Department of Energy & Climate Change

National Energy Efficiency Data-Framework

Stakeholder Event

17 May 2013

NEED Stakeholder Event

Overview

Department of Energy & Climate Change

10:30 Registration and coffee

11:00 Introduction Duncan Millard, DECC Head of Statistics

11:30 Domestic NEED overview

12:05 Non-domestic NEED overview

12:40 Lunch

13:15 Anonymised dataset plans

13:35 Group discussions on anonymised dataset

14:05 Feedback from group discussions

14:20 NEED Methods developments

14:50 Summary and Close

Aim of event

Department of Energy & Climate Change

1) Provide users with an update on developments since the last event; and
2) Ensure users are aware of DECC's plans for NEED and can feed into future priorities.

Department of Energy & Climate Change

An overview of DECC Statistics

Duncan Millard, Head of Statistics

17 May 2013

DECC Statistics

Overview

Department of Energy & Climate Change

"Official statistics are fundamental to good Government, to the delivery of public services and to decision-making in all sectors of society" – Statistics Code of Practice

DECC produce a wide range of statistics covering:

- Energy production/consumption/balances
- Energy Prices
- Renewables
- Emissions
- Energy Efficiency
- Fuel Poverty

DECC Statistics

Publications

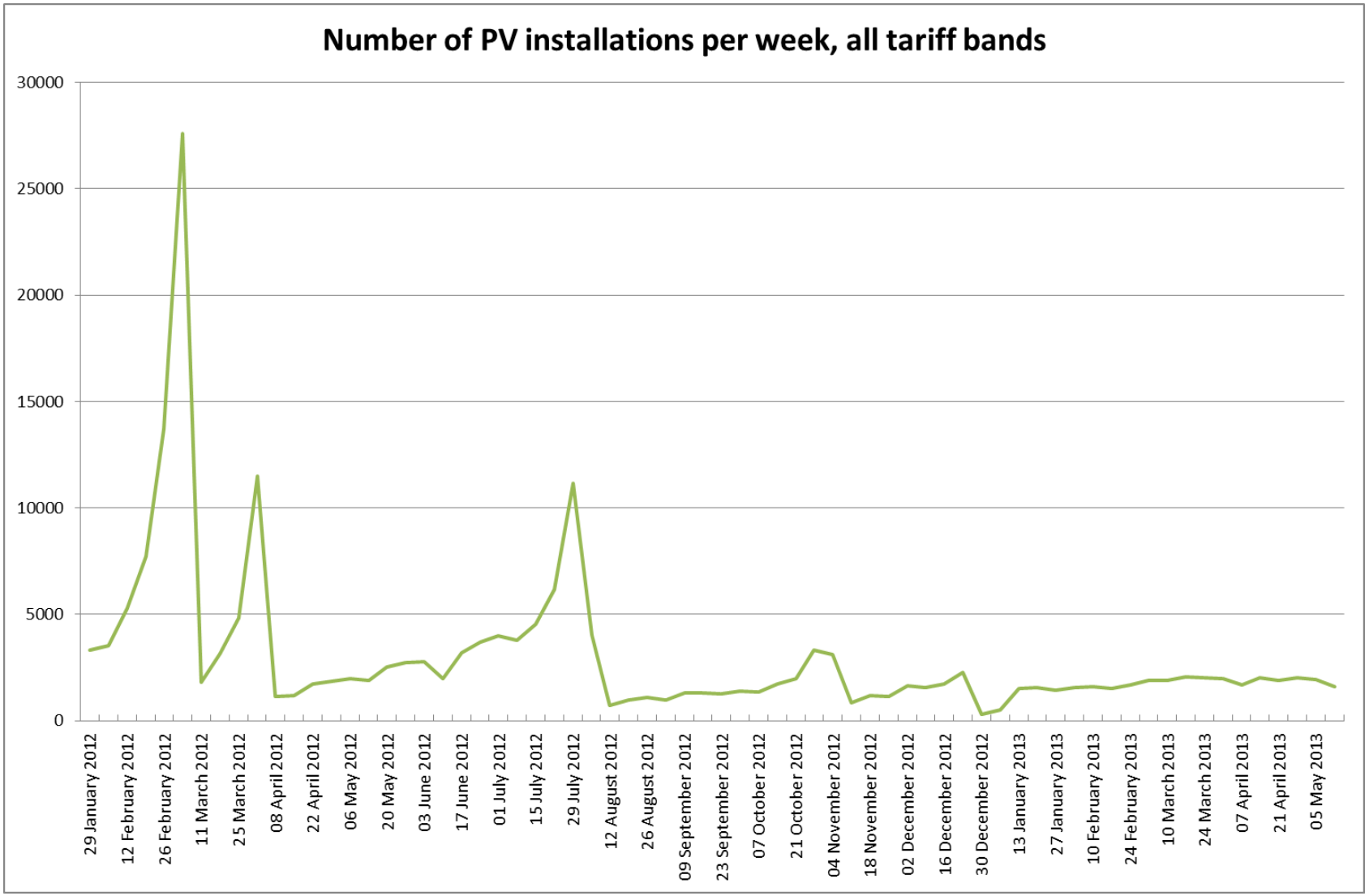
Department of Energy & Climate Change

DECC support policy monitoring and evaluation as well as external users through a range of publications. For example:

- **Weekly** FiTs data and motor fuel prices
- **Monthly** Headline energy production, Green Deal/ECO, RHI and RHPP
- **Quarterly** Energy Prices and Energy Trends (inc renewables)
- **Annual** Digest of UK Energy Statistics, Energy Consumption in the UK and Fuel Poverty

DECC Statistics
Feed-in-Tariffs data

Department of Energy & Climate Change

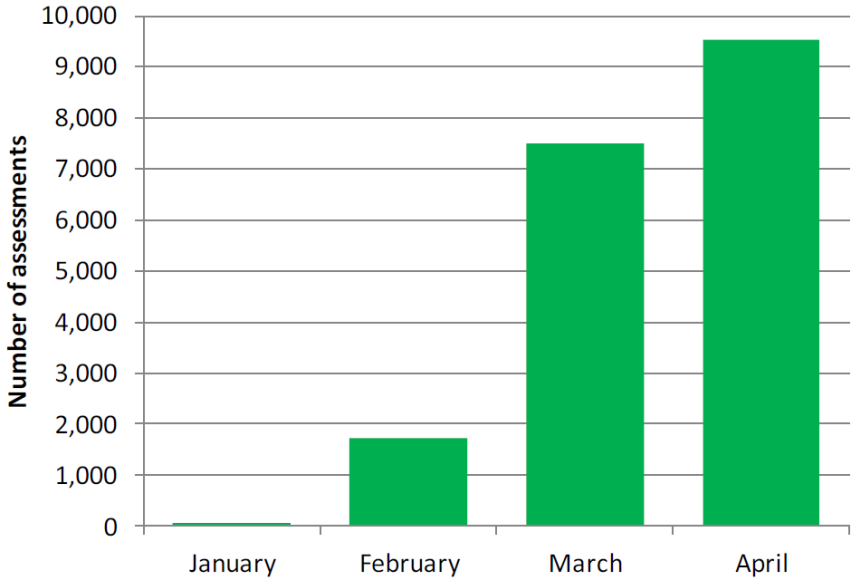


DECC Statistics

Energy Efficiency – Green Deal/ECO stats

Department of Energy & Climate Change

Internal MI reporting – Stats team playing crucial role in feeding live intelligence to policy development, working to develop data collections plans as part of original and on-going policy development, and playing active role in ad-hoc support.



Strong picture of GD assessments being delivered - 18,816 GD Assessments had been lodged to the end of April, up from 9,294 at end of March (with 9,522 in April alone, compared to 7,491 in March and 1,729 in February).

DECC Statistics

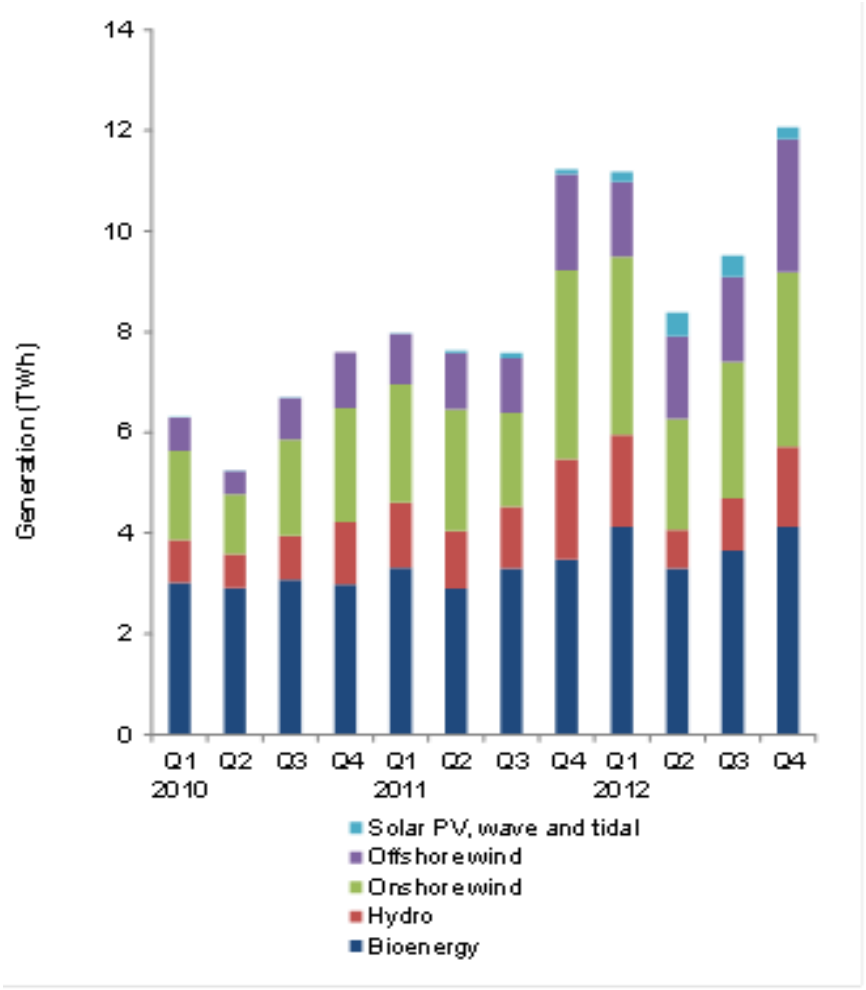
Quarterly renewable electricity generation

Department of Energy & Climate Change

•Total electricity generated from renewables in 2012 Q4 was up by 7.4 per cent on 2011 Q4, from 11.2 TWh to a record high of 12.1 TWh.

•Due to much increased capacity, offshore wind generation in 2012 Q4, increased by 38 per cent on a year earlier, from 1.9 TWh to 2.6 TWh.

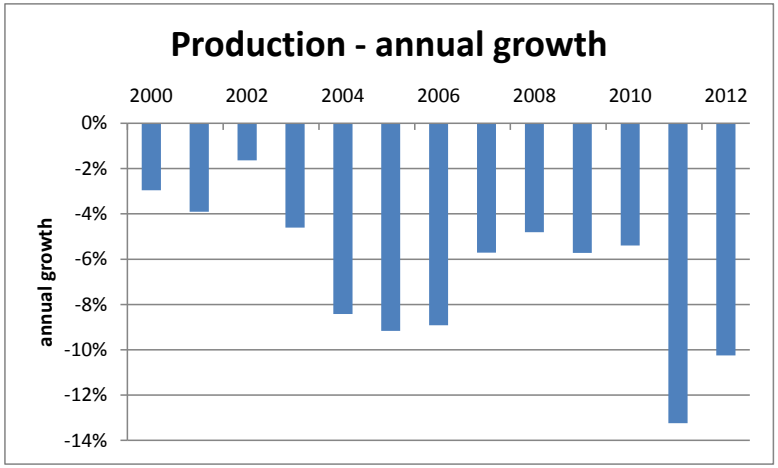
• Despite increased capacity, electricity generated from onshore wind in 2012 Q4 fell by 7.3 per cent on 2011 Q4, from 3.7 TWh to 3.5 TWh, due to much lower wind speeds (2.7 knots lower) than the high wind speeds of a year earlier.

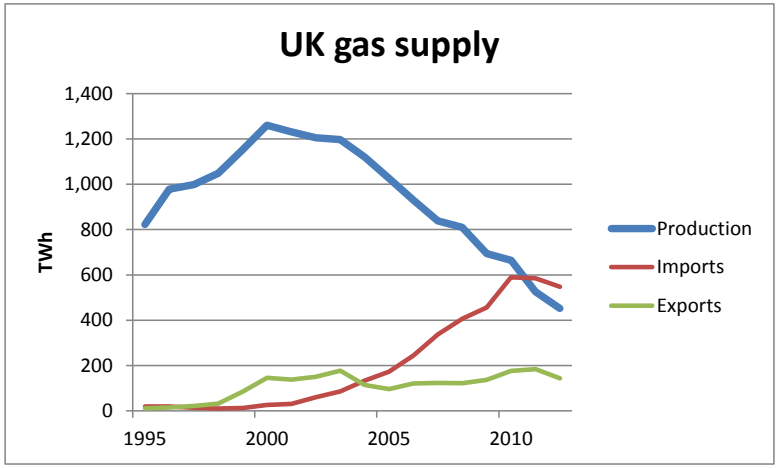


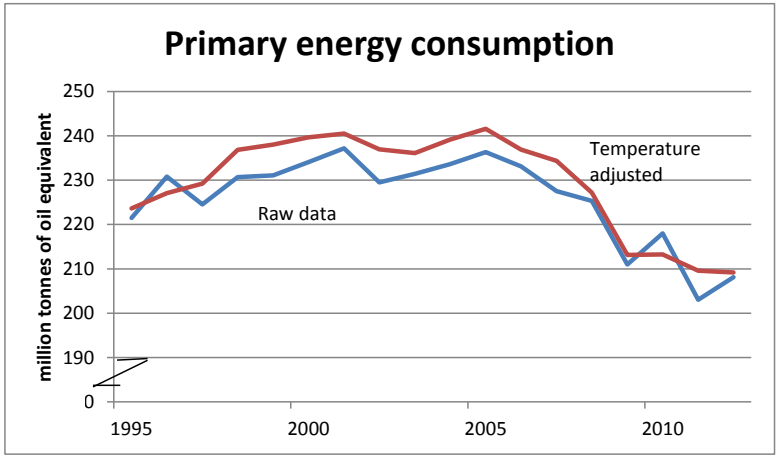
DECC Statistics

Traditional data…

Department of Energy & Climate Change







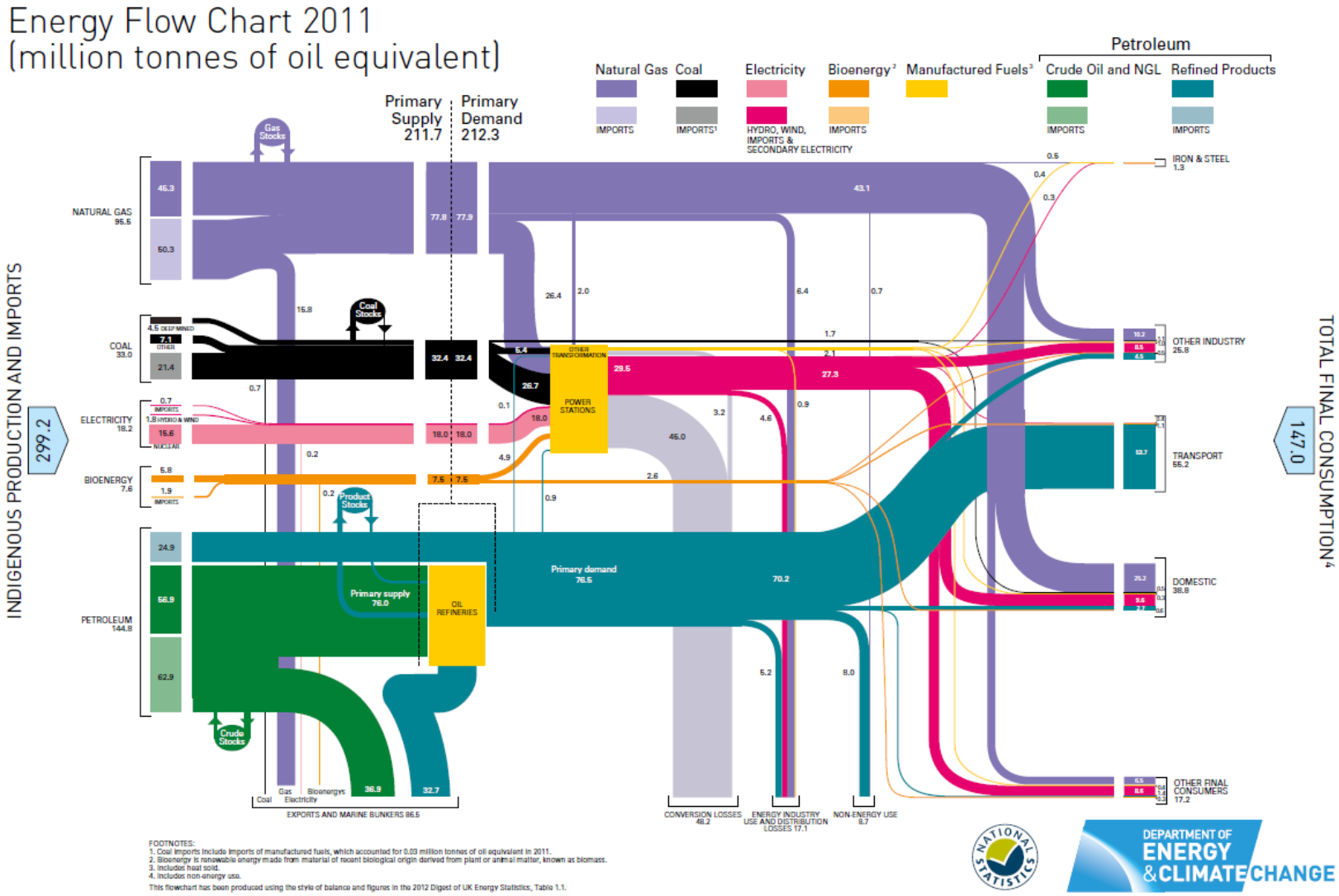
Key users

- Departmental energy policy
- Macro measures of energy efficiency
- Energy security of supply
- Source for emissions information
- Input to National Accounts (IOP)
- Energy industries
- International bodies
- … and general public.

DECC Statistics

Energy Flow Chart

Department of Energy & Climate Change



FOOTNOTES:
1. Coal imports include imports of manufactured fuels, which accounted for 0.03 million tonnes of oil equivalent in 2011.
2. Bioenergy is renewable energy made from material of recent biological origin derived from plant or animal matter, known as biomass.
3. Includes heat sold.
4. Includes non-energy use.

This flowchart has been produced using the style of balance and figures in the 2012 Digest of UK Energy Statistics, Table 1.1.

NATIONAL STATISTICS

DEPARTMENT OF ENERGY & CLIMATE CHANGE

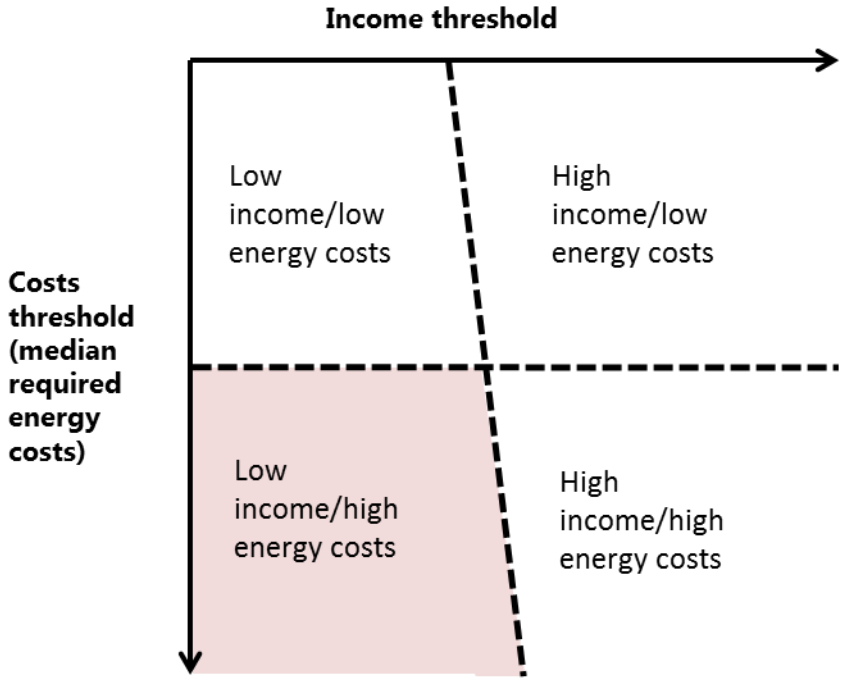
DECC Statistics
Policy Support

Department of Energy & Climate Change

Fuel Strikes and other disruptions – the statistics team support policy and industry by providing updates on fuel stocks and predicting likely outcomes from various operational scenarios.

Fuel Poverty – Hills Review

Latest estimates by old and new approach published Thursday 16th May.



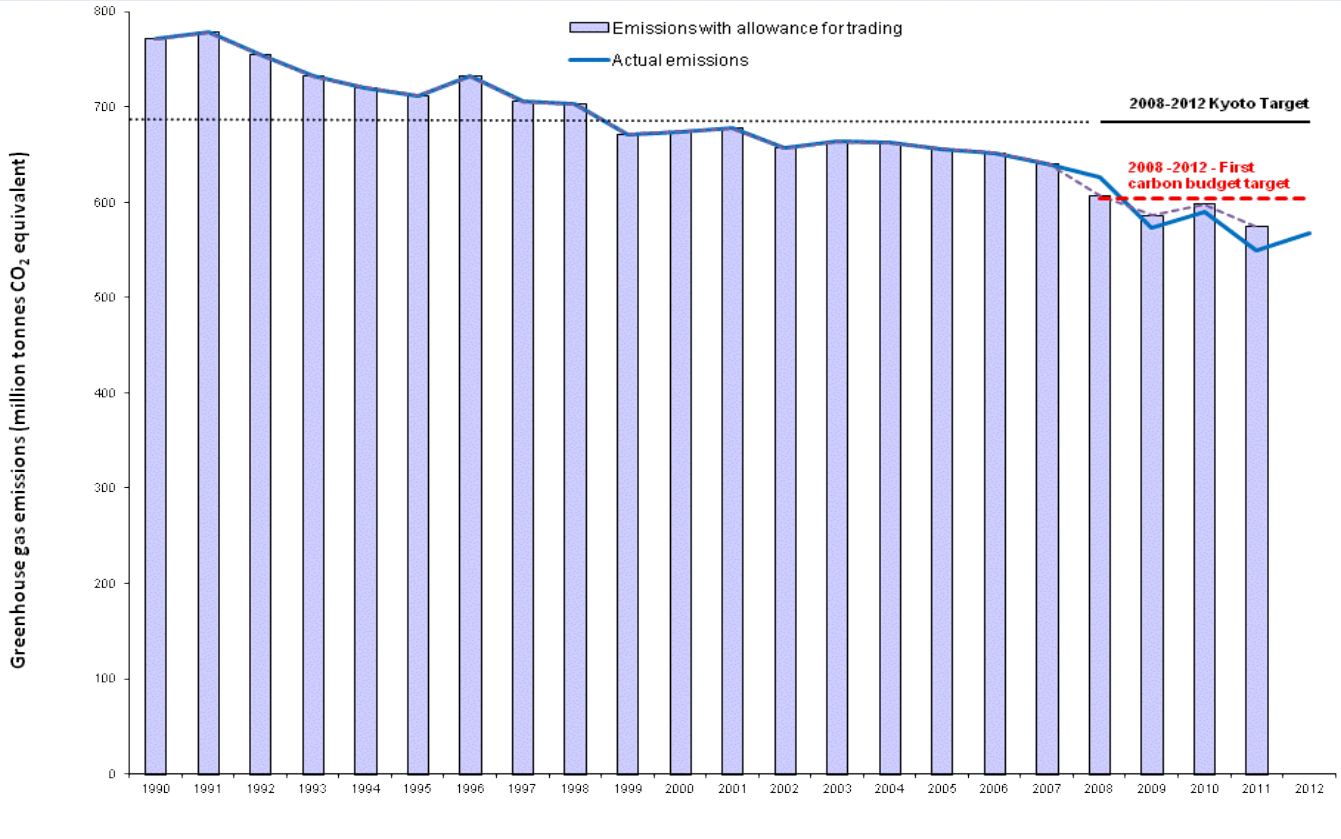
DECC Statistics

Policy support

Department of Energy & Climate Change

Understanding progress against emissions targets e.g for the 5-year period 2008-12

- International target - Kyoto Protocol = 12.5% reduction from base year
- Domestic target - Carbon Budget = 22% reduction from base year



Department of Energy & Climate Change

All outputs are available on the DECC website:

https://www.gov.uk/government/organisations/department-of-energy-climate-change/about/statistics

Also includes a range of tools and presentational formats which compliment the publications.

Underlying data for all outputs is also available on the website in Microsoft Excel and/or CSV files.

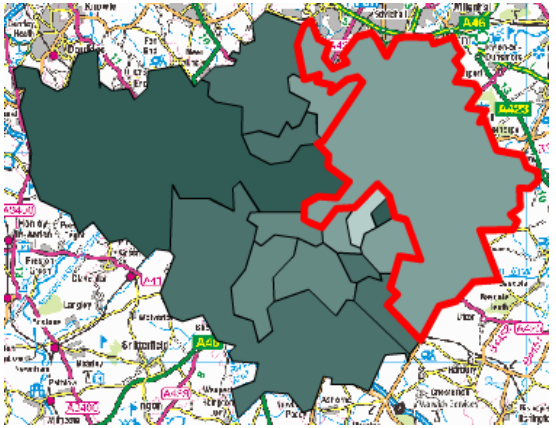
DECC Statistics

Sub-national data and tools

Department of Energy & Climate Change

Analyse data at low levels of geography – obtained by processing over 55 million pieces of meter-point level gas and electricity consumption; data published for:

- Local Authorities (LA)
- Middle Layer Super Output Areas (MSOA)
  /Intermediate Geography Zones
- Lower Layer Super Output Areas (LSOA)



For instance: Warwick LA is split into 15 MSOAs (above) and 88 LSOAs.

Looking at consumption for these breakdowns can help identify small pockets of low and high consuming users.

DECC won a “Royal Statistical Society” innovation & development award for producing this data in 2010.

Also won RSS award in 2012 for work on Fuel Poverty.

DECC Statistics

Sub-national data and tools

Department of Energy & Climate Change

Comparisons between local authorities

Select a relevant option from each of the drop down lists below, including up to 6 local authorities to compare.

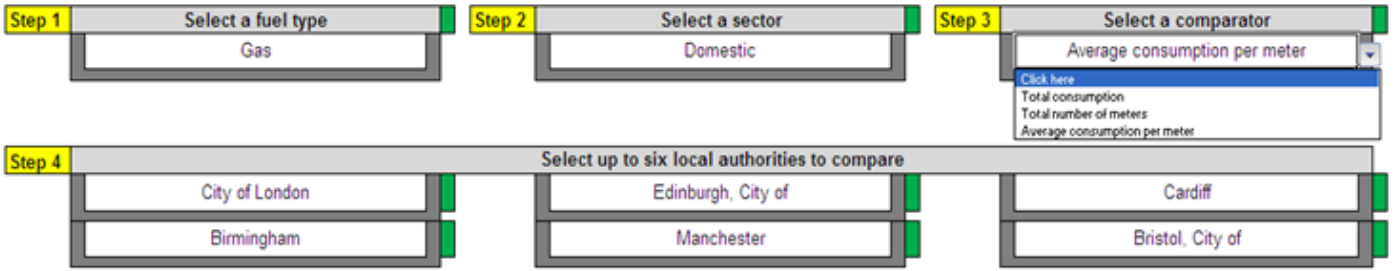
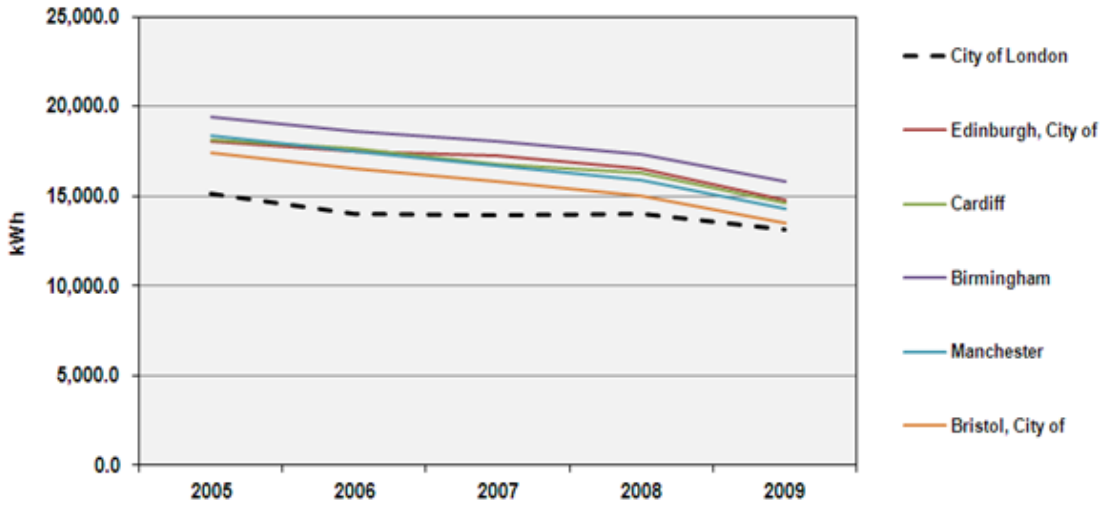


Chart 2:

Average consumption per meter for gas in the Domestic sector, 2005 to 2009



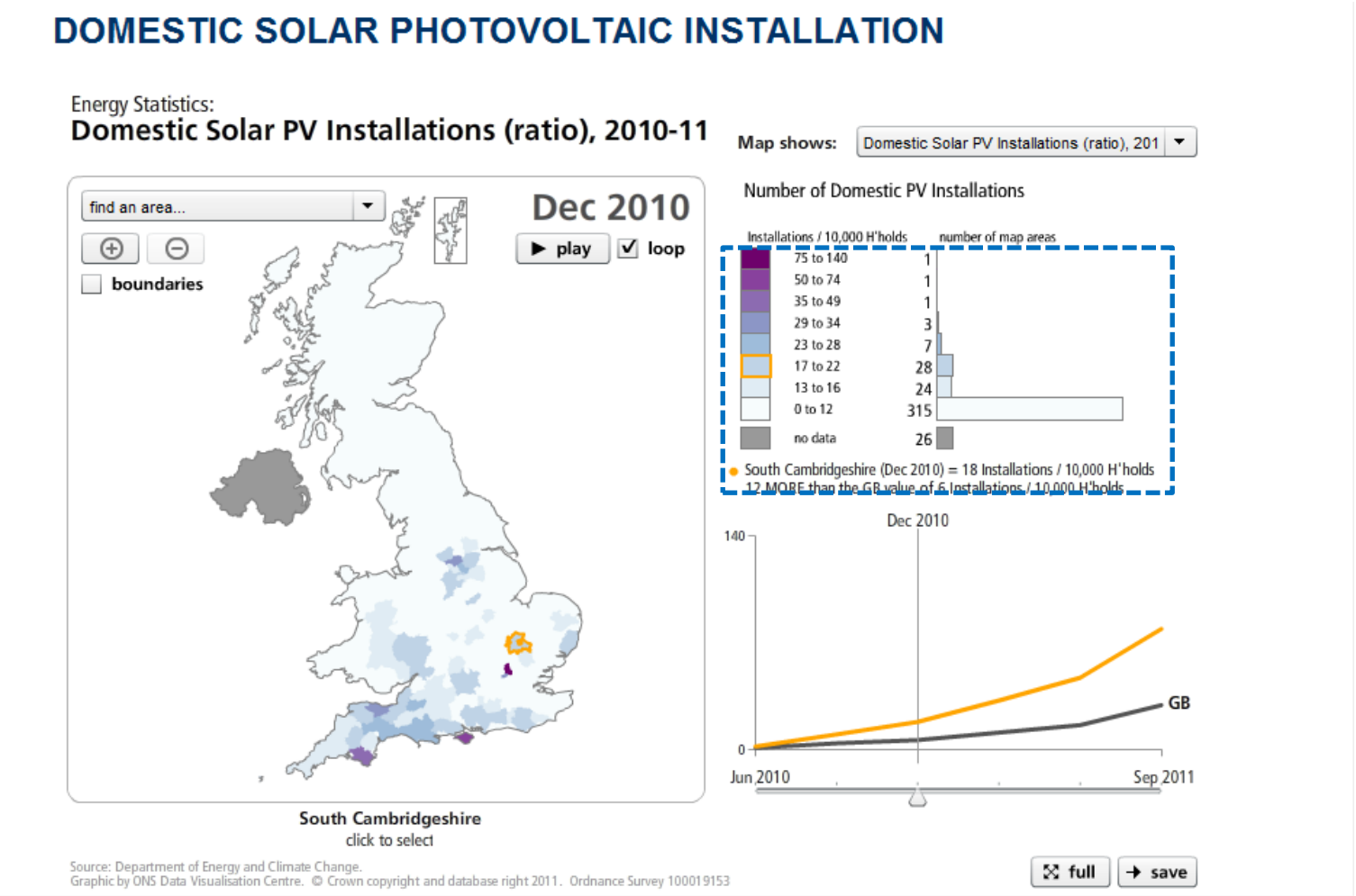
Source: Sub-national energy statistics, DECC

Please note that these data have been weather corrected and cover the gas year (1st October to 30 September) not the calendar year.

DECC Statistics

Interactive Maps

Department of Energy & Climate Change

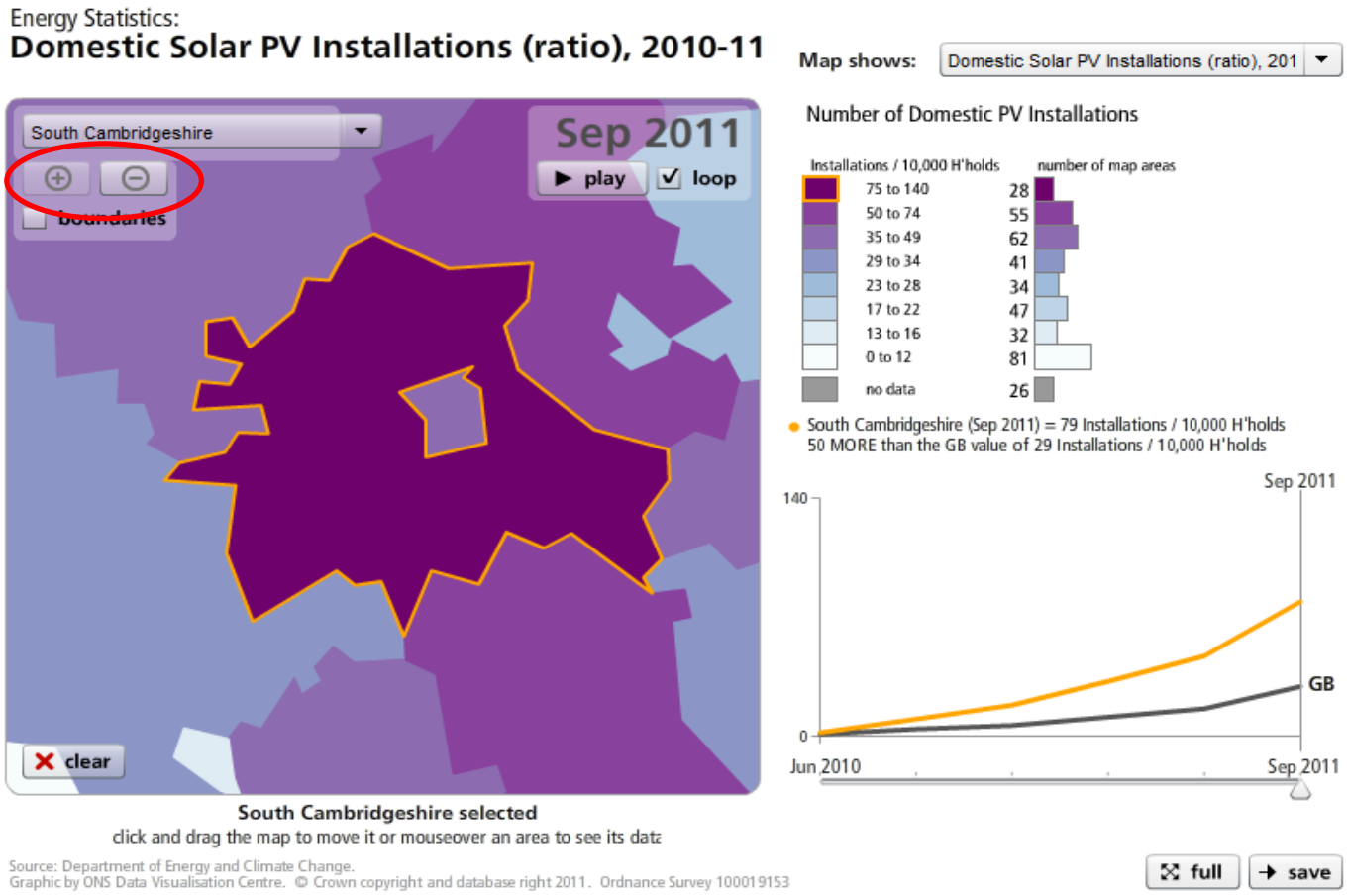


https://www.gov.uk/government/organisations/department-of-energy-climate-change/series/interactive-maps-trends-in-fuel-poverty-energy-use-and-energy-efficiency-measures

DECC Statistics
Interactive Maps

Department of Energy & Climate Change

DOMESTIC SOLAR PHOTOVOLTAIC INSTALLATION



Department of Energy & Climate Change

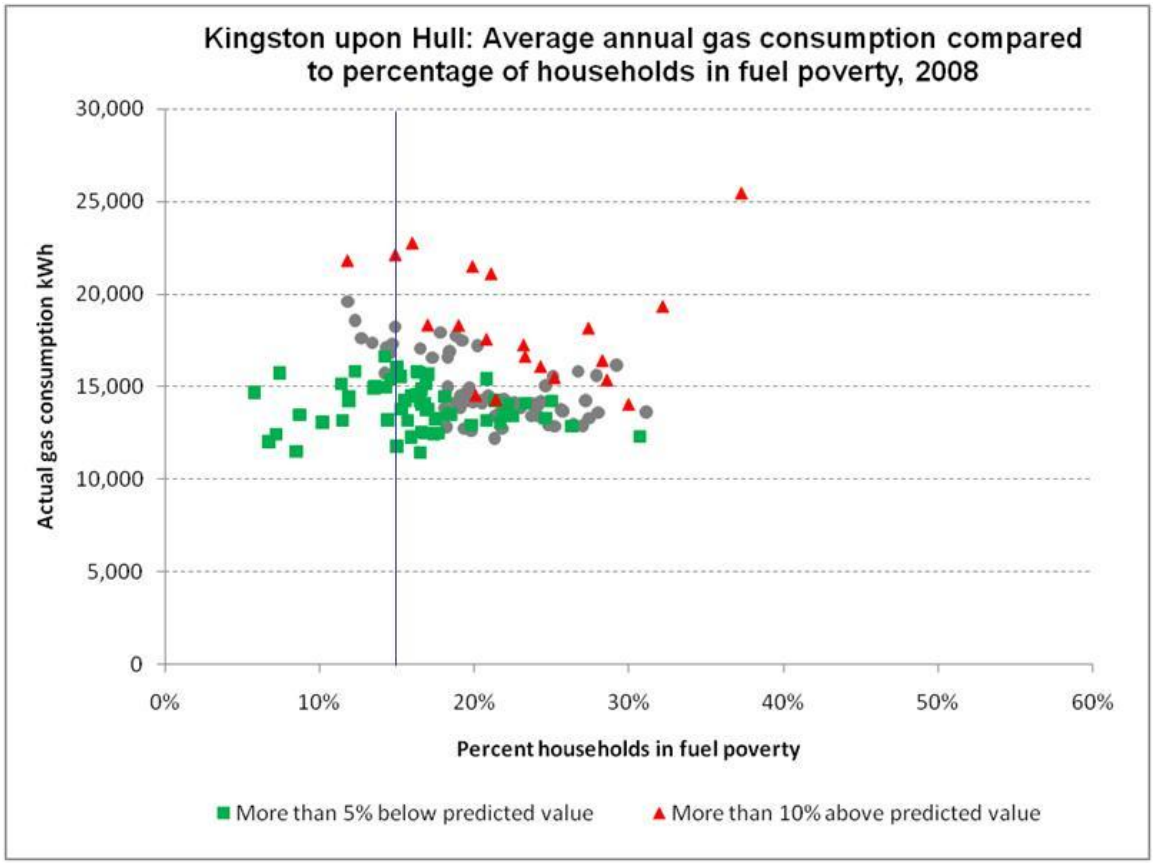
Neighbourhood Statistics Analysis

Identifying areas with higher than expected domestic gas use

• Produce a statistical model based on published data, which would aid local authorities and energy companies in identifying areas that may be most likely to benefit from energy efficiency investments and thus potentially reduce search costs in indentifying homes.

•Working with LAs to boost activity in Green Deal.

•Still testing and looking to improve model.



DECC Statistics

Key drivers going forward

Department of Energy & Climate Change

- Quality data – timely, relevant data produced to good and open methodology that are **used and make an impact**
- Maintain strong reputation for DECC statistics in UK and Internationally through maintaining and expanding quality data
- Wider users need data that refers to them – local data and access to anonymised underlying data
- Proactive use and design of management information data and data linking
- Help delivery
- Data dissemination must adapt with technology

Department of Energy & Climate Change

Domestic NEED Overview

Mary Gregory

What's covered…

Department of Energy & Climate Change

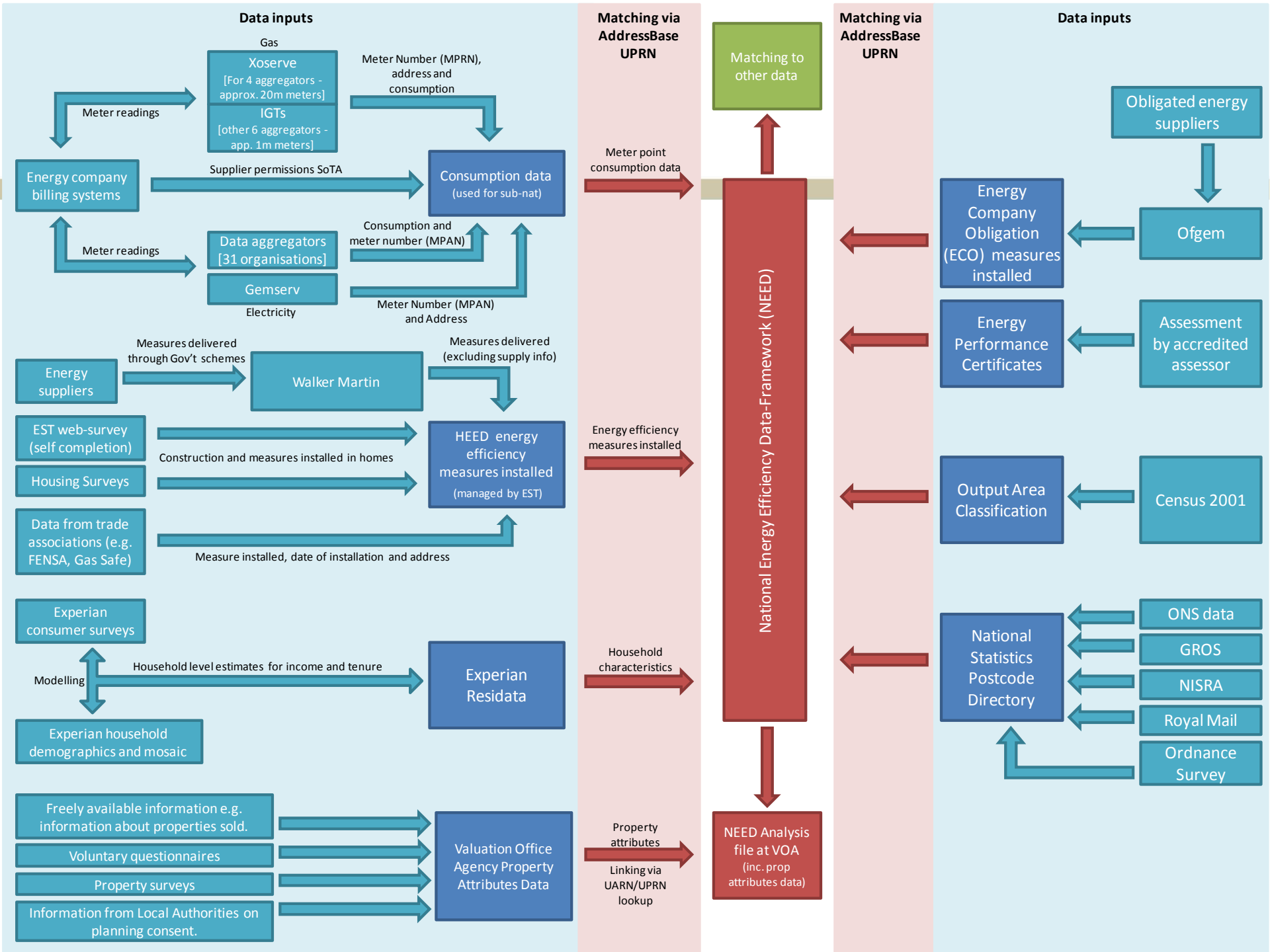
- What is NEED?
- Developments during 2012
- Summary of results
- How outputs have been used to date
- Future plans

What is NEED?

Department of Energy & Climate Change

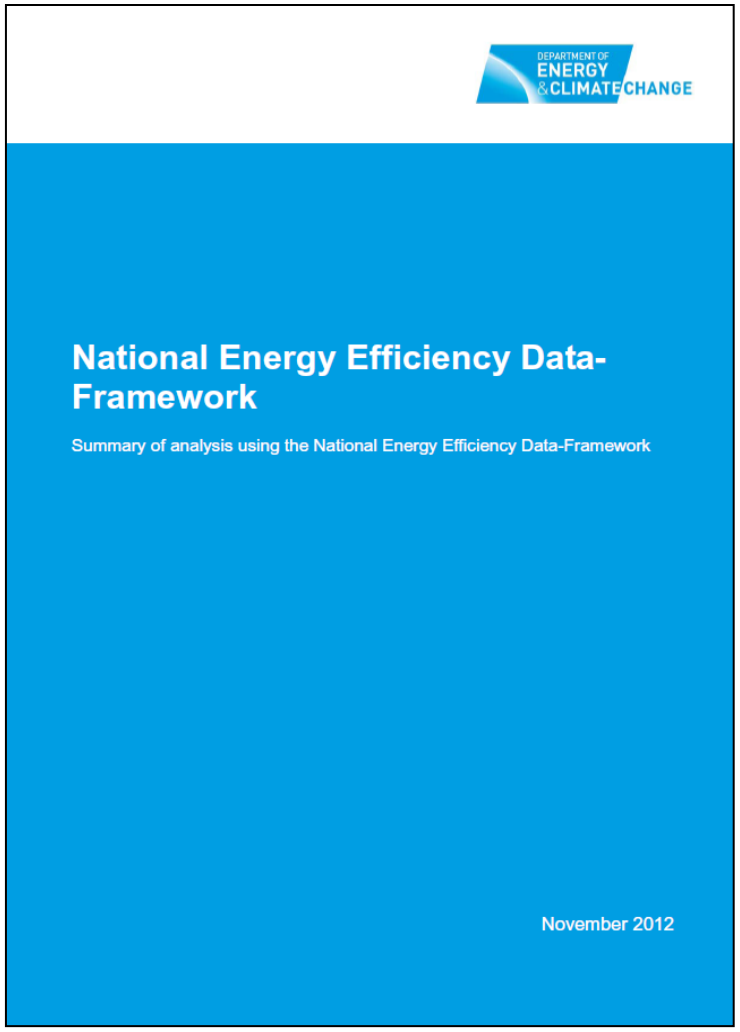
NEED is a framework for combining data from existing sources (administrative and commercial) to provide insights into how energy is used and what the impact of energy efficiency measures is, for different types of property and household.

In Scope	Out of Scope
Domestic and non-domestic properties	Very large consumers e.g. power stations
Great Britain	Northern Ireland
Metered gas and electricity	Non-metered fuels e.g. oil, coal
Energy Efficiency Measures in HEED	DIY measures and others not recorded on HEED


Data inputs
Gas
Xoserve
[For 4 aggregators - approx. 20m meters]
IGTs
[other 6 aggregators - app. 1m meters]
Meter Number (MPRN), address and consumption
Meter readings
Energy company billing systems
Supplier permissions SoTA
Consumption data
(used for sub-nat)
Meter readings
Data aggregators
[31 organisations]
Gemserv
Electricity
Consumption and meter number (MPAN)
Meter Number (MPAN) and Address
Energy suppliers
Measures delivered through Gov't schemes
Walker Martin
Measures delivered (excluding supply info)
EST web-survey (self completion)
Housing Surveys
Construction and measures installed in homes
HEED energy efficiency measures installed
(managed by EST)
Data from trade associations (e.g. FENSA, Gas Safe)
Measure installed, date of installation and address
Experian consumer surveys
Modelling
Household level estimates for income and tenure
Experian Residata
Experian household demographics and mosaic
Freely available information e.g. information about properties sold.
Voluntary questionnaires
Property surveys
Information from Local Authorities on planning consent.
Valuation Office Agency Property Attributes Data
Matching via AddressBase UPRN
Meter point consumption data
Energy efficiency measures installed
Household characteristics
Property attributes
Linking via UARN/UPRN lookup
Matching to other data
National Energy Efficiency Data-Framework (NEED)
NEED Analysis file at VOA
(inc. prop attributes data)
Matching via AddressBase UPRN
Data inputs
Obligated energy suppliers
Ofgem
Energy Company Obligation (ECO) measures installed
Energy Performance Certificates
Assessment by accredited assessor
Output Area Classification
Census 2001
National Statistics Postcode Directory
ONS data
GROS
NISRA
Royal Mail
Ordnance Survey

Summary of results – published November 2012

Department of Energy & Climate Change



Structure of report:

Main report

Annexes

Supplementary data tables

For more information contact:

Mary Gregory (mary.gregory@decc.gsi.gov.uk)

Claire Pini (claire.pini@decc.gsi.gov.uk)

Victoria Obudulu (victoria.obudulu@decc.gsi.gov.uk)

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

Developments

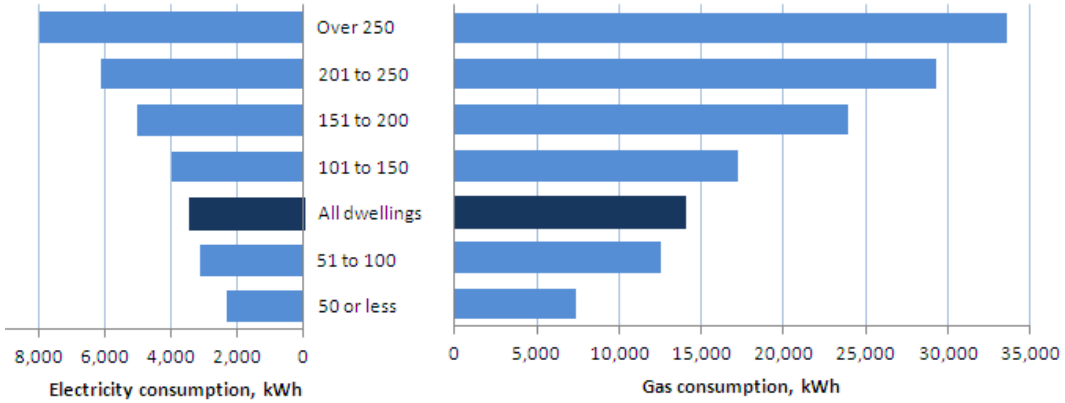
Department of Energy & Climate Change

- Refined methodology
- Results for
  - 2005 – 2009 (impact of measures)
  - 2005 – 2010 (consumption)
- Estimate of impact of solid wall insulation and longer term impact of all measures
- More detailed breakdowns of consumption by property types
- Data at local authority level
- Table including multiple attributes
- Assessment of non-domestic NEED

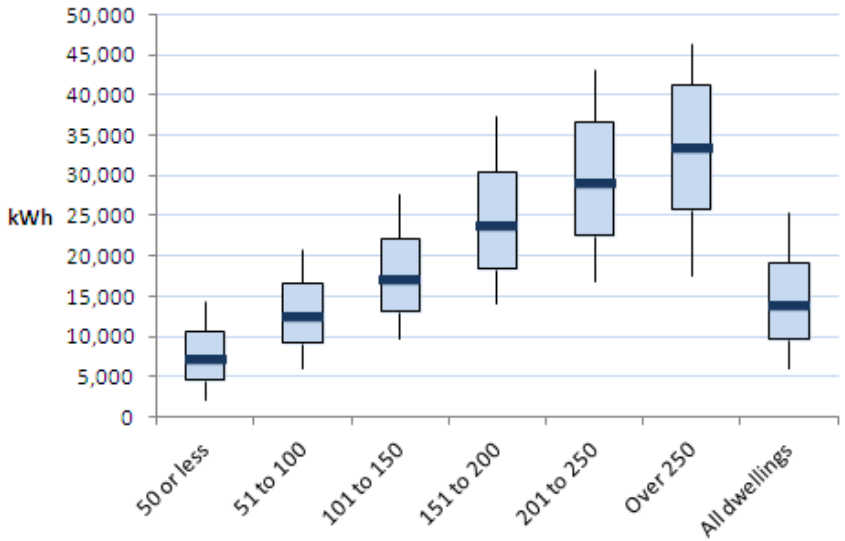
Results - Domestic consumption
Floor area (in m²)

Department of Energy & Climate Change

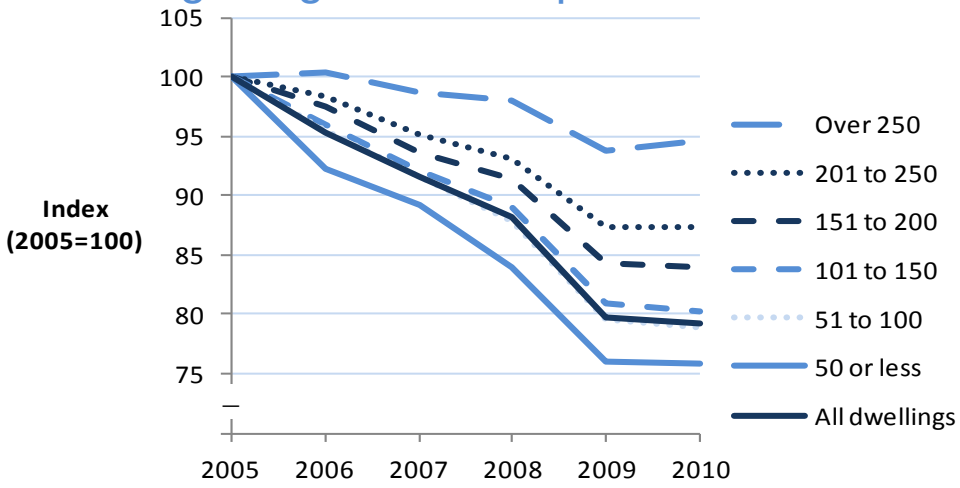
Median gas and electricity consumption



Range in gas consumption

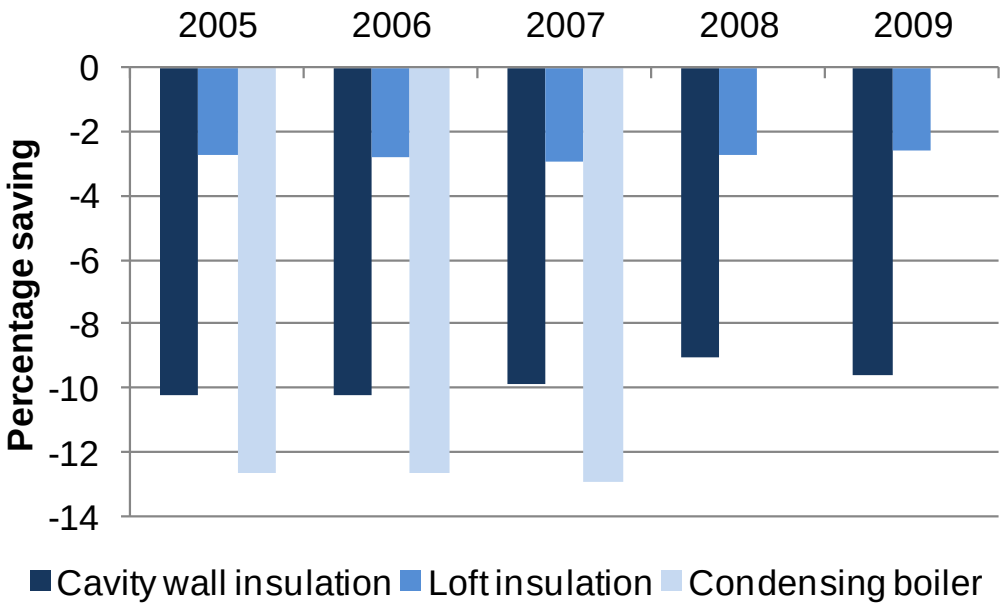


Change in gas consumption over time



Impact of energy efficiency measures Summary

Department of Energy & Climate Change



- 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

Making more data available

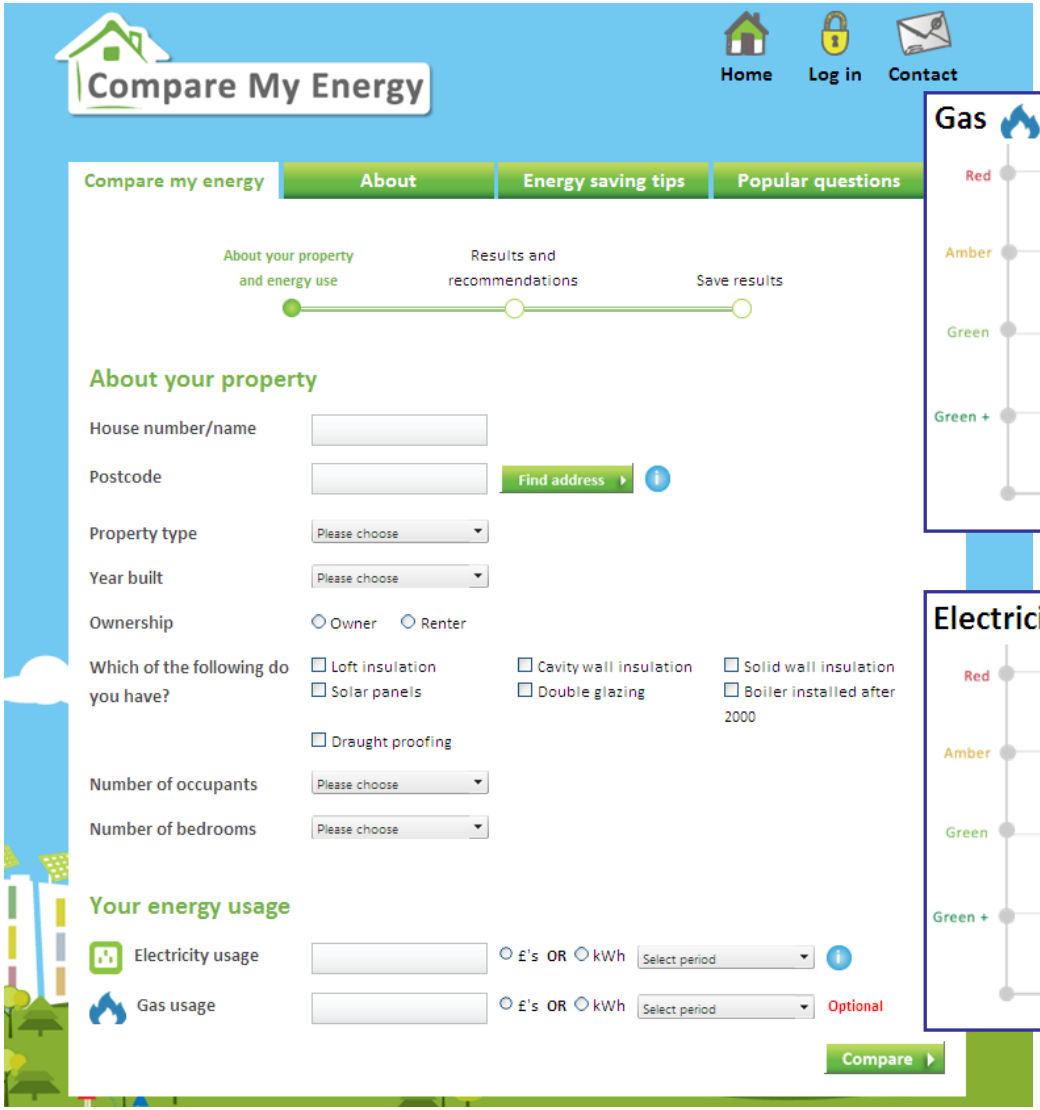
Department of Energy & Climate Change

- Table of data by multiple attributes published alongside November 2012 publication (3691 rows of data).
- Published with limited formatting to allow it to be easily reused

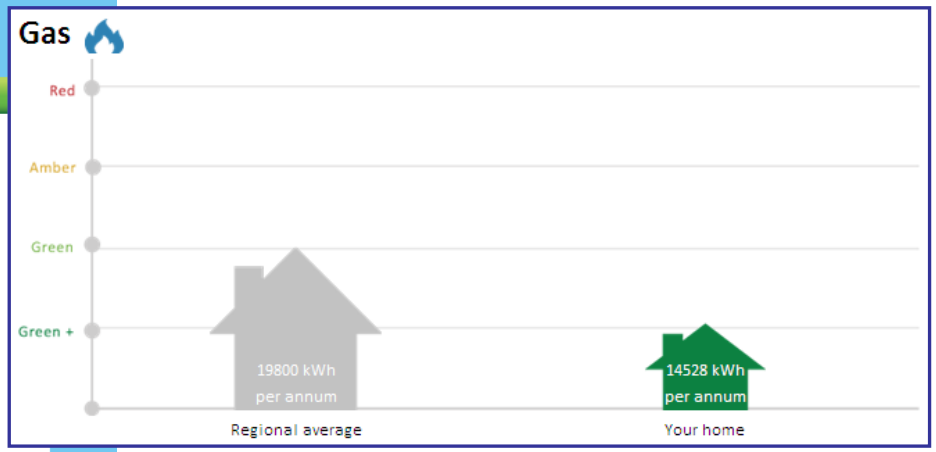
	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	2010 gas and electricity consumption by property attributes														
2															
3								Gas consumption (2010)				Electricity consumption (2010)			
4	Region	Dwelling type	Dwelling age	Number of bedrooms	Gas present	Electricity type	N	Mean	Upper quartile	Median	Lower quartile	Mean	Upper quartile	Median	Lower quartile
5	North East	Detached	Pre 1919	2 bedrooms	Yes	Standard	50	22,300	27,700	21,600	16,400	4,100	5,200	3,400	2,700
6	North East	Detached	Pre 1919	2 bedrooms	No	Standard	70	..	..	..	..	5,300	6,800	4,000	2,900
7	North East	Detached	Pre 1919	3 bedrooms	Yes	Standard	130	26,400	31,000	26,100	22,000	5,100	5,800	4,400	3,400
8	North East	Detached	Pre 1919	3 bedrooms	No	Standard	120	..	..	..	..	6,800	8,800	5,700	3,800
9	North East	Detached	Pre 1919	4 bedrooms	Yes	Standard	90	31,500	39,300	33,000	25,400	5,700	6,600	5,000	4,000
10	North East	Detached	Pre 1919	4 bedrooms	No	Standard	90	..	..	..	..	7,300	9,100	6,900	4,600
11	North East	Detached	Pre 1919	5 or more bedrooms	Yes	Standard	40	32,500	38,100	32,300	27,000	6,000	7,200	5,300	3,800
12	North East	Detached	Pre 1919	5 or more bedrooms	No	Standard	60	..	..	..	..	8,600	11,100	6,600	4,800
13	North East	Detached	1919-44	3 bedrooms	Yes	Standard	220	25,200	31,000	25,000	19,300	4,900	5,800	4,200	2,900
14	North East	Detached	1919-44	4 bedrooms	Yes	Standard	150	29,700	35,700	28,200	23,200	5,100	6,000	4,800	3,300
15	North East	Detached	1919-44	5 or more bedrooms	Yes	Standard	30	33,400	42,000	38,100	25,400	5,100	6,900	4,700	3,200
16	North East	Detached	1945-64	2 bedrooms	Yes	Standard	40	21,100	26,000	20,800	15,300	3,700	4,600	3,200	2,700
17	North East	Detached	1945-64	3 bedrooms	Yes	Standard	440	22,400	27,100	21,200	16,400	4,200	5,300	3,800	2,700
18	North East	Detached	1945-64	3 bedrooms	No	Standard	30	..	..	..	..	6,000	7,400	5,400	3,800
19	North East	Detached	1945-64	4 bedrooms	Yes	Standard	280	26,700	33,800	25,400	19,800	5,000	6,200	4,500	3,300
20	North East	Detached	1945-64	5 or more bedrooms	Yes	Standard	70	27,900	32,800	27,000	22,600	5,100	6,200	4,900	3,300
21	North East	Detached	1965-82	2 bedrooms	Yes	Standard	50	17,900	21,800	16,400	13,200	3,500	4,300	3,400	2,200
22	North East	Detached	1965-82	3 bedrooms	Yes	Standard	2,010	18,800	22,600	17,800	14,300	4,200	5,100	3,800	2,800

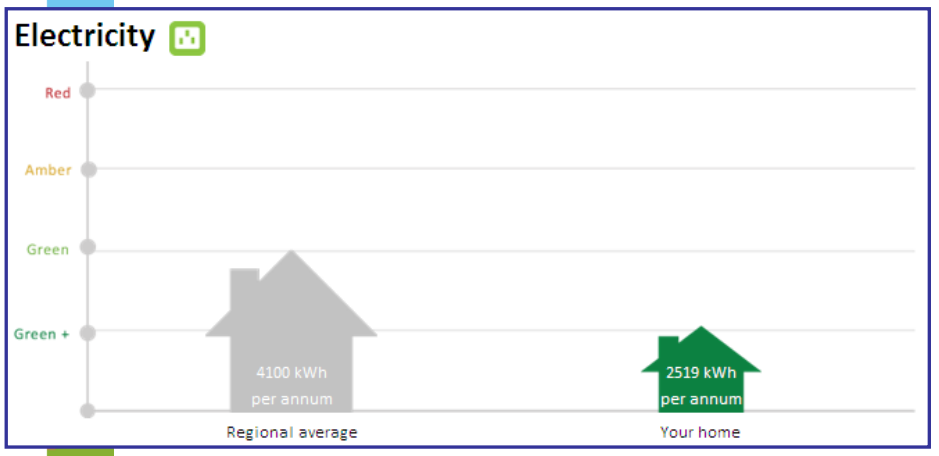
Working with industry

Department of Energy & Climate Change



http://www.comparemyenergy.org.uk/





Making data more accessible

Department of Energy & Climate Change

- Table Creator tool published 16th May

Variable 1 (Column) Property Type **Median/Mean:** Median **Fuel:** Gas **Year:** 2010

Variable 2 (Row) Region

Median Gas Consumption 2010 (kWh)

		Property Type										
		Detached	Semi detached	End terrace	Mid terrace	Bungalow	Converted flat	Purpose built flat				Total
Region	North East	19,000	15,500	14,100	13,300	14,000	10,600	8,600				14,400
	North West	20,000	15,200	13,500	12,100	14,900	8,500	6,900				14,100
	Yorks & Humber	19,800	15,200	14,200	12,700	14,300	9,100	7,300				14,400
	East Midlands	18,500	14,400	13,200	12,200	14,000	9,200	7,000				14,400
	West Midlands	18,600	14,700	13,300	12,400	13,400	8,600	7,300				14,100
	East of England	19,500	15,100	13,200	11,800	13,900	9,500	7,500				14,000
	London	26,900	19,900	16,600	14,900	17,100	10,600	8,900				14,300
	South East	20,000	14,700	12,700	11,600	14,600	9,500	7,400				14,000
	South West	16,900	12,700	11,300	10,500	13,100	8,900	6,600				12,400
Total		19,300	15,100	13,500	12,400	14,200	9,800	7,800				14,000

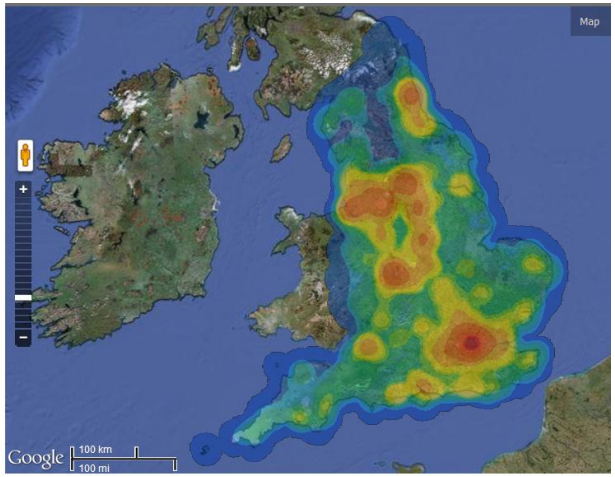
How outputs have been used within DECC

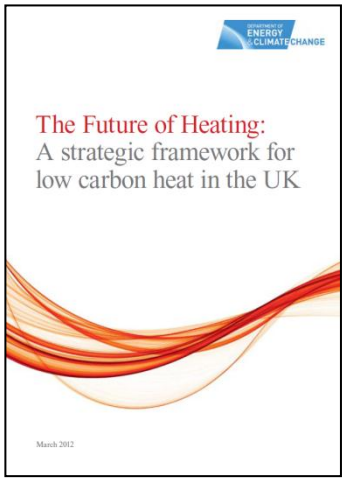
Department of Energy & Climate Change

Within DECC, outputs from NEED have already been used to inform a number of important policies, including:

- Estimates of savings from insulation measures to inform development of Green Deal and ECO.
- Consumption by income and tenure to inform Fuel Poverty policy.
- Consumption by property attributes to inform development of heat policy.
- DECC's Heat Map.

GREEN DEAL APPROVED

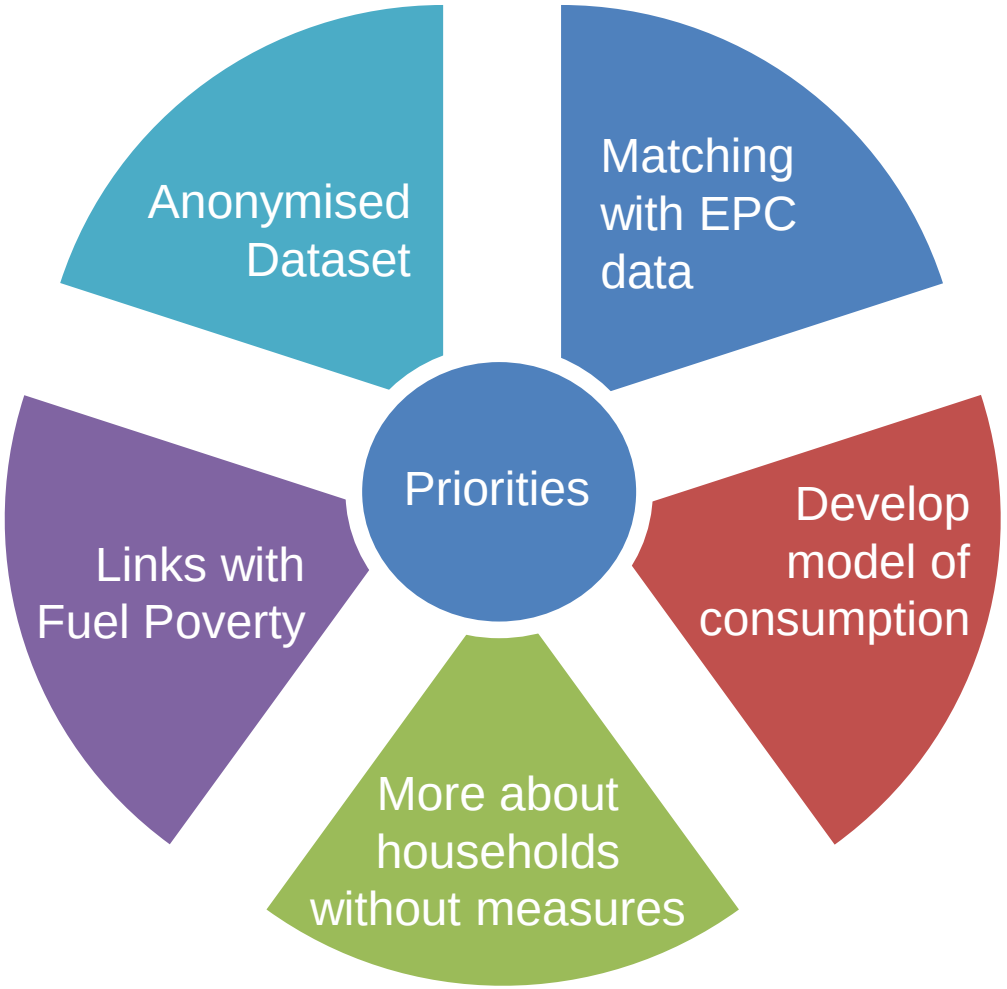




Priorities from Stakeholder Event November 2011

Department of Energy & Climate Change

A large range of ideas for the future of NEED were suggested at the event which were refined to give a short list of priorities for the future of NEED. Progress has been made on a number of these.



Future Plans – Phase 3 Aims

Department of Energy & Climate Change

- To produce estimates of consumption and savings from energy efficiency measures to inform policy evaluation and development (in national and local Government).
- To produce an anonymised domestic dataset available to approved external users.
- Further explore model of domestic energy consumption.
- To produce outputs in line with National Statistics guidance and standards.
- To communicate the results and benefits of NEED.

Beyond 2012 – summary project plan

Department of Energy & Climate Change

	Jan-March - complete	April - June	July – December	Longer term
Domestic	• Migration to internal hosting of NEED. • Refresh analysis sample (including Wales). • Identify key variables for model of consumption. • Produce PIA.	• Produce and publish consumption tables for 2011 cons. data. • Review impact of measure methodology. • Include final CERT and CESP measures in NEED. • Input into CERT and CESP evaluation. • Agreements in place for anonymised dataset. ◆	• Produce and publish updated impact of measures analysis (inc. measures installed in 2010). • Production and testing anonymised dataset. • Modelling alternative to Experian data. • Conversion to AddressBase. • Initial analysis of EPC data. ◆	• Input into Smart Meters and Green Deal reporting and evaluation. • Inclusion of data for Scotland. • National Statistics assessment. • Inclusion of additional measures. • Updated model of energy consumption

◆ Planned publications

Department of Energy & Climate Change

Questions…

Or comments on:

•Have DECC outlined the right priorities for the next 12-24 months?

•Are there any ways DECC could work more closely with your organisations to add value to outputs?

•Are there any ways we could better present outputs or communicate NEED?

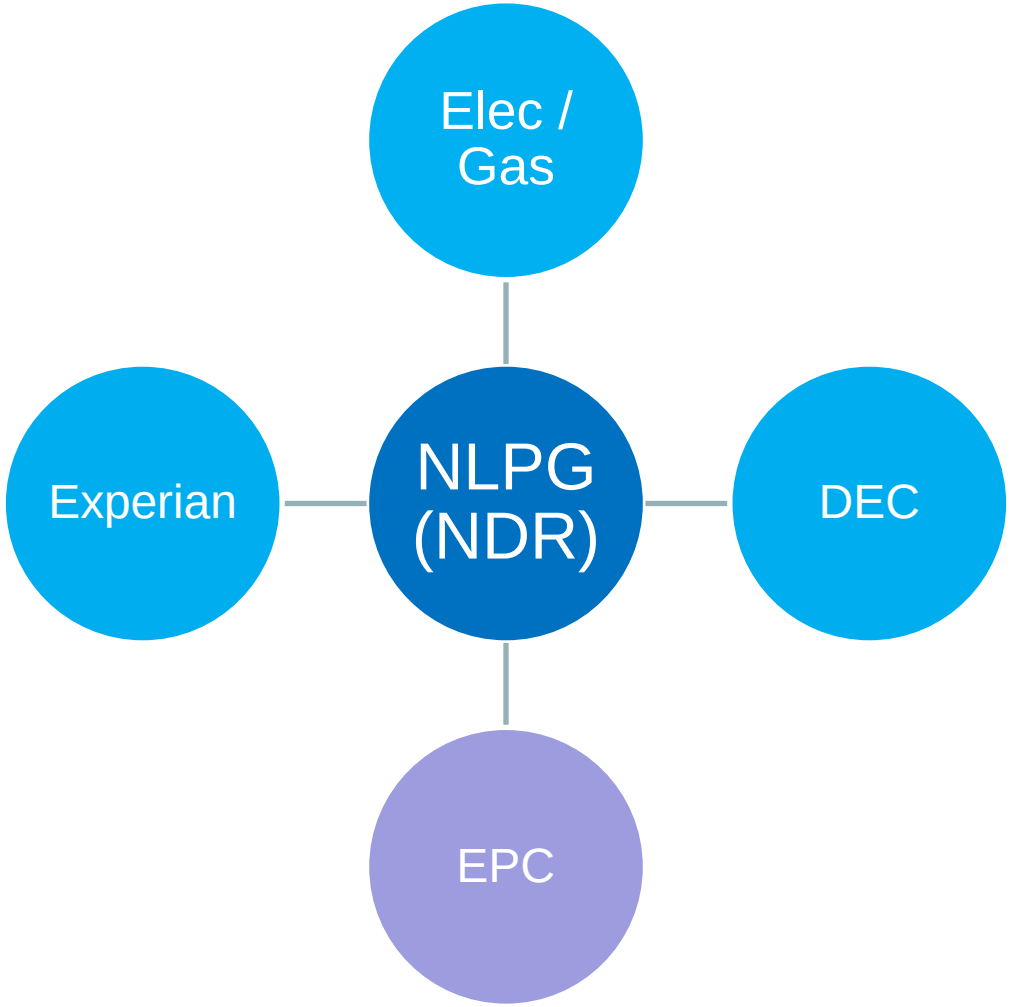
Department of Energy & Climate Change

Non-domestic NEED Overview

Sam Trewin

What is non-domestic NEED

Department of Energy & Climate Change



FRAMEWORK

Coverage: England & Wales

Consumption: Metered electricity & gas only

Non domestic ratings spine

c.1.8 million rateable spaces ***(****hereditaments/sub-premises)*

↓

c.1.6 million properties

Matched at property level

- Same approach as domestic
- Currently no measures data

Purpose of non-domestic NEED

Department of Energy & Climate Change

Understand metered energy consumption across building type and business sector	**Provide a framework for matching non-domestic admin/survey/programme data**
Build a profile of the non-domestic building stock	**Support the Non-domestic Energy Use project**

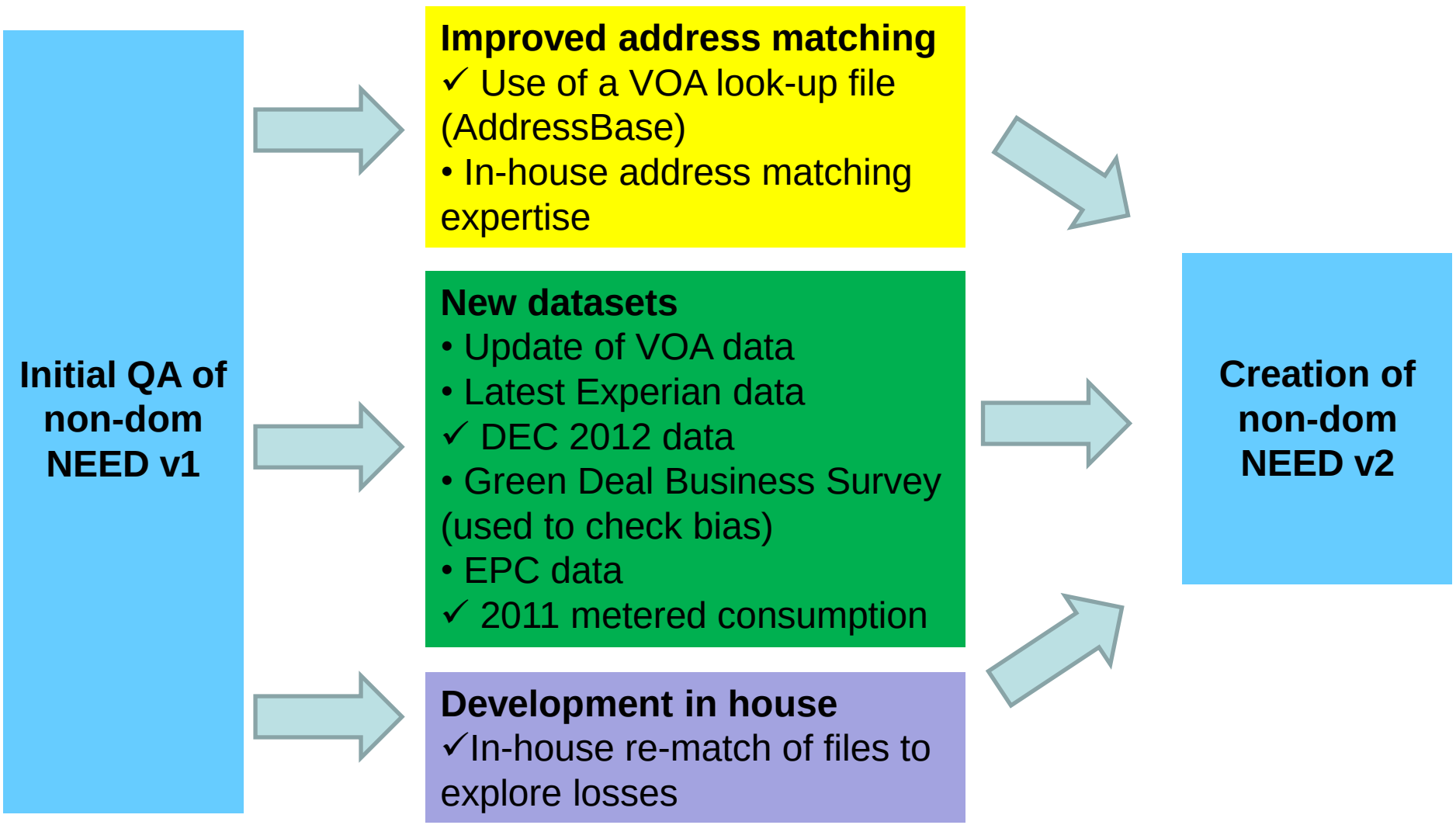
Project history and plan

Department of Energy & Climate Change

Projects	Dates
First matching attempt of non-domestic NEED	March 2012
Initial QA revealed a number of issues (e.g. poor matching, loss of consumption, missing records)	Summer 2012
NEED Report sets out some results and challenges from the QA	November 2012
Development of NEED version 2 (in house, making use of new data sources to improve matching rates)	March 2013
Structured QA to determine potential uses of NEED version 2 or further improvement work-streams	To May 2013
Next steps – review of QA/update of data (VOA and Experian, new address matching techniques)/possible publication of results	Summer 2013

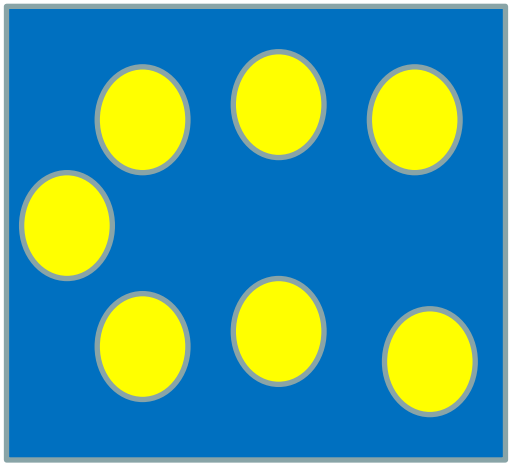
Planned improvement workstreams

Department of Energy & Climate Change

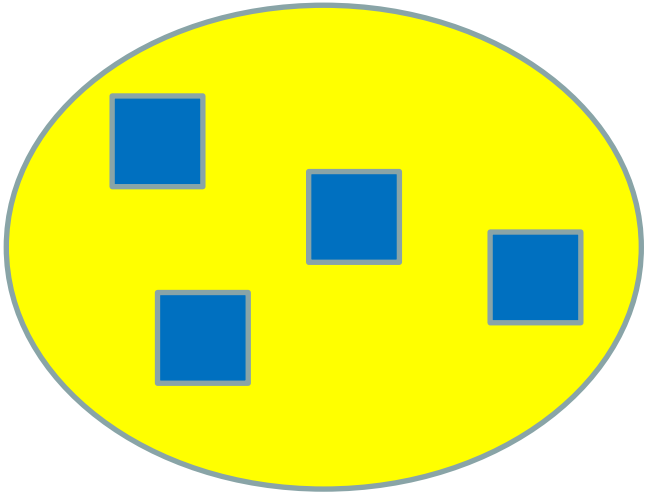


Why is it so hard to count non-domestic buildings?

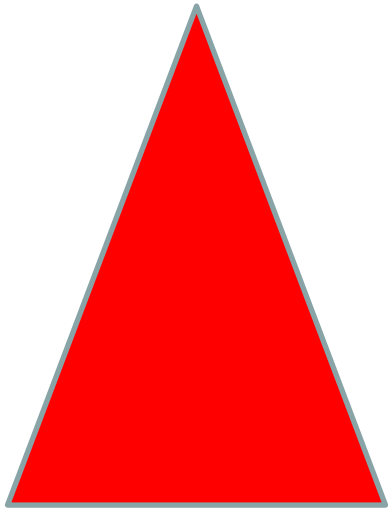
Department of Energy & Climate Change



Scenario 1: A building is occupied by different businesses creating multiple rateable units (e.g. large office)



Scenario 2: A site (e.g. industrial / education) contains multiple buildings



Scenario 3: A rateable site contains no buildings e.g. football pitch, advertising board.

Buildings

Hereditaments / rateable unit

Land without buildings

Department of Energy & Climate Change

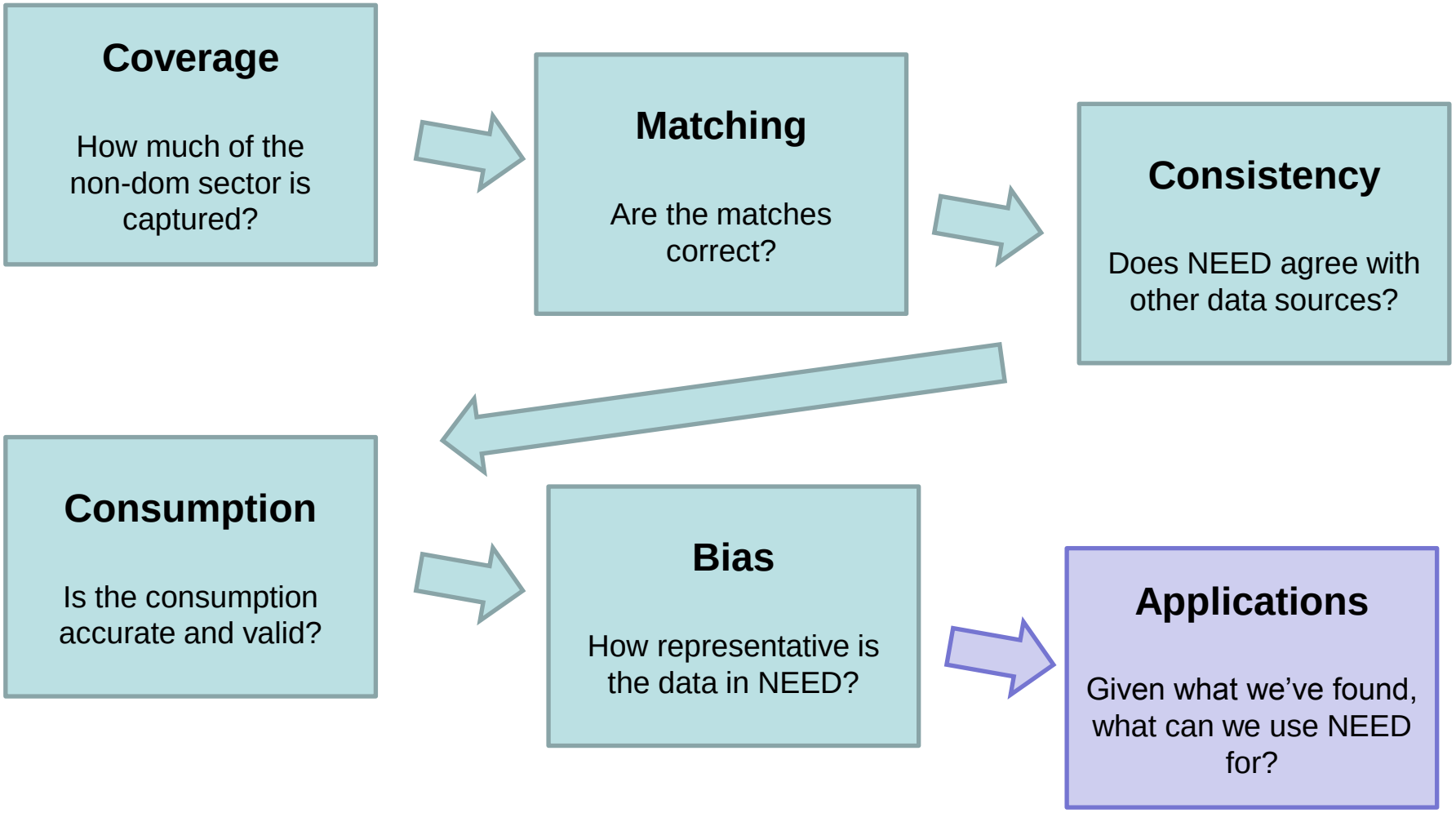
How useful is non-domestic NEED?

Emerging findings from Quality Assurance

QA Plan for Non-domestic NEED

Six factors to consider

Department of Energy & Climate Change



Initial QA of outputs and emerging findings

Department of Energy & Climate Change

Work in progress, results excluded

Department of Energy & Climate Change

Non-domestic NEED going forwards

Challenges encountered in non-domestic NEED

Department of Energy & Climate Change

- **Data matching rates** significantly lower than domestic – risk of bias in results
- Complicated **address structure** creates risk of misleading information (e.g. business run from home using one set of meters)
- Interpreting results for a **diverse sector**
- Limited existing **data landscape** to verify results against
- Part of the success of domestic NEED was the information on **measures installed**. This does not yet exist centrally for non-domestic buildings.

Applications

What can we use NEED for?

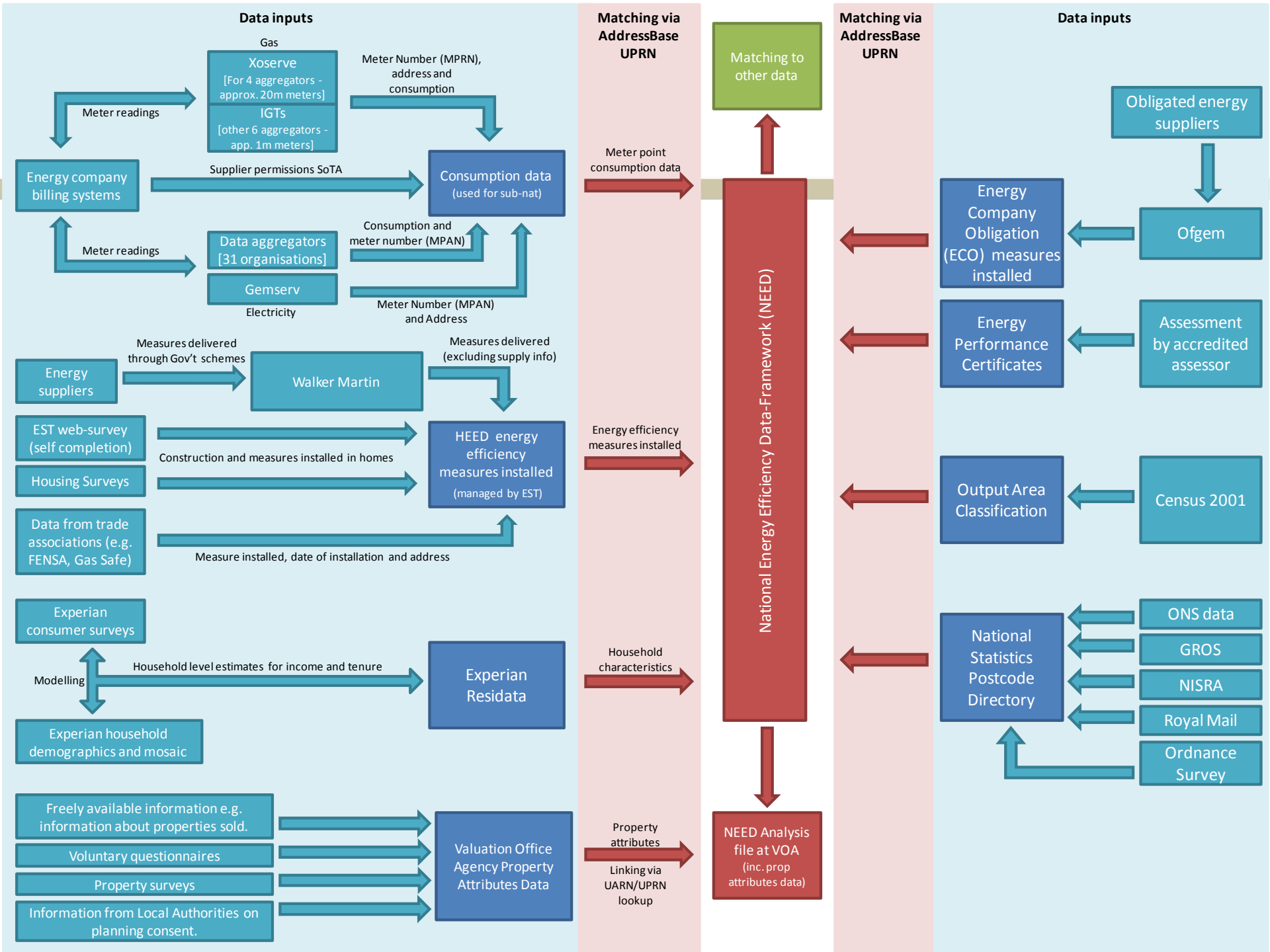
Department of Energy & Climate Change

- Will not know exactly until QA finished but there are several possible outcomes

GOOD COVERAGE? \ UNBIAS?	✓	✗
✓	Fully useable for robust subsector consumption estimates and as a framework	Still works as a framework, could investigate methods of correcting bias
✗	Take as representative of covered sector, look to improve coverage	Limited use

Department of Energy & Climate Change

Anonymised (domestic) dataset


Data inputs
Gas
Xoserve
[For 4 aggregators - approx. 20m meters]
IGTs
[other 6 aggregators - app. 1m meters]
Meter Number (MPRN), address and consumption
Meter readings
Energy company billing systems
Supplier permissions SoTA
Consumption data
(used for sub-nat)
Meter readings
Data aggregators
[31 organisations]
Gemserv
Electricity
Consumption and meter number (MPAN)
Meter Number (MPAN) and Address
Energy suppliers
Measures delivered through Gov't schemes
Walker Martin
Measures delivered (excluding supply info)
EST web-survey (self completion)
Housing Surveys
Construction and measures installed in homes
HEED energy efficiency measures installed
(managed by EST)
Data from trade associations (e.g. FENSA, Gas Safe)
Measure installed, date of installation and address
Experian consumer surveys
Modelling
Household level estimates for income and tenure
Experian Residata
Experian household demographics and mosaic
Freely available information e.g. information about properties sold.
Voluntary questionnaires
Property surveys
Information from Local Authorities on planning consent.
Valuation Office Agency Property Attributes Data
Matching via AddressBase UPRN
Meter point consumption data
Energy efficiency measures installed
Household characteristics
Property attributes
Linking via UARN/UPRN lookup
Matching to other data
National Energy Efficiency Data-Framework (NEED)
NEED Analysis file at VOA
(inc. prop attributes data)
Matching via AddressBase UPRN
Data inputs
Obligated energy suppliers
Ofgem
Energy Company Obligation (ECO) measures installed
Energy Performance Certificates
Assessment by accredited assessor
Output Area Classification
Census 2001
National Statistics Postcode Directory
ONS data
GROS
NISRA
Royal Mail
Ordnance Survey

Privacy Impact Assessment

Department of Energy & Climate Change

Privacy impact assessment for NEED being finalised and will then be published, seven specific privacy impacts identified:

- **Transparency:** Consumer awareness of data collection and usage
- **Public acceptability:** How people feel about data being used in this way
- **Linking:** Linking data from multiple sources
- **Quantity:** the large number of records (all properties in Great Britain)
- **Multiple organisations:** The involvement of multiple organisations in the supply and processing of the data
- **Retention:** The retention of historic data
- **Data release:** The publication of reports including outputs for aggregate data and release of an anonymised dataset at property level
- **Physical security:** security of data when transferred to and held by DECC

Producing a dataset – key steps

Department of Energy & Climate Change

Scoping – May - August

- Confirm legal agreements and see if it is possible to negotiate permissions where agreements don't allow data to be included
- Input from key users on what would be wanted out of dataset

Initial proposals and Consultation – August/September

- Set out proposals for anonymised dataset, covering sample size, variables for inclusion, level of geography etc
- Consultation on proposals

Hosting arrangements – June - September

- Agree where dataset will be hosted and how access will be managed (i.e. will it be available to all or just to approved researchers)

Production and Testing – October - December

- Produce anonymised dataset
- Internal testing DECC/ONS
- External testing

Publication – Ambition: January 2014

Data in NEED

Department of Energy & Climate Change

Energy	Energy Efficiency Measures	Property Attributes	Household characteristics	Geography	Other classifications
Gas 2005-2011	Measure installed	Property age	Household income	Region	Output Area Classification (2001 or 2011)
Electricity 2005-2011	Date of installation	Property type	Tenure	Local Authority	Index of multiple deprivation
Economy 7 flag	Scheme installed under	Number of bedrooms	Number of occupants	MSOA	Other indices of deprivation
Gas heating flag	Loft, CWI, SWI, draft proofing, double glazing, heating, RTDs	Floor area (category)	Length of residence	LSOA	Other small area outputs?
Elec heating flag				OA	
				Post code	
	Major measure flag				

Questions for discussion

Department of Energy & Climate Change

Variables

- Which variables or groups of variables are most important?
- Any variables which if excluded make the dataset unusable?
- Would modelled variables still be of use e.g. property type, gas heating flag?
- Are there any other variables not listed as already in NEED that would be usefully included? (e.g. data available at LSOA level).
- Would a weighting variable be useful?

Banding /level of geography

- What level of geography would be preferred? LSOA would mean fewer other variables, region would allow more.
- Size of gas and electricity consumption bands e.g. percentiles, quintiles or 100kWh, 1,000kWh or 5,000kWh bands.
- Are there any other variables which could be grouped/put into bands without reducing value of data?

Other

- What would the data primarily be used for?
- What size of dataset required (thousands/hundreds of thousands)?
- Is there value in the data even though it couldn't be linked to other sources (in the first stage at least)?
- Are there any more detailed aggregate outputs which would be useful in the mean time/as well?

Department of Energy & Climate Change

Methodology – impact of measures estimates

Methodology Overview

Department of Energy & Climate Change

- **June 2011** – First estimates of gas savings from installing energy efficiency measures published – for measures installed in 2006.
- Difference in difference approach used – single comparator group for all measures.

- **November 2012 –** Estimates for measures installed 2005 to 2009 published. A number of developments to methods:
  - Remove suspected estimated readings.
  - Only include households that use gas for heating (assume 2,500kWh - 50,000kWh consumption).
  - Exclude records with increase of more than 50% or decrease of more than 80% over the period.
  - Stratified comparator group for each measure and year
  - Headline on % savings.

- **November 2013 –** Next estimates - for 2010 - due to be published. Proposed developments:
  - use new sample.
  - match properties in the intervention group with an equivalent property in the comparator group – matched pairs.
  - weight the savings so that headline savings estimates reflect the full housing stock rather than just the population of households in the intervention group.

Sample creation

Department of Energy & Climate Change

A new sample was created in 2013 to be used for June and November 2013 and 2014 publications.

Created in order to:

- Include Wales;
- Ensure there was no significant bias in the original sample and therefore increase confidence in the results;
- Ensure the sample is representative at local authority level; and
- Use a more up to date sample of households.

Stratified by the following variables:

Variable	Categories
Property Age	Pre-1919 1919-44 1945-64 1965-82 1983-92 1993-99 Post 1999
Property Type	Detached Semi detached End terrace Mid terrace Bungalow Converted flat Purpose built flat
Number of Bedrooms	1 bedroom 2 bedrooms 3 bedrooms 4 bedrooms 5 or more bedrooms
Local Authority	Each LA in England and Wales

Methodology 2013 – intervention group

Department of Energy & Climate Change

- Intervention group conditions for measure installed in 2009

Variable	Condition
Date of installation	Cavity wall insulation recorded as being installed between 1st January 2009 and 31st December 2009 (inclusive).
Energy efficiency measures	No record of loft insulation, solid wall insulation, double glazing, draught proofing or heating measures being installed (at any time).
Gas consumption	Gas consumption in 2008, 2009 and 2010 between 2,500 kWh and 50,000 kWh. Estimated readings are excluded – this includes where the gas consumption reading is the same as the previous years, or where the reading is one of a number of suspected estimated values.
Change in gas consumption	Properties with an increase in gas consumption between 2008 and 2010 of more than 50 per cent or a decrease in gas consumption of more than 80 per cent are excluded.
Property type	Flats are excluded due to insufficient address details being available to identify which flat in a block received the energy efficiency measure.

Methodology 2013 – comparator group

Department of Energy & Climate Change

- Stratified random sample retrospectively selected to have same characteristics as intervention group
  - same pre-intervention consumption bands (2,500 kWh bands) and same grouping for each of the following variables

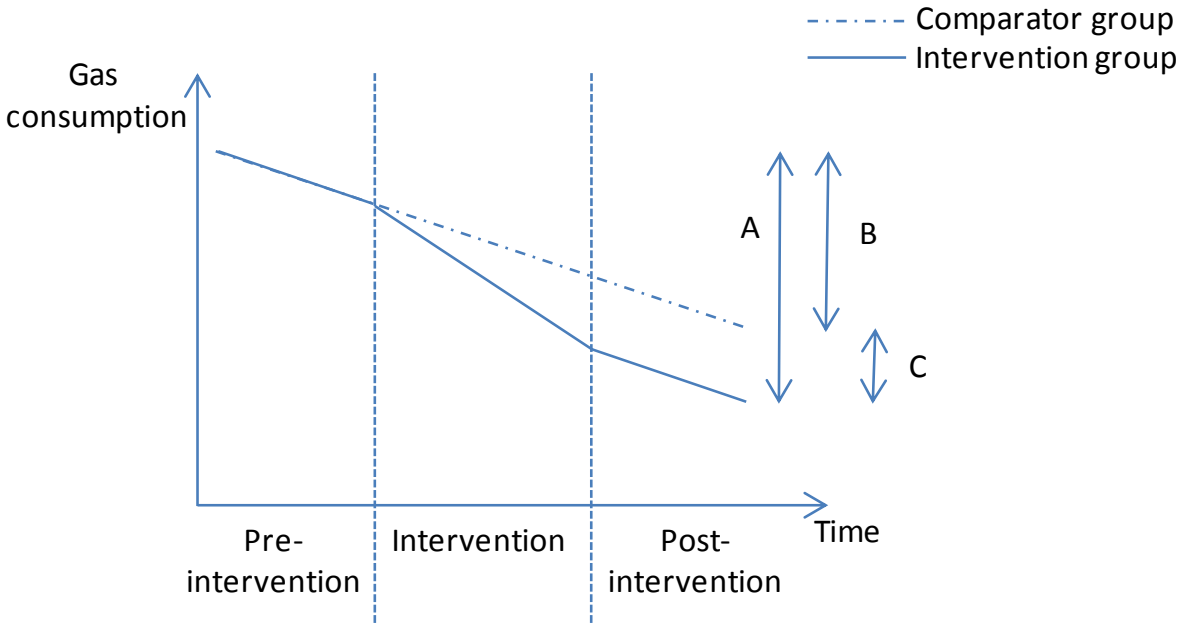
Variable	Categories
Property Age	Pre-1919 1919-44 1945-64 1965-82 1983-92 1993-99 Post 1999
Property Type	Detached Semi detached End terrace Mid terrace Bungalow Converted flat Purpose built flat
Number of Bedrooms	1 bedroom 2 bedrooms 3 bedrooms 4 bedrooms 5 or more bedrooms

- Also, same conditions as intervention group applied (except measure installed).

Methodology 2013 – savings estimates

Department of Energy & Climate Change

- Difference in difference approach



- Each property in the intervention group is also matched to an equivalent property in the comparator group to allow comparisons of median, and distributions.

Methodology 2013 - weighting

Department of Energy & Climate Change

Measure	Housing Stock	Sample stock
Cavity wall insulation	Cavity wall properties in EHS with gas as main heating fuel	Cavity wall intervention group properties
Loft insulation	Properties with lofts in EHS with gas as main heating fuel	Loft insulation intervention group properties
Solid wall insulation	Solid wall properties in EHS with gas as main heating fuel	Solid wall intervention group properties
Condensing boilers	EHS total housing stock with gas as main heating fuel	Condensing boiler intervention group properties

- Weighing is based on:
  - Region
  - Property age
  - Property type
  - Number of bedrooms

e.g. Group one for cavity wall insulation would be the number of properties recorded on the EHS as having cavity wall insulation and being in the North East, built pre-1919, detached with 5 or more bedrooms.

[1] Note that using the English Housing Survey (EHS) will mean the weighting factor is based on the English housing stock, not the England and Wales housing stock.

Methodology 2013 - weighting

Department of Energy & Climate Change

$$\text{Weighting factor for record n } (w_n) = \left(\frac{\text{housing}_g}{\text{sample}_g}\right) \Big/ \frac{\text{total}}{\text{housing stock}}$$

Where n is the record number in the sample

g is the group number (e.g. group 1 = North East, built pre-1919, detached with 5 or more bedrooms)

housing_g is the number of properties in group g in the total housing stock (EHS)

sample_g is the number of properties in group g from the intervention sample (NEED)

$$\textit{Population \% saving} = \sum_n (\text{\% age saving for record n} \times w_n)$$

Methodology – beyond 2013

Department of Energy & Climate Change

Continue to be areas for improvement to these estimates, in particular with the availability of new data sources:

- Energy Performance Certificates (EPCs)
- Green Deal and Energy Company Obligation (ECO) installations

Methodology itself is not planned to change, but may be possible to address some of the following issues:

Measures not recorded in HEED – DIY loft insulation and most measures installed outside Government schemes are not recorded in HEED. However, there will be information covering these on the EPC register.

Gas year – the annual gas consumption data used do not cover a calendar year; the gas year runs from 1st October to 30th September. Using Green Deal and ECO data may provide more confidence in the exact data of installation enabling the gas year and intervention year to cover the same period.

Heating fuel – data in NEED does not currently provide information on what fuel is used as the main heating fuel in a property. Data from the Green Deal and ECO will provide this information for the intervention group and it may be possible to use EPC data to build a similar comparator group.

Wall type – NEED does not currently include reliable information on the wall type (e.g. cavity or solid). EPC data should make it possible to build a comparator group which has the same wall types as the intervention group.