

# How digitalisation is changing solar

Words: Alison Finch



Alison Finch

As the world transitions to a low carbon electricity system, one of the key challenges is responsiveness. Traditional forms of power generation provide a reliable base load that can be dialled up and down as needed. In contrast, renewable energy generation is intermittent and cannot be increased as efficiently in response to peaks in demand; the sun doesn't always shine, the wind doesn't always blow.

As solar's share in global energy generation continues to rise exponentially, the industry's ability to innovate expands too, as large corporations continue to invest in this sustainable clean energy source. Thanks to rapid innovations in the application of digital technology the solar sector is able to offer one of the most flexible forms of power generation available.

## Industry 4.0

The world has seen a series of epochs: the first industrial revolution transformed production with mechanics, Industry 2.0 saw electricity enable mass production, and Industry 3.0 drove forward the increased use of electronics and IT. Today, a digital revolution is firmly underway and is considered by many to be the dawn of Industry 4.0. Smart technologies, including the Internet of Things, big data, cloud computing, artificial intelligence, virtual

reality and other forms of advanced communication, are fundamentally changing the way businesses and societies operate.

When applied to solar PV, Industry 4.0 is enabling the effective management of an abundant but volatile form of energy generation, providing much needed stability and reliability. The increase in the responsiveness of solar PV, as a source of energy, is also making the industry more competitive. With the correct application of smart technology and careful analysis, solar PV is well on the path towards a levelised cost of electricity (LCOE), where it can compete with traditional forms of energy on a level playing field, without subsidy. To achieve this grid parity, the industry must commit to the long-term digitalisation of solar, and continue to invest in making smart technologies smarter.

## Making solar 'smart'

Through the application of digital technologies, 'smart' solar systems generate vast volumes of data, down to the individual panel level. When correctly analysed, these data sets reveal valuable information. The application of complex algorithms equips asset managers with the means to forecast with accuracy and make real-time decisions that increase energy yield, thereby vastly increasing the return



simultaneously increasing their return on investment and lowering operating costs.

In Lakenheath, UK, a 12.8MW PV plant uses Huawei FusionSolar® to enable fully digitalised automated O&M. A balanced and flexible infrastructure comprised of multiple string inverters (rather than a few central inverters) ensures system reliability; one inverter failure simply cannot impact the whole array.

As a result of Huawei's string inverters and smart PV controller equipment, the plant generates higher yields, safely and reliably, whilst reducing O&M costs.

### Transforming the sector

Energy is perhaps one of the most complex industries globally, with deep rooted players and systems, yet it is also potentially the industry with the most to gain from Industry 4.0. As centralised generation models transition towards small-scale, scattered microgeneration, technology is the key to ensuring a stable and responsive source of supply. Investment in R&D is therefore crucial for the solar industry's continued progression.

Huawei is uniquely placed to apply experience in telecoms to energy, and as a business is deeply committed to investing in the technologies necessary to enable the global energy transition. From natural cooling technology to preventative maintenance to integrated DC disconnect, solar technology must be at the cutting-edge of digitalisation to maximise energy returns. Over the past decade, Huawei has invested \$45 billion in R&D and continues to assign over 10% of revenue each year.

Grid stability and cyber-security are also crucial to the successful digitalisation of solar. Huawei uses well-defined, advanced power electronics to provide enhanced grid support, stability, power quality and increased grid resilience. Its FusionSolar® Smart PV system supports complex, low

voltage, ride through and reactive power provisions, to bring frequency and voltage stability to weak grids.

Cyber security can significantly jeopardise the availability and reliability of power systems; as a leading ICT provider, Huawei participates in international protection standards to tackle present and future system vulnerabilities.

Clearly, one company cannot change an industry alone. Through the application of digitalisation to solar PV, producing higher yields and greater returns on investment, Huawei hopes to inspire everyone in the sector.

In addition, the company is building 15 new 'OpenLabs' across the world, where they will work collaboratively with industry partners to develop joint solutions in smart cities, energy, finance, logistics, manufacturing, and media.

### Looking towards the future

Digitalisation of solar has the means to overcome many of the challenges currently facing the sector, enabling world-wide access to clean and affordable electricity. The move toward an Industry 4.0 is a welcome one, set to transform the industry, but it will require a long-term view, investment and collaboration. Huawei is committed to progressing this transition, rooted in a deep foundation in technological innovation.

[www.huawei.com/solar](http://www.huawei.com/solar)

on investment of each solar array.

Huawei Solar's unique I-V Curve Diagnosis is one such technology, providing solar plant owners and operators with the ability to work remotely, while monitoring their solar PV plants in minute detail. Each string provides granular data about an array's performance which, when aggregated, provides precise information about the performance of a whole plant. From the comfort of their personal computer or smart phone, energy managers are able to scan each PV string in real-time across multiple PV plants, identifying faults and the root cause of issues quickly and with accuracy.

This real-time monitoring enables pre-emptive maintenance and removes the need for expensive ad-hoc, laborious, on-site testing, ensuring owners and O&M operators are confident their solar plants are always at maximum efficiency.

Huawei's FusionSolar® Smart PV Solution involves a combination of smart hardware, from the inverter through to innovative power line communication (PLC), with intelligent monitoring and reporting, using technologies such as I-V Curve Diagnosis.

This complete solution optimises plant uptime and increases energy yields. As a direct outcome, asset managers typically see much lower failure rates, thereby

### About Huawei

Huawei is a global leading ICT and network energy solution provider who entered the solar market in 2013, introducing its new generation string inverters with intelligent monitoring technology, to create a fully digitalised Smart PV Solution called FusionSolar®.

FusionSolar® is smart, safe, reliable and has delivers higher yields, making Huawei the preferred choice for investors and developers globally. 80,000 of Huawei's 180,000 employees work in R&D and during the past decade over US\$45 billion has been invested in product innovations, always driven by customer needs.

### About Alison Finch

Alison Finch studied Chemistry at Reading University, then began her corporate career as a graduate trainee for the privately-owned American Corporation, Mars. Over the next decade, her roles there varied from Sales & Marketing to Production Manager, in the largest canning factory in Europe, making petfood.

In 2000, Alison relocated to Melbourne Australia, as Head of Integration for a large Dairy Co-operative and furthered her expertise in Marketing, Human Resources & Value Chain Management.

In 2010, Alison set up her own Solar Installation business in Cardiff, UK and, as such, gained first-hand experience of the Solar Industry, before joining Huawei in March 2014 to establish Huawei Solar in the UK.

Two years on, Huawei succeeded in grabbing the largest share of UK ground-mount solar inverter market and Alison has now taken on the challenging role of Chief Marketing Officer, Huawei Solar Europe.