

Heat in Buildings Monitoring and Evaluation Framework

November 2023

Introduction

In our Heat in Buildings Strategy¹, published in 2021, we made a commitment to develop a monitoring and evaluation framework ('Framework') to be able to track progress against the strategy. This document sets out an initial Framework to fulfil that commitment, building on the initial outcomes identified in the Heat in Buildings Strategy.

The Framework is designed to demonstrate the extent to which our Heat in Buildings policies and programmes are delivering emission reductions and achieving wider outcomes. It provides a way to communicate our progress, supporting engagement and giving clarity to supply chain and industry about progress and direction of travel.

As we set out in the strategy, many different elements need to come together to enable us to deliver the heat transition. This includes a long-term regulatory framework, a strong supply chain, investment, public engagement and supporting infrastructure and planning. Drawing these elements together and understanding how they contribute to the strategy's goal is complex. We have therefore developed a monitoring map that sets out the relationship between the elements required to deliver our goal of reducing emissions from Scotland's buildings as part of a just transition.

This Framework is based on that developed by the Climate Change Committee² and was developed using the responses we received to the consultation on the Heat in Buildings Strategy³. We have consulted with the UK Government and the Climate Change Committee during the development of this Framework.

We aim to align this Framework with the Scottish Government's Climate Change Plan Monitoring Report⁴. The Framework will also support the development of a separate Fuel Poverty monitoring and evaluation framework next year to monitor progress against the Scottish Government's Fuel Poverty Strategy⁵.

We recently published our latest annual Heat in Buildings Strategy progress report⁶ as required by the Climate Change (Scotland) Act 2009. In future years, the report summarising progress against the indicators in this Framework will fulfil this requirement. We will therefore publish a report against this Framework for the first time in October 2024.

¹ [Heat In Buildings Strategy: Achieving Net Zero Emissions in Scotland's Buildings \(www.gov.scot\)](https://www.gov.scot)

² [CCC Mitigation Monitoring Framework - Climate Change Committee \(theccc.org.uk\)](https://theccc.org.uk)

³ [Heat in Buildings Strategy - Analysis of responses to the consultation \(www.gov.scot\)](https://www.gov.scot)

⁴ [Climate change monitoring report 2023 - gov.scot \(www.gov.scot\)](https://www.gov.scot)

⁵ [Tackling fuel poverty in Scotland: a strategic approach - gov.scot \(www.gov.scot\)](https://www.gov.scot)

⁶ [Heat in Buildings: progress report 2023 - gov.scot \(www.gov.scot\)](https://www.gov.scot)

How this Framework is structured

To meet our net zero targets in the buildings sector, alongside our other statutory requirements, we will need to reduce the energy demand from buildings and end the use of fossil fuels for heating by 2045, while delivering a just transition through the creation of sustainable jobs and ensuring that heating is affordable. Through developing this Framework, we have brought together all the different elements required to deliver the Heat in Buildings Strategy into one document.

Monitoring map

We have developed a monitoring map (Figure 1), based on that developed by the Climate Change Committee, to show how we expect our policy and delivery activities, supported by ‘enabling factors’, to contribute towards the overarching emissions reduction goal as set out in the Heat in Buildings Strategy⁷.

While we recognise the important role of the Scottish Government in delivering the heat transition, such as introducing regulations and providing support for those who need it most, action from a range of stakeholders, including from industry, local government, finance, the third sector and individuals, will also be key.

The structure of our Framework is described in the monitoring map. This has the following levels:

- **Goal:** the overarching target (in this case, to achieve net zero from buildings emissions by 2045)
- **Outcome:** what the project or activity expects to accomplish, which together bring about the heat transition. The Heat in Buildings Strategy has three outcomes
- **Enablers:** enabling factors that overcome barriers to achieving outcomes in the Heat in Buildings Strategy
- **Activities (policy and delivery):** Activities that support the enablers of the Heat in Buildings Strategy

Indicators

In the rest of this document, we describe the indicators we plan to use to track progress against each level of the monitoring map. We also describe the data

⁷ [Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot \(www.gov.scot\)](https://www.gov.scot/heat-in-buildings-strategy)

sources we will use to track progress against each indicator, and these are summarised in Annex A.

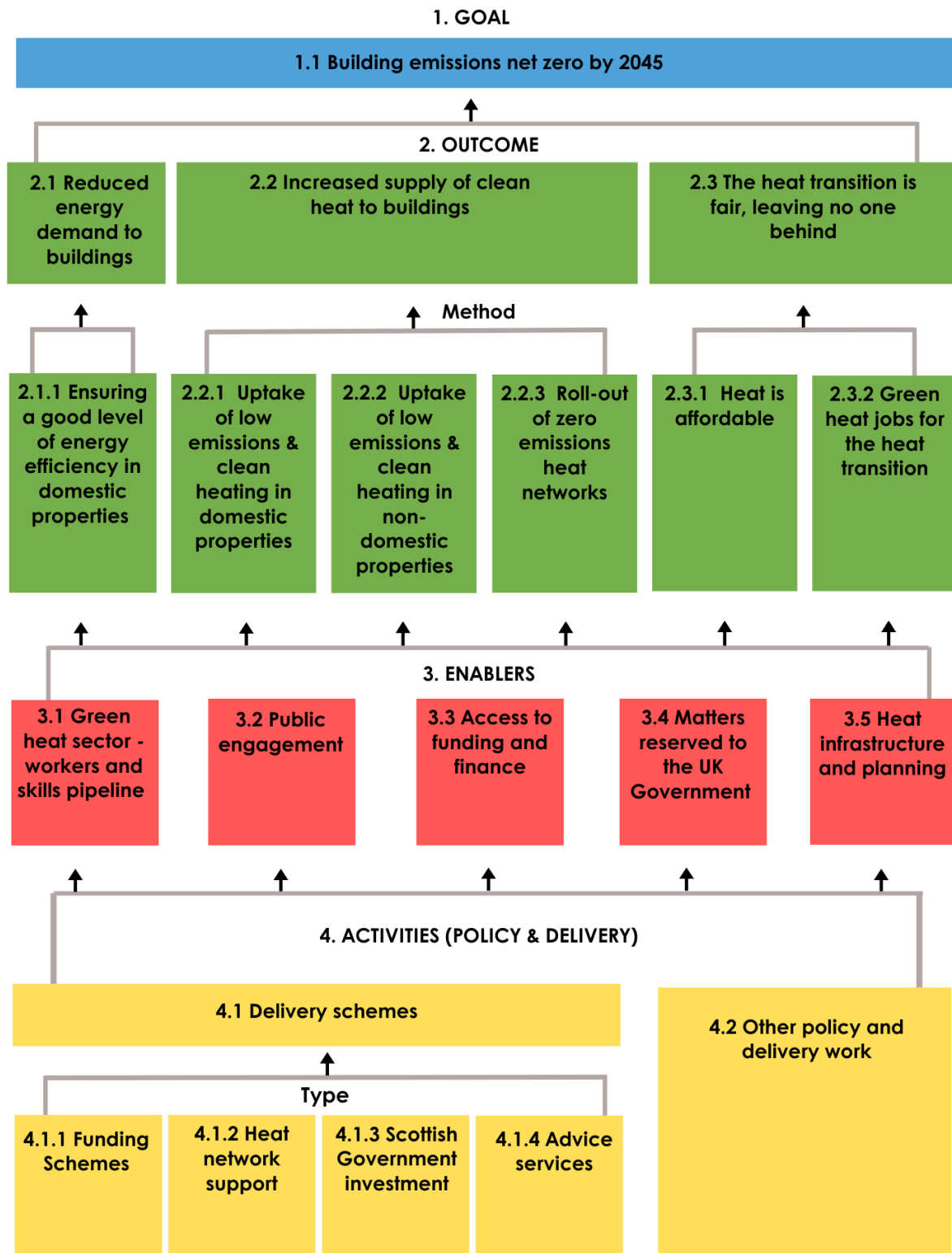
Gaps in data will make reporting on some areas challenging, particularly heat networks, non-domestic properties, and skills. However, we will continue to evolve the Framework and incorporate further data in future reporting as it becomes available.

For our funded delivery schemes, we have prioritised indicators that make clear how we plan to track implementation and scheme spending.

For some indicators, we have existing statutory targets, for example for emissions reductions, fuel poverty and heat provided by heat networks. However, we have not set targets for all the indicators e.g. technology specific milestones. This is because we recognise that there are a number of plausible pathways to net zero. As such, we will continue to explore how we can best monitor and communicate our progress in a way that takes into account a whole systems view.

Monitoring map

Figure 1: monitoring map for buildings



Indicators

1. Goals

1.1 Goal: buildings emissions net zero by 2045

Proposed indicator: annual/actual emissions compared to the annual emissions envelope for the buildings sector (in MtCO₂e)

Data source: Scottish Greenhouse Gas Statistics report

Unit: MtCO₂e

Description:

- Reducing emissions from the buildings sector is the overall goal of the Heat in Buildings Strategy.
- Scotland has a legally binding target to achieve net zero greenhouse gas emissions by 2045, with interim targets for a 75% reduction by 2030, and 90% by 2040.
- Heating our homes and buildings accounts for about 20% of greenhouse gas emissions, and the Scottish Government's Climate Change Plan Update (CCPu)⁸ states that these emissions will need to reach net zero by 2045.
- Outturn statistics reporting against the CCPu (2018-2030) showed that the emissions for the buildings sector were 8.5 MtCO₂e in 2020⁹ and 9.0 MtCO₂e in 2021¹⁰ – outside of the buildings sector emissions envelope. We will publish the next Climate Change Plan as soon as possible, ahead of March 2025, which will cover the period 2025-2040, and will set out any updates to sector envelopes in line with our emissions reduction pathway out to 2040.
- We plan to report annual buildings emissions compared to the annual envelope for the buildings sector to show progress against the sectoral emissions envelope.

⁸ [Securing a green recovery on a path to net zero: climate change plan 2018–2032 - update - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/2021-03-24/secure-recovery-on-a-path-to-net-zero-climate-change-plan-2018-2032-update-2021-03-24/summary/summary-page-10)

⁹ [Scottish Greenhouse Gas Statistics 2020 - Scottish Greenhouse Gas Statistics 2020 - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/scottish-greenhouse-gas-statistics-2020/summary/summary-page-1)

¹⁰ [Scottish Greenhouse Gas Statistics 2021 - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/scottish-greenhouse-gas-statistics-2021/summary/summary-page-1)

2. Outcomes

2.1 Outcome: reduced energy demand to buildings

2.1.1 Method: ensuring a good level of energy efficiency in domestic properties

Proposed indicator: share of domestic properties achieving a good level of energy efficiency (equivalent to Energy Performance Certificate (EPC) C or better):

- share of owner-occupier properties
- share of private rented sector properties
- share of social rented sector properties

Data source: Scottish Housing Condition Survey (SHCS)

Unit: per cent

Description:

- Achieving a good standard of energy efficiency across Scotland's buildings will play an important part in reducing emissions from our buildings, saving on energy bills and reducing fuel poverty.
- We will track the share of properties meeting an EPC C equivalent or better, using data from the SHCS. Where possible we will report progress for specific population demographics or household groups, for example those living in rural and urban settings, different tenures, different household make-ups (e.g. single-person, families), and by household income level.
- In the Heat in Buildings Strategy and in our consultation on proposals for EPC reform, we have been clear that we consider a good level of energy efficiency to be equivalent to EPC C or better. We recently consulted upon proposals for reforming EPCs and their metrics¹¹. Following analysis of the consultation responses, we plan to respond to the consultation and lay revised EPC regulations to implement the proposed reforms, during 2024. Any changes to the EPC system following this consultation will be reflected in the way we report progress against this Framework.
- Alongside this publication, we are consulting on proposals for a Heat in Buildings Bill, which will seek views on our introducing a minimum energy efficiency standard for privately rented and owner-occupied homes to achieve a good level of energy efficiency. We plan to report annually on the share of homes that meet this standard, subject to the consultation and its future introduction.
- We are also consulting on a similar heat and energy efficiency standard for the social housing sector and will aim to include progress against this standard as part of this Framework.

¹¹ [Energy Performance Certificate \(EPC\) reform: consultation - gov.scot \(www.gov.scot\)](https://www.gov.scot/resources/consultation-papers/collections/documents/energy-performance-certificate-epc-reform-consultation-2023.pdf)

- We have not included an indicator to monitor energy efficiency improvements in the non-domestic sector since there is currently no reliable data source available, and we do not plan to regulate non-domestic energy efficiency.

2.2 Outcome: increased supply of clean heat to buildings

2.2.1 Method: uptake of low emissions heating and clean heating in domestic properties

Proposed indicator: number of domestic properties currently with clean heating systems:

- heat pumps
- connected to a heat network
- other electric heating

Data source - heat pumps and electric heating: SHCS

Data source - heat networks: Heat Networks Metering and Billing Regulations data and SHCS

Unit: number of domestic properties

Description:

- We plan to report annually on the number of existing homes with clean heating systems¹² installed in Scotland, such as heat pumps (air source and ground source heat pumps), heat networks (communal heat pumps in a building or connections to district heating), as well as other electric heating (electric boilers and modern, efficient electric storage heaters).
- We will use SHCS to track the number of properties with heat pumps and electric heating installed. Where possible we will also include demographic data. Any year-on-year increases in the number of homes with these technologies installed will also include new builds since the SHCS survey covers the entire housing stock. As described in Annex A, all survey figures are estimates and, in general, the smaller the sample size, the greater the likelihood that the estimate could be misleading, so we will take care when using smaller subsets of the survey sample for analysis.
- We will use Heat Networks Metering and Billing Regulations data to track the number of domestic properties (both occupied and unoccupied). However, these data are only available every four years and compliance is an issue in practice. We may also use alternative data sources, such as SHCS, if such sources can provide additional context to our findings.

¹² A 'clean heating system' refers to a 'zero direct emissions heating system'. These systems do not produce any greenhouse gas emissions at the point of use.

Proposed indicator: number of domestic properties recently installing a clean heating system:

- heat pumps (over the last year)
- heat network connections (over the last four years)
- other electric heating (over the last year)

Data source - heat pumps: Microgeneration Certification Scheme (MCS)

Data source - heat networks: Heat Networks Metering and Billing Regulations data

Data source - other electric heating: no data source currently

Unit: number of properties

Description:

- We plan to report on the number of homes with recent installations of clean heating systems. This indicator will allow us to see changes in the rate of installations over time, not just the total housing stock converted to clean heating systems measured by the previous indicator.
- We will use MCS data to report on the number of installations of heat pumps over the last 12 months. While MCS data provide a good approximation of annual domestic installations, these data do not cover non-accredited MCS installations, may include some new build as well as some small scale non-domestic installations, and do not account for heat pumps that have been decommissioned.
- The MCS data do not currently enable us to determine the types of heating systems that heat pumps are displacing, but we will continue to engage with key stakeholders, including MCS and the UK Government to see how we can improve this.
- We do not currently have a reliable data source for the number of other electric heating systems installed each year as these systems are not covered by a certification scheme such as MCS for heat pumps. If data become available in future, we will report this here.
- For new connections to a heat network, we will use Heat Networks Metering and Billing data collected through UK regulations. However, as described above, there are limitations with this data source. As appropriate, we plan to use data from new UK or Scottish regulations in the future.
- We are committed to working with key stakeholders, such as UK Government and Ofgem, the new heat network regulator, to understand the data they will require and collect under proposed consumer protection regulations on heat networks and will seek to increase the availability of such data.

Proposed indicator: number of domestic properties with low emission or low emission ready heating systems, such as:

- biomass boilers
- combined heat and power (CHP)
- fuel cells
- hybrid heat pumps
- hydrogen-ready boilers

Data source - biomass boilers, CHP: SHCS

Data source - fuel cells, hybrid heat pumps and hydrogen-ready boilers: not currently covered by SHCS but could in future if these systems become more prevalent.

Unit: number of properties

Description:

- We will report on the number of low emission and low emission ready heating systems installed in Scotland currently.
- While biomass and hydrogen combustion offer significant emissions savings compared to fossil fuel-based heating, they still produce varying levels of direct emissions. We expect that technologies such as bioenergy may play a limited role in niche circumstances. We also do not consider that hydrogen will play a central role in the overall decarbonisation of domestic heat. We will however continue to monitor the prevalence of these systems, where possible, using SHCS data.
- The SHCS data do not currently record all low emission or low emission ready heating systems, but it may be possible to do so in the future. The data limitations described above relating to the use of small sample sizes in the SHCS are also relevant to this indicator.
- We will continue to review the list of clean and low emissions heating technologies we are monitoring, so that others can be added in future.

Proposed indicator: percentage of new domestic properties with clean heating system completed in the last year:

- with heat pumps
- connected to a heat network
- with other electric heating

Data source: EPC register

Unit: per cent

Description:

- We plan to report on the types of heating systems going into new build properties annually. From 1 April 2024, each new building will need to have a building warrant stating it will be constructed with a clean heating system.
- Our regulations will allow a wide range of suitable clean heating systems, including air source and ground source heat pumps, electric boilers, smart electrical storage heaters, communal heat pumps and connections to heat networks.
- We aim to use EPC register data to track the types of heating systems installed in new properties.

2.2.2 Method: uptake of low emissions heating and clean heating in non-domestic properties

Proposed indicator: number of non-domestic properties currently with clean heating systems:

- heat pumps
- connected to a heat network
- other electric heating

Data source - heat networks: Heat Networks Metering and Billing Regulations data

Data source - heat pumps and other electric heating: Non-Domestic Analytics (NDA)

Unit: number of properties

Description:

- We plan to report annually on the number of non-domestic properties with clean heat. Our current estimate is that just over a half of such buildings use a clean heating system.
- Data for non-domestic properties are limited to NDA which models the entire non-domestic sector based on information from the EPC Register. However, only 17% of non-domestic buildings have an EPC associated with them, so data we model about the sector as a whole should be treated with care.
- We are exploring options to fill this data gap, including working with key stakeholders to develop and enhance data sources. The UK Government is looking to develop a National Buildings Database in England, Scotland and Wales that is expected to include the non-domestic stock, and we are obtaining Building Assessment Reports from public sector bodies under the Heat Networks (Scotland) Act 2021.

Proposed indicator: number of non-domestic properties recently installing a clean heating system:

- heat pumps (over the last year)
- heat network connections (over the last four years)
- other electric heating (over the last year)

Data source - heat pumps and direct electric heating: no data source currently

Data source - heat networks: Heat Networks Metering and Billing Regulations data

Unit: number of properties

Description:

- We also want to be able to track the number of non-domestic properties that have recently installed a clean heating system in order to gauge recent progress. As with domestic properties, this indicator will allow us to see changes in the rate of installations over time, not just the total non-domestic stock converted to clean heating systems measured by the previous indicator.
- While we can use Heat Networks Metering and Billing Regulations data to monitor new heat network connections within the last four years, we do not currently have access to reliable data on recent installations of heat pumps and other electric heating in the non-domestic sector. We will continue to explore potential data sources to help fill this gap.

Proposed indicator: number of non-domestic buildings currently with low emission or low emission ready heating, such as:

- biomass boilers
- CHP
- fuel cells
- hybrid heat pumps
- hydrogen-ready boilers

Data source - biomass boilers and CHP: NDA

Data source - hybrid heat pumps, fuel cells and hydrogen-ready boilers: no data source currently

Unit: number of properties

Description:

- As with the domestic sector, while we do not expect low emission or low emission ready heating systems to be the main solutions to decarbonise Scotland's heating, we recognise that some low carbon technologies may have a limited role

to play in niche circumstances. Similarly, we will keep the list of clean and low carbon heating systems under review.

- As outlined above, we do not currently have a suitable data source to be able to track this information in the non-domestic sector, but we are exploring ways to measure progress against this metric.

Proposed indicator: percentage of new non-domestic properties with clean heat completed in the last year:

- with heat pumps
- connected to a heat network

Data source: non-domestic EPC register

Unit: number of properties

Description:

- We plan to report on the types of heating systems installed in new build non-domestic properties annually. As in the domestic sector, all building warrants for new non-domestic properties will need to state that the property will be constructed with a clean heating system from 1 April 2024.
- We aim to use the non-domestic EPC register to track the types of heating systems installed in new properties.

2.2.3 Method: rollout of zero emissions heat networks

Proposed indicator: heat supplied by heat networks (statutory target to reach 2.6 Terawatt hours (TWh) by 2027 and 6 TWh by 2030) to:

- domestic properties
- non-domestic properties

Data source: Heat Networks Metering and Billing Regulations data

Unit: TWh

Description:

- The Heat Networks (Scotland) Act 2021 sets ambitious targets for the amount of thermal energy (heat and cooling) to be supplied by heat networks. These are 2.6 TWh of output by 2027 and 6 TWh of output by 2030. These figures are equivalent to 3% and 8% respectively of current non-electrical heat consumption.
- A draft Scottish Statutory Instrument was laid on 25 September 2023 to set a further target for heat network deployment of 7 TWh by 2035, which would be equivalent to 9% of non-electrical heat consumption.

- We therefore want to measure the heat supplied by heat networks to both domestic and non-domestic properties in order to measure progress against these statutory obligations. While we will use Heat Networks Metering and Billing Regulations data to do this, the data is only available every four years and separating out domestic from non-domestic supply requires us to make assumptions.
- We plan to use data from new UK or Scottish regulations as appropriate, and when possible.

Proposed indicator: share of low carbon heat in existing networks

Data source: Heat Networks Metering and Billing Regulations data (share of fuel source and technology)

Unit: per cent

Description:

- We committed in our Heat Networks Delivery Plan¹³ to finding a way for existing heat networks to develop Decarbonisation Plans to cover both efficiency improvements and replacement of heat sources where these are not already low and zero emission.
- While we do not currently have access to reliable data on the share of low carbon heat in existing networks, we can report on the share of fuel and technology using Heat Networks Metering and Billing Regulations data. However, it is limited in that it assumes networks use only one source.
- We are exploring options to improve data to report against this indicator, including working with other stakeholders, such as the UK Government and Ofgem.

2.3 Outcome: the heat transition is fair, leaving no one behind

2.3.1 Method: heat is affordable

Proposed indicator: percentage of homes in fuel poverty (statutory target in 2040 no more than 5% of households are fuel poor with <1% in extreme fuel poverty)

Data source: SHCS

Unit: per cent

¹³ [Executive Summary - Heat networks delivery plan - gov.scot \(www.gov.scot\)](https://www.gov.scot/ExecSummary/HeatNetworksDeliveryPlan)

Description:

- As set out in our Heat in Buildings Strategy, it is critical that, as we take action to reduce emissions from Scotland's homes, we do so in a way that supports a just transition and the reduction of fuel poverty. Our ambitious statutory fuel poverty targets require that in 2040 no more than 5% of households are fuel poor, no more than 1% are in extreme fuel poverty and the fuel poverty gap is no more than £250 (in 2015 prices). We also have interim targets for 2030 and 2035.
- We currently estimate the share of Scottish homes in fuel poverty via the Scottish Government's annual SHCS. However, we recognise that the drivers of fuel poverty are complex and inter-linking, and not all within the scope of the Heat in Buildings Strategy Framework. Our Fuel Poverty Strategy¹⁴ set out four main drivers of fuel poverty that we are seeking to tackle: poor energy efficiency, high energy prices, low household income and how energy is used in the home.
- In line with the Fuel Poverty Act 2019, we consulted the Scottish Fuel Poverty Advisory Panel¹⁵ on next steps for our strategy and we are engaging with the Panel on its published recommendations¹⁶, while ensuring that they align with the Heat in Buildings Strategy and other key policies that support delivery of our 2040 statutory fuel poverty targets.
- We will also explore how additional metrics may help to monitor the impact of the Heat in Buildings Programme on fuel poverty, collaborating with the Scottish Fuel Poverty Advisory Panel and other key stakeholders. We are also considering how to measure the impact of heat affordability on non-domestic consumers.
- The Draft Energy Strategy and Just Transition Plan¹⁷ describes work to inform a monitoring and evaluation framework for a just transition in Scotland, incorporating an evidence assessment of just transition monitoring internationally. We will engage with stakeholders to build on the findings of this research in 2024 and to develop a framework that reflects the Just Transition Commission's recommendations.
- The overarching Just Transition Monitoring and Evaluation Framework will inform the development of the draft monitoring and evaluation framework for each Just Transition Plan.

2.3.2 Method: green heat jobs for the heat transition

Proposed indicator: net change in heat and energy efficiency jobs

Data source: available data insufficient for monitoring

¹⁴ [Fuel Poverty Strategy](#)

¹⁵ [Scottish Fuel Poverty Advisory Panel - gov.scot \(www.gov.scot\)](#)

¹⁶ [Recommendations to the Scottish Government on its Fuel Poverty Strategy - Fuel Poverty Scotland \(fuelpovertypanel.scot\)](#)

¹⁷ [Draft Energy Strategy and Just Transition Plan \(www.gov.scot\)](#)

Unit: net change

Description:

- We need to see growth in the number of reliable and skilled tradespeople and businesses who can advise upon and install clean heating systems and energy efficiency measures, as well as monitor potential job losses in more traditional sectors as a consequence of the heat transition. Measuring the net change in heat and energy efficiency jobs will, however, depend on data availability.
- The Office for National Statistics' Low Carbon and Renewable Energy Economy (LCREE) provides annual estimates of the number of full-time equivalents (FTEs) across sectors including renewable heat, renewable CHP, energy efficient lighting and energy efficient products. LCREE also provides data at the 'low carbon heat' grouping. However, these data are insufficient for monitoring purposes due to the wide confidence intervals around the estimates.
- Tracking or developing additional indicators as the supply chain grows will be important for monitoring progress against this indicator.
- We are working to establish reliable measures and indicators related to green heat jobs. For example, we are exploring indicators to track progress in skills and supply chain as part of the monitoring of the Built Environment and Construction Just Transition Plan. This includes research to analyse Scotland's net zero and climate adapted economy, with renewable heat as one of the sectors in focus, as well as monitoring the types of jobs created (for example manufacturing, installation), and the quality of jobs created (for example taking into account pay and representation in the sector).

3. Enablers

3.1 Enabler: green heat sector - workers and skills pipeline

Proposed indicator: number of people in training to achieve relevant qualifications through apprenticeships, further education and higher education – via Modern and Graduate Apprenticeships and enrolled on Further and Higher Education courses

Data source - numbers training in Modern and Graduate Apprenticeships:
Skills Development Scotland

Data source - numbers enrolled on Further and Higher Education courses:
Scottish Funding Council

Unit: number of people

Description:

- Parts of the existing workforce will need to retrain and reskill to support the required growth in the green heat and energy efficiency sector, leading to a

strong pipeline of talent with capacity and competency fit for current and future industry needs.

- We therefore aim to track the number of heat pump and energy efficiency installers who are entering the profession. This will include both new entrants to the sector and those currently retraining in the sector.
- We do not currently have accurate data on this and will continue to explore options to better measure these indicators. In the meantime, data on numbers training in Modern and Graduate Apprenticeships are available from Skills Development Scotland and data on numbers enrolled on Further and Higher Education courses are available from Scottish Funding Council. Due to some apprenticeships being carried out at colleges and universities there may be duplication in the data. These sources may give an indication of the scale of the skills pipeline for the sector, however since educational groupings can be quite broad, there are data limitations.
- It will also be important to understand the demographic split of the skills pipeline, such as by sex, age and geography, to ensure a fair access to skills and to identify any areas of under-representation.

3.2 Enabler: public engagement

Proposed indicator: public awareness and understanding of the need for the transition from fossil fuel heating to clean heat alternatives, of the changes that individuals and businesses need to make, and how to access support.

Data sources: Scottish Household Survey (SHS), Scottish Government Climate Change Public Engagement Strategy public polling¹⁸

Unit: to be confirmed

Proposed indicator: public participation in the heat transition - number of opportunities available for people to engage in heat transition-related public engagement activities in Scotland (for example public consultations and related engagement events, and citizens' panels)

Data source: no data source currently

Unit: to be confirmed

Proposed indicator: public willingness and intention to undertake energy efficiency improvement measures and install clean heating systems

Data sources: SHS, Scottish Government Climate Change Public Engagement Strategy public polling

¹⁸ [Climate change - public engagement: survey results 2022 - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/climate-change-public-engagement-survey-results-2022/pages/11/)

Unit: to be confirmed

Description:

- We know from research we commissioned in 2020 that there is a lack of public understanding about the link between fossil fuel heating and climate change. We are also aware that certain groups, such as those in fuel poverty and more critically extreme fuel poverty, are often seeking immediate and direct emergency crisis intervention in the first instance, rather than longer-term, sustainable support. We therefore recognise the need to increase public understanding and awareness of the changes required, and the solutions and support available to different groups for the heat transition.
- We plan to track people’s awareness and understanding of the need for the transition, of the clean heating system alternatives available, and of the role of improved energy efficiency in reducing emissions from buildings. We also want to be able to measure people’s intent to make the necessary changes, as well as their awareness of the support available to them.
- We will use data from the SHS to measure changes in people’s awareness of clean heat technology and the rates at which people are installing clean heating systems.
- The Climate Change Public Engagement survey will provide insights into the extent to which people’s awareness of and attitudes towards the heat transition are changing over time. To support this, we are currently developing questions specific to the heat transition to add to the existing survey. The next survey will run in spring 2024, and again in 2026.
- One limitation of these data sources is that they mainly poll domestic owner-occupiers. Therefore, we will also explore ways to poll other groups, such as private sector landlords and non-domestic audiences.
- We will also continue to explore how we measure public participation in the heat transition. While we do not currently have a data source for this indicator, we are planning to undertake a stakeholder mapping exercise to identify and understand who is delivering engagement on heat decarbonisation to the public, how, and who the key audiences are.

3.3 Enabler: access to funding and finance

Proposed indicator: number of privately available financing products

Data source: Green Finance Institute – UK Green Mortgage Products¹⁹

Unit: number of products

¹⁹ [Green Finance Institute – UK Green Mortgage Products](#)

Description:

- We estimate that the cost of the heat transition is in the region of £33 billion. The Scottish Government will continue to help people to meet the costs of these changes, especially those who need support the most.
- However, we also need to see a huge scale-up of private finance offerings that can support individuals and organisations to cover the upfront cost of installing clean heating systems and energy efficiency measures.
- These include green mortgages or additional secured loans, as well as more innovative financial product offerings for the UK market – e.g. property linked finance, where the financing is tied to the building and not an individual, and equity release products which allow people who own their property to release cash for green retrofit by selling a stake in their property. Choices will be required between the level of private finance - individual or institutional – relative to the public funding levels.
- We will monitor this indicator by tracking the number of available financing products on the market using the Green Finance Institute’s UK Green Mortgage Products database.

Proposed indicator: level of private financing that public funding leverages

Data source: data from the Scottish Government’s heat networks, social housing and public sector delivery schemes

Unit: ratio

Description:

- Blended finance mechanisms, combining funding from different private and public sources, will be an important part of the overall finance structures required to achieve our goal.
- We will therefore track the level of private finance leveraged as a ratio of public funding, using data from the Scottish Government’s heat networks, social housing and public sector delivery schemes. We will also continue to explore other ways to monitor the accessibility of finance to fund green heat and energy efficiency measures across Scotland.

3.4 Enabler: matters reserved to the UK Government

Proposed indicator: UK Government policy position: gas and electricity prices

Data sources: annual average domestic energy prices, annual average non-domestic energy prices, and a qualitative update from officials

Unit: ratio between domestic gas and electricity prices and a qualitative update

Proposed indicator: UK Government policy position: network planning and investment

Data source: qualitative update from officials

Unit: N/A

Proposed indicator: UK Government policy position: the future of the gas grid

Data source: qualitative update from officials

Unit: N/A

Proposed indicator: the percentage of UK heat pump installations which take place within Scotland as a result of the Clean Heat Market Mechanism

Data source: no data source currently

Unit: per cent

Description:

- The UK Government has committed to making significant policy decisions in reserved areas which could influence our progress in decarbonising heat in buildings.
- We plan to track indicators related to the status of some of these key reserved policy areas that we believe have most potential to impact the Heat in Buildings programme:
 - **The ratio between electricity and gas prices:** to meet our climate targets, we will need to see all homes and businesses currently heated by fossil fuel boilers convert to clean heating by 2045. The higher unit cost of electricity as compared to gas can make moving from a gas boiler to a clean heating system, such as a heat pump, more expensive to run. This is despite the efficiency of a heat pump (approximately three times more efficient than a gas boiler) mitigating some of the increase in running costs. To address this difference in energy prices, the UK Government has committed to making progress by the end of 2024 in ‘rebalancing’ the price of gas and electricity by moving policy costs away from electricity and onto fossil fuels when current high gas prices fall. Any rebalancing must take into account the potential impact on fuel poor households or those at risk of fuel poverty by ensuring that appropriate support is available.
 - **Wholesale electricity prices:** through a Review of Electricity Market Arrangements (REMA), the UK Government is considering reforms to ensure the wholesale electricity market can deliver a decarbonised electricity system by 2035, in a way that supports affordability and security

of supply. This includes whether or not to move away from a single national price to Locational Marginal Pricing (LMP). In theory, LMP could lower electricity costs for Scotland's consumers and end-users but increase costs for those investing in renewables in Scotland. We are developing our position on what 'good' electricity market arrangements look like for Scotland and will continue to seek to influence UK Government proposals.

- **Policies on network planning and investment in the electricity grid:** we plan to qualitatively monitor UK Government policies on network planning and grid investment, the decisions for which are mostly reserved to the UK Government under the Electricity Act (1989). The Scottish Government has general responsibility for determining applications relating to transmission infrastructure (such as overhead lines) under Sections 36 and 37 of the same Act, which we will look at in conjunction with wider GB decision-making. Investment will be critical to enhancing the electricity network to meet increased demand for electric heating (and transport) in the future, without which the network itself may leave us with poor energy security, poor resilience and the grid itself becoming a barrier to achieving net zero.
- **Policies on the future of the gas grid:** The UK Government plans to make a decision on the future role of the gas network in 2026, including on the role hydrogen may play. UK Ministers have recently indicated that heat pumps will remain the main solution for decarbonising heat in the UK, and our Hydrogen Action Plan²⁰ likewise expects only a limited role for hydrogen for domestic heating. Nevertheless, the decision on the future of the gas grid is reserved and will have a significant impact on the ability of the Scottish Government to meet its emissions reduction targets for heat in buildings.
- **Product Standards:** The UK Government is responsible for setting product standards, in particular through the EcoDesign regulations, and also through its proposed Clean Heat Market Mechanism (CHMM), legislated through the UK's Energy Act 2023. Through the CHMM, the UK Government hopes to reduce the upfront installation and running costs of heat pumps, and to support an expansion of heat pump manufacturing within the UK. The CHMM will place an obligation on the manufacturers of heating appliances to meet targets for the proportion of low carbon heat pumps they sell each year, relative to fossil fuel boilers. These targets will steadily increase year-on-year, providing firms with the certainty to invest in building the heat pump market. The UK Government expects to set targets for qualifying heat pump installations, totalling around 60,000 in

²⁰ [Hydrogen action plan - gov.scot \(www.gov.scot\)](https://www.gov.scot/hydrogen-action-plan)

2024-25 and around 90,000 in 2025-26. Targets for future years could be set to correspond to deployment of 150,000 heat pumps in 2026-27, 250,000 in 2027-28 and 400,000 in 2028-29. We plan to work with the UK Government to track the percentage of heat pump installations from across the UK which take place within Scotland as a result of the CHMM, using powers requiring the UK Government to engage with the Scottish Ministers within the UK Energy Bill, in the design and operation of low carbon heat schemes such as the CHMM.

3.5 Enabler: heat infrastructure and planning

Proposed indicator: number of properties covered by a designated heat network zone:

- domestic
- non-domestic

Data source: no data source currently

Unit: number of properties

Description:

- It is critical that we encourage key infrastructure for the heat transition to be developed, and that it is supported by effective planning. This is especially important for developing new heat networks, which tend to have longer lead-in times, and to ensure that households and businesses are aware of the options available to them to decarbonise their properties.
- Local government has a vital role in setting out the long-term plan for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area, via their LHEES and Delivery Plans, which they are required to publish by the end of 2023. Following on from LHEES, local authorities will need to identify areas likely to be particularly suitable for heat networks – a requirement of the Heat Networks (Scotland) Act 2021, and to then designate heat network zones that they deem suitable.
- We will explore ways to track the number of properties covered by a designated heat network zone, as local authorities begin to formally designate these zones, including working with other stakeholders, such as the UK Government and Ofgem.

Unit: number of measures

Description:

- We will report on the measures installed under our schemes, including specifically the number of insulation/other energy efficiency measures and clean heating system installations for the previous financial year across all our delivery schemes.
- We will report both on the number of households supported and the number and type of measures installed.
- We will split out our reporting by the different tenures, in line with the structure of our schemes: domestic (social rented sector, owner-occupied, private rented sector) and non-domestic (SME and public sector).
- As described above, while reporting on the number of energy efficiency measures and clean heating systems installed through delivery schemes gives some indication of progress against our outcomes, we recognise that it is not the only driver behind people and businesses making changes to their buildings. We also recognise that this indicator does not measure the capacity of heat pumps, and therefore the amount of gas replaced across the building stock, or the direct impact of installing measures on the number of homes/properties to achieving a suitable energy efficiency rating. However, we will continue to explore ways to better measure and reflect progress against our strategy's outcomes.

4.1.2 Type: heat network support

Proposed indicator: new pre-capital support projects in previous year

Data source: data collected directly by Scottish Government and delivery partners

Unit: number of projects

Proposed indicator: new capital support projects in previous year

Data source: data collected directly by Scottish Government and delivery partners

Unit: number of projects

Description:

- Given the longer lead-in times and investment required to develop heat networks, providing support to early-stage projects is critical to the rollout of heat networks across Scotland.
- We will track the number of new capital and pre-capital support projects each year to indicate the number of projects receiving advice, guidance and funding in the pre-capital stage of heat network development from the Scottish Government.

4.1.3 Type: Scottish Government investment

Proposed indicator: Scottish Government funding for the previous year (actual spend) on all schemes that support installation of energy efficiency measures and clean heating systems across domestic and non-domestic properties and the development of heat networks. This will be broken down by scheme and identify both capital and revenue funding.

Data source: Scottish Government delivery schemes

Unit: £

Description:

- As agreed in the Bute House Agreement²³, we have committed to invest £1.8 billion over the course of this parliamentary session towards heat and energy efficiency measures:
 - at least £465 million to support those least able to pay, delivered through our Warmer Homes Scotland and Area Based schemes,
 - £300 million for Scotland’s Heat Network Fund,
 - £200 million Social Housing Net Zero Heat Fund, investing in a sector already leading the way in the heat transition,
 - £200 million Scottish Green Public Sector Estate Scheme, supporting leadership for energy efficiency and heat decarbonisation right across the public sector.
- We will report annually on spend across our delivery schemes and how this breaks down per sector.

4.1.4 Type: advice services

Proposed indicator: number of unique households supported by Home Energy Scotland (HES) advice service

Data source: Scottish Government advice service

Unit: number of unique households

Proposed indicators: number of SMEs supported by Business Energy Scotland (BES) advice service and number of energy assessment reports completed by BES

Data source: Scottish Government advice service

Unit: number of SMEs/number of energy assessment reports

²³ [Bute House Agreement](#)

Proposed indicator: advice and referral services investment

Data source: Scottish Government advice service

Unit: £

Description:

- The Scottish Government provides a range of different types of advisory support via Energy Saving Trust who administer and deliver the Home Energy Scotland (HES) and Business Energy Scotland (BES) advice services on our behalf.
- We will track the annual number of unique households supported by HES, the number of SMEs supported by BES, as well as the number of energy assessment reports conducted by BES for SMEs in Scotland.
- Within the services there are a number of specialist advice offerings available. In the future, we may seek to provide further detail on the split between different types of advice offered.

4.2 Activities: other policy and delivery work

Using our devolved powers, we are also working on developing a range of policy and regulation to help unlock progress in Scotland’s heat transition. This policy and regulatory approach reflects some of the main barriers to the heat transition identified during the analysis of the responses²⁴ to our consultation on the Heat in Buildings Strategy. The latest overview of developments in these areas is summarised in our annual Heat in Buildings Strategy progress report ²⁵, and includes:

- Introducing a regulatory framework to scale up the deployment of clean heating systems and energy efficiency measures:
 - Regulating for clean heat and energy efficiency improvements in existing buildings
 - Reviewing our social housing standards to align with our net zero targets
 - Reforming EPCs to support the transition to net zero
- Working with UK Government and local government
 - Engaging closely with local authorities on their LHEES
 - Working with the UK Government on key heat in buildings policies
- Providing support for skills and the supply chain to enable the growth needed in the green heat sector to meet our climate targets
- Developing our approach to increasing public awareness and engagement with the heat transition

²⁴ [Heat in Buildings Strategy - Analysis of responses to the consultation \(www.gov.scot\)](http://www.gov.scot)

²⁵ [Heat in Buildings: progress report 2023 - gov.scot \(www.gov.scot\)](http://www.gov.scot)

- Exploring solutions to deliver the significant increase in private finance needed for the heat transition, alongside the Scottish Government's delivery and advice schemes
- Developing a regulatory regime for heat networks to meet the statutory requirements of the Heat Networks (Scotland) Act 2021.

Proposed indicator: qualitative update on developments over the last year

Data source: Scottish Government officials

Unit: N/A

Description:

- We plan to provide a qualitative update on progress against these key policy and regulatory areas of the Heat in Buildings Strategy. We intend to do this in a similar way to our reporting in the annual Heat in Buildings Strategy progress report.

Conclusion

Future improvements

We would welcome views from stakeholders on the Framework and how we can improve it, including where we might access further sources of data. We will also explore options for publishing the data on a web-based interface. Please provide feedback to heatinbuildings@gov.scot.

Data gaps and updates to indicators

We intend for this Framework to evolve as we make progress against our Heat in Buildings Strategy. As such, we will review the indicators we use, and adapt them as needed. We will also ensure that gaps in data are kept under review. We will fill these gaps where we can with new sources of data (when available), or with suitable proxies. If existing data sources are superseded by more suitable alternatives, we will consider how to use these.

Annex A: summary of data sources

Department for Energy Security and Net Zero:

[Annual domestic energy bills](#): Statistical dataset providing annual estimates of gas and electricity bills, along with statistics on household expenditure on fuel (data split by region).

[Annual and quarterly non-domestic energy bills](#): Quarterly and annual gas and electricity prices for the non-domestic sector, including and excluding the Climate Change Levy (CCL), split into consumption size bands (data for the UK - Scotland specific data not available).

[Energy Performance Certificate \(EPC\) data - Domestic and Non-Domestic](#):

These datasets present data from every current domestic and non-domestic EPC assessment held by the Scottish Energy Performance Certificate Register (SEPCR), covering the period from Q4 2013. The SEPCR updates daily overnight, while the published datasets are a snapshot of the register taken at quarterly intervals. EPCs present a range of key environmental data, intended to provide homeowners, tenants and the occupants of non-domestic buildings information on potential energy costs and carbon emissions.

[Green Finance Institute – UK Green Mortgage Products](#): The Green Finance Institute collects data on the number of green mortgage products offered in the UK.

Heat Networks Metering and Billing Regulations Data: This dataset is compiled from notifications submitted by heat network operators (heat suppliers) to the UK Government's Office for Product Safety and Standards (OPSS) under the [Heat Networks Metering and Billing Regulations](#). Networks can be district or communal and can serve domestic customers only, non-domestic customers only, or a mixture of the two. Data for each network include (where available):

- number and type of customer supplied
- number and type of building supplied
- capacity, generation and supply values for heating and cooling
- fuel type (e.g. biomass)
- technology used (e.g. heat pump)

[Low Carbon and Renewable Energy Economy \(LCREE\) Survey](#): The Low Carbon and Renewable Energy Economy (LCREE) Survey is the primary source of official information on LCREE activity in the UK. It is a predominantly an online survey of around 25,000 UK businesses, targeted at industries expected to be undertaking activities relevant to LCREE. Information is collected from businesses which self-identify as operating within LCREE sectors in relation to employment, turnover, imports, exports and capital assets for all LCREE sectors they operate in. Businesses are considered to be active in the LCREE if they provide information on economic performance within [17 predefined LCREE sectors](#).

[Microgeneration Certification Scheme \(MCS\) Installations Database](#): The MCS database provides near real-time information on all MCS certified, small-scale renewable installations in the UK. This is understood to cover most heat pump installations in existing domestic properties. However, it will not cover non-certified installations and may include some installs in new builds and smaller non-domestic buildings.

Non-Domestic Analytics (NDA): NDA provides address-level information about non-domestic properties in Scotland. NDA can be used to gain an understanding of the non-domestic building stock within an area. Data includes: building type and use, energy efficiency (including demand for space and water heating), and wider characteristics like floor area. NDA is produced by the Energy Saving Trust (EST) on behalf of the Scottish Government. It integrates several non-domestic datasets, including EPCs, to model Scotland's non-domestic building stock.

[Scottish Funding Council Statistics](#) - Numbers enrolled on Further and Higher Education courses: The Scottish Funding Council (SFC) collects statistics on the number of enrolments at Scottish Colleges and Universities. Data is captured by key characteristics and subject and course details. SFC is a non-departmental public body and is directly accountable to Scottish Government Ministers and the Scottish Parliament.

Scottish Government Climate Change Public Engagement Strategy public polling: The Scottish Government's five-year (2021-2026) Net Zero Nation: Public Engagement Strategy for Climate Change sets out our vision for all of Scotland to understand the challenges we face and embrace their role in our transition to a net zero and climate ready Scotland. In 2022, [a representative baseline survey](#) was conducted and included questions on: awareness of the Scottish Government net zero targets and climate policies (Understand), experiences of and attitudes to participating in policy and decision making relating to climate change (Participate), and understanding of the actions needed to tackle climate change, and instances of these actions being taken or planned at an individual, household or community level (Act). We plan to repeat this survey in 2024 and 2026.

Scottish Government delivery schemes data: These are data we collect for our delivery schemes in collaboration with delivery partners.

Scottish Greenhouse Gas Emissions [Statistics](#): This is an Official Statistics publication which reports results from the Scottish Greenhouse Gas Inventory, covering the period from 1990. It is published annually in June with around an 18-month lag. It presents information on territorial emissions and is compiled in accordance with guidelines from the Intergovernmental Panel on Climate Change.

[Scottish Housing Condition Survey \(SHCS\)](#): This is the Scottish Government's annual national survey looking at the physical condition of Scotland's homes as well as the experiences of householders. The survey fieldwork runs from January to December each year, with the survey now an integrated component of the [Scottish Household Survey](#). The SHCS annual report is based on a representative sample of

around 3,000 dwellings. All survey figures are estimates and will contain some error associated with sampling variability. In general, the smaller the sample size, the greater the likelihood that the estimate could be misleading, so we will take care when using smaller subsets of the survey sample for analysis.

Scottish Household Survey: The Scottish Government's annual, cross-sectional, national survey that provides robust evidence on the composition, characteristics, attitudes and behaviour of private households and individuals as well as evidence on the physical condition of Scotland's homes.

Skills Development Scotland Statistics - Numbers training in Modern and Graduate Apprenticeships: Skills Development Scotland collects statistics on the number of Graduate (GA) and Modern Apprenticeships (MA). The MA statistics are based on those where there is a public funding contribution administered by SDS, on behalf of the Scottish Government. GA are industry-recognised, accredited degree-level qualifications, available from Diploma up to Masters degree-level qualification. They are offered in key occupational growth areas of the economy and support the education and development of individuals so that they acquire the necessary skills, knowledge and competence required to work and progress in their chosen sector.

Annex B: Scottish Government delivery schemes and advice services

Domestic support:

Area Based Schemes

Scheme to reduce fuel poverty by enabling local authorities to design and deliver energy efficiency programmes in fuel poor areas. Primary focus on insulation measures for 'hard to treat' properties but includes clean heating and microgeneration measures as part of a 'whole house' approach.

Home Energy Scotland: Grant and Loan scheme

Grants up to £15,000 for heat pumps and energy efficiency measures. Loans are also available to cover additional costs. A rural uplift of £1,500 applies to both clean heating, such as heat pumps and energy efficiency grants.

Warmer Homes Scotland

Our national fuel poverty programme designed to help those living in or at risk of fuel poverty through the installation of measures such as insulation and clean heating systems.

Home Energy Scotland

Free independent advice and referral scheme.

Business support:

SME Loan and Cashback

The SME Loan and Cashback scheme provides interest free loans from £1,000 up to £100,000 to small and medium sized Scotland based businesses for the installation of energy efficiency measures and clean heating.

Business Energy Scotland

Free advice and support to SMEs for energy efficiency and heat decarbonisation.

Communities and public sector support:

Community and Renewable Energy Scheme (CARES)

Advice and funding support for renewable energy.

Scottish Green Public Sector Estate Decarbonisation Scheme

The main government-led capital funding mechanism to support leadership for decarbonisation of buildings owned by the public sector. The scheme comprises four support elements for public sector bodies:

1. The Scottish Public Sector Energy Efficiency Loan Scheme

2. The Scottish Public Sector Non-Domestic Energy Efficiency (NDEE) Frameworks and Project Support Unit (PSU)
3. The Scottish Central Government Energy Efficiency Grant scheme
4. Scotland's Public Sector Heat Decarbonisation Fund

Multi-sector support

Scotland's Heat Network Fund

Open to all public and private sector organisations, including support for new heat networks and the decarbonisation and expansion of existing heat networks.

District Heating Loan Fund

Support for the deployment of heat networks, as well as improving the efficiency of existing heat networks, and for non-domestic buildings to connect to heat networks. Open to social landlords, local authorities, SMEs and Energy Services Companies (ESCOs) with fewer than 250 employees.

Social rented sector support

Social Housing Net Zero Heat Fund

Grants to social housing landlords for the retrofit of clean heating systems and energy efficiency measures across existing stock.

See **District Heating Loan Fund**.



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