Identifying trends in the deployment of domestic solar PV under the Feed-in Tariff scheme

Introduction

The Feed-in Tariffs (FiTs) scheme, launched in April 2010, seeks to incentivise the uptake and deployment of small scale renewable technologies. Individual tariff rates are assigned, depending on the technology, size, and eligibility of the installation, and paid to owners of FiT installations (or their nominated recipients) for every unit of electricity generated. A separate export tariff is paid for any electricity exported (or assumed exported) to the national grid, which is a flat rate across all technologies and sizes. The scheme covers various technology types including solar photovoltaics (PV), anaerobic digestion, wind, and hydro up to 5MW of Total Installed Capacity and micro CHP up to 2kW of Total Installed Capacity (TIC).

Ofgem do not release specific site location information, as such data is only currently available down to Lower Layer Super Output Area[1] (LSOA). In this analysis we matched the LSOA data with data from the Neighbourhood statistics database (maintained by the Office for National Statistics) in order to try and identify trends in FiTs uptake and to determine the drivers that cause an individual to take up the scheme.

The data used in the analysis relates to installations confirmed onto the FiTs scheme (i.e. on the Central FiTs Register) between April 2010 and the end of 2011, with the main focus on domestic PV installations in England.

Summary of statistical data used in the analysis

LSOAs are a Census 2001 based geography designed to be of consistent size and with fixed boundaries. The minimum population in an LSOA is 1,000 and the average population is 1,500 (or around 500 households). Since the LSOAs are designed to be of roughly equal size to one another, in this analysis we have assumed that the number of households in each are equal. However, this is unlikely to be the case, especially given that these geographies are based on data from 2001 and, in some cases, the number of households is likely to have changed considerably since then.

The variables presented in Table 1 have been identified as having the potential to influence FiT uptake and all are available to download at LSOA level from the Neighbourhood Statistics website: www.neighbourhood.statistics.gov.uk/dissemination

[1] This is a Census 2001 based geography – for more information, see the 'Data issues' section. LSOAs apply to England and Wales only. Scotland has a separate geographical system in which data zones are roughly equivalent to (though smaller than) LSOAs.

Table 1 – Variables of interest

Variable	***Source – including latest year and coverage***
Average electricity consumption	DECC sub-national energy consumption statistics (2009[2], England and Wales)
Average gas consumption	DECC sub-national energy consumption statistics (2009[2], England and Wales)
Gas Coverage	Derived from DECC sub-national energy consumption statistics (2009[2], England and Wales)
Fuel Poverty – percentage of households in LSOA that are fuel poor	DECC (2009[2], England).
Average Age of population	Derived from Census 2001 data (England and Wales)
Index of Multiple Deprivation and its various domains	DCLG (2010, England)
Dwelling stock by tenure (%)	Derived from Census 2001 data (England and Wales)
Dwelling stock by type (%)	Derived from Census 2001 data (England and Wales)
Urban/Rural Classification	Derived from Census 2001 data (England and Wales)
Council Tax Band	DCLG, (2011, England)

Impact of Aggregators

The impact of aggregators (or multi-site owners) within the domestic PV market must be taken into consideration since the drivers for uptake of these are likely to be different to those for privately owned installations. Therefore, throughout this analysis, we have attempted to cover private owners schemes and aggregator schemes separately where possible. For this analysis we have defined an aggregator to be any single generator that owns 25 or more installations – this is in line with the recent changes to tariff rates for these owners which set the level at 25 or more. Overall, at the end of 2011 in England, 24 per cent of all domestic PV installations are assumed to be owned by aggregators.

Analysis

DECC publish data on the average electricity and gas consumption in every LSOA in England and Wales on an annual basis. At the time of analysis, the most recent data available was for 2009. Using this data, the LSOAs were grouped into 10 equally sized groups (or decile groups) based on their average annual domestic electricity consumption. Group 1 are the 10% of LSOAs with the highest average electricity consumption (approx. 4,800 kWh per annum and above) and group 10 contain the 10% of LSOAs with the lowest average electricity consumption (approx. 3,100 kWh per annum and below).

Chart 1 shows the number of PV installations (at the end of 2011) for each of the 10 groups and indicates that the highest electricity consuming group of LSOAs (group 1) has the most domestic PV installations and group 10 the lowest amount, with declining amounts seen for the groups in between. This would seem to suggest that high electricity consuming households were more likely to install a PV installation than low electricity consuming households. This trend is repeated for those PV installations assumed to be privately owned but we see a different trend for those assumed to be owned by aggregators where groups 7 and 8 (i.e. lower electricity users) have the most installations.

[2] DECC have now published 2010 data for this series but these were unavailable at the time that this analysis was carried out.

Chart 1 – Domestic PV Installations by average electricity consumption group

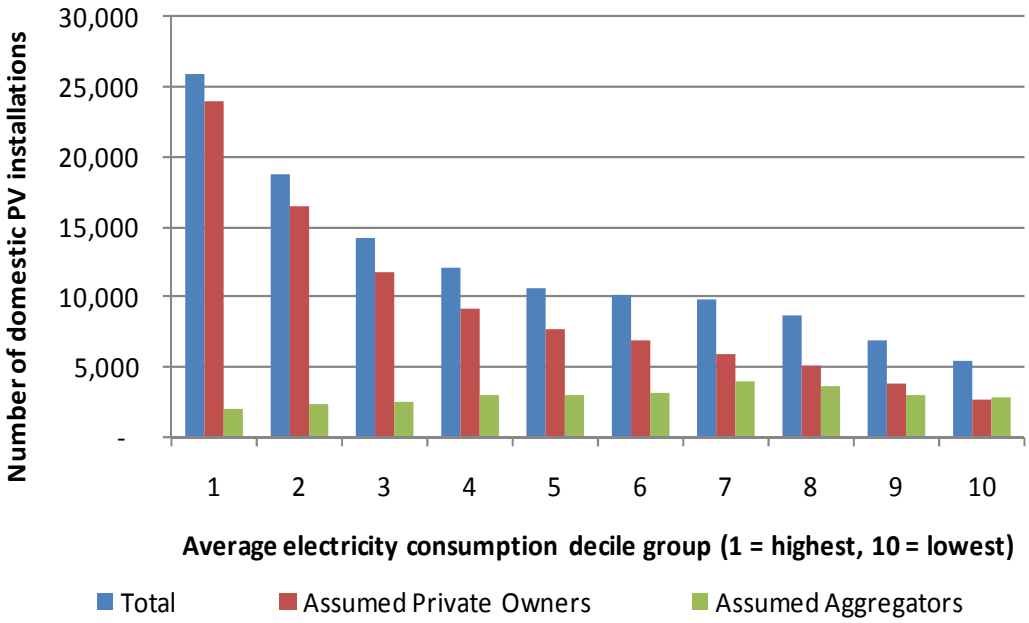
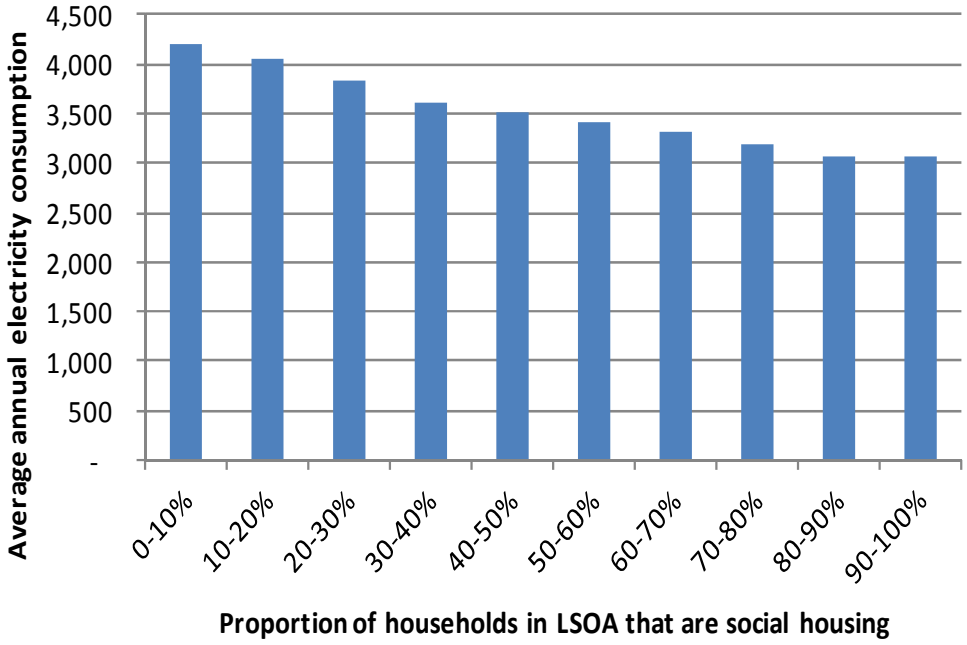


Chart 2 shows that those LSOAs with a high proportion of social housing have a lower average electricity consumption that those LSOAs with a low proportion of social housing. This may help to explain the trend for aggregator owned installations seen in Chart 1 where lower electricity consuming LSOAs tend to have higher amounts of aggregator owned PV installations.

Chart 2 – Average annual electricity consumption by proportion of social housing



Similar analysis was also carried out on the other variables listed in Table 1, the details of which are available in the full paper on the DECC website (see the 'Further information' below).

Summary of findings

The evidence from this analysis suggests that domestic PV installations are typically located in the more affluent, higher energy consuming households. This correlates with the additional findings that areas with a high proportion of detached housing, a low proportion of social housing and/or a low proportion of low value housing tend to have a higher amount of PV installations. The analysis also suggests that rural areas (and areas with low gas coverage, which are mostly rural) have a greater density[3] of domestic PV installations than urban areas. Social characteristics, such as age and education also have a part to play. Areas where the average age is 40 or above have a greater density of PV installations than those with an average age below 40. Areas where educational deprivation is low tend to have higher numbers of PV installations. Of course, there will be some degree of correlation between some or all of these variables. The drivers for uptake of aggregator owned installations, however, differ from those of privately owned installations, with the former typically located in less affluent, lower consuming households.

Further information

The full paper containing the details of this analysis is available on the DECC website at: www.decc.gov.uk/en/content/cms/statistics/energy_stats/source/fits/fits.aspx

We welcome all feedback from users, therefore if you have any comments or queries regarding this analysis, please contact either Laura Williams or Mita Kerai using the contact details below.

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[3] I.e. number of PV installations per 10,000 households.