



Understanding the impact of Solar PV on grid generation and household energy use – the UK experience

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- Sharing data
- UK's National Energy Efficiency Data-framework
- The distribution of Solar PV – 2014
- The impact of Solar PV on electricity and natural gas consumption



Sharing Data

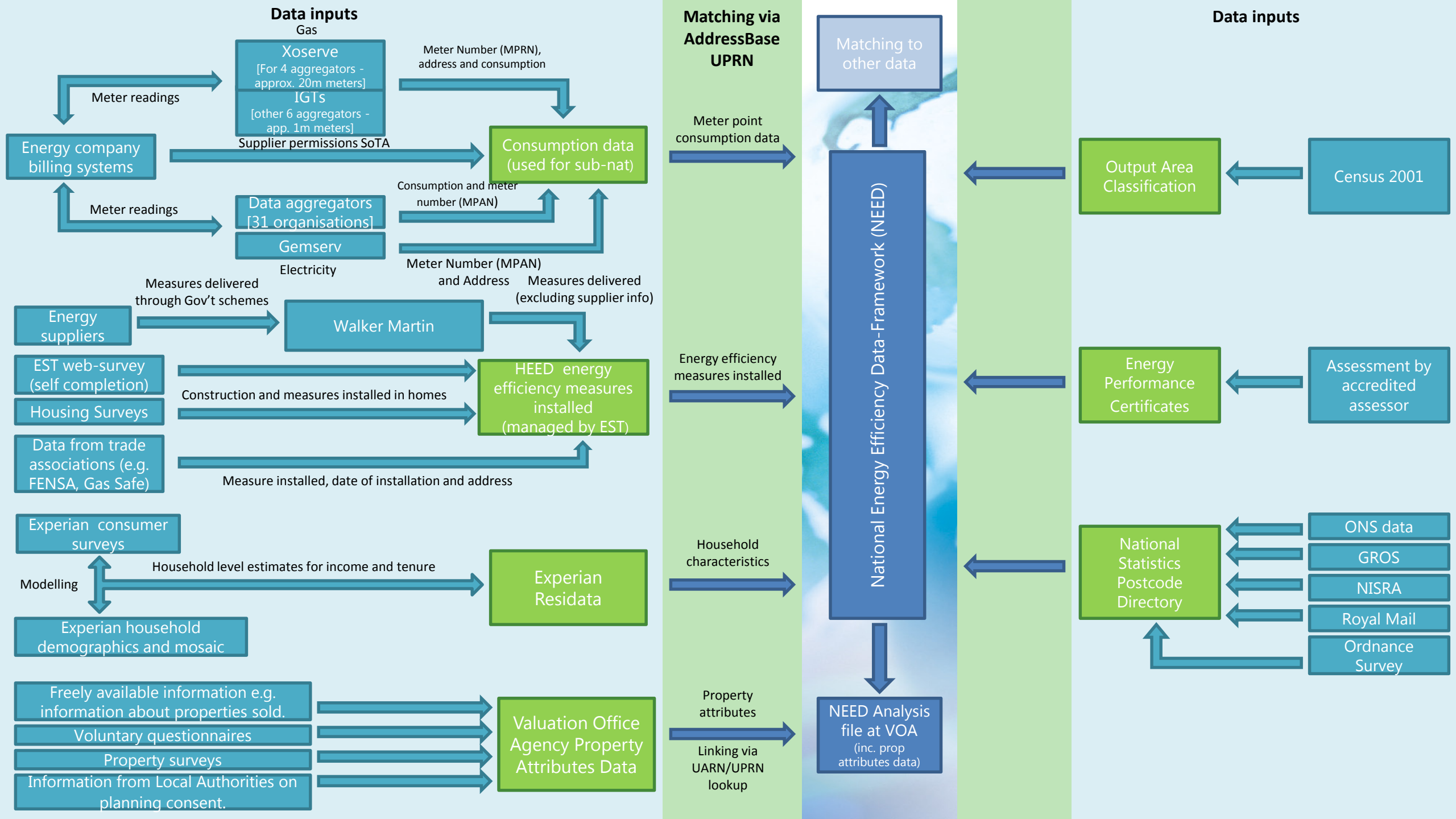
- Government often seen as one entity (people/business not interested in departments)
- Some data (eg tax, health, etc) needs enhanced protection
- A lot of data at aggregate (and case) level can be shared
 - Eg if a transport departments knows number of cars on the road, sharing with energy helps develop efficiency indicators fuel used/car
- Efficiency – collect once use often
- Generates complete picture
- Reduces burden on business
- Can be a difference between sharing across Government and publication – publication at a higher level can be later
- Will often need MoU between departments

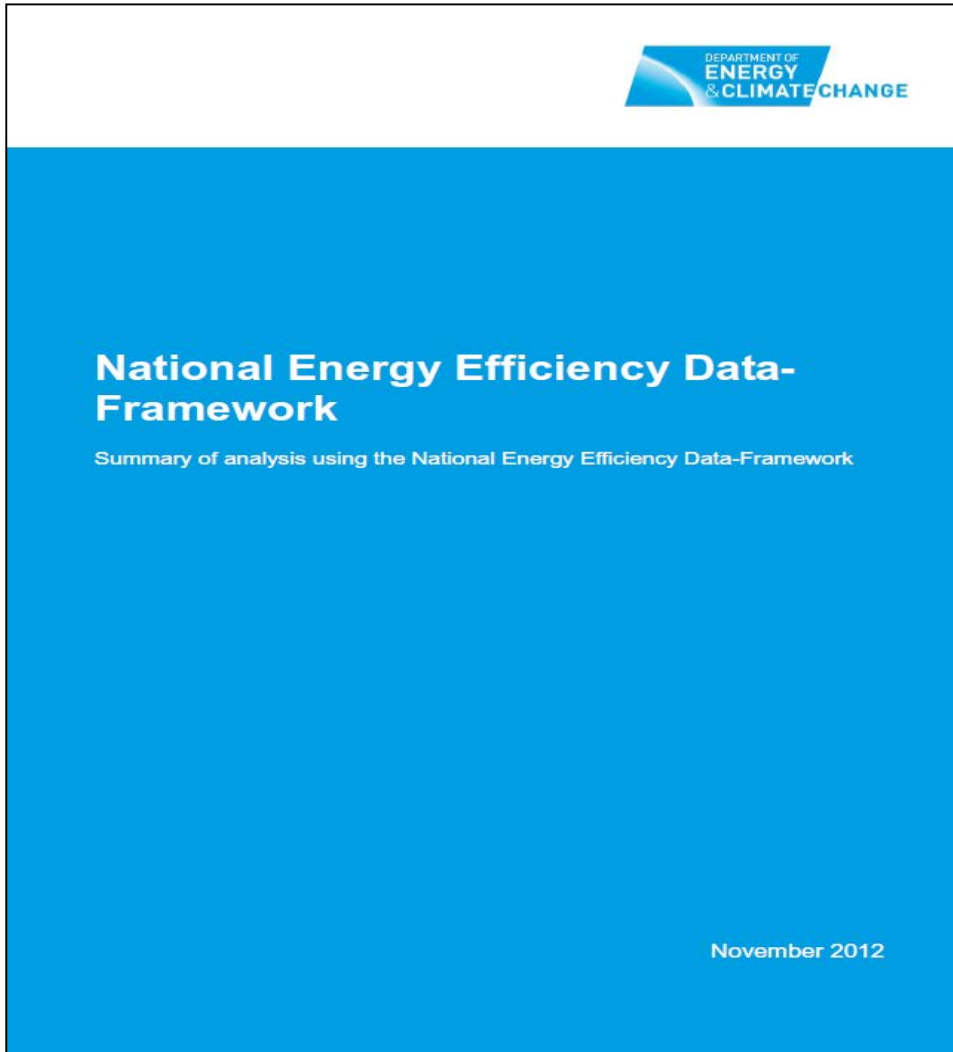


The UK's National Energy Efficiency Data-Framework (NEED)

What is NEED

- The National Energy Efficiency Data-Framework (NEED) is produced and published by DECC to provide detailed information on annual electricity and gas usage, and energy efficiency in domestic and non-domestic buildings in Great Britain.
- It is a data matching project that combines property level annual electricity and gas consumption (taken from meter reads) with a range of other property level data (including records on the installation of energy efficient or small renewables supported by government incentives).
- The published consumption figures are broken down by property and household attributes, as well as geographic and socio-demographic characteristics.
- Analyses conducted on a representative sample of households allow DECC to investigate the impact of installing energy efficiency measures on gas consumption.





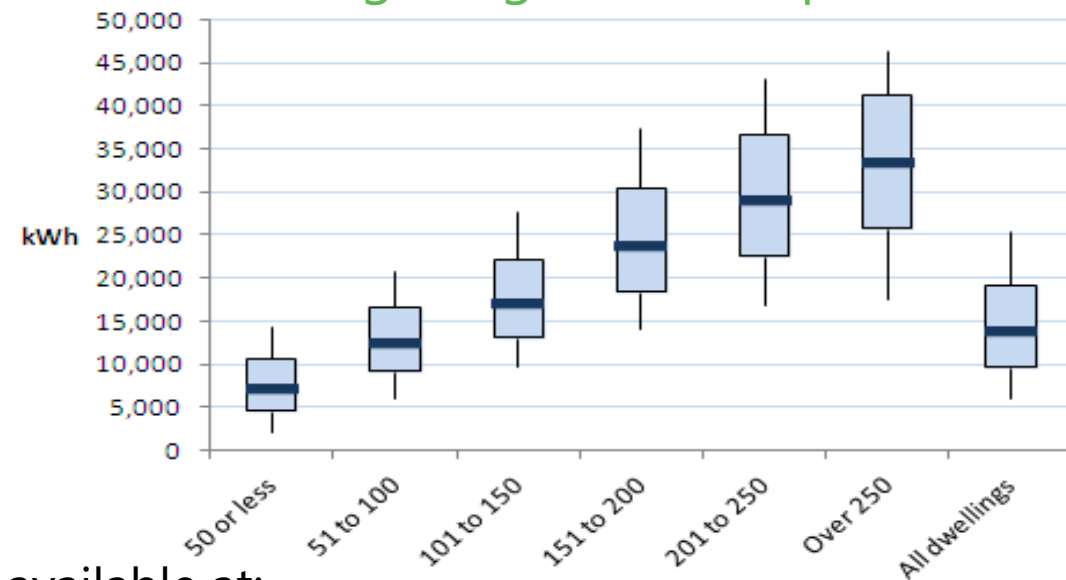
Structure of report:

Main report

Annexes

Supplementary data tables

Range in gas consumption

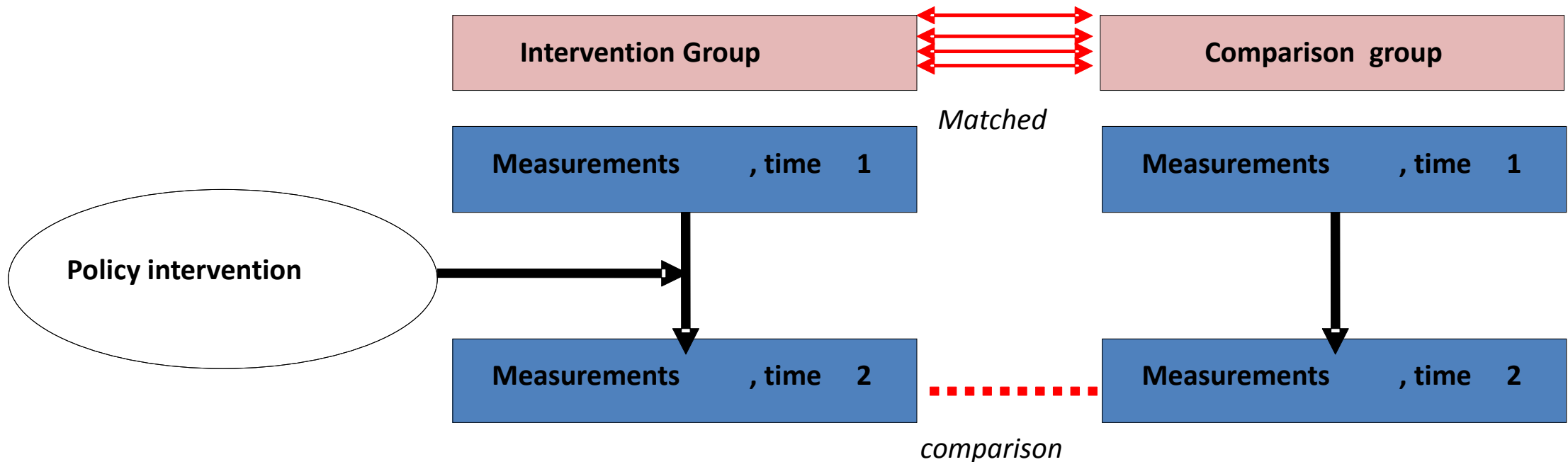


Report available at:

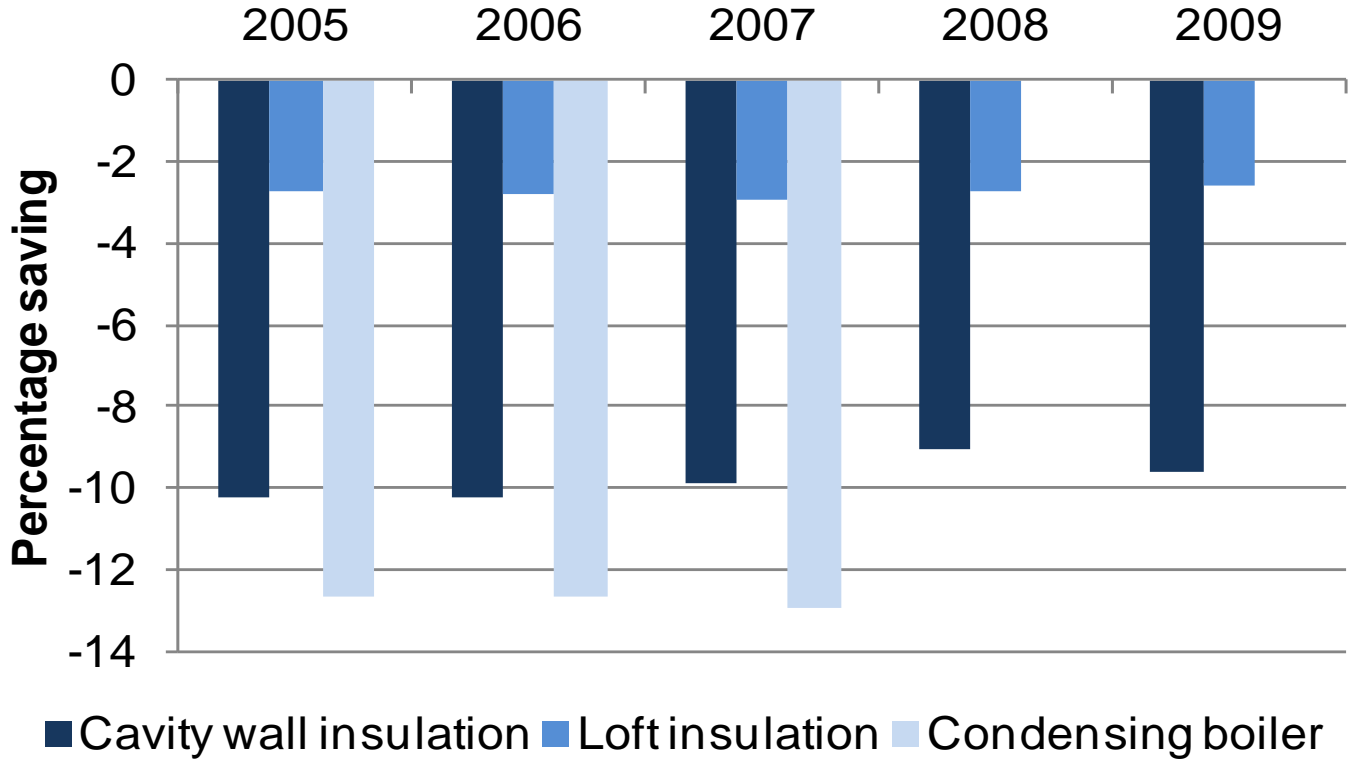
<https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/national-energy-efficiency-data-need-framework>

Matched groups

Groups **carefully matched** and outcomes of interest are compared between the intervention group and **matched** comparison group



How NEED helps the UK understand Impact of energy efficiency measures



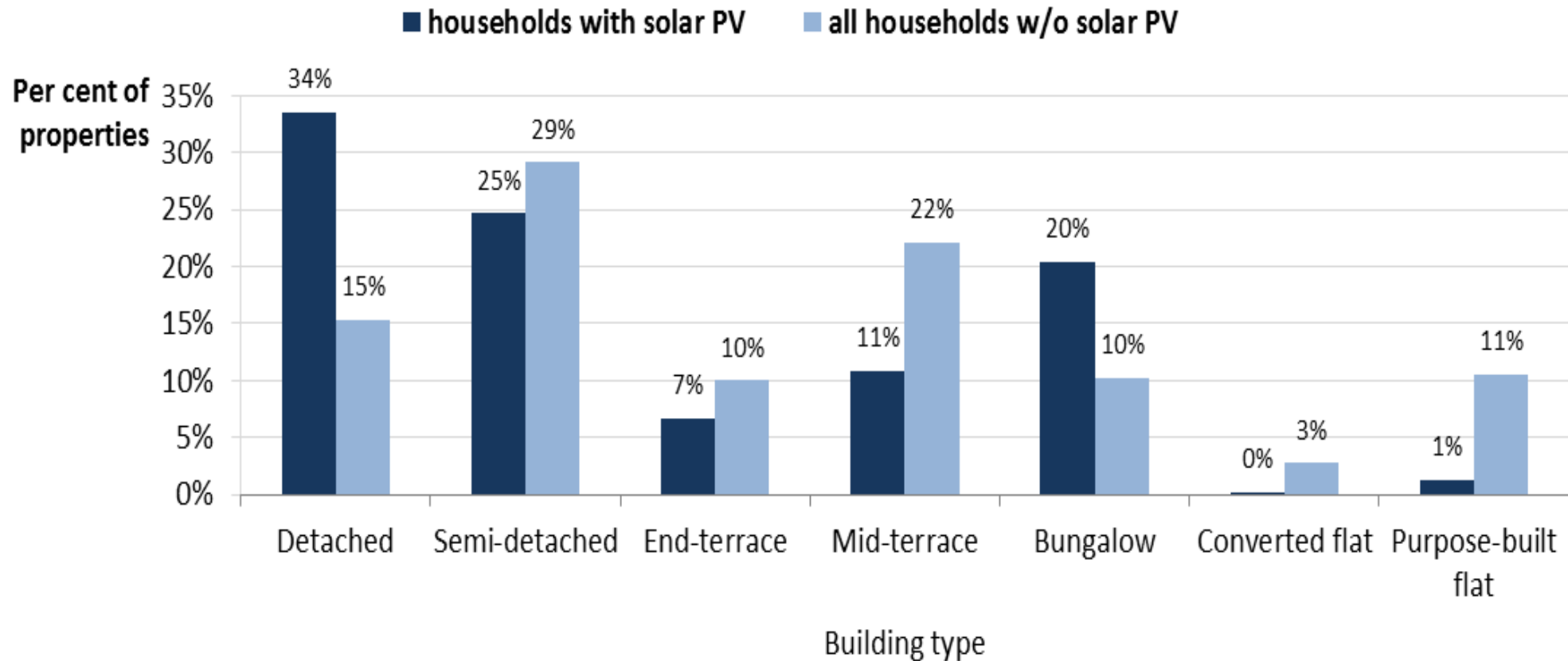
- CWI – median savings ranging from 9.0 to 10.2 per cent
- Loft – median savings between 2.6 and 2.9 per cent
- Condensing boiler – median savings ranging from 12.6 to 12.9 per cent

Using NEED to understand the impact of household Solar PV



- A total of 369,700 households in England and Wales that had solar PV installations could be assigned a unique property reference number (UPRN) from AddressBase, which allowed them to be matched with property attribute data from the Valuation Office Agency and thus integrated into NEED.
- Based on a comparison of distributions of various property attributes with the entire housing stock, in general, properties with solar PV installations in this sample tended to be large, relatively new, and have four external walls.

Relative frequency of building types in the UK housing stock with and without solar PV installations, 2011



Using NEED to understand the impact of household Solar PV



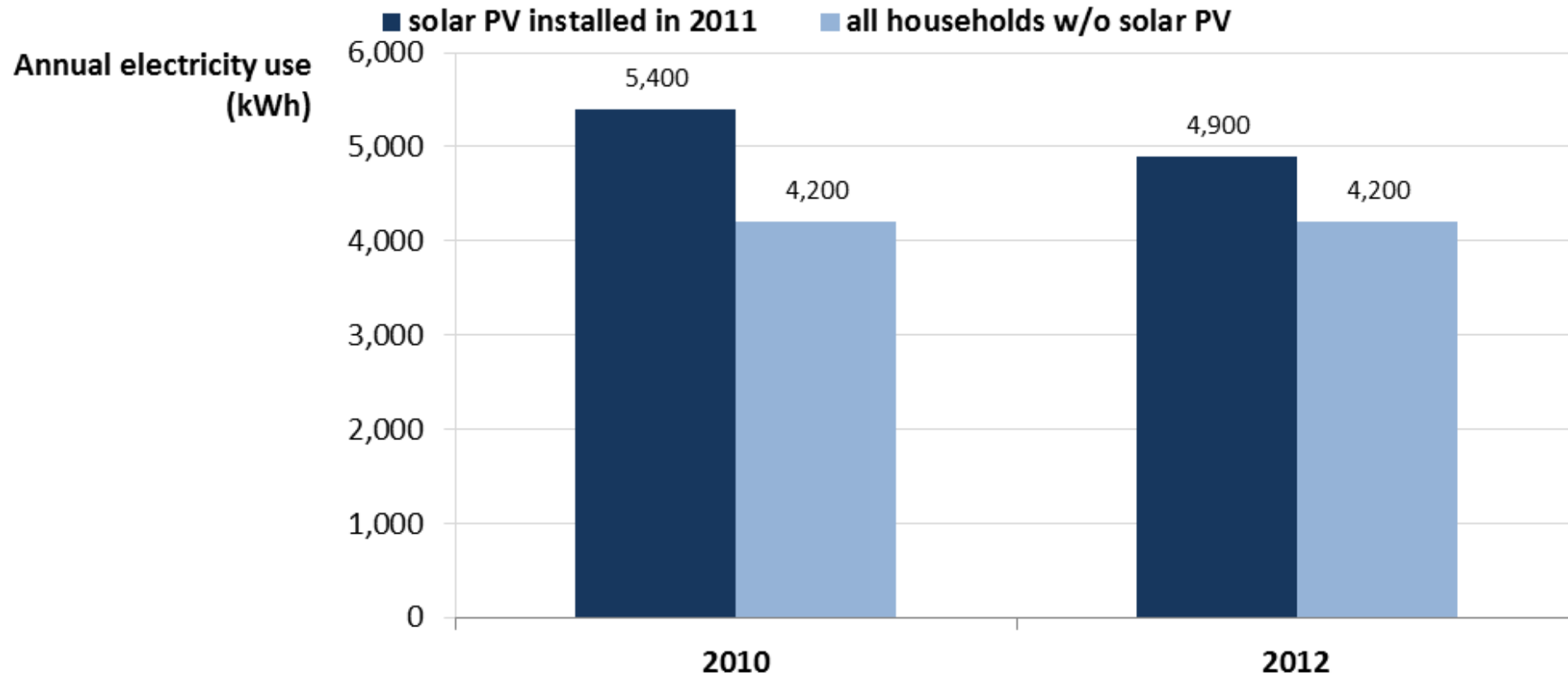
- To understand how the electricity and gas consumption of a household changed as a result of installing solar PV, a subset of properties that had solar PV panels installed in 2011 (181,050 properties or 88 per cent of all solar PV installations in 2011) was selected for further analysis.
- Their grid supplied electricity and (weather-corrected) gas usage figures for the full billing years before and after the installation, i.e. in 2010 and in 2012, were compared.

Results

- Households with Solar PV typically use more electricity than those without. In 2010, for example, the mean electricity consumption of these properties was 5,400 kWh, compared to the national average of 4,200 kWh (i.e. 27% higher), for a number of reasons including as mentioned above, households with solar PV installations tend to be larger
- By 2012, i.e. the year after the installation of solar PV, the gap in electricity consumption between properties with and without solar PV narrowed considerably, to 16 per cent.
- Between these two years, electricity consumption in households with Solar PV decreased substantially, by an average of 9.5 per cent (median: 13.2 per cent). Compared to lower falls in electricity usage in the same period, (mean: 1%, median: 5.7%) for other households;
- Grid electricity consumption fell by around 500 kWh in homes with PV installed
- The difference between PV and non-PV households for natural gas usage. In 2010, the mean gas consumption of PV properties was 17,100 kWh (median: 15,600 kWh), compared to 15,300 kWh in the non-PV (median: 14,200 kWh), i.e. 11 per cent higher. In 2012, after the installation of PV solar panels, the gap narrowed slightly to 10 per cent, because gas consumption decreased slightly faster in FIT properties (by 5.5%, compared to 4.5% in the non-FIT group).

The impact on grid generation of Solar PV

Mean electricity consumption of households that installed solar PV in 2011, and of the entire housing stock



Sources



- www.gov.uk/government/collections/national-energy-efficiency-data-need-framework

