 years for biogas and biomass. TNB and SESB (the FIT scheme has yet to cover Sarawak) are obligated under the Renewable Energy Act 2011 to accept the power into the grid.

> To be a power producer, companies and individuals apply online. Quotas are set for the various sectors every year.

> The payment is currently higher than electricity tariffs and varies: solar PV (from RM1.04 per kWh this year), biogas (from 31 sen), biomass (from 30 sen) and hydropower (from 23 sen). The rates are reduced annually (called depression) as the cost of renewable energy technology is expected to decline over time. For instance, the tariff for solar PV was RM1.23 in January 2012.

> For the renewable energy "sold" to the grid, TNB and SESB do not pay the full FIT rates but what it costs to produce the electricity using conventional means (currently 26.41 sen per kWh). The rest of the FIT payment comes from the Renewable Energy Fund. TNB and SESB also receive a 2% administrative fee from the fund, and Seda 3%.

> Households (except those using less than 300kWh per month) contribute to the fund - 1% of their monthly electricity bill since December 2011; this was raised to 1.6% in January. Only 29% of consumers in Peninsular Malaysia and 38% in Sabah are contributing.

> As of December, Seda has approved projects with renewable energy capacity of 482MW, comprising solar PV (40.2%), biomass (27.2%), hydropower (27.2%) and biogas (4.9%).

> To date, projects with 164.12MW have been completed: solar PV (88.38MW), biomass (52.3MW), biogas (11.74MW) and hydropower (11.7MW). These have avoided 740,222 tonnes of carbon dioxide emissions.

Learn more at [www.seda.gov.my](http://www.seda.gov.my)

What ails the FIT scheme - P4

Hurdles block the path to clean energy.

By TAN CHENG LI  
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Generation of solar power is at an all-time high, but such promising growth is absent in the other renewable energy sources of biogas, biomass and hydropower.

Many agree that the Feed-in Tariff (FiT) scheme has given the green energy sector a much-needed prod, but two years in the offing and teething problems have surfaced, ranging from unmet targets, underdeveloped sectors, uncertainty in the release of quotas for renewable energy generation, an invasion of foreign photovoltaic companies, and payment failures.

"There has been good progress in the development of renewable energy, but not as much as expected. We could have achieved more," says Ahmad Hadri Haris, chief executive officer of Malaysian Green Technology Corporation. For one, he says, too much focus and attention have been given to solar photovoltaic (PV), resulting in under-performance of the other RE resources.

He says the approved projects (until June 2015) to date met only 31% of the 10th Malaysia Plan target for the biomass, biogas and solid waste sectors, and 45% for small hydropower. For solar PV, however, it is 322% over the target. He says the poor showing of the other sectors means that we are unlikely to meet the goal of producing 985MW of renewable energy (5.5% of the total) by the end of 2015.

And because the solar energy sector uses more of the RE Fund (payment to the power producers are highest for solar energy), this results in less funds for the other RE resources. Ahmad Hadri says the Sustainable Energy Development Authority (SEDA, the statutory body that administers the FiT scheme) needs to address the low take-up in the biogas and biomass sectors, which were supposed to be the "early success story for Malaysia" in terms of RE.

He also questions Seda's plan to study the potential of producing energy from geothermal sources and wind.

"Earlier studies in the development of the RE policy have already identified biomass, biogas, small hydro and solar as the RE resources to be immediately tapped under FiT. Why would Seda diversify its resources into geothermal and wind when the immediate potential has not been fully tapped, and expand its fund to other initiatives instead of focusing on making a success of the identified

# What ails the FiT



**Powerful gases:** Methane emitted by decomposing trash can be tapped to generate energy, as is done at the Bukit Tegar landfill in Hulu Selangor and the Ayer Hitam landfill in Puchong, Selangor.

RE resources?"

Then there is the uncertainty in the release of quotas for RE generation. (To qualify for the FiT scheme, companies and house-owners apply online and Seda sets quotas each year for the various RE sectors).

"The quota was supposed to be updated every six months and provide the market potential for the next three years so that industry players can better plan their business models and investments. But the release has been inconsistent. Nobody knows when the quota will be released, and how much," says Ahmad Hadri.

There are also complaints of "quota hogging" (several companies with the same owners made multiple applications, and were successful) and of delayed projects receiving extended deadlines, instead of being rejected and the quota given to other applicants.

The Malaysian Photovoltaic Industry Association says foreign PV companies have monopolised the market.

"FiT now only benefit big players as when

the quota was first announced, they were taken up very fast by big foreign firms such as Sunedison and Hyundai. FiT was supposed to promote and develop local expertise, but local companies have obtained few projects," says vice-president Chin Soo Mau.

Ahmad Hadri agrees with this: "Due to their access to international financing and ability to offer competitive pricing, the foreign companies took over the market and this has hindered the growth and development of the local PV industry."

He says a lack of financing for home owners is another issue.

"When FiT was being planned, it was envisioned that local banks will offer personal loans to finance PV systems, so everyone can participate. When FiT was launched, however, the banks were not ready. Home owners faced difficulties in securing financing and only the affluent could afford to install solar PV in their homes, resulting in the impression that FiT only benefits the rich. It was only in mid-2013 that banks started offering financ-

ing packages for individuals. However, the timing was poor as by then, only a limited quota was available."

Faced with an onslaught of criticisms, Seda is seeking to make things right. Chief executive officer Datin Badriyah Abdul Malik assures of improvements in the FiT implementation process. This includes re-engineering the online application system and stricter guidelines: applicants to include share holding details to prevent quota hogging by a few individuals or companies; restrictions on applicants who already hold FiT permits; moratorium on companies with revoked FiT approvals; caps on generation capacities; and reasonable time for the market and industry to respond to quota announcements.

This year, there will also be substantial changes in the Renewable Energy Act 2011 which will impact payment rates, rules and regulations.

Seda has so far revoked 11 approved projects with a total capacity of 30.96MW. Badriyah says project delays are inevitable as FiT is still in its infancy here.

"In due course, the necessity for projects to apply for extension of time will reduce as the country matures in this market and industry."

She adds that solar PV systems have been readily taken up because their installation faces less risk and takes less time. Biomass and biogas projects, on the other hand, face issues such as availability of feedstock (raw materials), hikes in feedstock prices due to competing uses, transportation costs, distance to the grid, access to capital, competency in designing the systems, and hardware quality.

"Seda has reviewed these constraints and will revise the Act for attractive biomass/biogas (payment) rates to provide financial justification for investors. We are also talking to financial institutions to explain the measures taken to reduce various risks associated with RE projects and conducting training to improve competency for this industry."

Badriyah says the achievements of the FiT scheme is restricted by the size of the RE fund. She says to expand the generation of renewable energy, the Energy, Green Technology and Water Ministry is deliberating on other measures such as net metering and reverse bidding (the lowest bid by the solar project developer will be selected). Seda has also commissioned studies on geothermal and wind resources for possible future inclusion in the portfolio of renewable energy.

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