Department for Energy Security & Net Zero

OFFICIAL STATISTICS — Accredited

Domestic NEED 2024 Annex C: Comparisons with other Sources

27 June 2024 — **Accredited Official Statistics**

This document provides a comparative analysis and commentary assessing how representative the National Energy Efficiency Data-Framework (NEED) is of the domestic dwelling stock. In all cases, the NEED data are broadly consistent with the other sources available for comparison.

- The regional distribution of properties in NEED is representative and comparable to estimates of the number of households and the dwelling stock, with London showing the largest variation at around 1 per cent.

- NEED domestic gas and electricity consumption is aligned with data published in the Subnational electricity and gas consumption publication and Energy Consumption in the UK (ECUK). In England and Wales, for the most recent years consumption estimates:

  - Mean domestic gas consumption is 11,000 kWh in NEED, 11,200 kWh in the Subnational gas consumption statistics[1], and 11,000 kWh in ECUK[2].

  - Mean domestic electricity consumption is 3,300 kWh in NEED, 3,200 kWh in Subnational electricity consumption statistics and 3,400 kWh in ECUK[3].

- The composition of Valuation Office Agency (VOA) and Experian property attribute data contained in NEED is aligned with estimates published in the latest English Housing Survey (EHS) statistics. Overall, there is good alignment between VOA and NEED with some variations because of lower address matching rates for flats.

- The composition of the NEED 2024 Scotland sample is aligned with estimates published in the latest Scottish Household Survey (SHS) and the Scotland House Condition Survey (SHCS). The results provide assurance that the proportion of properties within each category are broadly similar.

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[1] The NEED and Subnational consumption statistics have slightly different values due to differences in what are considered valid data for each publication. For more information, please see Table 4 on page 12.

[2] Gas consumption for the United Kingdom is taken from ECUK (Table C9 - temperature corrected average consumption).

[3] Electricity consumption for the United Kingdom is taken from ECUK (Table C9 - unadjusted average consumption).

Contents

Introduction

The Domestic National Energy Efficiency Data-Framework (NEED) is based on data from various sources linked together using a unique property reference number (UPRN). This document provides information on the quality assurance of data used in the production of analysis using NEED. This section of Annex C covers properties in England and Wales. There is an additional section looking specifically at Scotland from page 20. This publication is updated and reviewed alongside each NEED publication. For more information on NEED, please see the NEED publication page.

Address Matching

Identifying properties using UPRNs is central to the NEED framework. DESNZ matches the address information from different datasets to a UPRN. For example, using address information provided by energy suppliers, metered energy consumption is matched to a property using its UPRN. Household attributes such as the number of bedrooms in a property (supplied by Valuations Office Agency) are also linked using the UPRN. With over 26.8 million properties[4], some properties have conflicting information, and it is not always possible to match to a UPRN. In other cases, incorrect property information may be matched to a meter, though these are a minority of cases. The address matching algorithm being used is estimated to have an error rate of around 1% for domestic addresses.

Outputs from England and Wales Domestic NEED are based on all UPRNs contained in the VOA Council Tax Database that have been successfully matched, via their UPRN, to gas and electricity meter data. Figure 1 shows the distribution of properties in 2024 NEED compared with the latest Office for National Statistics (ONS) English regional household and Welsh Government household estimates, and Department for Levelling Up, Housing and Communities (DLUHC) English regional and Welsh Government estimates of the housing stock. The overall distribution of properties in NEED is aligned with ONS household estimates, with the largest discrepancy being in London at around 1 percentage point. This is largely due to loss of records from the address matching process, which is disproportionately higher in London due to the higher proportion of flats, for which the address matching process has a lower match rate. In comparison with estimates of the dwelling stock the picture is broadly the same, with overall alignment between NEED across regions, and the largest discrepancy being seen in London.

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[4] Valuation Office Agency, Council Tax: stock of properties, 2023

Figure 1: The composition of Domestic NEED compared with the Council Tax Database (VOA), and other sources, England and Wales
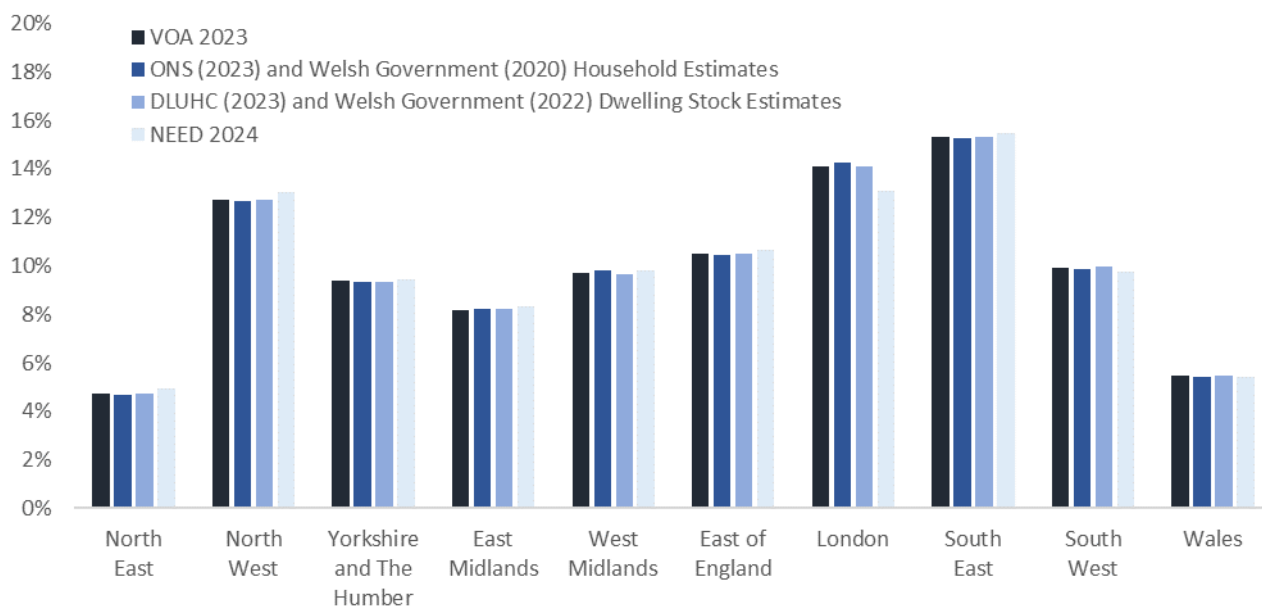

Table 1 summarises the strengths and weaknesses of each of the main data sources used for the June 2024 NEED publication. These strengths and weaknesses should be kept in mind when interpreting NEED statistics.

Table 1: Strengths and weaknesses of data in NEED

Data source	Coverage	Strengths	Weaknesses
Consumption data	Great Britain	• Good coverage of almost all properties. • Data provided by energy suppliers. • Gas data is weather-corrected.	• Based on meter readings. Estimates are used in place of actuals where a meter is not read. • Gas and electricity years do not align to the calendar year (or the same period as each other).
Valuation Office Agency (VOA)	Covers every property in England and Wales.	• Based on administrative data – it is a statutory requirement of the VOA to maintain accurate valuation lists.	• No Scotland data. • Some attributes data may not be up to date.
Experian	Data available for each property in Great Britain.	• Best source of data for property level household characteristics.	• Modelled data with varying accuracy at the property level.
Energy efficiency datasets (including the Energy Company Obligation (ECO) and Green Homes Grant.)	Covers properties in Great Britain which have an energy efficiency measure installed.	• Datasets contain details of energy efficiency measures installed under government schemes.	• Only covers measures installed through government schemes; does not include measures installed by the householder or house builder.
Gas Safe Boiler Installations	Covers every property in Great Britain which have had a new gas boiler installed.	• Excellent coverage, contains information on all boiler installations in Great Britain.	• Scotland data is less complete as registration of a new boiler is not mandatory in Scotland.

Address matching and sample creation

The NEED dataset compiled for the 2024 publication is comprised of data sets covering different time periods: the most recent gas and electricity consumption data covers 2022 (mid-May 2022 to mid-May 2023 for gas, and February 2022 to January 2023 for electricity), VOA property data extracted in autumn 2023, ONS unique property reference number (UPRN) directory data extracted in February 2024 and Experian data covers 2023 household characteristics.

Prior to 2019, a stratified random sample of approximately one in five records was selected from the complete property attribute dataset held by VOA. The resulting sample contained approximately 4 million records. From 2019, NEED has utilised all properties contained in the VOA Council Tax Database.

Table 2: How the samples of properties used in the 2022 NEED domestic energy consumption estimates for England and Wales are arrived at

	Number of Properties			Percentage of the starting population		
	Gas	**Electric**	**Either**	**Gas**	**Electric**	**Either**
Step 1: All domestic properties (VOA database)	26.9	26.9	26.9	100%	100%	100%
Step 2: Matching meter points (all Domestic NEED 2024)	20.6	24.8	25.2	76%	92%	94%
Step 3: Removing invalid consumption for 2022	19.0	23.6	24.5	70%	88%	91%
Step 4: Removing cases with missing attributes	18.8	23.3	24.2	70%	87%	90%
Step 5: Removing uncommon property types	18.7	23.2	24.1	69%	86%	89%
Final	**18.7**	**23.2**	**24.1**	**69%**	**86%**	**89%**

Table 2 shows the number of properties used for the latest (2022) consumption estimates for England and Wales. More details on the five steps set out in Table 2 can be found in Annex D: Methodology Note. After processing the data, a total of 18.7 million properties were used for gas (69% of all domestic properties) and 23.2 million properties were used for electricity (86% of all domestic properties).

The lower number of properties used for the 2022 gas estimates than for the 2022 electricity estimates is due to a lower proportion of domestic properties with a meter matched to them for gas (76%) than for electricity (92%). This is to be expected as a proportion of domestic properties are not connected to the gas grid.

The *Consumption data* section of this document is based on 18.7 million properties for gas and 23.2 million properties for electricity. All subsequent sections of this document (which look at attributes of the properties used for the 2022 estimates) are based on the 24.1 million properties which had either gas or electricity estimates in the 2022 consumption year.

To create NEED, the addresses corresponding to each record in a given dataset are matched to addresses in AddressBase (Ordnance Survey's database of all addresses in Great Britain).

This is to retrieve the unique property reference number (UPRN) that Ordnance Survey have assigned to the address. This process is referred to as "address-matching". Once the records in each dataset have been address-matched, the various datasets can be matched to each other using the UPRN. Table 3 shows the proportion of records in each dataset which could be matched to AddressBase.

Table 3: Address matching rates for data sources Used for England and Wales in Domestic NEED

Data source	Match rate
Matched using DESNZ address matching algorithm	
Meter point electricity (all meters)	91%
Meter point electricity (profile classes 1-2)	94%
Meter point gas (all meters)	93%
Meter point gas (less than 50,000 kWh)	94%
Central Feed-in Tariff Register	84%
MCS	76%
ECO measures	95%
GBIS	98%
GHGV	86%
HUG	85%
LAD	91%
SHDF	95%
HEED	94%
Green Deal measures	90%
Gas safe	89%
Data sources with UPRNs included	
VOA (property attributes)	100%
Experian (household characteristics)	97%
Energy Performance Certificates	98%

Consumption data

The UK Government has collected and published energy consumption data in the [Digest of UK Energy Statistics](#) since 1948. A time series on how energy has been used, including data back to 1970, is also published in [Energy Consumption in the UK](#). Data at individual meter point level (which makes up the consumption part of NEED) were first obtained in 2004 in order to produce local area estimates of consumption – this work was awarded a Royal Statistical Society Award for innovation in 2010. These meter point consumption data cover both gas and electricity consumption for all homes and businesses within England, Scotland and Wales. Property-level data are not available for other heating fuels such as oil, wood or coal.

The electricity and gas data are from energy suppliers' administrative systems and cover all domestic and non-domestic meters in Great Britain. In [2022](#), there were 31.5 million consuming electricity meters and 24.8 million consuming gas meters.

Consumption data based on these meter level readings are published by DESNZ down to postcode level for domestic meters and Middle Layer Super Output Area (MSOA) for non-domestic meters for both electricity and gas meters. This section provides more detail on the gas and electricity consumption data used in NEED.

Gas consumption data

Data collection

DESNZ obtains annualised consumption estimates for all gas meters in Great Britain. All meter-point data for 2022 came from Xoserve, the data service provider responsible for the collation and aggregation of gas consumption. DESNZ is provided with annualised estimates of consumption for all the Meter Point Reference Numbers (MPRNs) in Great Britain based on an Annual Quantity (AQ). The latter is an estimate of annualised consumption using consumption recorded between two meter readings at least six months apart. The estimate is then adjusted using a weather correction factor. The AQ for each MPRN represents consumption relating to the gas period – for the 2022 consumption year this covers consumption from mid-May 2022 through to mid-May 2023.

The data are provided with permission from the owners of the Local Distribution Zones (LDZ) network (these are the four major gas transporters in Great Britain – Cadent, SGN, Wales and West Utilities) and with agreement from the gas suppliers.

Within the meter-point data alone there is currently no reliable way to distinguish between gas used by domestic customers and that used by industry. NEED uses domestic council tax information to define which meter-points are domestic. DESNZ' Subnational consumption publication instead uses the gas industry cut off of 73,200 kWh, with customers using less than this cut-off value assumed to be domestic. This means a number of smaller commercial/industrial consumers are misallocated as domestic in the subnational estimates. DESNZ is looking to resolve this issue within the subnational gas consumption estimates, but this does not affect NEED data.

Data validation

Gas consumption in the majority (99.4 per cent) of VOA classified domestic properties is below 50,000 kWh and the relatively small number of properties with consumption greater than this have been excluded. This should reduce the likelihood of including non-domestic properties or domestic properties with invalid consumption in the analysis.

At the lower end of the consumption figures distribution, there is a cluster of values less than 100 kWh. In 2022, 0.6 per cent of gas consumption records in NEED fell into this category. These have also been excluded from all analysis, as they are likely to be properties with gas supplies which are not used, unoccupied new build properties or where there has previously been an overestimate of the gas consumed at a property.

In addition, meter readings thought to be estimated have been excluded from the data before analysis was undertaken. For any given year, an estimate is assumed if a property has a gas consumption value identical to either of the previous two years.

Comparison with other sources

To check that the sample used for analysis is consistent with the other estimates of domestic consumption published by DESNZ and to lend confidence in use of the data, the mean consumption for NEED[5] has been compared with the data published by DESNZ in [Energy Consumption in the UK](#) (ECUK) and the [Subnational consumption statistics](#).

Figure 2 shows that when looking at gas consumption for 2022, the mean is similar for the published subnational statistics[6] and NEED at 11,200 kWh and 11,000 kWh respectively (when rounded to the nearest 100 kWh). While the subnational estimate is based on the meter readings alone (with a maximum reading as per the gas industry cut-off of 73,200 kWh being classed as domestic), for the NEED estimates gas meters are matched to properties in the VOA's database of domestic properties, providing a more reliable way of isolating domestic properties.

Figure 2 also illustrates that for 2008 to 2015 there is some variation when comparing the mean consumption in NEED with that presented in [ECUK](#), however in the most recent year these are closely aligned with a difference of 10 kWh. There are several reasons why gas consumption data in the NEED sample cannot be exactly reconciled with ECUK:

- the consumption data in ECUK are based on a calendar year whereas the gas consumption data in NEED cover the "gas year" which has varied over the years covered.
- there are [differences in the weather correction method used for ECUK](#) and that for the meter point consumption data.
- the consumption data in ECUK cover the United Kingdom, whereas NEED covers England and Wales only.
- the different sources of data used for these publications: ECUK estimates are based on aggregate estimates of energy supplied, while NEED is based on end use consumption from gas meters.
- ECUK data are based on the number of customers. This differs from the number of meter points since it is possible for a single property to have more than one meter installed.

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[5] The consumption estimates for England and Wales cover England only for 2005 to 2010, and England and Wales from 2011 to 2019.
[6] For more information, see Table 4 below, and [Annex D: Methodology Note](#).

Figure 2: Comparison of estimates of mean gas consumption (kWh) per property
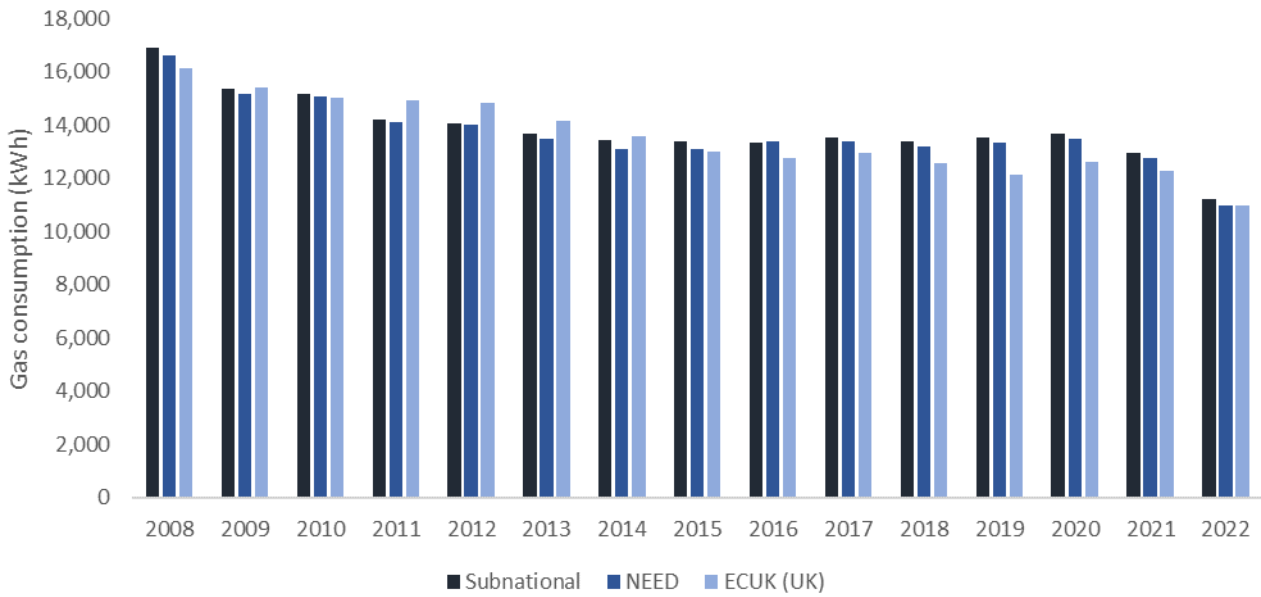
Electricity consumption data

Data collection

Data are collected with the full co-operation of the electricity industry. Annualised consumption data are generated by the data aggregators who work on behalf of electricity suppliers to collate and aggregate electricity consumption levels for each Meter Point Administration Number (MPAN). In addition to this, address information for each meter is obtained from the Electricity Enquiry Service (EES).

The electricity consumption data are generated for both Non-Half Hourly (NHH) meters (domestic and small/medium commercial/industrial customers) and for Half Hourly (HH) meters (larger commercial/industrial customers). In 2022, there were around 31.2 million NHH meters and approximately 0.3 million HH meters in Great Britain. For the NHH data, annualised estimates are based on either an Annualised Advance (AA) or Estimated Annual Consumption (EAC). The AA is an estimate of annualised consumption based on consumption recorded between two meter readings. In comparison, an EAC is used where two meter readings are not available, and an estimate of annualised consumption is produced by the energy company using historical information. These data provide a good approximation of annualised consumption, but do not exactly cover the calendar year. For example, 2022 annualised consumption estimates cover the period from 31 January 2022 up to 30 January 2023. For the half hourly meter consumption estimates, data aggregators produce a report for each MPAN for the relevant calendar year.

DESNZ publishes estimates of domestic and non-domestic consumption with aggregate and average consumption figures provided for each local authority. The domestic consumption is based on NHH meters with profiles 1 and 2 (these are the standard domestic and economy 7 meters respectively). Non-domestic consumption is based on NHH meters with profiles 3 to 8 and all HH meters[7]. However, it should be noted that these assumptions differ from those used in NEED, where the additional data available mean it is more appropriate to use a slightly different approach to ensuring a property is domestic and has valid consumption. This is described in more detail in the data validation section below.

Data validation

There are differences in the consumption records included in the subnational consumption publications and those used in NEED.

Electricity consumption in the majority of VOA classified domestic properties (99.6 per cent) is below 25,000 kWh. The relatively small number of properties with consumption greater than this have been excluded from NEED, in order to avoid biasing estimates. This should reduce the likelihood of including non-domestic properties or domestic properties with invalid consumption in the analysis.

At the lower end of the distribution, there is a further cluster of values (1.3 per cent) including negatives with consumption up to 100 kWh. These have been excluded from all analysis, as they are likely to represent properties with electricity supplies which are not used (or new build properties which are not yet occupied). Unlike in subnational consumption statistics, all negative meter readings are also excluded[8], which raises the overall mean of NEED electricity data.

In addition, suspected estimated values have been excluded from the data before analysis was undertaken. For any given year, if a property has a consumption value identical to either of the two previous years it is assumed to be an estimate.

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[7] Non-domestic consumption also includes any nominally domestic meters with consumption of more than 100,000 kWh in a year or meters with consumption between 50,000 and 100,000 kWh with address information which suggests non-domestic use.

[8] As data are based on billed consumption, it is possible that a negative reading is valid if an estimated reading provided in a previous year was too high, as at the aggregate level the effect of this will cancel out. However, these reading are not considered valid in NEED.

Comparison with other sources

To assess the consistency of the analysis sample with the other estimates of domestic consumption published by DESNZ – and therefore increase confidence in use of the data – mean electricity consumption for NEED was compared with the data published by DESNZ in ECUK and in subnational consumption statistics.

Figure 3 below shows that the mean electricity consumption is similar for all three sources being compared. When looking at consumption in 2022, the difference between the mean electricity consumption in NEED and ECUK is 150 kWh. The 2022 Subnational electricity consumption mean is very similar to that reported by NEED (a difference of 20 kWh).

Figure 3: Comparison of estimates of mean electricity consumption (kWh) per property
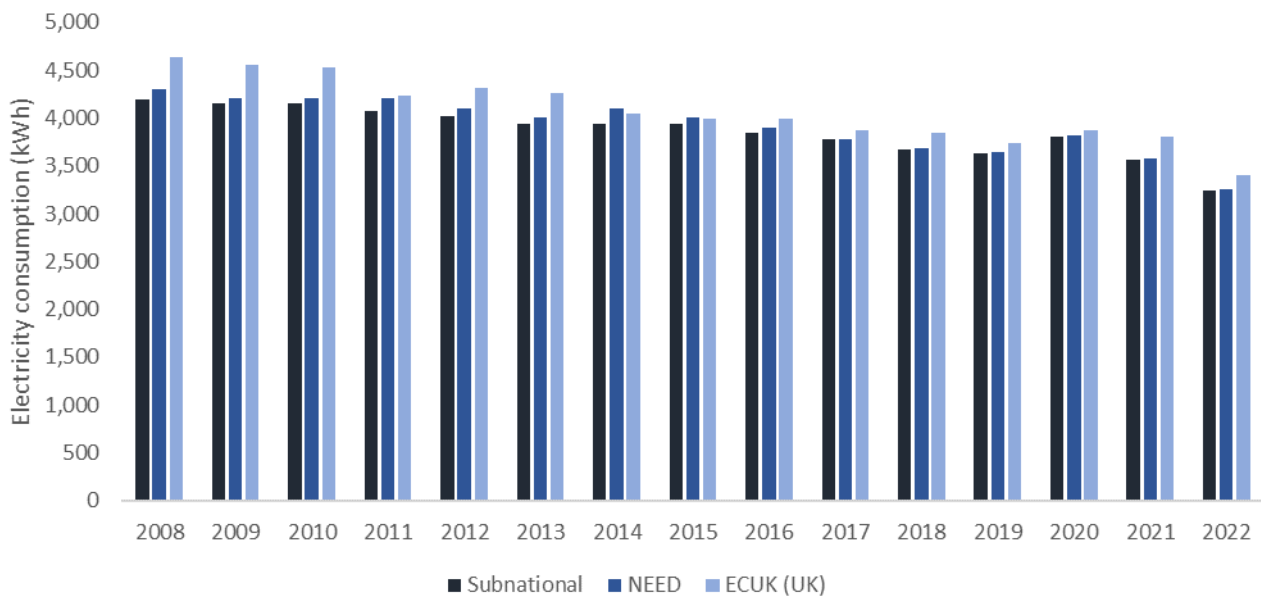
Conclusion

The consumption data are a rich source of data which form the core of NEED. Table 4 summarises the approaches taken towards using the meter point consumption data in domestic NEED and DESNZ' subnational estimates.

The differences lead to small discrepancies in mean consumption but provide confidence in the analysis carried out by NEED, including in relation to the impact of installing energy efficiency measures. The comparisons carried out against other data sources confirm that the consumption estimates based on NEED are consistent with other sources.

Table 4: Differences in domestic consumption data

NEED data	Subnational consumption estimates
The property must be included as a domestic property in the Valuation Office Agency property attribute dataset to be included in the domestic NEED analysis.	Domestic properties are based on consumption for gas (less than 73,200 kWh) and profile class for electricity (profiles 1 and 2 are domestic).
Gas consumption between 100 kWh and 50,000 kWh.	Gas consumption below 73,200 kWh.
Electricity consumption between 100 kWh and 25,000 kWh.	Electricity consumption below 100,000 kWh and profile class 1 or 2 (including negative readings). Electricity consumption of between 50,000 and 100,000 kWh is reviewed and if it is considered to have a non-domestic address then it is also excluded from the subnational domestic estimates.
Data matched to other sources via a unique property reference number (UPRN) at property level.	Data assigned to a Lower Super Output Area using postcode. This means that for the subnational consumption statistics some properties can be assigned accurately if the street is identified even if the exact property is not known.
Suspected estimated readings removed.	

Valuation Office Agency data

Introduction

The Valuation Office Agency (VOA) is the central Government agency responsible for valuing homes in England and Wales for council tax purposes[9]. The VOA has had responsibility for valuing properties for council tax purposes since it was first introduced in 1993 and, before then, for the earlier system of domestic rates. Property attribute data was originally introduced in the 1970s in order to provide a simple system for understanding the main features and attributes of a property.

In order to maintain accurate and fair lists of council tax bandings, the VOA needs to keep the information it holds about properties up to date. It does this in a number of ways, including:

- Obtaining information from the local authority when a home is extended or altered to the extent that planning permission is required;
- Using voluntary questionnaires to enable the occupier to confirm information about a property;
- Obtaining other sources of freely available and publicly published information. For example, a contract with Calnea Analytics to access the Residata website which contains details of properties marketed through mouseprice.com since 2007;
- In addition, the VOA will sometimes ask to visit a property when the information it needs cannot be ascertained from other sources. This can be at the occupier's request; for example, when they have challenged the council tax banding of their property and wish the VOA to carry out a review.

The following VOA property attributes are used in NEED analysis:

- property type
- property age
- floor area (m^2)
- number of bedrooms

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[9] It does not set the level of council tax nor collect the money, which is the task of local government.

Coverage

Table 5 below shows the categories of data used in the analysis for each of the VOA variables (categories are those published in the English Housing Survey). In most cases, VOA has more detailed data; the VOA categories have been grouped into the categories used for the purposes of the NEED analysis and presentation of results. Full details of the breakdowns included in the VOA dataset are available in the published VOA manuals.

Table 5: VOA property attribute data categories used in NEED

	Property age	Property type	Number of bedrooms	Floor area (m^2)
Categories	Pre-1919	Detached	1	1-50
	1919-44	Semi-detached	2	51-100
	1945-64	End terrace	3	101-150
	1965-82	Mid terrace	4	151-200
	1983-92	Bungalow	5 or more	Greater than 200
	1993-99	Purpose-built flat		
	Post 1999	Converted flat		

Summary of data and comparison with other sources

This section shows how NEED compares with the distribution of the data in the full VOA property attribute database and with the English Housing Survey (EHS).

The EHS will vary compared with the VOA data as it is a sample survey and only covers England, whereas VOA data and NEED cover England and Wales. However, it still provides a useful context to validate the NEED data.

Figures 4 to 6 show the proportion of properties in each category for three of the VOA variables used in NEED. EHS calculate different floor area categories which make meaningful comparison between sources difficult.

The most notable variations between NEED and other data sources are seen for flats and for one-bedroom and three-bedroom properties. This is likely to reflect difficulties in address matching flats.

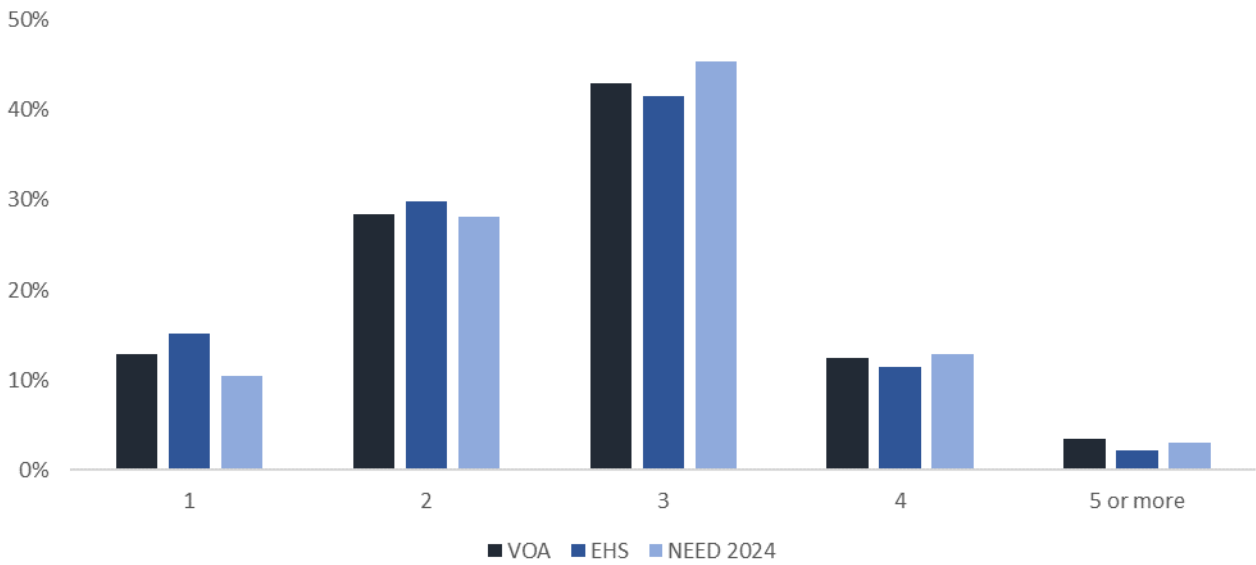**Figure 4: Comparison of distributions – number of bedrooms**

Figure 5: Comparison of distributions – property type
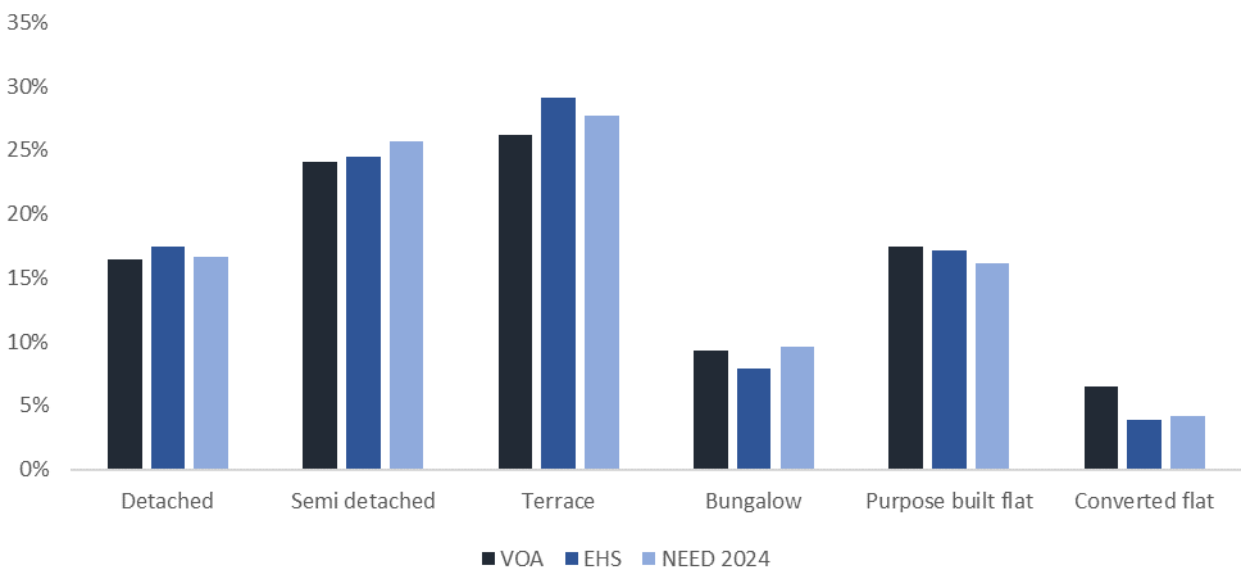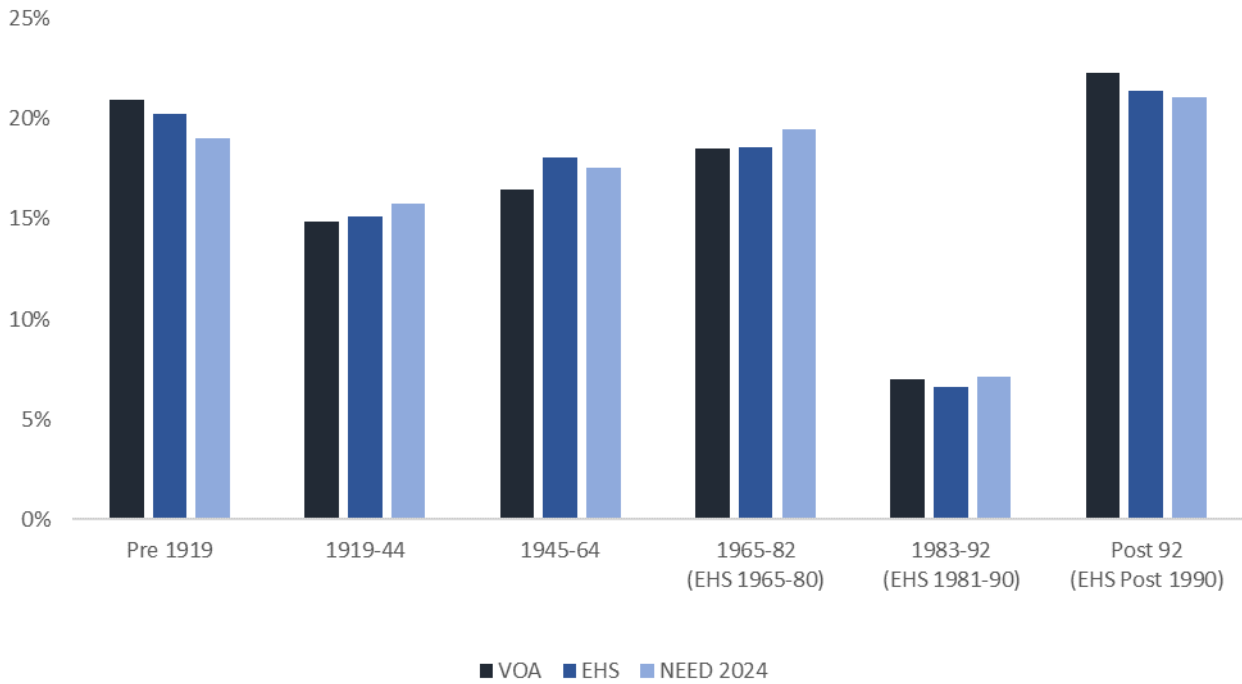
Figure 6: Comparisons of distributions – property age

Conclusion

The NEED data shows similar distributions of property attributes compared to the VOA administrative dataset and the EHS sample survey data. There are some differences for flats (more pronounced for converted flats) and smaller properties which should be considered when interpreting analysis based on NEED.

Experian data

DESNZ purchased data from Experian for each property in the UK based on the dwelling stock in 2023. Data are modelled by Experian based on other data sources including Experian surveys and aggregate published data (such as the Census). The Experian household characteristics data used in NEED are:

- household income
- tenure
- the number of adult occupants

Note that the Experian full dataset covers the UK, the NEED sample covers England and Wales, and the EHS covers England only. This section compares household income and tenure data from Experian with the EHS. The number of adult occupants is not compared as there is not a suitable comparable data source.

Household income

The household income variable identifies the likely household income for each property. The data are based on results from responses to Experian's consumer survey, which is then used alongside other predictive data (including Experian's person and household level demographics and Mosaic) to build a model. Household income is available in ten income bands which are set out below in Table 6.

Table 6: Distribution of income band using the 2023 full Experian dataset

Band	Description	Households (%)
1	Less than £15,000	11.6%
2	£15,000 - £19,999	6.5%
3	£20,000 - £29,999	16.1%
4	£30,000 - £39,999	14.7%
5	£40,000 - £49,999	12.5%
6	£50,000 - £59,999	9.4%
7	£60,000 - £69,999	7.3%
8	£70,000 - £99,999	12.9%
9	£100,000 - £149,999	6.3%
10	£150,000 or more	2.8%

When interpreting any analysis of income in the NEED report it should be noted that data for each property are modelled and therefore are indicative of the income a household is likely to have rather than being an actual value for the current occupant of the property.

Based on Experian's assessment of the 2023 data, 22 per cent of properties are in the correct category and 53 per cent of properties are assigned to within one band of the correct category. Figure 7 shows how the distribution of income for the Experian dataset and NEED compares with the income reported by the EHS (table FA1331). Note that some of the income categories from the Experian data have been grouped together to allow comparison with the categories used in the EHS.

Figure 7 shows that Experian appears to be under-assigning properties to the lowest income band and over-assigning them at the higher income bands, compared to the EHS data. This is consistent with DESNZ' understanding that the Experian income data is less reliable at the extremes. However, it should also be noted that the EHS is a survey and therefore subject to variation. Income is a self-reported variable and therefore likely to be less reliable compared to the EHS property variables which are based on a physical survey on the property carried out by a trained surveyor.

Figure 7: Comparison of distributions – household income band
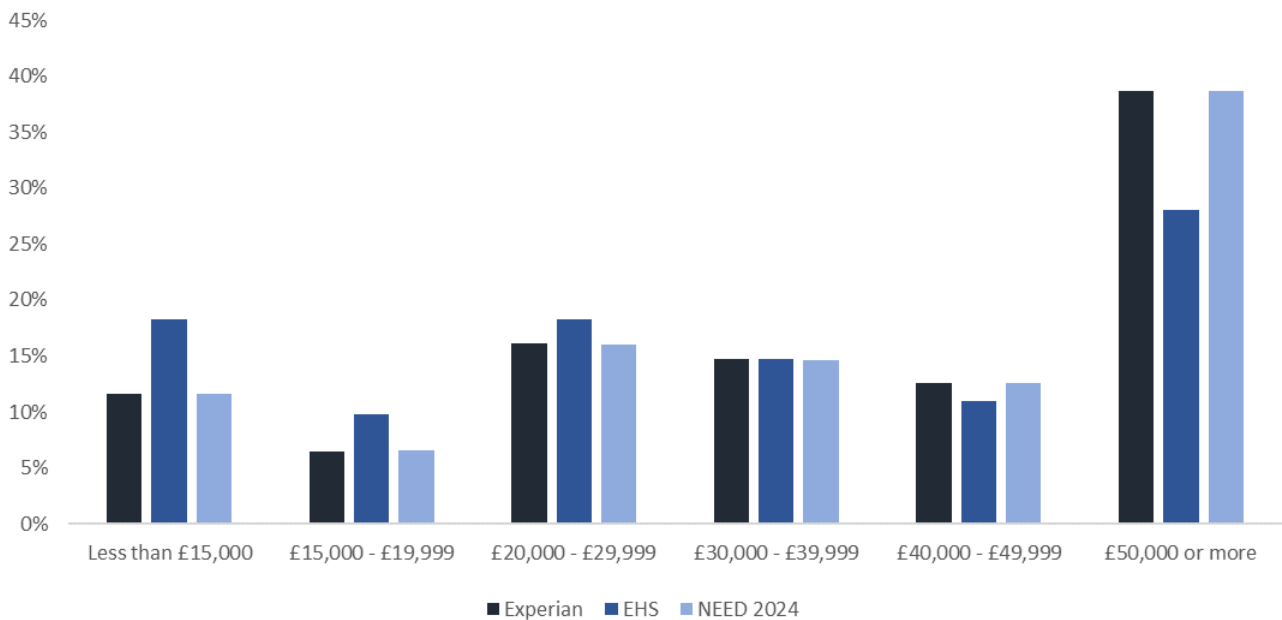
Tenure

Tenure data from Experian allocates each household in the UK to one of three categories; owner occupied, council/housing association or privately rented. The data are based on responses to Experian's lifestyle survey which are then used to predict the status of all households. As with the household income variable, a model is used to predict the tenure for each property.

Figure 8 shows how the Experian data compares with NEED and EHS at the national level. It shows that the proportion of properties assigned to each tenure category is similar for all sources.

Figure 8: Comparison of distributions – tenure
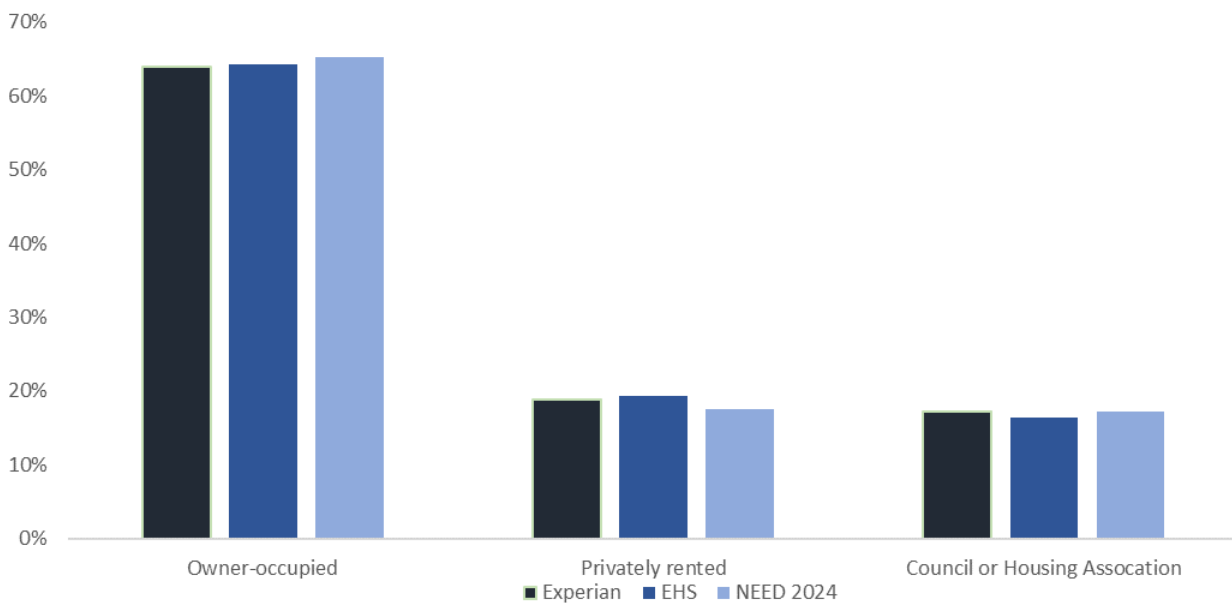
Conclusion

While the Experian data are valuable since they provide an understanding of the properties in NEED and how consumption and impact of energy efficiency measures vary for different types of households, it is important that interpretation of results relating to income, tenure and number of adult occupants is kept within the context of the limitations of the data.

Scotland data

For NEED 2024 a database of domestic properties in Scotland has been constructed using Ordnance Survey AddressBase Plus (OSAB). Previously a Scottish Assessors Association (SAA) dataset of domestic properties has been used as the Scotland database of domestic properties. This dataset was provided 10 years ago, and it is therefore likely that some of the attribute information is out of date, and it also doesn't include domestic properties built in Scotland since the dataset was received. This means SAA data is no longer being used as part of the Scotland NEED estimates.

Gas and electricity consumption data

This section of Annex C covers properties in Scotland. To check that the sample used for analysis is consistent with the other estimates of domestic consumption published by DESNZ and to lend confidence in use of the data, the mean consumption for NEED has been compared with the data published by DESNZ in ECUK and the Subnational consumption statistics.

Figure 9 shows that when looking at gas consumption for 2022, the mean is similar for the published subnational statistics and NEED at 11,400 kWh and 11,700 kWh respectively (when rounded to the nearest 100 kWh). There are larger differences when comparing with ECUK; possible explanations for this are covered in the England and Wales gas consumption data comparison with other sources section of this annex.

**Figure 9: Comparison of estimates of mean gas consumption (kWh) per property**
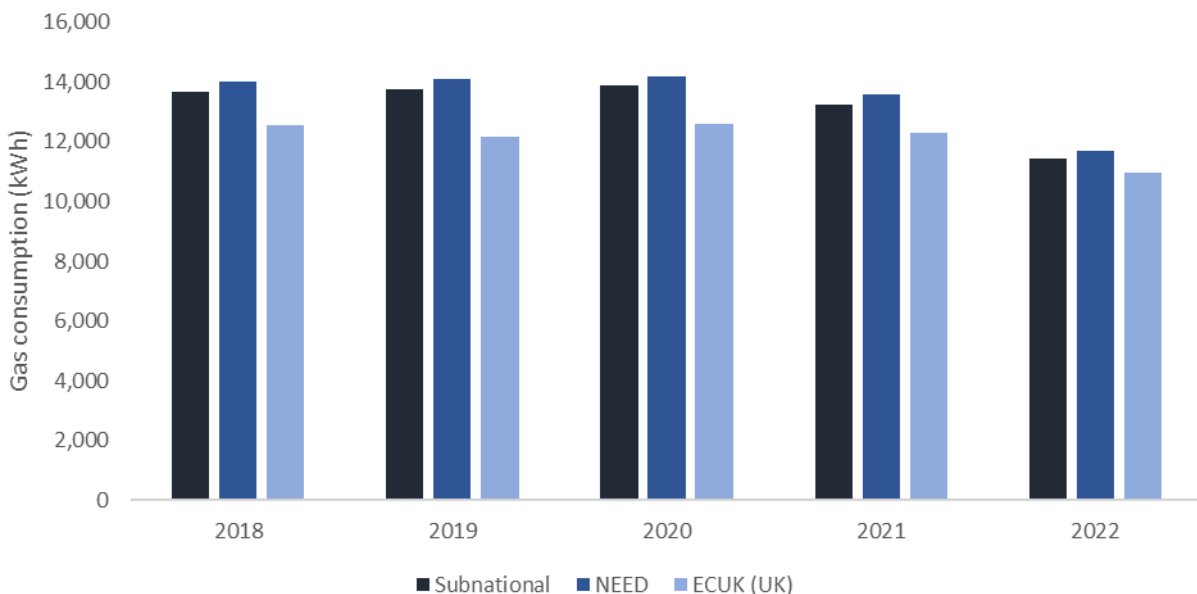
Figure 10 shows that the mean electricity consumption is similar for all three sources being compared. When looking at consumption in 2022, the difference between the mean electricity consumption for the published subnational statistics and NEED is 150 kWh. There is a slightly larger difference when comparing NEED with ECUK of around 200 kWh in the most recent two years, with ECUK mean consumption being higher than that reported in NEED. It should be noted that ECUK covers UK, whereas the NEED and subnational figures used here are for Scotland only.

Figure 10: Comparison of estimates of mean electricity consumption (kWh) per property
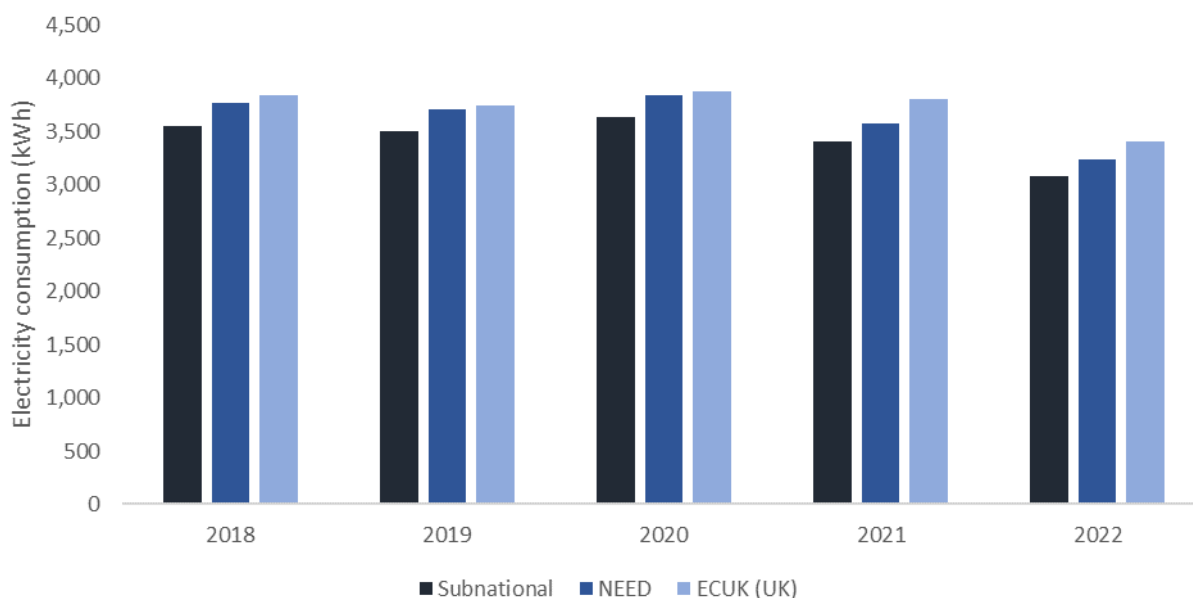
Property attributes and household characteristics

This final section of Annex C covers properties in Scotland and compares the NEED 2024 Scotland sample with data from the Scottish Household Survey (SHS) and the Scotland House Condition Survey (SHCS). Both the SHS and SHCS will vary when compared with the Experian data since they are sample surveys and because the Experian data which is used for all property and household characteristics in Scotland (except property type) is modelled data and therefore also subject to uncertainty. Nevertheless, the results provide assurance that the proportion of properties within each category are broadly similar.

Figures 11 to 15 show the proportion of properties in each category by different property and household characteristics. When looking at number of bedrooms the largest variation is seen for three-bedroom properties. For property type the largest variation is seen for flats which is likely to be a result of lower address matching rates for flats. The proportions by property age compare fairly well, there is a larger difference for the last age category, but it should be noted that the Experian age categories do not align exactly with those in the SHCS. When looking at household income, as is seen for England and Wales, there are larger differences at the extremes and, as with property age, the income bands do not align exactly between the two sources. Finally, there is very good alignment between tenure, when comparing the NEED sample with tenure as reported by the SHCS.

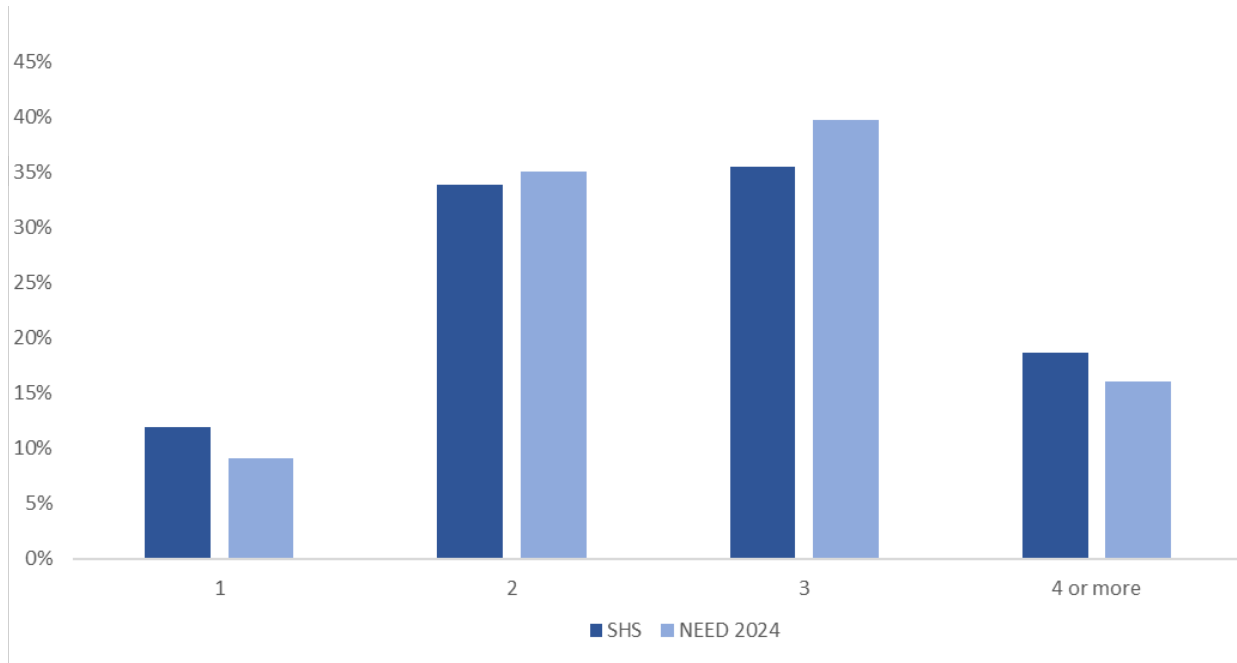**Figure 11: Comparison of distributions – number of bedrooms**
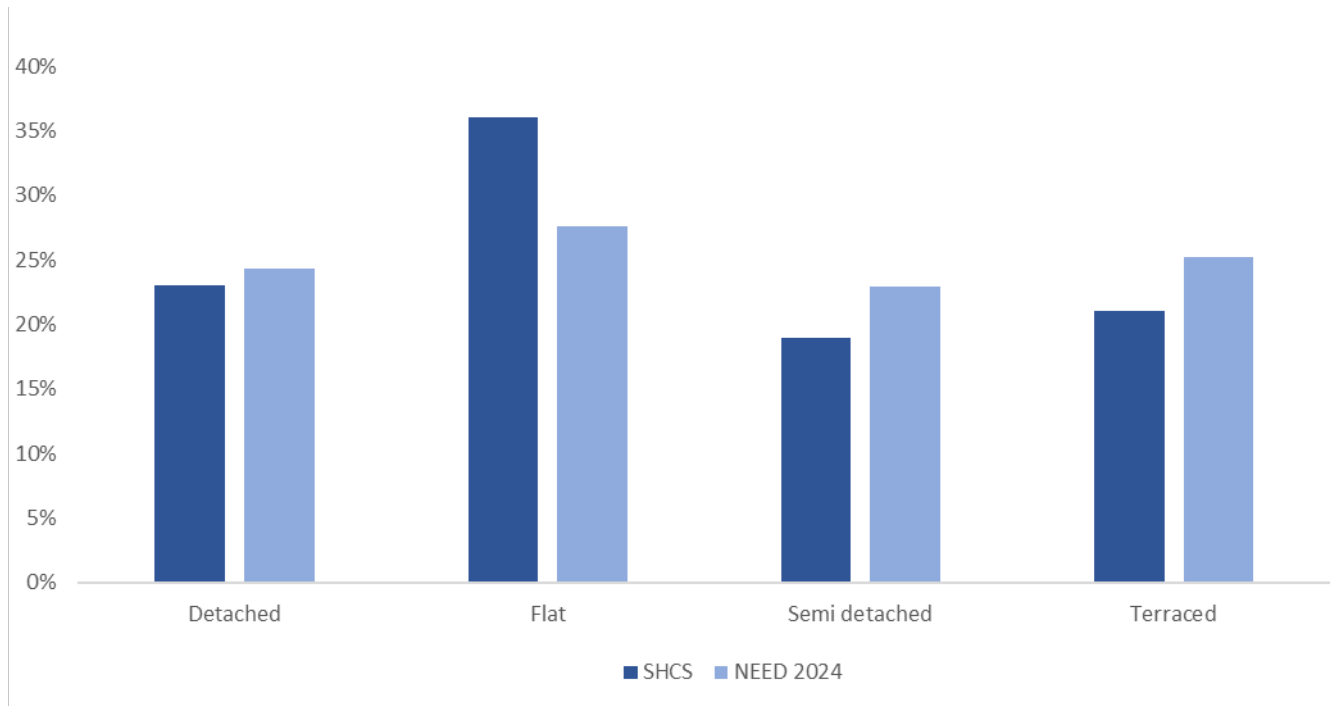

Figure 12: Comparison of distributions – property type
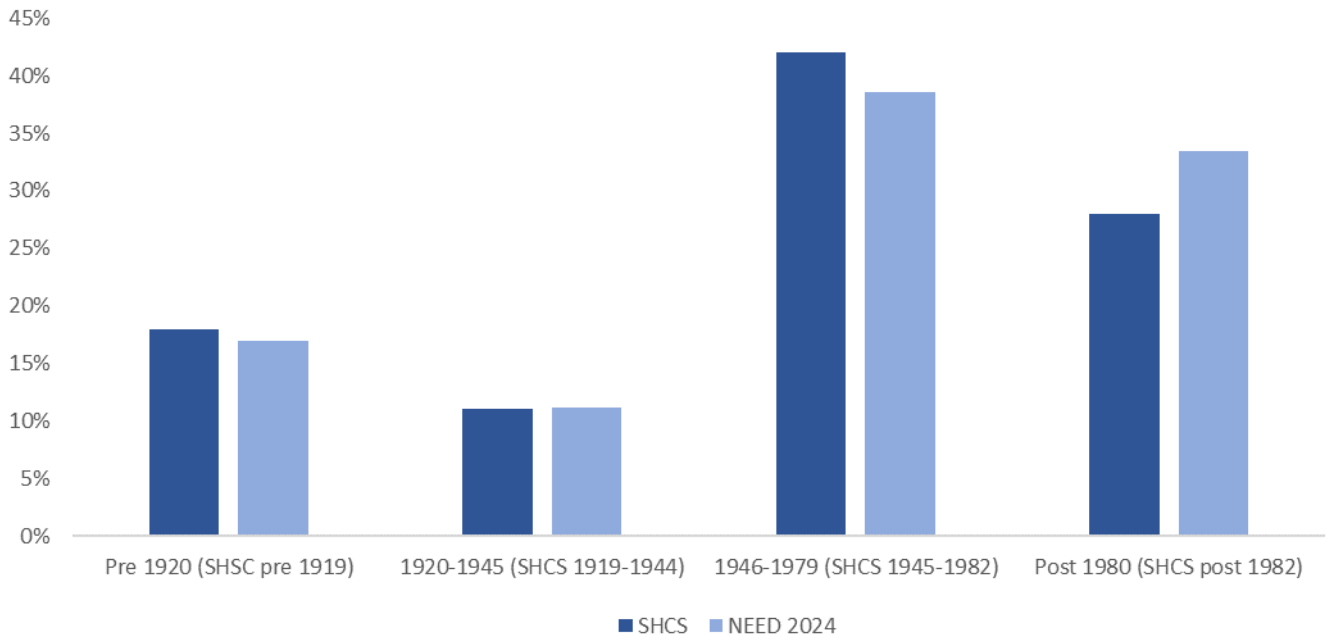
Figure 13: Comparisons of distributions – property age
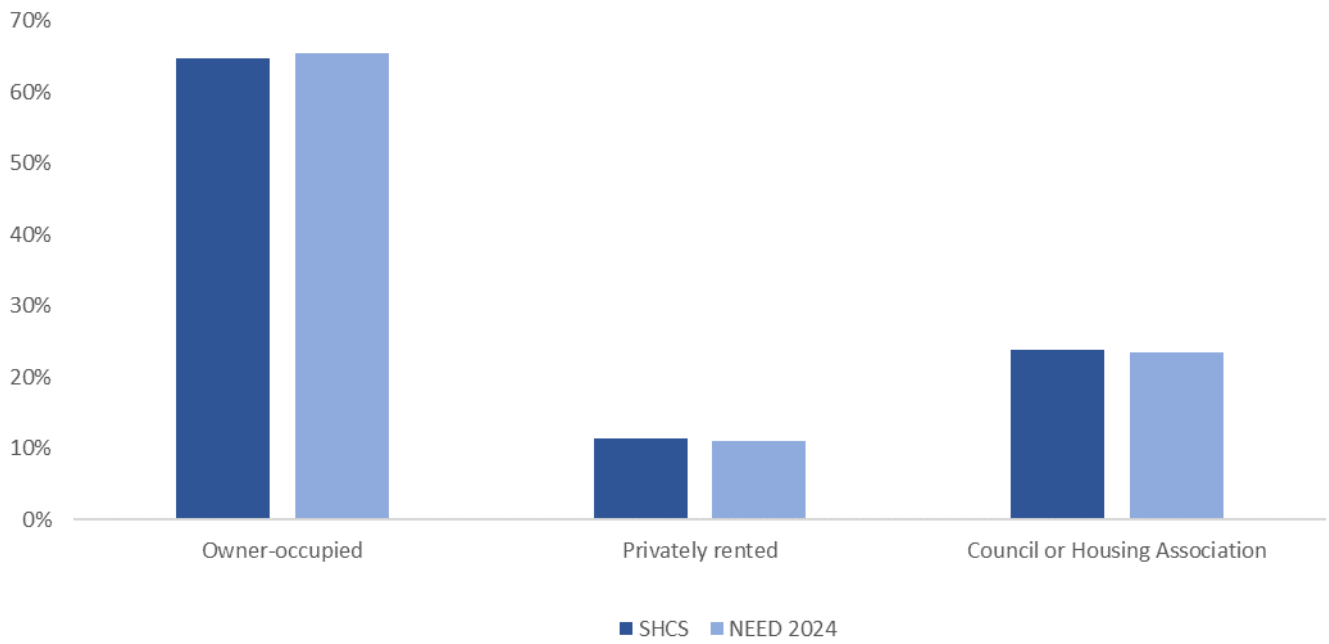

Figure 14: Comparisons of distributions – household income

Figure 15: Comparison of distributions – tenure