



Photo: KACO

SMA and ABB were the only non-movers in the latest ranking of global inverter suppliers, with SolarEdge the big risers and Advanced Energy's exit from the industry creating an opportunity for other players to grow.

The shuffle continues

Ranking inverter suppliers: Germany's SMA looks to have put the troubles of 2014 behind it this year, benefiting from Advanced Energy's exit from the inverter market to increase its share of global revenue, while SolarEdge is the big riser so far in 2015.

In May, data published by IHS painted a decidedly bleak picture for German inverter specialist SMA. The analysts' PV Inverter Market Tracker showed that the global PV inverter market shrank 4% in 2014, with global revenue falling to \$6.6 billion.

Intense price pressure drove this downward trend and served to play into the hands of the leading Chinese inverter suppliers – namely Sungrow and Huawei – both of which made large gains in terms of MW shipments. However, as the average price of inverters in China remained more than 50% below global averages (\$0.07/W compared to \$0.16/W), SMA and ABB were able to cling on to their positions at the top of the revenue table.

“Due to global demand shifting towards Asian markets, if suppliers main-

tained their current share in each country this year, it is possible that we would see a new global market leader,” said IHS senior analyst, solar supply chain, Cormac Gilligan, at the time. “In fact, for the first time on record SMA could be displaced as the leading PV inverter supplier, if not in terms of revenue then quite possibly in terms of MW shipments.”

Fast forward to fall and the threat of Sungrow usurping SMA as the world leader in terms of MW shipments remains, but in terms of both revenue and overall market share the German giant has actually improved upon last year, and is on course to perform far better in 2015 than it did in 2014.

These are not the days of complete German domination, however. In 2010 SMA cornered 40% of inverter revenue glob-

ally, and 24% in 2012. By the end of 2014 that figure was 14% – still nearly double that of nearest rival ABB, but tangible evidence that its stranglehold was loosening in the face of Asian pressure.

But according to the latest first half revenue data from IHS, SMA has engineered an upturn in its fortunes, securing 18% of global inverter revenues over the first six months of the year – an increase on the 11% share it had secured at the same point in 2014, and 4% more than the 14% market share it attained over the entire course of last year. This is the first time SMA has increased its share of global revenue for nearly five years – the undeniable fruits of a root-and-branch restructuring process that saw more than 1,600 jobs go over the course of last year, a suite of new product launches and the rather serendipitous exit of U.S. company Advanced Energy from the inverter industry, which served to create a revenue vacuum quickly filled by many of Europe's more fleet-footed suppliers.

Wider trends of 2015

The impressive recovery of SMA this year has been newsworthy, but even that is perhaps not the headline story. The

expansion of module level power electronics (MLPE) continues apace, and two of the leading proponents in this space – Israeli power optimizer specialist SolarEdge and U.S. microinverter manufacturer Enphase Energy – have both enjoyed a strong year so far in 2015.

“The MLPE sector is still heavily dependent on the U.S. market, in particular the residential and small commercial segments in which they account for a large proportion of the market,” Gilligan told **pv magazine**. “There has been a lot of partnering with module suppliers in this space, and this is an area that we expect to continue to go from strength to strength.”

Further trends covered by **pv magazine** throughout the year include a growing prevalence for three-phase string inverters at large scale, as well as a growing preference for 1,500 V components across the solar supply chain.

“The emergence and continuous promotion of string inverters in large-scale installations, driven by Huawei in China in particular (where the company is using its 30 kW–40 kW inverters in utility-scale solar farms) will continue into next year,” believes Gilligan. In the U.S. market, central inverters are still the preferred option for most utility-scale installations, but – the IHS analyst adds – “this is beginning to change. If there is ever a shortage of central inverters due to lead times, then certain U.S. EPCs may well be tempted to use string inverters in some markets across North America.” Gilligan



Photo: Enphase Energy

Enphase Energy’s microinverters have enjoyed impressive growth in the markets of Australia, New Zealand, France and the U.K. as attitudes shift favorably towards the technology.

added, however, that IHS does not foresee a central inverter capacity issue just yet in any of the major markets.

At the Solar Power International (SPI) exhibition held in September, the growing trend for 1,500 V inverters proved a hot topic. IHS believes that further test installations at 1,500 V are likely to become more widely apparent in the fourth quarter (Q4) of 2015, particularly among suppliers such as SMA, ABB, TMEIC, Power Electronics and General Electric (GE). “We see the 1,500 V market taking off in the second half of 2016 in the U.S., where the main central inverter suppliers will have a product ready to shift,” said Gilligan. “We know that some Chinese suppliers have done something similar already in China, using 1,500 V in large central inverters.”

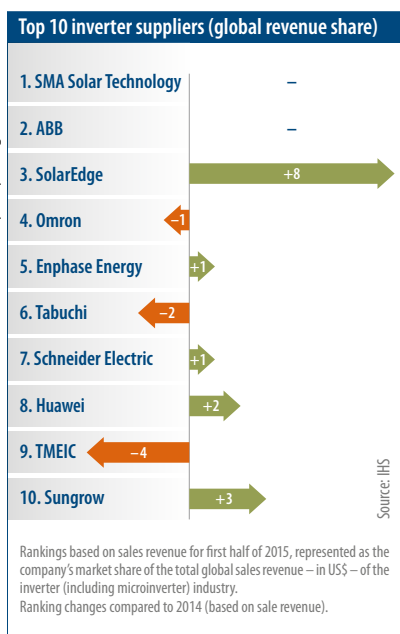
The tilt eastwards is a wider trend of the solar industry, and one that has been evident in the inverter landscape. However, with inverter prices still much lower in many of the major Asian markets bar Japan, suppliers that have greater market share in the U.S., Europe and some of the other emerging markets in Latin America and elsewhere are still able to compete in terms of global revenue. However, the looming Investment Tax Credit (ITC) phase-down on the horizon at the end of 2016 is likely to force many leading inverter suppliers to seek a more geographically diverse revenue stream. “Price pressure is going to continue to strain some of the suppliers who have not achieved the volumes they would have

liked, or where their projects are very stop-start,” warned Gilligan. “There will eventually be more fallout post-2016 with the ITC in the U.S. Market contraction in certain key markets will prove challenging for some companies.”

SMA: A second wind

The bigger they come, the harder they fall. But size and strength also bring stability, a longer reach and the ability to see the wider picture. SMA was certainly on the ropes this time last year. Revenue share had fallen to 11% of the market, having narrowed every year since 2010. At the height of summer 2014 the com-

Graphic: pv magazine/Harald Schütt



AT A GLANCE

- SMA engineers its first increase in global revenue share since 2010 as the German inverter supplier reaps the benefits of a proactive restructuring and marketing strategy.
- Asian pressure has continued to grow, but lower prices in China mean the revenues of the leading Chinese suppliers remain below those from the West.
- The growing trend for MLPE technologies has served SolarEdge and Enphase Energy extremely well, with both companies growing their global share.
- Japan's leading inverter suppliers have enjoyed a steady, if unspectacular year, with some beginning the long process of expanding into foreign markets.
- Wider trends include a continued preference for string inverters at large scale and the emergence of 1,500 volt inverters.

pany cut its sales forecast and announced that 600 staff would be losing their jobs.

By January this year that figure had risen to 1,600 employees, of which around 1,300 jobs were to go in Germany – SMA's domestic market. Pressure from Asian suppliers had exacerbated an already dire situation in Europe and served to slash SMA's global lead severely. "To return to profitability in this environment, we want to make adjustments to SMA's structures in line with the lower sales level," said SMA CEO Pierre-Pascal Urbon.

Not only did SMA do just that, but it also successfully rolled out a suite of new products at the same time that one of its stiffest challengers in the U.S. market – Advanced Energy – blinked first and exited the inverter business. This freed up a raft of new opportunities and, just before *pvmagazine* went to press, SMA revised its sales forecast for the year upwards by around \$60 million.

"SMA has had a very good year so far," said Gilligan. "The major driver has been the North American market at utility-scale, where the company has certainly benefited from the exit of Advanced Energy, but also the fact that the company has introduced a lot of new product there – including the 1,500 V inverter and its new 2.5 MW central inverter – really helped SMA consolidate and grow its position."

In the residential sector SMA has released its new Sunny Boy inverter, and at commercial scale its 60 kW inverter – via the acquisition of Danfoss – has also proven popular, as has the new 2.5 MW central inverter. "This new portfolio has assisted SMA's turnaround. The company has become more competitive with not so many high overheads," added Gilligan.

SMA's long-term activity in the U.S. market has ensured good relationships with major domestic suppliers such as First Solar and SunPower, which has cemented its growth across the large-scale market and helped secure an 18% share of global revenues for the first half of the year. Despite cutting staffing numbers, SMA has been able to steer its new, streamlined operations successfully into high growth areas in the Americas, Southeast Asia and Australia, identifying emerging markets as Europe continues to contract. One established and growing market where SMA is still struggling to gain a foothold, however, is China, where

Gilligan says the company has "limited market share."

"The Chinese market is extremely large and highly competitive, particularly this year, because of the intense price pressure among the top five suppliers there," said Gilligan. "SMA will instead apply its

4 GW in size. "The major advantage of having a supplier like ABB in the Indian market is that the company has many service engineers, a large after-sales team and plenty of subsidiaries so as regions take off ABB can supply products and services quickly," said Gilligan. "At util-



Photo: SolarEdge

The SolarEdge HD-Wave inverter is an example of the company's proactive approach in 2015.

energy to those markets where they have greater brand awareness and penetration." One such region will be southeast Asia, where the solar markets of Thailand, Malaysia and the Philippines hold a lot of promise, as does Australia, and SMA remains one of the most successful inverter suppliers in the Japanese market – a market notoriously dominated by domestic suppliers.

And then there is India. "In India, which is a fragmented market that varies by state, SMA is competing against companies such as ABB and Schneider Electric – big multinational suppliers that pose a challenge even to an inverter supplier of SMA's size," opined Gilligan.

ABB: Steady as she goes

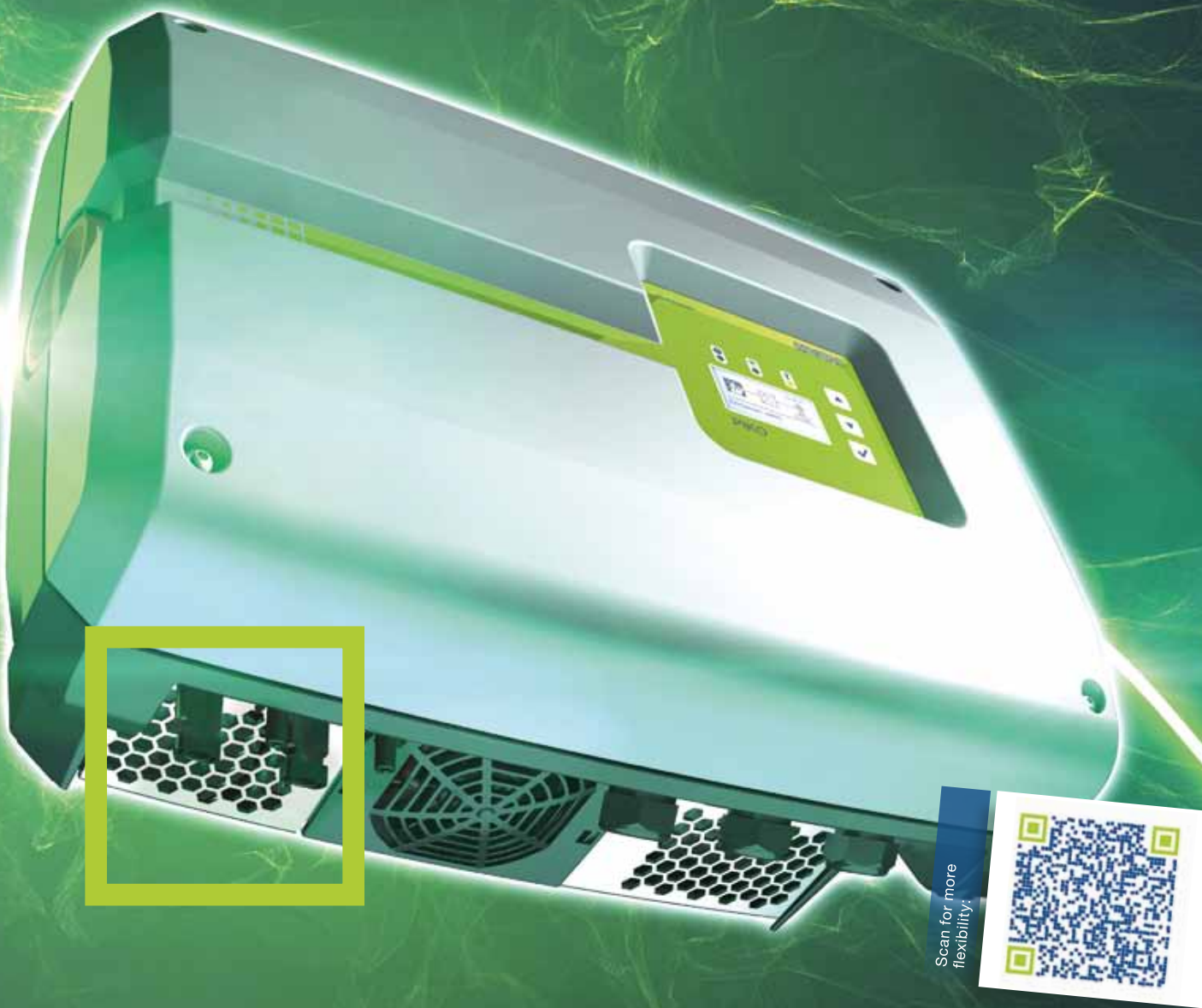
The expansion of the Indian solar market – which is on course to surpass 1.5 GW of new installations this year – has been great news for Swiss-headquartered power electronics company ABB. Its inverter division has 50% market share in India, supplying more than 2 GW of inverter capacity to a market that is some

ity-scale, having this comprehensive level of service is crucial when entering new markets."

ABB has so far been able to increase its share of global revenue to 9%, up slightly from 8% at the end of 2014 and a further increase on the 7% market share it enjoyed midway through 2014, according to the latest IHS data. "ABB is still doing very well, and is benefiting from the current environment where there is increasing price pressure," adds Gilligan.

Viewed throughout the industry as one of the more bankable suppliers, ABB has the edge when competing for the larger projects because many EPCs are even more cautious given what happened with Advanced Energy. "Security of supply when completing tight project deadlines is a growing concern, and plays into the hands of companies like ABB," Gilligan said. With plenty of expertise following the integration of Power-One, ABB's ability to aid grid maintenance, grid expansion and intelligent solutions will ensure it remains a key player in the evolving inverter landscape.

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Photo: Omron

Omron remains a dominant inverter player in its lucrative domestic market of Japan, but may have to step up the intensity of its internationalization plans if it hopes to remain a top five global supplier.

SolarEdge: The rise continues

Last year Israel’s SolarEdge was a new entrant into the top 10, securing 2.7% of global revenue over the first half of 2014 with its power optimizers. The company ended 2014 as the 10th largest in terms of global revenue share, but has surged up the table in 2015, standing third at the end of the first half of the year with an impressive 8% of the market.

The company’s strength lies in proactive marketing, an ability to diversify geographically, and a product offering that is both relatively low cost – particularly when compared to many microinverter solutions – and high quality.

“SolarEdge is active in a lot of markets, but it is in the U.S. that the company has been really successful in 2015,” said Gilligan. SolarEdge has partnered with many of the leading solar lease suppliers in the U.S. residential segment. “Its power optimizers have also tapped into the technical requirements of the U.S. market, including having rapid shutdown as a built-in feature, which has been rather persuasive in attracting new prospective customers to opt for their MLPE solution.”

In September the company launched its new HD-Wave technology that it claims can perform as well as a typical single-phase inverter but weighs just 9.5 kg and uses 16 times fewer magnetic and 2.5 times less cooling components than a typical inverter. This innovation, allied to its \$125 million initial public offering (IPO) earlier this year, should

set the company in good stead to enjoy a similarly fruitful 2016.

Omron: A slight fall

From third place in 2014 to fourth place midway through this year, Omron has enjoyed another steady year, consolidating its position in its home market of Japan rather than seeking to overreach or expand into foreign markets.

“Omron has been one of the slower suppliers to internationalize,” said Gilligan. “The residential market in Japan is lucrative and booming, and Omron has more than enough market share there to stay focused on that and remain profitable.”

The dangers of overreliance on one single market remain acute, however, and the signs may be on the wall that Omron might have to begin considering expansion sooner rather than later if it wishes to remain a top five player globally. In 2014 the company had 7% of global revenues, but has now been usurped by SolarEdge, with Enphase Energy hot on its heels for that fourth spot.

“IHS would highlight what has happened in booming markets before, such as Germany, Spain and Italy,” cautioned Gilligan. “Exposure to one market can be risky, and with that in mind each of Tabuchi, TMEIC and Yaskawa have expanded abroad. For Omron, Europe remains a small market and there has not yet been much of a push into middle priced markets such as the U.S.”

Enphase Energy: micro steps

Rising one place in the ranking to fifth, U.S. microinverter supplier Enphase Energy has augmented its product offering over the past few months with its highly touted AC Battery and its Home Energy Management system, which comprises monitoring software for the home.

These moves have helped the company to achieve impressive growth in 2015. First quarter data published by Enphase showed the company increased its microinverter shipments to 162 MW, a year-on-year increase of 74%, which helped revenues surge by 50% over that time frame. In the first half of 2014 the company had 3.5% of the global market revenues in the inverter sector, and Enphase has improved on that already this year.

“Enphase has had a phenomenal year in growing its shipments, particularly in Australia, New Zealand, and some of the stronger European markets such as France, the U.K. and the Netherlands,” said Gilligan. The company is eager to not be constrained by a single market or region, and has taken positive steps to position itself as a provider of intelligent inverter and monitoring solutions in a number of key markets.

Tabuchi: Falling but diversifying

Japan’s Tabuchi has fallen two places in the top 10 to sixth position. Having secured 5% of the global inverter revenue in 2014, the company is now below both Enphase Energy and SolarEdge – more a victim of the latter two companies’ impressive growth than anything else. In isolation, Tabuchi is doing a lot of things right, including announcing a recent partnership with U.S. MLPE supplier Ampt and also developing a storage offering to ensure it is not overly reliant on one product type or particular market.

“Outside of Japan, Tabuchi is looking at other ways to build brand awareness and find new avenues to market entry, so for the U.S., a storage solution is an attractive proposition – as is the partnership with Ampt,” said Gilligan. The appetite for MLPE solutions is growing all the time in the U.S., so a local U.S. power optimizer provider such as Ampt will assist Tabuchi’s growth strategy in the market.

Another avenue into the U.S. will be in the three-phase string inverter market, which is projected to be a high-growth, long-term segment over the

next few years, and is also a market where the now-absent Advanced Energy was strong. “There may be some opportunity there for Tabuchi,” adds Gilligan.

Schneider Electric: Solid ground

The more the inverter pack shuffles, the more entrenched and part of the furniture Schneider Electric becomes. In sixth place in 2014, the French multinational was the seventh-largest inverter supplier in terms of global revenue share at the midway point of this year, rising from eighth position at the same stage last year thanks to a few big-ticket projects, including the 300 MW Cestas installation in France. “Schneider Electric benefits from having a global presence and having an existing brand in plenty of markets,” said Gilligan. “The company has achieved a significant presence in India, which will further boost its revenue. Its main strength remains its ability to be one of the first movers into new markets, providing an integrated inverter solution that plenty of customers appear to prefer.”

Huawei: Nimble expansion

Rising one place from ninth to eighth at the midway point of 2015, Chinese telecommunications company Huawei has managed to expand upon its globalization efforts this year after 2014’s exploits. “As an inverter supplier, Huawei benefits from the significant brand awareness it enjoys in other parts of its business,” said Gilligan.

Despite its size, Huawei has been nimble in ensuring it has an early toehold in emerging solar markets, building upon a modest – but growing – presence in Europe. The U.S. market remains difficult, however, due to a low-level of brand exposure there and a reluctance among solar leasing companies to use their single and three-phase inverters – a reluctance currently shared by leading U.S. EPCs.

Nevertheless, Huawei forms one half of China’s ‘Big Two’ with Sungrow, and has eaten into the latter’s dominance of the domestic Chinese market – so much so that the company has enjoyed larger global revenues than Sungrow so far in 2015.

TMEIC: A smaller share

At the end of 2014 Japan’s TMEIC stood in fourth place in terms of global reve-

nue share, claiming 5% of the market. The first six months of 2015 have seen the company slip down to ninth place as MLPE providers have increased their prominence globally, edging out some of the more traditional inverter companies.

Despite this fall, TMEIC has still been doing the simple things right. The company posted a 48% year-on-year order increase earlier this year as its manufacturing hubs in India, the U.S. and China bore fruit, augmenting its Japanese facility. “This is a reasonably straightforward strategy from TMEIC – activity and investment in the four large global markets,” said Gilligan. “Having a manufacturing presence in the regions will set them in good stead to increase their market share.”

In Japan, TMEIC’s central inverters have long been something of a cash cow, and the recent acquisition of AEG’s business in India has allowed ramp-up in that growing market. There have also been notable successes in the U.S., while China – despite the intense competition – remains a keen focus for the company.

“TMEIC benefits from its bankability,” Gilligan added. “Having a strong balance sheet and being a major industrial supplier is beneficial when securing major large-scale contracts.”

Sungrow: Back in the top 10

Sungrow’s fortunes highlight the benefits and the drawbacks of enjoying single market dominance. A leader in the Chinese market, Sungrow may finish 2015 as the world’s largest inverter supplier in terms of MW shipped. However, it placed 10th in the IHS global revenue ranking precisely because of its reliance on Chinese revenues – which are much lower than in many other countries due to the low inverter costs across the country.

Sungrow is keenly aware of this, and spent much of 2014 expanding into new territories in southeast Asia and even the U.S. “The company is making a huge effort to expand globally, but it does take time to build brand awareness in these new markets,” notes Gilligan. Financial data from 2014 bear this out. Last year Sungrow shipped 3.8 GW of inverters globally, of which 430 MW were for non-domestic markets. Nevertheless, this 430 MW accounted for 20% of the company’s total revenue last year – a cautionary tale of the need for Chinese suppliers particularly to pursue global expansion.

Best of the rest

The decision by Advanced Energy to exit the inverter business in 2015 was the starkest indication that a two-tier industry is emerging. Many of the smaller suppliers are either folding or being repurchased to become niche players – serving local regions and leaving globalization to those suppliers that are firmly established at the top table. “This is the route SolarMax has taken,” Gilligan said of the Swiss-headquartered inverter supplier that went into liquidation at the end of 2014. “Their technology has good brand awareness in Switzerland and Germany, for example, so it makes sense to focus on those markets alone.”

The European downturn has continued to bedevil suppliers, and was pivotal in Advanced Energy’s retreat – with fewer opportunities in Europe, many companies targeted the U.S., thus heaping on further competition in an already crowded space. Somebody had to make way, and that was Advanced Energy. “The vacuum their exit left was filled immediately,” Gilligan said. For Kaco, the demise of European markets forced it to look overseas, and the company has enjoyed progress in South Korea and other southeast Asian markets, while Fronius has had success in the U.S. having partnered with leading solar lease companies. ♦

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