

The outlook for PV in 2017 - the true dawning of the solar age?

Business models | Solar is forecast to have another strong year of growth, but in spite rather than because of political support in many parts of the world. Simon Currie and Rob Marsh assess some of the commercial drivers for solar in 2017 and beyond as it finds itself increasingly at the mercy of market forces but arguably better placed to become a true global competitor

Perhaps the most surprising statistic in the renewables sector for 2016 will be that global investment into renewable energy generation decreased for the first time in many years (though final data is yet to confirm this downward trend). But this is not bad news for solar PV (or, indeed, other technologies), as the reduction in investment is not indicative of slowdown in deployment; it represents the exponential technological and efficiency improvements, driving down costs. Market commentators and analysts are measuring this decline in cost for solar PV to be 90% when compared to 2009, which is a staggering achievement in just eight calendar years.

Prices achieved in various auctions across the globe are certainly evidence of the above. Sixty-seven countries had used auctions for renewable energy by mid-2016, compared with 10 a decade earlier. The average price fell to US\$50/MWh, compared to an average of US\$250/MWh in 2010, with the record low price being broken almost auction by auction until Abu Dhabi achieved a price of US\$24.2/MWh last September. However, in certain circumstances these low tariffs are not always indicative of true project efficiencies – host state support (in the shape of providing designated sites or meeting grid connection costs) and concessional funding have helped achieve these prices in various jurisdictions. Indeed, the prices bid in these auction processes are not necessarily valuable indicators in their own right. It is the levelised cost of energy (LCOE - measuring the price required over the lifetime of the project to break even) that is the true measure of solar PV's ability to compete seriously, not just with wind but with fossil fuels. Last year saw sharp declines in this regard, with solar PV matching conventional generation on a LCOE basis in certain jurisdictions.



Credit: First Solar

There are strong indications that 2017 will see this trend continue one country at a time. Coupled with the ease of deployment and flexible application that the technology offers and viewed in the context of the wider trends driving the future of the energy sector, 2017 is likely to see the paradigm shift that has been predicted for some time; the question turns from whether solar can compete and whether it makes sense, to how to redesign the world's energy systems to accommodate the inevitably high (and varying) levels of deployment.

Reality check

Twenty-sixteen was not an unmitigated success story in the solar PV sector. Certain European jurisdictions (the UK most recently notable among them) saw a sharp decline in development plans and activity, owing to governments significantly reducing or removing subsidies or other forms of support for utility-scale solar PV projects. These cuts will likely continue as jurisdictions increasingly regard the technology as

The third phase of Dubai's Mohammed bin Rashid Al Maktoum Solar Park was one of a number of record-low tenders in 2016

mature and take note of the prices being achieved in auctions around the world. There have been examples of this in Africa, with utilities delaying the agreement to tariffs and causing projects to stall (though perhaps not fully appreciating the circumstances that underlie prices they are seeing bid elsewhere, as mentioned above). The situation in the US is uncertain post-election, particularly with a view to any mid to longer term development strategy.

This reaction is (at least in part) a response to surprisingly high levels of deployment and perceived windfall profits. The prevailing public sector view in such jurisdictions is that solar is a fast maturing technology that should compete on a level playing field with conventional generation and that the market should be left to determine the price for the power it generates. That message is a hard one to swallow among numerous companies that have fallen away and employees that have faced redundancy in the face of development pipelines drying up. However, others have adapted and refocused their business



Credit: Belectric

models, the services that they provide and/or the jurisdictions where they are deploying their development resource. Such decisions also need to be considered in the context of the political backdrop. The demand for access to affordable electricity is a sensitive issue in many countries and one that wins votes in elections.

Varying combinations of technology efficiencies, reducing costs of capital, sharpening of pricing in both construction and O&M agreements and the presence of corporate off-take solutions could yet see solar PV successfully developed in these jurisdictions in the future without any form of government support. The use of co-located storage solutions may also allow projects to deliver sufficient return – the recent Industrial Strategy published by the UK government is championing energy storage as a solution and other governments in Europe are following suit. If this is achieved, then arguably such governments will have been proved correct, demonstrating to the electorate that clean energy can be generated and delivered with no extra costs on utility bills.

Solar PV+

The adaptability of solar PV as a technology is going to be a key theme driving development in 2017 and beyond, and we see a trend developing which we term “PV+” - by this we mean a system or solution that delivers more than just AC or DC electricity on a standalone basis. We

‘PV+’, where solar is integrated with other technologies such as storage, offers numerous potential new commercial avenues for the technology

have already seen solar PV being utilised or integrated with other technologies in varying and innovative ways around the world.

Combining solar PV with battery storage is one of the more obvious examples of this approach and is hardly an innovative solution. Many companies have already come out with products which provide different solutions for industry and remote communities, while large-scale solar PV projects are being developed with associated batteries which have the advantage of allowing solar PV owners to shape generation profile to meet demand, reduce peak network demand and increase voltage control. However, integrating solar PV and storage creates the inevitable regulatory challenges.

Regulations and (the lack of) market rules create uncertainty, which places additional burden on the early projects. For example, in the US the Federal Energy Regulatory Commission may consider a storage project to be a generator, but at state level they may classify that same project as transmission or distribution. In the UK, it remains unclear whether the generator still owns the power once transferred to a third party storage provider and continues to qualify for the associated subsidies, particularly if the power is being transferred directly to the grid by such third-party storage operator. It is regulatory dilemmas like this that we will continue to encounter as we grapple with

integrating battery storage into a regulatory regime where network operators have not yet developed the technical standards to address the issues of connecting batteries to the system. It should also be noted that the costs of batteries aren’t falling at the same rate as solar PV. However, the overall system costs continue to fall and we believe this is helping to make the battery storage option increasingly viable. An increased appetite among the lender and investor community to finance these technologies may see their deployment accelerate with leveraged models making solutions more workable.

Solar PV is also providing affordable and quickly deployed generation solutions to various industrial processes, particularly in areas where grid connection is a problem or absent altogether. The mining sector is good example of this, where energy intensive processes usually powered by fossil fuel baseload plants are turning to solar solutions. Large manufacturing and industrial companies across the globe are now realising the benefits of utilising their real estate and developing on-site solar generation solutions. Structured correctly, these solutions reduce year-on-year energy bills and in some circumstances generate a spill that can be sold into the market, thus further reducing the overall cost of energy. That is before one accounts for the environmental, social and governance (ESG) and branding benefits that such a strategy brings.

Desalination is another energy-intensive process that is increasingly looking to solar as an alternative to fossil fuel baseload plants. Some countries are requiring desalination plants to incorporate renewable inputs in order to make the process more sustainable and solar powered water desalination has the potential to dramatically increase access to fresh water in arid locations. While solar PV as a technology is not always aligned to the load requirement of desalination plants, with it becoming one of the cheapest options on an LCOE basis in many places, it has to make sense where there is a limited supply of potable water, high irradiation and a non-arable land mass.

Remaining with the theme of water, floating solar is witnessing increasing deployment around the globe. Replacing the costs of frames and foundations with the cheaper alternatives of tethers and anchors, the technology has the potential to see exponential growth. Reservoirs in particular are ideal locations for floating solar, as the panels bring added benefits to the reservoirs in the shape of improving evaporation rates and reducing the risk of algae and weed.

In the agriculture sector, solar PV is offering an integrated energy solution to agricultural environments, without creating a food versus fuel debate like we have seen with biofuels. Solar greenhouses are already deployed at scale in a number of countries, while solar PV projects don't need to be developed in a way which sterilises farmland (as has sometimes been the case in Europe). Farmers can increasingly look to maximise the use of fence lines, driveways, barns and other non-arable land. There are other options we have seen

which include elevated solar where farm animals can graze under panels.

Deploying solar in and around other solutions is likely to see increased application in 2017. Telecom towers, pylons, wind farms, CSP facilities and hydro plants all have tracts of land in and around their processes and this land is usually not utilised in any way. There is inherent sense in deploying solar PV, taking advantage of the infrastructure and connection that exists at those sites, particularly where the host process has its own energy consumption needs. This logic is beginning to prevail in many emerging markets and we anticipate a continuation of this trend.

2017 – the true dawning of the solar age?

Solar PV is already a mainstream technology. A continued downward trend in the LCOE of solar PV will see increased deployment as well as (and in part achieved by) increased scale. Industrialised and developing economies alike are increasingly demanding development on a sustainable basis, while seeking cost efficient and easily deployed generation solutions. A genuinely competitive LCOE will increasingly make solar an obvious choice.

The above analysis of PV+ demonstrates the increasing diversity of applications for solar PV. As technology continues to disrupt the world in which we live, solar PV has the ability to further adapt and integrate with our changing world.

Focus is increasingly shifting from the generation to the use of electricity; electric vehicles, residential storage, smart networks and digitalisation are all key drivers in this regard. Climate change deniers are now an irrelevant voice in

the debate and the irreversible shift to a sustainable future has commenced. We view it as irreversible because the future will be consumer driven and the consumers of power demand affordable and sustainable energy. They also demand that the commercial and industrial parties with whom they interface and from whom they consume products demonstrate sound ESG principles. Google is the oft-championed example of the corporate world responding to this trend, but others are following quickly behind and it is a trend that is rapidly penetrating all sectors. To quote one of the oil majors: "We have to stay relevant to our customer base – if we fail to do that, we fail full stop".

Technology is moving faster than infrastructure and regulation can keep pace, but the increasing socio-economic sense of sustainable solutions will see any obstacles overcome. Solar PV will unquestionably be a winner. So, many of the foundations are laid and we anticipate that 2017 will see solar PV become a dominant force in the global energy mix. ■

Authors

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