STA Position Paper – Deployment Tracking

SUMMARY

The STA is profoundly concerned with the future of deployment tracking for UK solar. Already, there are significant challenges with regard to the accuracy and completeness of existing data sets, to the detriment of policy-makers, market-intelligence and overall understanding of the UK energy system. However, the rapidly approaching closure of the Feed-in Tariff will severely damage this already incomplete data collection system, effectively bringing to an end any visibility of household-level installations of solar PV.

This situation can be remedied. Through the authority granted to the Secretary of State under Section 98 (Provision of statistical information) of the *Electricity Act (1989)* it is possible to unify ongoing several workstreams to provide holistic deployment coverage. This includes the ENA *Open Networks Product 8: System Wide Resource Register* expanding their scope to capture commercially sized installations 50KW and upwards, the Low Carbon Technologies (LCT) Detection Project methodology and a mandatory MCS requirement to encompass small-scale installations.

CONTEXT

Deployment of both small and large scale solar PV has hitherto been publicly provided by BEIS 'Solar Photovoltaics Deployment in the UK':

> "This release provides users with timely information on *confirmed* solar capacity deployed; data are presented as soon as they are reported to BEIS. However, lags in reporting mean that total installations data for more recent months may not be complete until several months later."

The report uses three underlying data sources:

- Ofgem's Renewables & CHP Register for RO accredited cites
- Renewably Energy Planning Database (REPD) for a list of >1MW renewable schemes that have gone or are currently going through planning permission
- BEIS' estimated FITs deployment table for the latest MCS and ROOFiT deployment figures

With regard to large-scale PV specifically, up until the closure of the Renewable Obligation on 31 March 2017, this support mechanism guaranteed a fully comprehensive and highly accurate tracking of all ground-mount PV above 5 MW. Since then, the *Energy Trends: Renewables* statistics have been compiled on a quarterly basis, as an aggregation of the following data sources:

- Major Power Producers (MPPs) survey (monthly): census of approximately 35 MPPs surveyed electronically – for fuel used, electricity generated, electricity supplied to the grid, broken down by generation type/fuel, as well as sales. - Coverage: all MPPs, representing approximately 90% of electricity generation - Response rate: approximately 100% - Some MPPs' power stations will report individually

- Electricity Suppliers survey (monthly): approximately 30 main suppliers surveyed electronically – sales data split by industry; services; domestic; and other. - Covering approx. 95% of electricity sales - Response rate: approximately 100%
- Electricity Distributors survey (monthly): 12 Distribution Network Operators surveyed – for distribution and losses information.

The FIT installation data is the most detailed and granular, providing a monthly snapshot of UK solar deployment by capacity size, accreditation and number of installations. The FIT statistics included also provides a monthly snapshot of commissioned installations as well as a quarterly report with sub-regional FiT statistics, FIT installations on community-owned properties and schools and annual load factor statistics. Solar PV cost data is also reported on a yearly basis.

The FIT statistics were also supported by the Microgeneration Certification Schemes (MCS) database. The MCS is a nationally recognised quality assurance scheme. It is a pre-requisite for an MCS-certified installer to install a solar PV system in order for the system to be FiT-accredited. This serves as both a useful means of data collection and validation, and a critically important quality control mechanism for installers.

The Ofgem Central FiT register also provides a weekly update on capacity installed, detailing uptake and progress against each deployment cap, showing also when a cap is reached. Consequently, solar PV deployment tracking has until recently been consistently and quite accurately reported.

Now

Recent and rapidly approaching changes to the policy landscape have threatened the accuracy of solar PV deployment tracking. This is the result of much of the deployment databases being tied to specific solar PV support mechanisms. Until relatively recently, these programs provided what was effectively a complete and regularly updated picture of deployment covering FiT and RO customers, from which a reasonably accurate view of the overall market could be extrapolated.

However, since the FiT cuts initiated in 2015, commercial-scale solar PV often negotiate PPAs with suppliers on an individual basis, and it is already the case that many non-domestic sites are not registered on the deployment tracking databases. The STA is aware of advanced plans for commercial rooftop PV for 2019 that run into the hundreds of MW and anecdotally, we are told this is also increasingly the case for new-build homes with domestic rooftop PV installations.

Furthermore, the FiT scheme, which is currently the only domestic database for solar PV, is ending March 31st 2019 with no secured replacement. Whilst the Smart Export Guarantee proposal currently under consultation suggests the inclusion of a central Ofgem-administered database, it is uncertain what these tariffs will even look like, meaning it is uncertain whether installations of any size will opt into this offer. Linked to this, the MCS will also no longer be a requirement from 31st March 2019, meaning that this source of data is also likely to be incomplete.

These urgent concerns regarding the future accuracy of PV deployment tracking have been known for some time; however, it appears that is only with the imminent end of the FIT that the threat of total invisibility of household-level solar PV has arisen. Ironically, this comes at a time when there is more data than ever available within the energy system, as a consequence of the roll-out of smart meters and advances in machine learning. This data availability has not gone

unnoticed by industry. It is becoming clear there are many workstreams moving forward in a fragmentary (and likely commercially-focused) manner, in parallel to and possibly outside the scope of the BEIS-convened Energy Data Taskforce.

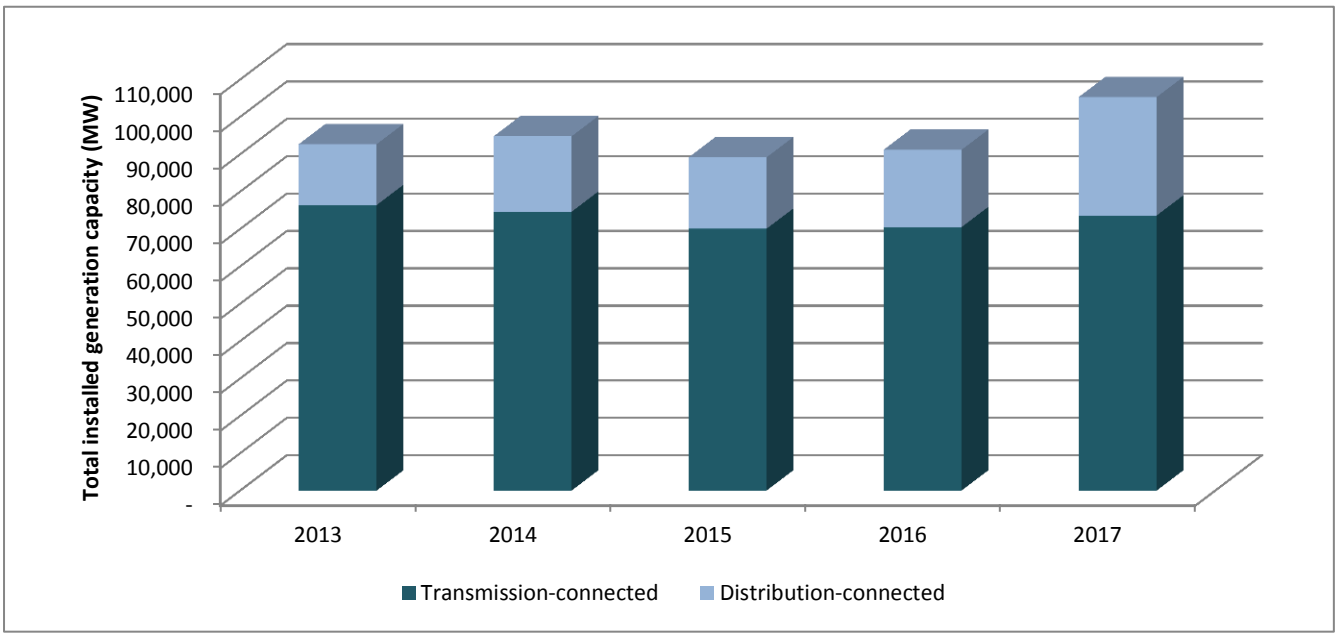
The Catapult-led Energy Data taskforce will deliver recommendations for how industry and the public sector can work together to reduce costs and facilitate competition, innovation and new business models in the energy sector, through improving data availability and transparency. It is unclear when its work will conclude or whether any substantive recommendations or outputs will be implemented.

Importance of Publicly Available Deployment Tracking

The continuation of accurate and reliable solar PV deployment tracking is of paramount importance to the industry, government, policymakers, and to society as a whole. There is no rationale that because the subsidies for solar have ended, the deployment tracking linked to it is of any less importance. In fact, as the proportion of distribution-connected generation and low-carbon technologies connected to distribution networks grows, this data will become more important than ever.

Ensuring safe, efficient and cost-effective grid operation and electricity supply

The proportion of generation capacity connected to the Distribution Network increased from 18% to more than 30% between 2013 and 2017, and will have increased further over the past year:



Knowing how much output to expect from each distributed energy resource on the system is critically important for transmission grid operators to undertake balancing operations as efficiently as possible. The lack of visibility on the part of DNOs of smaller-scale, weather-dependent renewable generation and storage connected to their networks has already arisen as a significant concern. As the costs of rooftop PV systems continue to fall, and incentives to register them vanish, this lack of visibility could emerge as an unnecessary and fully preventable impediment to grid decarbonisation. Going forward, higher volumes of variable zero-carbon generation can and must be integrated into the electricity system, without any sacrifice in terms of safety or reliability of supply. However, doing so will require vastly improved visibility of distributed energy resources across the entirety of the system.

Enabling efficient investment and lower-cost connection of renewable generation technologies

From another perspective, in the short- to medium term, this visibility is essential for energy suppliers and traders to make optimally efficient procurement decisions. Longer-term, this data is also critical for planning around future capacity requirements, and for making informed decisions about investing in flexibility, storage or network infrastructure reinforcement. These decisions of course also have a very clear and significant impact on consumer bills. For prospective developers of renewable energy, detailed data is absolutely essential for making the right decisions on whether to invest in a new project in a given location. But even if the right data is available to support efficient investment decision-making, grid availability is all too often far from clear.

Evidence provided by our members suggests that despite the instability and uncertainty of the overarching policy environment, the most significant impediment to the further deployment of renewables in GB is in fact the lack of affordable distribution grid connections across GB. These costs are currently at least 10% of the total capital cost for new large-scale groundmount PV developments, and will only increase as a proportion of total costs. In many areas, the time, cost and complexity of obtaining a connection offer are simply uneconomic, even if a suitable connection is in fact available. To be sure, this is largely driven by the lack of physical network infrastructure capacity, but another important and overlooked aspect is the simple fact that DNOs do not appear to have adequate insight into what is connected to their networks and where, leading to needless delays and rejections for prospective zero-carbon electricity generation developments which would in fact have been viable. This lack of granularity in grid congestion visibility therefore prevents the deployment of unsubsidised renewable generation, both for large rooftop and groundmount schemes, ultimately preventing consumers from benefitting from the positive impact that this generation capacity would have in terms of dampening wholesale power prices.

Maintaining continuity for research and policy-making

Solar PV support scheme data has been recorded continuously since 2010. A disjuncture between the end of the prevailing data collection and management methodology and the beginning of a new one is a significant concern in terms of accurately portraying the shifting dynamics of our energy system. It is absolutely vital that any disruption be minimised so as to maintain the integrity of the data, and ensure its suitability for energy system modelling, research and policy development going forward.

The UK's legally-binding carbon reduction targets require that the carbon intensity of electricity generation be reduced by 60% by 2030. These targets will not be achieved without a substantial increase in renewable generation, particularly solar PV. Tracking installed capacity, from both large-scale and rooftop systems, is the only way to understand solar's contribution to electricity system decarbonisation, and to determine how much more capacity is required in order to meet the Carbon Budget thresholds.

Many policy decisions made regarding the energy system are dependent on accurate sources of deployment. This includes, but is not limited to National Grid's Future Energy Scenarios (FES). Modelled scenarios based on FES data seemingly constituted the entire justification for Ofgem's proposed reforms to residual charging and Embedded Benefits as set out in the Targeted Charging Review.

It is also important to note that the UK is one of the world's leading countries for academic research, including on renewable energy and energy policy more broadly, at the forefront of open data for policy. Knowledge of deployment levels within the UK is central to ensuring this continues.

A data solution within reach

The Energy Catapult-led Energy Data taskforce will deliver recommendations for how industry and the public sector can work together to reduce costs and facilitate competition, innovation and new business models in the energy sector, through improving data availability and transparency. This is a worthy aim, and this work should continue. However, we are concerned that it is currently unclear when the Task Force's work will conclude, or whether any substantive recommendations or outputs arising from the process will be implemented. Moreover, in the case of solar PV deployment tracking it would seem that a practical solution based on information the DNOs already hold is already well within reach.

- For PV installations 1 MW and above, the ENA *Open Networks Product 8: System Wide Resource Register* would provide a fully workable framework for future data collection on large-scale PV. This Open Networks work stream is currently reviewing the feasibility of putting in place a central resource register for GB generation, storage and flexible demand. These registers would provide a single place where industry stakeholders could access comprehensive DER data. The scope of this project should be extended to include commercial sized installations of 50KW and above. Within the feasibility report it is noted: **"DNO records and knowledge of smaller DER, particularly domestic installations, is generally incomplete. However, should FITs data and DVLA data on electric vehicles be made available then this could be incorporated into the Resource Register"**

- For PV installations below 1 MW, the Low Carbon Technologies (LCT) Detection Project, an Electralink-WPD joint venture, would seem to have considerable potential as an implementable technological solution. This innovative project combines ElectraLink's unique energy market dataset, which includes near real-time visibility of the entire electricity retail market, supplemented with many thousands of data points recorded by WPD staff on visits to homes and businesses to carry out network repairs or inspections (for example, logging whether a home has solar panels on the roof, or an EV in the driveway). Electralink describe how the project utilises an AI from IBM's Watson Studio to analyse information "that has not been combined previously will be tied together – including images and text – to provide increasing visibility into where LCT equipment is located. This will allow WPD's network planners to accurately assess the existing network capacity and understand how this is likely to change in the future."[1] Essentially, by tracking how demand on a portion of the network fluctuates over the course of the day, and supplementing that information with AI-aggregated field reports from WPD staff, Electralink are able to predict with a level of accuracy apparently approaching 96% the amount of Electric Vehicles and rooftop PV systems connected on a given area of a distribution network.

- For <50KW installations, BEIS has indicated through its inclusion in the SEG the value it sees in maintaining the high standards of products, selling and installation that continuing the MCS would afford. **Mandating all <50KW installations to be MCS accredited would ensure this standard is holistic as well as providing visibility of <50KW deployment encompassing all installations, not just those opting to receive the SEG.**

Section 98 (Provision of statistical information) of the *Electricity Act (1989)* confers significant and far-ranging authority on the Secretary of State to obtain statistical information relating to the generation, transmission or supply of electricity from licence-holders, including electricity distributors (DNOs). We would urge the Secretary of State to use this authority to bring these three elements together and deliver a clear, concise and usable picture of solar electricity in GB. We feel that together, these three elements – A comprehensive DNO-administered, mandatory registry of generation 1 MW and above; An MCS-linked registry of small-scale PV installations; and an AI-based technological solution to regularly test the validity of these data sets – it will be possible to bridge the post-subsidy PV data gap.

[1] Electralink: "Low Carbon Technologies (LCT) Detection project" – 12 November 2018. Available from: https://www.electralink.co.uk/2018/11/low-carbon-technologies-lct-detection-project/