

The Essential Guide to Derisking Solar



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“Operation and Maintenance (O&M) has become a standalone segment within the solar industry and it is widely acknowledged by all stakeholders that high-quality O&M services mitigate potential risks, improve the levelised Cost of Electricity (ICOE) and Power Purchase agreement (PPA) prices, and positively impact the return on investment (ROI)”.

Solar Power Europe ‘O&M Best Practices Guidelines 3.0



Powering up the solar PV market

Solar PV represents one of the fastest-growing sources of renewable energy in the world. In its latest report, IHS Markit predicts that the global solar PV market will grow by a further 25% in 2019, with a total of 129GW of new solar capacity installed.

In the UK, incentive schemes introduced by the government, such as the feed in tariffs (FITs), fuelled significant interest in solar development among investors and commercial organisations alike. While FITs came to an end on 31 March 2019 and the pipeline has now slowed, there remains a legacy of roof top and ground mount solar PV assets that could be operational for decades to come.

The price of solar PV components continues to reduce, in tandem technological advances mean solar panels are now more efficient than ever before. What this has led to is a drop in the cost of solar energy, of up to 86% since 2009.

The lower the cost and the higher the potential returns, the more economically viable the investment case is for revamping and repowering existing solar sites – and operation and maintenance is playing an increasingly important role.

Alongside this, many existing solar installations are soon to come out of warranty, making O&M and the role it can play in derisking such assets, a hot topic within the industry.


Solar PV operation and maintenance (O&M)

The reliability of solar PV remains a critical issue for stakeholders, who range from city investors to lenders, asset managers, commercial organisations and landowners. Not to mention the part such developments will play in the UK's transition towards a renewable power network.

With large-scale solar installations typically running for 20+ years, operation and maintenance is a vital piece in the puzzle.

An O&M service package needs to ensure that a PV system continues to operate at a high technical level, helping to optimise the financial returns achieved over its lifetime. But as the solar industry has evolved, so too has the scope of O&M services, along with the expectations held by stakeholders.

Far from being simply a tick-box exercise, O&M is now a tried and tested route to derisking solar assets and ensuring they achieve the maximum potential returns.



Evolution of solar O&M

The O&M market began life, in many respects, as an afterthought. Solar installations were being built at speed, often to meet specific deadlines that were linked to a subsidy, such as FITs or ROCs. Getting commissioned was the priority and thoughts around O&M were secondary.

In the early days, the scope and provision of O&M services was purely reactive, meaning that if something went wrong then the client would be alerted, and the problem fixed.

Flash forward to the present day and the best practice approach to solar O&M is now one of proactive action. It not only aims to fix problems but to prevent them - and going beyond that, to enhance performance through data analysis and a deep understanding of the solar assets themselves. Leading in some cases to overperformance and uplift.

The arrival of battery storage on the scene has added yet another dynamic. For O&M teams and the customers they support, the technology presents an additional revenue generating opportunity and way to maximise return on investment through proactive action. But storage O&M is significantly more complicated than solar, involving a large range of components and subsystems, as well as power distribution and load management issues. All of which requires a high level of expertise and a comprehensive skill set across multiple technologies, to get right.

O&M contract renewals

Many solar PV owners are currently assessing their O&M options, either because they are soon to be out of warranty; a site is underperforming; or ownership has changed. What they are finding is:

- **Contracts have shortened** In contrast to many of the original O&M agreements, modern contracts have a far shorter lifespan. Five years is now the typical contract length for the industry. The process also begins with a period of benchmarking and review. If a contractor performs well in an initial two-year period, they are likely to go on to secure a five-year contract.
- **Prices have reduced** Competition within the O&M sector is fierce and that is impacting on pricing, tenders and scope of works. O&M contracts were priced at around the £12,000/MW per year mark in 2011, whereas the average price available on the market is now less than half of that, with a fully comprehensive PPM scope included.
- **An end-to-end solution** The emphasis is now on O&M contractors to provide a total wrap around solution. Operation and maintenance must be proactive, combining preventative and predictive maintenance with corrective action, as well as ongoing administration, warranty management and support. Knowledge and experience of new and emerging technologies, such as energy storage, is also an advantage and key for providing a comprehensive and flexible service.

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Best practice and industry standards

The solar O&M market is still relatively young and continues to evolve at pace. As such, wide discrepancies can exist between contractors.

However, some movement is now being made towards industry standardisation. In December 2018, Solar Power Europe issued its O&M Best Practices Guidelines 3.0 setting out a vision for the future of the market. The guidance aims to dive deeper into innovative business models that will improve O&M services and realise its full potential.

The guidelines were first published in 2016 to address quality issues in solar O&M and by 2018 they had become a living document with an active community behind it, consisting of nearly one hundred top experts from nearly 50 companies – including Anesco.

How an O&M provider can help derisk a solar array

1 Minimise operational costs through preventative maintenance

If a contractor understands a site's core components, such as inverters, then they can work on prolonging their life. Having experience and understanding for why certain errors might occur is key here. Rather than just swapping out 'bad' inverters, at a significant cost, a good O&M provider will manage their usage. This is important, as operational costs can have a significant impact on the total levelised Cost of Electricity (ICOE) and overall profitability of a project

2 Ensure a solar asset is physically protected

The physical security of a site is as important as its technical capabilities. Solar farms, for example, are increasingly a target for criminal gangs, due to the resale value of their component parts and the metal content within items such as cabling. A good O&M provider will be able to advise on best practice when it comes to onsite security measures that comply with all relevant environmental, planning and health and safety issues.

3 Avoid performance dips through predictive maintenance

Predictive maintenance is a service currently provided by only a few O&M contractors who follow best practices principles. Analysts will use information provided by the systems and devices on site to evaluate and predict trends or events that might signal deterioration. By analysing historical data and identifying changes that might jeopardise the system, they can prevent potential failures that would otherwise result in safety issues or dips in performance.

4 Reduce time spent on repair

Spare Parts Management is a core part of strong O&M provision. A contractor should ensure that spare parts are available in a timely manner for any corrective maintenance that may be required. This minimises potential downtime. As it is impossible to store every part onsite, an understanding for what may be needed and when, along with a cost-benefit analysis, helps ensure the best choice of parts are always quickly accessible.

5 Guard against cybersecurity

Any system connected to the internet is at risk of a cyberattack and with hacks and data breaches on the rise, it is an area that calls for the implementation of robust systems, which need to be continually updated and improved. Having effective cyber security provision in place will reduce the risk of an attack and help protect a system against unauthorised access and potential exploitation.

6 Manage vital administration functions and deadlines


Many O&M providers offer a managed services function, which can take care of key financial responsibilities and reporting. This includes the management of revenue streams associated with renewable assets and portfolios, ensuring the correct information is submitted at the right time and revenue is protected. For example, FITs, ROC, RHI, LECs and Power Purchase Agreements. Reporting may also include detailed profit and loss information, balance sheet data, analysis of performance to budget, monthly bank reconciliations, financial year end and bank covenant reporting, so stakeholders always know how their asset is performing, as well as what action has been taken on their behalf.

7 Mitigate health and safety risks

The solar asset owner will ultimately be responsible for H&S compliance, so it's important to choose the right O&M contractor – one who understands the risks associated with solar installations and how best to mitigate them. Managing any risks posed to the health and safety of people, both in and around the scheme, should be a primary concern of all stakeholders.

8 Promote sound environmental practices

Environmental problems can usually be avoided through proper solar plant design and maintenance. For ground mount sites, the area should be used to provide valuable natural habitat for plants and animals, alongside its primary purpose of power generation. Best practice also includes processes for the recycling of broken panels and electric waste so that glass, aluminium and semiconductor materials are recovered and reused.



The future and innovation

As the sector evolves and new innovations and technological advances emerge, what might we see in the future?

- **Machine learning** IO&M contractors are increasingly moving towards innovation and data-driven solutions, adopting 'smarter' solutions based on advanced data mining techniques.
- **Drones may monitor from the skies** Advanced aerial thermography may be done with drones instead of using handheld devices.
- **Solar components may be enhanced** Innovations in this area will seek to increase production and minimise maintenance costs, such as anti-reflective and anti-soiling coatings for panels.
- **Battery storage will become commonplace** The use of battery storage units alongside solar installations will continue to increase, helping to maximise the returns achieved by solar assets and further derisking the investment made.

10-point checklist for appointing an O&M provider

The choice of O&M provider is key to derisking any solar asset and there are certain criteria and questions that should help guide your decision. For any prospective contractor, check that they are:

- 1 Well established
- 2 Experienced
- 3 Have qualified team members
- 4 Hold all relevant accreditations, certifications and insurances
- 5 Take a proactive approach
- 6 Have broad market knowledge and stay informed on the latest industry issues
- 7 Are committed to quality standards and methods of best practice
- 8 Can provide total wrap provision
- 9 Are flexible and agile to meet your individual needs
- 10 Technology focused with advanced monitoring and reporting systems

Anesco is a leading authority on solar energy and battery energy storage.

With a heritage that mirrors the growth of renewables in the UK, we continue to innovate and influence policy whilst regularly being called upon to speak within the renewable energy industry.

As a company, we remain instrumental in the design, construction, connection, optimisation and maintenance of high-performing solar and battery storage assets, from domestic to large scale ground mount systems. This puts us in a strong position to deliver the best possible return for both owner and investor alike.

To date, we have developed and built in excess of 100MW of ground mount solar PV and we are the largest importer of grid scale battery storage in the UK, both as part of new developments and co-location into existing assets.

Anesco developed its Operations & Maintenance (O&M) service in parallel with asset construction to provide a superior and comprehensive range of support services for solar and battery storage sites. As part of this service, we optimise assets to minimise downtime, extend the life and deliver the best possible return.



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