

# **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**

**Strategic Environmental Assessment**

**Environmental Report**

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**Table 1. List of abbreviations**

“the 2005 Act”	The Environmental Assessment (Scotland) Act 2005
“the 2009 Act”	The Climate Change (Scotland) Act 2009
“the 2019 Act”	Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
AQMA	Air Quality Management Area
CCS	Carbon Capture and Storage
CO <sub>2</sub>	Carbon dioxide
CO <sub>2</sub> e	Carbon dioxide equivalent
EIA	Environmental Impact Assessment
GHG	Greenhouse gases
HES	Historic Environment Scotland
MtCO <sub>2</sub> e	million tonnes of carbon dioxide equivalent
NPF	National Planning Framework
NS	NatureScot
PDR	Permitted Development Rights
PM <sub>10</sub>	Particulate matter 10 µm in diameter
PPS	Plans, Programmes and Strategies
SEA	Strategic Environmental Assessment
SEPA	Scottish Environment Protection Authority
SIMD	Scottish Index of Multiple Deprivation

# Non-Technical Summary

## Introduction

This is a non-technical summary of the Environmental Report of the Proposals for a Heat in Buildings Bill Consultation ('the consultation').

To achieve our climate change targets, we need to stop using gas, oil and other fossil fuels to heat our homes, shops, offices, schools and other buildings, and make the transition to new systems such as electrically powered heat pumps or (in some areas) to local heat networks.

The proposals contained within the consultation on proposals for a Heat in Buildings Bill set out standards and targets for all built stock, both domestic and non-domestic, with dates for compliance and triggers to bring about earlier action. With a focus on the prohibition of direct emissions (referred to as "polluting" from here on) heating systems, it also provides a driver for the improvement of energy efficiency standards in the domestic stock before 2033 (with the exception of social housing, which will remain subject to a separate but equivalent regulatory standard).

The consultation fulfils the commitments made in the Heat in Buildings Strategy to develop proposals and an approach which brings together ambitions on energy efficiency and heat decarbonisation for Scotland into a single regulatory framework.

The proposals set a backstop date of 2045 for the prohibition on polluting heating systems, giving a twenty year span to achieve significant change. The consultation recognises the need for proposals to be fair, achievable and proportionate, and ensuring a Just Transition as part of which no one is left behind.

The consultation, and this assessment, also recognise the role of lower tier plans and future regulations which will be needed to bring to life the powers proposed in the consultation document. Where any future policies and proposals are developed, these will themselves be subject to consideration in accordance with the requirements of the Environmental Assessment (Scotland) Act (2005).

## What is Strategic Environmental Assessment

Strategic Environmental Assessment (SEA) is the assessment of the likely significant environmental effects that a public plan, programme or strategy will have on the environment if implemented. Where possible, it proposes how negative effects can be avoided or reduced and identifies opportunities for positive effects to be maximised. SEA provides an opportunity for the public to express their views on the proposals for the bill and on an Environmental Report setting out the assessment findings.

The Environmental Report has been prepared in accordance with the Environmental Assessment (Scotland) Act 2005. The SEA focused on the effect of the proposals contained within the consultation on climatic factors, air, population and human health, material assets, and cultural heritage.

The Environmental Report sets out the assessment findings and makes recommendations for mitigation and enhancement where appropriate. Early

comments from the SEA Consultation Authorities (NatureScot, SEPA and Historic Environment Scotland) have been taken into account in shaping how the assessment has been undertaken, what it covers, and the level of detail presented in the Environmental Report.

## **Key Environmental Issues**

### **Climatic Factors: Summary and Key Issues**

- Observed climate change trends are likely to intensify in the future – wetter winters and drier summers with an increase in the frequency of extreme weather events and climate change can negatively impact energy infrastructure – e.g. through flooding.
- Key issues for climate change include greenhouse gas emissions from a range of sources, with energy supply and use of homes and buildings contributing to emissions.
- Climate change can also give rise to indirect effects arising from mitigation and adaptation measures.
- Climate change has also been identified as a primary pressure on many of the SEA topic areas

### **Population and Human Health : Summary and Key Issues**

- Scotland's population is growing and Scotland has experienced a small increase in heat demand in recent years.
- Heat in buildings accounts for approximately a fifth of Scotland's GHG emissions.
- Challenging weather, poor energy efficiency and reduced heating options (especially in rural areas) can make fuel bills unaffordable, resulting in fuel poverty.
- The potential impacts of climate change on population and human health will not be evenly spread. ( e.g. negative health impacts are likely to be disproportionately severe in area of high deprivation).

### **Cultural Heritage: Summary and Key Issues**

- Scotland's many and varied historical sites are unique and irreplaceable.
- Development is a key pressure on the historic environment and cultural heritage, both directly in terms of damage to known and unknown features, and possible impacts on setting.

### **Air: Summary and Key Issues**

- Whilst air quality has improved significantly, poor air quality in certain areas continues to affect human health and the environment
- Air pollution can contribute to a number of health problems and climate change may exacerbate these issues and alter current patterns and concentrations.
- Key issues for air include emissions from a number of sectors leading to air pollution with air quality and GHG emissions intrinsically linked as they both arise from broadly the same sources.

- Measures that seek to reduce emissions from buildings such as from improved energy efficiency and heat decarbonisation, have the potential to broadly contribute to improved air quality

#### Material Assets: Summary and Key Issues

- Today, heat is responsible for approximately half of Scotland's energy use and buildings/ Infrastructure associated with the development/deployment of heat decarbonisation will play a key role in ensuring the future of its security of supply and decarbonisation.
- Key issues for material assets include those associated with development and infrastructure and pressure on land use.
- Changes in land use required to meet Climate change targets could also have environmental effects.

#### What are the conclusions of the assessment?

The assessment concludes that the proposals which may form the basis of a future Heat in Buildings Bill are likely to have **significant positive effects** on **climatic factors, air, population and human health** and **material assets**. This is likely to be gradual but increasing towards the backstop date of 2045. This is particularly true when considering the reduction in GHG emissions which will result from the prohibition of polluting heating systems.

The potential for **effects in combination** with other plans, programmes and strategies has also been considered. The proposals and subsequent Bill form part of a wider framework which has the potential to **positively** and **cumulatively** contribute across a wide range of Scottish Government policy areas within the context in which it sits.

The assessment identifies the potential for **mixed/uncertain secondary effects on a range of SEA topics** as a result of the deployment of strategically important energy efficiency measures and heat technologies ready for deployment (including energy efficiency measures, heat pumps and heat networks) at the local level. Existing mitigation measures can help to address these.

The assessment further recognises that any **future** roll out of the powers contained within the proposed Heat in Buildings Bill will require secondary regulations which will be the subject of future and more detailed assessment.

Existing mitigation at the local level can help to address adverse effects and relevant emerging PPS also has the potential to provide mitigation at the strategic level.

#### What are the proposals for mitigation and enhancement.

Where there is potential for secondary adverse effects associated with the development and deployment of energy efficiency measures and clean heat technologies in the short term further consideration should be given to opportunities to mitigate any such effects including at the local level. There are existing controls in place, for example through the relevant consenting and licensing procedures, that can help to address these.

In addition to local mitigation measures identified, the development of emerging and future PPS (secondary regulation and delivery programmes) improvements to the supply chain associated with heat decarbonisation are particularly relevant as they could potentially provide mitigation at an appropriate level.

The SEA findings support the dates proposed in the consultation with triggers and backstop dates to drive action. Reductions in GHG emissions will contribute to significant positive environmental effects across both domestic and non-domestic sectors.

In order to help obtain maximum environmental benefits, a focus could be given to:

actions that support opportunities for early take up across domestic stock. This could be done through support, advice and messaging to raise the profile of the proposed Heat in Buildings Standard (“the Standard”) and works needed to meet it.

people living in deprived areas and in rural areas where extreme fuel poverty rates are highest. This could be done through the existing delivery programmes where there is a focus on those in or at risk of becoming fuel poor.

deployment of zero direct emissions heating technologies (referred to from here as “clean heating systems”) in areas which currently use high carbon heating fuels, in areas recognised as being cost effective in the short term and in areas least likely to receive a heat network in the longer term. This could be done through focused targeting and messaging.

working with stakeholders, such as Historic Environment Scotland, to develop more solutions to transition Scotland’s historic buildings to zero emissions heating while respecting and preserving the special characteristics of our buildings and places.

### **Monitoring**

Section 19 of the Environmental Assessment (Scotland) Act (2005) requires the responsible authority to monitor significant environmental effects of the implementation of the PPS. This should be done in a way to enable the authority to take appropriate remedial action where applicable

A wide range of existing programmes have associated monitoring in place at the national level. At a programme level, the Heat in Buildings Strategy committed to the publication of a monitoring and evaluation framework in 2023. This will help provide the basis for future monitoring of the effects of the proposals contained within this consultation.

### **What Reasonable alternatives have been considered**

The 2005 Act requires the Environmental Report to identify, describe and evaluate the likely significant effects on the environmental of reasonable alternatives to a plan, programme, or strategy taking into account its objectives and geographical scope.

Do nothing/business as usual is not a reasonable alternative to the proposal to introduce a Heat in Buildings Bill because the Climate Change (Scotland) Act 2019 requires plans to be laid that set out the pathway to reaching our net zero and interim

emissions reduction targets. A Bill as proposed will play an essential part in achieving zero emissions in the built stock.

There are different strategic technologies that are available now, or could become available in the future, to reduce emissions from space and water heating. These include electric heating options such as heat pumps and storage heaters, heat networks and potentially the use of renewable hydrogen as a replacement for methane gas in the mains gas network.

The main technologies available for deployment today, and which are likely to remain the main strategic options for the next ten years, are electric solutions (and in particular heat pumps) and heat networks. Subject to the safety and commercial case being established we may see 100% hydrogen becoming available in parts of the gas network towards the end of the decade.

The consultation is technology neutral, however, on the basis that there are no recognised and reasonable alternatives to a mixed or blended technology pathway as the most effective and credible means of achieving our statutory emission reduction targets in the buildings sector.

Finally, future PPS may set further and more specific ambitions in this context; for example, there may be a need for technology specific PPS (such as any new and emerging hydrogen and bioenergy PPS) as well as lower tier plans. Where any future policies and proposals are developed, these will themselves be subject to consideration in accordance with the requirements of the Environmental Assessment (Scotland) Act

### **Next steps and consultation**

Public views and comments are invited on both this Environmental report and the consultation on Proposals for a Heat in Buildings Bill to which it relates. Responses are invited by 8 March 2024. These can be submitted:

- **Online** using the Scottish Government's consultation platform, Consultation Hub, at: <https://consult.gov.scot/energy-and-climate-change-directorate/heat-in-buildings-strategy/>. Consultation Hub allows you to save and return to your responses while the consultation is still open. A copy of your final response will be emailed to you.

**By Email:** Responses can be submitted by email, with the Respondent Information Form to [HiBConsultation@gov.scot](mailto:HiBConsultation@gov.scot)

Following the consultation, a Post-Adoption Statement will be prepared. The Statement will reflect on the views provided on the findings of the assessment and the proposals in the consultation paper and will explain how the issues raised have been taken into account in finalising the Heat in Buildings Bill.



## **1. Proposals for a Heat in Buildings Bill Consultation (“the consultation”)**

### **1.1 Introduction**

- 1.1.1 The consultation on proposals to be contained within a planned Heat in Buildings Bill comes after our plans for decarbonising Scotland’s buildings which were set out in the 2021 Heat in Buildings Strategy. This made clear that regulations would be essential to reducing emissions from Scotland’s buildings. This consultation is the first step in this process.
- 1.1.2 The proposed Bill to which the consultation relates will help deliver on the Vision laid out in the Strategy, as follows:

#### **Our Vision - “By 2045 our homes and buildings are warmer, greener and more efficient”**

- 1.1.3 This vision and the deliverables progressed through the Strategy are underpinned by energy efficiency and heat decarbonisation supporting outcomes as detailed in Figure 1.
- 1.1.4 Our approach 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.
- 1.1.5 The consultation on proposals to be contained within a Heat in Buildings Bill sets out the legislative intentions to set new standards for all buildings in Scotland, both in terms of their energy efficiency and the direct emissions which they produce from heating. The setting of these standards in law is intended to drive progress across the building stock in a way which has not been achieved through persuasion thus far. The setting of standards will also help drive emissions reductions commensurate with net zero and interim climate change targets.
- 1.1.6 Since there is no single technology that will work in all places for all buildings, the consultation is technology neutral, giving choice to consumers which reflects their own circumstances and the diverse nature of the built stock across Scotland.
- 1.1.7 The consultation asks questions on timeframes for the built stock to meet the standards proposed, intending to contribute towards us meeting our wider targets on emissions reductions laid out in the Climate Change Plan update.
- 1.1.8 Further, the consultation recognises that the proposals included are the first step to the creation of a legislative framework. Secondary regulations will be required to provide the details of delivery and will be the subject of future consultations. Where any future policies and proposals are developed, these will themselves be subject to consideration in accordance with the

requirements of the Environmental Assessment (Scotland) Act (2005). Further detail on the consultation's interaction with other plans, programmes and strategies (PPS) is provided in **Section 3**.

#### **National Performance Framework Outcomes**

- **Economy** – We have a globally competitive, entrepreneurial, inclusive and sustainable economy
- **Environment** – We value, enjoy, protect and enhance our environment
- **Poverty** – We tackle poverty by sharing opportunities, wealth and power more equally
- **Health** – We are healthy and active
- **Fair work and business** – We have thriving and innovative businesses, with quality jobs and fair work for everyone
- **Communities** – We live in communities that are inclusive, empowered, resilient and safe

#### **Heat in Buildings Strategy Outcomes**

- The cost of heating our homes and businesses is affordable and those occupying them have a high comfort level
- We have reduced our demand for heat and poor energy efficiency is no longer a driver of fuel poverty
- The systems we use are smart and resilient and provide us with a reliable source of heat
- 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
- Our indoor and outdoor spaces are filled with cleaner air
- Our heating systems enable and efficiently use Scotland's renewable energy resources
- Electricity and non-electrical fuels are produced from sustainable sources in a way which is consistent with net zero emissions and biodiversity targets
- Our heating systems enable the flexible and stable operation of our energy networks

**Figure 1 – Heat in Buildings Strategy outcomes**

## **2. Heating Scotland’s homes and buildings**

### **2.1 Introduction**

- 2.1.1 Buildings account for around 20% of Scotland’s total greenhouse gas emissions<sup>1</sup>. (the third-largest cause of emissions across the economy). Around 2,199,000 (88%) Scottish homes use polluting heating systems, as do almost half (c. 110,000) of our non-domestic buildings. Currently gas supplied via the mains gas network is predominantly natural gas, a fossil fuel composed mainly of methane.

### **2.2 Strategically Important energy efficiency measures and heat technologies ready for deployment**

- 2.2.1 The main strategically important energy efficiency and clean heat technologies that are currently ready for deployment in Scotland and which can make a meaningful contribution towards targets include building energy efficiency measures, heat pumps and connection to heat networks.

#### **Energy Efficiency Measures**

- 2.2.2 Energy efficiency measures make buildings easier to keep warm (reducing the demand for heat), and can reduce the cost of achieving thermal comfort. ‘Fabric first’ energy measures include draught-proofing (e.g. blocking or sealing gaps around windows, doors, and skirting boards); loft, floor and wall insulation; insulating thermal stores and heating pipes; and improving window glazing. The proposals included in the principal consultation suggest a short list of measures to help property owners understand the steps needed to reach an acceptable level of energy efficiency. This list will be complemented with an option to submit an EPC which should reach band C.
- 2.2.3 A minimum level of energy efficiency is an important prerequisite to supporting the rollout of clean heating systems for buildings across all technology scenarios.

#### **Heat Pumps and Heat Networks**

- 2.2.4 The key clean heating solutions and systems available today for Scotland are heat pumps and heat networks.
- 2.2.5 Heat pumps provide an efficient and effective way to use electricity to heat buildings because they use electricity to draw a larger amount of heat from either air, ground or water. Heat pumps can supply heat to individual buildings or can supply a heat network.
- 2.2.6 Heat pumps can also be highly effective in most, but not all buildings when they are combined with appropriate energy efficiency measures. For example, air source heat pumps require a place outside the building where an external unit can be fitted to a wall or placed on the ground, including space around it

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<sup>1</sup> National Atmospheric Emissions Inventory. (2023), Devolved Administrations – Greenhouse Gas Reports [Devolved Administrations - Greenhouse Gas Reports - NAEI, UK \(beis.gov.uk\)](https://www.beis.gov.uk/devolved-administrations-greenhouse-gas-reports-naei-uk)

to ensure the flow of air. The size of heat pump will also vary depending on the property's heat demand.

- 2.2.7 Heat networks can heat our homes and other buildings by distributing hot water or steam through insulated pipes. The thermal energy that heats the water or steam can come from a variety of low or zero emissions sources including large-scale heat pumps, solar energy, biomass boilers, and heat captured from industrial processes such as at whisky distilleries. They have the potential to not only remove emissions from heating buildings but at the same time provide real consumer benefits.
- 2.2.8 The Committee on Climate Change has recommended that heat networks should form a significant part of Scotland's future heat supply. Heat networks can contribute to emissions reduction because they are source neutral, opening up opportunities to make use of low and zero emissions heat sources that otherwise could not be used such as waste industrial heat and water. Heat networks can also deliver heat to buildings that have limited alternative options (such as flats). Thermal storage is likely to play an important role in the operation of heat networks, helping to optimise operation and potentially reduce running costs.

### **2.3 Other heat technologies (Hydrogen and Bioenergy)**

- 2.3.1 In the longer term, **hydrogen** has a potential role in decarbonising heat in some buildings.
- 2.3.2 In broad terms there are three types of hydrogen production. So-called 'grey' hydrogen is produced from the reforming of natural gas and this process produces both hydrogen and carbon dioxide. Blue (or low-carbon) hydrogen is produced in the same way as grey hydrogen but the process is aligned with CCS systems which capture most of the CO<sub>2</sub> produced, preventing it from entering the atmosphere and storing it safely in deep geological formations. Green hydrogen is produced from the electrolysis of water, a process which splits water into its constituent parts of hydrogen and oxygen. When renewably sourced electricity is used, this process is completely green (i.e. it produces no emissions).<sup>2</sup>
- 2.3.3 The technology to produce hydrogen is well understood and in the longer term, hydrogen could also be used to displace the direct use of methane for heat in some of our homes and in the provision of heat and industrial processes in our heavy industries. This is because domestic central heating systems and industrial applications can potentially be adapted to use hydrogen.
- 2.3.4 However, we do not consider that hydrogen will play a central role in the overall decarbonisation of domestic heat<sup>3</sup>. The potential for hydrogen to play a

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<sup>2</sup> Scottish Government (2020) Hydrogen Policy Statement. [Scottish Government Hydrogen Policy Statement - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/hydrogen-policy-statement/pages/introduction.aspx)

<sup>3</sup> Scottish Government (2022) Hydrogen Action Plan [Hydrogen Action Plan \(www.gov.scot\)](https://www.gov.scot/publications/hydrogen-action-plan/pages/introduction.aspx)

role in heating buildings depends upon strategic decisions by the UK Government that will be made over the coming years.

- 2.3.5 **Bioenergy** can be generated and used in a wide range of ways. Solid forms of biomass (such as forestry waste or energy crops) can be used as feedstock for combustion to produce heat. Bioenergy can be used to produce biomethane for injection into the gas grid, or further processed into liquid fuels. Certain types of bioenergy, such as food waste, may be more suitable for anaerobic digestion to produce biogas, which can then be combusted to produce heat and/or power or upgraded to biomethane.<sup>4</sup>
- 2.3.6 In line with advice from the UK's Climate Change Committee<sup>5</sup> it is considered that bioenergy is likely to have a fairly limited role in the future of low and zero emissions heating. However, as a renewable, and potentially net zero, energy source it may continue to be utilised for some time by households who have already been incentivised and encouraged to adopt bioenergy. It may also play some role in providing a net zero heating option in homes for which electric heating systems are not suitable. Future use of bioenergy for heating would need to be balanced with the need to protect and ensure the supply of bioenergy in other sectors of the economy that also rely on bioenergy to remove emissions.

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<sup>4</sup> Ricardo (2018) The potential contribution of bioenergy to Scotland's energy system. <https://www.climatechange.org.uk/media/3609/the-potential-contribution-of-bioenergy-to-scotland-s-energy-system.pdf>

<sup>5</sup> UK Climate Change Committee (2018) Biomass in a low-carbon economy [Biomass in a low-carbon economy - Climate Change Committee \(theccc.org.uk\)](https://www.theccc.org.uk/publication/energy-in-a-low-carbon-economy/)

### **3. Relationship with other Plans, Programmes and Strategies (PPS)**

#### **3.1 Introduction and Policy Context**

3.1.1 The consultation policy context in which the regulatory framework underpinning the Programme as a whole, as of which this proposed Bill forms one part, is complex and relies on, but not limited to, the publications listed below. These are interlinked and also rely on other PPS as they emerge.

- Climate Change (Scotland) Act 2009
- Climate Change (Emissions Reduction Targets) (Scotland) Act 2019
- Fuel Poverty (Targets, Definitions and Strategy) (Scotland) Act 2019
- Local Heat and Energy Efficiency Strategies and Heat Networks (Scotland) Act (2021)
- Heat Decarbonisation Policy Statement (2015)
- Renewable Heat Action Plan 2009
- Energy Strategy and Just Transition Plan
- Third Climate Change Plan 2018 – 2032 (2018)
- Infrastructure Investment Plan (2012)
- Climate Change Plan update (2020)
- Housing to 2040 (2012)
- Fuel Poverty Strategy (2012)
- Energy Strategy (2017)
- Energy Efficient Scotland (2018)
- Heat in Buildings Strategy (2012)
- Emerging National PPS relevant to land use and planning
- New and emerging hydrogen and bioenergy PPS

## 3.2 Climate and Fuel Poverty targets

### Climate Change Targets

- 3.2.1 The proposals included in the consultation document are intended, on becoming law, to reduce the contribution of heating buildings to Scotland's greenhouse gas emissions, to help achieve ambitious climate change targets set out in legislation.
- 3.2.2 The Climate Change (Scotland) Act 2009<sup>6</sup> ("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.
- 3.2.3 The Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 ("the 2019 Act")<sup>7</sup> 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.
- 3.2.4 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 recently published 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.

### Fuel Poverty Targets

- 3.2.5 Statutory Fuel Poverty Targets are set in the Fuel Poverty (Targets, Definition and Strategy) (Scotland) Act (2019)<sup>8</sup>. The '2019 Act' 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

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<sup>6</sup> Scottish Parliament (2009) Climate Change (Scotland) Act: [Climate Change \(Scotland\) Act 2009 \(legislation.gov.uk\)](http://www.legislation.gov.uk)

<sup>7</sup> Scottish Parliament (2019) Climate Change (Emissions Reduction Targets)(Scotland) Act 2019: <http://www.legislation.gov.uk/asp/2019/15/enacted>

<sup>8</sup> Scottish Parliament (2019), Fuel Poverty (Targets, Definition and Strategy (Scotland) Act [Fuel Poverty \(Targets, Definition and Strategy\) \(Scotland\) Act 2019 \(legislation.gov.uk\)](http://www.legislation.gov.uk)

Ministers to produce a comprehensive strategy to show how they intend to meet the new targets. Statutory 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.

- 3.2.6 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 Act<sup>9</sup>. A Fuel Poverty Strategy was published in 2021<sup>10</sup> which set out policies and proposals for national and local government and third sector partners to help make strong progress towards the established targets.

### **3.3 Energy efficiency and clean heating**

- 3.3.1 Improving the energy efficiency of buildings is seen as a key driver to reducing heat demand. Scottish Ministers designated energy efficiency as a national infrastructure priority in 2015<sup>11</sup> and made a long-term commitment to reduce the energy demand and decarbonise the heat supply of our residential, services and industrial sectors. This commitment was then brought forward in Scotland's Energy Strategy<sup>12</sup> and Energy Efficient Scotland<sup>13</sup>.
- 3.3.2 The Scottish Energy Strategy position statement was published in 2021<sup>14</sup> which provided an overview of key priorities for short to medium term in ensuring a green economic recovery whilst remaining aligned to our net zero ambitions.
- 3.3.3 The subsequent Heat in Buildings Strategy<sup>15</sup> drew together commitments and targets with a clear focus on buildings, setting out a vision for the future of heat in buildings across Scotland in a way which delivers on commitment, maximising economic opportunities and ensuring a just transition. It built on the ambitious Energy Efficient Scotland route map to transform energy efficiency and support the scaling up and acceleration of existing work with the aim of reducing emissions from heating our homes and buildings to levels compatible with net zero by 2045.

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<sup>9</sup> Scottish Government (2023) Scottish House Condition Survey 2021 [Scottish House Condition Survey: 2021 Key Findings - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/scottish-house-condition-survey-2021-key-findings/)

<sup>10</sup> [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/)

<sup>11</sup> Scottish Government (2015), Infrastructure Investment Plan 2015.

<https://www.gov.scot/publications/infrastructure-investment-plan-2015/>

<sup>12</sup> Scottish Government (2017), The future of energy in Scotland: Scottish Energy Strategy: <https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/>

<sup>13</sup> Scottish Government (2017), Energy Efficient Scotland Consultation: Making our homes and buildings warmer, greener and more efficient: [https://consult.gov.scot/better-homes-division/energy-efficient-scotland/user\\_uploads/188061\\_sct0118873760-1\\_energy-p8.pdf](https://consult.gov.scot/better-homes-division/energy-efficient-scotland/user_uploads/188061_sct0118873760-1_energy-p8.pdf)

<sup>14</sup> [Energy strategy: position statement - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/energy-strategy-position-statement/)

<sup>15</sup> [Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/heat-in-buildings-strategy-achieving-net-zero-emissions-in-scotland-s-buildings/)



- 3.3.4 The Bute House Agreement<sup>16</sup> in 2019 went on to confirm that both the Scottish Government and Scottish Green Party believe that we need to decarbonise how we heat our homes and buildings to meet the net zero pathway, and 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”.
- 3.3.5 This consultation brings together proposals to deliver on these commitments on energy efficiency and decarbonising heating in our homes and buildings, setting out ways in which a legislative framework might bring forward the necessary change.

### **3.4 Infrastructure, Planning and Land Use**

- 3.4.1 The proposals included in the consultation, which are devised to contribute towards commitments made in the Heat in Buildings Strategy, will also influence and be influenced by a range of existing and emerging plans, programmes and strategies relating to infrastructure, planning and land use.
- 3.4.2 The Infrastructure Investment Plan for Scotland 2021-2022 to 2025-2026 was published on 4 February 2021. It sets out a long term vision of infrastructure in Scotland, which supports an inclusive, net zero carbon economy and includes details on over £26 billion of major projects and large programmes. One area of focus for the plan is decarbonising heat and boosting the energy efficiency of buildings.
- 3.4.3 The fourth National Planning Framework (NPF) was published by the Scottish Parliament on 13 February 2023<sup>17</sup>. It makes clear that every decision on our future development must contribute to making Scotland a more sustainable place. It encourages low and zero carbon design and energy efficiency, development that is accessible by sustainable travel, and expansion of renewable energy generation. It makes a direct link between Local Development Plans and Local Heat and Energy Efficiency Strategies, and formalises the link between development proposals and heat networks.
- 3.4.4 NPF4 also makes clear that as well as building new homes to net zero standards, more will need to be done to meet the bigger challenge of upgrading the existing housing stock to reduce emissions and adapt to future climate impacts. Emissions from our homes need to be very substantially reduced – by 2030, they must fall by 68% from 2020 levels. Improved energy efficiency will be needed, by providing zero emissions heating solutions and more sustainable water management practices for existing settlements and homes.

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<sup>16</sup> Scottish Government and Scottish Green Party - Working Together to build a greener, fairer, independent Scotland [SG+SGP+Talks+--+Draft+Policy+Programme+--+version+7+--+FINAL+--+OFFSEN.pdf \(www.gov.scot\)](#)

<sup>17</sup> [National Planning Framework 4 - gov.scot \(www.gov.scot\)](#)

3.5 The Scottish Government is also currently carrying out a multi-phase review of Permitted Development Rights (PDR) in Scotland. This review includes a commitment to consider the case for new or extended PDR for micro-renewables and heat networks. As such we carried out a consultation on proposals as phase 3 of the review (brought forward from phase 4 in light of the urgent need to consider). The consultation has now closed and we are analysing the responses with a view to lay amendments/new PDR early next year.

### **3.6 Other recent and emerging PPS and regulations of relevance**

- 3.6.1 In addition to emerging national PPS detailed above, the development of the proposed Bill which is the subject of the consultation will also influence and be influenced by a range of emerging PPS that focus on support for heat decarbonisation and energy efficiency and the potential future role of heat technologies (such as hydrogen and bioenergy) at the national level as well as lower tier future plans and a supporting regulatory framework. These are discussed below.
- 3.6.2 The Housing to 2040 Strategy<sup>18</sup> (2021) reinforces the commitment to ending Scotland's commitment to climate change by 2045 in a just and fair way. Its aim is that existing homes are adapted and retrofitted to improve their energy efficiency and decarbonise their heating, ending their contribution to climate change.
- 3.6.3 Further, it confirms that as we move to clean heating systems in existing homes, we must take the opportunity to ensure that these installations and any works to improve the fabric of the building also serve to increase comfort and affordability for fuel poor households.
- 3.6.4 The Strategy also considers wider housing standards and the need to create high quality and sustainable homes for the future. It proposes a new tenure-neutral housing standard, set in law, which will set out what people are entitled to expect, and what they are expected to do, so that everybody living in Scotland can have a warm, comfortable and safe place to live. The delivery of this commitment will be an important piece of work which this consultation and its subsequent Bill must take cognisance of.
- 3.6.5 Local Heat and Energy Efficiency Strategies (LHEES) will be in place for all local authority areas in Scotland by the end of 2023. LHEES Strategies and Delivery Plans will provide an important platform to consider both local community and wider national infrastructure issues and their associated potential environmental effects. LHEES Strategies will set out the long term vision for decarbonising heat in buildings and improving their energy efficiency across an entire local authority area. For each local area, LHEES Strategies will draw on a consistent data driven methodology to:

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<sup>18</sup> [Housing to 2040 - gov.scot \(www.gov.scot\)](https://www.gov.scot/housing-to-2040)

- set out how each segment of the building stock needs to change to meet national objectives, including achieving zero greenhouse gas emissions in the building sector, and the removal of poor energy efficiency as a driver of fuel poverty;
- identify indicative heat decarbonisation zones, setting out the principal means for decarbonising buildings within each zone; and
- support the prioritisation of delivery.

### **Developing a Regulatory Framework for Zero Emissions Buildings**

3.6.6 This consultation takes forward the commitments made in the Heat in Buildings Strategy to develop a new regulatory framework for clean heating and energy efficiency for Scotland. The framework, beginning with the proposed Bill, will build on our existing commitments to extend regulation for minimum energy efficiency standards to include requirements, where possible within our legal competence, to install clean heating systems by no later than 2045, with some buildings or areas being required to comply with standards earlier. This approach will complement the requirements we will put in place for new buildings to have zero emissions heating systems from 2024<sup>19</sup>. Our consultation will also include proposals to require the installation of clean heating systems in our non-domestic buildings.

3.6.7 Heat networks will play an important role in the heat transition and the Heat Networks (Scotland) Act 2021<sup>20</sup> provides a regulatory regime to be operational by the end of 2023 to support consenting of only renewable and low carbon heat networks. It includes a duty on local authorities to consider the designation of heat network zones. This links to the requirements now in NPF regarding heat networks discussed above.

### **3.7 The Guiding Principles**

3.7.1 The UK Withdrawal from the European Union (Continuity) (Scotland) Act<sup>21</sup> became law in January 2021. This Act provides Scottish Ministers with a discretionary power to continue to keep devolved law in line with EU law following the end of the implementation period. and ensures Scots law can remain closely aligned with EU standards.

3.7.2 The Act includes provisions for the continuity of environmental governance in domestic arrangements, and for the continuation of the effect of the EU environmental principles as the guiding principles on the environment in Scots law. During the passage of the Continuity Act, the principle of integration requirement was added as a fifth principle to complete the guiding principles on the environment.

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<sup>19</sup> Scottish Government (2020) New Build Heat Standard – Scoping Consultation [New Build Heat Standard - Scoping Consultation - Scottish Government - Citizen Space](#)

<sup>20</sup> [Heat Networks \(Scotland\) Act 2021 \(legislation.gov.uk\)](#)

<sup>21</sup> [UK Withdrawal from the European Union \(Continuity\) \(Scotland\) Act 2021 \(legislation.gov.uk\)](#)

3.7.3 Section 14 places a duty on public authorities to have due regard to the guiding principles on the environment when preparing a plan, programme or strategy requiring a SEA under the 2005 Act. These guiding principles are set out below and have been taken into account in the preparation of this Environmental Report:

- (a) the principle that protecting the environment should be integrated into the making of policies,
- (b) the precautionary principle as it relates to the environment,
- (c) the principle that preventative action should be taken to avert environmental damage,
- (d) the principle that environmental damage should as a priority be rectified at source,
- (e) the principle that the polluter should pay.

3.7.4 The consultation and its proposals are essential to the Heat in Buildings Strategy vision for all buildings to reach zero emissions by 2045, and thus has environmental protection principles at its heart. The SEA considers the potential for any likely significant environmental effects arising, both positive and negative, and where appropriate seeks to identify opportunities for avoiding or mitigating negative effects and enhancing positive effects. Further information on the assessment findings can be found in section 6 of this report.

## 4. Approach to the Assessment

### 4.1 Purpose

4.1.1 The Scottish Government (SG) is carrying out a Strategic Environmental Assessment (SEA) of its planned consultation. SEA is a systematic method for considering the likely significant environmental effects of certain plans, programmes and strategies. SEA involves the following key stages:

- **Screening** – determining whether the Consultation and its proposals are likely to have significant environmental effects and whether an SEA is required;
- **Scoping** – establishing a method for assessment and setting out the consultation period for the Consultation;
- **Environmental Assessment** – assessing the emerging content of the Consultation and setting out its likely significant environmental effects in an Environmental Report to be published alongside the consultation document; and
- **Post Adoption Statement** – preparing and publishing a post-adoption statement.

4.1.2 This report has been prepared in accordance with the Environmental Assessment (Scotland) Act 2005 ( “the 2005 Act”) and sets out the findings of the environmental assessment stage.

### 4.2 SEA activities to date

4.2.1 Scoping was undertaken in November/December 2022 and a combined scoping report was submitted to the SEA gateway inviting views from the consultation authorities. This determined that an SEA was required due to the potential for significant positive effects on climatic factors, population and human health, air, cultural heritage and the historic environment, and material assets.

4.2.2 The comments received from the statutory consultation authorities have been taken into account in the preparation of the Environmental Report. It is noted that as the proposals to be included in the consultation have developed, its focus was increasingly on the setting of standards for energy efficiency and zero emissions heating for Scotland’s homes and buildings and how these might be achieved through the use of primary legislation.

4.2.3 Where the potential for localised indirect effects are identified, including on those topics scoped out of the assessment (**biodiversity, flora and fauna, water, landscape and visual impacts, and soil**) these will also be noted, as relevant.

**Table 2. Scoping of SEA topics**

Climatic factors	✓
Biodiversity, flora and fauna	✗
Population and human health	✓
Soil	✗
Water	✗
Air	✓
Cultural and historic heritage	✓
Landscape	✗
Material assets	✓

### **4.3 SEA Methodology**

4.3.1 The assessment methodology has been refined from that originally identified within the scoping report, which proposed a set of assessment questions. The finalised approach has been developed to reflect the high level nature of the Consultation which will lead to a draft Bill. It also draws on findings from other relevant SEA work. Key stages in the assessment methodology are described below.

Assessment Stage	Description
Stage 1	Identify relevant environmental information to inform the Environmental baseline
Stage 2	Review and collate findings of previous relevant SEA Environmental reports and summarise key findings to provide an overview of known effects
Stage 3	Assess potential for likely environmental effects (including consideration of potential cumulative, synergistic and in-combination effects) of the Consultation's key proposals: <ol style="list-style-type: none"> <li>1. Powers to support the <b>growth of heat networks</b>, primarily focused on non-domestic properties, which in turn will create a larger and more economic heat network market for all properties</li> <li>2. Powers to set backstop and interim dates to <b>prohibit the use of polluting heating systems</b> (2038 for properties owned by public authorities; 2045 for all buildings; and use of triggers between 2025 and 2045 requiring some building owners to make the transition before 2045 (initially property purchase)</li> <li>3. Powers to require home owners to meet a <b>minimum energy efficiency requirement</b> by 2028 for PRS and 2033 for other private homes</li> <li>4. Powers to give <b>abeyances (extra time) and exemptions</b> to reflect individual circumstances</li> </ol>
Stage 4	Consider how the key proposals of the Consultation address key environmental issues identified, and make recommendations where appropriate for enhancing environmental benefits.

4.3.2 Early assessment work identified key environmental issues across the scoped in topics. A considerable amount of work has already been undertaken exploring the environmental effects of existing energy-related (including heat decarbonisation) policies and proposals. Of significance is the SEA of the Climate Change Plan Update (2020)<sup>22</sup>.

4.3.3 Other SEAs of relevance that have been reviewed and where relevant findings have been taken into account include the following:

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<sup>22</sup> Scottish Government (2021) Strategic Environmental Assessment of the update to the Climate Change Plan 2018-2032: [Strategic Environmental Assessment of the update to the Climate Change Plan 2018-2032 - Scottish Government - Citizen Space \(consult.gov.scot\)](#)

- The Heat Generation Policy Statement (2015)<sup>23</sup>
- The Climate Change Plan and the Energy Strategy (2017)<sup>24</sup>
- Energy Efficient Scotland (2018)<sup>25</sup>
- Climate Change (Emissions Targets Reduction) (Scotland) Act (2019)<sup>26</sup>
- The Scottish Government's Programme for Extending Permitted Development Rights in Scotland: A Sustainability Appraisal (2019)<sup>27</sup>
- Draft Infrastructure Investment Plan (2020)<sup>28</sup>
- Heat in Buildings Strategy (2021)<sup>29</sup>

4.3.4 The finalised assessment takes the form of a broad narrative analysis of the overarching proposals included in the Consultation:

- 1 Powers to **support the growth of heat networks**, primarily focused on non-domestic properties, which in turn will create a larger and more economic heat network market for all properties
- 2 Powers to set backstop and interim dates to **prohibit the use of polluting heating systems** (2038 for properties owned by public authorities; 2045 for all buildings; and use of triggers requiring some building owners to make the transition before 2045 (initially property purchase)
- 3 Powers to require home owners to meet a **minimum energy efficiency standard** by 2028 for PRS and 2033 for other private homes
- 4 Powers to give **abeyances and exemptions** to reflect individual circumstances

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<sup>23</sup> Scottish Government (2015) Heat Policy Statement – towards decarbonising heat: Maximising the Opportunities for Scotland: [Heat Policy Statement Towards Decarbonising Heat: Maximising the Opportunities for Scotland \(www.gov.scot\)](http://www.gov.scot)

<sup>24</sup> Scottish Government (2017) Draft Climate Change and Energy Strategies: joint Strategic Environmental Assessments [Draft Climate Change and Energy Strategies: joint strategic environmental assessments - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>25</sup> Scottish Government (2018), Energy Efficient Scotland: Strategic Environmental Assessment [Energy Efficient Scotland: strategic environmental assessment - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>26</sup> Scottish Government (2020), Climate Change Bill – Strategic Environmental Assessment: [Climate Change Bill - strategic environmental assessment: post adoption - gov.scot \(www.gov.scot\)](http://www.gov.scot)

<sup>27</sup> Scottish Government (2019), The Scottish Government's Programme for Extending Permitted Development Rights in Scotland: A Sustainability Appraisal: [The Scottish Government's Programme for Extending Permitted Development Rights in Scotland: A Sustainability Appraisal \(www.gov.scot\)](http://www.gov.scot)

<sup>28</sup> Scottish Government (2020). The draft Infrastructure Investment Plan 2021-22 to 2025-26 Strategic Environmental Assessment Environmental Report : [The Draft Infrastructure Investment Plan: 2021-22 to 2025-26 Strategic Environmental Assessment Environmental Report \(www.gov.scot\)](http://www.gov.scot)

<sup>29</sup> [Heat in Buildings Strategy - achieving net zero emissions in Scotland's buildings - gov.scot \(www.gov.scot\)](http://www.gov.scot)



4.3.5 Potential cumulative, synergistic and in-combination effects have also been considered as relevant, and opportunities for environmental enhancement have also been identified.

#### **4.4 Alternatives**

4.4.1 The 2005 Act requires the Environmental Report to identify, describe and evaluate the likely significant effects on the environment of reasonable alternatives to a plan, programme or strategy, taking into account its objectives and geographical scope.

##### **Do nothing/Business as Usual**

4.4.2 Do nothing/business as usual is not a reasonable alternative to the proposal to introduce a Heat in Buildings Bill because the Climate Change (Scotland) Act 2019 requires plans to be laid that set out the pathway to reaching our net zero and interim emissions reduction targets. As such, a Bill to require all homes and buildings in Scotland to transition to clean heating systems by 2045 is essential if Scotland is to reach net-zero.

##### **Consideration of alternative energy efficiency and heat technology scenarios as a means to deliver the decarbonisation of homes and buildings in line with statutory climate change targets**

4.4.3 There are different strategic technologies that are available now, or could become available in the future, to reduce emissions from space and water heating. These include electric heating options such as heat pumps and storage heaters, heat networks and potentially the use of renewable or low carbon hydrogen as a replacement for methane gas in the mains gas network.

4.4.4 The main technologies available for deployment today, which are likely to remain the main strategic options for the next ten years, are electric solutions (in particular heat pumps) and heat networks. Subject to the safety and commercial case being established we may see 100% hydrogen becoming available in parts of the gas network towards the end of the decade.

4.4.5 The consultation is technology neutral, however, based on our view that there are no reasonable alternatives at this time to a proposal which allows for a mixed or blended technology pathway as the most effective and credible means of achieving our statutory emission reduction targets.

4.4.6 Finally, future PPS are likely to set further and more specific ambitions in this context, with technology specific PPS (such as any new and emerging hydrogen and bioenergy PPS) as well as lower tier plans likely to prove significant. Where any future policies and proposals are developed, these will themselves be subject to consideration in accordance with the requirements of the Environmental Assessment (Scotland) Act.

#### **4.5 Uncertainty and potential limitations of the assessment**

4.5.1 The subject matter of this assessment means that there are a number of areas of uncertainty, some of which will only be resolved as deployment of energy efficiency measures or low and zero emissions heat technologies increases. These include:

- The precise siting and location of any new development associated with usage and deployment of identified technologies at a range of scales (such as individual appliances as well as a need for any new or upgraded infrastructure);
- The need to secure all relevant permissions and licences (such as those associated with the operation of new heat networks);
- The role that technologies could play in the longer term; and
- Relevant emerging PPS (such as national technology specific PPS and future lower tier plans).

4.5.2 Existing planning and consenting regimes and regulatory processes, allied to good working practices and monitoring, can help ensure that potential adverse effects are avoided and positive effects enhanced. Future more detailed secondary regulations which will deliver the proposals laid out in the consultation at a lower legislative level will also be the subject of future assessment in accordance with the requirements of the Environmental Assessment (Scotland) Act.

## 5. Environmental Baseline

### 5.1 Introduction

5.1.1 Schedule 3 of the 2005 Act requires that the following be identified when undertaking an SEA:

- Relevant aspects of the current state of the environment and its likely evolution without implementation of the plan or programme.
- Environmental characteristics of areas likely to be affected.
- Relevant existing environmental problems.
- Relevant environmental protection objectives at the international, European or national level.

5.1.2 This section sets out a high level summary of the key environmental issues relevant to the consultation and its proposals. This is followed by a summary of how the environment is likely to evolve in the absence of proposals contained in this consultation.

### 5.2 Climatic Factors

5.2.1 The global climate is changing. Since the 1880s, human activity has led to a significant increase in atmospheric greenhouse gas emissions and global warming. This has resulted in an increase in the average temperature of the atmosphere and oceans, a reduction in snow and ice cover, and sea-level rise. The average temperature over the most recent decade (2009-2018) has been on average 0.3 °C warmer than the 1981-2010 average and 0.9 °C warmer than the 1961-1990 average. All the top ten warmest years for the UK, in the series from 1884, have occurred since 2002. Total rainfall from extremely wet days (days exceeding the 99th percentile of the 1961-1990 rainfall) increased by around 17% in the decade (2008-2017)<sup>3</sup>, for the UK overall. However, changes are largest for Scotland.<sup>30</sup>

5.2.2 In general, climate change projections suggest observed climate trends will continue to intensify in the future, including:

- an increase in both summer and winter average temperatures across both low and high emission scenarios;
- drier summers and wetter winters;
- an increase in the intensity of rainfall; and
- increased risk of flooding, drought, and extreme weather events.<sup>31</sup>

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<sup>30</sup> UK Climate Projections Headline findings (2022) [ukcp18\\_headline\\_findings\\_v4\\_aug22.pdf \(metoffice.gov.uk\)](#)

<sup>31</sup> UK Climate Projections Headline findings (2022) [ukcp18\\_headline\\_findings\\_v4\\_aug22.pdf \(metoffice.gov.uk\)](#)

- 5.2.3 A special report by the Intergovernmental Panel on Climate Change (IPCC), published in October 2018 (Global Warming of 1.5 °C), predicts that the impacts and costs of global warming of 1.5°C above pre-industrial levels will be far greater than expected, and consequently much worse at 2°C<sup>32</sup>. Further, the IPCC also reported that 1.5°C could be reached in as little as 11 years, and almost certainly within 20 years without major reductions in CO<sub>2</sub> emissions. Climate change trends such as increased risk of flooding can negatively impact energy infrastructure.
- 5.2.4 In 2021, the total greenhouse gas emissions (GHG) emissions in Scotland were estimated to be 41.6 million tonnes of carbon dioxide equivalent (MtCO<sub>2e</sub>), down 49.2% from 1990, but up 2.4% from 2020. The main contributors to this increase between 2020 and 2021 were increased emissions in Domestic Transport (+1.1 MtCO<sub>2e</sub>) following the impact of the COVID lockdown in 2020, and residential (+0.4 MtCO<sub>2e</sub>) sectors. Emissions reductions were seen in Energy (-0.5 MtCO<sub>2e</sub>), Business (-0.2 MtCO<sub>2e</sub>) and International Aviation and Shipping (-0.1 MtCO<sub>2e</sub>) sectors. All remaining sectors showed relatively modest increases in the latest year.<sup>33</sup>
- 5.2.5 Between 1990 and 2021, there was a 49.2 per cent reduction in estimated emissions, a 40.3 MtCO<sub>2e</sub> decrease. The most significant contributors to this overall reduction were:
- Reduction in Energy Supply emissions (such as power stations) (-16.8 MtCO<sub>2e</sub>; 77.6 per cent reduction)
  - ‘Land Use, Land Use Change And Forestry’ (LULUCF) reducing its net emissions over the period, reducing by 5.7 MtCO<sub>2e</sub> since 1990.
  - Reduction in Waste Management emissions (such as Landfill) (-5.0 MtCO<sub>2e</sub>; a 76.2 per cent reduction)
  - Reduction in Business emissions (-4.2 MtCO<sub>2e</sub>; a 35.3 per cent reduction)
  - Reduction in Domestic transport emissions (-2.6 MtCO<sub>2e</sub>; a 19.3 per cent reduction).
- 5.2.6 All other sectors have demonstrated a reduction in emissions since 1990.
- 5.2.7 Climate change can also give rise to indirect impacts arising from mitigation and adaptation measures. For example energy efficiency and heat decarbonisation of Scotland’s homes and buildings contributes to meeting statutory climate change targets, the primary purpose of the consultation in question in this assessment. However, individual technologies can have negative impacts such as localised visual effects, changes in landscape and land use, and impacts on biodiversity, water and air quality, amongst others.

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<sup>32</sup> IPCC (2018) Global Warming of 1.5oC October 2018 <https://www.ipcc.ch/>

<sup>33</sup> Scottish Government (2021) Scottish Greenhouse Gas Emissions 2121 [Scottish Greenhouse Gas Statistics 2021 - gov.scot \(www.gov.scot\)](https://www.gov.scot/resources/consultation-papers/collections/documents/Scottish-Greenhouse-Gas-Statistics-2021.pdf)



increased to 76.6 years and 80.8 years for males and females respectively<sup>40</sup>. However, life expectancy in Scotland remains the lowest in western Europe<sup>41</sup>.

- 5.3.4 The Scottish Index of Multiple Deprivation (SIMD), which identifies small concentrations of multiple deprivation across all of Scotland, shows that the 20% most deprived data zones in Scotland are located predominantly in urban areas, including Glasgow, Dundee, and Edinburgh<sup>42</sup>.
- 5.3.5 The buildings and buildings construction sectors combined are responsible for 30% of total global final energy consumption and 27% of total energy sector emissions<sup>43</sup>. In Scotland, around 80% of homes<sup>44</sup> and approximately 30% of non-domestic buildings<sup>45</sup> use mains gas for heating. Non-domestic mains gas accounts for a greater proportion of energy use in this sector. Gas supplied via the mains gas network is predominantly natural gas, a fossil fuel composed mainly of methane. Challenging weather, poor energy efficiency and reduced heating options (especially in rural areas) can contribute to making fuel bills unaffordable, resulting in fuel poverty.<sup>46</sup>
- 5.3.6 Fuel poverty is affected by levels of household income, the price of fuel required for space and water heating, the energy efficiency of housing and the use of fuel in households. In 2021 an estimated 19.65% (around 495,000 households) of all households were in fuel poverty, a reduction from 2019 when 24.6% were in this category. 9.5% (241,000 households) were living in extreme fuel poverty, a reduction from 12.4% (or 311,000 households) in 2019. The figure is continuing to fall with 11.3% (279,000 households) in 2018 and a decrease from the peak of 16% (384,000 households) in 2013. The median fuel poverty gap (adjusted for 2015 prices) for fuel poor households in 2021 (£690) is slightly lower than in 2019 (£700) but higher than in 2018 (£610) and similar to the median gap in 2012 to 2017. Between 2018 and 2019, rates of fuel poverty increased in remote rural areas (from 33% to 43%), increasing the gap when comparing overall urban (24%) to overall rural areas (29%). In 2021 rates of fuel poverty in remote rural areas had fallen to 21%. In 2021 levels of extreme fuel poverty were higher in rural areas (15%) compared to urban areas (9%). This reflects the high proportion of rural households which use electricity and other fuel types (such as solid mineral fuels) as their primary fuel type and the associated increase in fuel prices for these fuel types. Levels of fuel poverty among households using electricity as

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<sup>40</sup> [Life Expectancy in Scotland 2019-2021 \(nrsotland.gov.uk\)](https://nrsotland.gov.uk)

<sup>41</sup> [Life Expectancy in Scotland 2019-2021 \(nrsotland.gov.uk\)](https://nrsotland.gov.uk)

<sup>42</sup> [SIMD \(Scottish Index of Multiple Deprivation\)](#)

<sup>43</sup> [Buildings – Topics - IEA](#)

<sup>44</sup> Scottish Government. (2023), Scottish House Condition Survey, 2021 [Scottish House Condition Survey 2021 \(www.gov.scot\)](https://www.gov.scot)

<sup>45</sup> *This is currently unpublished findings from Energy Saving Trust's modelling of Scotland's nondomestic building stock.*

<sup>46</sup> Scottish Government (undated) Home energy and fuel poverty [Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-203: Environmental Report \(www.gov.scot\)](https://www.gov.scot)

their primary heating fuel have remained the highest, at 41% (a reduction from 43% in 2019), compared to households using gas (16%), oil (23%) and other fuel types (22%) as their primary heating fuel in 2021.<sup>47</sup>

- 5.3.7 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 Fuel Poverty (Target, Definition and Strategy) (Scotland) Act<sup>48</sup> and the Fuel Poverty Strategy for Scotland 2021<sup>49</sup>.
- 5.3.8 Flooding can have significant environmental impacts and can also affect people, communities and businesses. When floods occur they disrupt day-to-day lives and their impacts can be long lasting. Climate change is expected to increase the risk of flooding, and it also brings additional risks to human health posed by changes to air quality and rising temperatures.<sup>50</sup>
- 5.3.9 The potential impacts of climate change on population and human health will not be evenly spread. For example, pockets of dense urban development will be more at risk from surface water flooding and summer heat stress. In addition the effects to human health from climate change may have the greatest impact on vulnerable people. Negative health impacts are likely to be disproportionately severe in areas of high deprivation because of the reduced ability of individuals and communities in these areas to prepare, respond and recover.<sup>51</sup>

### **Population and Human Health: Summary and Key Issues**

- Scotland's population is growing and Scotland has experienced a small increase in heat demand in recent years.
- Heat in buildings accounts for approximately a fifth of Scotland's GHG emissions.
- Challenging weather, poor energy efficiency and reduced heating options (especially in rural areas) can make fuel bills unaffordable, resulting in fuel poverty.
- The potential impacts of climate change on population and human health will not be evenly spread. ( e.g. negative health impacts are likely to be disproportionately severe in area of high deprivation).

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<sup>47</sup> Scottish Government). (2023), Scottish House Condition Survey, 2021 [Scottish House Condition Survey 2021 \(www.gov.scot\)](https://www.gov.scot)

<sup>48</sup> The Scottish Parliament (undated), Fuel Poverty (Targets Definitions Strategy) Act 2019: <https://www.legislation.gov.uk/asp/2019/10>

<sup>49</sup> [Tackling fuel poverty in Scotland: a strategic approach - gov.scot \(www.gov.scot\)](https://www.gov.scot)

<sup>50</sup> Scottish Government (2020) Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-2032 [Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-2032: Environmental Report \(www.gov.scot\)](https://www.gov.scot)

<sup>51</sup> Scottish Government (2020) Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-2032 [Strategic Environmental Assessment of the Update to the Climate Change Plan 2018-2032: Environmental Report \(www.gov.scot\)](https://www.gov.scot)



## 5.4 Air

- 5.4.1 Air quality is affected by pollutants released into the atmosphere through human activity as well as from natural sources. In Scotland all priority air pollutants were lower in 2021 than in 2005. The greatest rate of decline is observed in the trend for SO<sub>2</sub> emissions, principally due to the reduction in coal use within the economy, with more modest declines observable for CO, NO<sub>x</sub>, Hg, Pb, VOCs, NH<sub>3</sub>, PM<sub>2.5</sub>, PM<sub>10</sub> and B[a]p. Emissions from Hg initially increased between 2005 and 2007 before decreasing due to the trend in emissions from power stations<sup>52</sup>. Despite this, in certain areas, poor air quality continues to negatively affect human health and the environment.
- 5.4.2 In regard to the domestic environment, since 2005 there has been an increase in emissions from the domestic sector due to an increase in popularity of open fires and wood burning stoves. Approximately 38% of UK primary particulate matter emissions come from burning wood and coal in domestic open fires and solid fuel stoves. This compares with industrial combustion (16%) and road transport (12%)<sup>53</sup>.
- 5.4.3 Air pollution can contribute to a number of health problems and climate change may exacerbate these issues and alter current patterns and concentrations of air pollution. For example, air pollution can lead to and exacerbate existing health problems such as respiratory conditions, and lead to reduced life expectancy<sup>54</sup>.
- 5.4.4 Where air standards are not being met, local authorities in Scotland have set up Air Quality Management Areas (AQMAs) to help reduce pollution. In July 2021 there were 36 AQMAs across Scotland which were established primarily as a result of road traffic emissions. Between 1990 and 2015 there have been reductions in emissions across all pollutants including ammonia (10%), PM<sub>10</sub> (63%), NMVOC (66%), nitrogen oxides (71%), carbon monoxide (83%), sulphur dioxide (92%) and lead (99%). The majority of these are declared in urban areas and primarily as a result of traffic emissions.<sup>55</sup>
- 5.4.5 Key issues for air include emissions from a number of sectors leading to air pollution, with air quality contributing to a number of health problems. Air quality and GHG emissions are intrinsically linked as they both arise from broadly the same sources. Measures that seek to reduce emissions from buildings such as from improved energy efficiency and heat decarbonisation, have the potential to broadly contribute to improved air quality.

### Air: Summary and Key Issues

- While air quality has improved significantly, poor air quality in certain areas continues to affect human health and the environment

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<sup>52</sup> [Publication of the Scottish Air Quality Database Annual Report for 2021 | Scottish Air Quality](#)

<sup>53</sup> [Clean Air Strategy 2019 \(publishing.service.gov.uk\)](#)

<sup>54</sup> [Cleaner Air For Scotland 2: Towards a Better Place for Everyone \(www.gov.scot\)](#)

<sup>55</sup> [Air Quality Management Areas \(scottishairquality.scot\)](#)



- Air pollution can contribute to a number of health problems and climate change may exacerbate these issues and alter current patterns and concentrations.
- Key issues for air include emissions from a number of sectors leading to air pollution with air quality and GHG emissions intrinsically linked as they both arise from broadly the same sources.
- Measures that seek to reduce emissions from buildings such as from improved energy efficiency and heat decarbonisation , have the potential to broadly contribute to improved air quality

## 5.5 Material assets

### Energy, development and infrastructure

- 5.5.1 In 2021, heat made up approximately half of Scotland’s energy consumption (50.6%) with transport (24.8%) and electricity generation (22%) the other major sectors consuming energy<sup>56</sup> . Of energy consumed for heat, 57% is used by the non-domestic sector and the remaining 43% by the domestic sector<sup>57</sup>. Energy consumption in the domestic sector has decreased by 19.0% since 2005-07, and in the non-domestic sector has decreased by 24.0% from the baseline.
- 5.5.2 The vast majority of the electricity that Scotland generates is from low carbon sources (87.8%), which has changed rapidly since 2010 when about half of Scotland’s generation came from fuels.<sup>58</sup> In the 12 months ending March 2023, 83.6% of the electricity that Scotland consumed came from low carbon sources<sup>59</sup>
- 5.5.3 There have been significant changes to the electricity generation mix in recent years with the vast majority of the electricity that Scotland generated from low carbon sources. Most recently however, electricity generation from fossil fuels increased from 10.2% in 2017, compared to 48.4% in 2010. In 2019, useful renewable heat generated in Scotland was equivalent to 6.5% of the fuel consumed for non-electrical heat demand, an increase from 6.2% in 2018 and from 0.9% in 2008<sup>60</sup>.
- 5.5.4 Infrastructure will play a key role in ensuring security of supply and decarbonising our energy systems in the most cost effective, affordable way. Energy storage is likely to be an increasingly important part of the transition to delivering clean, affordable and secure supplies of energy<sup>61</sup>.

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<sup>56</sup> [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io/scottish-energy-statistics/)

<sup>57</sup> [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io/scottish-energy-statistics/)

<sup>58</sup> [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io/scottish-energy-statistics/)

<sup>59</sup> [Scottish Energy Statistics Hub \(shinyapps.io\)](https://shinyapps.io/scottish-energy-statistics/)

<sup>60</sup> [Annual compendium of Scottish energy statistics - gov.scot \(www.gov.scot\)](https://www.gov.scot/resources/consultation-papers/collections/documents/Annual-compendium-of-Scottish-energy-statistics.pdf)

<sup>61</sup> ClimateXChange (2016) Energy Storage in Scotland - Summary of reports on thermal and electrical energy storage : [https://www.climateexchange.org.uk/media/1391/summary\\_energy\\_storage.pdf](https://www.climateexchange.org.uk/media/1391/summary_energy_storage.pdf)

- 5.5.5 Support for energy efficiency and heat decarbonisation as a means to deliver emission reductions from Scotland's homes and buildings is likely to require new or expanded infrastructure at a range of scales.

### Land Use

- 5.5.6 Key land uses in Scotland include agriculture and forestry, covering approximately 80% of Scotland's land mass<sup>62,63</sup>.
- 5.5.7 Intensive land management practices, such as the use of high levels of fertilisers and pesticides, is one of the key pressures on land with a shift toward intensification having the possibility to lead to negative impacts across a number of topics including biodiversity<sup>64</sup> and soil<sup>65</sup>.
- 5.5.8 In the context of heat decarbonisation and energy efficiency in the current built stock, effects will depend on the scale of technology deployment and type of technology used.

### Material Assets : Summary and Key Issues

- Today, heat is responsible for approximately half of Scotland's energy use and buildings/infrastructure will be an important underpinning for heat decarbonisation.
- Key issues for material assets include those associated with development and infrastructure and pressure on land use.
- Any changes in land use required to meet climate change targets could also have environmental effects.

## 5.6 Cultural and historic heritage

- 5.6.1 Scotland's many and varied historical sites are unique and irreplaceable. These sites and features are regarded as making a valuable contribution to our quality of life, cultural identity, education and economy. While these assets are distributed widely throughout Scotland, there are clusters of sites in and around our settlements and also around our coastlines.
- 5.6.2 Some parts of Scotland's historic environment are protected through a process of designation. The process aims to identify parts of the historic environment for their significance and enhance their protection. As of 2016, it is estimated that around 5-10% of the historic environment is designated<sup>66</sup>.

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<sup>62</sup> [Agriculture facts and figures: 2019 - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/agriculture-facts-and-figures-2019/pages/1-introduction.aspx)

<sup>63</sup> Forestry Research (2022) Forestry Statistics 2022. [2022 - 1: Woodland Area & Planting - Forest Research](https://www.forestryresearch.co.uk/2022-1-woodland-area-planting-forest-research)

<sup>64</sup> Scotland's Environment (2014) State of the Environment Report. <https://www.environment.gov.scot/media/1170/state-of-environment-report-2014.pdf>

<sup>65</sup> Scotland's Soils (undated) Extent of soil erosion and landslides: [Home | Scotland's soils \(environment.gov.scot\)](https://www.environment.gov.scot/publications/scotlands-soils/pages/1-introduction.aspx)

<sup>66</sup> Historic Environment Scotland (2016) Scotland's Historic Environment Audit: Summary Report 2016 : <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=315b3f0d-631b-4a24-b12b-a6db00ba1696>

- 5.6.3 Designated assets currently include World Heritage Sites, listed buildings, scheduled monuments, conservation areas and Historic Marine Protected Areas. However, whilst most of the historic environment is undesignated (90-95%), these known but undesignated assets provide important contextual information which helps us better understand designated sites. Scotland's historic environment resonates internationally and nationally, as well as being culturally important to local communities.
- 5.6.4 Development is a key pressure on the historic environment and cultural heritage, both directly in terms of damage to known and unknown features, and the potential for impacts on setting. Other known pressures include changing land use and land management, such as through the installation of infrastructure such as pipelines; as well as pressure from tourism/visitors, and climate change<sup>67</sup>. An example of these pressures is development associated with the installation and operation of fabric first energy efficiency measures, technologies such as heat pumps as well as any land management change associated with bioenergy. Climate change related impacts include damage to masonry, risk of dampness, condensation and fungal growth, vegetation growth, and accelerated decay. Historic landscapes and sites within the coastal zone are particularly vulnerable and this and these threats are likely to grow in the future, given the future predictions of the likely effects of global warming and climate change for the remainder of this century. Action to mitigate and adapt to the effects of climate change are also likely to have a significant effect.

### **Cultural Heritage: Summary and Key Issues**

- Scotland's many and varied historical sites are unique and irreplaceable.
- Development is a key pressure on the historic environment and cultural heritage, both directly in terms of damage to known and unknown features, and possible impacts on setting.

### **5.7 Likely evolution of the environment without implementation of the proposals contained in the consultation**

- 5.7.1 The proposals contained within the consultation are intended to drive forward improved energy efficiency and implement zero direct emissions heating across all built stock in order to contribute to statutory climate change targets.
- 5.7.2 The proposals are intended to support the acceleration of GHG emissions reductions associated with Scotland's homes and buildings in line with ambitious climate change targets. In the absence of the proposals heat decarbonisation of homes and buildings might continue along observed trends meaning that decarbonising heat will take longer and will not be in line with the required pathway for reducing emissions in buildings as set out in the Update to the Climate Change Plan.

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<sup>67</sup> Historic Environment Scotland (2019) Historic Environment Policy for Scotland: <https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=1bcfa7b1-28fb-4d4b-b1e6-aa2500f942e7>

## **6. Findings of the Assessment**

### **6.1 Introduction**

- 6.1.1 A staged approach to the assessment has been undertaken as set out in the Assessment methodology (See **Section 4.3**). Early assessment work included a review of relevant SEA environmental reports to identify known likely environmental effects. See **Appendix A** for further details.

### **6.2 What are the Key Proposals**

#### **1. Supporting the growth of heat networks**

- 6.2.1 We have made good progress with the legislative framework surrounding heat networks, and have identified heat networks as a source of heat which could play a much greater role if grown to a scale which makes the network of heat networks economic to both create and run. To that end, the proposals suggest duties and requirements to be placed on the non-domestic sector which will, in turn, support heat networks which can then be to the benefit of domestic consumers.

#### **2. Prohibiting the use of Direct Emissions Heating systems, including the establishment of dates for compliance (both backstop and interim triggers)**

- 6.2.2 We know that emissions will only fall if polluting heating (e.g. gas and oil boilers) are removed, and that this will only occur at the scale necessary if a regulatory pathway is created and enforced.
- 6.2.3 To support the pathway to zero emissions for all properties across Scotland, the consultation is proposing to prohibit the use of polluting heating systems by 2045. It also proposes the use of backstop dates for different sectors (2038 for public authorities, 2045 for all other properties), and seeks views on the use of triggers requiring earlier action where appropriate.
- 6.2.4 The use of such triggers will also help to avoid the risk of property owners waiting until the 2045 backstop date and help with supply chain management.

#### **3. Setting minimum energy efficiency standards for domestic properties**

- 6.2.5 Improving the energy efficiency of a home means that it needs less energy to heat it to a comfortable temperature. A good level of energy efficiency helps the performance of many zero direct emissions heating systems.
- 6.2.6 The consultation is proposing to set a standard for all privately owned domestic properties based on either a list of measures which is simple to understand for all property owners.
- 6.2.7 This standard should be reached by 2033 for all privately owned properties, and by 2028 for privately rented properties, the reason for this being that tenants are least able to implement change in the properties in which they live, but are most affected by poor quality standards.

#### **4. Providing flexibility**

- 6.2.8 We also understand that there may be occasions when it will be necessary to vary the standard, or provide extra time to meet it. This might apply to either

part (energy efficiency and clean heat) or both. The consultation therefore proposes options when a variation might be needed. It also proposes options when a property owner might need an abeyance, or extra time.

### **6.3 What are the environmental issues of relevance**

- 6.3.1 Key environmental issues of relevance relate to the SEA topics of climatic factors, population and human health, air, material assets, and cultural and historic heritage.
- 6.3.2 Key issues for **climatic factors** include greenhouse gas emissions from a range of sources, with energy supply and use of homes and buildings contributing to emissions. Observed climate change trends (such as wetter winters, drier summers and extreme weather events) are likely to intensify in the future and this can negatively impact on energy infrastructure (such as through flooding). Climate change can also give rise to indirect effects arising from mitigation and adaptation measures. For example energy efficiency and heat decarbonisation of Scotland's homes and buildings contributes to meeting statutory climate change targets. However, individual technologies can have negative impacts such as localised visual effects on cultural and historic heritage, changes in landscape and land use, and impacts on biodiversity, water and air quality, amongst others. Climate change has also been identified as a primary pressure on many of the SEA topic areas.
- 6.3.3 Key issues for **population and human health** include challenging weather, poor energy efficiency and reduced heating options (especially in rural areas) which can contribute to making fuel bills unaffordable, resulting in fuel poverty. The potential risks and benefits of climate change on population and human health will not be evenly spread. For example, areas of dense urban development will be more at risk from surface water flooding and summer heat stress. In addition the effects to human health from climate change may have the greatest impact on vulnerable people. Negative health impacts are likely to be disproportionately severe in areas of high deprivation because of the reduced ability of individuals and communities in these areas to prepare, respond and recover.
- 6.3.4 Key issues for **air** include emissions from a number of sectors leading to air pollution, with air quality contributing to a number of health problems. Air quality and GHG emissions are intrinsically linked as they both arise from broadly the same sources. Measures that seek to reduce emissions from buildings such as from improved energy efficiency and heat decarbonisation, have the potential to broadly contribute to improved air quality.
- 6.3.5 Key issues for **material assets** include those associated with development and infrastructure and pressure on land use. Energy efficiency and heat decarbonisation as a means to support emission reductions from Scotland's homes and buildings will require new or expanding infrastructure facilities at a

range of scales<sup>68</sup>. Changes in land use required to meet wider climate change targets could also have environmental effects.

- 6.3.6 Key issues for **cultural heritage** include development which is a key pressure on the historic environment and cultural heritage, both directly in terms of damage to known and unknown features, and possible impacts on setting such as changes to the fabric of buildings.

## 6.4 What are the likely significant environmental effects of key proposals

### 1. Supporting the growth of Heat networks

- 6.4.1 Previous SEA work recognises that the installation of district heating network infrastructure such as pipes has the potential for **localised environmental effects** including **short term negative effects** on **material assets** from new development activities. **Localised negative effects** on **population and human health** could also arise such as, through noise linked to the operation of heat pumps. **Potential localised negative effects** on **landscape and cultural and historic heritage** could also occur as a result of at scale changes to infrastructure necessary for deployment. For example, the installation of an individual air source heat pump would require an external unit, which would require a place outside the home where it can be fitted to a wall or placed on the ground, including space around it to ensure the flow of air. The size of the unit could vary greatly depending on the building's heat demand and the local characteristics.
- 6.4.2 **Localised mixed/uncertain secondary effects** on a **range of SEA topics** could occur as a result of the deployment of heat pumps and heat networks, the significance of which would be largely dependent on the scale as well as location with respect to sensitive human, natural and cultural receptors.
- 6.4.3 **Localised positive effects** on **material assets** and **population and human health** could also occur from support for more affordable and locally available supplies of heat associated with heat networks.
- 6.4.4 Any potential adverse impacts are considered likely to be mitigated by existing mechanisms such as the planning system as well as environmental guidance and on-site management measures and these, as well as potential strategic mitigation opportunities, are discussed further in Section 7.
- 6.4.5 **Adverse localised effects** on a **number of SEA topics** such as **population and human health, soil, water, air and biodiversity**, as a consequence of construction and infrastructure improvement works could also occur but it is recognised that these effects are likely to be **temporary** in nature.
- 6.4.6 Previous SEA work highlights that further benefits for **population and human health** are also likely to arise from improved security of energy supply and reduced heat demand, which may also have benefits for general health and

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<sup>68</sup> [National Planning Framework 4 - gov.scot \(www.gov.scot\)](http://www.gov.scot)

wellbeing. The above benefits are likely to be experienced to a greater extent where support is focused towards those living in deprived areas.

- 6.4.7 **Significant positive effects for material assets** are also considered likely from the approach presented across all proposals which is technology agnostic. This is because a focus on strategically important technologies that are ready for deployment (energy efficiency measures, heat pumps and heat networks) in the **short term**, as well as recognition of a potential role for hydrogen for example, in the **long term** can enable the flexible and stable operation of the energy network at a national scale.

### **Considered cumulatively**

- 6.4.8 **Cumulative positive effects for material assets** are also considered likely as a result of benefits associated with a greater diversity in technologies and future-proofing energy supply as a means to support greater resilience to the effects of climate change.
- 6.4.9 **Mixed/uncertain secondary effects on a range of SEA topics** could also occur as a result of the take up of strategically important energy efficiency measures and heat technologies ready for deployment. Effects could range from **permanent to temporary** and significance would be dependent on a number of factors, including scale, siting and design.

### **2. Prohibiting the use of Direct Emissions Heating systems, including the establishment of dates for compliance (both backstop and interim triggers)**

- 6.4.10 The prohibition of fossil fuels in a phased way affecting all existing properties, will make a direct contribution to the reduction of emissions over the medium and longer term and change the contribution made by the built sector to the legally binding targets. This will contribute to broad environmental benefits for **climatic factors, air, population and human health and material assets**. Similarly the requirement to meet minimum energy efficiency standards will help to reduce demand for energy from that property, and in turn, reduce bills. This will then contribute positively to broad environmental benefits for **population and human health**. This will be further developed through the support systems which will sit alongside the standards proposed. Where outcomes recognise existing biodiversity targets this can also contribute to broad environmental benefits for **biodiversity, soil and water**.
- 6.4.11 Linked to this, there is potential for associated **significant positive effects for air quality** (as emissions and air pollutants often originate from the same source), as well as associated benefits for **population and human health**. Previous SEA work highlights that further benefits for **population and human health** are also likely to arise from improved security of energy supply and reduced heat demand, which may also have benefits for general health and wellbeing. The above benefits are likely to be experienced to a greater extent where support is focused towards those living in deprived areas.
- 6.4.12 **Cumulative positive effects for climatic factors** are considered likely as a result of reducing GHG emissions associated with broad support for measures that reduce the overall demand for heat (see below). Associated **air quality**

improvements are also considered likely due to linkages between sources of GHG emissions and air pollutants such as particulate matter

- 6.4.13 The setting of requirements which will drive change will aid the supply chain in planning and delivering across Scotland will contribute to the broad environmental benefits of **population and human health, and material assets**.
- 6.4.14 The costs associated with changes needed to properties to remove direct emissions heating systems are likely to have a **negative** effect on **population and human health**. This can be viewed however against the supportive services which Scottish Government already offers through its various advice service third party providers (HES, BES, etc) and through its targeted delivery programmes including for those in fuel poverty.
- 6.4.15 **Cumulative positive effects** for **population and human health** are also considered likely where a focus is given to reducing fuel poverty. For example, individual heat pumps can be highly effective in most buildings when they are combined with appropriate energy efficiency measures.
- 6.4.16 **Mixed effects** on a range of SEA topics could occur as a result of the standard when considered with the secondary phasing, triggers and abeyances. The impact of these latter provisions will spread the impacts of standard and allow for more individualised application.
- 6.4.17 Any potential adverse impacts are considered likely to be mitigated by existing mechanisms such as the planning system, the provision of environmental guidance and on-site management measures and the targeting of support and advice, together with the above mentioned use of abeyances and variations to the standard. Local mitigation is discussed further in Section 7.
- 6.4.18 The use of phasing through property purchase will similarly make a direct contribution to the reduction of emissions over the medium and longer term and change the contribution made by the built sector to the legally binding targets. This will contribute to broad environmental benefits for **climatic factors, air, population and human health** and **material assets**. Where outcomes recognise existing biodiversity targets this can also contribute to broad environmental benefits for **biodiversity, soil and water**.
- 6.4.19 As with the domestic standard, linked to this, there is potential for associated **significant positive effects** for **air quality** (as emissions and air pollutants often originate from the same source), as well as associated benefits for **population and human health**. Previous SEA work highlights that further benefits for **population and human health** are also likely to arise from improved security of energy supply and reduced heat demand, which may also have benefits for general health and wellbeing. The above benefits are likely to be experienced to a greater extent where support is focused towards those living in deprived areas.
- 6.4.20 **Cumulative positive effects** for **climatic factors** are also considered likely here, as a result of reducing GHG emissions associated with broad support for measures that reduce the overall demand for heat. Associated **air quality**



improvements are also considered likely due to linkages between sources of GHG emissions and air pollutants such as particulate matter.

- 6.4.21 The setting of standards which aid the supply chain in planning and delivering across Scotland will contribute to the broad environmental benefits of **population and human health, and material assets**.
- 6.4.22 As with domestic properties, installation and operation of energy efficiency measures could, in principle give rise to some localised **negative effects on biodiversity** (as a result of works undertaken in roof cavities/loft insulation, which may hold bat roosts, for example). These measures may also impact **negatively on cultural and historic heritage** (such as directly from visual impacts on properties and their environs). This could also be true for the installation of clean heating systems, such as air source heat pumps. The impacts of these measures could more broadly have a minor localised **negative effect on landscapes** (such as directly from visual impacts on settings). The installation works for both energy efficiency measures and clean heating systems could have localised and short term **negative effects on population and human health, and air quality**, occurring as a result of construction activity and development. These effects are likely to be **temporary** in nature.
- 6.4.23 **Mixed effects** on a range of SEA topics could occur as a result of the standard when considered with phasing as a result of property purchase, and variations. The impact of these latter provisions will spread the impacts of standard and allow for more individualised application.
- 6.4.24 Any potential adverse impacts are considered likely to be mitigated by existing mechanisms such as the planning system as well as environmental guidance and on-site management measures. Local mitigation is discussed further in Section 7.

### 3. Setting minimum energy efficiency standards for domestic properties

- 6.4.25 The setting of a standard to be met by all domestic properties which, by the end date, will improve the energy efficiency of those properties, thus reducing their demand for energy, is designed to make direct contribution to our commitments to climate change targets. They deliver on the commitments of other PPS including, in particular, the Heat in Buildings Strategy. Considered separately and together the measures to prohibit direct emissions heating, and improve energy efficiency will make a **significant positive effects for climatic factors, population and human health, air and material assets**.
- 6.4.26 **Cumulative positive effects for climatic factors** are considered likely as a result of reducing GHG emissions associated with broad support for measures that reduce the overall demand for heat (see above). Associated **air quality** improvements are also considered likely due to linkages between sources of GHG emissions and air pollutants such as particulate matter
- 6.4.27 As above, the setting of standards which aid the supply chain in planning and delivering across Scotland will contribute to the broad environmental benefits of **population and human health, and material assets**.

- 6.4.28 Installation and operation of energy efficiency measures could, in principle give rise to some localised **negative effects** on **biodiversity** (as a result of works undertaken in roof cavities/loft insulation, which may hold bat roosts, for example). These measures may also impact **negatively** on **cultural and historic heritage** (such as directly from visual impacts on properties and their environs). This could also be true for the installation of clean heating systems, such as air source heat pumps. The impacts of these measures could more broadly have a minor localised **negative** effect on **landscapes** (such as directly from visual impacts on settings). The installation works for both energy efficiency measures and clean heating systems could have localised and short term **negative** effects on **population and human health**, and **air quality**, occurring as a result of construction activity and development. These effects are likely to be **temporary** in nature. Localised **positive effects on population and human health** are also considered likely (as a result of reducing the cost of achieving thermal comfort).
- 6.4.29 As above, the costs associated with changes needed to properties to improve the energy efficiency standard are likely to have a **negative** effect on **population and human health**. This can be viewed however against the supportive services which Scottish Government already offers through its various advice service third party providers (HES, BES, etc) and through its targeted delivery programmes including for those in fuel poverty.
- 6.4.30 **Cumulative positive effects** for **population and human health** are also considered likely where a focus is given to reducing fuel poverty. For example, fabric first measures can help to reduce the cost of achieving thermal comfort. Individual heat pumps can also be highly effective in most buildings when they are combined with appropriate energy efficiency measures.
- 6.4.31 As above, **Mixed effects** on a range of SEA topics could occur as a result of the standard when considered with the phasing, early trigger as a result of property purchase and abeyances. The impact of these latter provisions will spread the impacts of standard and allow for more individualised application.
- 6.4.32 Any potential adverse impacts are considered likely to be mitigated by existing mechanisms such as the planning system, the provision of environmental guidance and on-site management measures and the targeting of support and advice, together with the above mentioned use of abeyances and variations to the standard. Local mitigation is discussed further in Section 7.

#### 4. Providing flexibility

- 6.4.33 **Mixed effects** on a range of SEA topics could occur as a result of the standard when considered with the use of triggers and abeyances. The impact of these latter provisions will spread the impacts of the standard and allow for more individualised application.
- 6.4.34 As above, the setting of standards in a way which provides clarity to the supply chain and smooths out the uptake of change, and thus smooths the impact on suppliers in planning and delivering across Scotland will contribute to the broad environmental benefits of **population and human health, and material assets**

6.4.35 Any potential adverse impacts are considered likely to be mitigated by existing mechanisms such as the planning system, the provision of environmental guidance and on-site management measures and the targeting of support and advice, together with the above mentioned use of abeyances and variations to the standard. Local mitigation is discussed further in Section 7.

## 6.5 Do the key proposals address key environmental issues identified?

6.5.1 Taken together, and when considered in the round, the proposals set out in the Consultation are likely to contribute to addressing the key environmental issues identified. Significant reductions in **GHG emissions** associated with Scotland's homes and buildings are likely as well as **associated benefits** for **air** and **population and human health** (including through measures which help mitigate fuel poverty). Further, a technology neutral position is likely to contribute to diversifying energy supply and can support the use of local energy systems, with the potential to improve the resilience of energy networks (including to the impacts of climate change).

6.5.2 The assessment recognises that there is potential for direct and indirect impacts on **cultural and historic heritage** and **landscape** associated with the development and deployment of energy efficiency measures and heat technologies and their associated infrastructure now and in the future. It is considered that existing mitigation measures as well as strategic mitigation opportunities can help ensure that potential adverse effects are avoided and positive effects enhanced. Further opportunities for mitigation and enhancement are included in Section 7.

## 7. Conclusions, Mitigation and Enhancement

### 7.1 Conclusions

- 7.1.1 The assessment concludes that the proposals set out in the Consultation are likely to have **significant positive effects** on **climatic factors, air, population and human health** and **material assets**. This is increase over time as the backstop dates of 2033 for energy efficiency standards, and 2045 for heating are reached.
- 7.1.2 The potential for effects **in combination** with other plans, programmes and strategies has also been considered. The Consultation, and its subsequent Bill have the potential to **positively** and **cumulatively** contribute across a wide range of Scottish Government policy areas within the context in which it sits.
- 7.1.3 Taking into account the high-level nature of the Consultation and any subsequent Bill, which will rely on secondary legislation to provide the detail of delivery, there is some inherent **uncertainty** regarding the environmental impacts that may arise as a result of upscaling expected as a result of legislative requirements for all buildings.
- 7.1.4 The assessment identifies the potential for **mixed/uncertain secondary effects** on a **range of SEA topics** as a result of the expected deployment of energy efficiency measures and heat technologies ready for deployment (including energy efficiency measures, heat pumps and heat networks) at the **local level**. Existing mitigation measures can help to address these.
- 7.1.5 The assessment further recognises that the precise effects would be dependent on a range of factors including the scale of development and deployment of individual technologies as well as location with respect to sensitive human, natural and cultural receptors. Existing mitigation at the local level can help to address these and relevant emerging PPS also has the potential to provide mitigation at the strategic level.

### 7.2 Mitigation

#### Local mitigation measures

- 7.2.1 Where future development and deployment of strategically important energy efficiency measures and heat technologies have the potential to result in **secondary mixed/uncertain effects** consideration should be given to opportunities to mitigate any such effects at lower tiers of plan-making and at the project level. This is likely to occur only in the case of heat networks which will be the subject of specific and individual permissions.
- 7.2.2 There are a range of existing mitigation measures in place which may apply including EIA, environmental management plans, European protected species licencing, and through the planning system as well as best practice guidance

such as that with a focus on landscape<sup>69</sup> and the historic environment<sup>70</sup> Sustainability management tools such as those under the Renewable Heat Incentive, which includes requirements for biomass used in renewable heat installations to meet a set of sustainability criteria that aim to guarantee that it was sustainably produced, are also relevant.

## Strategic Mitigation

- 7.2.3 The assessment further recognises that any **future** upscaling of heat technologies has the **potential for mixed/uncertain environmental effects across SEA topics** but precise effects would be dependent on a range of factors including the scale of development and deployment of individual technologies as well as location with respect to sensitive human, natural and cultural receptors. Emerging and future PPS at the lower-tier can potentially provide for more detailed consideration of environmental effects and set out the potential for future strategic level mitigation, taking into account the findings of this SEA.
- 7.2.4 In addition to local mitigation measures identified above, the development of emerging and future PPS with a focus on specific technologies (such as national action plans), place-based approaches to energy efficiency and heat decarbonisation (such as lower tier plans) and national PPS that focus on planning and land use (such as NPF4, and the third Land Use Strategy) are particularly relevant as they could potentially provide mitigation at the strategic level.
- 7.2.5 For example, at the national level, powers contained within a future Heat in Buildings Bill will require the introduction of secondary regulations which will be the subject of further scrutiny at a more detailed level.
- 7.2.6 Also, the roll-out of Local Heat and Energy Efficiency Strategies will provide an important platform to consider both local community and wider national infrastructure issues and their associated potential environmental effects. These Strategies will set out the long term vision for decarbonising heat in buildings and improving their energy efficiency on a local authority area basis.

## 7.3 Opportunities for Enhancement

- 7.3.1 The SEA findings support the introduction of a 2045 backstop date and energy efficiency and heat decarbonisation aspirations of the consultation. The proposed Heat in Buildings Bill and any future secondary regulations to roll out its primary powers begin a positive journey to realise the Scottish Government policies and proposals laid out in the Heat in Buildings Strategy in relation to heat transition for buildings across Scotland. When taken together with existing PPS the proposals can contribute to significant positive environmental effects across all sectors.

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<sup>69</sup> Such as [Micro-renewables | NatureScot](#)

<sup>70</sup> such as <https://www.historicenvironment.scot/advice-and-support/your-property/saving-energy-in-traditional-buildings/>

7.3.2 The SEA supports the technology neutral approach proposed in the consultation regarding heat systems which might achieve zero emissions. This coupled with a focus on fabric first energy efficiency measures recognises the need for choice in achieving the behaviour change needed to achieve the targets.

7.3.3 The following specific opportunities for enhancement have been identified:

- To obtain the maximum environmental benefits, a focus could be given to actions that support opportunities for early take up of the Standard across domestic stock. This could be done through support, advice and messaging to raise the profile of the Standard and works needed to meet it.
- To obtain the maximum environmental benefits a focus could be given to people living in deprived areas and in rural areas where extreme fuel poverty rates are highest. This could be done through the existing delivery programmes where there is a focus on those in or at risk of becoming fuel poor.
- To obtain maximum environmental benefits a focus could be given to deployment of zero emissions technologies in areas which currently use high carbon heating fuels, and in areas recognised as being cost effective in the short term and in areas least likely to receive a heat network in the longer term. This could be done through focused targeting and messaging.
- To obtain maximum environmental benefits a focus could be given to working with stakeholders, such as Historic Environment Scotland, to develop more solutions to transition Scotland's historic buildings to zero emissions heating while respecting and preserving the special characteristics of our buildings and places.

## 8. Monitoring

- 8.1.1 Section 19 of the Environmental Assessment (Scotland) Act (2005) requires the responsible authority to monitor significant environmental effects of the implementation of the PPS. This should be done in a way to enable them to take appropriate remedial action, where applicable.
- 8.1.2 A wide range of existing programmes have associated monitoring in place at the national level. For example, the Annual Energy Statement reports<sup>71</sup> and the Annual compendium of Scottish energy statistic<sup>72</sup> on progress towards the targets outlined in the 2017 Scottish Energy Strategy<sup>73</sup> and in the recently published draft Energy Strategy<sup>74</sup>. This includes reporting on heat demand, main sources of heat and the amount of renewable heat generated annually.
- 8.1.3 Building on these existing monitoring arrangements, a monitoring and evaluation framework will also be published in 2023 to help measure progress against our Heat in Buildings Strategy. It is proposed that monitoring for significant environmental effects is an integral part of this framework. It is anticipated that it will set out:
- a comprehensive framework covering homes, work places, public sector buildings and other non-domestic buildings; and
  - a range of output and outcome indicators, linked to our outcomes, to inform an annual statement of progress, taking account of the Climate Change Plan monitoring framework, monitoring and evaluation requirements for Fuel Poverty as required by the Fuel Poverty (Targets, Definition and Strategy) Act 2019.
- 8.1.4 It is proposed that monitoring for significant environmental effects is an integral part of this framework.

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<sup>71</sup> [Annual energy statement: 2020 - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/annual-energy-statement-2020/pages/1-introduction.aspx)

<sup>72</sup> [Annual compendium of Scottish energy statistics - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/annual-compendium-of-scottish-energy-statistics/pages/1-introduction.aspx)

<sup>73</sup> Scottish Government (2017) Scottish Energy Strategy. <https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/>

<sup>74</sup> [Scotland's Energy Strategy and Just Transition Plan: Ministerial statement - gov.scot \(www.gov.scot\)](https://www.gov.scot/publications/scotland-s-energy-strategy-and-just-transition-plan-ministerial-statement/pages/1-introduction.aspx)

## 9. Next Steps and Consultation

- 9.1.1 Public views and comments are invited on both this Environmental report and the proposals for the Bill to which it relates. Details of how to respond are provided below:

### When can I respond?

Respondents are asked to submit responses to this Environmental Report directly to the Scottish Government by closing date of 8 March 2024.

### How can I respond?

**Online:** You can respond online using the Scottish Government’s consultation platform, Consultation Hub, at: <https://consult.gov.scot/energy-and-climate-change-directorate/heat-in-buildings-strategy/>

Consultation Hub allows you to save and return to your responses while the consultation is still open. A copy of your final response will be emailed to you.

**By Email** Responses can be submitted by email to [HiBConsultation@gov.scot](mailto:HiBConsultation@gov.scot)

### How will responses be considered?

Following the consultation, a Post-Adoption Statement will be prepared. The Statement will reflect on the views provided on the findings of the assessment and the proposals in the Consultation Paper and will explain how the issues raised have been taken into account in finalising the proposed Heat in Buildings Bill.

### Consultation Questions on the Environmental Report

Respondents may find the following questions helpful to provide a focus for their responses to this Environmental Report. Please note that responses do not need to be limited to these questions, and more general comments on this Environmental Report and the proposals set out in the Consultation Paper are also invited.

1. What are your views on the accuracy and scope of the information used to describe the SEA environmental baseline set out in the Environmental Report?
2. What are your views on the reasonable alternatives set out in the Environmental Report?
3. What are your views on the predicted environmental effects as set out in the Environmental Report?
4. What are your views on the findings of the SEA and the proposals for mitigation and monitoring of the environmental effects set out in the Environmental Report?



## Appendix A - Stage 1 Assessment summary

Table 3. Summary of relevant SEA findings by environmental topic

**Climatic factors - Significant positive effects** on climatic factors are likely as a result of measures that improve energy efficiency and thus reduce demand for heat. The prohibition of fossil fuel heating systems is a proposal designed to contribute directly to our commitments to climate change and the targets associated with that. **Cumulative positive effects** are also expected for climate factors as a result of a reduction in GHG emissions. These conclusions hold true for both domestic and non-domestic properties.

**Population and human health** – for both domestic and non-domestic properties, **significant positive effects** on population and human health are likely as a result of measures, mentioned above to improve energy efficiency and reduce demand for heat. This is also likely as a result of the reduction which will occur to total GHG emissions. Linked to this are the benefits which will occur to human health as a result in improvements to air quality. This is also true when considered against energy security and our current efforts to reduce reliance on the gas network. Further positive effects are likely to come from the support being offered to ensure change happens in a fair way.

**Positive effects** associated with this factor are also likely when looking at the supply chain and impact the proposals will have as a result of delivering across Scotland. The impact of the proposal on those in or at risk of becoming fuel poor are also likely to be positive, with the help of targeted support programmes.

**Negative effects** may occur as a result of installation works, but these are likely to be short lived and localised in nature. Boarder negative effects are however identified associated with the costs of meeting the standard/target. Efforts to mitigate these effects will be needed to ensure the successful roll out of the proposals.

**Air - Significant positive effects on air quality** are likely from measures that reduce energy generation emissions which will be brought about through energy efficiency measures and a prohibition of direct emissions heating systems. This reduction is a key founding principle of the Bill itself.

**Cultural and historic heritage** – There are likely to be **negative impacts** on this factor as a result of works which might impact both directly and indirectly. The visual impact on properties which might fall within this category will need to be carefully considered. Impacts are likely to be visual in nature. This may also hold true for the expansion of heat networks, again as a result of the visual impact of works.

**Material assets** – the proposals are likely to have **significant positive effects** on this factor as a result of improvements resulting from the installation of energy efficiency measures in particular. The prohibition of direct emissions heating will make a direct contribution to the reduction of emissions, again having a positive effect. The combination of these proposals will, as above, impact positively on the supply chain, which will in turn have a positive effect on this factor. Any negative

impacts associated with installation works, both at a property level and heat network level are likely to be short term in nature.

## **Detailed relevant SEA findings by SEA topic**

### **Climate Factors**

- Setting a standard which prohibits the use of fossil fuel boilers and which drives improvements in energy efficiency in domestic properties will make a direct positive contribution to our commitments to climate change targets.
- The setting of the standard will reduce the need for energy for heat, and will reduce overall GHG emissions arising from heat use
- The clarity provided by the proposals will drive continued development of renewable and low carbon technologies which will provide broader climatic improvements.
- Likely minor positive long term effects on reducing GHG through use of zero emissions energy sources, and supporting climate change adaptation through resilience of the energy efficiency work
- Provisions which support climate change adaptation including improvements in the energy efficiency of housing stock, reducing energy demand and consumption contribute to improving the resilience of energy infrastructure.

### **Air Quality**

- Supporting measures to reduce demand and increase energy efficiency has the potential to lead to reduced demand for energy as a whole
- Eliminating emissions from heating systems on a building by building basis is likely to improve air quality
- With reductions in GHG emissions are likely to come associated benefits to air quality, especially if there is a greater emphasis placed on the benefits for population and human health of reducing exposure to cold and damp properties
- Positive effects as a result of heat network expansion

### **Population and human health**

- Addressing energy efficiency issues and providing zero emissions heating are likely to have a beneficial impact on living conditions, particularly those vulnerable to the impacts of damp (such as respiratory conditions) and those considered to be fuel poor
- Benefits for human health likely as a result of making buildings more resilient to the effects of climate change, improving network reliability and though promoting the decentralisation of energy and increased uptake of heat and electricity generation at local level

In some instances, negative impacts can arise through operational activities, such as the potential for disturbance during installation of measures

### **Material assets**

- Benefits to assets as a result of focus on energy efficiency and insulation, through fabric first measures

- Greater uptake of technologies could improve efficiencies across the sector
- In some instances, negative impacts can arise through operational activities, such as the potential for disturbance during installation of measures
- the installation of heat network infrastructure such as pipes could result in environmental effects, including impacts to material assets from construction activities and siting of developments

#### Cultural heritage

- Negative effects are identified in relation to developments or changes to historic buildings brought about through fabric first insulation measures, and the installation of heat pumps and other sources of energy.



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