NEW BUILD HEAT STANDARD: SCOPING CONSULTATION

Scottish Government
Riaghaltas na h-Alba
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CONTENTS

EXECUTIVE SUMMARY

Introduction

Scotland aims to be a world leader in decarbonisation, and remains at the forefront of global efforts to tackle climate change.

Already, Scotland has some of the most ambitious and stringent climate change legislation and targets in the world: with the Climate Change (Emissions Reduction Targets) (Scotland) Act 2019[1] setting a target to reduce the country's emissions from all greenhouse gases to net-zero by 2045. More pressingly, on the immediate horizon, there is a further statutory target of an emissions reduction of at least 75% by 2030.

While considerable progress has been made in the decarbonisation of electricity (in 2019, an estimated 90% of gross electricity consumption across Scotland came from renewables[2]), the focus has now shifted to how we can decarbonise other key areas such as agriculture and transport – and, in particular, emissions associated with heating our buildings.

To illustrate the scale of this challenge, emissions from buildings are responsible for approximately 20% of Scotland's total greenhouse gas emissions. Although significant headway has been made in the decarbonisation our homes and businesses (this figure represents a 24% reduction in emissions from 1990[3]), **Scotland cannot meet its legislated climate change targets unless virtually *all emissions* from heating (and cooling) buildings are eliminated.**

This means, in effect that by 2045, zero emissions heating will need to be deployed across Scotland's building stock.

We also have to ensure that demand for heat in our buildings is as low as possible, to meet our fuel poverty obligations and to protect consumers from high energy costs and cold homes - as well as to optimise efficient use of energy networks.

The Scottish Government will develop regulations to ensure that, as far as is within our legislative competence, all buildings use zero emissions heating and cooling systems by 2045.

Separately, we will begin work to put in place the necessary regulatory measures needed to drive the transition away from high emissions heating systems towards these zero emissions heating systems in existing buildings. We will outline our likely approach to

[1] http://www.legislation.gov.uk/asp/2019/15/contents/enacted
[2] https://www.gov.scot/binaries/content/documents/govscot/publications/statistics/2018/10/quarterly-energy-statistics-bulletins/documents/energy-statistics-summary-june-2020/energy-statistics-summary-june-2020/govscot%3Adocument/Scotland%2BEnergy%2BStats%2BQ1%2B2020.pdf
[3] https://www.theccc.org.uk/publication/reducing-emissions-in-scotland-2019-progress-report-to-parliament/

regulation of existing buildings in the Heat in Buildings Strategy for Scotland and updated Energy Efficient Scotland Route Map, due for publication later in 2020 alongside the updated Climate Change Plan.

This current consultation focuses on our approach to regulation of **new** buildings, meeting the commitment set out in the 2019 Programme for Government to require new buildings to use renewable or low carbon heat.

However, if we are to meet the targets set out within the Climate Change Act 2019, the Scottish Government believes simply requiring 'low carbon' heat will no longer be sufficient – instead, it is imperative that new homes consented from 2024 use zero direct emissions heating and cooling, and also feature high levels of fabric energy efficiency to reduce overall heat demand. It is our intention to phase in a similar approach from 2024 for new non-domestic buildings.

While new buildings are only a small part of the problem, we cannot add any new emissions to Scotland's overall inventory because of the rapid decarbonisation efforts needed to reach net zero – to do so would be incompatible with our commitment to end Scotland's contribution to climate change within a generation.

By acting now and legislating for 2024, new buildings will lead the way: by helping Scotland achieve our statutory climate change targets, avoiding adding further greenhouse gas emissions to Scotland's inventory, and negating the need for the disruptive and expensive retrofit of buildings further down the line.

Delivering this ambition will require work to build upon two of the key priorities of the 2050 vision detailed in Scotland's Energy Strategy[4]:

Low Carbon Solutions

We will continue to champion and explore the potential of Scotland's huge renewable energy resource, and its ability to meet our local and national heat, transport and electricity needs – helping to achieve our ambitious emission reduction targets

Energy Efficiency

We will continue to take direct and supporting actions to improve the use and management of energy in Scotland's homes, buildings, industrial processes and manufacturing.

[4] https://www.gov.scot/publications/scottish-energy-strategy-future-energy-scotland-9781788515276/

Furthermore, it is envisaged that these proposals would also be reflected in the Housing to 2040 vision and route map to get there.

The draft vision[5], which sets out the Scottish Government aspirations for Scotland's future housing system, is underpinned by a number of key, high-level principles – including Principle 9 which set out our initial vision for 'high quality, sustainable homes', and how they can 'be consistent with the target for Scotland's emissions to be net zero carbon by 2045'.

Purpose

The purpose of this Scoping Consultation is to seek your views on the Scottish Government's vision for delivering the heating requirements of new buildings from 2024 onwards, as it is imperative that this Standard is one which is effective, practical and fit-for-purpose.

This vision will be supported by a number of key outcomes (listed in Chapter 1) that we wish to see achieved during this transition.

The feedback and evidence received in response to this consultation will help to prepare the foundations for a more detailed *Technical Consultation* – which will launch in 2021. This second consultation will specify the proposed Standard and contain information on key areas such as compliance and enforcement.

The Scottish Government believes that the time is now right to set out a clear vision for 2024 and to signal our intentions, giving industry sufficient time to prepare for the changes this Standard will introduce.

Whilst emissions standards for new buildings, set through building regulations, were significantly improved in 2010 and 2015, the economic downturn of the late 2000s was a limiting factor in realising these broader ambitions.

However, these changes have still delivered, on aggregate, a reduction of over 70% in the greenhouse gas emissions associated with energy use in new homes compared to standards applied in 1990 (the base reporting year for carbon dioxide emissions).

Now, with the industry striving to return to a sense of normality a result of the COVID-19 pandemic, the Scottish Government is committed to working with the construction sector to help ensure the transition to a zero emissions future is successful.

We are working through the Construction Leadership Forum (CLF), chaired by the Minister for Local Government, Housing and Planning, through the pandemic, to produce a green recovery plan for the industry which will support the development of a more sustainable, productive, innovative, and profitable construction sector.

Ensuring support for training and skills development - as well as supply chain capacity building – will be vital, and these issues (as well as the actions taken/ proposed by the

[5] https://www.gov.scot/publications/housing-to-2040/pages/what-is-housing-to-2040/

Scottish Government to support these) are explored further within Chapter 3 of this document.

Chapter Summary

1. **Chapter 1** seeks views on the key outcomes that underpin this Scoping Consultation.

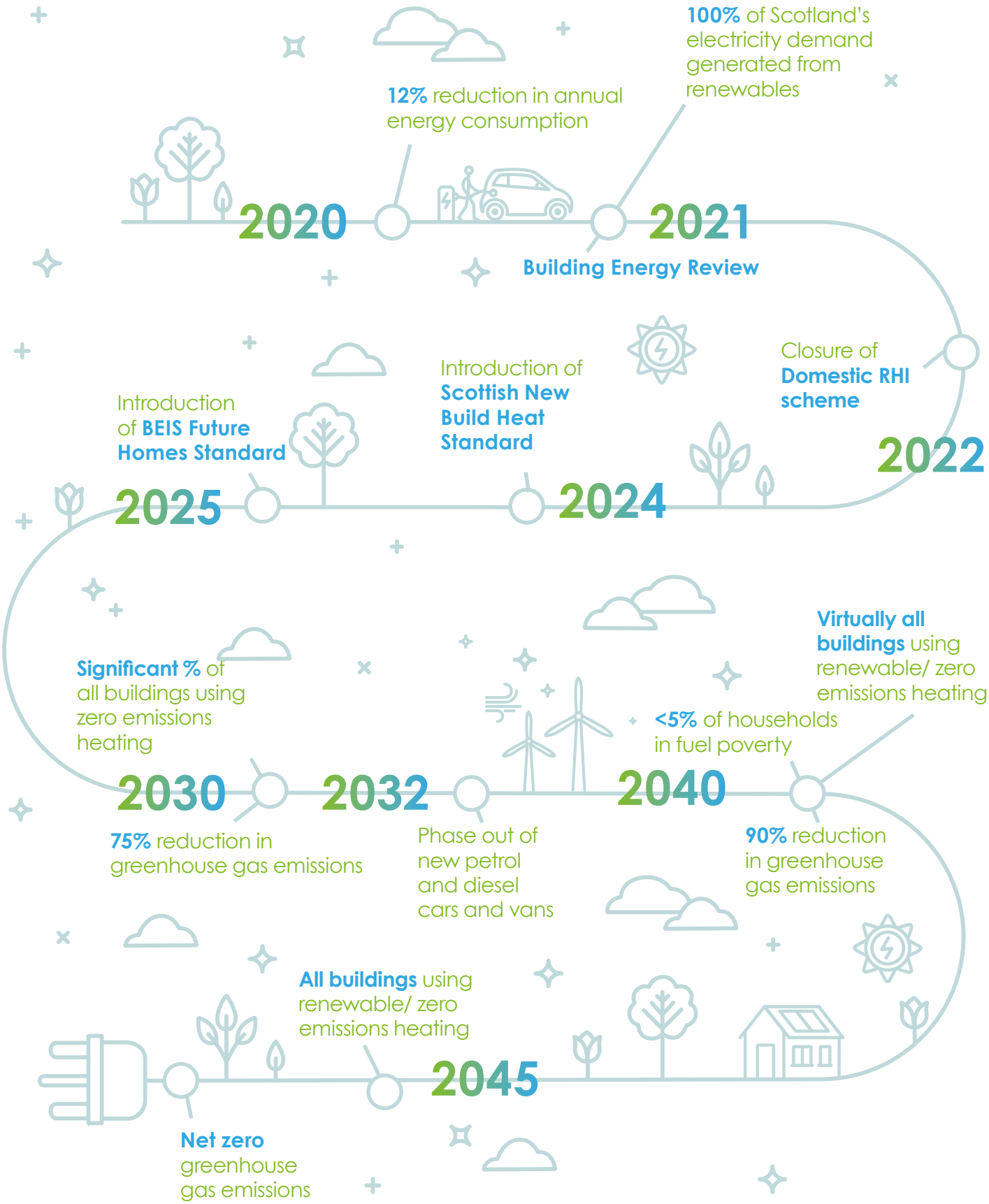
2. **Chapter 2** outlines and seeks views on the proposed scope of the Standard, and contains details on how this may be achieved in practice for new buildings.

3. **Chapter 3** seeks to gather views on what the key challenges and opportunities are to implementing this Standard, and what can be done to either mitigate or grasp these.

Heat Decarbonisation Pathway

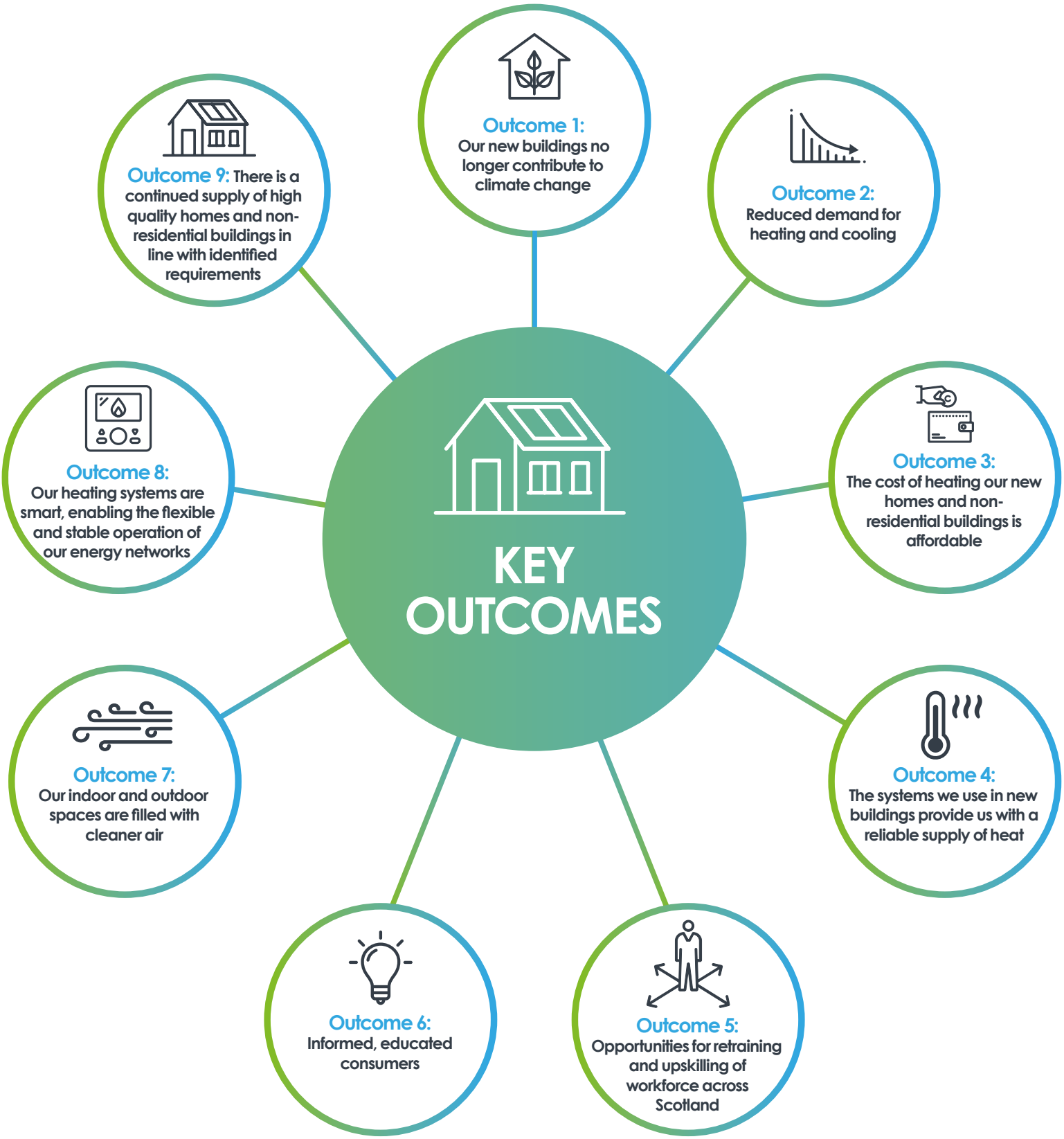
The following chart (overleaf) shows the key milestones and targets set by the Scottish Government in the journey to net zero in 2045, alongside parallel workstreams at a UK-level.

HEAT DECARBONISATION PATHWAY



Chapter 1: KEY OUTCOMES

Outcomes



There are **nine key outcomes** supported by transitioning to zero direct emissions heating systems, from 2024, in **new buildings –** they are informed by, and will contribute towards, the wider outcomes for heat in buildings, in our upcoming Heat in Buildings Strategy for Scotland.

Through this Scoping Consultation process, we are seeking the views and input from all stakeholders to ensure these outcomes are achievable and deliverable:

Outcome 1: Our new buildings no longer contribute to climate change

- Through the use of zero direct emissions heating systems - coupled with very high levels of energy efficiency in new buildings - we have the opportunity to greatly reduce our emissions, while also living and working in the kind of homes and workplaces that are fundamental to happy and healthy lives.

Outcome 2: Reduced demand for heating and cooling

- As set out in our *Energy Efficient Scotland Route Map*[6], there are numerous economic, social and health benefits that accrue from concerted effort to improve the energy efficiency of buildings.
- These benefits extend to supporting the transition to zero emission heating systems. While the exact technology mix that will form Scotland's future supply is not yet clear, we can be confident that requiring high standards of energy efficiency for our buildings will be essential.
- By improving the energy performance of new buildings, zero direct emission heating systems – such as heat pumps and low-temperature heat networks – can be integrated and work effectively, regardless of what our heat supply looks like in future.
- The rationale is not only technological: energy efficient buildings also reduce the demand for heat which, more widely (at a systems-level) may help to ease pressure on energy networks while also, potentially, resulting in reduced energy costs for consumers.

Outcome 3: The cost of heating our new homes and non-residential buildings is affordable

- High energy costs are a challenge for many households and, for many of our businesses and public services, energy inefficiency and high energy bills add unnecessary financial burdens.

[6] Energy Efficient Scotland: Route Map, the Scottish Government, May 2018.

- It is important to recognise there are may be cost differences between high emission and zero direct emission heating in new developments.

- While these differences may adjust over time as technologies develop, markets and suppliers adapt, and consumer needs change, we can minimise any cost increases by using the evidence available to us to determine the most cost-effective systems in different areas of Scotland.

- How any remaining cost increases are distributed has potentially important consequences for fuel poverty which will be considered in the Scottish Government's upcoming Heat in Buildings Strategy for Scotland. That statement, along with our Fuel Poverty Strategy, will set out our approach to mitigating these impacts. The Fuel Poverty Strategy will also set out our approach to tackling the other drivers of fuel poverty.

Outcome 4: The systems we use in new buildings provide us with a reliable supply of heat

- It is vital that the technologies we use in buildings and the wider energy systems behind them can be relied upon to provide us with heat and hot water when we need it.

- Zero direct emissions heating and cooling systems must be installed and maintained by trained and qualified engineers, and it is vital that businesses are able to secure the parts and the workforce required to install and keep these systems running.

- We will work with the energy networks to make use of Scotland's existing and reliable infrastructure, wherever possible.

Outcome 5: Opportunities for retraining and upskilling of workforce across Scotland

- Zero direct emission heating systems require assessment, design installation, maintenance, and fuel. This will need to be delivered by a prepared and skilled renewable heat sector, with reliable localised resources.

- The supply chain will need to expand and grow to meet increased demand as heat decarbonisation rolls out. This will require the recruitment and training of technicians and engineers, and the establishment of localised hubs and workforces.

- As we transition through to the decarbonisation of heat, support will be provided to ensure incumbent businesses and their employees can adapt. This will help maintain jobs and upskill our workforce.

- By embracing these changes now, the supply chain can grow in advance of 2024 – and be well-placed to tackle the issue of decarbonising existing buildings beyond 2024.

Outcome 6: Informed, educated consumers

- Awareness raising is key: while the importance of tackling climate change has been highlighted considerably in recent years, it is possible that many consumers are not aware of the role which heating our homes and businesses play – and how our efforts to tackle this may impact directly on them.

- Therefore, it will be important to consider how we (the Scottish Government, industry and wider-partners) can communicate the significance of the proposed changes outlined within this document to consumers across Scotland in advance of 2024.

- As the technologies and fuels used to heat our buildings change, it is also important that consumers have the confidence and reassurance to know that their homes and businesses will have a reliable energy supply and, should there be a fault or breakdown, there will be a qualified and competent engineer available to resolve any issue.

Outcome 7: Our indoor and outdoor spaces are filled with cleaner air

- Buildings can lose significantly more heat when they are poorly insulated and, when these buildings are also using high emissions heating systems, they can emit NOx - which pollutes the air we breathe[7].

- Better building insulation and ventilation, more passive heat technologies, low input heat recovery systems, and minimising heat loss or inefficient heating ultimately reduce energy use and the need for supplementary domestic heating.

Outcome 8: Our heating systems are smart, enabling the flexible and stable operation of our energy networks

- Our heating systems must be designed to be flexible, adjusting alongside other technologies associated with our properties that have high electrical demand (such as electric vehicles charging infrastructure), to support sustainable and secure electricity networks.

[7] Cleaning the Air: The Mayor's Air Quality Strategy, Mayor of London, December 2010.

- The heating technologies which can support secure and reliable electricity networks are the same as those needed to ensure efficient use of renewable electricity: demand-side flexibility, the incorporation of smart systems and technologies, the use of battery and thermal storage.

Outcome 9: There is a continued supply of high quality homes and non-residential buildings in line with identified requirements

- The shift towards zero direct emission heating should continue to support the delivery of high quality new homes and non-residential buildings across Scotland - ensuring we can meet the needs of Scotland's people.

- Measures to reduce the demand for heat in new homes are essential for meeting this objective, helping to ensure that new homes are more affordable to heat.

Questions

1. **Do you agree with the above key outcomes? Please explain your view.**

2. **Are there any additional outcomes which should be embedded here?**

CHAPTER 2: THE STANDARD

2.1 Introduction

This chapter explores the potential scope of this new Standard, and how the Scottish Government envisages this being achieved in practice.

2.2 What is a 'new building'?

For context, it is proposed that any reference to a 'new building' is aligned to that set out under existing building regulations, and would cover both (a) any property built for the first time and (b) any property created by the conversion[8] of an existing building.

2.3 Scope of this Standard

We propose that the focus of this Standard will be on the **emissions generated within the curtilage of the building for delivering a building's space and hot water heating and cooling requirements.**

Therefore, in order to comply with this Standard, we propose that any installed heating system (both in terms of a building's main and any other fixed heating system) would:

- **Produce no direct greenhouse gas emissions at the point of use**

The rationale for focusing our approach on regulating direct emissions that the building owner has control over (i.e. emissions from the heating systems contained within a new building) is to:

a) Ensure that responsibility for eliminating emissions is appropriately allocated to those with the ability to act. The proposed approach places a duty on the developer (or building owner/ tenant/ occupier) to take action where they have the agency and power to do so - with responsibility for decisions about decarbonising upstream emissions properly located elsewhere, and delivered through duties on other actors to deliver wider-energy system decarbonisation; and

b) Maximise alignment with the internationally-agreed emissions reporting schemes used for measuring progress towards Scotland's statutory emissions reduction targets. Those targets are set at the level of the economy as a whole, but annually published Official Statistics also provide a sector by sector breakdown – which distinguishes between the direct emissions from sources located in buildings and upstream emissions associated with the wider energy supply system.

Any embodied energy (i.e. the emissions produced throughout the lifetime of a building, including from the materials used in its construction, maintenance and demolition) associated with new buildings will be out of scope for this Standard.

[8] In this context, work that constitutes a 'conversion' would be defined by Regulation 4 and Schedule 2 of The Building (Scotland) Regulations) 2004, as amended.

The construction sector, where possible, should aim to be more ambitious than the Standard when considering how to reduce the energy demand of new buildings.

2.4 Zero direct emissions vs Net zero emissions

It is important to differentiate between 'zero direct emissions' and 'net zero emissions'.

'Zero direct emissions from heating and cooling' will ensure that no greenhouse gas emissions are produced at all from the heating or cooling system contained within a building at the point of use.

In contrast, the concept of net-zero greenhouse gas emissions allows for additional measures to be used to 'offset' any greenhouse gas emissions produced, or otherwise associated with energy use at the building. This Standard will not allow for offsetting.

2.5 Delivering the Standard

The Scottish Government believes developers should retain as much flexibility as possible in meeting this Standard, although we also expect developers to be mindful of the running costs of any heating system and the impact that these will have on the occupant to ensure they are able to afford to heat the building.

Decisions will be dependent on the characteristics of each individual site, as well as a location's natural resource(s) and the nature of the energy networks serving the site.

It is envisaged that this will predominantly involve the installation of individual building/ dwelling-level zero-direct emissions technologies, as well as connecting new buildings to new or existing heat networks.

Indeed, many of these technologies are widely-available and are already being installed in new buildings by developers across Scotland:

CASE STUDY: West Highland Housing Association (WHHA) - Imeraval, Port Ellen, Islay, Argyll & Bute

One of the biggest challenges in an island location like Imeraval is fuel poverty, and this is acknowledged by the Council in their Local Housing Strategy. West Highland Housing Association are currently on site at Imeraval, Port Ellen on Islay with 8 affordable homes comprising 6 for social rent and 2 for new supply shared equity.

Photograph courtesy of WHHA

All the units will have high efficiency air source heat pumps which are much more efficient than electric storage heating which should help reduce tenants fuel bills. The Energy Savings Trust estimate that using an air source heat pump could reduce tenants energy costs by £695- £815 when comparing to a modern electric storage heating.

2.6 Compliance methodology

The purpose of this Scoping Consultation is to lay the groundwork and set a high-level vision for what the Scottish Government is looking to achieve in 2024.

Therefore, no definitive compliance methodology will be specified within this document. The Technical Consultation (to be launched in 2021) will contain proposals for a compliance methodology, taking into account input provided through this Scoping Consultation.

There are a number of potential options which the Scottish Government could use to define compliance with this Standard, such as:

a) Continuing with an existing methodology and – potentially – changing the emissions factors to reflect a 'direct emissions'[9] rating for different technologies.

b) Creating an easily understood and enforceable stipulation about the types of heating systems that would be permissible under the new Standard (i.e. those which, if used, would not generate greenhouse gases at point of use).

[9] With a focus on 'Scope 1' direct greenhouse gas emissions (i.e. emissions that 'occur from sources that are owned or controlled by the company' or building owner), as set out within the World Business Council for Sustainable Development (WBCSD) Greenhouse Gas Protocol (2004) https://ghgprotocol.org/sites/default/files/standards/ghg-protocol-revised.pdf

However, this list is not exhaustive, and we are seeking stakeholder views as part of this consultation process, including allowing for a review over time as new ways of ensuring zero direct emissions from heating become available.

2.7 'Zero-rating' of emissions from certain heat sources

By limiting the Standard to direct point of use emissions only, any indirect or upstream greenhouse gas emissions that are produced during the generation or distribution of purchased thermal or electrical energy - which is delivered via a heat network or heat produced from grid electricity - would be considered out of scope.

We propose that electricity and thermal energy from heat networks would, therefore, be considered **'zero-rated' (i.e. considered to produce zero direct emissions at the point of heat consumption).**

With regards to energy which is supplied to new buildings via grid electricity, our proposed approach is to consider this to be zero-rated emissions as:

a) Any emissions would occur upstream; and

b) These would be regarded as being the responsibility of electricity system actors - not the building owner/ user.

Furthermore, in each of the scenarios outlined within the National Grid's Future Energy Scenarios (July 2020)[10], power sector carbon emissions are forecast to fall in each scenario. In particular, within the '*Leading the Way*' scenario, power sector carbon intensity is predicted to reach net negative emissions by 2030 - with the remaining two net zero scenarios envisaged to achieve this by the mid-2030s.

As new ways of ensuring zero direct emissions from heating become available, these could also be considered to be 'zero-rated' and reviewed over time. **The Scottish Government welcomes evidence submitted to this consultation on other ways of ensuring zero direct emissions from heating**. For example, a great deal of work is now underway to develop and test hydrogen for heating. There may be other ways to capture or prevent greenhouse gas emissions – however, the heat produced would need to release zero greenhouse gas emissions at point of use to comply with the Standard.

Our rationale for this is to ensure that any heating technology, for which there exists a regulatory requirement to decarbonise to zero in line with wider-climate change legislation, and which does not directly emit greenhouse gases at the point of use, would be considered to meet the requirements of this Standard.

2.8 Connections to heat networks

As noted earlier in this chapter, the Scottish Government proposes that developers should retain as much flexibility as possible to meet the Standard.

[10] https://www.nationalgrideso.com/document/173821/download

However, unlike other zero direct emissions heating systems that could be used to meet the Standard, and that are installed on an individual basis, heat networks require a critical mass of buildings to use the infrastructure in order for them to be viable.

Where heat networks are most viable, it has been found that they can offer fuel savings of up to 36%[11]. As such, there is an interdependence between the number of buildings using the heat networks, and the ability for heat networks to offer a cost-effective heat supply. **That is why we propose that new buildings be required to be designed and constructed so as to connect to an existing heat network, where that development takes place within a Heat Network Zone[12].**

The expectation that 'proposals should seek to connect to existing or planned networks' has been in place in London[13] for a number of years, and members of the Heat Networks Working Group[14] have advised that this has been a key policy in accelerating the deployment of heat networks in the city[15].

The London Model is implemented through planning policy. Currently, Scottish Planning Policy (SPP)[16] sets out that Planning should support the development of heat networks and should help to reduce emissions and energy use in new buildings and from new infrastructure.

Work is underway to prepare National Planning Framework 4 (NPF4), which will incorporate SPP and will form part of the development plan for planning purposes.

The Scottish Government sought early views on NPF4 in January to April 2020, including on whether planning policies should say more about co-location and requirements for connections to heat networks. Further information on this Call for Ideas, including on the responses received, is available online[17] and we have published an interim Position Statement in Autumn 2020 ahead of a draft NPF4 in Autumn 2021. However, at this stage, the Scottish Government is minded to believe that this Standard offers the most robust route as – unlike the Planning system in which Planning Authorities make their decisions having balanced all considerations – it is anticipated that this Standard would be underpinned by secondary legislation.

In circumstances where the location of a proposed new building is within a Heat Network Zone, to meet this Standard, we are proposing that the building would have to be

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[11] Heat Networks (Scotland) Bill: Business and Regulatory Impact Assessment (BRIA), the Scottish Government, 3 March.

[12] The Heat Networks (Scotland) Bill would enable local authorities or the Scottish Ministers to designate an area as particularly suitable for the development of district or communal heating. The process for identifying Heat Network Zones will be set by subsequent regulations but, as a minimum, the Bill requires consideration to be given to the local presence of: buildings with large-scale heat demand; waste heat sources; constrained renewable generation; or other infrastructure.

[13] The London Plan, The Mayor of London, March 2016.

[14] In May 2019, the Minister for Energy, Connectivity and the Islands invited stakeholders to form the Heat Networks Regulation Working Group. The remit of the Group was to support the preparation of legislation by advising on a regulatory framework for heat networks.

[15] Interim Recommendations Report, the Heat Networks Regulation Working Group, 3 December 2019.

[16] https://www.gov.scot/publications/scottish-planning-policy/

[17] https://www.transformingplanning.scot/national-planning-framework/call-for-ideas/

designed and constructed to connect to an existing heat network, or otherwise demonstrate that it was not an effective solution – for the building owner or for the wider community[18]. An alternative zero direct emissions heating system would then be permissible in complying with the Standard.

2.9 Improving and optimising levels of fabric energy efficiency

Regardless of which system supplies a building's heating requirements, it is important that action is taken to limit the amount of energy that needs to be delivered to a new building to meet the heating demand to the best levels practicable. This is seen as a parallel and complementary action to support the development of this Standard. This is most critical in our existing stock - also contributing towards removing poor energy efficiency as a driver of fuel poverty, making homes more affordable to heat.

Already, new homes and buildings are built with high standards of energy efficiency, but there is a need to take further action. For new builds, this will mean **buildings will be required to achieve higher levels of building fabric performance from the outset**.

The Committee on Climate Change (CCC) has made recommendations that new homes must achieve 'ultra-high' levels of energy efficiency. Whilst, there is no one agreed definition of what this would look like in practice, the CCC view is that this should '*be consistent with a space heat demand of 15-20 kWh/m²/yr*'[19]. This figure is similar to the space heating demand of a Passivhaus building – which is ≤15 kWh/m²/yr[20].

Advice from the Committee on Climate Change

Our approach attempts to be consistent with the advice and recommendations from the Committee on Climate Change (CCC), which has made clear (within the *Reducing emissions in Scotland – 2019 Progress Report to Parliament*) its expectations that, by 2025 at the latest, new homes should:

- Not be connected to the gas grid;
- Be heated through low carbon sources; and
- Have ultra-high levels of energy efficiency.

The CCC's *Letter: Future Homes Standard and proposals for tightening Part L in 2020*[21], to the UK Government also reiterated that:

- By 2025, or earlier, ultra-energy efficient homes (which are the equivalent to or close to

[18] Further detail on how a developer may evidence that connection to an existing heat network is not an effective solution to meeting the Standard will be developed alongside this proposal. However, for illustration, examples may be where unreasonable costs have been quoted by the Heat Network Permit Holder or where the costs to connect the building would result in excessive increased costs for other users of the heat network.
[19] https://www.theccc.org.uk/wp-content/uploads/2019/02/UK-housing-Fit-for-the-future-CCC-2019.pdf
[20] https://www.passivhaustrust.org.uk/what_is_passivhaus.php
[21] https://www.theccc.org.uk/publication/letter-future-homes-standard-and-proposals-for-tightening-part-l-in-2020/

Passivhaus standards), are achievable and desired.
- The continued use of fossil fuel (including any measures to offset this) in any future standard would not be credible.

The Scottish Government's 2021 Building Regulations Energy Review will consider measures to improve targets to reduce heat demand, and associated carbon emissions, in new buildings.

This will inform discussions on this topic for 2024, where a further review of energy standards in building regulations will be carried out in parallel to the development of this Standard to be introduced for new buildings consented from 2024.

2.10 Additional considerations

2.10.1 Cooking

As it is proposed that this Standard would be limited to direct emissions from space and water heating and cooling only, it is envisaged that this would not cover emissions associated with cooking.

Scotland's greenhouse gas emissions targets mean greenhouse gas emissions from cooking appliances must also be reduced. Whilst we propose that cooking emissions are out of scope for this Standard, we will keep this under review.

2.10.2 Process heating

It is proposed that this Standard would not cover process or industrial heating.

While these are direct emissions produced within a building's curtilage, they do not specifically relate to a building's space and water heating (and cooling) demand.

2.11 Summary of Standard

In order to comply with the Scottish Government's New Build Heat Standard, it is proposed that, new homes and buildings consented from 2024 onwards in Scotland must:

- ✓ **Meet their space and hot water heating (and cooling) demand by producing no direct greenhouse gas emissions at point of use.**

Additionally, we will further reduce the heat demand in new homes from 2024 through a review of existing provisions set under Scottish Building regulations.

2.12 Action by the UK Government

We recognise that the UK Government is in parallel consulting on its proposed *Future Homes Standard* for 2025, and the Scottish Government will continue to engage with the UK Government to ensure that any action that would be needed in reserved areas to complement our 2024 New Build Heat Standard is taken forward by the UK Government – as advised by the Committee on Climate Change in its Net Zero advice of May 2019, where it made clear that the UK Government would need to take action in reserved areas to support Scotland meeting its net zero target.

As made clear throughout this document, we propose that our New Build Heat Standard is introduced in 2024. However, the Scottish Government recognises that the CCC continue to stress the need for accelerated action to be taken.

Indeed, within the CCC's response to the UK Government's *Future Homes Standard 2019* consultation[22] - the CCC recommended that the UK Government follows Scotland's example and brings forward the date of the Future Homes Standard to earlier than 2025.

Therefore, as part of this Scoping Consultation process, we are seeking stakeholder views on the proposed implementation date for this Standard.

2.13 Questions

3. **Do you agree with limiting this Standard to 'new buildings' as defined within section 2.2?**

4. **Do you agree with: (a) our approach taken to require future installed heating systems to be zero direct emissions only, and (b) our approach taken to focus on direct/ point of use emissions that a building owner has responsibility over only?**

5. **What evidence can you offer on ways of ensuring zero direct emissions from heating that could be compliant with this Standard?**

6. **What are your views on section 2.6, specifically regarding what mechanism the Scottish Government could use to ensure compliance with the Standard?**

7. **What steps can the Scottish Government take to support industry to deliver this Standard, and how could we make compliance with this Standard easier?**

8. **How do we ensure that consumers are protected from increased energy bills, while giving developers flexibility to comply with the Standard?**

[22] https://www.gov.uk/government/consultations/the-future-homes-standard-changes-to-part-l-and-part-f-of-the-building-regulations-for-new-dwellings

9. **What are your views on new buildings connecting to an existing heat network, where development takes place within a heat network zone? Do you envisage any unintended consequences as a result of this proposal?**

10. **Do you agree with the Scottish Government's proposal to introduce this Standard in 2024? What are your views on this Standard being brought into force for new buildings consented earlier than 2024?**

CHAPTER 3: Key Challenges & Opportunities

3.1 Introduction

This chapter outlines the main challenges to implementing this Standard that the Scottish Government has identified so far – alongside the potential opportunities that can be seized in this transition to a 'zero emissions' future.

3.2 Developing skills and supply chain capacity

The requirements proposed under this Standard will have an impact on the equipment, materials and skills needed to deliver modern homes and buildings from 2024 onwards.

Therefore, we need to ensure there is a sufficiently skilled workforce and supply chain capacity available to successfully deliver the requirements of the Standard across Scotland.

It is, however, encouraging that this has already began to take place – with a number of developers across Scotland already delivering homes with zero direct emission heating, and taking the necessary steps to reskill their workforce to do so.

The skills and qualifications required for zero direct emissions technologies differ from those required to install and maintain more 'traditional' plant and equipment – and this presents an excellent opportunity for the development and re-training of personnel across the industry.

Also, the skills and supply chain opportunities arising from action to decarbonising heat in buildings are also an important part of our green recovery from the COVID-19 pandemic.

The Scottish Government has laid out future plans to help ensure Scotland's workforce is equipped with the necessary knowledge and skills to take full advantage of the changes which this Standard (and the wider-net zero agenda) will bring:

Economic Recovery Implementation Plan[23]: Snapshot

We have:

- Focussed on improving the provision of lifelong learning and enabling people to reskill with it being one of the key themes at the heart of the **Future Skills Action Plan**.
- Been engaging with Skills Development Scotland, other agencies and key stakeholders to collaboratively review current interventions against emerging **labour market intelligence**.

[23] https://www.gov.scot/publications/economic-recovery-implementation-plan-scottish-government-response-to-the-advisory-group-on-economic-recovery/

- Doubled investment in workforce upskilling and retraining through the **Flexible Workforce Development Fund (FWDF)** and established a framework for revised delivery so it benefits more employers and individuals across Scotland.

We will now:

- Ensure that our skills response builds on the work already in development to identify and plan for the skills and jobs needed for key transitions in the future, including the **Climate Emergency Skills Action Plan**. This will ensure jobs created in response to COVID-19 are sustainable, support a just transition to net zero and help us to achieve our inclusive growth ambitions.

We plan to:

- Introduce a **Transition Training Fund** as a flexible mechanism to support individuals facing redundancy and unemployment in those sectors most exposed to a downturn. This will provide opportunities to upskill and transition into employment in sectors with continuing skills gaps/growth opportunities and to support our transition to net zero.
- Work with delivery agencies, partners and stakeholders to evaluate FWDF, ITAs and other current skills interventions to ensure alignment and effectiveness. As set out in the **Future Skills Action Plan**, we are committed to developing a culture of collective investment in skills and will continue to play an active role in workforce development.

3.3 Grid impacts

With the introduction of this Standard, one potential outcome is a substantial increase in electrical heating systems serving new buildings.

Heat Pumps, and other forms of electric heating such as storage heating, can have a substantial impact on the amount of electricity that a building uses, and to the contribution that building makes to local peak demand. It is important that we understand the potential grid impacts of electrifying the demand for heat, and the opportunities for dealing with them.

Separately, the Scottish Government is committed to encouraging and promoting the uptake of ultra-low emission vehicles (ULEVs), and have set out the ambition to phase out new petrol and diesel cars and vans by 2032.[24] An increased number of ULEVs on Scotland's roads and the additional charging infrastructure required, including at a domestic-level through home charging points, represents a further pressure on electricity networks that will require the implementation of smart management solutions.

There is a need to consider how new buildings will also incorporate other zero direct emissions technologies and, from the perspective of the electricity network, the interaction with ULEV charging will be important. For example, in addition to this Standard, the Scottish Government will also be developing regulations that it plans to introduce next year to

[24] https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

facilitate the installation of ULEV charge points in car parks of new as well as existing buildings.

The diagram below illustrates how heat pumps and ULEV charging can change domestic electricity demands:

Demand

Domestic property (gas grid)
Contribution to peak electrical demand: 1 – 3 kW
Typical annual electricity demand: 3,000 kWh

Domestic charge point for single electric vehicle
Installed capacity: 7 kW
Typical annual electricity demand: 2,000 – 4,000 kWh

Heat pump
Installed capacity: 3 – 10 kW
Typical annual electricity demand: 3,000 kWh – 6,000 kWh

Indicative values showing how the addition of heat pumps and electric vehicle charge points can substantially increase both the annual electricity demand of a household and the contribution that house makes to local peak demand. Adding heat pumps and EV charge points will require greater capacity on the electricity networks.

The electricity network impacts will affect housing developers, Distribution Network Operators (DNOs) and domestic customers themselves. Housing developers will need to provide larger connections to new buildings which could push up electricity connection costs.

While this may be unavoidable, the Scottish Government's approach aims to mitigate some of the anticipated pressure on Scotland's electricity grid infrastructure by further improvements to reduce heat demand in new buildings as part of the current and future review of energy standards within building regulations.
There is also the potential for connection costs to be managed by providing greater flexibility through smart-home management systems and energy storage (for example thermal storage or batteries).

We are keen to understand the evidence base and opportunities as well as the risks and limitations of relying on flexibility to reduce a building's peak demand and manage electricity networks capacity, and any potential benefits of storage from a consumer perspective.

3.4 Potential cost implications

The Scottish Government recognises that the requirements of this Standard may have implications for the costs to construct new buildings and, also, on the energy bills of building owners and tenants.

It is important to address the likelihood that the capital and running costs of zero direct emissions heating may be higher than for the high greenhouse gas emitting systems they replace – which only further illustrates the importance of the need to reduce the demand for heat as far as possible.

This is most likely to be true if energy efficiency is also not considered as a priority – hence, why parallel work (i.e. the Scottish Government's 2021 Building Regulations Energy Review) will investigate further opportunities to reduce heat demand (as recommended by the CCC), and the potential this offers to reduce overall development and running costs.

Scottish Government Support: Affordable Housing Supply Programme

Through the Scottish Government's Affordable Housing Supply Programme (AHSP), we will be exploring these costs further by gathering evidence on:

a) The additional costs of installing zero direct emissions heating systems including any associated energy network connection costs within new build homes across Scotland.
b) The running costs for heating and hot water using these systems against 'business as usual' counterfactual assuming conventional high emissions heating systems would have been used.
c) The impacts of these actions on the end user/ consumer.

We envisage the evaluation will be in two phases:

1. **Pre-construction** - which may use, for example, modelled data.
2. **Post-construction** - with tenant occupancy.

Through the AHSP, we will be able to test and evaluate zero direct emissions heating solutions so that lessons could, ultimately, be shared across industry and beyond.

The transition to a zero emissions future is one which must be just: ensuring that no one is left behind and no individual (particularly society's most vulnerable) is unfairly impacted by the changes that this Standard will introduce.

Therefore, as part of the wider-consultation process (including the Technical Consultation, planned for 2021), the Scottish Government commits to undertaking a suite of impact assessments, including an Equality Impact Assessment (EQIA) and a Fairer Scotland Duty Assessment.

The purpose of undertaking these impact assessments is to ensure that, through the introduction of this Standard, there are no unintended consequences that have negative impacts on individuals or groups across Scotland. If any regressive impacts are identified, we will work with stakeholders to take steps to mitigate these.

3.5 Consumer awareness and education is key

Consumers have become accustomed to traditional heating systems, and many have had the comfort of knowing that there is a secure supply available at a comparatively low cost. Traditionally, direct electric heating is often perceived to be complex and expensive to run.

The introduction of this proposed Standard requires consumer awareness raising about the heat technologies it implies, and potentially some reassurance about ongoing maintenance, ease of use and comfort levels.

There is a general low level of awareness of zero emissions heat technologies amongst the public - highlighting the importance of raising consumer awareness around the transition to zero direct emissions heating technologies.

Heat pumps provide an example of where it is important to ensure that the user of the system is aware of the most effective way of running it. The maximum output of heat pump-based systems can be significantly lower than equivalent boiler systems, meaning that heat pumps will take longer to heat up a cold building. Users need to be aware that keeping a property warm, even when they are out all day, is the most effective way to use a heat pump.

We are keen to better understand the impact that consumer behaviour can have on the effectiveness and efficiency of zero direct emissions heating systems, and the implications for awareness and education.

Developers are already obliged to provide written information to the new building owner regarding the operation and maintenance of the building services and energy supply system[25]. This also includes a Quick Start Guide, which should assist the home owner in identifying '*all installed building services, the location of controls and identifying how systems should be used for optimum efficiency*'.

The right introduction to the zero emissions heating system, which is simple to operate for efficient use, will be instrumental in building consumer understanding – while also ensuring they are able to take full advantage of the system to minimise their ongoing costs.

3.6 Wider-environmental impacts

It is envisaged that the transition to zero direct emissions heating and cooling in new buildings would have a positive environmental impact (for example, through improved air quality with the reduction in greenhouse gas emissions).

[25] https://www.gov.scot/publications/building-standards-technical-handbook-2019-domestic/6-energy/6-8-written-information/

In terms of a Strategic Environmental Assessment (SEA), the Scottish Government will, as part of the development of this Standard, establish its statutory requirements under the Environmental Assessment (Scotland) Act 2005 – and ensure these are undertaken where required.

However, at this stage in the preparation of the Standard, it is our view that it would be beneficial to complete this work as part of the Technical Consultation in 2021 – scoping out views of stakeholders. Once the Scottish Government has had an opportunity to reflect on these initial views, and formulate a more comprehensive view on the depth of the proposals required, we could then better understand and explain our SEA needs.

3.7 Timings

Within Scotland's 2019-20 Programme for Government, the Scottish Government's aspirations for this new Standard to take effect from 2024 are made clear.

A regulatory Standard is essential to create a 'level playing field' across the construction industry - ensuring a common starting point for the transition to a zero emissions future.

The approach taken by the Scottish Government is to legislate in advance of 2024 to give industry clarity on what is expected for new developments moving forward, and also to allow industry sufficient time to prepare in advance of this Standard coming into force.

Scotland is already seen as a leader in its efforts to decarbonise – and, by embracing the requirements set out within this Standard prior to 2024, there may be prospects for Scottish businesses and supply chains to eventually take advantage of potential export opportunities: thereby, growing the Scottish economy as well as further contributing to the effort to decarbonise globally.

However, the Scottish Government does recognise that many developers operate across the UK as a whole, and consistency with the rest the UK (as far as reasonably possible) is a priority for many developers.

As set out previously, for new non-domestic buildings, similar requirements will be 'phased-in' from 2024 - whereas all new domestic dwellings consented from 2024 will be required to comply with this Standard. There are further challenges associated with non-domestic buildings (for example, due to the diverse building stock), and it is the Scottish Government's intention to address these within this Standard's Technical Consultation in 2021.

3.8 Questions

11. **How can opportunities be maximised for the supply chain involved in the delivery of new homes (ranging from product suppliers to on-site operatives), including skills?**

12. **What do you envisage the key challenges would be for developers, and wider-building industry, in meeting this proposed Standard? How could this sector be supported to address those challenges?**

13. **What are the key challenges for the energy networks regarding the deployment of zero emissions heating in new developments? How could this sector be supported to address those challenges?**

14. **How do you see this Standard interacting with wider-energy system changes, and what role do you see for flexibility and smart technologies?**

15. **What can be done to encourage greater consumer awareness and understanding?**

16. **What approach should be taken when considering new non-domestic buildings, and what are the specific challenges and opportunities relating to new non-domestic buildings?**

17. **By introducing this Standard, what challenges or opportunities might result for households on low incomes (for example, around affordability or access), and how can the Scottish Government best take account of these?**

Consultation Questions: Summary

Chapter 1

1. **Do you agree with the above key outcomes? Please explain your view.**

2. **Are there any additional outcomes which should be embedded here?**

Chapter 2

3. **Do you agree with limiting this Standard to 'new buildings' as defined within section 2.2?**

4. **Do you agree with: (a) our approach taken to require future installed heating systems to be zero direct emissions only, and (b) our approach taken to focus on direct/ point of use emissions that a building owner has responsibility over only?**

5. **What evidence can you offer on ways of ensuring zero direct emissions from heating that could be compliant with this Standard?**

6. **What are your views on section 2.6, specifically regarding what mechanism the Scottish Government could use to ensure compliance with the Standard?**

7. **What steps can the Scottish Government take to support industry to deliver this Standard, and how could we make compliance with this Standard easier?**

8. **How do we ensure that consumers are protected from increased energy bills, while giving developers flexibility to comply with the Standard?**

9. **What are your views on new buildings connecting to an existing heat network, where development takes place within a heat network zone? Do you envisage any unintended consequences as a result of this proposal?**

10. **Do you agree with the Scottish Government's proposal to introduce this Standard in 2024? What are your views on this Standard being brought into force for new buildings consented earlier than 2024?**

Chapter 3

11. **How can opportunities be maximised for the supply chain involved in the delivery of new homes (ranging from product suppliers to on-site operatives), including skills?**

12. **What do you envisage the key challenges would be for developers, and wider-building industry, in meeting this proposed Standard? How could this sector be supported to address those challenges?**

13. **What are the key challenges for the energy networks regarding the deployment of zero emissions heating in new developments? How could this sector be supported to address those challenges?**

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17. **By introducing this Standard, what challenges or opportunities might result for households on low incomes (for example, around affordability or access), and how can the Scottish Government best take account of these?**

Responding to this Consultation

We are inviting responses to this consultation by 3 March 2021.

Please respond to this consultation using the Scottish Government's consultation hub, Citizen Space (http://consult.gov.scot). Access and respond to this consultation online at https://consult.gov.scot/energy-and-climate-change-directorate/new-build-heat-standard. You can save and return to your responses while the consultation is still open. Please ensure that consultation responses are submitted before the closing date of 3 March 2021.

If you are unable to respond using our consultation hub, please complete the Respondent Information Form to:

Heat Planning and Delivery Team
Scottish Government
5 Atlantic Quay
Glasgow, G2 8LU

Handling your response

If you respond using the consultation hub, you will be directed to the About You page before submitting your response. Please indicate how you wish your response to be handled and, in particular, whether you are content for your response to published. If you ask for your response not to be published, we will regard it as confidential, and we will treat it accordingly.

All respondents should be aware that the Scottish Government is subject to the provisions of the Freedom of Information (Scotland) Act 2002 and would therefore have to consider any request made to it under the Act for information relating to responses made to this consultation exercise.

If you are unable to respond via Citizen Space, please complete and return the Respondent Information Form included in this document.

To find out how we handle your personal data, please see our privacy policy: https://www.gov.scot/privacy/

Next steps in the process

Where respondents have given permission for their response to be made public, and after we have checked that they contain no potentially defamatory material, responses will be made available to the public at http://consult.gov.scot. If you use the consultation hub to respond, you will receive a copy of your response via email.

Following the closing date, all responses will be analysed and considered along with any other available evidence to help us. Responses will be published where we have been given permission to do so. An analysis report will also be made available.

Comments and complaints

If you have any comments about how this consultation exercise has been conducted, please send them to the contact address above or at 2024heatstandard@gov.scot.

Scottish Government consultation process

Consultation is an essential part of the policymaking process. It gives us the opportunity to consider your opinion and expertise on a proposed area of work.

You can find all our consultations online: http://consult.gov.scot. Each consultation details the issues under consideration, as well as a way for you to give us your views, either online, by email or by post.

Responses will be analysed and used as part of the decision making process, along with a range of other available information and evidence. We will publish a report of this analysis for every consultation. Depending on the nature of the consultation exercise the responses received may:

- indicate the need for policy development or review
- inform the development of a particular policy
- help decisions to be made between alternative policy proposals
- be used to finalise legislation before it is implemented

While details of particular circumstances described in a response to a consultation exercise may usefully inform the policy process, consultation exercises cannot address individual concerns and comments, which should be directed to the relevant public body.

Scottish Government
Riaghaltas na h-Alba
gov.scot

New Build Heat Standard: Scoping Consultation

RESPONDENT INFORMATION FORM

Please Note this form **must** be completed and returned with your response.

To find out how we handle your personal data, please see our privacy policy: https://www.gov.scot/privacy/

Are you responding as an individual or an organisation?

☐ Individual

☐ Organisation

Full name or organisation's name

Phone number	

Address

Postcode	
Email	

The Scottish Government would like your permission to publish your consultation response. Please indicate your publishing preference:

Information for organisations:

The option 'Publish response only (without name)' is available for individual respondents only. If this option is selected, the organisation name will still be published.

If you choose the option 'Do not publish response', your organisation name may still be listed as having responded to the consultation in, for example, the analysis report.

☐ Publish response with name

☐ Publish response only (without name)

☐ Do not publish response

We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

☐ Yes

☐ No

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Any enquiries regarding this publication should be sent to us at

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