Developing Trajectories for Forward Indicators of the UK's Heat Pump Supply Chains

Final Report for the Climate Change Committee

2023

eunomia

Report For

The Climate Change Committee (CCC)

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Glossary

ABOS – Address based online survey

ASHP – Air source heat pump

BEIS – Department for Business, Energy and Industrial Strategy

BSRIA – Building Services Research and Information Association

CCC – The Climate Change Committee

COP – Coefficient of performance (Indicator of efficiency of a heat pump)

$$COP = \frac{Energy\ output\ (kW)}{Energy\ consumed\ (kW)}$$

ENA – Energy Networks Association

EoH – Electrification of heat

EPC – Energy performance certificate

GSHP – Ground source heat pump

GSHPA – Ground Source Heat Pump Association

Haas – Heat as a service

HABS – Heat and Buildings Strategy

IPO – Intellectual Property Office

MCS – Microgeneration certification scheme

MID – MCS installations database

PAS – Publicly available specification

PAT – Public attitudes tracker

REA – Rapid evidence assessment

RHI – Renewable Heat Incentive

SCOP – Seasonal coefficient of performance (average measurement that shows how efficient a heat pump is on an annual basis)

$$SCOP = \frac{Total\ energy\ output\ per\ annum\ (W)}{Total\ energy\ consumed\ per\ annum\ (W)}$$

SOC – Standard Organisational Classification

1.0

Introduction

Eunomia Research & Consulting Ltd ('Eunomia') is pleased to present this report to the Climate Change Committee (CCC). It presents the work undertaken to develop a suite of indicators and trajectories that can be used by the CCC to track progress in the development of the UK heat pump market. This report is accompanied by the annex 'Heat Pumps - CCC Indicator Template_V3.0' that presents the outputs in the CCC Microsoft Excel template.

1.1 Project Background

The CCC is an independent, statutory body established under the Climate Change Act 2008. Its purpose is to advise the UK and devolved governments on emissions targets. It also produces a statutory annual report for Parliament detailing the UK's progress on reducing greenhouse gas emissions and preparing for and adapting to the impacts of climate change.[1]

Decarbonising heat is key to reducing greenhouse gas emissions and achieving 'Net Zero' emissions by 2050. The transition to Net Zero requires changes that go beyond the deployment-related metrics tracked in CCC progress monitoring and reporting to date. For example, supply chain and skills development, changes in public attitudes, corporate commitments, funding, finance, and governance.

The Government's Heat and Buildings Strategy[2] and the Net Zero Strategy[3] outline a policy framework that aims to substantially reduce emissions from buildings over the next 15 years. The Government aims to use a market-based approach to drive the adoption of low carbon heat in buildings. Under this market-based approach, heat pump installations should scale up to 600,000 per year by 2028.[4]

To ensure that the market is developing, monitoring progress in the development of the heat pump market is required. As such, the CCC is seeking to broaden its assessment of real-world progress, including underlying enablers of policy delivery. The main output of this project was a set of forward-looking indicators and trajectories (defined in section 1.2) for tracking progress in heat pump supply chain development which the CCC can report against on an annual basis.

1.2 Project Aims

This project aimed to develop a series of indicators and their trajectories to enable the CCC to understand how the UK domestic heat pump market is developing, beyond simply how many heat pumps are being installed, whereby:

- **'Indicators'** are the metrics to track – e.g., the number of installers; and
- **'Trajectories'** are forward targets for indicators – e.g., the pathway for the number of installers needed each year to achieve decarbonisation targets.

It was recognised that this exercise would be constrained by the availability of good quality data. Therefore, another aim of the project was to identify key data gaps and make recommendations on how this data could be collected going forward.

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[1] CCC (2021) Progress Report to Parliament, https://www.theccc.org.uk/publication/2021-progress-report-to-parliament/
[2] HM Government (2021) Heat and Buildings Strategy, https://www.gov.uk/government/publications/heat-and-buildings-strategy
[3] HM Government (2021) Net Zero Strategy: Build Back Greener, https://www.gov.uk/government/publications/net-zero-strategy
[4] In its Sixth Carbon Budget advise the CCC advised that the government should aim for 900,000 installations per year by 2028.

1.3 Report Structure

This report is structured as follows:

- **Section 2.0 Methodology** – provides a brief methodology including consideration of research challenges and limitations.

- **Section 3.0 Indicators and Trajectories –** outlines the indicators and trajectories including a summary of the data gaps identified.

- **Section 4.0 Recommendations and Next Steps**

- **Appendices –** includes a template of the summary profile used to present information on indicators and trajectories in section 3.0 and details of the scoring system used to appraise the quality of indicators.

- **Annex –** presents the indicators and trajectories in the CCC Microsoft Excel template.

2.0

Methodology

The following section describes the methodology used to develop the indicators and their trajectories.

2.1 Rapid Evidence Assessment

The first step involved a rapid evidence assessment (REA) which was used to:

- Identify suitable evidence that could be used to inform the development of indicators; and
- Identify data that could be used to populate the indicators and their trajectories.

The starting point was the CCC's pathways for the Sixth Carbon Budget and the Government's Net Zero Strategy, which have underlying assumptions on the number of required heat pump installations across different parts of the housing stock. In addition to this, we identified and reviewed over 50 relevant sources of evidence that included government and industry databases and trade information, longitudinal surveys, and grey literature.

The evidence was collated in an Excel spreadsheet that captured information on each evidence source, such as: author, publication date, frequency of data collection, accessibility, source of funding, whether the evidence had been peer-reviewed, market coverage (domestic / non-domestic) and geographical coverage (e.g., England or UK).

2.2 Indicator Long list

A long list of over 60 indicators was developed using the findings from the REA and our own understanding of the heat pump market.

Each indicator was either categorised as 'core' or 'contextual'. **Core indicators** can be used to directly measure developments in the market, e.g., the number of trained installers. These are the indicators that we think are most important for the CCC to track over time. **Contextual indicators** can also be used to measure developments in the market, but they are considered less insightful than core indicators. Contextual indicators might also be used to provide alternative sources of information that can corroborate core indicators, or they provide wider contextual information to help explain why core indicators may change over time. Some indicators measure the same thing (e.g., the cost of heat pumps), however they use different data sources, so have been included as separate indicators.

Each indicator was scored according to several criteria to indicate overall utility. The criteria included frequency of data collection, comprehensiveness of the methodology and the value of the market insight. Each indicator was given a score out of 27. This was used to decide which indicators to discuss with the CCC during the workshop (see section 2.3) and later on which ones to include in the final list (see section 2.4). The scoring criteria can be found in Appendix A 1.2.

2.3 Workshop with the CCC

A two-hour workshop was held with the CCC in April 2022 to review the long list of indicators to collect feedback on the approach taken and refine the indicators to create a final list. The workshop focused on the indicators that were categorised as core and had the highest scores (21 or above).

2.4 Finalising Indicators and Developing Trajectories

The indicator list was refined following feedback from the workshop and subsequent discussion with the CCC. Some indicators were removed, and some new ones were added (where it was thought they could add value). 70 indicators were included in the final list.

Trajectories were developed, where possible, for core indicators. They were informed by assumptions based on the most recent data available on market conditions and future market targets up until 2035. Targets were inferred from a variety of sources, starting with the CCC's pathways for the Sixth Carbon Budget and the government's Heat and Building Strategy[5] and Net Zero Strategy[6]. It was decided that trajectories should not be informed by historical trends given the significant increase in heat pump deployment expected up to 2035. Instead, compound annual growth rates[7] were applied to estimate trends in the market, assuming future targets and milestones were met. Historic data was provided for core indicators where it was available.

Detailed methodologies were developed for how indicators could be tracked over time. Where data was not available, but the indicator was considered 'core', a recommendation was made on how that data could be collected in the future and by whom.

2.5 Challenges & Limitations

The main challenges and limitations associated with the project are set out below.

- **Market uncertainty** – there is uncertainty as to how the heat pump supply chain will develop in response to Government strategy. This means that a wide range of indicators are needed to capture the different possible routes to scale-up (e.g., importing heat pumps vs UK manufacturing). It also means that the trajectories for core indicators should be considered illustrative. The route to how buildings are decarbonised and which interventions are deployed at which rate is unknown, therefore illustrative scenarios must be used to set trajectories. For example, electrification (air source heat pumps - ASHPs) will be prioritised with moderate levels of energy efficiency uptake, whereas another scenario may be a mix of low carbon heat technologies including hydrogen, and electrification. It will therefore be necessary to review trajectories going forward in recognition of changing market conditions.

- **Domestic vs non-domestic data** – the focus of the CCC's progress reporting – and thus the scope of this work – is on domestic heat pumps. However, many of the data sources available do not

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[5] HM Government (2021) Heat and Buildings Strategy, https://www.gov.uk/government/publications/heat-and-buildings-strategy

[6] HM Government (2021) Net Zero Strategy: Build Back Greener, https://www.gov.uk/government/publications/net-zero-strategy

[7] The following formula was used to calculate the CAGR: $\left(\frac{End\ Value}{Start\ Value}\right)^{\left(\frac{1}{Years}\right)} - 1$

make the distinction between domestic and non-domestic applications. Because the non-domestic heat pump deployment levels are small this is not considered to be a significant issue.

- **Availability of data** – there were several indicators (both core and contextual) for which data is either not available or considered to be poor quality. For these indicators, we have made a recommendation on how data could be collected in the future and by whom. For example, there is a lack of in situ heat pump performance data, therefore a recommendation is made (see section 3.2 on Data Gaps), for the Department for Business, Energy and Industrial Strategy (BEIS) to introduce mandatory remote monitoring of heat pumps through the Microgeneration Certification Scheme (MCS) or a similar product standard to ensure installs have this functionality.

- **Ability to set trajectories –** a lack of future targets for several indicators means that it has not been possible to develop trajectories for all core indicators. For example, we know how many heat pump installers are required to achieve Government targets, however, the required number to be in training is less known given that there is a multitude of training routes available to both those new to the industry, or those transferring across from the current heating and ventilation industry.

- **Relevance of data sources –** one challenge with tracking indicators is that the relevance of certain data sources will change over time. Data collected via MCS is a good example of this. All domestic heat pumps must be accredited under the scheme to receive payment under the Renewable Heat Incentive (RHI). The MCS as a source of data will become less relevant over time as heat pumps become more cost-effective and are installed without public subsidy, or when public subsidy for heat pumps no longer exists.

3.0

Indicators and Trajectories

This section presents each indicator within a 'summary profile' which provides an overview of the indicator, guidance on how to update them going forward, and associated trajectories where relevant. A full explanation of each field in the summary profile can be found in Appendix A 1.1.

Each indicator has been placed within the customer journey, which refers to the path of interactions that an individual would have with a heat pump project or service. This includes:

- The **'enabling environment'** concerns the conditions that make purchasing a heat pump the right choice for a source of heating. It includes the willingness to install, the cost-effectiveness of a heat pump compared to other heating sources and the choice of products on the market.

- **'Preparation'** focuses on the availability of good quality information on heat pumps that can be researched by the individual. An ideal state for this point in the journey would be that there is credible information about heat pump technologies publicly available and accessible.

- The third stage is **'Manufacturing & sales'**. This stage includes themes such as supplier and installer availability and choice, as well as

- The fourth stage is **'Installation'**. This includes general indicators on heat pump installation (e.g., the number of heat pumps installed) as well as factors that facilitate the installation process such as installer work rate and the number of borehole drillers (for ground source heat pumps – GSHP).

- The fifth stage is **'Post Installation & maintenance'**. This includes final stage performance and quality as well as the availability of heat pump servicing and repair.

A high-level overview of the indicators is provided in Figure 1. The summary profiles are provided in section 3.1.

Figure 1: Indicators by Point in the Customer Journey[8]

Enabling Environment	Preparation	Manufacturing & sales	Installation	Post-installation & Maintenance

Enabling Environment

Willingness to install heat pumps*

Cost effectiveness of electricity*

Average cost of a heat pump*

Average cost of an MCS accredited heat pump installation*

Average cost of a heat pump installation (labour only)*

Average cost of a heat pump (capex) and installation (labour only)*

Average total cost of a heat pump installation (unit + install + ancillary)*

Energy efficiency of domestic buildings*

Heat pump innovation

Heat pump efficiency (SCOP)

Number of manufacturers offering heat pumps in the UK

Number of heat pumps models on the UK market (ENA)

Number of new heat pumps models registered on the UK market

Number of heat pumps models on the UK market (MCS)

Number of heat pump models manufactured in the UK**

Public awareness of heat pumps

Value of heat pump components imported into the UK

Preparation

Availability of green mortgages

Availability of loans for heat pumps

Number of customers on a Heat as a Service (Haas) tariff

Number of customers on a Time of Use tariff

Website traffic on Energy Bill Advice Service

Manufacturing & sales

Number of MCS registered installers*

Number of MCS registered installers**

Number of certified PAS 2035:2019 retrofit co-ordinators*

Number of certified PAS 2035:2019 retrofit co-ordinators**

Heat pump demand met by imports*

Heat pump demand met by imports**

UK heat pumps sales*

UK heat pumps sales**

UK heat pump sales per capita vs European country sales per capita

Average lead time from order to delivery**

Number of installers in training

Number of certified PAS 2035:2019 retrofit co-ordinators in training

Number of MCS registered auditors

Number of certified heat pump installers

Number of listed heat pump installers (on TrustMark)

UK heat pump sales vs European country sales

Relative market share of manufacturers

Popular manufacturer market share of MCS accredited installations

Installation

Main method of heating homes in the UK*

Time taken to install a heat pump**

Main method of cooling homes in the UK

Heat pumps installed in domestic properties

Number of heat pumps installed in domestic properties (EPC data)

Number of heat pumps installed in domestic properties (BSRIA data)

Type of house heat pumps are installed in

Housing occupancy for heat pump installations

Heat pump installation by tenure

Installer work rate

Number of borehole drillers

Number of boreholes drilled

Number of shared ground loops

Post-installation & Maintenance

Heat pump efficiency (COP) - in situ**

Weather compensation usage**

Heat pump installation quality

Availability of heat pump insurance

Average flow temperature

Heat pump efficiency (SCOP) of high temperature heat pumps

Heat pump efficiency (SCOP) of low temperature heat pumps

Availability of heat pump servicing and repair

Warranty lengths

Key

Bold text = core indicator

Non-bold text = contextual indicator

* a trajectory has been developed for this indicator

** data gap – recommendations for data collection have been made in section 3.2

[8] Additional contextual indicators for Enabling Environment that could not fit in the figure include: Value of heat pump components exported from UK, Value of heat pumps imported into the UK, Value of heat pumps exported from the UK, Value of capital invested in heat pumps, Number of investment funds dedicated to heat pumps, Online searches for heat pumps, Online searches for air source heat pumps, Online searches for ground source heat pumps, Online searches for boiler replacement, Online searches for low carbon / eco-friendly heating, Online searches for heat pump installer, Heating system insurance policy conditions.

3.1 Indicator Profiles

3.1.1 Enabling Environment

3.1.1.1 Core

Indicator Information – Indicator No.: EE.01

General Information		Data Characteristics	
Name	Willingness to install heat pumps	**Type**	Social
Description	% owner occupiers likely to install heat pumps next time they need to change their heating system	**Purpose**	Core
Theme	Motivation	**Data source**	BEIS[9] [10]
Journey Point	Identifying push/pull factors	**Link to Source**	https://www.gov.uk/government/collections/public-attitudes-tracking-survey https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1080043/BEIS_PAT_Winter_2021_Heat_and_Energy_in_the_Home_REVISED.pdf
Ideal State	Information about future incentives / disincentives about switching to heat pumps is available	**Update frequency**	Quarterly
Indicator Score	27	**Location**	UK

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[9] BEIS, 2022. BEIS public attitudes tracker. [Accessed: 10/06/2022]
[10] BEIS, 2021. BEIS public attitudes tracker: Heat and energy in the home. Winter 2021, UK. [Accessed: 10/06/2022]

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Air source = 14% fairly likely, 5% very likely; ground source = 11% fairly likely, 3% very likely.	
Unit % indicating "Fairly Likely" or "Very Likely"	

Indicator Data Method & Assumptions

Methodology	• Step 1: Go to Question: LCHEATINSTALLA-E in Heat and Energy in the Home report. ("How likely is it that you would install each of the following heating systems in your home when you next need to change your heating system or boiler?")
	• Step 2: Sum of % Very Likely and % Fairly Likely for Air source heat pumps, repeat for Ground source heat pumps
Assumptions	• No assumptions
Key limitations	• Autumn 2021 was the first BEIS Public Attitudes Tracker (PAT) wave using the Address Based Online Survey (ABOS) methodology, which uses random probability sampling. This methodology change arose following disruptions to data collection due to COVID-19 and the time series was restarted for Autumn 2021. These results can therefore not be compared with previous PAT surveys. Autumn 2021 is therefore the benchmark year.
	• Government benchmark trajectories are based on air source heat pump attitudes only, they do not include ground source heat pumps.

Indicator Information – Indicator No.: EE.02

General Information		Data Characteristics	
Name	Cost effectiveness of electricity	**Type**	Economic
Description	Ratio of domestic electricity to gas price	**Purpose**	Core
Theme	Motivation	**Data source**	BEIS[11]
Journey Point	Identifying push/pull factors	**Link to Source**	https://www.gov.uk/government/statistical-data-sets/annual-domestic-energy-price-statistics
Ideal State	Price of electricity to be cost effective	**Update frequency**	Quarterly
Indicator Score	26	**Location**	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
1.37	
Unit Ratio of domestic electric to gas price	

Indicator Data Method & Assumptions

Methodology	• Step 1: Review Average annual domestic electricity bills "Overall: Unit cost" (Pence per kWh) (QEP 2.2.3 Time Series tab) and Average annual domestic gas bills bills "Overall: Unit cost (Pence per kWh)" (QEP 2.3.3 Time Series tab) to obtain annual average unit cost for energy bills
	• Step 2: Divide Electricity price by Gas Price
Assumptions	• No assumptions
Key limitations	• No key limitations identified

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[11] BEIS, 2022. Annual domestic energy bills. [Accessed: 10/06/2022]

Indicator Information – Indicator No.: EE.03

General Information		Data Characteristics	
Name	Average cost of a heat pump	**Type**	Economic
Description	Average cost of a domestic heat pump unit	**Purpose**	Core
Theme	Motivation	**Data source**	BEIS[12]
Journey Point	Identifying push/pull factors	**Link to Source**	Unpublished - Eunomia research on the cost of heating
Ideal State	Price of heat pump to be cost effective	**Update frequency**	Unknown - assumed ad-hoc
Indicator Score	22	**Location**	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
£3,760	
Unit Cost of a heat pump in £ (real terms 2021 prices)	

Indicator Data Method & Assumptions

Methodology	• Based on the mean domestic heat pump unit cost for an 8kW air source heat pump in Eunomia research on the cost of heating.
Assumptions	• Assumes a cost trajectory based on an 8kW heat pump.
Key limitations	• A one-off study, with no current plan for data to be updated on a regular basis. Costs need to be updated regularly with inflation and other impacts such as Covid-19 pandemic (and subsequent disruption to supply chains) and the impacts of EU Exit, which both have increased average costs.

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[12] Eunomia Research and Consulting (2022), for an upcoming project for the Department for Business, Energy and Industrial Strategy - Cost of Domestic and Commercial Heating Measures.

Indicator Information – Indicator No.: EE.04[13]

General Information		Data Characteristics	
Name	Average cost of an MCS accredited heat pump installation	Type	Economic
Description	Average cost of an MCS accredited heat pump installation (equipment and labour to install)	Purpose	Core
Theme	Motivation	Data source	MCS Register[14]
Journey Point	Identifying push/pull factors	Link to Source	Unpublished - MCS MID extract file(s)
Ideal State	Price of installation to be cost effective	Update frequency	Unknown - assumed ad-hoc
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
£11,832	
Unit Cost of a heat pump in £ (real terms 2021 prices)	

Indicator Data Method & Assumptions

Methodology	• Based on the average cost of an MCS accredited heat pump installation in 2021, from the MCS-MID data request.
Assumptions	• Assumes that costs reported to the MCS have a consistent methodology and are representative of the actual value
Key limitations	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is unknown
	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.
	• The cost of a heat pump installation has been provided as one average cost. In practice the cost of a heat pump can vary significantly depending on the property where it is being installed.

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[13] This is the same indicator as EE.05, but using a different data source to provide another perspective
[14] Unpublished extract data from MCS provided to Eunomia for this research only.

Indicator Information – Indicator No.: EE.05 [15]

General Information		Data Characteristics	
Name	Average cost of a heat pump installation (labour only)	Type	Economic
Description	Average cost of the installation (labour only) of a domestic heat pump	Purpose	Core
Theme	Motivation	Data source	BEIS [16]
Journey Point	Identifying push/pull factors	Link to Source	Unpublished - Eunomia research on the cost of heating
Ideal State	Price of installation to be cost effective	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
£3,677	
Unit Cost associated installation of a heat pump in £ (real terms 2021 prices)	

Indicator Data Method & Assumptions

Methodology	• Based on the mean domestic installation costs for an 8kW air source heat pump in Eunomia research on the cost of heating
Assumptions	• Assumes a cost trajectory based on an 8kW heat pump retrofitted in a 3-4 bed house with significant changes to the incumbent heating system.
Key limitations	• A one-off study, with no current plan for data to be updated on a regular basis. Costs need to be updated regularly with inflation and other impacts such as Covid-19 pandemic (and subsequent disruption to supply chains) and the impacts of EU Exit, which both have increased average costs. • The cost of a heat pump installation has been provided as one cost for a scenario provided in the assumptions section. In practice the cost of a heat pump can vary significantly depending on the property where it is being installed.

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[15] This is the same indicator as EE.04, but using a different data source to provide another perspective
[16] Eunomia Research and Consulting (2022), for an upcoming project for the Department for Business, Energy and Industrial Strategy - Cost of Domestic and Commercial Heating Measures.

Indicator Information – Indicator No.: EE.06

General Information		Data Characteristics	
Name	Average cost of a heat pump (capex) and installation (labour only)	Type	Economic
Description	Average cost of a domestic heat pump and its installation (labour only)	Purpose	Core
Theme	Motivation	Data source	BEIS[17]
Journey Point	Identifying push/pull factors	Link to Source	Unpublished - Eunomia research on the cost of heating
Ideal State	Price of installation to be cost effective	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
£7,437	
Unit Cost of a heat pump and associated installation in £ (real terms 2021 prices)	

Indicator Data Method & Assumptions

Methodology	• Based on the mean domestic heat pump unit and installation costs for an 8kW air source heat pump in Eunomia research on the cost of heating
Assumptions	• Assumes a cost trajectory based on an 8kW heat pump retrofitted in a 3-4 bed house with significant changes to the incumbent heating system.
Key limitations	• A one-off study, with no current plan for data to be updated on a regular basis. Costs need to be updated regularly with inflation and other impacts such as Covid-19 pandemic (and subsequent disruption to supply chains) and the impacts of EU Exit, which both have increased average costs
	• The cost of a heat pump installation has been provided as one cost for a scenario provided in the assumptions section. In practice the cost of a heat pump can vary significantly depending on the property where it is being installed.

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[17] Eunomia Research and Consulting (2022), for an upcoming project for the Department for Business, Energy and Industrial Strategy - Cost of Domestic and Commercial Heating Measures.

Indicator Information – Indicator No.: EE.07

General Information		Data Characteristics	
Name	Average total cost of a heat pump installation (unit + install + ancillary)	Type	Economic
Description	Average total cost of the installation of a domestic heat pump, including installation and the heat pump unit.	Purpose	Core
Theme	Motivation	Data source	BEIS[18]
Journey Point	Identifying push/pull factors	Link to Source	Unpublished - Eunomia research on the cost of heating
Ideal State	Price of installation to be cost effective	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
£12,413	
Unit Cost of a heat pump in £ (real terms 2021 prices)	

Indicator Data Method & Assumptions

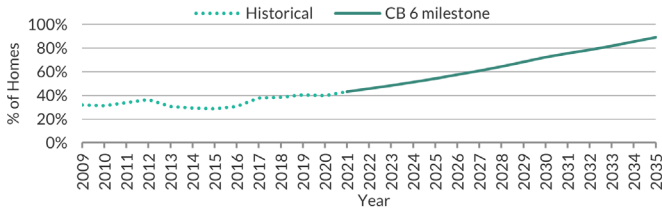| Methodology	• Based on the mean domestic installation costs for an 8kW air source heat pump in Eunomia research on the cost of heating
Assumptions	• Assumes a cost trajectory based on an 8kW heat pump retrofitted in a 3-4 bed house with significant changes to the incumbent heating system.
Key limitations	• A one-off study, with no current plan for data to be updated on a regular basis. Costs need to be updated regularly with inflation and other impacts such as Covid-19 pandemic (and subsequent disruption to supply chains) and the impacts of EU Exit, which both have increased average costs
	• The cost of a heat pump installation has been provided as one cost for a scenario provided in the assumptions section. In practice the cost of a heat pump can vary significantly depending on the property where it is being installed.

Indicator Information – Indicator No.: EE.08

General Information		Data Characteristics	
Name	Energy efficiency of domestic buildings	**Type**	Social
Description	Percentage of properties achieving minimum EPC rating of C	**Purpose**	Core
Theme	Physical capability	**Data source**	Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government[19]
Journey Point	Assessing property suitability	**Link to Source**	https://www.gov.uk/government/statistical-data-sets/live-tables-on-energy-performance-of-buildings-certificates#epcs-for-all-domestic-properties-existing-and-new-dwellings
Ideal State	Properties' characteristics allow for heat pump installation	**Update frequency**	Quarterly
Indicator Score	20	**Location**	England & Wales

Indicator Value & Trajectory

Indicator Value		Trajectory Values
43.5%		
Unit	Percentage of properties achieving minimum EPC rating of C	

Indicator Data Method & Assumptions

Methodology	• Step 1: Open 'Table D2: domestic Energy Performance Certificates for all dwellings by environmental impact rating'
	• Step 2: Go to tab 'D2' and calculate the % that are rated A-C for the relevant year (total number of certificates can be found in column C)
Assumptions	• Based on a study by Rightmove[20] analysing EPC certificates, only 89% of properties would be able to meet EPC C rating. This value was assumed to be equivalent to the government target of upgrading all properties to EPC C where 'practical, cost-effective and affordable'
Key limitations	• EPCs do not give an accurate reflection of real-life energy usage and performance of the buildings to which they are attached.
	• Only around half of all domestic buildings in Great Britain appear on the EPC register and the dataset does not include any Northern Irish properties.
	• EPCs once issued are valid for ten years. Once they expire a new one is not required unless you are entering a new tenancy or selling the property. Therefore, they do not always give an up to date picture.

[20] Rightmove (2021) *1.7 million homes unable to improve energy efficiency to C rating*, Available at: https://www.rightmove.co.uk/press-centre/1-7-million-homes-unable-to-improve-energy-efficiency-to-c-rating/ [Accessed: 10/06/2022].

Indicator Information – Indicator No.: EE.09

General Information		Data Characteristics	
Name	Heat pump innovation	Type	Economic
Description	Relative specialisation of the UK for heat pump patents	Purpose	Core
Theme	Opportunity (Innovation)	Data source	Intellectual Property Office (IPO)[21]
Journey Point	Innovation context provides physical opportunity to acquire heat pumps	Link to Source	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1031166/Greener-buildings-and-heat-pumps.pdf
Ideal State	High level of innovation driving availability of heat pumps with high COP suitable for UK homes	Update frequency	One off study
Indicator Score	18	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
0.155		N/A
Unit	Relative Specialisation Index (RSI) Score	

Indicator Data Method & Assumptions

Methodology	• Full method for future RSI score can be taken from the IPO report on patents for greener buildings and heat pumps.
	• Appendix A provides the search strategy for interrogating the LexisNExis worldwide patent database using PatentSight. Appendix C provides the method for the full RSI calculation.
Assumptions	• No assumptions
Key limitations	• One-off study so data source will not be updated.

Indicator Information – Indicator No.: EE.10

General Information		Data Characteristics	
Name	Heat pump efficiency (SCOP)	Type	Economic
Description	Average SCOP value (at 40°C) for Air Source Heat Pumps certified in 2021	Purpose	Core
Theme	Opportunity (Innovation)	Data source	MCS Register[22]
Journey Point	Innovation context provides physical opportunity to acquire heat pumps	Link to Source	Unpublished - MCS MID extract file(s)
Ideal State	High level of innovation driving availability of heat pumps with high SCOP suitable for UK homes	Update frequency	Unknown - assumed ad-hoc
Indicator Score	23	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
3.90		N/A
Unit	Average (mean) of SCOP Values of heat pump products certified in the last year	

Indicator Data Method & Assumptions

Methodology	• Based on the calculated average (mean) of the SCOP for MCS accredited installations with a flow temperature of 40°C for a given year, from the MCS-MID data request
Assumptions	• Assumes that SCOP values reported to the MCS have a consistent methodology and are representative of the actual value
Key limitations	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is not known
	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes.

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[22] Unpublished extract data from MCS provided to Eunomia for this research only.

This means the data source may become less comprehensive or obsolete in the future.

Indicator Information – Indicator No.: EE.11

General Information		Data Characteristics	
Name	**Number of manufacturers offering heat pumps in the UK**	**Type**	Economic
Description	Number of manufacturers offering heat pump models to UK customers	**Purpose**	Core
Theme	Opportunity (Consumer Choice)	**Data source**	Energy Networks Association[23]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	**Link to Source**	https://www.energynetworks.org/industry-hub/databases
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	**Update frequency**	Unknown - assumed ad-hoc
Indicator Score	26	**Location**	UK + Ireland

Indicator Value & Trajectory

Indicator Value		Trajectory Values
35 manufacturers		N/A
Unit	Count of the number of manufacturers	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to 'Heat pump database' and click the 'database of heat pumps' link to open the database
	• Step 2: Count the number of unique manufacturers in the column named 'make' (column B)
Assumptions	• No assumptions
Key limitations	• The database considers air conditioning units as a form of air source heat pump (air-to-air) if it can provide heating and cooling. Air to air heat pump manufacturers are therefore included in this indicator.
	• The frequency of updates is not known

[23] Energy Networks Association, 2022. Databases. [Accessed: 10/06/2022].

Indicator Information – Indicator No.: EE.12[24]

General Information		Data Characteristics	
Name	Number of heat pumps models on the UK market (ENA)	Type	Economic
Description	Number of heat pump models available in the UK market	Purpose	Core
Theme	Opportunity (Consumer Choice)	Data source	Energy Networks Association (ENA).[25]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://www.energynetworks.org/industry-hub/databases
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Unknown - assumed ad-hoc
Indicator Score	26	Location	UK + Ireland

Indicator Value & Trajectory

Indicator Value		Trajectory Values
As of 26/05/2022, 305 unique models		N/A
Unit	Count of the number of models	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to 'Heat pump database' and click the 'database of heat pumps' link to open the database
	• Step 2: Count the number of unique manufacturers in the column named 'model' (column C)
Assumptions	• No assumptions
Key limitations	• The database considers air conditioning units as a form of air source heat pump (air-to-air) if it can provide heating and cooling. Air to air heat pump models are therefore included in this indicator.
	• The frequency of updates is not known

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[24] This is the same indicator as EE.13 and EE.14, but using a different data source to provide another perspective
[25] Energy Networks Association, 2022. Databases. [Accessed: 10/06/2022].

Indicator Information – Indicator No.: EE.13 [26]

General Information		Data Characteristics	
Name	Number of new heat pumps models registered on the UK market	Type	Economic
Description	Number of new heat pump models available in the UK market	Purpose	Core
Theme	Opportunity (Consumer Choice)	Data source	Energy Networks Association [27]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://www.energynetworks.org/industry-hub/databases
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Unknown - assumed ad-hoc
Indicator Score	26	Location	UK + Ireland

Indicator Value & Trajectory

Indicator Value		Trajectory Values
For reference: as of 26/05/2022, 305 unique models		N/A
Unit	Count of the number of new models since last update	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to 'Heat pump database' and click the 'database of heat pumps' link to open the database
	• Step 2: Count the number of unique manufacturers in the column named 'model' (column C)
	• Step 3: Subtract this value from that from the previous update to obtain the number of new models placed on the market since the last update
Assumptions	• No assumptions
Key limitations	• The database considers air conditioning units as a form of air source heat pump (air-to-air) if it can provide heating and cooling. Air to air heat pump models are therefore included in this indicator.
	• The frequency of updates is not known

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[26] This is the same indicator as EE.12 and EE.14, but using a different data source to provide another perspective
[27] Energy Networks Association, 2022. Databases. [Accessed: 10/06/2022].

Indicator Information – Indicator No.: EE.14 [28]

General Information		Data Characteristics	
Name	Number of heat pumps models on the UK market (MCS)	Type	Economic
Description	Number of heat pump models available in the UK market	Purpose	Core
Theme	Opportunity (Consumer Choice)	Data source	MCS Register[29]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	Unpublished - MCS MID extract file(s)
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Unknown - assumed ad-hoc
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
1,287 ASHP models in 2021￼ 641 G/WSHP models in 2021		N/A
Unit	Count of the number of MCS registered models	

Indicator Data Method & Assumptions

Methodology	• Based on the number of MCS certified ASHP and G/WSHP models, from the MCS-MID data request.
Assumptions	• No assumptions
Key limitations	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is not known
	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.

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[28] This is the same indicator as EE.12 and EE.13, but using a different data source to provide another perspective.
[29] Unpublished extract data from MCS provided to Eunomia for this research only.

Indicator Information – Indicator No.: EE.15

General Information		Data Characteristics	
Name	Number of heat pump models manufactured in the UK	Type	Economic
Description	Number of heat pump models that are manufactured in the UK	Purpose	Core
Theme	Opportunity (Consumer Choice)	Data source	Unknown data set and MCS Register[30]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://mcscertified.com/product-directory/
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Unknown - assumed ad-hoc
Indicator Score	21	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of heat pump models that are manufactured in the UK	

Indicator Data Method & Assumptions

Methodology	• Step 1: Identify UK based manufacturers (current data unavailable)
	• Step 2: Review the MCS data and categorise by UK based manufacturer
Assumptions	• No assumptions
Key limitations	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.
	• The method is incomplete as a data source for UK based manufacturers has not been identified, this would need to be collected on a case-by-case basis from manufacturers which could be a time consuming method, unless streamlined through a survey or a through a trade association.

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[30] MCS, 2022. Product directory. [Accessed: 10/06/2022].

Indicator Information – Indicator No.: EE.16

General Information		Data Characteristics	
Name	Public awareness of heat pumps	Type	Social
Description	Public awareness of heat pumps within the UK	Purpose	Core
Theme	Awareness	Data source	BEIS [31] [32]
Journey Point	Becoming aware of heat pumps as a potential heating system for homes	Link to Source	https://www.gov.uk/government/collections/public-attitudes-tracking-survey https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1064033/BEIS_PAT_Winter_2021_Heat_and_Energy_in_the_Home.pdf
Ideal State	Credible information about heat pump technologies publicly available & accessible	Update frequency	Quarterly
Indicator Score	26	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Air source 71%; ground source 67%; biomass boilers 62%; hybrid heat pump 51%; heat network 50%; hydrogen boiler 50%; solar thermal panels 81% (likely some confusion with solar PV despite clarification though)	N/A
Unit — % Total Aware of specific low carbon heating systems (inc. air source heat pumps, ground source heat pumps)	

[31] BEIS, 2022. BEIS public attitudes tracker. [Accessed: 10/06/2022]
[32] BEIS, 2021. BEIS public attitudes tracker: Heat and energy in the home. Winter 2021, UK. [Accessed: 10/06/2022]

Indicator Data Method & Assumptions

Methodology	• Step 1: Go to Question: LCHEATKNOW1-8 in Heat and Energy in the Home report. ("How much would you say you know about the following low carbon heating systems?")
	• Step 2: For each of the low carbon heating systems, add the % of responses categorised as '% know a lot or fair amount' and '% know a little or hardly anything'
Assumptions	• No assumptions
Key limitations	• Autumn 2021 was the first BEIS Public Attitudes Tracker (PAT) wave using the Address Based Online Survey (ABOS) methodology, which uses random probability sampling. This methodology change arose following disruptions to data collection due to COVID-19 and the time series was restarted for Autumn 2021. These results can therefore not be compared with previous PAT surveys. Autumn 2021 is therefore the benchmark year.

Indicator Information – Indicator No.: EE.17

General Information		Data Characteristics	
Name	Value of heat pump components imported into the UK	Type	Economic
Description	Value of heat pump components imported into the UK	Purpose	Core
Theme	Trade (imports & exports)	Data source	UK Trade Info[33]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://www.uktradeinfo.com/trade-data/ots-custom-table/?id=aa0e3549-e46a-45da-a92b-b54a8f6933e5
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Annual
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
£133,192,076		N/A
Unit	Value of heat pump components that are imported in to the UK	

Indicator Data Method & Assumptions

Methodology	• Step 1: Review UKTradeInfo website by HS6 code: 841899 (Parts of refrigerating or freezing equipment and heat pumps)
	• Step 2: Add the 'EU – Imports' and the 'Non EU – Imports' totals to obtain the value of heat pump components that are imported into the UK in a given time period
Assumptions	• Assumes the data is in real terms
Key limitations	• UK Trade Info only provides a financial value (not the number of units).
	• Some heat pump components are used in other industries and may not be recorded under the heat pump HS6 code, so the complete value of heat pump components is unknown.

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[33] UK Trade Info, no date. Overseas trade data table: Custom table. [Accessed: 10/06/2022].

- The service is in BETA version, so its data collection methodology may change in the future

Indicator Information – Indicator No.: EE.18

General Information		Data Characteristics	
Name	Value of heat pump components exported from UK	Type	Economic
Description	Value of heat pump components exported from UK	Purpose	Core
Theme	Trade (imports & exports)	Data source	UK Trade Info[34]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://www.uktradeinfo.com/trade-data/ots-custom-table/?id=8c37d3fb-3645-4339-bf51-08db18576dd8
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Annual
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
£50,744,621		N/A
Unit	Value of heat pump components that are exported from the UK	

Indicator Data Method & Assumptions

Methodology	• Step 1: Review UKTradeInfo website by HS6 code: 841899 (Parts of refrigerating or freezing equipment and heat pumps)
	• Step 2: Add the 'EU – Exports' and the 'Non EU – Exports' totals to obtain the value of heat pump components that are exported from the UK in a given time period
Assumptions	• Assumes the data is in real terms
Key limitations	• UK Trade Info only provides a financial value (not the number of units).
	• Some heat pump components are used in other industries and may not be recorded under the heat pump HS6 code, so the complete value of heat pump components is unknown.

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[34] UK Trade Info, no date. Overseas trade data table: Custom table. [Accessed: 10/06/2022].

- The service is in BETA version, so its data collection methodology may change in the future

Indicator Information – Indicator No.: EE.19

General Information		Data Characteristics	
Name	Value of heat pumps imported into the UK	Type	Economic
Description	Value of heat pumps imported into the UK	Purpose	Core
Theme	Trade (imports & exports)	Data source	UK Trade Info[35]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://www.uktradeinfo.com/trade-data/ots-custom-table/?id=2793363b-88b3-4401-83d0-e8a668d13aba
Ideal State	Large variety of heat pumps available to the UK market to enable sufficient choice	Update frequency	Annual
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
£119,305,275		N/A
Unit	Value of heat pump models that are imported in to the UK	

Indicator Data Method & Assumptions

Methodology	• Step 1: Review UKTradeInfo website by HS6 code: 841861 (Heat pumps other than air conditioning machines)
	• Step 2: Add the 'EU – Imports' and the 'Non EU – Imports' totals to obtain the value of heat pump that are imported into the UK in a given time period
Assumptions	• Assumes the data is in real terms
Key limitations	• UK Trade Info only provides a financial value (not the number of units).
	• The service is in BETA version, so its data collection methodology may change in the future

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[35] UK Trade Info, no date. Overseas trade data table: Custom table. [Accessed: 10/06/2022].

Indicator Information – Indicator No.: EE.20

General Information		Data Characteristics	
Name	Value of heat pumps exported from the UK	Type	Economic
Description	Value of heat pumps exported from the UK	Purpose	Core
Theme	Trade (imports & exports)	Data source	UK Trade Info[36]
Journey Point	Manufacturers provides physical opportunity to acquire heat pumps	Link to Source	https://www.uktradeinfo.com/trade-data/ots-custom-table/?id=545e4abb-2f4b-4469-b92b-1118b86f11b0
Ideal State	N/A	Update frequency	Annual
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
£9,533,454		N/A
Unit	Value of heat pump models that are exported from the UK	

Indicator Data Method & Assumptions

Methodology	• Step 1: Review UKTradeInfo website by HS6 code: 841861 (Heat pumps other than air conditioning machines)
	• Step 2: Add the 'EU – Exports' and the 'Non EU – Exports' totals to obtain the value of heat pump components that are exported from the UK in a given time period
Assumptions	• Assumes the data is in real terms
Key limitations	• UK Trade Info only provides a financial value (not the number of units).
	• The service is in BETA version, so its data collection methodology may change in the future

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[36] UK Trade Info, no date. Overseas trade data table: Custom table. [Accessed: 10/06/2022].

3.1.1.2 Contextual

Indicator Information – Indicator No.: EE.21

General Information		Data Characteristics	
Name	Value of capital invested in heat pumps	Type	Economic
Description	Amount of capital invested in the UK heat pump market that is focussed on heat pump manufacture and installation	Purpose	Contextual
Theme	Opportunity (Investment)	Data source	No data available
Journey Point	Investment context provides physical opportunity to acquire heat pumps	Link to Source	No data available
Ideal State	Investment infrastructure & funding available for heat pumps in the UK	Update frequency	No data available
Indicator Score	2	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Value of investment in the UK heat pump market that is focussed on heat pump manufacture and installation.	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: EE.22

General Information		Data Characteristics	
Name	Number of investment funds dedicated to heat pumps	Type	Economic
Description	The total number of investment funds that are dedicated to the heat pump sector	Purpose	Contextual
Theme	Opportunity (Investment)	Data source	No data available
Journey Point	Investment context provides physical opportunity to acquire heat pumps	Link to Source	No data available
Ideal State	Investment infrastructure & funding available for heat pumps in the UK	Update frequency	No data available
Indicator Score	2	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of active investment funds in the UK heat pump market that is focussed on heat pump manufacture and installation.	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: EE.23

General Information		Data Characteristics	
Name	Online searches for heat pumps	Type	Social
Description	Internet searches for heat pumps in the UK	Purpose	Contextual
Theme	Motivation	Data source	Google[37]
Journey Point	Identifying push/pull factors	Link to Source	https://trends.google.com/trends/explore?date=all&geo=GB&q=heat%20pump
Ideal State	Information about future incentives / disincentives about switching to heat pumps available	Update frequency	Daily
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
34		N/A
Unit	Google trend score (normalised to a scale between 0 to 100)	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the line graph and hover over the relevant month to obtain the score • See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052[38]
Assumptions	• No assumptions
Key limitations	• Google Trends uses a normalised scale[39] and it is not possible to collect data on the actual number of Google searches over time.

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[37] Google, 2022. Google trends – heat pumps. [Accessed: 13/06/2022].
[38] Google, 2022. FAQ about Google Trends data. [Accessed: 13/06/2022].
[39] Normalisation is a scaling technique in which values are shifted and rescaled so that they end up ranging between 0 and 1, or 1 and 100 in this case.

Indicator Information – Indicator No.: EE.24

General Information		Data Characteristics	
Name	Online searches for air source heat pumps	Type	Social
Description	Internet searches for air source heat pumps in the UK	Purpose	Contextual
Theme	Motivation	Data source	Google[40]
Journey Point	Identifying push/pull factors	Link to Source	https://trends.google.com/trends/explore?date=all&geo=GB&q=air%20source%20heat%20pump
Ideal State	Information about future incentives / disincentives about switching to heat pumps available	Update frequency	Daily
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
46		N/A
Unit	Google trend score (normalised to a scale between 0 to 100)	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the line graph and hover over the relevant month to obtain the score • See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052[41]
Assumptions	• No assumptions
Key limitations	• Google Trends uses a normalised scale[42] and it is not possible to collect data on the actual number of Google searches over time.

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[40] Google, 2022. Google trends – air source heat pump. [Accessed: 13/06/2022].
[41] Google, 2022. FAQ about Google Trends data. [Accessed: 13/06/2022].
[42] Normalisation is a scaling technique in which values are shifted and rescaled so that they end up ranging between 0 and 1, or 1 and 100 in this case.

Indicator Information – Indicator No.: EE.25

General Information		Data Characteristics	
Name	Online searches for ground source heat pumps	Type	Social
Description	Internet searches for ground source heat pumps in the UK	Purpose	Contextual
Theme	Motivation	Data source	Google[43]
Journey Point	Identifying push/pull factors	Link to Source	https://trends.google.com/trends/explore?date=all&geo=GB&q=ground%20source%20heat%20pump
Ideal State	Information about future incentives / disincentives about switching to heat pumps available	Update frequency	Daily
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
31		N/A
Unit	Google trend score (normalised to a scale between 0 to 100)	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the line graph and hover over the relevant month to obtain the score • See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052[44]
Assumptions	• No assumptions
Key limitations	• Google Trends uses a normalised scale[45] and it is not possible to collect data on the actual number of Google searches over time.

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[43] Google, 2022. Google trends – ground source heat pump. [Accessed: 13/06/2022].
[44] Google, 2022. FAQ about Google Trends data. [Accessed: 13/06/2022].
[45] Normalisation is a scaling technique in which values are shifted and rescaled so that they end up ranging between 0 and 1, or 1 and 100 in this case.

Indicator Information – Indicator No.: EE.26

General Information		Data Characteristics	
Name	Online searches for boiler replacement	Type	Social
Description	Internet searches for boiler replacement in the UK	Purpose	Contextual
Theme	Motivation	Data source	Google[46]
Journey Point	Identifying push/pull factors	Link to Source	https://trends.google.com/trends/explore?date=all&geo=GB&q=boiler%20replacement
Ideal State	Information about future incentives / disincentives about switching to heat pumps available	Update frequency	Daily
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
49		N/A
Unit	Google trend score (normalised to a scale between 0 to 100)	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the line graph and hover over the relevant month to obtain the score • See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052[47]
Assumptions	• No assumptions
Key limitations	• Google Trends uses a normalised scale[48] and it is not possible to collect data on the actual number of Google searches over time.

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[46] Google, 2022. Google trends – boiler replacement. [Accessed: 13/06/2022].
[47] Google, 2022. FAQ about Google Trends data. [Accessed: 13/06/2022].
[48] Normalisation is a scaling technique in which values are shifted and rescaled so that they end up ranging between 0 and 1, or 1 and 100 in this case.

Indicator Information – Indicator No.: EE.27

General Information		Data Characteristics	
Name	Online searches for low carbon / eco-friendly heating	Type	Social
Description	Internet searches for low carbon heating in the UK	Purpose	Contextual
Theme	Motivation	Data source	Google[49]
Journey Point	Identifying push/pull factors	Link to Source	https://trends.google.com/trends/explore?date=all&geo=GB&q=low%20carbon%20heating,eco%20friendly%20heating
Ideal State	Information about future incentives / disincentives about switching to heat pumps available	Update frequency	Daily
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Low carbon heating = 11; eco friendly heating = 5		N/A
Unit	Google trend score (normalised to a scale between 0 to 100)	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the line graph and hover over the relevant month to obtain the score
	• See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052[50]
Assumptions	• No assumptions
Key limitations	• Google Trends uses a normalised scale[51] and it is not possible to collect data on the actual number of Google searches over time.

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[49] Google, 2022. Google trends – low carbon heating. [Accessed: 13/06/2022].
[50] Google, 2022. FAQ about Google Trends data. [Accessed: 13/06/2022].
[51] Normalisation is a scaling technique in which values are shifted and rescaled so that they end up ranging between 0 and 1, or 1 and 100 in this case.

Indicator Information – Indicator No.: EE.28

General Information		Data Characteristics	
Name	Online searches for heat pump installer	Type	Social
Description	Internet searches for heat pump installers in the UK	Purpose	Contextual
Theme	Motivation	Data source	Google[52]
Journey Point	Identifying push/pull factors	Link to Source	https://trends.google.com/trends/explore?date=all&geo=GB&q=heat%20pump%20installer
Ideal State	Information about future incentives / disincentives about switching to heat pumps available	Update frequency	Daily
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
62		N/A
Unit	Google trend score (normalised to a scale between 0 to 100)	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the line graph and hover over the relevant month to obtain the score
	• See https://support.google.com/trends/answer/4365533?hl=en&ref_topic=6248052[53]
Assumptions	• No assumptions
Key limitations	• Google Trends uses a normalised scale[54] and it is not possible to collect data on the actual number of Google searches over time.

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[52] Google, 2022. Google trends – heat pump installer. [Accessed: 13/06/2022].
[53] Google, 2022. FAQ about Google Trends data. [Accessed: 13/06/2022].
[54] Normalisation is a scaling technique in which values are shifted and rescaled so that they end up ranging between 0 and 1, or 1 and 100 in this case.

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Indicator Information – Indicator No.: EE.29

General Information		Data Characteristics	
Name	Heating system insurance policy conditions	Type	Economic
Description	Current insurance on heating system allowing for customers to replace gas boiler with heat pumps if boiler breaks down, and not just like for like replacements	Purpose	Contextual
Theme	Economic capability	Data source	No data available
Journey Point	Identifying push/pull factors	Link to Source	No data available
Ideal State	Price of insurance to be cost effective	Update frequency	No data available
Indicator Score	2	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of insurance offerings	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

3.1.2 Preparation

3.1.2.1 Contextual

Indicator Information – Indicator No.: PR.01

General Information		Data Characteristics	
Name	Availability of green mortgages	Type	Social
Description	Availability of green mortgages which pay for heat pumps	Purpose	Contextual
Theme	Research	Data source	GFI, UK Green Mortgage Products [55]
Journey Point	Researching purchase & financing mechanisms	Link to Source	https://www.greenfinanceinstitute.co.uk/programmes/ceeb/green-mortgages/
Ideal State	Credible information about heat pump purchase and financing mechanisms available & accessible	Update frequency	Unknown – assumed ad-hoc
Indicator Score	23	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
46 green mortgages available as of May 2022		N/A
Unit	The number of mortgage products available in the UK market	

Indicator Data Method & Assumptions

Methodology	• Step 1: Scroll down to the bottom of the UK Green Mortgage Products table • Step 2: The total number of entries is the value of UK Green Mortgages available on the date of the last update
Assumptions	• Assumes all financial institutions offering green mortgages have contacted the Green Finance Institute for listing in their database

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[55] Green Finance Institute (2022) UK Green Mortgage Products [Accessed 13/07/2022]

Key limitations	• The database does not specify whether the green mortgages offer finance for low-carbon heating system upgrades, such as for heat pumps
	• The frequency of updates is not known

Indicator Information – Indicator No.: PR.02

General Information		Data Characteristics	
Name	Availability of loans for heat pumps	Type	Social
Description	Availability of loans for heat pumps	Purpose	Contextual
Theme	Research	Data source	No data available
Journey Point	Researching purchase & financing mechanisms	Link to Source	No data available
Ideal State	Credible information about heat pump purchase and financing mechanisms available & accessible	Update frequency	No data available
Indicator Score	2	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	The number of loan products available in the UK market	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: PR.03

General Information		Data Characteristics	
Name	Number of customers on a Heat as a Service (HaaS) tariff	Type	Social
Description	Number of households that are on HaaS tariff using a heat pump	Purpose	Contextual
Theme	Research	Data source	No data available
Journey Point	Choosing an appropriate tariff	Link to Source	No data available
Ideal State	Suitable tariffs are available that are appropriate for heat pumps	Update frequency	No data available
Indicator Score	3	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of customers on the tariff	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: PR.04

General Information		Data Characteristics	
Name	Number of customers on a Time of Use Tariff	Type	Social
Description	Number of customers on a Time of Use Tariff	Purpose	Contextual
Theme	Research	Data source	No data available
Journey Point	Choosing an appropriate tariff	Link to Source	No data available
Ideal State	Suitable tariffs are available that are appropriate for heat pumps	Update frequency	No data available
Indicator Score	3	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of customers on the tariff	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: PR.05

General Information		Data Characteristics	
Name	Website traffic on Energy Bill Advice Service	Type	Social
Description	Number of searches on Energy Bill Advice Service	Purpose	Contextual
Theme	Research	Data source	No data available
Journey Point	Choosing an appropriate tariff	Link to Source	No data available
Ideal State	Suitable tariffs are available that are appropriate for heat pumps	Update frequency	No data available
Indicator Score	2	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of searches	

Indicator Data Method & Assumptions

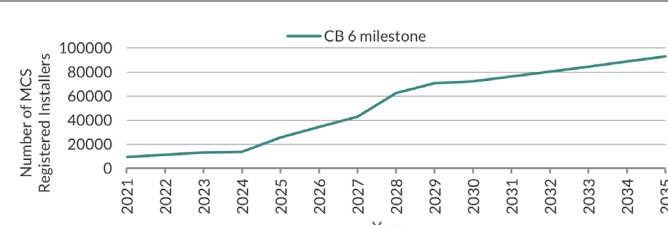| Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• This is a website service the Government is intending to setup, but it is unknown when it will become live.

3.1.3 Manufacturing & Sales

3.1.3.1 Core

Indicator Information – Indicator No.: MS.01

General Information		Data Characteristics	
Name	Number of MCS registered installers	Type	Social
Description	Number of registered installers for heat pumps on the MCS register	Purpose	Core
Theme	Installer Availability & Choice	Data source	MCS Register[56]
Journey Point	Identifying an installer	Link to Source	Unpublished – MCS-MID extract file(s)
Ideal State	Sufficient number of accredited installers are available to meet demand	Update frequency	Unknown - assumed ad-hoc
Indicator Score	25	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
1,178 installers	
Unit Count of number of installers	

Indicator Data Method & Assumptions

Methodology	• Based on number of MCS certified installation companies/contractors, from the MCS-MID data request.
Assumptions	• No assumptions
Key limitations	• MCS certification only applies to businesses instead of individual installers, so the figure is not a true indication of the total number of installers
	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is not known

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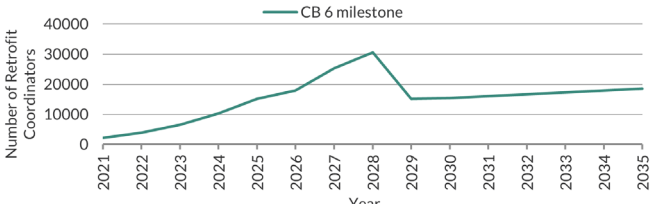
[56] Unpublished extract data from MCS provided to Eunomia for this research only.

- MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future. The current indicator value varies between sources and is much lower than the value required for the trajectory

Indicator Information – Indicator No.: MS.02

General Information		Data Characteristics	
Name	**Number of certified PAS 2035:2019 retrofit co-ordinators**	**Type**	Social
Description	Number of certified PAS 2035 retrofit co-ordinators. Includes all Retrofit Roles (Retrofit Advisor, Retrofit Assessor, Retrofit Coordinator, Retrofit Designer, Retrofit Evaluator)	**Purpose**	Core
Theme	Installer Availability & Choice	**Data source**	TrustMark[57]
Journey Point	Identifying an installer	**Link to Source**	https://www.trustmark.org.uk/homeowners/find-a-tradesperson
Ideal State	Sufficient number of accredited installers are available to meet consumer demand	**Update frequency**	Unknown - assumed ad-hoc
Indicator Score	22	**Location**	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
490 retrofit coordinators	
Unit Count of number of retrofit coordinators	

Indicator Data Method & Assumptions

Methodology	• Step 1: Select 'Advanced Search'
	• Step 2: Under 'Trade description', type and select 'Retrofit coordinator'
	• Step 3: Select all regions and countries and click 'Find tradespeople' to obtain the number of results
Assumptions	• No assumptions

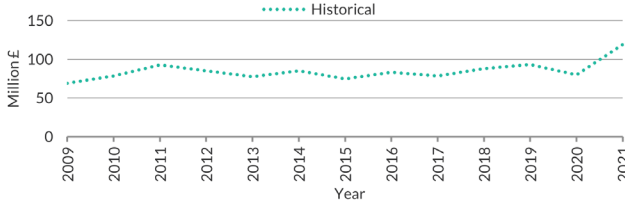[57] Trustmark, 2022. Find a tradesperson. [Accessed: 13/06/2022].

| Key limitations | • The frequency of Trustmark website updates is unknown |
| | • Trustmark register applies to businesses instead of individual retrofitters, so figure is not a true indication of the total number of retrofitters |

Indicator Information – Indicator No.: MS.03

General Information		Data Characteristics	
Name	Heat pump demand met by imports	Type	Economic
Description	Number of domestic UK heat pumps purchases fulfilled by imports	Purpose	Core
Theme	Purchase	Data source	UK Trade Info[58]
Journey Point	Order placed	Link to Source	https://www.uktradeinfo.com/trade-data/ots-custom-table/?id=2bc00d9f-7911-4f79-a3ef-307fb17f8022
Ideal State	Supply chains sufficiently robust to minimise disruption	Update frequency	Annually
Indicator Score	21	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
£119,305,275	
Unit Value of heat pump imports from EU and Non-EU to the UK	

Indicator Data Method & Assumptions
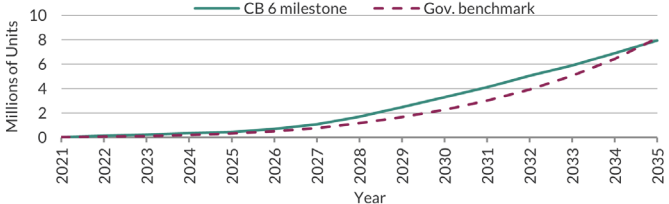
Methodology	• Step 1: Review UKTradeInfo website by HS6 code: 841899 (Parts of refrigerating or freezing equipment and heat pumps)
	• Step 2: Add the 'EU – Imports' and the 'Non EU – Imports' totals to obtain the value of heat pump components that are imported into the UK in a given time period
	• Convert the value to number of units and compare to heat pump demand
Assumptions	• Assumes the data is in real terms
Key limitations	• UK Trade Info only provides a financial value (not the number of units).
	• The service is in BETA version, so its data collection methodology may change in the future

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[58] UK Trade Info, no date. Overseas trade data table: Custom table. [Accessed: 10/06/2022].

Indicator Information – Indicator No.: MS.04

General Information		Data Characteristics	
Name	UK heat pumps sales	Type	Economic
Description	Number of domestic heat pumps sold	Purpose	Core
Theme	Purchase	Data source	No data available
Journey Point	Order placed	Link to Source	No data available
Ideal State	Heat pump has been received by consumer	Update frequency	No data available
Indicator Score	4	Location	No data available

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Data unavailable	
Unit Number of domestic heat pumps sold UK	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• Trajectory assumes number of heat pump sales can be correlated to the cumulative number of heat pumps installed in the UK
Key limitations	• No robust data available for current value

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Indicator Information – Indicator No.: MS.05

General Information		Data Characteristics	
Name	UK heat pump sales per capita vs European country sales per capita	Type	Economic
Description	Number of domestic UK heat pumps sold per capita, versus number of heat pump sales per capita in other european countries	Purpose	Core
Theme	Purchase	Data source	European Heat Pump Association[59] Eurostat[60]
Journey Point	Order placed	Link to Source	https://www.ehpa.org/market-data/ https://ec.europa.eu/eurostat/databrowser/view/tps00001/default/table?lang=en
Ideal State	Heat pump has been received by consumer	Update frequency	Annually
Indicator Score	17	Location	Europe

Indicator Value & Trajectory

Indicator Value	Trajectory Values
	N/A

0.0005 sales per capita in 2020 in the UK, 0.0039 (weighted average) sales per capita in 2020 in rest of Europe

Legend: ■ Heat Pump Sales per Capita in 2020 ◆ Thousands of Units Sold by Country in 2020

[59] European Heat Pump Association, 2022. Market Report 2021. [Accessed: 14/06/2022].
[60] Eurostat, 2022, Population on 1 January TPS00001 [Accessed: 14/06/2022].

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Unit	Number of domestic heat pumps sold per capita UK, and other countries	

Indicator Data Method & Assumptions

Methodology	• Step 1: Obtain headline stats from link. Alternatively, the market report for purchase provides more detail.
	• Step 2: Download population statistics from table for the corresponsing countries
	• Step 3: Divide heat pump sales by population for given year to obtain sales per capita
Assumptions	• No assumptions
Key limitations	• EHPA's Methodology is unclear, and data is costly to repeat as the market report would have to be purchased annually

Indicator Information – Indicator No.: MS.06

General Information		Data Characteristics	
Name	Average lead time from order to delivery	Type	Social
Description	Average (mean) lead time from order to delivery by manufacturers	Purpose	Core
Theme	Purchase	Data source	BEIS[61]
Journey Point	Waiting for order fulfilment	Link to Source	Unpublished - Eunomia research on the cost of heating
Ideal State	Manufacturers are able to fulfil orders quickly	Update frequency	Unknown - assumed ad-hoc
Indicator Score	21	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
16 days		N/A
Unit	Average (mean) lead time for supply of equipment in days	

Indicator Data Method & Assumptions

Methodology	• Based on the mean domestic installation time
Assumptions	• Ensure that assumptions around typical heat pump installation remain the same
Key limitations	• A one-off study, with no current plan for data to be updated on a regular basis. Timeframe data needs to be updated regularly with impacts such as Covid-19 pandemic (and subsequent disruption to supply chains) and the impacts of EU Exit, which both have increased lead times

[61] Eunomia Research and Consulting (2022), for an upcoming project for the Department for Business, Energy and Industrial Strategy - Cost of Domestic and Commercial Heating Measures.

3.1.3.2 Contextual

Indicator Information – Indicator No.: MS.07

General Information		Data Characteristics	
Name	Number of installers in training	Type	Social
Description	Number of registered installers for heat pumps in training	Purpose	Contextual
Theme	Installer Availability & Choice	Data source	Multiple sources: Heat Pump Associations / Manufacturers
Journey Point	Identifying an installer	Link to Source	N/A
Ideal State	Sufficient number of accredited installers are available to meet demand	Update frequency	Unknown - assumed ad-hoc
Indicator Score	21	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Data unavailable	N/A
Unit Count of number of installers in training	

Indicator Data Method & Assumptions

Methodology	• Step 1: Speak to the Heat Pump Association to understand how many individuals have taken their installer training course.
	• Step 2: Ask the Heat Pump Association whether they have collated data on the number of installers trained by manufacturers. Or whether they can collect this.
Assumptions	• No assumptions
Key limitations	• This does not take into account training delivered by the higher education sector,
	• This does not consider training delivered by manufacturers for specific products once installers have been qualified
	• There is only partial data coverage that is highly dependant on the source and difficult to access or obtain

Indicator Information – Indicator No.: MS.08

General Information		Data Characteristics	
Name	**Number of certified PAS 2035:2019 retrofit co-ordinators in training**	**Type**	Social
Description	Number of certified PAS 2035 co-ordinators in training. Includes all Retrofit Roles (Retrofit Advisor, Retrofit Assessor, Retrofit Coordinator, Retrofit Designer, Retrofit Evaluator)	**Purpose**	Contextual
Theme	Installer Availability & Choice	**Data source**	Multiple sources[62]
Journey Point	Identifying an installer	**Link to Source**	HABS – page 51 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1044598/6.7408_BEIS_Clean_Heat_Heat__Buildings_Strategy_Stage_2_v5_WEB.pdf
Ideal State	Sufficient number of accredited installers are available to meet demand	**Update frequency**	Unknown – assumed ad-hoc
Indicator Score	21	**Location**	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Information from the Retrofit Academy: 1,992 in training for Level 5 Diploma in Retrofit Coordination and Risk Management, 750 who have graduated to date.	N/A

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[62] BEIS, 2021. Heat and buildings strategy. London: BEIS. [Accessed: 13.06.2022].

Unit	Count of number of retrofit coordinators in training	

Indicator Data Method & Assumptions

Methodology	• Speak to key training providers (see example list of courses in the HABS) to understand how many individuals have been trained.
Assumptions	• No assumptions
Key limitations	• There are a number of training providers, and it will be hard to capture everyone that has been trained • There is only partial data coverage that is highly dependant on the source and difficult to access or obtain • The frequency of updates is not known

Indicator Information – Indicator No.: MS.09

General Information		Data Characteristics	
Name	Number of MCS registered auditors	Type	Social
Description	Number of registered auditors for heat pump installations and designs	Purpose	Contextual
Theme	Installer Availability & Choice	Data source	No data available
Journey Point	Identifying an installer	Link to Source	No data available
Ideal State	Sufficient number of accredited installers are available to meet demand	Update frequency	No data available
Indicator Score	21	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Count of number of auditors	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: MS.10[63]

General Information		Data Characteristics	
Name	Number of certified heat pump installers	Type	Social
Description	Number of registered installers for heat pumps by an accredited certification body	Purpose	Contextual
Theme	Installer Availability & Choice	Data source	MCS Register[64]
Journey Point	Identifying an installer	Link to Source	https://mcscertified.com/find-an-installer/
Ideal State	Sufficient number of accredited installers are available to meet demand	Update frequency	Unknown - assumed ad-hoc
Indicator Score	26	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
535 installers		N/A
Unit	Count of number of installers	

Indicator Data Method & Assumptions

Methodology	• Based on a count of the number of installers registered to install heat pumps by MCS
	• Step 1: Filter for air source heat pump and under the 'Operates in' section, tick the box 'All of UK'
	• Step 2: Scroll to the bottom of the list to obtain the total number of registered installers
Assumptions	• No assumptions
Key limitations	• MCS certification only applies to businesses instead of individual installers, so figure is not a true indication of the total number of installers
	• The frequency of MCS-MID database updates is not known
	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.

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[63] This is the same indicator as MS.11, but using a different data source to provide another perspective
[64] MCS, 2022. Find a contractor. [Accessed: 13/06/2022].

- The current indicator value varies between sources

Indicator Information – Indicator No.: MS.11 [65]

General Information		Data Characteristics	
Name	Number of listed heat pump installers (on TrustMark)	Type	Social
Description	Number of registered installers for heat pumps on TrustMark	Purpose	Contextual
Theme	Installer Availability & Choice	Data source	TrustMark[66]
Journey Point	Identifying an installer	Link to Source	https://www.trustmark.org.uk/homeowners/find-a-tradesperson
Ideal State	Sufficient number of accredited installers are available to meet demand	Update frequency	Unknown – assumed ad-hoc
Indicator Score	24	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
713 installers		N/A
Unit	Count of number of installers	

Indicator Data Method & Assumptions

Methodology	• Step 1: Select 'Advanced Search'
	• Step 2: Under 'Trade description', type and select 'Air source heat pump'
	• Step 3: Select all regions and countries and click 'Find tradespeople' to obatin the number of results
Assumptions	• No assumptions
Key limitations	• The frequency of updates is not known
	• Trustmark register applies to businesses instead of individual retrofitters, so figure is not a true indication of the total number of retrofitters
	• The current indicator value varies between sources

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[65] This is the same indicator as MS.10, but using a different data source to provide another perspective
[66] TrustMark, 2022. Find a tradesperson. [Accessed: 13/06/2022].

Indicator Information – Indicator No.: MS.12

General Information		Data Characteristics	
Name	UK heat pump sales vs European country sales	Type	Economic
Description	Number of domestic UK heat pumps sold, versus number of heat pump sales in other european countries	Purpose	Contextual
Theme	Purchase	Data source	European Heat Pump Association[67]
Journey Point	Order placed	Link to Source	https://www.ehpa.org/market-data/
Ideal State	Heat pump has been received by consumer	Update frequency	Annually
Indicator Score	17	Location	Europe

Indicator Value & Trajectory

Indicator Value	Trajectory Values
	N/A

32,000 units sold in 2020 in the UK, 157,000 (weighted average) units sold in 2020 in rest of Europe

Unit	Number of domestic heat pumps sold UK, and other countries

Indicator Data Method & Assumptions

Methodology	• Step 1: Obtain headline statistics from link. Alternatively, the market report for purchase provides more detail.
Assumptions	• No assumptions
Key limitations	• EHPA's Methodology is unclear, and data is costly to repeat as the market report would have to be purchased annually

[67] European Heat Pump Association, 2022. Market Report 2021. [Accessed: 14/06/2022].

Indicator Information – Indicator No.: MS.13

General Information		Data Characteristics	
Name	Relative market share of manufacturers	Type	Economic
Description	Relative market share of the most popular heat pump manufacturer	Purpose	Contextual
Theme	Purchase	Data source	BEIS [68] MCS Register
Journey Point	Waiting for order fulfilment	Link to Source	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/943712/heat-pump-manufacturing-supply-chain-research-project-report.pdf
Ideal State	Supply chains sufficiently robust to minimise disruption	Update frequency	One off study
Indicator Score	16	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Mitsubishi, Daikin and Samsung account for a combined 54% of annual sales in the UK in 2019. The rest of the market is distributed among over thirty firms.	N/A

Unit	Market share (%)	

Indicator Data Method & Assumptions

Methodology	• Market share taken from one-off study for BEIS provided in the link. Values based on MCS data, market intelligence report data and primary research with manufacturers
Assumptions	• No assumptions
Key limitations	• One-off study so data source will not be updated

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[68] BEIS, 2020. Heat pump manufacturing supply chain research project. [Accessed: 14/06/2022].

Indicator Information – Indicator No.: MS.14

General Information		Data Characteristics	
Name	Popular manufacturer market share of MCS accredited installations	Type	Economic
Description	Relative market share of the most popular heat pump manufacturer for those installed by MCS certified installers	Purpose	Contextual
Theme	Purchase	Data source	MCS Register[69]
Journey Point	Waiting for order fulfilment	Link to Source	Unpublished - MCS MID extract file(s)
Ideal State	Supply chains sufficiently robust to minimise disruption	Update frequency	Unknown - assumed ad-hoc
Indicator Score	20	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
Manufacturer 1, 7,950 installations, 27%	N/A
Manufacturer 2, 4,501 installations, 15%	
Manufacturer 3, 4,276 installations, 14%	
Manufacturer 4, 2,368 installations, 8%	
Manufacturer 5, 2,014 installations, 7%	
Manufacturer 6, 1,732 installations, 6%	
Manufacturer 7, 1,628 installations, 6%	
Manufacturer 8, 1,447 installations, 5%	
Manufacturer 9, 601 installations, 2%	
Manufacturer 10, 572 installations, 2%	
Rest of Market, 2,415 installations, 8%	
Unit Number of installations in 2021, % Market share	

Indicator Data Method & Assumptions

[69] Unpublished extract data from MCS provided to Eunomia for this research only.

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Methodology	• Based on anonymised popular manufacturer market share of MCS accredited installations, from MCS-MID data request
Assumptions	• No assumptions
Key limitations	• Does not cover all heat pump installs and the data is anonymised
	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is not known
	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.
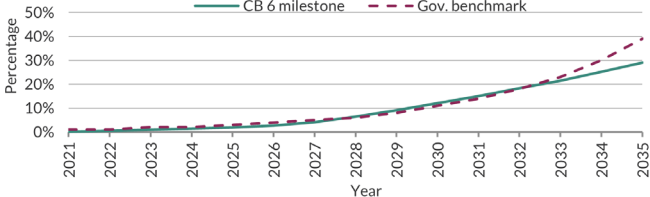
3.1.4 Installation

3.1.4.1 Core

Indicator Information – Indicator No.: IN.01

General Information		Data Characteristics	
Name	Main method of heating homes in the UK	Type	Social
Description	Percentage of UK households reporting that their main method of heating is via a heat pump	Purpose	Core
Theme	Installation	Data source	BEIS[70][71]
Journey Point	Installation of heat pumps	Link to Source	https://www.gov.uk/government/collections/public-attitudes-tracking-survey https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1080043/BEIS_PAT_Winter_2021_Heat_and_Energy_in_the_Home_REVISED.pdf
Ideal State	Heat pumps are installed and operational	Update frequency	Quarterly
Indicator Score	26	Location	UK

Indicator Value & Trajectory

Indicator Value	Trajectory Values
1%	
Unit % indicating "heat pump" as main method of heating home	

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[70] BEIS, 2022. BEIS public attitudes tracker. [Accessed: 10/06/2022]
[71] BEIS, 2021. BEIS public attitudes tracker: Heat and energy in the home. Winter 2021, UK. [Accessed: 10/06/2022]

Indicator Data Method & Assumptions

Methodology	• Step 1: Go to Question: HEATMAIN in the Heat and Energy in the Home report. ("What is the main way you heat your home?")
	• Step 2: Obtain the % of people who responded 'Heat pump'
Assumptions	• No assumptions
Key limitations	• Autumn 2021 was the first BEIS Public Attitudes Tracker (PAT) wave using the Address Based Online Survey (ABOS) methodology, which uses random probability sampling. This methodology change arose following disruptions to data collection due to COVID-19 and the time series was restarted for Autumn 2021. These results can therefore not be compared with previous PAT surveys. Autumn 2021 is therefore the benchmark year.

Indicator Information – Indicator No.: IN.02

General Information		Data Characteristics	
Name	Time taken to install a heat pump	Type	Social
Description	Average time taken to install and commission a heat pump	Purpose	Core
Theme	Installation	Data source	BEIS[72]
Journey Point	Installation of heat pumps	Link to Source	Unpublished - Eunomia research on the cost of heating
Ideal State	Work rate of installers is productive	Update frequency	Unknown - assumed ad-hoc
Indicator Score	19	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
4.5 days		N/A
Unit	Average (mean) installation time in days	

Indicator Data Method & Assumptions

Methodology	• Based on the mean domestic installation time in Eunomia research on the cost of heating
Assumptions	• Assumes timescales based on an 8kW heat pump retrofitted in a 3-4 bed house with significant changes to the incumbent heating system.
Key limitations	• A one-off study, with no current plan for data to be updated on a regular basis. Timeframe data needs to be updated regularly with impacts such as Covid-19 pandemic (and subsequent disruption to supply chains)

3.1.4.2 Contextual

Indicator Information – Indicator No.: IN.03

General Information		Data Characteristics	
Name	Main method of cooling homes in the UK	Type	Social
Description	Percentage of UK households reporting that their main method of cooling is via a heat pump	Purpose	Contextual
Theme	Installation	Data source	BEIS[73] [74]
Journey Point	Installation of heat pumps	Link to Source	https://www.gov.uk/government/collections/public-attitudes-tracking-survey https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1080043/BEIS_PAT_Winter_2021_Heat_and_Energy_in_the_Home_REVISED.pdf
Ideal State	Heat pumps are installed and operational	Update frequency	Quarterly
Indicator Score	26	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
<1%		N/A
Unit	% indicating "heat pump" as main method of cooling home	

Indicator Data Method & Assumptions

Methodology	• Step 1: Go to Question: COOLMAIN in the Heat and Energy in the Home report. ("What is the main way you cool your home when you need to?")

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[73] BEIS, 2022. BEIS public attitudes tracker. [Accessed: 10/06/2022]
[74] BEIS, 2021. BEIS public attitudes tracker: Heat and energy in the home. Winter 2021, UK. [Accessed: 10/06/2022]

	• Step 2: Obtain the % of people who responded 'Heat pump'
Assumptions	• No assumptions
Key limitations	• Autumn 2021 was the first BEIS Public Attitudes Tracker (PAT) wave using the Address Based Online Survey (ABOS) methodology, which uses random probability sampling. This methodology change arose following disruptions to data collection due to COVID-19 and the time series was restarted for Autumn 2021. These results can therefore not be compared with previous PAT surveys. Autumn 2021 is therefore the benchmark year.

Indicator Information – Indicator No.: IN.04

General Information		Data Characteristics	
Name	Heat pumps installed in domestic properties	Type	Social
Description	Number of EPCs showing a heat pump has been installed in domestic properties	Purpose	Contextual
Theme	Installation	Data source	Gov.UK[75]
Journey Point	Installation of heat pumps	Link to Source	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1055629/Energy_Report_2019-20.pdf
Ideal State	Heat pumps are installed and operational	Update frequency	Unknown - assumed ad-hoc
Indicator Score	20	Location	England

Indicator Value & Trajectory

Indicator Value		Trajectory Values
2019: 103,000 dwellings had a heat pump - from English Housing Survey, Energy Report, 2019-20		
Unit	Number of heat pumps installed.	

Indicator Data Method & Assumptions

Methodology	• Step 1: Search the document for 'heat pump' and read the surrounding text to obtain the number of dwellings with a heat pump
Assumptions	• The value is from a survey which assumed its sample was representative of the UK building stock and can therefore be scaled to give the population statistic
Key limitations	• Only around half of all domestic buildings in Great Britain appear on the EPC register and the dataset does not include any Northern Irish properties. • EPCs once issued are valid for ten years. Once they expire a new one is not required unless you are entering a new tenancy or selling the property. Therefore, they do not always give an up to date picture.

[75] Ministry of Housing, Communities and Local Government, 2021. The English housing survey: Energy report 2019-2020. [Accessed: 14/06/2022].

- The frequency of updates is not known

Indicator Information – Indicator No.: IN.05[76]

General Information		Data Characteristics	
Name	Number of heat pumps installed in domestic properties (EPC data)	Type	Social
Description	Number of EPCs showing a heat pump has been installed in domestic properties	Purpose	Contextual
Theme	Installation	Data source	Gov.UK[77]
Journey Point	Installation of heat pumps	Link to Source	https://epc.opendatacommunities.org/
Ideal State	Heat pumps are installed and operational	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	England & Wales

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Example analysis of the database from English Housing Survey, Energy Report, 2019-20: 103,000 dwellings had a heat pump in England		N/A
Unit	Number of heat pumps installed.	

Indicator Data Method & Assumptions

Methodology	• Step 1: Use the database to download all EPCs and the determine number of dwellings with heat pumps
Assumptions	• The value is from a survey which assumed its sample was representative of the UK building stock and can therefore be scaled to give the population statistic
Key limitations	• Only around half of all domestic buildings in Great Britain appear on the EPC register and the dataset does not include any Northern Irish properties.
	• EPCs once issued are valid for ten years. Once they expire a new one is not required unless you are entering a new tenancy or selling the property. Therefore, they do not always give an up to date picture.
	• The frequency of updates is not known

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[76] This is the same indicator as IN.06, but using a different data source to provide another perspective
[77] Department for Levelling Up, Housing & Communities (2022) Energy Performance of Buildings Data: England and Wales [Accessed: 14/06/2022]

Indicator Information – Indicator No.: IN.06[78]

General Information		Data Characteristics	
Name	Number of heat pumps installed in domestic properties (BSRIA data)	Type	Social
Description	Number of heat pumps installed in UK	Purpose	Contextual
Theme	Installation	Data source	BSRIA[79]
Journey Point	Installation of heat pumps	Link to Source	https://www.bsria.com /uk/news/article/bsria_ world_heat_pump_stud y_2020/
Ideal State	Heat pumps are installed and operational	Update frequency	Annually
Indicator Score	19	Location	UK and Ireland

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		
Unit	Number of heat pumps installed.	

Indicator Data Method & Assumptions

Methodology	• Purchase BSRIA annual world heat pump study and obtain UK sales statistic
Assumptions	• Trajectory assumes the number of heat pumps installed trajectory using CB6 and government milestones will be equivalent to BSRIA data
Key limitations	• BSRIA's Methodology is unclear, and data is costly to repeat as the market report would have to be purchased annually

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[78] This is the same indicator as IN.05, but using a different data source to provide another perspective
[79] BSRIA, 2021. BSRIA world heat pump study 2020. [Accessed: 15/06/2022].

Indicator Information – Indicator No.: IN.07

General Information		Data Characteristics	
Name	Type of house heat pumps are installed in	Type	Social
Description	Number of heat pumps installed in new build properties versus retrofit properties	Purpose	Contextual
Theme	Installation	Data source	No data available
Journey Point	Installation of heat pumps	Link to Source	No data available
Ideal State	Heat pumps are installed and operational	Update frequency	No data available
Indicator Score	3	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	% of heat pumps installed in new build and % of heat pumps installed in retrofit	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: IN.08

General Information		Data Characteristics	
Name	Housing occupancy for heat pump installations	Type	Social
Description	Number of heat pumps installed in single occupancy dwelling versus multi occupancy dwellings	Purpose	Contextual
Theme	Installation	Data source	No data available
Journey Point	Installation of heat pumps	Link to Source	No data available
Ideal State	Heat pumps are installed and operational	Update frequency	No data available
Indicator Score	3	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	% of heat pumps installed in single occupancy dwellings, % of heat pumps installed in multi occupancy dwellings	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: IN.09

General Information		Data Characteristics	
Name	Heat pump installation by tenure	Type	Social
Description	Tenure type installing heat pumps in English households	Purpose	Contextual
Theme	Installation	Data source	Department for Levelling Up, Housing and Communities and Ministry of Housing, Communities & Local Government[80] [81]
Journey Point	Social context provides physical opportunity to acquire heat pumps	Link to Source	https://www.gov.uk/government/collections/english-housing-survey https://www.gov.uk/government/statistics/english-housing-survey-2019-to-2020-energy
Ideal State	Social influences exist such as social pressure, norms and comparisons to create an environment in which people want to switch to heat pumps	Update frequency	Annual
Indicator Score	24	Location	England

Indicator Value & Trajectory

Indicator Value		Trajectory Values
49.8% owner occupied; 16.3% local authority; 23% housing association (private rented sample size too small)		N/A
Unit	% of Heat Pumps by Tenure	

Indicator Data Method & Assumptions

Methodology	• Step 1: Open 'Chapter 2: annex tables'

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[80] Department for levelling up, housing and communities, 2022. English housing survey. [Accessed: 15/06/2022].
[81] Department for levelling up, housing and communities, 2022. English housing survey, 2019 to 2020: energy. [Accessed: 15/06/2022].

	• Step 2: Go to tab 'AT2_3'
	• Step 3: Scroll down to the data presented as percentages to obtain the % of dwellings with heat pumps under 'tenure'
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: IN.10

General Information		Data Characteristics	
Name	Installer work rate	Type	Social
Description	Average number of heat pumps installed by a trained installer in a year	Purpose	Contextual
Theme	Installation	Data source	MCS Register[82]
Journey Point	Installation of heat pumps	Link to Source	Unpublished - MCS-MID extract file(s)
Ideal State	Work rate of installers is productive	Update frequency	Unknown - assumed ad-hoc
Indicator Score	21	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
26 ASHP installs per ASHP certified installer per year. 11 G/WSHP installs per G/WSHP certified installer per year.		N/A
Unit	Average count of heat pumps installed by a trained installer each year	

Indicator Data Method & Assumptions

Methodology	• Based on count of number of MCS accredited heat pump products installed per contractor in 2021, from MCS data request
Assumptions	• No assumptions
Key limitations	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is unknown
	• MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.

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[82] Unpublished extract data from MCS provided to Eunomia for this research only.

Indicator Information – Indicator No.: IN.11

General Information		Data Characteristics	
Name	Number of borehole drillers	Type	Social
Description	Number of GSHP borehole drillers as determined by the membership numbers of the GSHPA	Purpose	Contextual
Theme	Installation	Data source	GSHPA[83]
Journey Point	Installation of heat pumps	Link to Source	https://gshp.org.uk/members/
Ideal State	Sufficient drillers are available for the GSHP industry	Update frequency	Unknown - assumed ad-hoc
Indicator Score	27	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
21 borehole drillers		N/A
Unit	Number of drillers	

Indicator Data Method & Assumptions

Methodology	• Step 1: Click on the drop down box under 'Select Type' to see the number in brackets next to 'Drilling' to obtain the number of registered drillers
Assumptions	• Assumes all GSHP drillers will be members of this trade association
Key limitations	• It is unclear whether all GSHP drillers will be member of this trade association • The frequency of GSHPA updates is unknown

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[83] Ground Source Heat Pump Association, 2022. Members directory. [Accessed: 15/06/2022].

Indicator Information – Indicator No.: IN.12

General Information		Data Characteristics	
Name	Number of boreholes drilled	Type	Social
Description	Number of boreholes drilled	Purpose	Contextual
Theme	Installation	Data source	No data available
Journey Point	Installation of heat pumps	Link to Source	No data available
Ideal State	Boreholes are drilled and connected to a domestic GSHP	Update frequency	No data available
Indicator Score	4	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of boreholes	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: IN.13

General Information		Data Characteristics	
Name	**Number of shared ground loops**	**Type**	Social
Description	Number of shared ground loops	**Purpose**	Contextual
Theme	Installation	**Data source**	No data available
Journey Point	Installation of heat pumps	**Link to Source**	No data available
Ideal State	At least 2 or more properties have an individual heat pump connected to a communal ground loop	**Update frequency**	No data available
Indicator Score	4	**Location**	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Number of shared ground loops	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

3.1.5 Post-Installation & Maintenance

3.1.5.1 Core

Indicator Information – Indicator No.: PIM.01

General Information		Data Characteristics	
Name	Heat pump efficiency (COP) - in situ	Type	Social
Description	The average COP achieved for operational heat pumps	Purpose	Core
Theme	Performance & Quality	Data source	Energy Systems Catapult
Journey Point	Getting a high performing heat pump suitable to customer conditions	Link to Source	No data available
Ideal State	Suitable heat pump products are available	Update frequency	One off study
Indicator Score	17	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Not yet published		N/A
Unit	COP - ratio of heating or cooling provided to energy inputted	

Indicator Data Method & Assumptions

Methodology	• The EoH project now moves on to the monitoring and optimisation phase where the Delivery Contractors collect detailed performance data on the installed Heat Pumps and look to ensure they are performing within the expected parameters. Once published, this data will provide the data source for the indicator value.
Assumptions	• No assumptions
Key limitations	• The data has not yet been published and will only include data from 750 heat pumps in three regions (SE of Scotland, Newscastle and SE of England) • One-off study so data source will not be updated

Indicator Information – Indicator No.: PIM.02

General Information		Data Characteristics	
Name	Weather compensation usage	Type	Social
Description	Percentage of heat pumps with weather compensation turned on	Purpose	Core
Theme	Performance & Quality	Data source	No data available
Journey Point	Getting a high performing heat pump suitable to customer conditions	Link to Source	No data available
Ideal State	Suitableheat pump products are available	Update frequency	No data available
Indicator Score	2	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Percentage with weather compensation turned on	

Indicator Data Method & Assumptions

Methodology	• No data available
Assumptions	• No assumptions
Key limitations	• No key limitations identified

Indicator Information – Indicator No.: PIM.03

General Information		Data Characteristics	
Name	Heat pump installation quality	Type	Social
Description	What proportion of heat pumps installed are performing as expected	Purpose	Core
Theme	Performance & Quality	Data source	No data available
Journey Point	Getting a high performing heat pump suitable to customer conditions	Link to Source	No data available
Ideal State	Suitable heat pump products are available	Update frequency	No data available
Indicator Score	3	Location	No data available

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Data unavailable		N/A
Unit	Electricity consumption, system temperatures, flow rate and heat metering	

Indicator Data Method & Assumptions

Methodology	• Suggest that BEIS introduces mandatory monitoring of heat pumps. This could be remote monitoring done through the MCS or a similar product standard to ensure that installations have this functionality. This data could be sent back to the manufacturer for review (it current goes to the installer). • This should allow for the identification of what proportion of heat pumps installed are flawed/ not performing as should be.
Assumptions	• No assumptions
Key limitations	• No data is yet available

3.1.5.2 Contextual

Indicator Information – Indicator No.: PIM.04

General Information		Data Characteristics	
Name	Availability of heat pump insurance	Type	Social
Description	Number of insurance products focused on heat pumps	Purpose	Contextual
Theme	Maintenance	Data source	Compare the market[84]
Journey Point	Organising maintenance and repairs	Link to Source	https://www.comparethemarket.com/energy/content/air-source-heat-pumps/
Ideal State	Maintenance and repairs easy to organise; channels are transparent and trained staff available	Update frequency	Unknown - assumed ad-hoc
Indicator Score	19	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Comparison data unavailable due to energy crisis		N/A
Unit	Number of companies providing insurance service for heat pumps	

Indicator Data Method & Assumptions

Methodology	• Compare heat pump insurance costs to identify number of insurers
Assumptions	• No assumptions
Key limitations	• The service is currently unavailable as Compare the Market have had to temporarily pause their energy comparisons due to the energy crisis at the time of this research
	• The frequency of Compare the Market updates is unknown

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[84] Compare the Market, 2022. Air source heat pumps. [Accessed:15/06/2022].

Indicator Information – Indicator No.: PIM.05

General Information		Data Characteristics	
Name	Average flow temperature	Type	Social
Description	The average flow temperature of installed heat pumps	Purpose	Contextual
Theme	Performance & Quality	Data source	Energy Systems Catapult[85]
Journey Point	Getting a high performing heat pump suitable to customer conditions	Link to Source	https://www.gov.uk/government/publications/electrification-of-heat-demonstration-project-successful-bids
Ideal State	Suitable heat pump products are available	Update frequency	One off study
Indicator Score	17	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Not yet published		N/A
Unit	Flow temperature - degrees Celsius	

Indicator Data Method & Assumptions

Methodology	• The EoH project now moves on to the monitoring and optimisation phase where the Delivery Contractors collect detailed performance data on the installed Heat Pumps and look to ensure they are performing within the expected parameters. Once published, this data will provide the data source for the indicator value.
Assumptions	• No assumptions
Key limitations	• The data has not yet been published and will only include data from 750 heat pumps in three regions (SE of Scotland, Newscastle and SE of England) • One-off study so data source will not be updated

Indicator Information – Indicator No.: PIM.06

General Information		Data Characteristics	
Name	Heat pump efficiency (SCOP) of high temperature heat pumps	Type	Social
Description	The average SCOP achieved for operational high temperature heat pumps	Purpose	Contextual
Theme	Performance & Quality	Data source	MCS Register[86]
Journey Point	Getting a high performing heat pump suitable to customer conditions	Link to Source	Unpublished - MCS MID extract file(s)
Ideal State	Suitable heat pump products are available	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
2.98		N/A
Unit	SCOP - ratio of heating or cooling provided to energy inputted for high temperature heat pumps with a flow temperature over 55 degrees Celsius	

Indicator Data Method & Assumptions

Methodology	• Based on SCOP and flow temperature reported by installer, from MCS-MID data request
Assumptions	• Assumes that SCOP values reported to the MCS have a consistent methodology and are representative of the actual value
Key limitations	• Does not cover all MCS heat pump installs as some don't specify SCOP • Value requires a data request from the MCS-MID database • The frequency of MCS-MID database updates is unknown

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[86] Unpublished extract data from MCS provided to Eunomia for this research only.

- MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future.

Indicator Information – Indicator No.: PIM.07

General Information		Data Characteristics	
Name	Heat pump efficiency (SCOP) of low temperature heat pumps	Type	Social
Description	The average SCOP achieved for operational low temperature heat pumps	Purpose	Contextual
Theme	Performance & Quality	Data source	MCS Register[87]
Journey Point	Getting a high performing heat pump suitable to customer conditions	Link to Source	Unpublished - MCS MID extract file(s)
Ideal State	Suitableheat pump products are available	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
3.64		N/A
Unit	SCOP - ratio of heating or cooling provided to energy inputted for low temperature heat pumps with a flow temperature under or equal to 55 degrees Celsius	

Indicator Data Method & Assumptions

Methodology	• Based on SCOP and flow temperature reported by installer, from MCS-MID data request
Assumptions	• Assumes that SCOP values reported to the MCS have a consistent methodology and are representative of the actual value
Key limitations	• Does not cover all MCS heat pump installs as some don't specify SCOP
	• Value requires a data request from the MCS-MID database
	• The frequency of MCS-MID database updates is unknown

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[87] Unpublished extract data from MCS provided to Eunomia for this research only.

- MCS certification is a requirement for previous (e.g. Renewable Heat Incentive) and current funding schemes (e.g. Boiler Upgrade Scheme). Although MCS will continue to work with industry certifying products, it is unclear whether MCS will be required for future government schemes. This means the data source may become less comprehensive or obsolete in the future

Indicator Information – Indicator No.: PIM.08

General Information		Data Characteristics	
Name	Availability of heat pump servicing and repair	Type	Social
Description	Number of organisations offering servicing and repairs	Purpose	Contextual
Theme	Maintenance	Data source	TrustMark[88]
Journey Point	Organising maintenance and repairs	Link to Source	https://www.trustmark.org.uk/homeowners/find-a-tradesperson
Ideal State	Maintenance and repairs easy to organise; channels are transparent and trained staff available	Update frequency	Unknown - assumed ad-hoc
Indicator Score	22	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
24		N/A
Unit	Number of companies offering servicing and repair services for heat pumps	

Indicator Data Method & Assumptions

Methodology	• Step 1: Select 'Advanced Search'
	• Step 2: Under 'Trade description', type and select 'Installation, Maintenance & Repairs' within the 'Air Source Heat Installers' category
	• Step 3: Select all regions and countries and click 'Find tradespeople' to obatin the number of results
Assumptions	• No assumptions
Key limitations	• Lower value than expected since some installers are also expected to be able to service and repair heat pumps. However, TrustMark only records the primary function of the business, so many applicable companies are not accounted for.
	• The frequency of TrustMark updates is unknown

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[88] Trustmark, 2022. Find a tradesperson. [Accessed: 13/06/2022].

Indicator Information – Indicator No.: PIM.09

General Information		Data Characteristics	
Name	Warranty lengths	Type	Social
Description	Length of typical equipment warranty	Purpose	Contextual
Theme	Maintenance	Data source	Individual Manufacturers Websites
Journey Point	Organising maintenance and repairs	Link to Source	N/A
Ideal State	Maintenance and repairs easy to organise; channels are transparent and trained staff available	Update frequency	Unknown - assumed ad-hoc
Indicator Score	17	Location	UK

Indicator Value & Trajectory

Indicator Value		Trajectory Values
Examples include: NIBE = 7 years (Pro Partner and Pro Exclusive installers); Panasonic = 7 years (PRO Partner)		N/A
Unit	Years of warranty once product installed	

Indicator Data Method & Assumptions

Methodology	• Navigate to manufacturer websites where product brochures can be found, and search for state warranty.
Assumptions	• No assumptions
Key limitations	• The method requires individual manual searches and is therefore time consuming
	• The data required can be difficult to access and the frequency of updates on manufacturers' websites is unknown

3.2 Summary of Data Gaps

The data gaps for core indicators are outlined in Table 1. This includes recommendations for how this data could be collected in the future.

Table 1: Data Gaps for Core Indicators

	Indicator name	Type of data gap (current / future)	Recommendation for how to fill data gap
Enabling Environment	Number of heat pump models manufactured in the UK	Current & future	An annual survey of heat pump manufacturers with products sold in the UK (those listed on the ENA register[89])
Manufacturing & Sales	Number of MCS registered installers / Number of certified heat pump installers	Current & future	We understand that BEIS have created a new Standard Organisational Classification (SOC) code for heat installers. This will become active from 2023.
	Number of certified PAS 2035:2019 retrofit co-ordinators	Current & future	We are engaged with the Retrofit Academy to access their data on the number of retrofit-coordinators. However, this is only one of the main training providers. Going forward we recommend that BEIS create a new SOC code (as they have done for heat pump installers) to identify retrofit co-ordinators.
	Heat pump demand met by imports	Current & future	Import data is available via the UK Trade Info website. However, this provides an overall sales figure for UK import, individual UK heat pump sales data is not currently available (other than via BSRIA as discussed above).

[89] Energy Network Association (2022) Heat Pump Database: https://www.energynetworks.org/industry-hub/databases

	Indicator name	Type of data gap (current / future)	Recommendation for how to fill data gap
	UK heat pump sales	Current & future	Data is currently available via BSRIA. However, this is a paid-for market report and there is no transparency on the method used to collect this data, leaving questions over the robustness of the data. Given the importance of this information we recommend that it is collected by BEIS going forward.
	Average lead time from order to delivery	Future	A single data point is available for this indicator for 2021. However, this is from a one-off data study conducted by Eunomia for BEIS. This could be collected via an annual survey with heat pump installers in the future.
Installation	Time taken to install a heat pump	Future	A single data point is available for this indicator for 2021. However, this is from a one-off data study conducted by Eunomia for BEIS. This could be collected via an annual survey with heat pump installers in the future.
Post-installation & maintenance	Heat pump efficiency (COP) – in situ	Current & future	These could be collected via remote monitoring of heat pumps. The data could be collected in a centralised database. This could be mandated by BEIS through the MCS or another product standard. Some companies are offering this as an optional service.[90]
	Weather compensation usage	Current & future	

The contextual indicators for which data was unavailable are listed in Table 2. As these are not considered critical for tracking the developing of the heat pump market recommendations of how to fill these data gaps have not been provided.

Table 2: Data Gaps for Contextual Indicators

Customer journey	Indicator name
	Value of capital invested in heat pumps

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[90] https://passivuk.com/mmsp/

Enabling Environment	Number of investment funds dedicated to heat pumps
	Heating system insurance policy conditions
Preparation	Availability of green mortgages
	Availability of loans for heat pumps
	Number of customers on a Heat as a Service (HaaS) tariff
	Number of customers on a Time of Use tariff
	Website traffic on Energy Bill Advice Service
Manufacturing & Sales	Number of MCS registered auditors
	Number of certified heat pump installers
	Number of installers in training
	Number of certified PAS 2035:2019 retrofit co-ordinators in training
Installation	Type of house heat pumps are installed in
	Housing occupancy for heat pump installations
	Number of boreholes drilled
	Number of shared ground loops
Post-installation & Maintenance	Availability of heat pump servicing and repair
	Availability of heat pump insurance

4.0

Recommendations and Next Steps

In total 70 indicators have been identified to track over time, of which 19 are core which means they are fundamental to the development of the heat pump market, and 51 are contextual, which means they would be useful to track but are not necessarily foundational in the development of the market.

The indicators and trajectories presented in this report will need reviewing over time as the market develops. This is because:

a) New data sources may become available which improve upon the data sources identified in this report; and

b) New indicators may need to be developed in response to changes in the market, and trajectories may need to be reconsidered in response to new targets set by government.

Therefore, the framework of indicators and trajectories will need to evolve over time to ensure they remain current and comprehensive.

Crucially, this research has identified several data gaps for core indicators, where there is either no data, or a perceived lack of robust data. Recommendations on how these should be collected and by who have been made. The indicators in question include number of heat pump models manufactured and assembled in the UK; heat pump sales; heat pump demand met by imports; number of MCS registered installers / number of certified heat pump installers; number of certified PAS 2035:2019 retrofit co-ordinators; average lead time from order to delivery; time taken to install a heat pump; heat pump efficiency (COP) – in situ; and weather compensation usage.

It is recommended that government ensure that this data is collected in an independent and robust manor as early as possible. This is critical in ensuring the risks, opportunities, barriers, and drivers associated with the development of the UK heat pump market is understood so that policy can be developed to minimise and maximise these as appropriate.

A1.0

Appendices

A 1.1 Indicator Summary Profile Template

Indicator Information – Indicator No.: «Indicator_Framework»

General Information		Data Characteristics	
Name	*The indicator name*	**Type**	*Economic or social*
Description	*A description of the indicator*	**Purpose**	*Core or contextual*
Theme	*Each stage in the customer journey is born broken up into a number of 'themes'*	**Data source**	*The source of data used to derive the 'indicator value'*
Journey Point	*Each theme contains indiviudal points within the journey that form research statements to measure and evaluate.*	**Link to Source**	*A hyperlink to the 'data source' used to derive the indicator value*
Ideal State	*The ideal steady-state to be achieved in the market*	**Update frequency**	*How frequently the 'data source' is updated*
Indicator Score	*Each indicator was scored against several criteria to give a score out of 27. The scoring criteria can be found in Appendix A 1.2.*	**Location**	*What geography the 'data source' relates to*

Indicator Value & Trajectory

Indicator Value		Trajectory Values
The value of the indicator for the reference year given in brackets		*Details of the trajectories where relevant (core indicators only)*
Unit	*Unit used for the indicator value*	

Indicator Data Method & Assumptions

Methodology	• *The methodology for how the 'indicator value' was derived and how to track the indicator going forward*
Assumptions	• *Any assumptions relating to the 'indicator value'*

Key limitations	• *The most critical limitations to the dataset*

A 1.2 Scoring Criteria

Each indicator was scored against several criteria. These are outlined in Table 3.

Table 3: Scoring Criteria

Criteria	Scoring
Data coverage of activity	Full coverage – 2 Partial coverage – 1
Clarity of method	Very clear method – 3 Somewhat clear method – 2 Unclear method – 1
Comprehensiveness of method	Comprehensive method – 3 Method has some gaps / issues – 2 Method is incomplete / limited – 1
Repeatability of method & assumptions	Method could be easily repeated – 3 Method could be somewhat easily repeated – 2 Method would be difficult or costly to repeat – 1
Frequency of data collection	Data is / could be collected frequently annually or more frequently that annual– 3 Data is / could be collected less frequently than annually – 2 Data has been provided from a one-off study– 1
Ease of access	Data is easily accessible (e.g., quick download) – 3 Data is accessible but requires some effort to collate/ apply assumptions – 2 Data is difficult to access (e.g., paywall) – 1
Value of market insight (desirability)	High desirability – 5 Medium desirability – 4 / 3 /2 Low desirability – 1
Duration of indicator	Indicator is likely to stay relevant in the medium to long-term – 2 Indicator is likely to be relevant in the short-term only – 1

Relevance to the customer journey point	Indicator is highly relevant to the point in the customer journey – 3
	Indicator is somewhat relevant to the point in the customer journey – 2
	Indicator is not very relevant to the point in the customer journey – 1
Total score available:	**27**

A 1.3 Indicator Scoring

According to the criteria set out in Appendix 1.2, Table 4 displays the scores given to each indicator. A RAG rating (Red, Amber, Green) was then applied to each indicator, highlighting its overall utility. Scores of 21+ were given a green rating, scores between 16-20 were given an amber rating and scores 0-16 were given a red rating.

Table 4 Indicator Scoring

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
EE.01	Willingness to install heat pumps	2	3	3	3	3	3	5	2	3	27	
EE.02	Cost effectiveness of electricity	2	3	3	3	3	3	4	2	1	24	
EE.03	Average cost of a heat pump	2	3	3	1	1	3	4	2	3	22	
EE.04	Average cost of an MCS accredited heat pump installation	2	3	3	3	3	3	4	2	3	26	
EE.05	Average cost of a heat pump installation (labour only)	2	3	3	1	1	3	4	2	3	22	
EE.06	Average cost of a heat pump (capex) and installation (labour only)	2	3	3	1	1	3	4	2	3	22	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
EE.07	Average total cost of a heat pump installation (unit + install + ancillary)	2	3	3	1	1	3	4	2	3	22	
EE.08	Energy efficiency of domestic buildings	2	3	1	3	3	3	2	2	1	20	
EE.09	Heat pump innovation	1	2	3	1	1	3	3	2	2	18	
EE.10	Heat pump efficiency (SCOP)	2	3	3	3	3	3	4	1	2	24	
EE.11	Number of manufacturers offering heat pumps in the UK	2	3	3	3	3	3	4	2	3	26	
EE.12	Number of heat pumps models on the UK market (ENA)	2	3	3	3	3	3	4	2	3	26	
EE.13	Number of new heat pumps models registered on the UK market	2	3	3	3	3	3	4	2	3	26	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
EE.14	Number of heat pumps models on the UK market (MCS)	2	3	3	3	3	3	4	1	3	25	
EE.15	Number of heat pump models manufactured in the UK	2	3	2	2	3	2	3	1	3	21	
EE.16	Public awareness of heat pumps	2	3	3	3	3	3	4	2	3	26	
EE.17	Number of heat pump components imported into the UK	2	3	3	3	3	3	3	1	3	24	
EE.18	Number of heat pump components exported from UK	2	3	3	3	3	3	3	1	3	24	
EE.19	Value of heat pumps imported into the UK	2	3	3	3	3	3	3	1	3	24	
EE.20	Value of heat pumps exported from the UK	2	3	3	3	3	3	3	1	3	24	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
EE.21	Value of capital invested in heat pumps	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2	
EE.22	Number of investment funds dedicated to heat pumps	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2	
EE.23	Online searches for heat pumps	2	3	3	3	3	3	2	2	1	22	
EE.24	Online searches for air source heat pumps	2	3	3	3	3	3	2	2	1	22	
EE.25	Online searches for ground source heat pumps	2	3	3	3	3	3	2	2	1	22	
EE.26	Online searches for boiler replacement	2	3	3	3	3	3	2	2	1	22	
EE.27	Online searches for low carbon / eco-friendly heating	2	3	3	3	3	3	2	2	1	22	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
EE.28	Online searches for heat pump installer	2	3	3	3	3	3	2	2	1	22	
EE.29	Heating system insurance policy conditions	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2	
PR.01	Availability of green mortgages	2	3	2	3	3	3	2	2	3	23	
PR.02	Availability of loans for heat pumps	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2	
PR.03	Number of customers on a Heat as a Service (Haas) tariff	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	3	
PR.04	Number of customers on a Time of Use tariff	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	3	
PR.05	Website traffic on Energy Bill Advice Service	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2	
MS.01	Number of MCS registered installers	2	3	3	3	2	3	5	1	3	25	

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Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
MS.02	Number of certified PAS 2035:2019 retrofit co-ordinators	2	3	3	3	2	3	2	2	2	22	
MS.03	Heat pump demand met by imports	2	3	1	2	3	3	3	1	3	21	
MS.04	UK Heat pumps sales	N/A	N/A	N/A	N/A	N/A	N/A	4	N/A	N/A	4	
MS.05	UK heat pump sales per capita vs European country sales per capita	2	1	1	1	3	3	3	2	1	17	
MS.06	Average lead time from order to delivery	2	3	3	1	1	3	3	2	3	21	
MS.07	Number of installers in training	1	3	2	2	2	1	5	2	3	21	
MS.08	Number of certified PAS 2035:2019 retrofit co-ordinators in training	1	3	2	2	2	1	5	2	3	21	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
MS.09	Number of MCS registered auditors	2	3	3	3	2	1	4	1	3	22	
MS.10	Number of certified heat pump installers	2	3	3	3	3	2	5	1	3	25	
MS.11	Number of listed heat pump installers (on TrustMark)	2	3	3	3	2	3	3	2	3	24	
MS.12	UK heat pump sales vs European country sales	2	1	1	1	3	3	3	2	1	17	
MS.13	Relative market share of manufacturers	2	2	2	1	1	3	2	2	1	16	
MS.14	Popular manufacturer market share of MCS accredited installations	2	2	2	3	3	1	2	1	1	17	
IN.01	Main method of heating homes in the UK	2	3	3	3	3	3	4	2	3	26	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
IN.02	Time taken to install a heat pump	2	3	3	1	1	1	3	2	3	19	
IN.03	Main method of cooling homes in the UK	2	3	3	3	3	3	4	2	3	26	
IN.04	Heat pumps installed in domestic properties	1	3	3	3	1	3	1	2	3	20	
IN.05	Number of heat pumps installed in domestic properties (EPC data)	1	3	3	3	3	3	1	2	3	22	
IN.06	Number of heat pumps installed in domestic properties (BSRIA data)	2	1	1	1	3	1	5	2	3	19	
IN.07	Type of house heat pumps are installed in	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	3	
IN.08	Housing occupancy for heat pump installations	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	3	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
IN.09	Heat pump installation by tenure	2	3	3	3	3	3	3	2	2	24	
IN.10	Installer work rate	2	3	3	3	3	1	2	1	2	20	
IN.11	Number of borehole drillers	2	3	3	3	3	3	5	2	3	27	
IN.12	Number of boreholes drilled	N/A	N/A	N/A	N/A	N/A	N/A	4	N/A	N/A	4	
IN.13	Number of shared ground loops	N/A	N/A	N/A	N/A	N/A	N/A	4	N/A	N/A	4	
PIM.01	Heat pump efficiency (COP) - in situ	1	3	2	1	1	1	4	1	3	17	
PIM.02	Weather compensation usage	N/A	N/A	N/A	N/A	N/A	N/A	2	N/A	N/A	2	
PIM.03	Heat pump installation quality	N/A	N/A	N/A	N/A	N/A	N/A	3	N/A	N/A	3	
PIM.04	Availability of heat pump insurance	1	3	2	2	3	2	2	2	2	19	
PIM.05	Average flow temperature	1	3	2	1	1	1	4	1	3	17	

Stage ID	Indicator name	Data coverage of activity	Data sourced has a clear method	Compre-hensiveness of method	Repeat-ability of method & assumptions	Frequency of data collection	Ease of access	Desirability - value of market insight	Duration of indicator	Relevance to the customer journey point	Overall score	RAG rating
PIM.06	Heat pump efficiency (COP) of high temperature heat pumps	2	2	2	3	3	1	3	1	2	19	
PIM.07	Heat pump efficiency (COP) of low temperature heat pumps	2	2	2	3	3	1	3	1	2	19	
PIM.08	Availability of heat pump servicing and repair	1	1	2	2	3	3	2	2	3	19	
PIM.09	Warranty lengths	2	2	1	2	3	1	2	2	2	17	

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