

Local Authority Common Ask Electricity



Guide – District Heating

Technical guidance for assembling data for your local network operator's forecasting from a Local Area Energy Plan for District Heating

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Acronyms and Abbreviations

Name	Description
LAEP	Local Area Energy Plan
LSOA	Lower Layer Super Output Areas
DFES	Distribution Future Energy Scenarios

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1. OVERVIEW

1.1 Introduction

This guide was written to accompany version 2 of the LAEP input for modelling Local Authority Common Ask. The purpose of this guide is to explain the reasoning behind providing a Local Authority Common Ask, how to use it and address frequently asked questions. This document does not override the requirements of the Local Authority Common Ask definition itself, and wherever there is a perceived difference between this guide and the Local Authority Common Ask definition, the Local Authority Common Ask definition is to be taken as the authoritative definition.

This guide specifically covers the compilation of district heating data. Other guides are provided to support the compilation of data for other technologies. Note that as well as the data requested for the technology in this section, metadata information for this technology should be provided in the Local Authority Common Ask questionnaire, which is in the “General Information” section.

The Local Authority Common Ask is intended to help in the formatting of inputs to be used in your local network operator’s network modelling. The requirements of the data are designed to allow for like for like comparison between different LAEP outputs, and to ensure that the data can be processed effectively by the network modelling tool. It should not require additional outputs to be produced but may require existing outputs to be transformed or reframed in a different way.

The Local Authority Common Ask consists of the Local Authority Common Ask definition in Microsoft Excel format (named Local Authority Common Ask Definition – DH) this guide and the associated checklist in Microsoft Word and PDF format, a series of example sheets filled out with data demonstrating the format that data should be returned in using CSV UTF-8 (Comma delimited) format, and a series of templates in Microsoft Excel Workbook format (CSV format available on request). The Local Authority Common Ask definition consists of a sheet describing the inputs required for the relevant technology. The document(s) to be returned are defined in the Local Authority Common Ask definition, which also specifies column naming, data types and includes a description of the data required for the column with examples. The Local Authority Common Ask definition itself does not need to be returned. Where templates are to be provided, these have already been partially filled out, and should be completed and returned in the same format as they are provided in. Apart from custom geographic area shapefiles, all documents returned should be in either CSV UTF-8 (Comma delimited) or Microsoft Excel Workbook format. The Local Authority Common Ask Questionnaire should be returned in Microsoft Excel Workbook format.

Note that where names are used for categorisation, then we ask that names match exactly with standard definitions, allowing no room for interpretation. This includes correctly matching the spelling, capitalisation and spaces present in the official definition of the name.

1.2 General guidance for preparing technology specific data

Existing data can be used as a basis for the data provided and convert it into the correct format to be used as an input for your local network operator’s analysis, as defined in the Local Authority Common Ask definition.

If the data template is used, then note that placeholder text has been included to indicate where the LAEP data will be needed to complete the file. Additional rows should be added so the data file encompasses all of the data contained within the LAEP, ranging across the different categories of data within the LAEP such as different geographical areas.

The “*unit*” column provided is for information only and should not be altered. The content of the column in the first row can be copied to all of the rows in the file.

The “*laep_name*” columns, which are present in all data templates to be returned, should contain a single name across all data and across all files which describes the LAEP work which the data

originates from. This will be used to label the data used in your local network operator's analysis to distinguish it from data from other LAEP projects.

Where the Local Authority Common Ask definition specifies a column for geographical area information, then the naming of standard geographical areas should exactly match the definitions found on the [ONS Open Geography Portal](#) for the relevant boundary. The geographical areas referenced here should match the resolution declared in the Local Authority Common Ask questionnaire for this technology. If using LSOAs, note that the "General Information" folder of the Local Authority Common Ask contains lists of relevant LSOAs for your local network operator's area for both 2011 and 2021 boundary definitions, both of which can be selected as the geographical area in the Local Authority Common Ask questionnaire. If the data uses a custom geographical definition for which a shapefile has been provided, then the names of areas in these columns should exactly match the names in the accompanying shapefile provided. Note that if your data is at a higher granular resolution than LSOA, then we ask for you to aggregate it to LSOA level before submitting it. This is to ensure only an appropriate level of data is shared, and to avoid intellectual property concerns about disclosing the details of modelling approaches. Wherever data is not provided for a specific geographical area, then data derived from the local network operator's DFES will be used in its place. If your LAEP spans across multiple licence areas or DNOs and you are unable to resolve it to LSOA level, note that this data can be accepted, and will be processed to represent only the relevant contribution before it is used in modelling.

In some cases, there may be a trade-off between granularity in different categories, such as between high geographic granularity with data provided for years at set intervals and a lower geographic granularity with a full annualised forecast for every year between the base year and 2050. In these cases, the order of preference for granularity is first a preference for data resolved into archetypes that reflect the reference archetypes as closely as possible, then for geographic granularity, and finally for a full time series of data. This order of preference reflects the assumptions that must be made to convert the data into the right format where cannot be provided in the preferred data format. Where the Local Authority Common Ask definition specifies a column for categories referenced in an associated definitions file, then the naming of the categories in this column should exactly match the naming of the categories in the LAEP data from the relevant definitions file.

Where the Local Authority Common Ask definition allows columns for multiple years, then a base year column and a 2050 column must be included, but intermediate year columns should only be completed where output data from the LAEP is available for that year. The base year of the forecast will be taken as the first year for which any data is provided. If data for any years is not provided, then interpolation methods will be applied to create an annual forecast for use in your local network operator's forecasting tool. Note that a column should be included for every year between the base year and 2050 to clearly indicate the years for which data is provided.

The definition of a year can be given in the Local Authority Common Ask questionnaire for each technology by specifying the day of the year on which values apply. For LAEPs with shorter timescales, this information could have a significant impact on the rate of uptake expected by a target date. However, for some LAEP datasets, this information will be less critical as the longer timescales make differences in the day of the year that uptake applies minor, such as for 2050 net zero plans. If a date is not provided, then a default DFES date will be used in its place, so this information should only be provided if it is felt to be important for your case.

As the naming used in the categorical data columns are cross-referenced to other tables and data sources, it is important that the names used are precise to avoid any ambiguity when comparing names. For all files, we ask that the format of the names be carefully checked, including spelling, capitalisation and spaces, especially spaces that might occur at the end of names.

Note that if data is provided for fractions of LSOAs as defined in the “*non_standard_area_loa_definition*” file in the General Information folder, the data provided should only cover the fraction of the LSOA affected by the LAEP and should not be scaled up. If data is provided for a custom area defined in a geojson shapefile, then data should be relevant to the whole of the area referenced in the geojson file.

2. DISTRICT HEATING UPTAKE DATA

The preferred data format for this technology is for domestic and non-domestic data to be provided in separate files, as they may use different units or geographic areas and are handled differently in modelling. If distinction cannot be made in the LAEP outputs between domestic and non-domestic district heating uptake, then a single CSV UTF-8 (Comma delimited) or Microsoft Excel Workbook file labelled “All District Heating Uptake Data” can be provided, but this is not preferable. When selecting options in the Local Authority Common Ask questionnaire, select the same option for both domestic and non-domestic district heating questions on geographical area and unit used.

For both domestic and non-domestic district heating, district heating networks are defined by multiple premises being heated from a centralised location. The network could use a number of different heating sources, including heat pumps, waste heat or fossil fuels. By indicating that buildings are connected to district heating in the modelling, these buildings will not be considered when modelling individual building heating uptake such as through individual heat pumps or resistive heating, as it is assumed that these houses will be solely heated through the heat network.

For clarity, this data is used to classify the uptake information given in the files described in section 3.1. The equations below show how the uptake data is broken down to identify the percentage of buildings with heat pumps, for reference. Note how in subsequent equations, the value used for the numerator of an equation becomes the denominator for the next equation in the series:

District heating uptake:

$$\frac{\text{Number of buildings connected to district heating}}{\text{Total Building Stock}}$$

Percentage of buildings with district heating using heat pumps or waste heat as a fuel source:

$$\frac{\text{Number of buildings connected to district heating with heat pumps or waste heat as a fuel source}}{\text{Number of buildings connected to district heating}}$$

Percentage of buildings with district heating using heat pumps as a fuel source of those connected to district heating using heat pumps or waste heat as a fuel source:

$$\frac{\text{Number of buildings connected to district heating with heat pumps as a fuel source}}{\text{Number of buildings connected to district heating with heat pumps or waste heat as a fuel source}}$$

2.1 Domestic District Heating Uptake Data Input

This file (with a template named “*district_heating_domestic_data_template*” in the Local Authority Common Ask) will contain the data describing domestic district heating uptake across the LAEP area between the base year and 2050 as a percentage of building stock, indexed by geographical area.

Please refer to the [general guidance on preparing technology specific data](#) for advice on how to compile the data and checks to perform.

The file should contain the following columns:

- *laep_name* – this should be the universal name for the data from this LAEP, as described in the general advice section.
- *geographical_area* – this should be an index for the data describing the area which the row corresponds to, the definition of which matches the definition declared in the Local Authority Common Ask questionnaire, and is either a standard geographical area, or a custom area for which boundary data has been supplied.
- Annualised data columns from base year to 2050 – there should be as many columns as required to span, with one column for each year. The unit of each column should be the proportion of domestic buildings in the geographical area connected to a district heating network.

laep_name	geographical_area	unit	2023
TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	As defined in data dictionary questionnaire	TO BE COMPLETED BY LAEP PRACTITIONER - COMPLETE ALL YEARS FOR WHICH YOUR LAEP REPORTS DATA

Figure 1: First row of domestic district heating uptake data template including first year of data, with comments detailing how data should be entered. Identical to non-domestic template.

2.2 Non-Domestic District Heating Uptake Data Input

This file (with a template named “*district_heating_non_domestic_data_template*” in the Local Authority Common Ask) will contain the data describing non-domestic district heating uptake across the LAEP area between the base year and 2050 as a percentage of building stock, indexed by geographical area. Please refer to the [general guidance on preparing technology specific data](#) for advice on how to compile the data and checks to perform.

Note that the percentage of building stock values for non-domestic district heating uptake used in this file should use units of percentage of buildings with district heating if possible for consistency with other inputs into your local network operator’s forecasting system. The local network operator’s forecast system ingests separate information relating to the floorspace of buildings within the geographical regions within the network, which will be combined with this LAEP input data when calculating heating consumption from non-domestic buildings. If values can only be provided in terms of percentage of I&C building floorspace, this will be accepted but should be noted in the metadata section of the Local Authority Common Ask questionnaire.

The file should contain the following columns:

- *laep_name* – this should be the universal name for the data from this LAEP, as described in the general advice section.
- *geographical_area* – this should be an index for the data describing the area which the row corresponds to, the definition of which matches the definition declared in the Local Authority Common Ask questionnaire, and is either a standard geographical area, or a custom area for which boundary data has been supplied.
- Annualised data columns from base year to 2050 – there should be as many columns as required to span, with one column for each year. The unit of each column should be the proportion of non-domestic buildings in the geographical area connected to a district heating network.

laep_name	geographical_area	unit	2023
TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	As defined in data dictionary questionnaire	TO BE COMPLETED BY LAEP PRACTITIONER - COMPLETE ALL YEARS FOR WHICH YOUR LAEP REPORTS DATA

Figure 2: First row of non-domestic district heating uptake data template including first year of data, with comments detailing how data should be entered. Identical to domestic template.

3. DISTRICT HEATING FUEL TYPE DATA

These files let you indicate the fuels used by the heat networks modelled in your LAEP area. This is done by first stating the proportion of buildings connected to heat networks which use either heat pumps or waste heat as a fuel source. Then you can indicate the number of buildings connected to heat networks which are connected to heat pumps rather than waste heat. This allows a description of heat networks both in terms of which networks are likely to be Net Zero compatible in 2050, and to differentiate between the types of district heating within the net zero compatible subset.

Note that the fuel type files do not differentiate between domestic and non-domestic uptake, and will be applied to both. This is intended to reflect the reality that types of district heating networks which buildings connect to in a given region is not likely to vary between domestic and non-domestic buildings, and to reduce the complexity of the data input.

If your district heating network has a multiple fuel sources, then this should be represented by a consideration of the expected annual heat demand met by each fuel type. For example, if a heat network is expected to meet 50% of the heat demand through a heat pump and 50% through natural gas heating, then this would be represented by multiplying the fraction of buildings connected to a waste heat or heat pump network by 50% for the area that it covers.

If fuel type data is not provided, then underlying assumptions derived from your local network operator's DFES will be used to determine the fuel source of buildings connected to the network. Accordingly, if you only have relevant data for one set of fuel type information and not the other, you can provide data only where you have information and the inputs will be ingested accordingly.

3.1 District Heating Networks with Heat Pump or Waste Heat Fuel Data

This file (with a template named "*district_heating_hp_wh_proportion_data*" in the Local Authority Common Ask) will contain the data on **the percentage of buildings connected to district heating networks** across the LAEP area between the base year and 2050 **which use either heat pumps or waste heat as a fuel source** as a percentage of the total building stock connected to district heating, indexed by geographical area. Please refer to the [general guidance on preparing technology specific data](#) for advice on how to compile the data and checks to perform.

The file should contain the following columns:

- *laep_name* – this should be the universal name for the data from this LAEP, as described in the general advice section.
- *geographical_area* – this should be an index for the data describing the area which the row corresponds to, the definition of which matches the definition declared in the Local Authority Common Ask questionnaire, and is either a standard geographical area, or a custom area for which boundary data has been supplied.
- Annualised data columns from base year to 2050 – there should be as many columns as required to span, with one column for each year. The unit of each column should be the proportion of domestic buildings in the geographical area connected to a district heating network.

laep_name	geographical_area	unit	Quantity	2023
TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR BOTH QUANTITIES FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR BOTH QUANTITIES FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	%	heat_pump_or_waste_heat_proportion	TO BE COMPLETED BY LAEP PRACTITIONER - COMPLETE ALL YEARS FOR WHICH YOUR LAEP REPORTS DATA

Figure 3: First row of district heating heat pump or waste heat proportion data template including first year of data, with comments detailing how data should be entered.

3.2 District Heating Networks with Heat Pump Fuel as a Percentage of Heat Pump and Waste Heat Networks Data

This file (with a template named “*district_heating_heat_pumps_percentage_of_total_hp+wh_data*” in the LACA) will contain the data on the **percentage of buildings connected to either a heat pump or waste heat fuelled district heating network** across the LAEP area between the base year and 2050 **which use heat pumps as a fuel source** as a percentage of the total building stock, indexed by geographical area. Please refer to the [general guidance on preparing technology specific data](#) for advice on how to compile the data and checks to perform.

The file should contain the following columns:

- *laep_name* – this should be the universal name for the data from this LAEP, as described in the general advice section.
- *geographical_area* – this should be an index for the data describing the area which the row corresponds to, the definition of which matches the definition declared in the Local Authority Common Ask questionnaire, and is either a standard geographical area, or a custom area for which boundary data has been supplied.
- Annualised data columns from base year to 2050 – there should be as many columns as required to span, with one column for each year. The unit of each column should be the proportion of domestic buildings in the geographical area connected to a district heating network.

laep_name	geographical_area	unit	Quantity	2023
TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR BOTH QUANTITIES FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	TO BE COMPLETED BY LAEP PRACTITIONER - ADD ROWS FOR BOTH QUANTITIES FOR EACH GEOGRAPHICAL AREA IN YOUR LAEP	%	heat_pumps_percentage_of_total_heat_pump_and_waste_heat	TO BE COMPLETED BY LAEP PRACTITIONER - COMPLETE ALL YEARS FOR WHICH YOUR LAEP REPORTS DATA

Figure 4: First row of district heating heat pump connections as a percentage of total heat pump and waste heat connections data template including first year of data, with comments detailing how data should be entered.