Department for Business, Energy & Industrial Strategy

National Energy Efficiency Data-Framework (NEED): Summary of Analysis, Great Britain, 2021

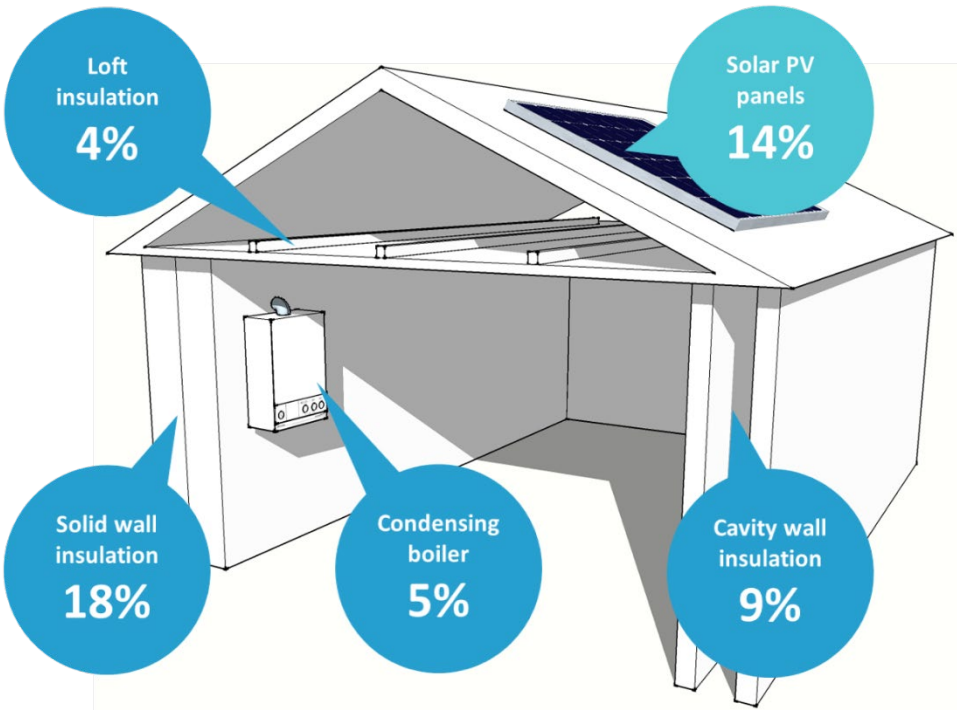
24 June 2021 **National Statistics**

This report presents analysis of domestic energy consumption using the latest version of the National Energy Efficiency Data-Framework (NEED).

Report highlights

- The pattern of average consumption by household and property attributes remains broadly stable over time. Energy consumption (both gas and electricity) tends to be lower for smaller properties, and newer properties tend to consume less gas.
- The estimated median savings in gas consumption in 2019, from energy efficiency measures installed in England and Wales in 2018, ranges from 4 per cent for loft insulation to 18 per cent for solid wall insulation. Solar PV installations result in an estimated 14 per cent median saving in electricity consumption.
- While gas savings from cavity wall insulation remain stable in the 5 years following installation, the annual gas savings from both new condensing boilers and loft insulation decline by around 10 per cent over the first 5 years. The electricity savings from solar PV decline by around 20 per cent in the 5 years following installation. This analysis is based on the measures installed in England and Wales over the years 2011 to 2014 and may reflect changes in physical structures and occupant behaviour.

Typical gas savings in 2019 from measures installed in 2018, England and Wales (electricity savings are shown for Solar PV)



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Next publication: TBC

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User survey on development of Domestic NEED

BEIS is reviewing its work programme for the Domestic National Energy Efficiency Data framework (NEED). To inform this, we would like to hear from users of this publication on how they use these statistics and if they could be adapted to better meet their requirements.

Whilst decisions will necessarily be subject to the resources available, we are considering ways to modify the published materials, so they are resilient and appropriate for future changes in the energy system as we transition to net zero. We will also be considering changes as motivated through wider activities such as:

- the recommendations in the Energy Data Task Force,
- Ofgem's work on Settlement Reform,
- the forthcoming Energy Digitalisation Strategy and the Public Interest Advisory Group on smart meters.

We are likely to have to pause the 2022 NEED publication to enable development work to take place; our decision will be subject to available resource and to your survey responses.

To help inform our thinking, please provide your input through this short survey, which closes on 31 July, or by emailing energyefficiency.stats@beis.gov.uk.

What you need to know about this report

What is Domestic NEED provides an introductory overview of the NEED framework. All accompanying Consumption tables and Impact of energy efficiency measures tables are published alongside this report. This includes a NEED Data Explorer which allows users to create custom breakdowns of average energy consumption.

This NEED publication only covers domestic properties. Non-domestic consumption is analysed in a separate Non-Domestic publication.

Note that "2019" refers to mid-May 2019 – mid-May 2020 for gas consumption, and the months February 2019 to January 2020 for electricity consumption.

Contents

1. Introduction

This report presents key findings from the latest version of Domestic NEED. Chapter 2 presents evidence on how both domestic gas and electricity consumption vary by different property/household characteristics. Chapter 3 estimates the average impact of the most common energy efficiency measures on household energy consumption. This also includes common combinations of measures installed in the same year. As well as the estimated savings in the first year after the installation of the given measure, Chapter 3 also looks at how these savings change in subsequent years.

In addition to this report, other documents published are as follows:

- **Consumption data tables** – provides gas and electricity consumption estimates for different property/household characteristics.
- **Impact of measures data tables** – provides estimated consumption savings arising from installation of different energy efficiency measures.
- **Annex A: What is Domestic NEED?** – provides an introductory overview of the NEED framework.
- **Annex B: Overview of Data Tables** – provides a list of all the published tables and their contents.
- **Annex C: Comparisons with other Sources** – provides a summary of the data sources used in NEED and provides comparisons of NEED outputs with other data sources.
- **Annex D: Methodology Note** – provides details of how the estimates of domestic electricity and gas consumption by property attributes/ household characteristics are produced. It also sets out how the estimates of the impact of energy efficiency measures were derived.

Uses of the data

Domestic NEED uniquely provides meter consumption estimates linked to other data sources for a total of 24.5 million[1] properties in England and Wales (around 94 per cent of total dwellings)[2] and 2.2 million[3] properties in Scotland (around 85 per cent of total dwellings)[4]. For the 2019 consumption data, the current Domestic NEED dataset is based on 22.4m properties

[1] The 24.5 million figure is higher than the number of properties used in the 2019 estimates for England and Wales consumption estimates. This is because some of these properties are not included in the 2019 estimates (e.g. where they do not have a valid figures specifically for 2019, but can be used in analyses for other years).
[2] Based on the Ministry of Housing, Communities and Local Government and Welsh Government estimates of dwellings. The definition of dwellings and properties differs slightly, and data relate to different time periods to NEED, so this percentage should be taken as an approximation only.
[3] See footnote 1 for explanation on why this figure may differ from total properties used for the 2019 estimates.
[4] Based on data from Scottish Government estimates of total number of dwellings. The definition of dwellings and properties differs slightly, and data have been published at different time periods to NEED, so this percentage should be taken as an approximation only.

in England and Wales for electricity consumption and 18.2m properties for gas consumption. Estimates for Scotland are based on 2.1m properties for electricity and 1.5m for gas.
With a range of data on the characteristics of the properties and the households linked to the property level consumption data, domestic NEED can provide insight on factors affecting household energy consumption and the consumption savings resulting from installation of government supported energy efficiency measures. As such, it is a key part of the evidence base supporting BEIS to develop, monitor and evaluate energy policies.

Summary of data sources

The main data sources which contribute to Domestic NEED are summarised below:

Data	Source
Meters and consumption	
Gas meters and gas consumed	Xoserve
Electric meters and electricity consumed	Electricity data aggregators
Geographical information	
Address information	Ordnance Survey (OS)
Geographies and area classifications	Office for National Statistics (ONS)
Property characteristics	
Domestic properties in England and Wales	Valuation Office Agency (VOA)
Energy Performance Certificate (EPC) ratings for England and Wales	Ministry for Housing and Local Government (MHCLG)
Domestic properties in Scotland	Scottish Assessors Association
Household characteristics	Experian
Energy efficiency measures installed	
New boiler installations	Gas Safe Register
Energy efficiency measures installed under the Energy Company Obligation (ECO) scheme (as well as other schemes such as Green Deal)	Ofgem
Solar panels within the Feed-In Tariffs (FITS) scheme	Ofgem

Temporal coverage of the data

The latest consumption data in this report relate to 2019. The precise time periods covered by different years of data differ for gas and electricity consumption.

The gas consumption years used are as follows:

- Prior to 2015: October – September (same period as 2015)
- 2015: October 2014 – September 2015
- 2016: mid-July 2016 – mid-July 2017
- 2017: mid-June 2017 – mid-June 2018
- 2018: mid-May 2018 – mid-May 2019
- 2019: mid-May 2019 – mid-May 2020[5]

For this report and all accompanying annexes and tables, when years are mentioned with reference to gas consumption (or savings), these relate to the "gas years" set out above, rather than calendar years.

For electricity consumption, the years cover the months February to January. For example, the 2019 electricity consumption refers to the period 31 January 2019 to 30 January 2020.

Consistency of the gas data over time

Updates to gas meter point data

The summer of 2017 saw the implementation of new gas meter point management and settlement processes, which caused a change in the period of gas consumption covered by the 2016 data. Furthermore, with the 2016 consumption figures, Xoserve introduced a new data collection system. Due to this, a large proportion of meters which had not reported for some time had their annual consumption figures updated in the 2017 gas consumption figures.

This large update led to an increase in the total gas consumption reported in 2017. With the majority of gas meters now providing timely meter readings, the figures from 2017 onwards are a more accurate reflection of gas consumption. Further details are contained in the Domestic NEED Methodology note.

For more details on quality assurance carried out on the NEED gas data through a comparison of other datasets, please also see the Annex C: Comparisons with other Sources document.

Extreme Weather Events

The weather correction process used assumes a brief lag between changes in weather and the average consumer's change in heating behaviour. This assumption generally results in good performance of the weather correction process. However, in extreme weather events, such as those seen in the UK in February and March 2018, the rapid drop in temperatures means that the weather correction process may not have fully compensated for the lower temperatures for those days. This means that a "truly" weather corrected figure for the 2017 gas year could be slightly lower than that which is reported.

[5] The 2019 data for gas covers the early part of the first COVID-19 lockdown (up to mid-May 2020), but this should not have a material impact on the trends described in this release. For more information on the overall impacts of COVID-19 on domestic consumption, please see the Energy Trends publication.

2. Domestic energy consumption

This section presents a summary of how both domestic gas and domestic electricity consumption vary by property and household characteristics, showing trends in median gas and electricity consumption between 2005 and 2019. No attempt is made to control for relationships between characteristics in the dataset or other characteristics not captured by this data.

The data included in this chapter can be found in the Consumption data tables published alongside this report. A full list of the breakdowns provided can be found in Annex B: Overview of Data Tables.

The most recent estimates for England and Wales are based on 22.4 million properties for electricity and 18.2 million properties for gas. The estimates for the years 2017 onwards make use of the full property database, while the estimates for earlier years are based on smaller samples[6]. The results for Scotland are based on around 2 million properties for electricity and around 1.5 million properties for gas.

For gas, only households with gas consumption in the range of 100 to 50,000 kWh (kilowatt hours) have been included. For electricity, only households with electricity consumption in the range of 100 to 25,000 kWh are included. All consumption figures have been rounded to the nearest 100 kWh.

As gas is predominantly a heating fuel, its use depends heavily on the weather. Because of this, gas consumption for each household has been adjusted for differences in temperature and wind speed in each year ("weather correction"). This allows for a consistent comparison of gas consumption over time. As electricity is used far less often as a heating fuel, electricity consumption is less affected by the weather, so this data has not been weather corrected.

Energy consumption in England and Wales

Trends in domestic energy consumption

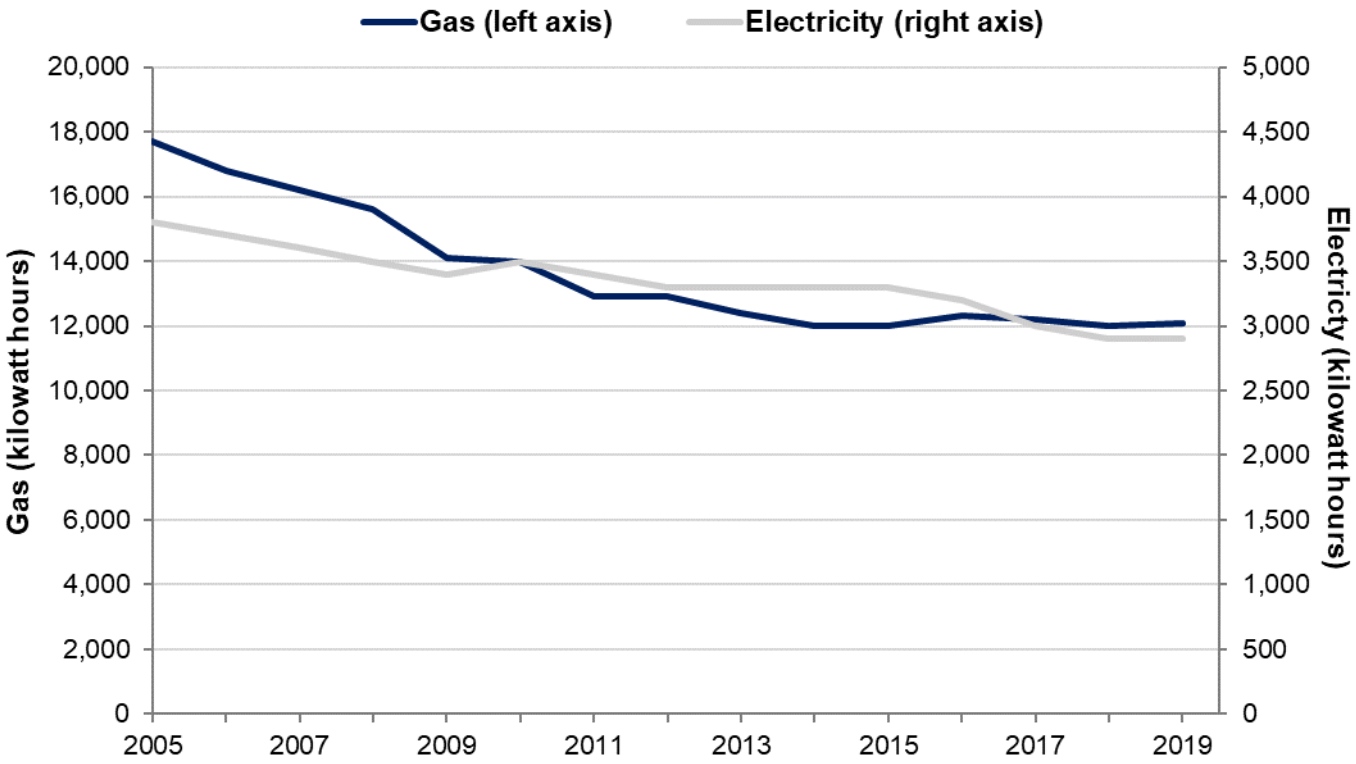
Table 2.1 provides summary statistics for domestic gas and electricity consumption in England and Wales. The mean gas consumption is over three times that of mean electricity consumption, and median gas consumption is over four times that of median electricity consumption. For a comparison of trends over time and against other data sources that look at trends in consumption, please see Annex C: Comparisons with other Sources.

[6] In previous years only a sample was used from the Valuation Office Agency (VOA) data on the characteristics of domestic properties in England and Wales. This resulted in the consumption estimates for England and Wales in this report being based on only 4 million properties for electricity and 3 million for gas. In more recent years we have had access to the full dataset (for producing the consumption estimates for the years 2017 onwards).

Table 2.1: Annual consumption summary statistics, England and Wales, 2019
All consumption values are in kWh

	Properties (millions)	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Gas	18.2	13,300	7,600	8,200	12,100	17,000
Electricity	22.4	3,600	2,800	1,900	2,900	4,400

Figure 2.1: Trends in median annual domestic gas and electricity consumption, England and Wales, 2005 – 2019



The median is generally a better indicator of typical consumption than the mean, as the mean can be influenced by a relatively small number of high-consuming households that are not representative of the population as a whole.

Figure 2.1 shows estimated median household gas and electricity consumption. Data for 2005 to 2010 cover England only, while the data for all subsequent years cover both England and Wales. Also note that the gas consumption estimates for the years 2017 onwards are not fully comparable with those for earlier years owing to changes in how gas meter readings are processed by Xoserve (see page 6).

Median gas consumption was 32 per cent lower in 2019 than in 2005. Median electricity consumption decreased by 24 per cent over the same period. The downward trend in median gas consumption appears to have levelled off over the past 5 years.

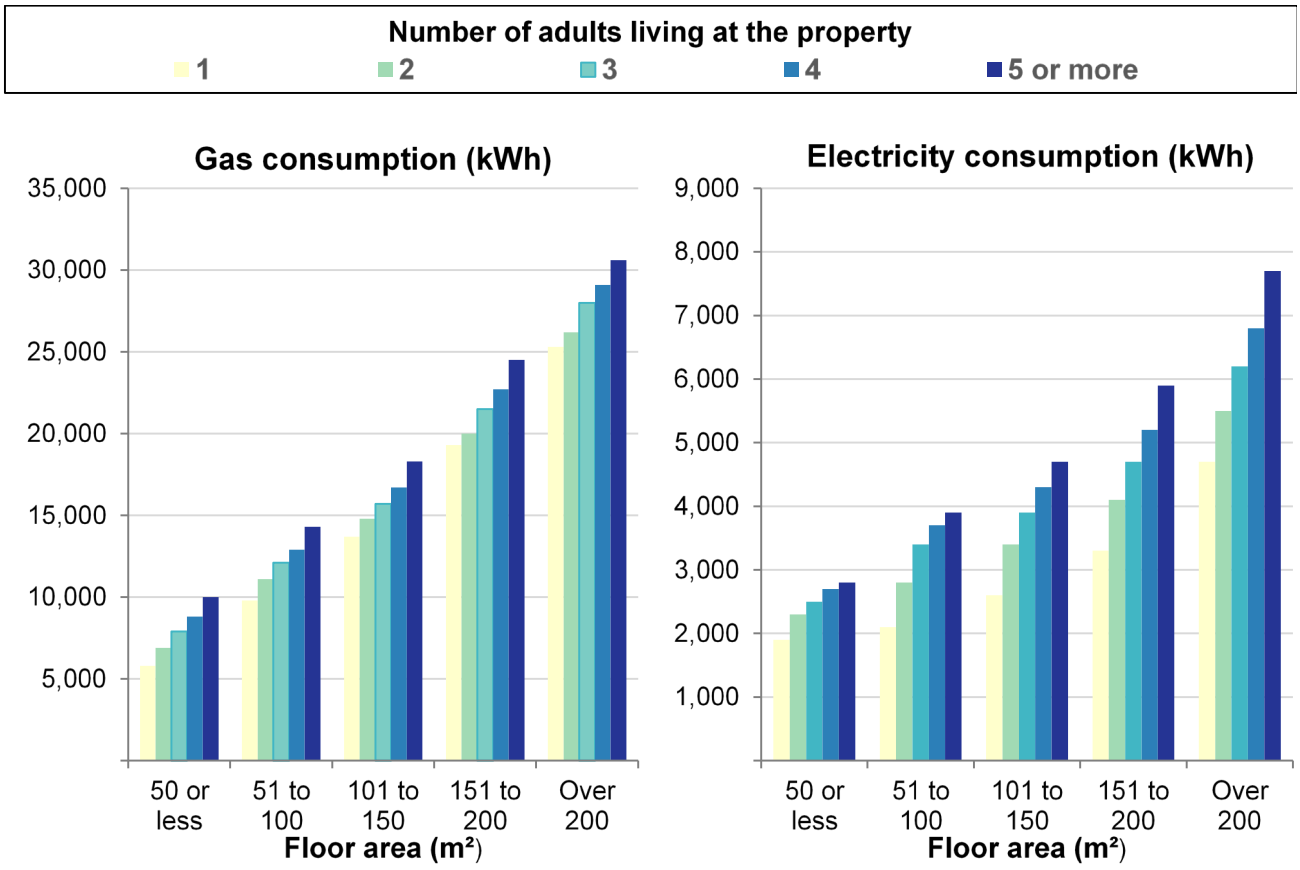
The fall in median consumption is seen consistently across property types, household characteristics, regions and areas with different socio-demographic area characteristics.

Domestic consumption by size of the property and household

Energy consumption appears to increase with the size of the property[7] (as measured by the floor area) and the size of the household (as measured by number of adults living in the household), as illustrated in Figure 2.2.

For gas in particular, the floor area of the property appears to be the more important of these two factors. This is because gas is primarily used for space heating, and in general larger properties require a greater amount of gas to ensure adequate heating.

Figure 2.2: Median annual gas and electricity consumption by floor area, and the number of adults living at the property, England and Wales, 2019



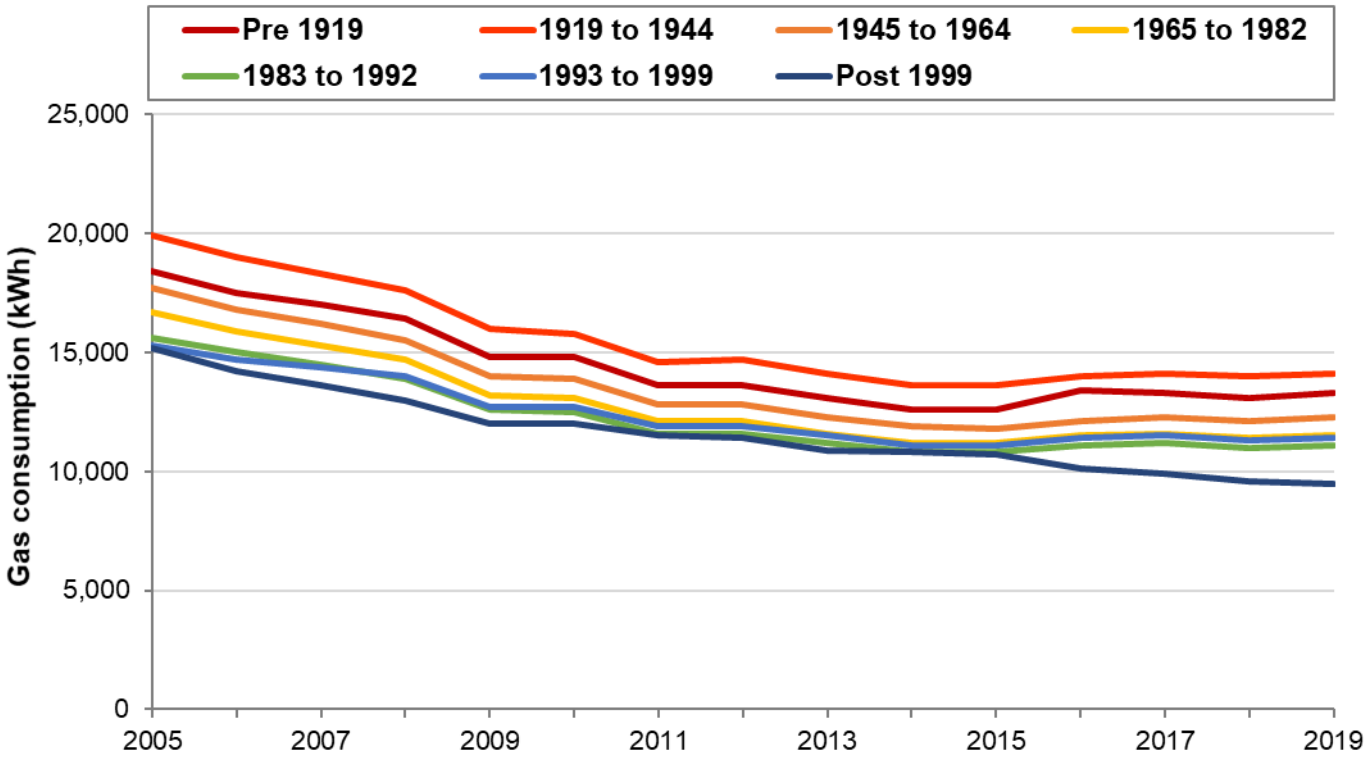
[7] For more information on how gas consumption is affected by different factors, please see a 2019 BEIS analysis on determinants of domestic gas consumption.

Domestic consumption by property age

In general, the newest properties tend to have the lowest average gas consumption (see Figure 2.3), as they tend to have higher quality insulation, due to building regulations becoming more rigorous over time.

The downward trend in gas consumption for properties built before 1999 has levelled off. However, among properties in the post-1999 age group, median gas consumption continues to fall with successive waves of more efficient new builds contributing to this trend[8].

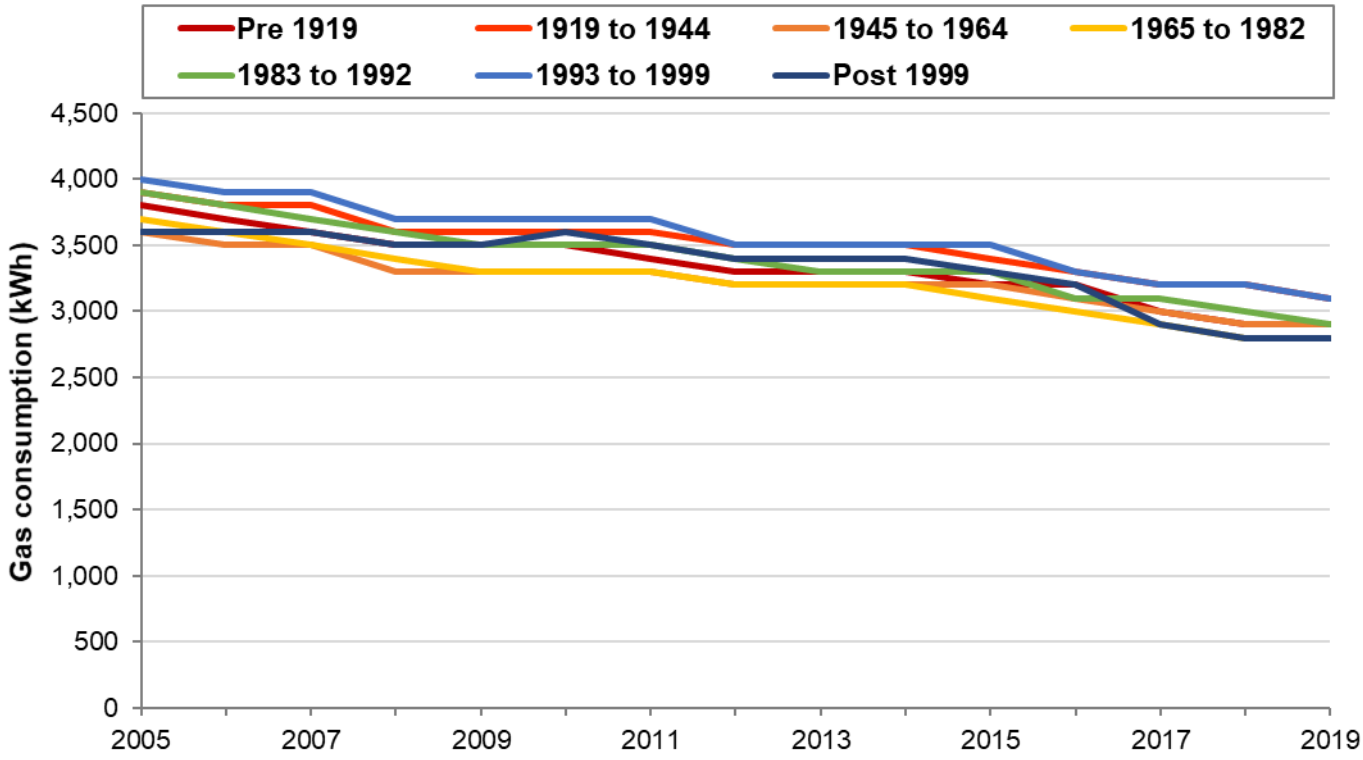
Figure 2.3: Median annual gas consumption over time by property age, England and Wales, 2005 – 2019



While there is a clear trend of newer properties consuming less gas, the same relationship does not hold for electricity (see Figure 2.4). While gas is primarily used for space heating, electricity is less commonly used for heating. It is estimated that only 14 per cent of properties are off the gas grid and use non-gas fuel sources, including electricity to heat their homes. Therefore, the building regulations for new properties are likely to have a smaller impact on electricity consumption.

[8] For more information, please see a 2019 BEIS analysis on energy consumption in new domestic buildings between 2015 to 2017.

Figure 2.4: Median electricity consumption over time by property age, England and Wales, 2005 – 2019



Domestic consumption by property type

The fall in gas consumption and subsequent levelling off in more recent years is reflected across all property types (see Figure 2.5), with median gas consumption around 30 per cent lower in 2019 than in 2005, in all categories.

Detached properties tend to have the highest gas and electricity consumption, which partly reflects the fact that they tend be the largest properties (see Figures 2.5 and 2.6). As flats are generally the smallest properties, they tend to have the lowest gas and electricity consumption.

In 2019 converted flats had a median gas consumption 28 per cent higher than purpose-built flats, despite the fact that both property types tend to be similar sizes. This reflects the fact that most converted flats are in dwellings originally built before 1919, and are therefore among the least energy efficient properties, while the majority of purpose-built flats were built from 1965 onwards.

Note that lower address matching rates tend to be achieved for flats compared to other property types which may affect the reliability of trends over time.

Figure 2.5: Median annual gas consumption over time by property type, England and Wales, 2005 – 2019

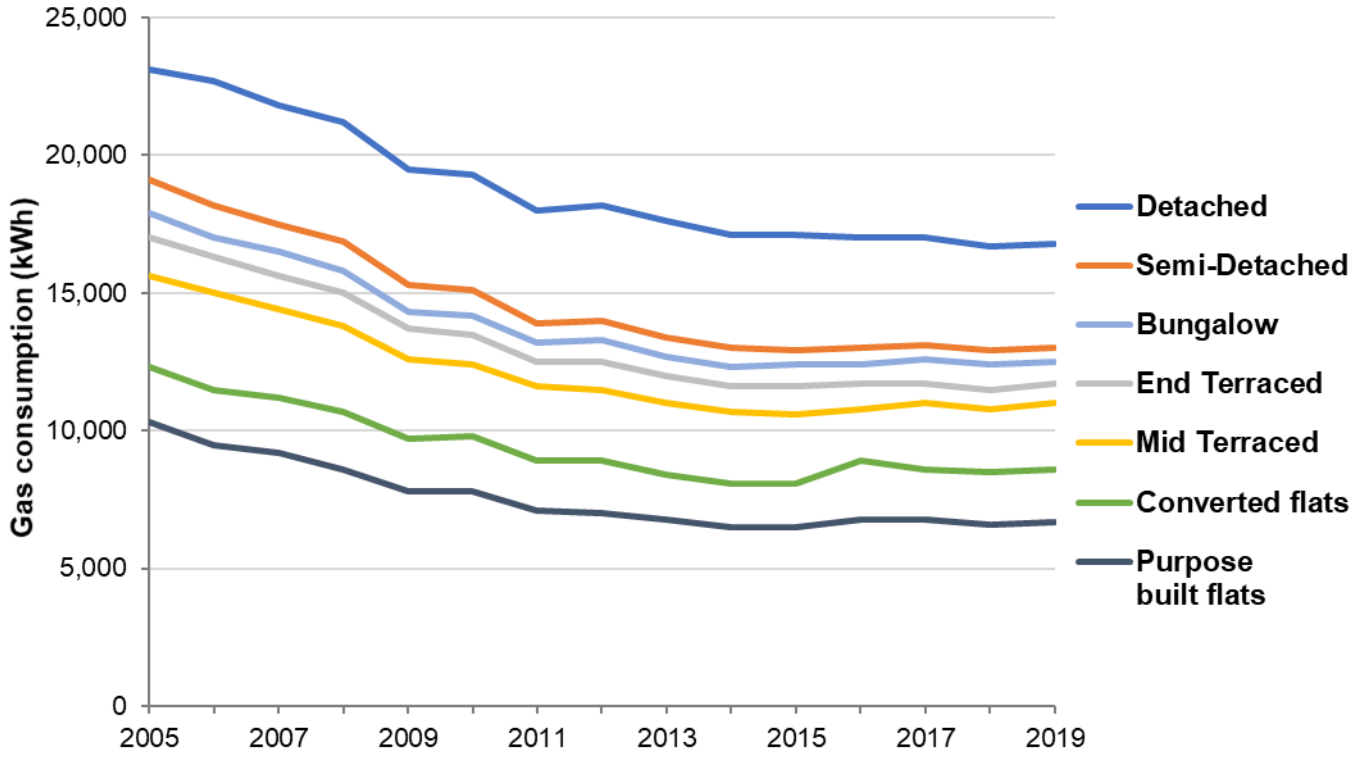
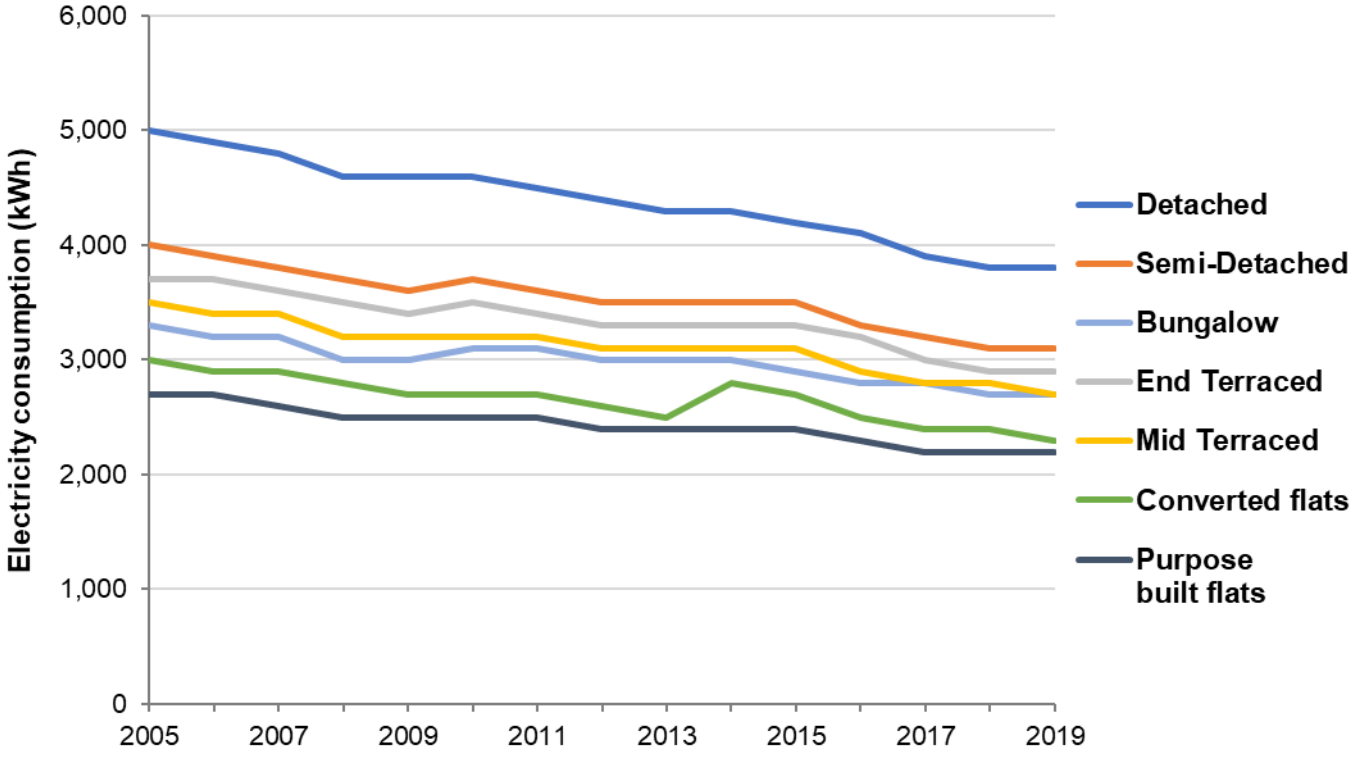


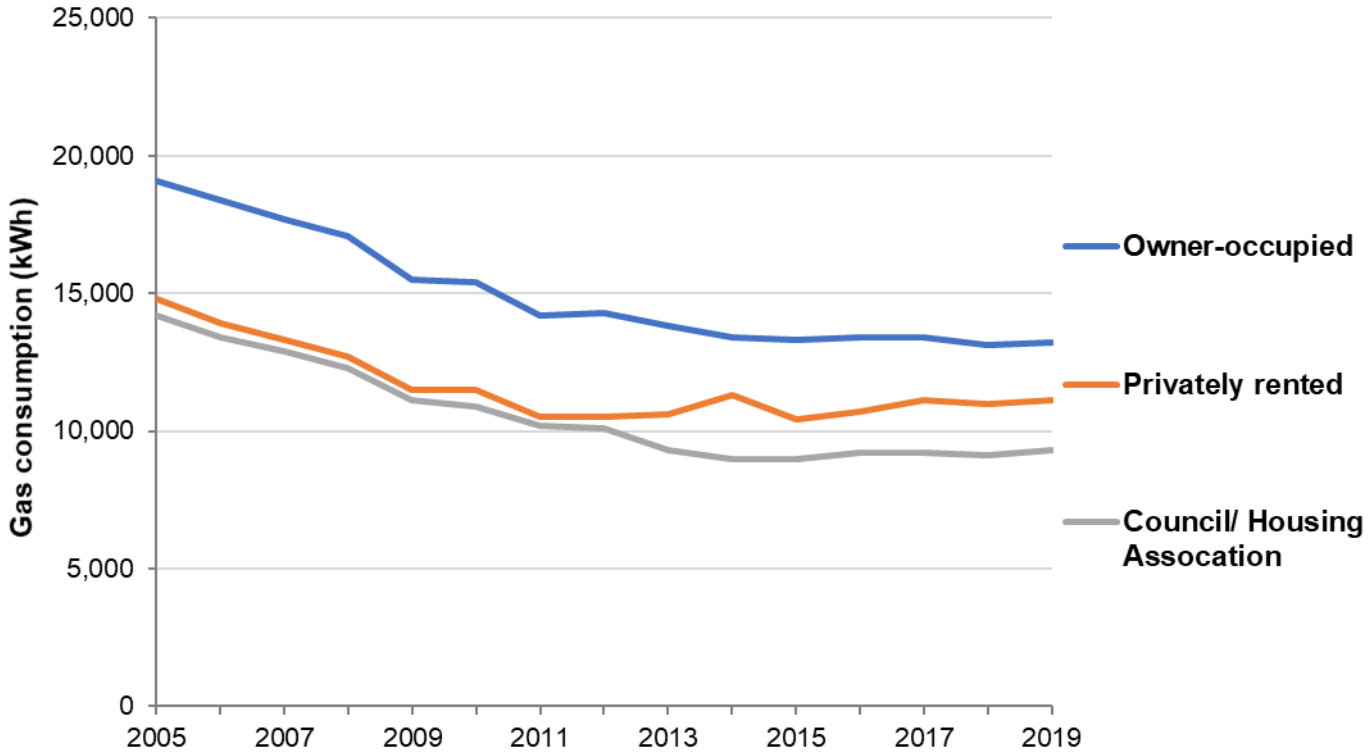
Figure 2.6: Median annual electricity consumption over time by property type, England and Wales, 2005 – 2019



Domestic consumption by tenure

Prior to 2013, social housing (council and housing association owned properties) and privately rented properties had similar median consumption, with both being significantly below owner-occupied properties (see Figure 2.7). Since 2013, the privately rented consumption trend has decoupled from the council/housing association trend.

Figure 2.7: Median annual gas consumption over time by tenure, England and Wales, 2005 – 2019



Energy consumption in Scotland

For Scotland, for both property type and floor area, data from the Scottish Assessors Association[9] are used. Modelled data from Experian have been used for all other property attributes and household characteristics.

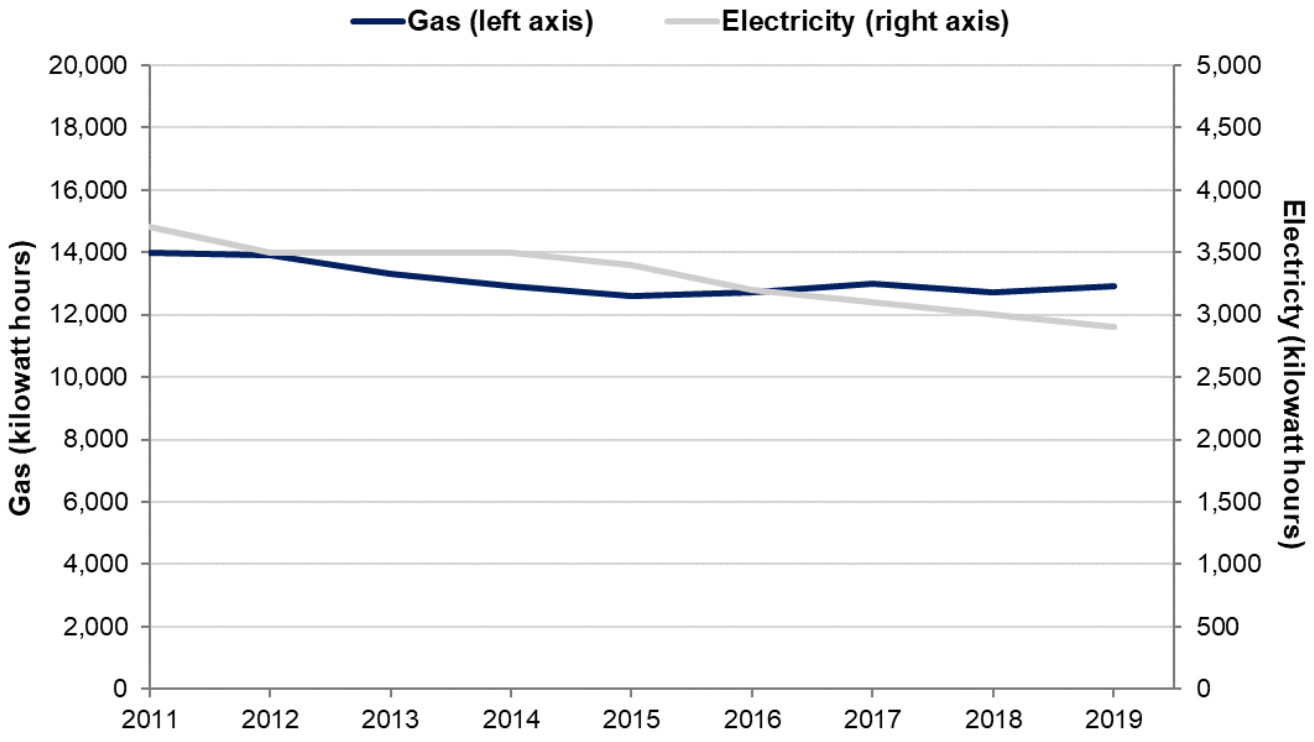
Table 2.2: Annual consumption summary statistics, Scotland, 2019
All consumption values are in kWh

	Properties (millions)	Mean	Standard Deviation	Lower Quartile	Median	Upper Quartile
Gas	1.5	14,200	8,100	8,700	12,900	18,200
Electricity	2.1	3,700	3,000	1,900	2,900	4,500

Users should be aware that while the data provided by the Scottish Assessors Association (SAA) is considered accurate, the SAA data held in NEED was last updated several years ago. This means that properties built more recently than this have not been included in the analysis. Therefore, mean and median consumption figures given may be overestimating consumption, as newer properties tend to be more energy efficient.

It should also be noted that the gas consumption estimates for the year 2017 onwards are not fully comparable with those for earlier years, owing to changes in how gas meter readings are processed by Xoserve (see page 6).

Figure 2.8: Trends in median annual domestic gas and electricity consumption, Scotland, 2011 – 2019

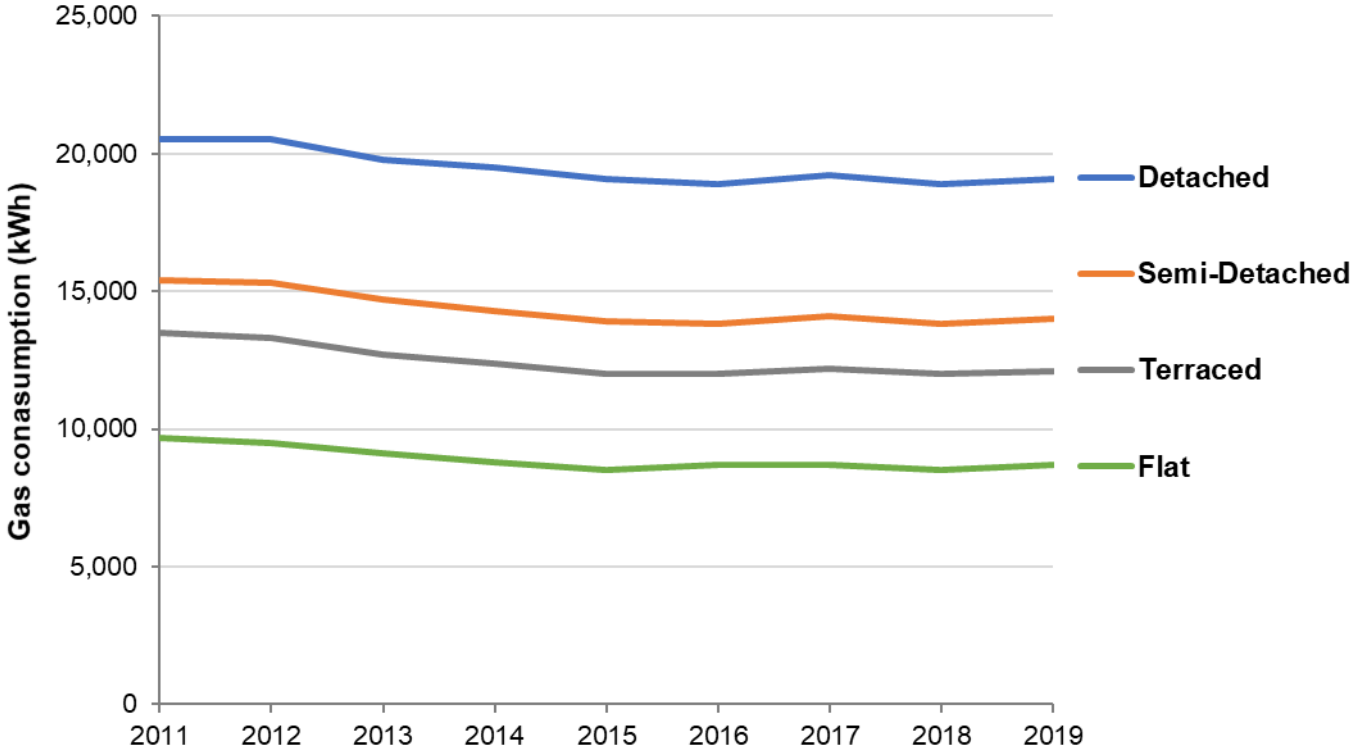


[9] The Scottish Assessor Association is the organisation responsible for valuing properties in Scotland.

In 2019, the median gas consumption for properties in Scotland was 12,900 kWh (7 per cent higher than in England and Wales) and median electricity consumption was 2,900 kWh (the same as England and Wales).

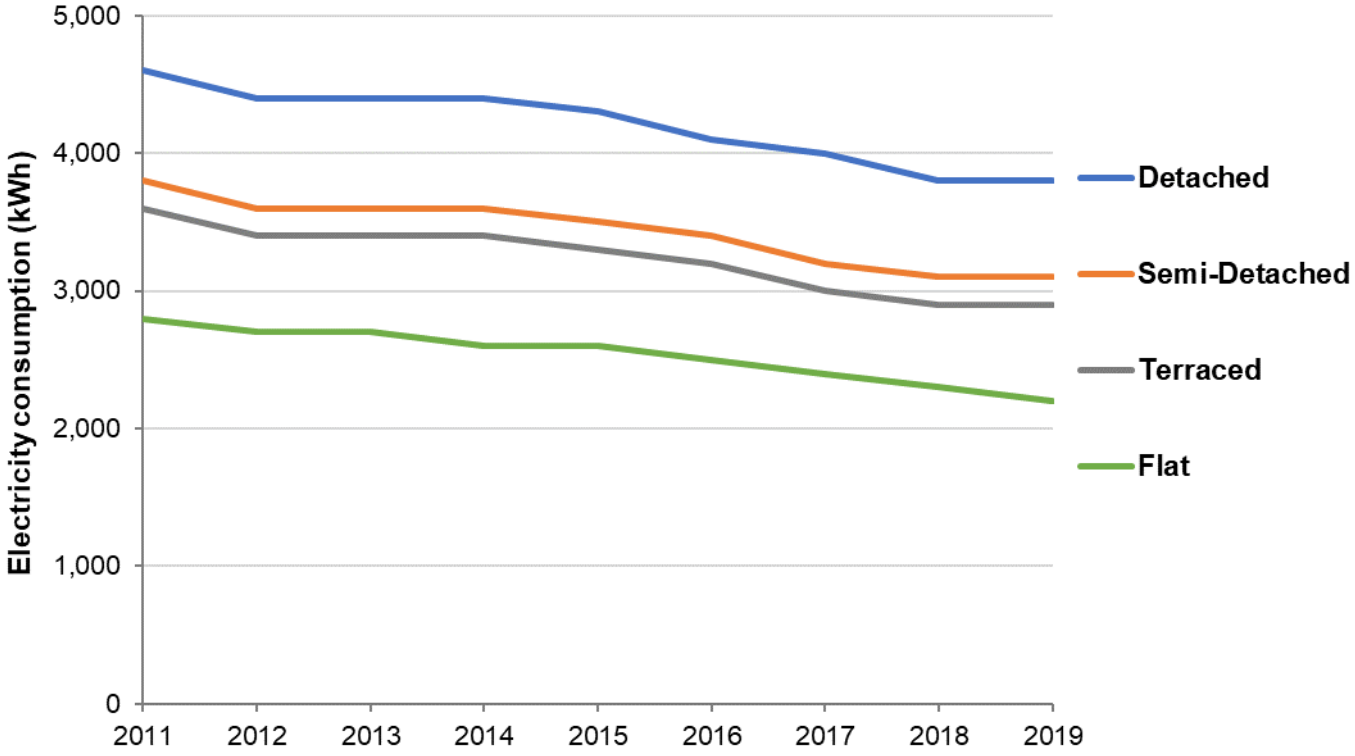
Median gas consumption was 8 per cent lower in 2019 than in 2011 (see Figure 2.8), similar to the 6 per cent reduction seen in England and Wales over the same period. Similar to England and Wales, the downward trend in median gas consumption appears to have levelled off over the past 5 years, and this is reflected across all property types (see Figure 2.9).

Figure 2.9: Median annual gas consumption over time by property type, Scotland, 2011 – 2019



Median electricity consumption in Scotland fell by around a fifth (22 per cent) between 2011 and 2019 compared to a fall of 15 per cent for England and Wales over the same period. The downward trend in median electricity consumption in Scotland is reflected across all property types (see Figure 2.10).

Figure 2.10: Median annual electricity consumption over time by property type, Scotland, 2011 – 2019



3. Impact of energy efficiency measures

This chapter presents estimates of the impact of installing energy efficiency measures[10] on gas consumption for properties in England and Wales, and separately for Scotland.

The analysis compares:

- gas consumption changes in properties which had energy efficiency measures installed (the intervention group), before and after the measure was installed with;
- the change in consumption over the same period for similar properties which have not had any measure installed the year before, the year after or during the year of installation (the comparator group).

This method is also applied to solar PV, with corresponding comparisons of electricity consumption. For more details on how impact of energy efficiency measures estimates are derived, please see Annex D: Methodology Note.

Note that this analysis is only applied to measures which have been installed under government schemes, as the registration from such schemes provides the data on the measures installed. Boilers are the exception to this, as the data on boiler installations used is supplied by the Gas Safe Register.

The headline estimates refer to energy savings in 2019 from energy efficiency measures installed in 2018. The energy efficiency measures included in this analysis are:

- Condensing boiler (gas savings)
- Loft insulation (gas savings)
- Cavity wall insulation (gas savings)
- Solid wall insulation (gas savings)
- Solar PV (electricity savings)

Not all properties where a measure has been installed are included in the analysis. The properties excluded are:

- Flats, due to issues with matching these meters to properties. This is because including flats with the wrong meter point readings matched to them may result in inaccurate estimates.
- Where the consumption estimates are extreme compared to the previous year or are thought to be imputed.

All figures in this chapter are weighted, meaning that savings have been adjusted to be representative of the complete housing stock (excluding flats) rather than just the properties which have had the measure installed in the year under consideration. For more information on the weighting used, see Annex D: Methodology Note.

[10] Apart from solar PV, the impact of measures analysis is presented for measures installed between mid-July 2018 and mid-May 2019, as the savings are based on comparing 2017 (before installation) and 2019 (after installation) gas years. For Solar PV the analysis refers to installations made during the months February 2018 to January 2019 as the savings are based on comparing the 2017 and 2019 electricity years.

Uncertainty in estimated savings

The savings estimates for each measure vary from year to year and should be considered indicative rather than precise. There are a number of factors that are likely to contribute to variations in estimated savings from one year to the next:

Methodology and data

- While the fundamental methodological approach used for the impact of measures estimates has remained consistent since the creation of NEED, refinements have been made over time. The sensitivity of the estimates to these changes has not been fully assessed and therefore variation seen in estimates may in part be a result of methodological changes. Comparisons between the results published in different years should therefore be treated with caution.
- The number of measures installed differs year on year. For installation periods where fewer measures have been installed, the sample size will likely be smaller as a result. Estimates based on smaller sample sizes are likely to be less reliable.
- The increasing prevalence of measures outside of government schemes means that properties included in the comparator group may have had energy efficiency improvements made that have not been identified in the NEED data. All other things being equal, this would lead to a decrease in the estimated savings derived from NEED over time.

Unknown information about the installations or property

- The quality of installations may vary between years.
- The average size of the measures installed may vary between years. For example, larger solar panels can generate more electricity.
- The attributes of the installation are unknown and may vary between years. For example, the number of walls in the property covered by wall insulation and the thickness of loft insulation may vary between installations.
- The brand or subtype of measure may vary between years. For example, while cavity wall insulation is considered to be a single class of intervention, there are several types of cavity fill (notably bead and mineral wool), which may have different impacts.

Unknown information about the household

- The results may be different for early adopters of novel measures because this self-selecting treated population may have a different energy consumption pattern to other consumers.
- Any variation between the treated populations which is not available in the data cannot be controlled for, for example, age of residents and the number of children in the home.
- Changes in energy consumption behaviour which follow the installation of an energy efficiency measure and may also vary over time and between different types of household. An example is when a household chooses to heat their home to a higher temperature following installation of a measure; this is a known phenomenon referred to as *comfort taking*.

Comfort taking

A known phenomenon when properties become more energy efficient is *comfort taking*. Rather than heating their home to the same temperature after the installation of the measure as before it, the resident takes advantage of the more efficient home by heating it more frequently and/or to a higher temperature ("taking comfort"). The impact of measures analysis presented here is based on metered savings and these will also reflect any extra consumption due to comfort taking. Therefore, the consumption savings presented here may be lower than expected based on energy efficiency considerations alone.

A similar effect can be expected with the installation of solar PV. The installation of solar PV may result in less electricity being drawn from the grid (which is detectable in NEED). However, this fall in electricity use from the grid may be partially offset by the household changing their consumption habits to use more electricity following the installation of a solar PV measure. Therefore, the grid-consumption savings following the installation of a solar PV measure may be lower than expected based on solar PV generation capacity alone.

Impact of Measures Installed in England and Wales

Single measures

Figure 3.1 shows the median[11] and mean savings in 2019 from measures installed in 2018. Solid wall insulation has the highest median gas savings (18 per cent), while loft insulation yielded the lowest median gas savings (3 per cent). The median is regarded as a more appropriate measure of typical savings as a small number of extreme values for individual properties (which are not representative of the rest) can distort the mean.

Figure 3.1: Median and mean gas savings in 2019 for measures installed in 2018, England and Wales (electricity savings are shown for Solar PV)

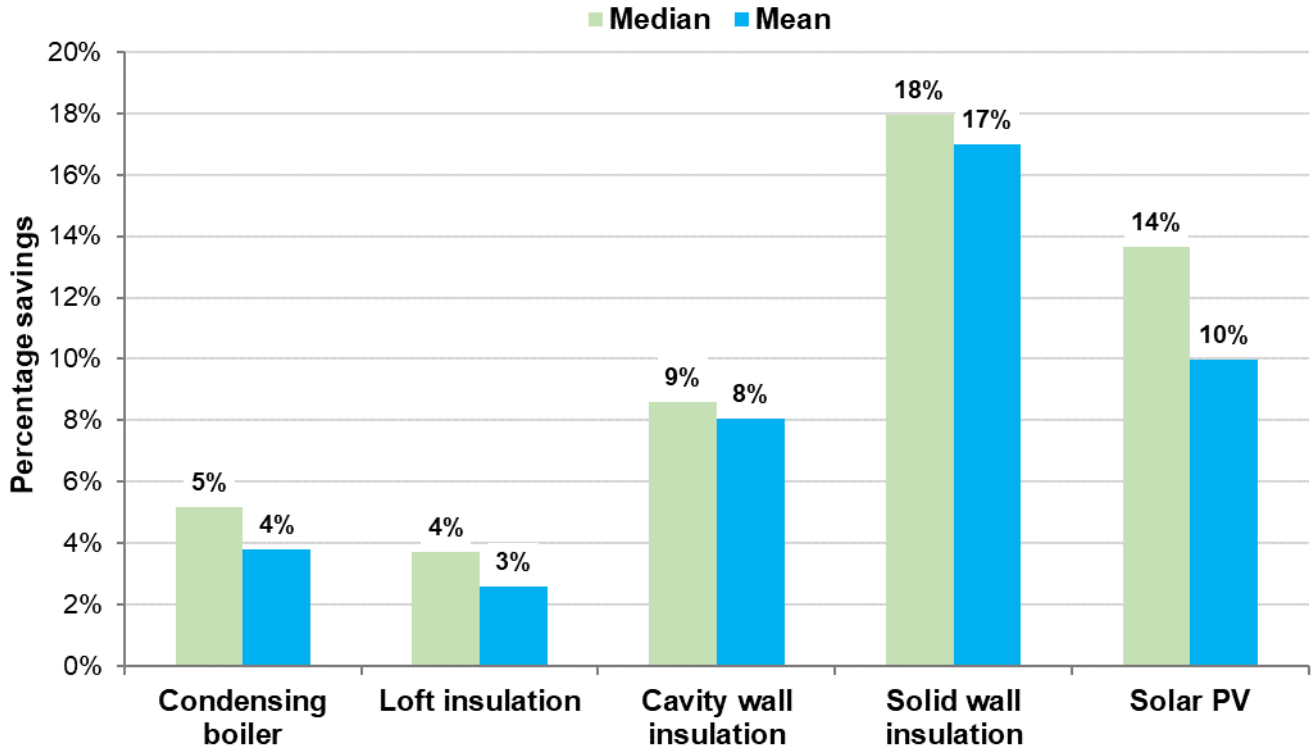
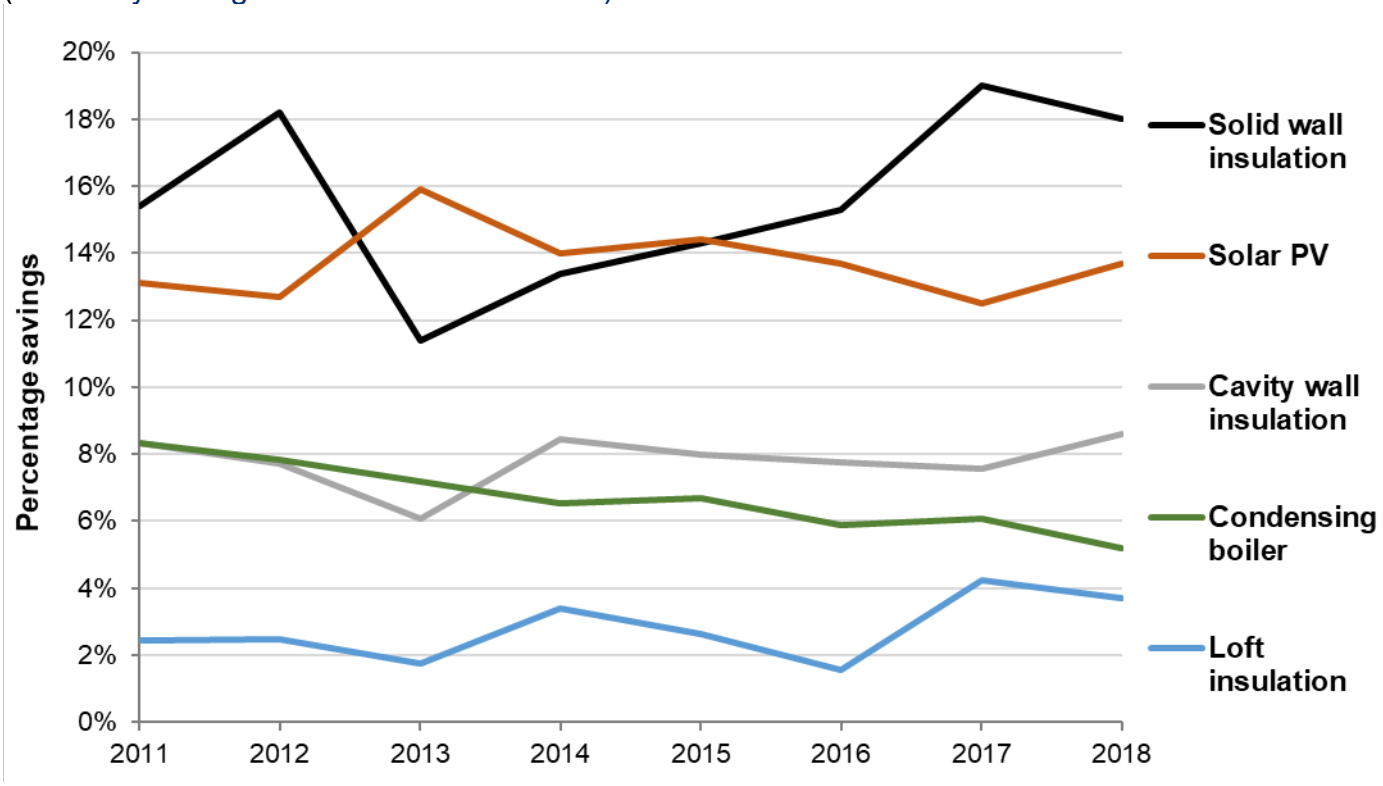


Figure 3.1 presents the estimated savings from measures installed in 2018, for the first year after installation. Comparing these estimates with the equivalent estimates from previous editions of this publications is problematic. As mentioned on page 18, refinements have been made over time to how impact of measures estimates are derived, which means that the estimates from the various editions of this report (which refer to earlier installation years) are not necessarily comparable with each other.

To examine how the effectiveness of energy efficiency measures has changed over successive installation years, the median savings from the main energy efficiency measures were recalculated for past years using the latest methodology (as used for the 2018 installations) and based on the latest version of Domestic NEED. The resulting estimates are presented in Figure 3.2.

[11] The median is a more appropriate measure as the mean can be influenced by outliers.

Figure 3.2: Median gas saving from energy efficiency measures in the first year after installation, by year of installation, England and Wales, 2011 – 2018
(electricity savings are shown for Solar PV)



Solid wall insulation consistently yields the highest gas savings while loft insulation consistently results in the lowest gas savings.

It should be noted that possible reasons for changes in the savings from energy efficiency measures from one installation year to the next are outlined on page 18. In general, the trends over time appear fairly volatile, which is probably a result of the low sample sizes on which these estimates are based. An example of this is solid wall insulation, which has a consistently large percentage saving, but the variation between years is most likely due to volatility originating from the small sample size combined with a large degree of variability in the savings estimates between individual properties in the sample.

Condensing boilers are the main exception, and the relatively smooth trend probably reflects the relatively large sample sizes (hundreds of thousands) on which the estimates for this measure are based. The downward trend for condensing boilers needs careful interpretation. In each year there is a saving in average gas consumption from installation of a new condensing boiler (relative to the old boiler it replaced). However, this analysis indicates that average savings have reduced slightly over time. This suggests that the greater efficiency of the replacement boilers *relative* to those being replaced is decreasing over time.

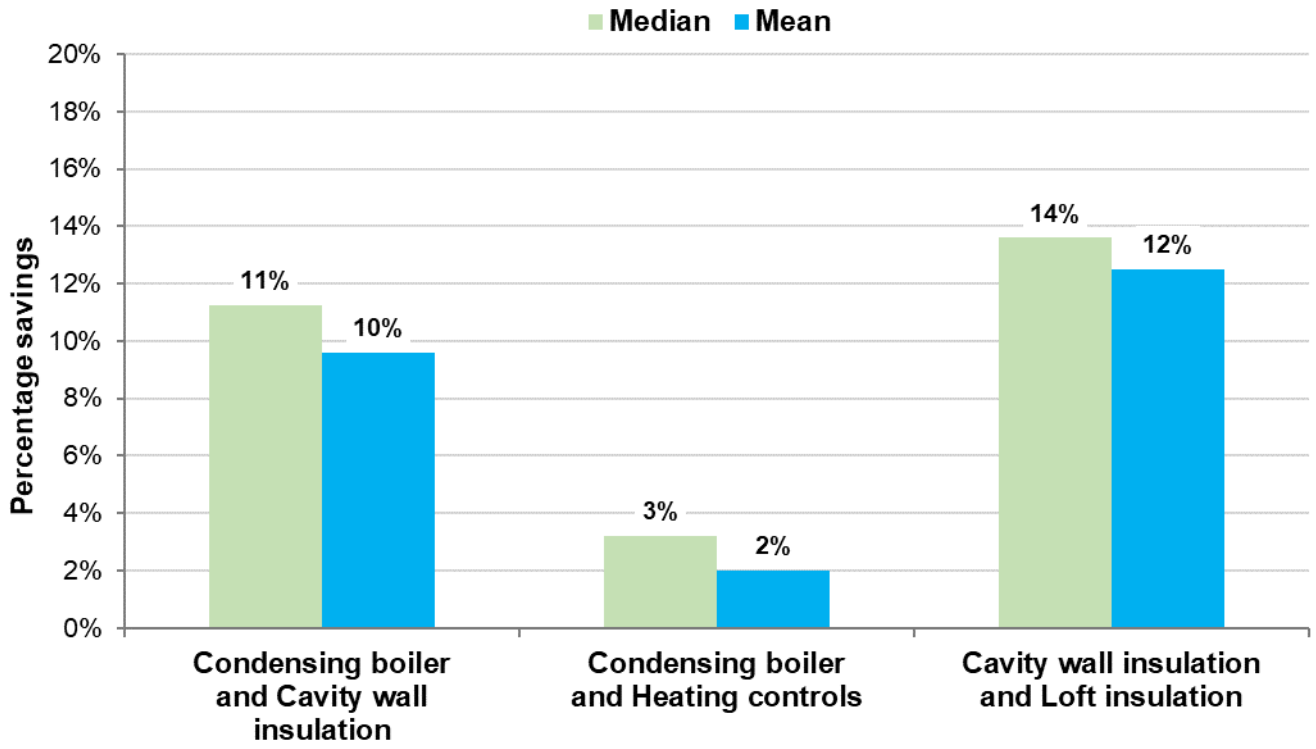
Combinations of measures

Where a large enough number of properties have installed a particular combination of measures in a single year, the impact of that combination of measures can be estimated. Figure 3.3 below shows the savings from the most common combinations of measures installed in 2018. The combination of measures with the greatest estimated median gas saving were cavity wall insulation and loft insulation, with a median saving of 14 per cent.

The installation of both a boiler and heating controls appears to yield a lower gas saving than installing a new boiler alone. This suggests that heating controls tend to increase gas consumption. This finding should be interpreted with caution (e.g. those properties that have both a new boiler and heating controls may differ in some way from those which only had a new boiler installed). Notably, a research paper assessing the evidence on heating controls suggests that comfort taking may be a key factor, stating that:

"Evidence suggests domestic consumer use of heating controls is often driven by a desire to achieve thermal comfort rather than a wish to save energy".

Figure 3.3: Median and mean gas savings in 2019 from common combinations of measures installed in England and Wales in 2018



Savings in the years following installation

Estimates of savings over time for measures installed in 2011, 2012, 2013 and 2014 are published alongside this report in the table "Impact of measures in years following installation". The method used for these estimates was the same as that used for the other impact of measures analyses. The difference is that, instead of comparing the year before installation (Year -1) to the year after (Year +1), the year before installation is also compared to further years moving forward from Year +1 (Year +2, Year +3, etc). This is to estimate how savings change over time. More details on this can be found in Annex D: Methodology Note which accompanies this report.

Figure 3.4: Median annual percentage gas savings (electricity savings for solar PV), in the 5 years following installation, relative to savings in Year 1, averaged over the installation years 2011 – 2014, England and Wales

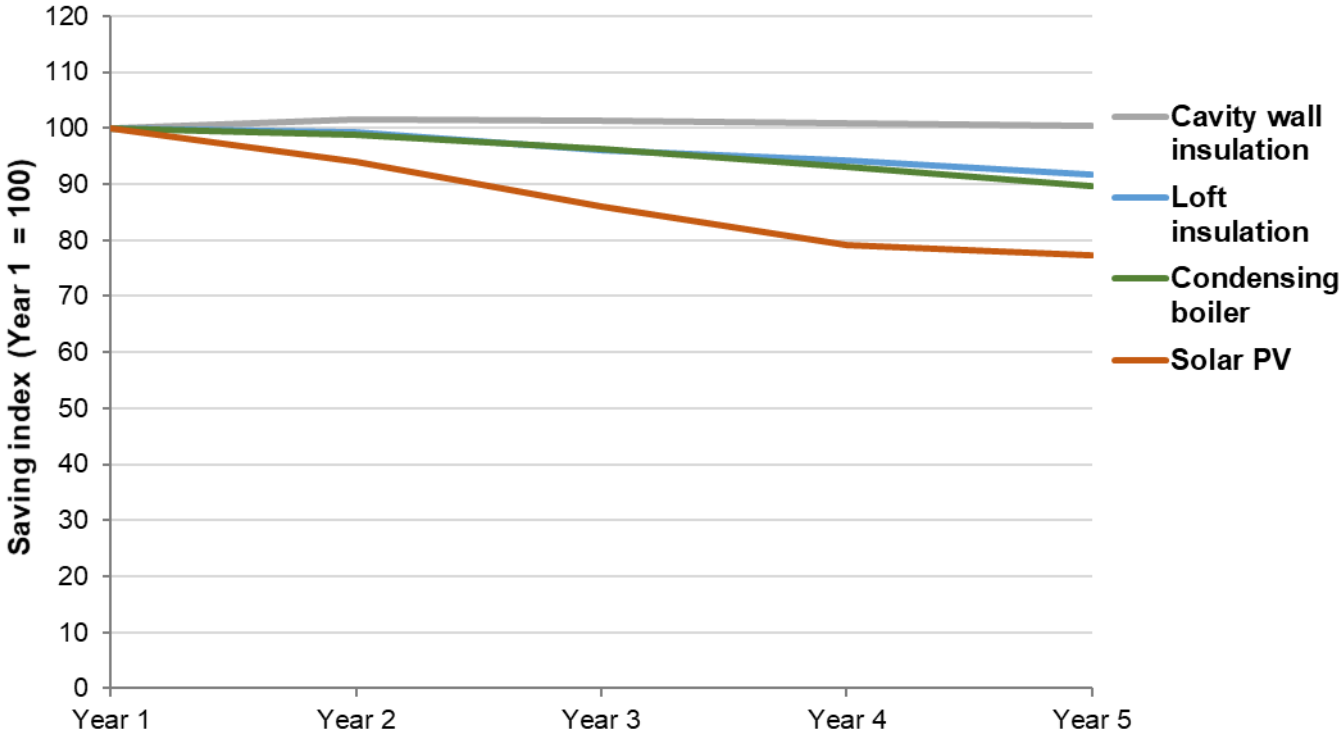


Figure 3.4 shows that gas savings from cavity wall insulation were sustained in the 5 years following installation, while the savings from loft insulation and new condensing boilers decreased by around a tenth between Year 1 and Year 5 after installation. While this may indicate the physical degradation of these measures over time, other possible reasons for this reduction in savings may include increased comfort taking (see page 19).

The electricity savings from solar PV declined by around a fifth between Year 1 and Year 5 after installation. Sources indicate that degradation of a solar PV panel is likely to be below 1 per cent per year; however, this can be expected to vary between solar PV installations[12]. It is therefore likely that, in this case, the reduction in metered savings over time is too large to be attributed to physical degradation of the measure alone and is likely be due to other factors. This may include residents taking advantage of the energy generated on-site and increasing their overall electricity use (see comfort taking definition on page 19).

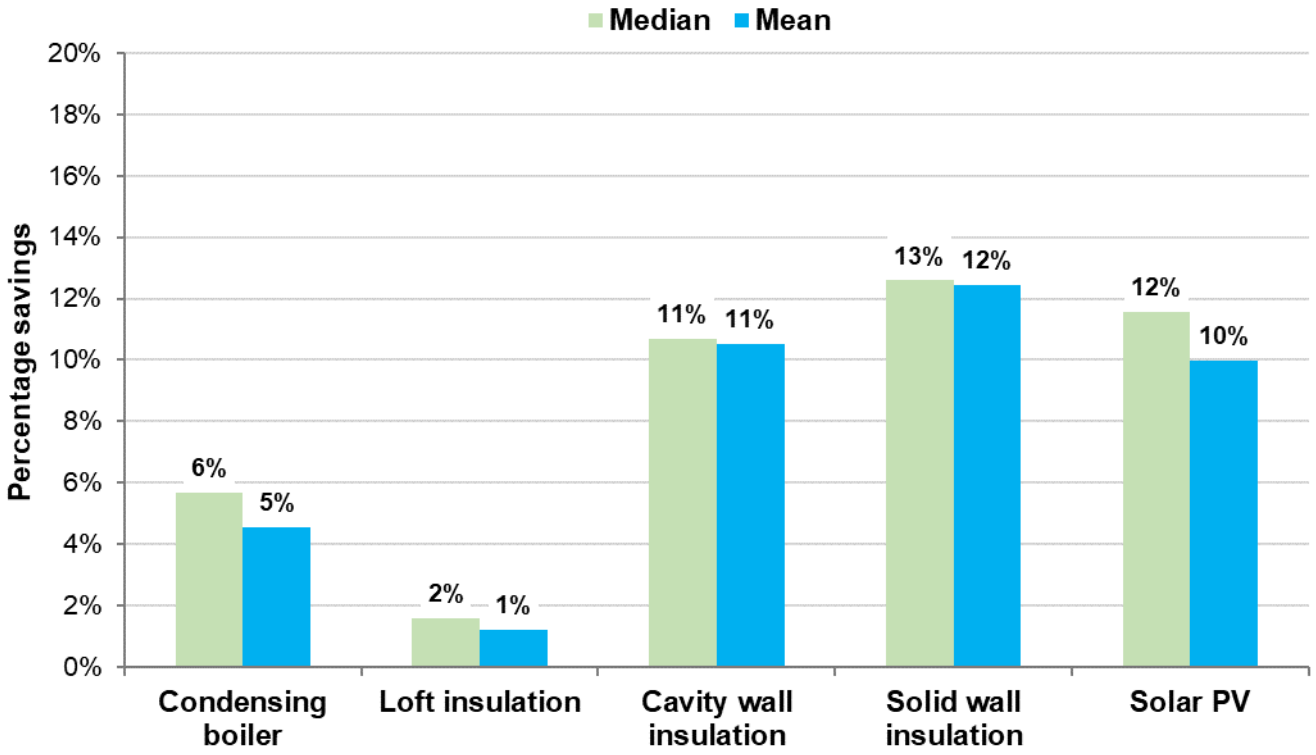
[12] For example, Compendium of photovoltaic degradation rates, Jordan et al, 2016, https://onlinelibrary.wiley.com/doi/abs/10.1002/pip.2744

Impact of Measures Installed in Scotland

The following section sets out the results for the impact of measures analysis for measures installed in Scotland. Apart from different sources of information being used for the household characteristics used in the analysis[13] , the method for Scottish properties is identical to that used for properties in England and Wales. Tables are published alongside this report giving estimated savings for Scottish properties ("Headline impact of measures: Scotland, 2018").

Estimates for the median and mean gas savings from installing various measures are shown in Figure 3.5. The chart shows that solid wall insulation measures yield the highest median gas savings (13 per cent), followed closely by cavity wall insulation (11 per cent). Additionally, Solar PV measures are estimated to result in a 12 per cent median electricity saving.

Figure 3.5: Median and mean gas savings in 2019 for measures installed in 2018, Scotland (electricity savings are shown for Solar PV)



[13] For Scotland, property characteristics are taken from a combination of data supplied by the Scottish Assessors Association (which is several years out of date) and Experian data (which is modelled). For England and Wales, the equivalent information is taken from Valuation Office Agency data that is updated annually.

Further Information

Supporting data tables

The electricity and gas consumption data tables can be found here.
The impact of energy efficiency measures data tables can be found here.

Access to data

Domestic NEED provides a valuable resource, and the team recognises potential uses beyond the projects currently taking place. Information about how to access property level data can be found here.

Samples of anonymised record-level data are available up to 2017 and can be here.

Future updates to these statistics

The timing of next release of these statistics is yet to be confirmed. Sub-national consumption statistics for 2020 will next be published in December 2021.

Related statistics

Sub-national electricity consumption statistics
Summary statistics of domestic and non-domestic electricity consumption at different geographic levels from local authority to postcode level.

Sub-national gas consumption statistics
Summary statistics of domestic and non-domestic electricity consumption at different geographic levels from local authority to postcode level at different geographic levels from local authority to postcode level.

Sub-national total final energy consumption statistics
Summary statistics of domestic and non-domestic consumption of all fuels reported on by BEIS at local authority level.

Household energy efficiency statistics
Monthly statistics on installations under the Energy Company Obligation (and previous schemes such as Green Deal).

Feed-in tariff statistics
Monthly statistics on installations under the Feed-in Tariff.

Revisions policy

The BEIS statistical revisions policy sets out the revisions policy for these statistics, which has been developed in accordance with the UK Statistics Authority Code of Practice for Statistics.

User engagement

BEIS is reviewing its work programme for the National Energy Efficiency Data framework (NEED). To inform this, we would like to hear from users of this publication on how they use these statistics and if they could be adapted to better meet their requirements.

Whilst decisions will necessarily be subject to the resources available, we are considering ways to modify the published materials, so they are resilient and appropriate for future changes in the energy system as we transition to net zero. We will also be considering changes as motivated through wider activities such as the recommendations in the Energy Data Task Force, Ofgem's work on Settlement Reform, the forthcoming Energy Digitalisation Strategy and the Public Interest Advisory Group on smart meters.

As changes require investment, it is likely we will need to pause the publication in 2022 to enable development work to take place, subject to responses from users. To help inform our thinking, please provide your input through this short survey, which closes on 31 July, or by emailing energyefficiency.stats@beis.gov.uk.

The BEIS statement on statistical public engagement and data standards sets out the department's commitments on public engagement and data standards as outlined by the Code of Practice for Statistics.

National Statistics designation

National Statistics status means that our statistics meet the highest standards of trustworthiness, quality, and public value, and it is our responsibility to maintain compliance with these standards.

The continued designation of these statistics as National Statistics was confirmed in February 2015 following a compliance check by the Office for Statistics Regulation.

Pre-release access to statistics

Some ministers and officials receive access to these statistics up to 24 hours before release. Details of the arrangements for doing this and a list of the ministers and officials that receive pre-release access to these statistics can be found in the BEIS statement of compliance with the Pre-Release Access to Official Statistics Order 2008.

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