National Energy Efficiency Data-Framework

Introduction

In November 2012 the Department of Energy and Climate Change (DECC) published its second report summarising analysis from the National Energy Efficiency Data-Framework (NEED). NEED is a project set up by the Department to develop its understanding of energy use and the impact of energy efficiency measures. It brings together data from existing sources, including meter point energy consumption data and information on energy efficiency measures installed in households[1], and links them to information about property characteristics to provide a rich resource for analysis.

The published report covers:

- Development of the framework – an overview of what NEED is and how it was developed.
- Domestic energy consumption – analysis of energy consumption by property attributes and household characteristics.
- Energy efficiency measures in homes – including estimates of the savings from key energy efficiency measures and a summary of which households have had measures installed.
- Non-domestic consumption – an initial assessment of the quality of the non-domestic data.

A number of annexes were also published alongside the report providing more detailed results, as well as further information on the quality of the data, the methodology for estimating the impact of energy efficiency measures and a review of work undertaken by DECC contractors. The publication can be found on the DECC website at: www.decc.gov.uk/en/content/cms/statistics/energy_stats/en_effic_stats/need/need.aspx.

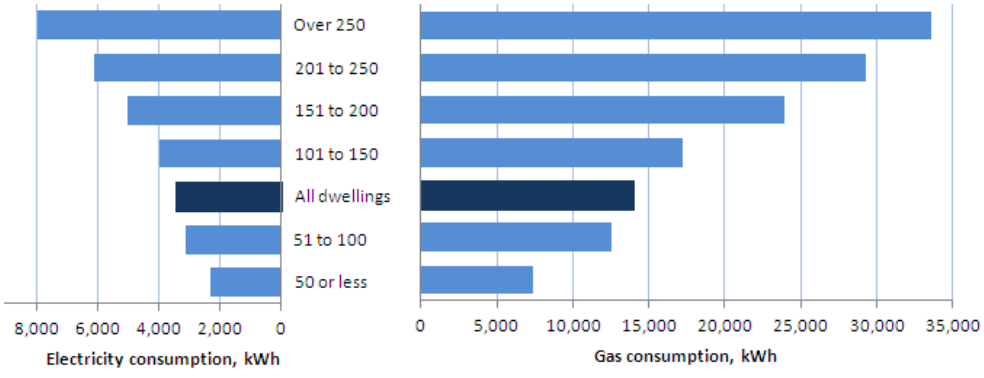
Summary of results

All results for the domestic sector are based on a sample of properties in England. All gas data used in the analysis are weather corrected.

Domestic energy consumption

Analysis of data in NEED shows that while the property attributes and household characteristics considered in NEED influence electricity and gas consumption there is a significant amount of variation which has not been explained. This echoes other work undertaken by and on behalf of DECC to model gas consumption[2], which shows that only approximately 30 to 40 per cent of the variation in gas consumption seen in different households can be explained using the variables available in NEED[3]. Of the variables within NEED, property size has the greatest influence.

Chart 1: Median gas and electricity consumption in 2010, by area of property, m^2



[1] Information on energy efficiency measures installed is from the Homes Energy Efficiency Database (HEED): www.energysavingtrust.org.uk/Organisations/Local-delivery/Free-resources-for-local-authorities/Homes-Energy-Efficiency-Database

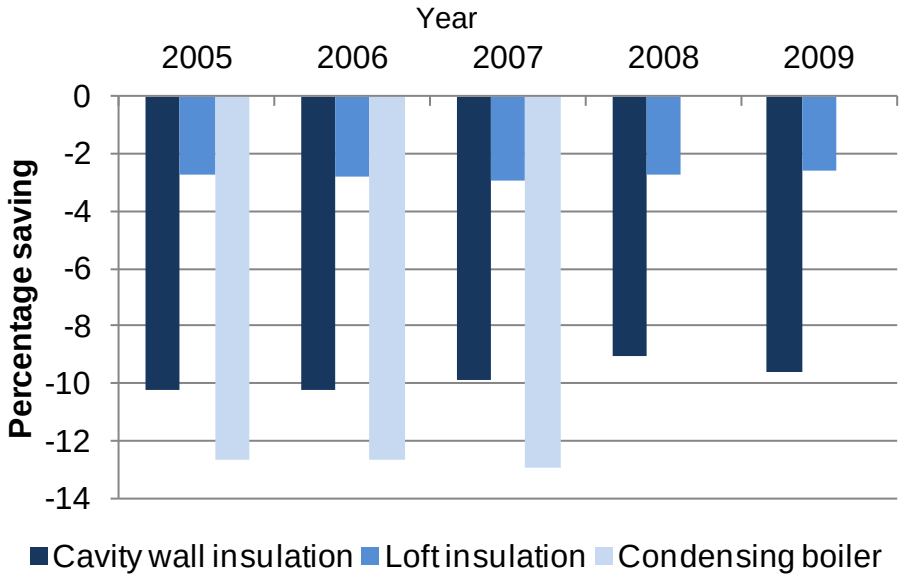
[2] Work undertaken by NERA and Katalysis set out in Annexes E and F of the NEED report.

[3] DECC's local area gas model also draws a similar conclusion (See the special feature 'Identifying local areas with higher than expected domestic gas use' in Energy Trends, March 2012 available at: www.decc.gov.uk/assets/decc/11/stats/publications/energy-trends/4779-energy-trends-mar12.pdf).

Impact of energy efficiency measures

Considerable savings can be made by installing energy efficiency measures in homes. Chart 2 shows the typical percentage savings for the three main measures considered in this report for households which use gas as the primary heating fuel. Initial work is also published for solid wall insulation. However, the number of observations is low, so this will be expanded in future work.

Chart 2: Summary of observed savings for energy efficiency measures (median)



The percentage saving for each of these measures is consistent across all the years considered. However, the typical kWh savings have decreased over time as typical gas consumption has decreased[4].

Savings based on data in NEED reflect observed savings, so they provide an estimate of the saving after comfort taking (where a household takes the benefit of the insulation through increased warmth) and an average for all properties irrespective of whether the measure has been installed fully throughout the property. As a result there will be differences between the savings estimates reported in NEED and more technical physics based estimates. The savings estimates from NEED reflect what occurs in practise.

Future plans

The analysis from NEED will help monitor and support the development of key DECC policies, including the Green Deal, and will be used alongside other evidence to help understand observed savings and how and why these differ from physics based estimates. If possible, the work will be extended to cover Wales and Scotland, in future. Further work will also be undertaken on the non-domestic data in NEED to see whether robust analysis can be produced in order to inform energy policy in the non-domestic sector.

Contacts

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[4] It should be noted that the data used for this analysis are weather corrected. This is important to ensure comparability between years but masks the variation in savings occurring as a result of different temperatures during the heating season. For example, in a year with a cold winter households will experience a greater absolute saving than they would in a warmer year.