

Delivering Net Zero for Scotland's Buildings Changing the way we heat our homes and buildings

A Consultation on proposals for a Heat in Buildings Bill

**Business and Regulatory Impact Assessment
(Partial)**

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Title of proposal

1.1 A consultation on proposals for a Heat in Buildings Bill.

Scope

2.1 A Business and Regulatory Impact Assessment (BRIA) looks at the likely costs, benefits and risks of any proposed primary or secondary legislation. It also covers voluntary regulation, codes of practice, guidance, or policy changes that may have an impact on the public, private or third sector.

2.2 The BRIA explains:

- The reason why the Scottish Government is proposing to intervene
- Options the Scottish Government is considering, and which one is preferred
- How and to what extent the new policies may impact on the Scottish Government, business and on Scotland's competitiveness
- The estimated costs and benefits of the proposed measures.

2.3 This partial Business and Regulatory Impact Assessment (BRIA) accompanies the Scottish Government's Consultation on proposals which may inform a Heat in Buildings Bill and subsequent regulations. As a partial BRIA we will use it to aid discussions with businesses across Scotland to consider the impacts they might face as a result of our proposals. We will work with stakeholders in parallel with the consultation process for the draft Bill to identify the likely costs and benefits of the proposed framework as a whole. Paragraphs from 5.3 below explain how this will be done. We will then take the responses from those conversations to inform a full BRIA which will accompany the Bill as it is introduced to Parliament.

2.4 The Bill and its proposals will help deliver on the vision laid out in the Heat in Buildings Strategy¹ ("the Strategy"): "By 2045 Our Homes and Buildings are Warmer, Greener and More Efficient".

2.5 This document provides an indicative assessment of the impact of the proposals for primary legislation on various parties and sectors within the Scottish economy. As we progress through the consultation and refine the policy positions, we will continue to gather and share more data on costs and the impacts of our proposals on those affected. This will help inform the drafting of the Bill as we progress towards its introduction to Parliament.

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

Objectives

- 3.1 The objectives of the proposals set out in the consultation are consistent with the Strategy. The Strategy set out how we plan to transform Scotland's homes and workplaces so that they are warmer, greener and more efficient, and made clear that regulations would be essential to delivering the required reduction in emissions from Scotland's buildings. The proposed Bill is the first step in this process.
- 3.2 The Strategy:
- established principles to underpin our policies and actions on energy efficiency and heat, including principles to prevent fuel poverty worsening.
 - set out strengthened action and increased investment to support delivery of energy efficiency and zero direct emissions heat (referred to from here and in the consultation as "clean heat").
 - considered whole system energy issues and how these are to be managed over the course of the transition.
 - outlined the scale of the economic opportunity presented and the measures necessary to realise this and to ensure a just transition.
- 3.3 One of the actions set out in the Strategy to achieve these objectives was to introduce a regulatory framework for clean heating and energy efficiency, subject to consultation and to limits of devolved competence. The proposed Heat in Buildings Bill, and this consultation on proposals which may inform such a Bill, are steps towards delivering this framework.
- 3.4 Our efforts to make our homes and non-domestic properties warmer, greener and more energy efficient can secure a wider set of outcomes that will benefit Scotland's people and places.

Outcomes	
National Performance Framework	Heat in Buildings Strategy and Consultation on proposals for a Heat in Buildings Bill
Economy We have a globally competitive entrepreneurial, including and sustainable economy	The cost of heating our homes and businesses is affordable and those occupying them have a high comfort level
Environment We value, enjoy, protect and enhance our environment	We have reduced our demand for heat and poor energy efficiency is no longer a driver of fuel poverty
Poverty We tackle poverty by sharing opportunities, wealth and power more equally	The systems we use are smart and resilient and provide us with a reliable source of heat
Health We are healthy and active	We have a secure supply chain with high value, local, sustainable jobs across Scotland and people have been helped to transition to new, secure jobs as part of a just transition
Fair Work and Business We have thriving and innovative businesses, with quality jobs and fair work for everyone	Our indoor and outdoor spaces are filled with clean air
Communities We live in communities that are inclusive, empowered, resilient and safe	Our heating systems enable and efficiently use Scotland's renewable energy resources
	Our heating systems enable the flexible and stable operation of our energy networks

- 3.5 Our proposal to introduce formal regulations by way of primary legislation draws together existing and emerging Scottish Government policies and proposals relating to energy efficiency and heat decarbonisation as they affect buildings across Scotland. These underpin the high level outcomes identified and include measures to direct and support people, places, our economy, future energy networks, delivery and investment.
- 3.6 In order to meet our interim climate targets and ensure long-term delivery of our net-zero objectives, the Update to the Climate Change Plan², which was the subject of its own suite of impact assessments, clarified that emissions from homes and non-domestic buildings combined will have to fall 68% by 2030 compared to 2020.
- 3.7 The consultation on proposals that may inform a Heat in Buildings Bill asks for views on the introduction of new standards for all buildings in Scotland³ in terms of their energy efficiency and use of clean heating systems. The setting

² Scottish Government (2020) Securing a green recovery on a path to net zero: climate change plan 2018-2032 – update [online], Available at: [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/securing-a-green-recovery-on-a-path-to-net-zero-climate-change-plan-2018-2032-update/pages/20/) (accessed 30/03/23).

³ The exception to this is Scotland's social housing stock, which will remain subject to a separate performance standard designed to grow zero emission heat and improve energy efficiency.

of these standards in law, alongside the continued development of our support frameworks and the growth of financial products such as green mortgages, would accelerate heat decarbonisation in a way which has not been achieved by market forces (alone) thus far and which will be essential to achieving our legally binding emissions reductions targets.

- 3.8 The consultation asks for views on timeframes for the building stock to meet the standards proposed, and makes clear that the proposed Bill will be the first step in the creation of a legislative framework. Secondary regulations will be required to provide the details of implementation and will be the subject of future consultations.

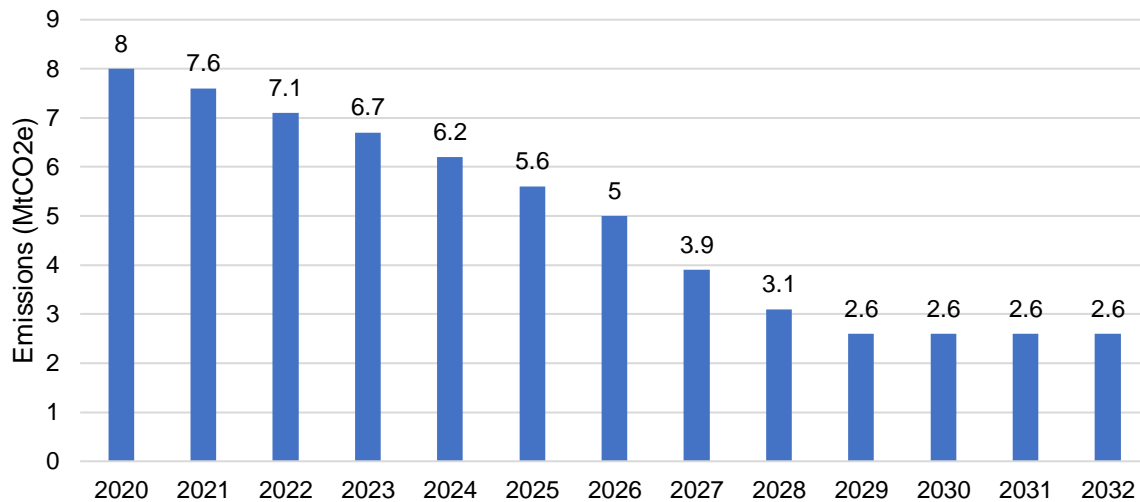
Context

- 4.1 The proposals included in the consultation are intended to reduce the contribution of heating buildings to Scotland's greenhouse gas emissions and help achieve ambitious climate change targets set out in legislation.
- 4.2 The Climate Change (Scotland) Act 2009⁴ ("The 2009 Act") (Section 61) sets out a requirement to prepare and publish a plan for the promotion of renewable heat, including a renewable heat target, and to review the plan at least every two years. A new target is now required in order to comply with the 2009 Act's requirement and the proposals included in the Consultation are intended to contribute to this requirement.
- 4.3 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 ("the 2019 Act")⁵ increases the ambition of Scotland's targets to reduce greenhouse gas emissions, including a target for net zero greenhouse gas emissions by 2045 and interim targets for reductions of 75% and 90% by 2030 and 2040 respectively. The 2019 Act also includes a range of measures to improve transparency – for example basing progress against targets on actual emissions from all sectors of the Scottish economy. There is a continuing requirement for Scottish Ministers to lay regular "Climate Change Plans" in Parliament setting out their proposals and policies for meeting targets.
- 4.4 The provisions in the 2019 Act inform the preparation of a range of Scottish Government strategic documents, including but not limited to, an update to the Climate Change Plan. The Climate Change Plan update sets out the Scottish Government's pathway to our new and ambitious targets set by the Climate Change Act 2019, and is a key strategic document for Scotland's green recovery. It considers the period 2019-2032 and the level of effort that is likely to be required to meet the new 2032 greenhouse gas emissions target of 78%, as set out in the 2019 Act, in addition to taking account of the future of ambition set by the introduction of a net-zero target by 2045.

⁴ Scottish Parliament (2009) Climate Change (Scotland) Act [online] Available at: [Climate Change \(Scotland\) Act 2009 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2009/27/section/61) (accessed 30/03/23)

⁵ Scottish Parliament (2019) Climate Change (Emissions Reduction Targets)(Scotland) Act 2019 [online] Available at: <http://www.legislation.gov.uk/asp/2019/15/enacted> (accessed 30/03/23)

Figure 1. Scotland's Climate Change Plan 2018-2032 (2020 update), Emissions Reduction Pathway for Buildings



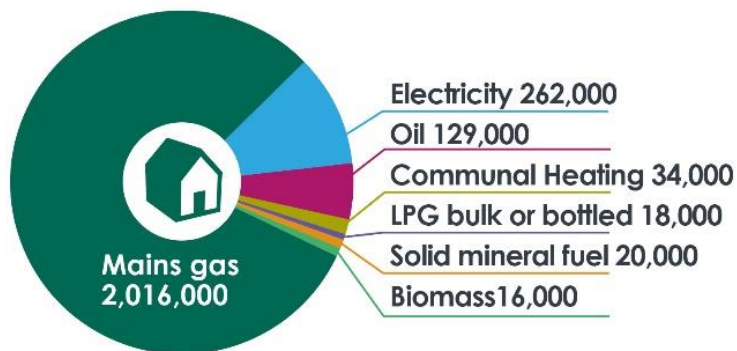
4.5 Sector-level emissions envelopes run to 2032. In order to achieve our economy-wide net-zero target, by 2045 all of our homes and buildings will need to significantly reduced their energy use and use a clean heating system.

Heat supply and emissions across residential housing

4.6 Figure 2 shows that the vast majority of Scottish homes rely on fossil fuel boilers: 81% of Scottish homes use mains gas; 5% use heating oil; and a further 2% use LPG or solid mineral fuels⁶. These fuels are referred to in the consultation, and from here on in this document, as “polluting heating systems”. Together these high carbon fuels account for an estimated 88% of the Scottish residential fuel mix, none of which are compatible with our net zero target.

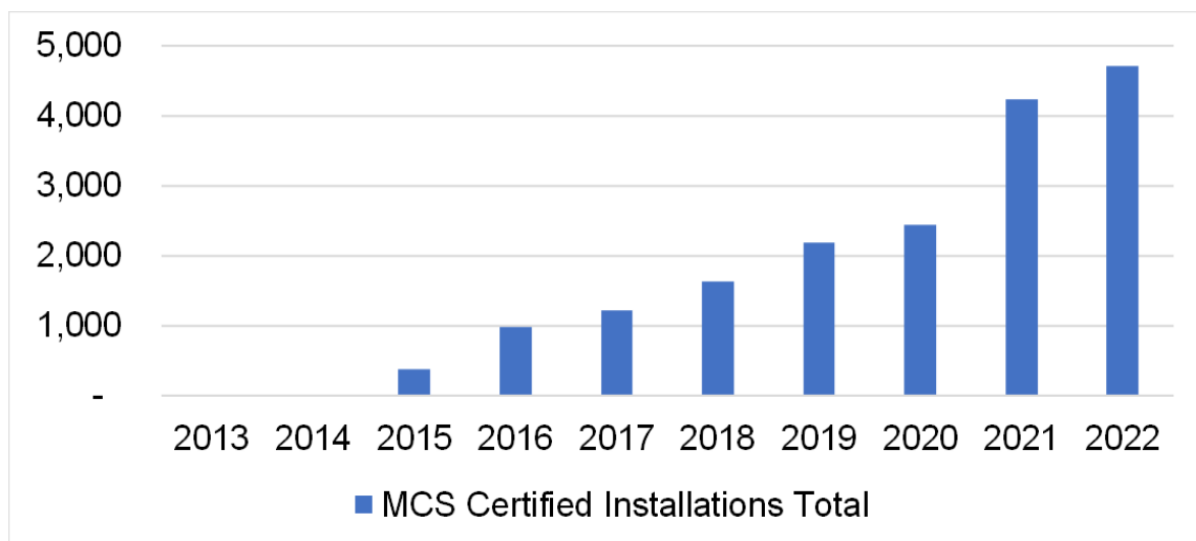
⁶ [Scottish house condition survey: 2019 key findings - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/scottish-house-condition-survey-2019-key-findings/) 2020 Scottish House Condition Survey fieldwork was suspended on March 17th due to the effects of COVID-19 and the restrictions around travel. The 2021 physical survey was carried out by an external-only inspection (carried out only in COVID protection levels 0,1 and 2), supplemented with alternative sources of data and the householder providing information to surveyors via telephone. More details can be found at: <https://www.gov.scot/publications/coronavirus-covid-19-impact-on-scottish-household-survey-and-scottish-house-condition-survey-fieldwork-in-2020-and-2021/>). Results for the SHCS 2020 were published in May 2023, but are not comparable due to methodological differences related to the COVID-19 pandemic. Representative results for the 2021 SHCS are expected to be published in 2024.

Figure 2– Main heating fuel across Scottish housing, 2019



4.7 Only around 11% of households currently have a renewable or very low emissions heating system, such as a heat pump, biomass boiler or electric storage heating⁷.

Fig. 3 Annual certified installations of heat pumps in domestic dwellings in Scotland, 2013-2022



Source: The MCS Data Dashboard - MCS (mcs-certified.com)

4.8 The Energy Saving Trust estimates that over half of non-domestic properties already use low or zero emissions sources, mainly electricity. However, the non-domestic stock varies significantly in size, and some of the largest non-domestic buildings are more likely to have mains gas systems⁸.

4.9 Emissions from buildings have decreased from 10.10 MtCO₂e in 2013 to 9.03 MtCO₂e in 2021, a reduction of around 11%. However emissions across the economy have fallen significantly, particularly in energy supply. As a result, the

⁷ An estimated 34,000 homes are connected to heat networks; however these are predominantly fuelled by gas and not considered renewable/zero emissions.

⁸ Source: Unpublished analysis by the Energy Saving Trust (EST)

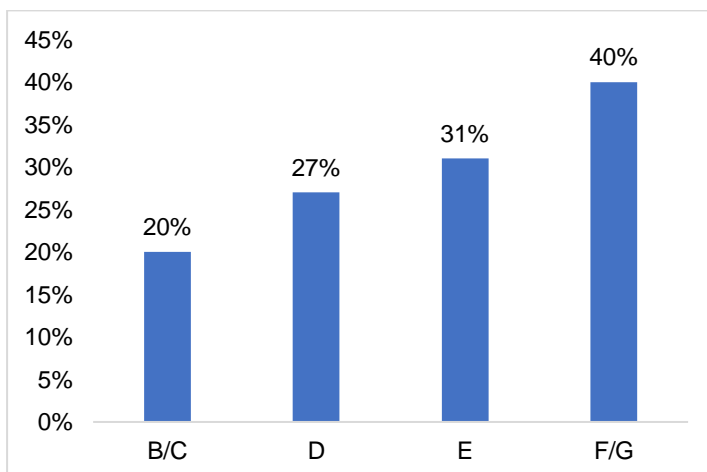
share of total emissions from buildings has increased from 18% in 2013 to 22% in 2021.

Fuel Poverty Targets

4.10 The 2019 Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act (2019)⁹ sets statutory targets for reducing fuel poverty, and introduces a new definition which aligns fuel poverty more closely with relative income poverty. It requires Scottish Ministers to produce a comprehensive strategy to show how they intend to meet the new targets. The 2040 fuel poverty targets require that no more than 5% of households are fuel poor, and that no more than 1% are in extreme fuel poverty by 2040.

4.11 Work to eradicate fuel poverty is linked to the Scottish Government's work to improve housing standards, and this has been considered as part of the 2019 Act¹⁰. A Fuel Poverty Strategy was published in 2021¹¹ which set out policies and proposals for national and local government and third sector partners to help make strong progress towards the established targets.

Figure 4 Fuel Poverty rate in all tenures, broken down by EPC band of dwelling – 2019



Source: Scottish House Condition Survey 2019¹²

⁹ Scottish Parliament (2019), Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act [online] Available at: [Fuel Poverty \(Targets, Definition and Strategy\) \(Scotland\) Act 2019 \(legislation.gov.uk\)](https://www.legislation.gov.uk/ukpga/2019/12/section/1) (accessed 30/03/23)

¹⁰ Scottish Government (2020) Scottish House Condition Survey 2019 [online] Available at: <https://www.gov.scot/publications/scottish-house-condition-survey-2019-key-findings/> (accessed 30/03/23)

¹¹ [Tackling fuel poverty in Scotland: a strategic approach - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/tackling-fuel-poverty-in-scotland-a-strategic-approach-2021-2024/pages/1-1-introduction/)

¹² The data presented is a best estimate based on the new fuel poverty definition as at Stage 2 of the Bill process. The first official measurement of fuel poverty, fully compatible with all elements of the Act, requires additional data to be collected and the production of a new Minimum Income Standard for rural areas, rural small town and island areas. 2020 Scottish House Condition Survey fieldwork was suspended on March 17th due to the effects of COVID-19 and the restrictions around travel. The

4.12 Following the UK Government budget in March 2023, the Scottish Government has estimated that from April to June 2023 there were around 920,000 fuel poor households in Scotland – 37% of all households. This is an increase of 60,000 households from estimates for the winter. The Energy Price Guarantee had set the price cap at £2,500 this winter with the universal £400 Energy Bills Support Scheme (EBSS) providing additional support to households. The £400 EBSS was being withdrawn from April 2023 and is the main driver behind this increase in fuel poverty.

Energy Efficiency and Clean Heating – policy context

4.13 Proposals to regulate energy efficiency and clean heating have been in development for many years. Scottish Ministers designated energy efficiency as a national infrastructure priority in 2015¹³ and made a long-term commitment to reduce the energy demand and decarbonise the heat supply of our residential, services and industrial sectors. 2021's Heat in Buildings Strategy reiterated the role of regulations in delivering these outcomes.

4.14 The Draft Energy Strategy and Just Transition Plan (ESJTP)¹⁴ published for consultation in January 2023, provided an update to the Scottish Energy Strategy position statement which was published in 2021¹⁵. The draft ESJTP set out key ambitions for Scotland's energy future, including the need to transform the way we heat our homes, workplaces, communities and other public buildings.

4.15 The Bute House Agreement¹⁶ also underlined the need to decarbonise how we heat our homes and buildings to meet the net zero pathway. It included a commitment to “phasing out the need to install new or replacement fossil fuel boilers, in off gas [areas] from 2025 and in on gas areas from 2030, subject to technological developments and decisions by the UK Government in reserved areas”.

4.16 This consultation, the publication of which this year was included as a commitment in the Programme for Government 2023, brings together and

2021 physical survey was carried out by an external-only inspection (carried out only in COVID protection levels 0,1 and 2), supplemented with alternative sources of data and the householder providing information to surveyors via telephone. More details can be found at: <https://www.gov.scot/publications/coronavirus-covid-19-impact-on-scottish-household-survey-and-scottish-house-condition-survey-fieldwork-in-2020-and-2021/>). Results for the SHCS 2020 were published in May 2023, but are not comparable due to methodological differences related to the COVID-19 pandemic. Representative results for the 2021 SHCS are expected to be published in 2024.

¹³ Scottish Government (2015), Infrastructure Investment Plan 2015. Available at:

<https://www.gov.scot/publications/infrastructure-investment-plan-2015/> (accessed 30/03/23)

¹⁴ [Supporting documents - Draft Energy Strategy and Just Transition Plan - gov.scot \(www.gov.scot\)](#)

¹⁵ [Energy strategy: position statement - gov.scot \(www.gov.scot\)](#)

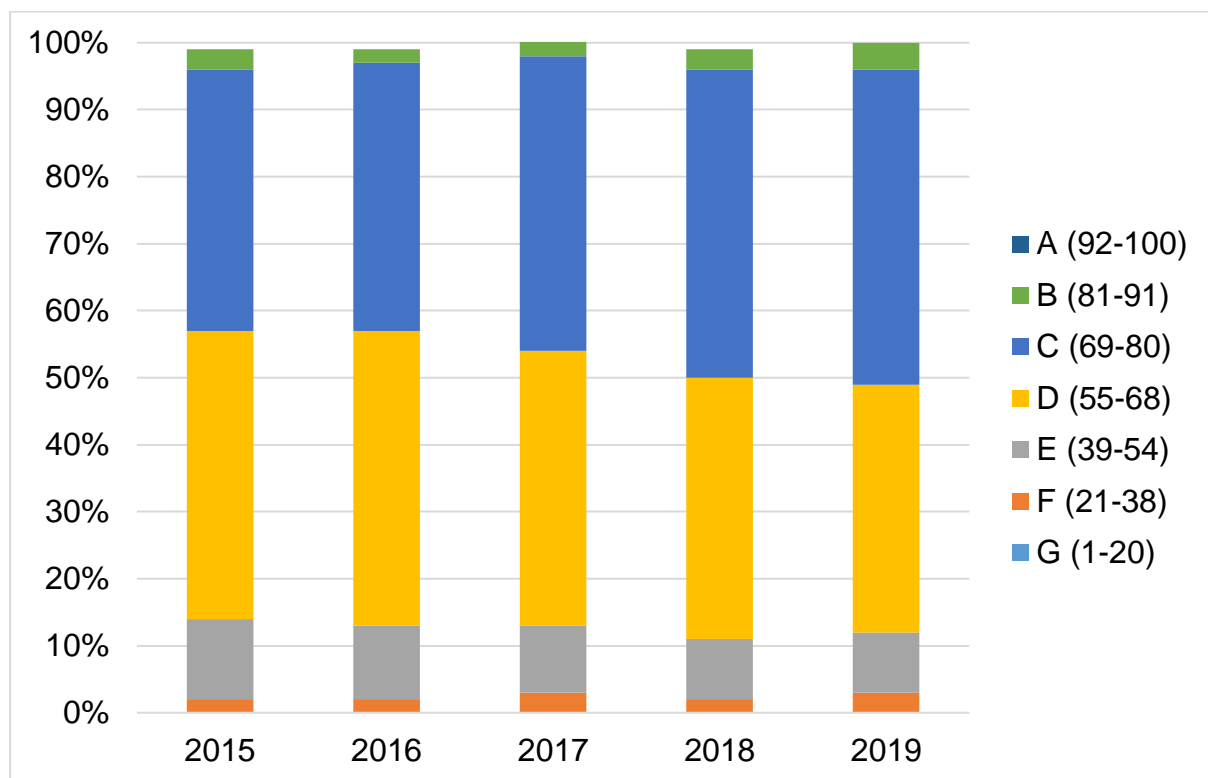
¹⁶ [SG+SGP+Talks+-+Draft+Policy+Programme+-+version+7+-+FINAL+-+OFFSEN.pdf \(www.gov.scot\)](#)

seeks views on proposals which could inform the legislative framework which we believe is required to deliver on these commitments.

Energy efficiency and Zero Direct Emissions Heating – scale of task

The following provides useful context for both the domestic and non-domestic stock in Scotland.

Figure 5 Distribution of the Scottish Housing Stock by EPC Band and SAP score (SAP 2009), 2015 to 2019



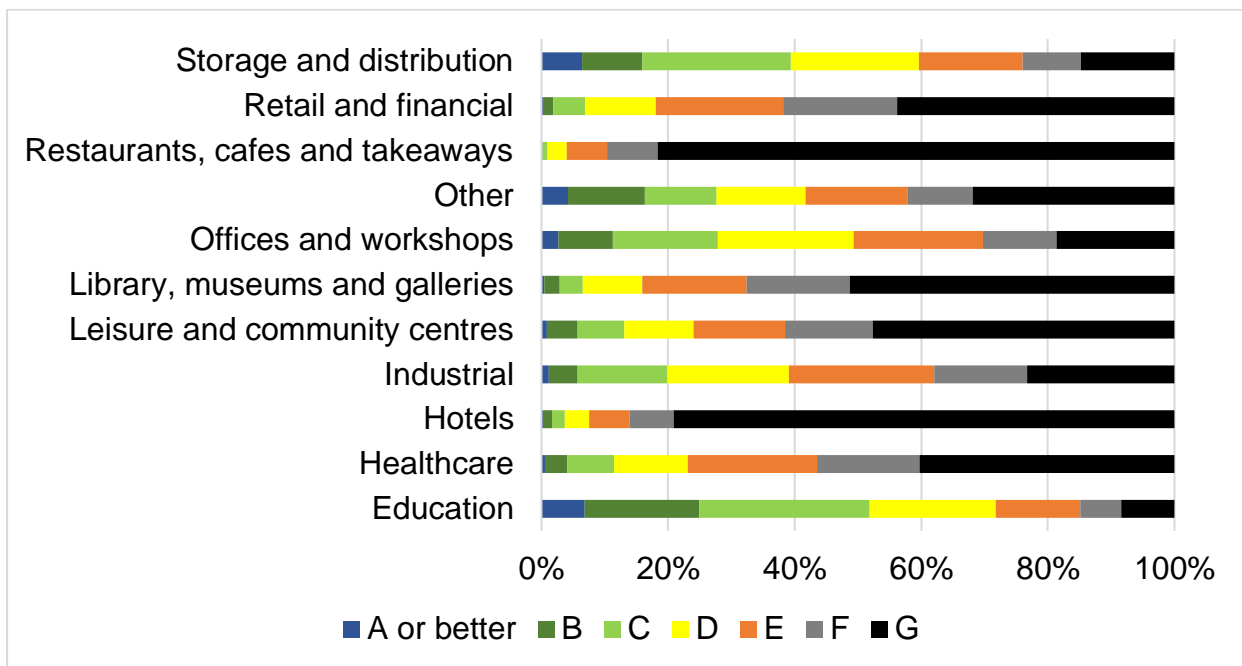
Source: [Scottish House Condition Survey: 2019](#) Table 17.

4.17 Scotland's non-domestic buildings are highly diverse and analysis shows that nearly 70% of all non-domestic premises have an EPC rating of E or worse¹⁷. Only 7% are rated B or better; however, this is a slight increase since 2017, when only 5% of non-domestic buildings were rated B or better¹⁸.

¹⁷ [Data Extracts \(scottishepcregister.org.uk\)](#)

¹⁸ [Scotland's non-domestic energy efficiency baseline: report - gov.scot \(www.gov.scot\)](#)

Figure 6: Non-domestic building types by EPC band, 2022



Source: Scottish EPC Register non-domestic extracts 2022¹⁹

¹⁹ [Data Extracts \(scottishepcregister.org.uk\)](https://www.scottishepcregister.org.uk)

Shaping the Consultation

Strategic Oversight Board

- 5.1 The Scottish Government's Strategic Oversight Board has played an important advisory role in the development of proposals contained in the consultation – helping to develop our thinking and acting as a critical friend.

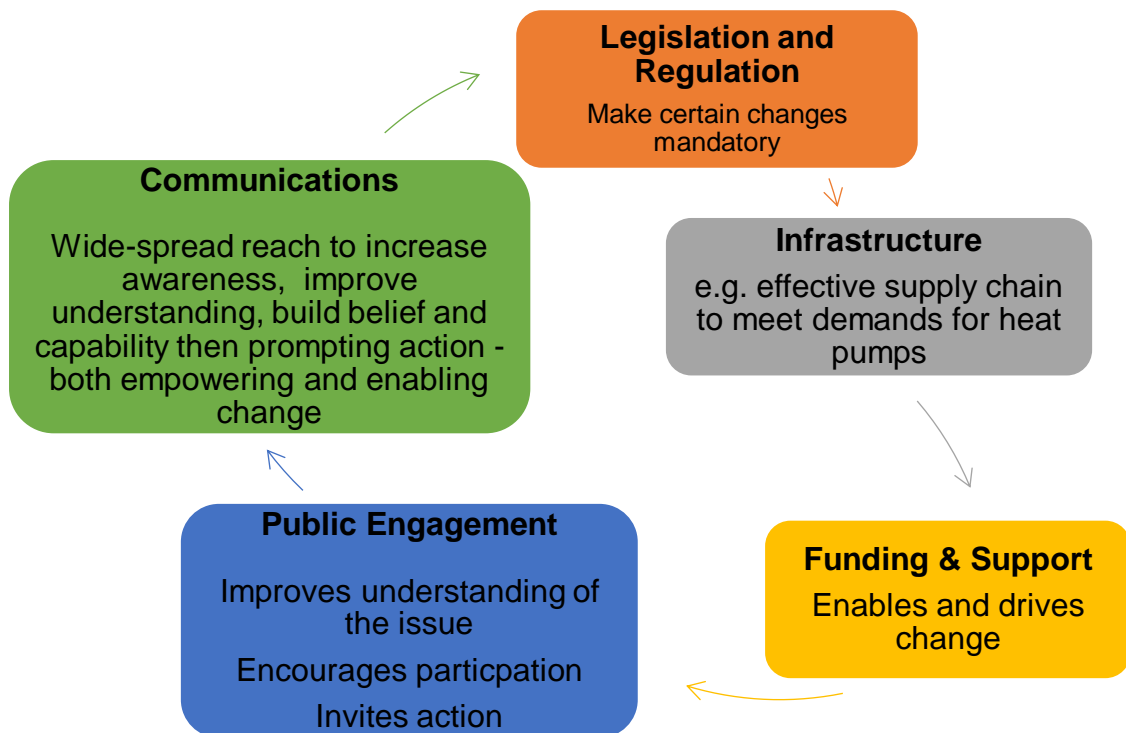
Qualitative Research

- 5.2 We have also commissioned research to explore attitudes of homeowners in Scotland to the regulatory standards proposed to be implemented between 2025-2045. It considered both energy efficiency and clean heating in domestic properties. The research explored participants' views on: (i) the concept of net zero, (ii) three proposed scenarios for introducing new regulations, (iii) the support needed to comply with any new regulations, (iv) the fairest way to introduce these regulations in a phased approach and (v) the different ways in which the public can be made aware of the proposed regulations and home upgrades that will be required to reach the net zero targets.
- 5.3 The findings of this research have helped shape thinking on domestic proposals and has also helped give an informed insight into future work, with the research concluding that there needs to be a large-scale campaign to engage with the public about all required changes and the reasoning behind them. The campaign needs to be widely distributed and must target all aspects of the population; it needs to start with an upfront 'education' piece to help people understand why the changes are required, what net zero means and the impact it will have on people and their properties. The information needs to be distributed as soon as possible, to give people enough time to understand what is going to change and the impact that this will have on them.

Future engagement and consultation

- 5.4 The consultation will spearhead wider work being undertaken this year on a Public Engagement Strategy (PES) for our Heat in Buildings programme. The PES has been undergoing a series of stakeholder engagements since the end of 2022, gathering views and evidence on the challenges involved in this – with that feedback highlighting disjointedness across existing activities as well as uncertainty for consumers as to what the heat transition will mean in practice.
- 5.5 A communications and engagement plan supports the launch and public participation of this consultation. The purpose of the upcoming consultation is to listen to what the people of Scotland (as individuals, communities, groups, organisations and businesses) think should be included in a Heat in Buildings Bill, reflecting key concerns and needs of those who will be affected by any future regulations.

- 5.6 The Scottish Government is determined to manage the decarbonisation of heat in buildings fairly, openly and thoughtfully – with ambition and urgency. However, the current cost of living crisis has a direct impact on the tone and positioning of this issue as well as the receptiveness of people to engage and/or take action.
- 5.7 We know that we need to create the infrastructure and support that will facilitate widescale behaviour change. Communications to widespread audiences can inform, build belief, motivate, prompt and support the action required to achieve the behaviour change needed to help Scotland reach net zero.
- 5.8 Many levers will be needed to support a successful consultation, the subsequent development of the Bill and, ultimately, the societal behaviour change required around heat in buildings to 2045.



5.9 The consultation will include in-person public events, alongside targeted engagement with housing and business stakeholders, local authorities and other key stakeholders. Organising and holding public meetings and discussions will ensure as wide a geographical reach as possible and reduce the chance of excluding those unlikely or unwilling to respond or take part in online discussion.

To include (not exhaustive):

Formal **12 week consultation** using the Scottish Government's **Citizen Space** platform

Focused **stakeholder engagement** (in person & virtual) based on sectoral pillars of the proposal

Broad **comms & messaging** through Scottish Government comms and social media routes

Face to face engagement across Scotland with communities in a bid to reach beyond normal engagement routes (with assistance from voluntary sector and CoSLA)

Ministerial visits and in person engagement events including with the general public during summer tours

Creation of and dissemination of **material to facilitate community groups** to facilitate their own discussions and feed back in an informed way

Direct links to broader Heat in Buildings **public engagement strategy** roll out with associated events, promotion and messaging

5.10 Our consultation will be linked strongly to the Scottish Government's climate change engagement and activity. The consultation's content and proposals will in many ways represent one of the strongest tests to date of wider public awareness and acceptance regarding Scotland's climate change targets and what they will mean in practice.

5.11 Our engagement with business will build on previous consultation with business such as through the non-domestic working group, which included representatives from organisations such as the Federation of Small Businesses and engagement with other organisations representing business, industry and property owners.

Rationale for Government Intervention

6.1 We need to reduce emissions from buildings through a wide-scale transition to clean heating and, where necessary, installation of fabric efficiency measures. This section briefly describes why the presence of market failures means we are unlikely to achieve the scale of decarbonisation at the pace required to meet our climate change targets in the absence of government intervention.

Negative Externalities

6.2 The harmful greenhouse gas emissions resulting from the continued combustion of fossil fuels imposes a wider cost on society, including the cost of climate change adaptation and those associated with natural disasters and biodiversity loss resulting from rising global temperatures. These wider costs are not reflected in the price of carbon intensive fuels such as natural gas and heating oil. Therefore, action is required to align private incentives with societal goals.

Distributional impacts

6.3 The transition to clean heat will require additional investment over and above the current business-as-usual scenario, and will impose additional costs across many groups. How these costs are distributed depends on a range of factors including the energy market framework and energy prices, taxes and subsidies, the technologies deployed, and the technology displaced. Two significant distributional risks arise which require government intervention:

- Impacts on low-income households and particularly those currently in or vulnerable to fuel poverty. The transition will require significant capital costs and may also involve increased running costs, particularly for low income households where a higher proportion of income is typically spent on household energy. Government intervention is necessary to ensure that those unable to pay increased energy costs are not left behind or harmed.
- Access to the benefits of low carbon, smarter technologies – for instance, lowered costs through integrating energy storage or taking part in demand side response may be uneven due to varying ability to pay upfront costs, digital literacy or resilience to risks. Government intervention may be needed to ensure that appropriate access is available.

Imperfect information

6.4 Evidence suggests that a significant proportion of consumers are not aware of the contribution of their existing heating system to climate change²⁰.

20 [Net Zero: A Consumer Perspective - Energy Systems Catapult](#)

- 6.5 Challenges in quantifying the health benefits or reductions in fuel bills following energy efficiency measures or a change in heating system can make it harder to persuade homeowners and landlords to take action even where the private net benefit is positive. Empirical evidence suggests that consumers find it hard to evaluate and take decisions where the costs are imposed up front but the benefits are realised over a longer time horizon.

Immature market for clean heating systems

- 6.6 Early adopters may face limited choice between market participants for clean heating systems due to the current and relatively low annual volumes of such installations. Government interventions, such as regulation, are needed to grow levels of demand for such systems. This will give installers confidence to invest in the equipment and skills necessary to deliver the rollout of clean heat, while also achieving economies of scale and learn-by-doing effects.

Coordinating collaborative efforts

- 6.7 The transition to clean heat sometimes requires coordinated action across building owners, network operators and energy generation/production facilities, which markets in their current form are unable to deliver. The need for coordination is particularly acute in the case of mixed and multi-tenure buildings as well as in the development of heat networks. Certain fabric measures such as cavity and solid wall insulation in multiple occupancy buildings require mutual consent and collective efforts from each household.

Options

Option 1 – Business as Usual (no regulation)

7.1 The continuation of existing Scottish Government programmes including Warmer Homes Scotland, Area Based Schemes, the Low Carbon Infrastructure Transition Programme, CARES, and the Home Energy Scotland loan and cash back mechanism at recent funding levels, alongside UK Government support mechanisms such as the Green Gas Support Scheme. While deployment of clean heating systems is increasing, evidence suggests that this currently extends to around only 10% of Scottish homes.²¹ Meeting our targets means that this figure needs to grow as quickly as possible.

Option 2 – A combination of regulatory, economic and behavioural change initiatives as part of a cohesive strategy (as promoted by the Heat in Buildings Strategy)

7.2 We know that our statutory climate change and net zero targets will not be met unless we decarbonise the systems used to heat our homes, businesses and other buildings. Over two million Scottish homes use polluting heating systems, as do almost half of our non-domestic buildings. They will **all** need to transition to clean heat by 2045 if Scotland is to reach net zero.

7.3 We also know that relying on a business as usual approach of incentivising and funding particular sectors is not achieving the rate of change needed. Option 2 relies on a cohesive package of actions, one of which includes the introduction of regulations to drive change. This package includes the use of non-regulatory measures to boost public engagement and enhance support for households, the public sector and businesses through consumer advice and advocacy and a range of financial and funding mechanisms. It also targets supply chain and skills development to support the transition and maximise economic opportunities.

7.4 The consultation proposes the following approaches to clean heat and energy efficiency:

- properties would be required to install clean heating systems when they are purchased, with a grace period from the date of purchase. We ask in the consultation document a question on the length of this grace period, between 2 and 5 years.
- PRS dwellings would be required to install energy efficiency measures to meet EPC C equivalent by 2028.

²¹ [Scottish house condition survey: 2019 key findings - gov.scot \(www.gov.scot\)](https://www.gov.scot/resources/documents/2019/04/Scottish-house-condition-survey-2019-key-findings)

- Owner occupied dwellings would be required to install energy efficiency measures to meet EPC C equivalent by 2033.

7.5 This regulatory approach, based on powers to be introduced under the proposed Heat in Buildings Bill, will provide certainty to the market and supply chain, and a strong signal to home and building owners across Scotland.

7.6 It will sit within the following broader package:

- Use of Local Heat and Energy Efficiency Strategies, to provide an area-based long-term framework for planning, delivery, coordination (e.g. with network investment) and potentially triggering regulation.
- Scottish Government support of £1.8 billion available during the current parliamentary session, evolving and expanding existing delivery mechanism to reflect focus on Heat in Buildings and our four key priorities: (1) supporting those least able to pay, (2) investing in strategic technologies in low- and no-regrets areas, (3) showcasing Net Zero leadership and (4) innovation and demonstration.
- A public engagement strategy and action plan to enable people to participate in shaping the decisions that affect them, and support to enable communities across Scotland to play a role in the developing heat transition. This is planned for publication by the end of 2023.
- Progressing the outline business case to establish a National Public Energy Agency. As a first step we launched the Agency in virtual form – known as Heat and Energy Efficiency Scotland (HEES) - this operates in house within Scottish Government and comprises the Heat in Buildings Delivery Division within the Directorate of Energy and Climate Change
- Working towards a long-term market framework, including development of new finance mechanisms and work to align financial incentives around clean heating choices.
- Working with the supply chain to ensure skills and supply chains are adequate to deliver the transformation needed, maximising the economic benefits to Scotland by building local supply chains, maximising local job creation, and ensuring a just transition.
- Working with network companies, Ofgem and UK Government to ensure that the wider energy system is able to supply the energy needed for heating buildings in Scotland through the transition.
- Working more broadly with the UK Government to ensure coherence across reserved and devolved areas, including regulations, investment and market mechanisms, customer protection, product standards, taxes, levies, data access and GB wide schemes.

Sectors and groups affected

- 8.1 Transforming the way we heat our homes and buildings will touch the lives of almost everyone in Scotland.
- 8.2 The following sectors and groups will be affected by the proposals.

Domestic owners (private rented sector and owner occupier) – impact as a result of energy efficiency proposals

- 8.3 Providing space and hot water heating to homes and non-domestic buildings²² accounts for around 20% of Scotland’s total greenhouse gas emissions (the third-largest cause of emissions across the economy).
- 8.4 Emissions from buildings can be partially reduced by installing energy efficiency measures²³. This also reduces energy demand, and therefore bills, while improving comfort by making homes better insulated and warmer. Therefore, improving energy efficiency can also make a very helpful contribution to mitigating the cost-of-living and cost-of-doing-business crises.
- 8.5 It is proposed that private rented sector dwellings are required to meet the minimum energy efficiency standard by 2028 – five years earlier than owner occupiers. This quicker timeline reflects the fact that homes in the PRS sector are more likely to be in the lowest bands for energy efficiency (10% of PRS homes are EPC F or G compared to 5% of owner-occupied homes (SHCS 2019)) and that tenants have limited rights to make improvements to their homes to improve energy efficiency and make them more affordable to heat. As tenants generally pay energy bills but do have powers to undertake works to reduce running costs, homes in the PRS sector will be required to meet the energy efficiency standard irrespective of whether they have installed a clean heating system, potentially saving tenants money on their bills and reducing fuel poverty.
- 8.6 While the consultation proposes that a minimum energy efficiency standard should be required in all owner-occupied homes by 2033, this will not apply to those who have by then installed a clean heating system. This means that those who have removed heat-related emissions as a result of their heating system will not incur costs on energy efficiency measures. However, for many homeowners who install clean heating systems before 2033 it is likely that they will voluntarily install energy efficiency measures to improve their heating system’s efficiency and to lower the system’s likely running costs in turn.

²² Not including emissions arising from process energy use in Energy Intensive Industries, which are accounted for in the Industrial sector in the Climate Change Plan.

²³ Such as floor, loft or wall insulation.

Building owners and occupants (including households, businesses, and public bodies) – impact of clean heat proposals

- 8.7 Focusing on energy efficiency measures alone would not be sufficient to deliver the contribution that we estimate would be required from the Buildings sector to help meet the wider emissions reduction target under our Climate Change Act. Moreover, the cost per ton of carbon removed via energy efficiency measures is much higher than via changing the heating. Emissions are only fully removed when buildings switch from direct emissions heating systems²⁴ to zero direct emissions heating systems²⁵. Our consultation refers to these respectively as “polluting” and “clean” heating systems.
- 8.8 Around 2,200,000 (88%) Scottish homes use polluting heat, as do around 40% (c. 110,000) of our non-domestic buildings²⁶. They will all need to transition to clean heat by 2045 if Scotland is to reach net-zero.
- 8.9 Upgrading energy efficiency and switching to clean heating systems will have widespread impacts, though the scale and nature of these impacts will vary across different buildings and different heating options. Fabric and heating system upgrades will often be disruptive. Disruption may arise from insulation, installation or reconfiguration of an internal distribution and radiator system, ventilation, and replacement of heating, cooling and cooking appliances. In instances where this is required, new or upgraded connection to network infrastructure may also require excavation of outdoor space and streets. The extent of disruption will vary from case to case.
- 8.10 The consultation on proposals for a Bill recognises that over two million Scottish homes use polluting heating systems, as do almost half of our non-domestic buildings. They will **all** need to transition to clean heating systems by 2045 if Scotland is to reach net zero, and are likely to undergo differing degrees of disruption, which will vary in cost.

Small-to-Medium Enterprises

- 8.11 Small-to-medium enterprises (SME) are likely to experience varying impacts as a result of these regulations. As demand for clean heat and energy efficiency measures is likely to increase, many small businesses will see an increase in business. Research by NESTA²⁷ indicates that heat pump installing businesses

²⁴ Heating systems which emit greenhouse gases, within the curtilage of the building, when in use – e.g. gas, oil and LPG boilers – and also those using bioenergy.

²⁵ Heating systems which do not emit greenhouse gases, within the curtilage of the building, when in use – e.g. heat pumps, heat networks fuelled by zero carbon energy, or direct electric heating.

²⁶ There are limited data on non-domestic buildings and this figure is extrapolated from non-domestic EPCs which are only available for 17% of the stock. As these EPCs are not necessarily representative, and as non-domestic buildings vary in size and energy demand, this is only a rough indication.

²⁷ [How to scale a highly skilled heat pump industry | Nesta](#)

"tend to be small", suggesting that an increase in demand for heat pumps could lead to increased economic activity among SMEs.

8.12 SMEs also appear to show a higher rate of uptake of energy efficiency measures than businesses as a whole. In 2021, 22% of SME employers in cohort A in Scotland had installed some kind of energy efficiency measures in the prior year, and 7% had installed a low carbon heating system. However, 82% of SMEs reported no plans to install clean heating or energy efficiency measures in the next 12 months.²⁸

8.13 Initial internal research suggests that SMEs (ie those below 100m²) are more likely than large businesses to already use clean heating. Scottish Government will engage with SMEs and carry out further research to develop the understanding of how regulations will impact SMEs in Scotland.

Supply chain business

8.14 In 2021, the low carbon and renewable heat and energy efficiency sectors in Scotland generated an annual turnover of around £7.5 billion, with full time equivalent employment of around 22,200. Of these, low carbon heat is estimated to employ around 1,500 people, and energy efficient products around 7,200 people²⁹. As uptake of energy efficiency and clean heating systems increases, these figures are expected to increase.

8.15 To meet the increased demand for clean heating, and to ensure that workers can benefit from new employment opportunities, we will need to grow the skills base in Scotland across the following a number of areas including:

- Building assessment
- Manufacture and installation of energy efficiency measures
- Manufacture, installation and servicing of heat pumps
- Design, installation, operation and servicing of heat networks
- Ancillary services including smart heating controls, support services, innovation and financing
- Delivery, conversion, maintenance and servicing of hydrogen ready boilers, if this becomes a relevant technology in the next decade.

8.16 The proposals included in the consultation do not discuss the impact on supply chains in detail as this is contained within the Strategy. The Strategy commits to building local supply chains, maximising local job creation, and ensuring a just transition. Our Heat in Buildings Supply Chains Delivery Plan³⁰, published

²⁸ [Small Business Survey Scotland: 2021 - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/small-business-survey-scotland-2021/pages/10-12.aspx)

²⁹ [Low carbon and renewable energy economy estimates - Office for National Statistics \(ons.gov.uk\)](https://www.ons.gov.uk/economy/green-economy/low-carbon-and-renewable-energy-economy-estimates)

³⁰ [Towards an Industry for Green Heat: heat in buildings supply chains delivery plan - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/heat-in-buildings-supply-chains-delivery-plan/pages/1-3.aspx)

in November 2022, sets out the practical steps that we are taking to support the growth of the clean heating sector.

8.17 The Supply Chains Delivery Plan provides an overview of Scotland's heating and building improvement sector, background to the challenges and opportunities of developing the supply chain and sets out how the supply chain will need to grow and change to meet future demand driven by our proposed regulation of heating and energy efficiency. It outlines our commitment to work in partnership with the sector to overcome supply chain constraints and fill the skills gap.

8.18 We are exploring the potential for a new supplier-led funding scheme to be delivered in Scotland, which will help sharpen the impact of our financial stimulus, drive supply chain development through economies of scale and also provide a vehicle to drive up quality standards alongside fair work, diversity and equality objectives.

All non-domestic properties

8.19 For non-domestic properties, just over half are thought to already comply with the proposed new standard. Of the £33 billion quoted above, around £6 billion is estimated to relate to the decarbonisation of the remaining roughly 50% of the non-domestic stock which continue to use polluting heating. However, as outlined further in section 9.30, there is significant heterogeneity present in the non-domestic stock which limits the accurate prediction of capital costs. Therefore, estimates relating to non-domestic properties remain under review and should be treated as indicative only.

8.20 For commercial properties, those purchasing such properties in Scotland are likely to face increased costs compared to England and Wales. This may make it less attractive to invest in Scotland. However, phasing in these regulations (or providing additional time to inward investors) could reduce this impact. We will gather more information on this as the consultation progresses, and use this to inform the final BRIA.

Local authorities

8.21 Local authorities will be affected in various ways beyond their role as building owners/occupants.

- Potential role in enforcement of regulations: As we develop our regulatory framework through the Heat in Buildings Bill, we will work with local government to identify where responsibility for enforcing standards should lie.
- More widely we continue to work with local authorities and COSLA on progressing LHEES. We are committed to supporting local authorities to deliver these, including through resource provision.

- While the proposals in this consultation do not impact social housing, there remains a role for local authorities in supporting deployment, including building on our Area Based Schemes.

8.22 Local authorities will have a role to play as we develop our approach to heat network support, which will facilitate local authorities achieve their own fuel poverty and net zero ambitions.

Private Sector Landlords and Tenants

8.23 The proposals would require that homes in the private rented sector meet a minimum energy efficiency standard by the earlier date of 2028. This quicker timeline reflects the fact that homes in the PRS sector are more likely to be in the lowest bands for energy efficiency (10% of PRS homes are EPC F or G compared to 5% of owner-occupied homes (SHCS 2019)) and that tenants have limited rights to make improvements to their homes to improve energy efficiency and make them more affordable to heat. As tenants generally pay energy bills but do have powers to undertake works to reduce running costs, homes in the PRS sector will be required to meet the energy efficiency standard irrespective of whether they have installed a clean heating system, potentially saving tenants money on their bills and reducing fuel poverty.

8.24 Scottish Government will build on existing small-scale qualitative research around the impact of regulations on PRS landlords to better understand how the sector will be affected.

Property Market

8.25 As the consultation proposes that those purchasing a home will be required to transition their new property to a clean heating system within a specified grace period, and sets backstop dates for homes to meet both the energy efficiency and clean heat elements of the standard, we are aware this may have various impacts on the housing market, including impacting the value of homes which do not comply with regulations. The consultation makes clear that homes will not be banned from being sold should they not meet the Standard.

8.26 We have commissioned a project with Climate Exchange to investigate any potential housing market impacts of introducing heat and energy efficiency regulations. This work will include investigation of the impacts on: the PRS market of being required to meet the minimum energy efficiency standard in 2028, ahead of the 2033 backstop date for the rest of the privately owned housing stock; house prices; number of homes let; rental prices; length of time homes are on the market; and the geographical distribution of homes sold and let.

8.27 In the near term for those impacted by the property purchase trigger, most buyers are already considering large sums of money, with many using financial products like mortgages and having their ability to make repayments

considered independently by banks. Continued development of the green mortgage market means that the private finance market can play a key role in supporting the transition through this route.

Cost impacts for all

- 8.28 The regulations and requirements which will flow from our proposed Heat in Buildings Bill, and which homeowners, landlords, businesses and other organisations may need to meet, will involve considerable costs. Our Heat in Buildings Strategy put total costs for property level retrofit for both domestic and non-domestic buildings, including energy efficiency and clean heat, at an estimated £33 billion by 2045, with investment to meet the interim 2030 emissions target estimated at £14 -16 billion (for residential buildings). This cost does not include the cost of energy network upgrades and reinforcement or the costs of the extra energy generation required – these costs are additional.
- 8.29 Our initial internal analysis has produced an estimated cost for individual homeowners of circa £14,000 to meet the proposed Standard – although this is an average figure, and will vary considerably depending on the size, condition and other circumstances of each building. Of the £33 billion quoted above, around £27 billion is estimated to relate to decarbonisation and improving energy efficiency of domestic dwellings.
- 8.30 The cost faced by building owners in upgrading energy efficiency and installing clean heat will depend on how measures are funded and financed. In the near term financial support is available under GB-wide and Scotland-specific programmes. The Scottish Government has committed to making available £1.8 billion in heat and energy efficiency programmes over the current parliament, building upon, expanding and improving existing programmes. In the near future we will review current programmes to ensure best value, which could include a shift from the current universal programme of grants towards a means-based provision. We will also consider the eligibility criteria to ensure those most in need get the help they need.
- 8.31 We will continue to focus our spend on those most in need, through existing funded programmes such as Warmer Homes Scotland.
- 8.32 Work is required to identify future funding packages past 2026 to set out the choices as to the levels of financial support provided by the Scottish Government as compared to individuals in the future, how this could be funded, how this can be targeted appropriately and the implications that this has for the Scottish budget and our commitment to ensure a just transition.
- 8.33 The priorities identified above will directly support building owners manage upfront costs, supporting those least able to pay, and expand our domestic energy efficiency programme to support more households eliminate poor energy efficiency as a driver of fuel poverty. A number of financing options already exist which could help property owners cover the upfront cost of retrofit,

including green mortgages, home improvement loans and equity release products. These financing options can be combined with varying levels of governments grants and loans.

- 8.34 The Scottish Government has also considered further the need to provide funding to meet the requirements of the energy efficiency standard. Initial analysis which looked at a selection of data drawn from across Dumfries and Galloway, Fife and Orkney estimated an average cost of meeting the list of measures (suggested in our consultation as comprising evidence that the new energy efficiency standard has been met) of £2,500³¹. Including underfloor insulation, 75% of dwellings are expected to need to spend £3,500 or less. Excluding underfloor insulation, 75% are expected to spend £1,200 or less.
- 8.35 The Scottish Government has also established a Green Heat Finance Taskforce to mobilise and work in collaboration with the private sector to leverage investment beyond that provided by the public sector. The interim report from this work will be published before the end of 2023. In considering the impact of these proposals we have drawn on the work of this task force, together with ongoing work with Scottish Futures Trust, and discussions with Scottish National Investment Bank, and engagement with the First Minister's Investor Panel.
- 8.36 The impact of changing heating systems on running costs in the medium- to long-term will be influenced by tariffs available in the energy market. The present differential in cost between gas and electricity and the situation where gas costs are setting the marginal price of electricity remains politically unsustainable; although the UK Government has committed to rebalancing electricity and gas costs, this may still be quite some time from happening. Until it does, the higher running costs of electric clean heating systems will raise concerns that the proposals in this consultation could have a significant impact on energy bills for anyone currently using gas for any form of heating.

³¹ This estimate drew on existing data (from PEAT – the Portfolio Energy Assessment Tool) and involved a sample of 1,345 homes across these areas; the estimate of £2,500 **includes** the installation of suspended floor insulation, where that is an option. **Without** that measure, the total estimated cost falls to £600.

Costs and Benefits

9.1 This section provides a qualitative assessment of the use of a cohesive strategy based on a combination of regulatory, economic and behavioural change initiatives (option 2) as compared with BAU (option 1). Given the proposed option comprises a comprehensive policy package, covering both regulatory and non-regulatory action most of which is in the early stages of development, it is not possible to provide a detailed appraisal of the costs and benefits at this stage. The focus here is on the role of non-regulatory actions providing mitigation to the impacts of the regulatory actions.

Qualitative Assessment

9.2 The following provides a brief qualitative assessment of the two options against relevant criteria arising from the policy objectives and outcomes presented above.

Climate change mitigation

9.3 Option 1 (do nothing) will not achieve the levels of deployment of energy efficiency or zero emissions heat required to achieve emissions reductions for the Buildings sector and thus wider Climate Change objectives. This is due to a combination of supply and demand constraints, including a lack of public engagement, misaligned incentives, underdeveloped supply chains and skills gaps which taken together suggest the continued deployment of zero emissions heat will be limited and an ongoing reliance on fossil fuelled heating systems. Through a coordinated approach, including regulatory and non-regulatory action, Option 2 provides a framework to drive up the deployment and ensure the building sector begins to make a contribution to overall emissions targets, giving a clear direction of travel, including dates, to the supply chain.

Fuel poverty reduction

9.4 The Heat in Buildings Strategy recognises reaching emissions reduction and fuel poverty targets simultaneously is challenging, but we are committed to ensuring we decarbonise in a manner that does not increase the rate or depth of fuel poverty. We know that zero emissions heat can be more expensive to run than a modern efficient fossil fuel boiler and we remain committed to taking forward no action that could have a detrimental impact on fuel poverty rates, unless additional mitigating measures can also be put in place.

9.5 Scottish Government investment is underway and will provide direct mitigation through existing programmes including Warmer Homes Scotland, our flagship fuel poverty scheme, Home Energy Scotland and the Social Housing Net Zero Heat Fund. For domestic properties, Scottish Government currently fund 100% of the clean heating system and the related energy efficiency works for those in fuel poverty, and offers a grant of up to £7,500 for installation of a heat pump

for other owner occupiers along with up to £7,500 loan for energy efficiency works.

Economy

- 9.6 Analysis suggests the heat transition, through investment in the deployment of energy efficiency and zero emissions heat, could significantly benefit the Scottish economy through employment opportunities. Under Option 1, without further action investment and deployment will remain marginal and the extent of the economic benefits outlined will not be realised.
- 9.7 In contrast, Option 2, through coordinated regulation and non-regulatory support schemes, will provide certainty to the market and drive deployment, securing and maximising economic opportunities. By promoting innovation and skills development, not only will the combined approach of regulation and incentives and support provide high quality jobs, it may also position Scotland to take advantage of export opportunities.
- 9.8 It is important to note, however, the potential for displacement such that the level of positive net impact on jobs may be more limited, and that while certain sectors are likely to benefit from the transition (energy efficiency, and low and zero emission fuels and technologies), others may see a reduction in their market (high carbon fuels and technologies). However, existing firms may be able to switch from supply associated with fossil fuel to zero emissions, and policy development will seek to ensure barriers to entry are minimised.
- 9.9 We are committed to building local supply chains, maximising local job creation, and ensuring a just transition. We will work with Scottish businesses so that they can play a significant part in the transformation of Scotland's homes and buildings, and work with industry bodies to enable existing gas and oil boiler installers to offer expert knowledge on alternative systems.

Deliverability and quality

- 9.10 Without additional direct government intervention and the certainty and clarity provided by proposed regulation, it is unlikely that the clean heat sector will have sufficient incentives to invest in developing supply chains and upskilling their workforce to match the deployment levels required to meet emissions reduction objectives, which are far higher than current rates. This could lead to lower standards, with poor performance resulting from misspecification, particularly in the case of heritage or other hard-to-treat buildings where a specialised skillset may be required. Therefore, Option 1 poses risks in terms of deliverability and quality, which are addressed specifically under Option 2 which relies on broad engagement with the UK Government, skills delivery partners and the supply chain to ensure the necessary skills, quality assurance, accreditation and standards are in place to support deployment and drive high standards necessary to deliver the changes brought about through the setting of regulated standards.

Affordability and value for money

- 9.11 The upfront cost of installing a clean heating system is often significantly higher than replacing incumbent polluting boilers, and as noted above, may lead to increased fuel bills. Therefore, there are affordability concerns associated with the mass deployment of clean heating systems. However, steps can be taken to ensure affordability and value for money. As the clean heat market is relatively immature, there may be opportunities for economies of scale as demand increases and businesses can increase the efficiency of their production processes, leading to lower costs for consumers.
- 9.12 Under Option 1, without kick-starting deployment at scale, it is unlikely that these efficiencies will be realised. There may also be increased running costs associated with misspecification where skills and standards are not in place, or where energy efficiency and clean heat are not considered in tandem, potentially leading to suboptimal outcomes.
- 9.13 Option 2, by taking a holistic view to energy efficiency and clean heat, whilst targeting skills and embedding standards, is more likely to lead to cost-effective outcomes for households and businesses. Furthermore we have established a Green Heat Finance Taskforce which is exploring potential new and value for money innovative financing mechanisms for both at-scale and individual level investment. Our holistic approach to heat in buildings reflects our broader commitment to taking a whole system view, and will support identification of least cost options and coordination efficiencies.
- 9.14 The heat transition will necessarily require significant investment, and by putting in place both regulatory and non-regulatory support, there is increased likelihood of attracting private sector investment, while putting in place mechanisms to support those less able to pay. Taking a holistic and strategic approach allows an accurate assessment of how costs will be recovered to ensure these, alongside benefits, are distributed fairly.

Population and human health

- 9.15 Option 1 will not deliver significant changes to health outcomes. Option 2, through the deployment of energy efficiency, may provide health benefits through improvements to thermal comfort and in particular prevent fuel poverty worsening. Furthermore, switching away from polluting heating systems may have additional benefits in terms of reducing pollution and improving air quality. The impact on the population and human health will be considered further.

Quantitative Assessment

- 9.16 As policies are not yet fully developed and the proposals are now the subject of consultation, this section provides necessarily high level estimates. All figures should be treated as indicative and viewed in the light of current uncertainties around key aspects of the transition.

- 9.17 The changes to our buildings and systems that are needed to eliminate emissions from heating comprise both capital investment and ongoing costs. Different pathways and options have different balances as to where these costs arise.
- 9.18 How heat consumers are exposed to these costs, e.g. whether through bills, upfront costs, or taxes, depends on policy choices, energy market frameworks and new business models (such as heat-as-a-service). This diversity in potential outcomes further underscores the rationale for this impact assessment to take a broad qualitative approach, with quantitative assessment deferred to more specific policy development.
- 9.19 The total gross capital cost of converting buildings stock to clean heat, including energy efficiency upgrades, has been estimated in the region of £33 billion, with additional investment required to upgrade energy networks and ensure sufficient energy generation capacity. This is an estimate of the gross cost and does not take account of investment in fabric measures and boiler replacements in a business-as-usual scenario. For example, it would cost around £5 billion to replace existing fossil fuel heating systems in the domestic sector on a like-for-like basis. This figure is under review.
- 9.20 We also anticipate that, under the current market framework and electricity pricing structure, clean heat could result in increased running costs for some, however this may be partly or fully offset by the higher efficiency of some clean heating systems, demand reduction through improved energy efficiency and targeted support where appropriate.
- 9.21 In recent years, several key factors have shown high level of variation, resulting in uncertainty around the impact of the transition to clean heating:
- Fluctuations in energy prices have resulted in, on average, significantly higher fuel bills for most households, and therefore more households facing fuel poverty.
 - Associated with this, inflation in the UK has been highly variable. While not consistent across all goods and services, this is likely to result in higher nominal costs of the conversion.
 - The rate of clean heating installation has increased significantly since 2015. While this reduces the total number of buildings to move to clean heating, without regulation, the increased rate is still not sufficient to meet climate targets.
 - Living and working patterns have changed during and since the COVID-19 pandemic, with many more people working from home. As a result, the average energy intensity of a home in Scotland has increased on previous years³².

³² [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io)

9.22 While cost projections are subject to considerable uncertainty, the finding that low and zero emissions heating is likely to add whole-system lifecycle costs relative to the incumbent system is robust, reflecting a wider range of estimates.³³

Residential buildings: Upfront building-level costs

9.23 Heat pumps and heat networks can be deployed in many areas and buildings as no- or low-regrets interventions to reduce direct emissions from buildings. The capital cost of a heat pump alone is estimated at under £7,000; however, there are additional costs associated with decommissioning and water/thermal storage, which on average cost an additional £2,000. Many Scottish homes will also need energy efficiency upgrades if heat pumps are to run as efficiently as possible, which are estimated at an average of around £4,500. Therefore, the average total estimated cost to convert a home to highly efficient ZDEH is estimated at around £14,000³⁴.

9.24 More recent research has estimated the potential costs of upgrading the Scottish housing stock to adequate levels of energy efficiency. These estimates vary based on the approach taken, with some homes likely needing very high levels of intervention to achieve energy efficiency sufficient to support the efficient running of a heat pump. On average however, these estimates are broadly in line with the CCC estimates above³⁵.

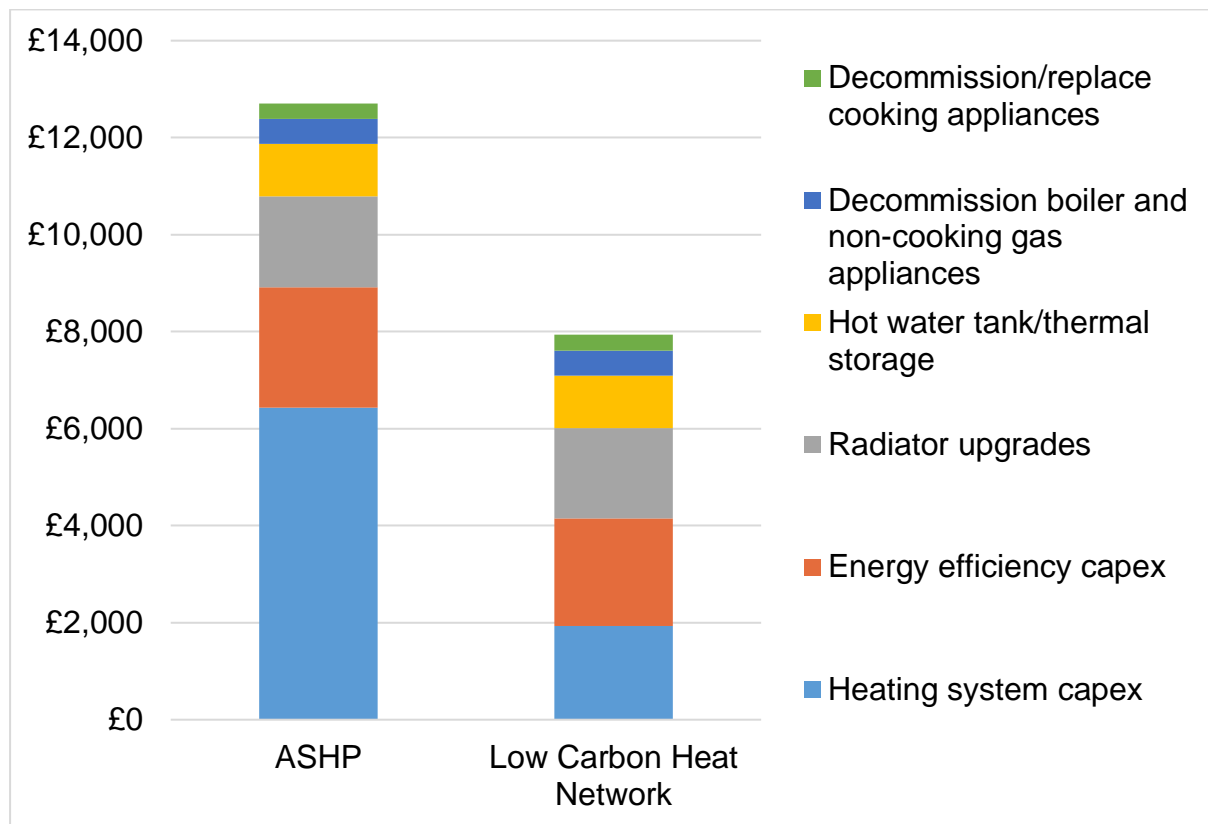
9.25 By comparison, replacing a fossil fuel boiler (without fabric upgrades) costs in the region of £2,000 to £3,000.

³³ Energy Research Partnership 2017 “Transition to Low Carbon Heat“ <https://erpuk.org/project/low-carbon-heat/>

³⁴ Development of trajectories for residential heat decarbonisation to inform the Sixth Carbon Budget (Element Energy) - Climate Change Committee (theccc.org.uk), with adjustments to estimate the impact of inflation.

³⁵ Unpublished research from Element Energy (2023) suggests that around 15% of homes do not need energy efficiency upgrades currently, 40% of homes would need to install energy upgrades at a cost of less than £2,000, and a further 25% would need to install energy upgrades at a cost of £6,000 - £14,000. Research from BRE (2023, [Scottish Energy Performance Certificates - new metrics: research - gov.scot \(www.gov.scot\)](https://www.gov.scot/research/scottish-energy-performance-certificates-new-metrics-research)) suggests that by installing insulation in lofts, flat roofs, cavity or solid walls, floors and hot water cylinders, as well as installing thermostats, solar water heating and double glazing, nearly 90% of homes would be reach the required level of energy efficiency.

Figure 7: UK-average capital costs to convert from fossil fuel boiler to zero emissions heating (2020 estimate).



Source: Element Energy (2020) “Development of trajectories for residential heat decarbonisation to inform the Sixth Carbon Budget” study for the Committee on Climate Change.³⁶

Residential Buildings: Operating costs

9.26 The impact on energy bills of converting a home from fossil fuel heating to a zero emissions system depends on property characteristics such as build form, occupancy levels, and fabric efficiency. The retail cost of energy is also an important factor. Environmental and social obligation costs (levies) play a significant role in the relative costs of different options. The development of UK Government policy in this area, along with future evolution of wholesale and other system prices, means forecasting future relative operating costs is challenging. Therefore, this section considers the impact on fuel bills of adopting strategic zero emissions heat technologies according to existing evidence, but it should be noted that recent fluctuations in energy costs are likely to have a significant impact on these findings.

³⁶ <https://www.theccc.org.uk/publication/development-of-trajectories-for-residential-heat-decarbonisation-to-inform-the-sixth-carbon-budget-element-energy/>

- 9.27 Heat pumps are a key zero emissions technology, and a very efficient way of using electricity to provide heat. Although one kWh of electricity is currently more expensive than one kWh of gas (currently by a factor of about 3), the median energy efficiency of an Air Source Heat Pump (ASHP) is nearly 250%, meaning that the energy demand is significantly lower. This means that for some properties, heat pumps can help reduce bills where they are replacing older, more inefficient oil and gas heating systems, or where they are combined with upgrades to the efficiency of the building's fabric. Modelling undertaken using the National Household Model shows that for the vast majority of Scottish dwellings using fossil fuels and which are below the equivalent of an EPC C, modelled fuel costs can fall where a heat pump is installed along with fabric measures, supplemented in some cases by solar PV or solar thermal. Conversely, properties currently using fossil fuels that have already attained the equivalent of an EPC C may have fewer options to offset the increase in fuel costs due to change in heating system. This latter group comprises around half of homes that use gas and around 8% of homes that use oil.³⁷ Nevertheless, these results are highly sensitive to both fuel prices and behavioural factors.
- 9.28 Running costs when using a heat network are more difficult to generalise, as they are dependent on the configuration of the network infrastructure (and hence capital cost that are recovered through bills) and the particular heat sources used. Heat networks are often suited to high density areas where per-connection network costs can be minimised. Larger networks are able to generally supply at lower cost, due to their lower average cost of development and operation, driven by factors such as more consistent demand, storage potential, renewable usage and available business models. Evidence collated by KPMG to inform the Heat Networks (Scotland) Bill Business and Regulatory Impact Assessment³⁸ suggests that heat networks could provide bill savings, with a potential saving of around 17% or 1.29 p/kWh in 2019 under a central scenario, and potentially ranging up to 36% under a high scenario. While further work is needed to estimate the range of heat network operating costs faced by users should networks extend to lower density areas, in this BRIA we assume they will generally be lower than levelised costs of alternative zero emissions options, as this represents an efficient resource allocation.

Non-Domestic Buildings costs

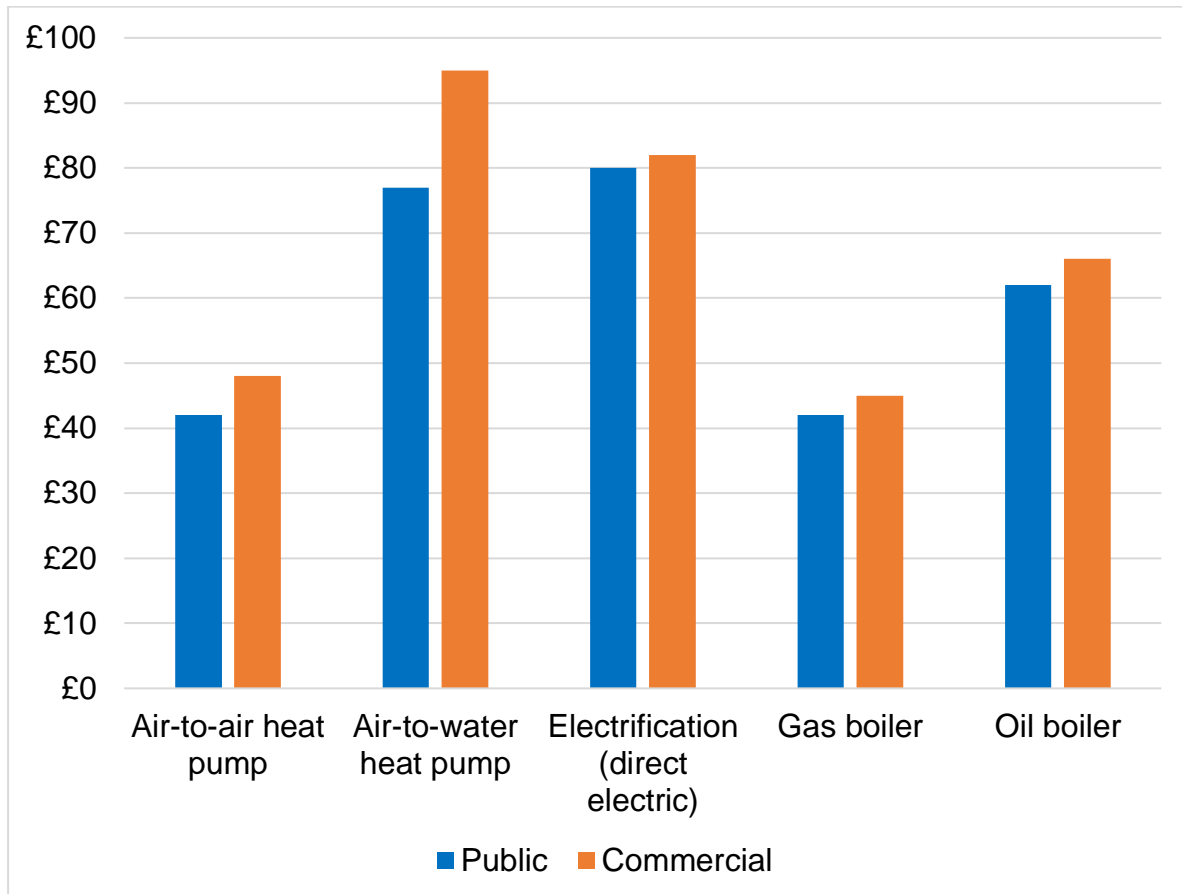
- 9.29 Figure 8 shows the estimated levelised costs associated with zero emissions heating options for non-domestic buildings, alongside equivalent costs for gas and oil boilers. These are presented on a £ per MWh basis. This is because the size, use and energy demand of non-domestic buildings varies significantly and

³⁷ See Table 22 in [Scottish house condition survey: 2019 key findings - gov.scot \(www.gov.scot\)](http://www.gov.scot/publications/scottish-house-condition-survey-2019-key-findings/)

³⁸ <https://www.gov.scot/binaries/content/documents/govscot/publications/impact-assessment/2020/03/heat-networks-scotland-bill-business-regulatory-impact-assessment/documents/heat-networks-scotland-bill-business-regulatory-impact-assessment/heat-networks-scotland-bill-business-regulatory-impact-assessment/govscot%3Adocument/heat-networks-scotland-bill-business-regulatory-impact-assessment.pdf>

to a much a greater extent than residential buildings. As such, average costs are unlikely to provide an accurate representation of the cost of zero emissions heat in the non-domestic sector.

Figure 8: Levelised cost of energy for heat technologies in the non-domestic Buildings sector (£/MWh)



Source: CCC Sixth Carbon Budget. Note: costs of capital of 3.5% assumed for public sector and 7.5% assumed for commercial

9.30 The levelised³⁹ costs of an air-to-air heat pump are similar to those of gas boilers at around £40-50/MWh. They present a potential saving in comparison to oil boilers, which are around £60-70/MWh. Air-to-water heat pumps are more expensive than both gas and oil boilers, at £77/MWh for public buildings and £95/MWh for commercial buildings, reflecting the relatively high upfront capital costs of air-to-water systems. Direct electric heating is also more expensive, at around £80/MWh, reflecting high fuel costs.

9.31 As stated above, there is a significant amount of heterogeneity present in the non-domestic stock. The decarbonisation solution selected for a given building will depend on its physical characteristics as well as the characteristics of the

³⁹ This is the smoothed cost over the technology lifetime for an installation in a given year, incorporating assumptions on capex, opex, fuel costs and efficiencies of each technology.

business that operates within it. Furthermore, we are not proposing to require non-domestic buildings to install energy efficiency measures to achieve a particular standard, as in the domestic sector, however some building owners may be incentivised to install energy efficiency measures to partially or fully mitigate any increase in potential operating costs. Therefore, non-domestic building costs are difficult to predict and subject to uncertainty, however we will continue to review and build the evidence base in this area.

Energy infrastructure and other costs

9.32 By 2030, a much larger proportion of heat demand will be electrified compared to today, supplied through either individual heat pumps or larger scale heat pumps supplying heat networks. In the wider context of policy initiatives to decarbonise other sectors such as transport and industry, there is significant potential for increased electricity demand in the future. This could have implications for both electricity generation capacity and distribution networks. Therefore, there is likely to be costs associated with increasing capacity and reinforcing networks. Given the electricity system's role in decarbonising services other than heat, the sharing and apportionment of these additional costs to zero emissions heat is difficult to specify. Due to the significant complexity and interdependencies, a robust estimate of these costs is not available currently. However, as set out in the Strategy, research is being commissioned to explore the likely range of network investment costs and potential impacts on consumers.

9.33 In addition to electrification, decarbonised gas is also likely to play a role (albeit a more limited one) in emissions reduction to 2030. This will involve increasing amounts of green gas (currently exclusively biomethane, but in the future also potentially hydrogen) being blended into the gas network. As committed to in the Strategy, the costs and benefits of increased hydrogen blending will be kept under review. Furthermore, subject to successful demonstration and safety case trials, parts of the gas network could be converted to 100% hydrogen and in the longer term this could play a vital role in decarbonising Scotland's building stock. This will require continued demonstration and rapid investment in hydrogen generation, storage, and the repurposing of the gas grid. The Energy Strategy refresh will provide more detail on the pathways to decarbonised gas and options for hydrogen for heat, and it is not possible to provide robust estimates of potential investment costs or the impact on consumers in the meantime. However, in all instances the evolution of energy infrastructure costs (both for electricity and gas) depends on UK Government action, as energy policy and regulation remains reserved.

Scottish firms impact test

10.1 The objectives of the proposed Heat in Buildings Bill will have two broad categories of impact on firms in Scotland:

- Impacts on firms in the energy industries and clean heat supply chains:
 - Switching buildings from polluting heating systems to clean heat will reduce demand for the manufacture, installation and maintenance of polluting heating systems, and in the extraction, refinery and supply of these fuels. Demand for clean heating technologies will increase. On balance, it is likely that the net effect on employment will be positive with more jobs created in manufacturing and services than are displaced.
 - The impact on individual firms involved in heating technology supply chains will depend on the extent to which they switch technology focus.
 - The development of a market for clean heating systems in Scotland on a faster timescale than the rest of the UK has potential to build competitive advantage for firms active in Scotland to then deliver products and services in the rest of the UK.
 - There is potential for an increase in demand for energy efficiency upgrades to building fabric, leading to increased activity in the sector.

- Impacts on firms as owners / occupants / users of buildings:
 - The transition to clean heat will likely on average create a net lifecycle cost at building level relative to continuing the use of incumbent polluting technologies. The size of this cost (and hence firms' competitiveness with others not facing equivalent costs) will be dependent on developments across energy markets, reserved energy policy, financing options and subsidies.
 - Based on EPC records, around half of non-domestic buildings already use clean heat, meaning many businesses will not be directly affected by the regulation. For the businesses which are affected, the heterogeneity of the sector means the impacts are likely to be wide ranging. Scottish Government will look to mitigate the impacts of the regulation for businesses through stakeholder engagement and support.
 - In 2023/23 there were 4,223 commercial sales of buildings and 848 long term commercial leases.⁴⁰
 - The impact on individual firms may depend on whether they are in a heat network zone.
 - The impact on firms will also be determined by the content of subsequent secondary legislation, such as any variations to requirements. These regulations will be subject to full consultation with businesses and a further BRIA.

⁴⁰ Registers of Scotland: [Registers of Scotland Property Market Report 2023 \(ros.gov.uk\)](https://ros.gov.uk)

- 10.2 For this BRIA, these impacts have been judged qualitatively. This reflects that further work is to be carried out to develop secondary regulations which will rely on the primary, high level, powers to be included in this bill.
- 10.3 Further work will be carried out to better assess the impact on Scottish firms, including targeted stakeholder engagement.

Competition Assessment

Will the Measure directly or indirectly limit the number or range of suppliers?

11.1 The transition to clean heat will alter the market for heating systems, energy efficiency and energy. However, this need not have a detrimental impact on the number or range of suppliers as existing firms are likely to be able to switch from supply associated with polluting systems to clean heat, and policy development will seek to ensure barriers to entry are minimised, and firms are supported to switch to ensure a just transition.

Will the measure limit the ability of suppliers to compete?

11.2 The Bill proposes development of regulations that would constrain demand for certain heating systems (e.g. fossil fuel boilers) which some suppliers provide. These regulations are subject to further policy development and consultation, which will allow a fuller assessment of the impact of specific proposals.

Will the measure limit suppliers incentives to compete vigorously?

11.3 There are no measures in this Bill which limit suppliers' incentives to compete vigorously by either incentivising suppliers to coordinate their behaviour, exempting suppliers from competition law, or introducing or amending an intellectual property regime.

Will the measure limit the choices and information available to consumers?

11.4 The Bill proposes a comprehensive regulatory framework which when introduced may limit the choices of heating systems to clean heating systems, and within that limit choice further to certain types of heating system depending on various factors including location, local infrastructure availability and proximity to the gas grid.

11.5 Regulations requiring installation of clean heating systems will limit choices available to consumers, though by supporting development of alternatives, such as heat network connections or hydrogen, that are currently unavailable to individual consumers (for example, due to infrastructure limitations), the total range of options available need not reduce in all cases. Development of regulations will be accompanied by further Business and Regulatory Impact Assessments of the specific proposals as they develop.

11.6 In addition, the Heat in Buildings Strategy commits to scaling up advice services and the development of further public engagement, enabling people to actively participate in decisions that involve them. Information about options will form an important part of this activity, and will potentially identify additional policy measures needed to ensure consumers are able to make informed choices.

Consumer assessment

Does the policy affect the quality, availability or price of any goods or services in a market?

12.1 Yes, the Bill will effect a change in the way we heat our homes and businesses. Specific impacts on quality, availability and price are dependent on interacting factors, and will be assessed as more detailed policies are developed. The bill aims to provide certainty, signalling to the market the need to upscale to meet future demand. Measures are consulted on to ensure the quality of good and services is maintained alongside rising demand.

Does the policy affect the essential services market, such as energy or water?

12.2 Yes. The Bill aims to ensure the costs of heating our homes and businesses is affordable and those occupying them have a high comfort level, as the systems supplying heat transition to zero emissions.

Does the policy involve storage or increased use of consumer data?

12.3 No impact on the storage or increased use of consumer data identified.

Does the policy increase opportunities for unscrupulous suppliers to target consumers?

12.4 Yes, a significantly increased installation rate for insulation, low or zero direct emissions technologies and heat networks increases the risk that customers will have poor experiences, either through poor installations or poor service, or will be victim to criminals who take advantage of the increased activity to commit fraud or other crimes. There is precedent in previous schemes where bad actors exploited customers, poor quality installs were not 'made right' and consumer confidence in energy efficiency programmes was significantly damaged.

12.5 Work will be undertaken to develop and encourage the adoption of standards that ensure good quality advice exists to help consumers make informed decisions, ensure that installers meet required standards and that there are adequate redress procedures within the limits of Scottish Government's devolved powers and assistance in place for when things go wrong.

Does the policy impact the information available to consumers on either goods or services, or their rights in relation to these?

12.6 No negative impact identified.

Does the policy affect routes for consumers to seek advice or raise complaints on consumer issues?

12.7 No negative impact identified.

Test run of business forms

13.1 No new forms will be introduced.

Digital impact test

14.1 Not yet known.

Legal aid impact test

15.1 No impact identified. The Consultation itself will not create a new procedure or right of appeal to a court or tribunal, any change in such a procedure or right of appeal, or any change of policy or practice which may lead people to consult a solicitor. Any subsequent Bill or secondary regulation of heating systems may create such procedures, and that impact will be assessed as the Scottish Governments' approach to regulation is further developed.

Enforcement, sanctions and monitoring

16.1 The Consultation proposes to introduce powers which will allow the creation of a compliance and appeals process which will include sanctions and monitoring. This will have implications for enforcement, sanctions and monitoring, those dimensions of the strengthened regulatory regime will be the subject of future policy development and an accompanying BRIA, and so cannot be assessed at this stage.

Implementation and delivery plan

17.1 The Consultation sets out both near term and longer term actions out to 2045. The Heat in Buildings Bill will be informed by the findings of this consultation, making any adjustments required and setting out more detailed actions to accelerate and drive progress to meet interim targets.

Summary and recommendation

18.1 This BRIA lays out the rationale behind the consultation and the proposed Heat in Buildings Bill. The consultation will be used to shape and finalise the draft Bill. The final BRIA which will accompany the Bill once introduced to Parliament will be informed by the consultation responses.

Declaration and Publication

19.1 I have read the Business and Regulatory Impact Assessment and I am satisfied that, given the available evidence, it represents a reasonable view of the likely costs, benefits and impact of the leading options. I am satisfied that business impact has been assessed with the support of businesses in Scotland.

Signed: Sue Kearns, Deputy Director, Heat in Buildings Policy and Regulations

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This publication is available at www.gov.scot

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The Scottish Government
St Andrew's House
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ISBN: 978-1-83521-673-6 (web only)

Published by The Scottish Government, November 2023

Produced for The Scottish Government by APS Group Scotland, 21 Tennant Street, Edinburgh EH6 5NA
PPDAS1388694 (11/23)

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