Aberdeenshire COUNCIL

From mountain to sea

Route Map 2030 and Beyond (DRAFT)
Aberdeenshire Council

June 2022

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1 Introduction to the Route Map

Aberdeenshire Council is responsible for providing a wide range of services to the population of Aberdeenshire (circa 243,000). The Council is currently made up of 70 elected Councillors representing 19 multi-member electoral wards with a number of Councillors in each.

Aberdeenshire Council currently employs around 13,500 workers and is responsible for an annual revenue budget of around £661 million.

On 18 March 2020 Aberdeenshire Council agreed a Climate Change Declaration, committing to working towards a carbon free society by reducing its own emissions by 75% (2010/11 baseline) by 2030 and to work with others across the region to ensure that Aberdeenshire reaches Net Zero by 2045.

Aberdeenshire Council's first Carbon Budget was set on 9 February 2017. Each year the process has been developed further and it has also become more embedded within services.

However, the Carbon Budget has never been fully integrated into the financial budgets and the Route Map aims to position the key actions and financial impact of reaching a 75% reduction in emissions by 2030.

This Route Map 2030 and beyond document describes

- Aberdeenshire's Route Map to 2030 and Beyond, summarising the key activities and milestones to deliver the vision

- The future Carbon Budgets

2 Route Map to 2030 and Beyond

2.1 Introduction

Scotland has set in law ambitious targets to reach net-zero emissions by 2045 (Scottish Government, 2019) with interim targets of 90% reduction by 2040 and 75% reduction by 2030. Aberdeenshire Council has aligned with these targets.

As set out in the Public Sector Leadership on the Global Climate Emergency Guidance:

"*Climate change is a responsibility for all organisations, and action on it is a core deliverable of all public bodies. There must be clear accountability across senior leadership in the organisations for climate action. Climate change should be embedded using good governance principles*".

Communication of the direction of change and key milestones through this Route Map 2030 and beyond is to provide opportunities for joining up national and local priorities.

The content is built up from an amalgamation of key activities and targets from the following sources

- **Scottish Government national guidance** – refer to Appendix A for a detailed overview of the key policies;

- **Climate Ready Aberdeenshire-** Aberdeenshire's climate change adaptation and mitigation regional strategy development;

- **Aberdeenshire Council Climate Change Declaration** - the move to a more sustainable and low carbon future; and

- **Route Map 2030 Transformation Map** – summarising key activities to transform the authority and build the capability and capacity to meet a 75% reduction in its own emissions by the end of the decade.

As part of the Route Map development, a detailed analysis was conducted of current Council challenges around climate action, followed by an assessment of the root causes and recommended solutions of these issues.

This insight fed into a risk assessment to Route Map 2030 implementation aimed at considering the key risks to delivering on the 2030 and 2045 milestones. All risks were categorised Very High, High, Medium and Low to support prioritisation of the mitigation measures. The Transformation Map presents the proposed actions to mitigate these risks in different colours as indicated in the legend of Figure 1.

2.2 Recommendations

Recommended actions have been grouped for implementing the Route Map as follows:

- **Process & Organisation**

- **Technology**

- **Information**

- **People and Culture**

2.2.1 Process & Organisation

	Recommended actions	Key Stakeholders
1	**Set up a central steering group:** Take ownership of and monitor progress of delivery of the projects and Route Map 2030. Identification and recommend measures to manage resistance to change.	Senior representatives from all Directorates
2	**Define clear roles & responsibilities:** Define accountabilities, roles, responsibilities across the Authority for delivering the Route Map 2030. This should be followed by delivering an internal capability and capacity gap analysis against this for all services and recommend actions to address the gaps and resource challenges.	Environment & Sustainability working closely with HR and Legal
3	**Supply Chain Capacity and Capability Gap Analysis:** Confirm the ability for current and local suppliers to deliver the future type and volume of hard interventions and services. This includes procurement strategy review, frameworks and existing (long term and FM) contract gap analysis.	Procurement
4	**Set targets for reducing Direct and Indirect emissions:** Requirement as set out in the Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Amendment Order 2020 for reporting periods commencing on or after 1 April 2021. These will need to be identified and then different targets set for different sources.	Environment and Sustainability working closely with other services e.g. Housing, Commercial & Procurement

2.2.2 Technology

	Recommended actions	Key Stakeholders
5	**Delivery of the Feasibility studies at operational buildings, to support definition of the 2023/24 Carbon Budget by January 2023**, which includes: • Pilot study design and feasibility study specification • Heat pump study specification (both ground and air source)	Property and Facilities Management

	• Procure contractors to deliver both surveys as well as the hard interventions to the estate • Oversee delivery of the surveys and quality assurance • Assessing the potential for further renewables programme • Assess data and design interventions • Develop the Whole Life Cost and Business Case regarding the financial implications of the interventions • Identify the synergies with concurrent activity including the Non Domestic Energy Efficiency Fund • Identify roofs on buildings that are suitable for the installation of PV and the enabling works required to allow PV to be installed • Finalise 2023/24 Carbon Budget This should include the following elements: • Design heat pump pilot studies and develop specification for the survey; and • Update current fuel/technology choice strategy.	
	Delivery of supporting technical studies including	
6	• EV/H2 Fleet Assessment	Roads and Infrastructure
7	• Develop Hydrogen Strategy	Environment and Infrastructure/Business Services
8	• Electrification Risk/Resilience Study • Embed zero carbon standard for both new build and retrofit initiatives	Property and Facilities Management
9	• Residual Emission Action Plan including an organisational carbon footprint scope and target review • Resilience/Adaptation Assessment • Develop Local Heat and Energy Efficiency Strategy (LHEES) • Develop Re-use Business Case	Environment & Sustainability

2.2.3 Information

	Recommended actions	Key stakeholders
10	**Central assurance and reporting:** Design and implement a central reporting function, possibly incorporated in the current carbon budget tool. All services should centrally store progress data to track if projects are on track, delivered on or under budget and risks to successful delivery can be identified on time to be mitigated. A dashboard function can present near real-time data to management to support KPI reporting and data led decision-making.	Environment & Sustainability

2.2.4 People and Culture

	Recommended actions	Key stakeholders
11	**Communications to support and implement the change and generate buy-in of the people and Directorates at all levels:** Design and management of the communications and map the impact on the people and what it means for them.	Environment & Sustainability, supported by senior representatives from all Directorates

Figure 1: Aberdeenshire Transformation Map – Recommendations to set up the organisation and people for successful delivery of the Route Map
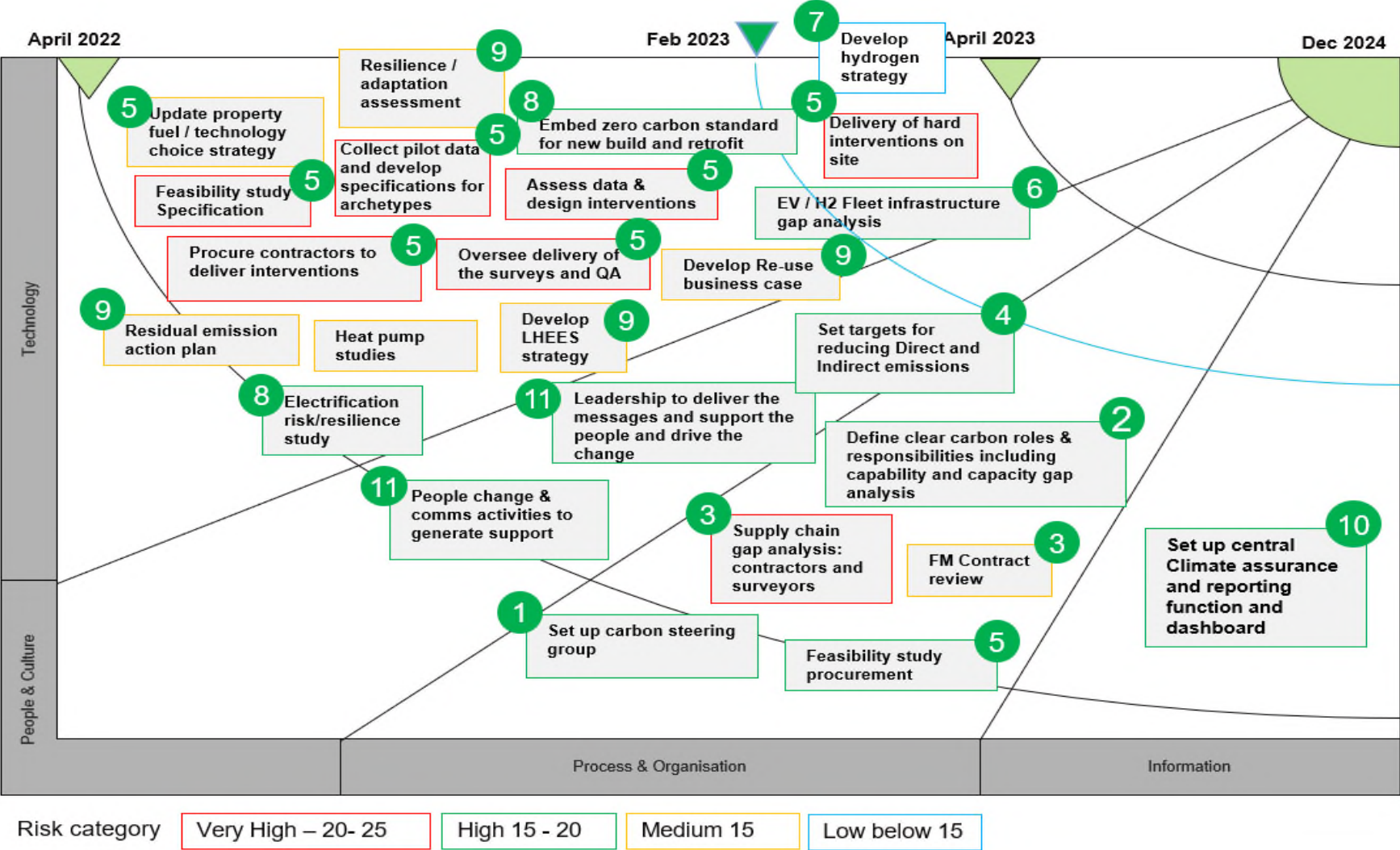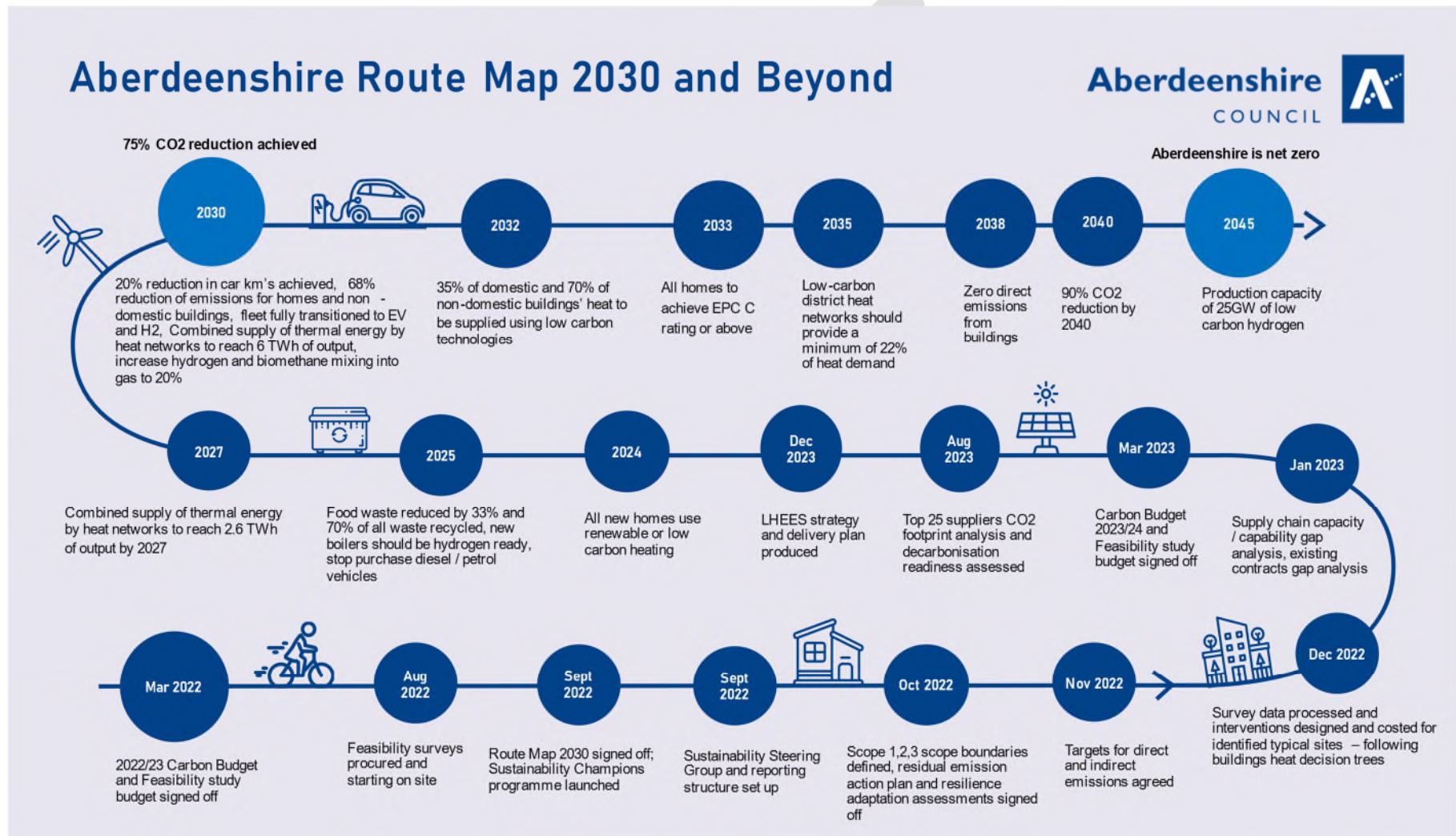
Figure 2: Aberdeenshire Route Map 2030 and Beyond

Aberdeenshire Route Map 2030 and Beyond

Aberdeenshire COUNCIL

75% CO2 reduction achieved

Aberdeenshire is net zero

2030 — 20% reduction in car km's achieved, 68% reduction of emissions for homes and non-domestic buildings, fleet fully transitioned to EV and H2, Combined supply of thermal energy by heat networks to reach 6 TWh of output, increase hydrogen and biomethane mixing into gas to 20%

2032 — 35% of domestic and 70% of non-domestic buildings' heat to be supplied using low carbon technologies

2033 — All homes to achieve EPC C rating or above

2035 — Low-carbon district heat networks should provide a minimum of 22% of heat demand

2038 — Zero direct emissions from buildings

2040 — 90% CO2 reduction by 2040

2045 — Production capacity of 25GW of low carbon hydrogen

2027 — Combined supply of thermal energy by heat networks to reach 2.6 TWh of output by 2027

2025 — Food waste reduced by 33% and 70% of all waste recycled, new boilers should be hydrogen ready, stop purchase diesel / petrol vehicles

2024 — All new homes use renewable or low carbon heating

Dec 2023 — LHEES strategy and delivery plan produced

Aug 2023 — Top 25 suppliers CO2 footprint analysis and decarbonisation readiness assessed

Mar 2023 — Carbon Budget 2023/24 and Feasibility study budget signed off

Jan 2023 — Supply chain capacity / capability gap analysis, existing contracts gap analysis

Mar 2022 — 2022/23 Carbon Budget and Feasibility study budget signed off

Aug 2022 — Feasibility surveys procured and starting on site

Sept 2022 — Route Map 2030 signed off; Sustainability Champions programme launched

Sept 2022 — Sustainability Steering Group and reporting structure set up

Oct 2022 — Scope 1,2,3 scope boundaries defined, residual emission action plan and resilience adaptation assessments signed off

Nov 2022 — Targets for direct and indirect emissions agreed

Dec 2022 — Survey data processed and interventions designed and costed for identified typical sites — following buildings heat decision trees

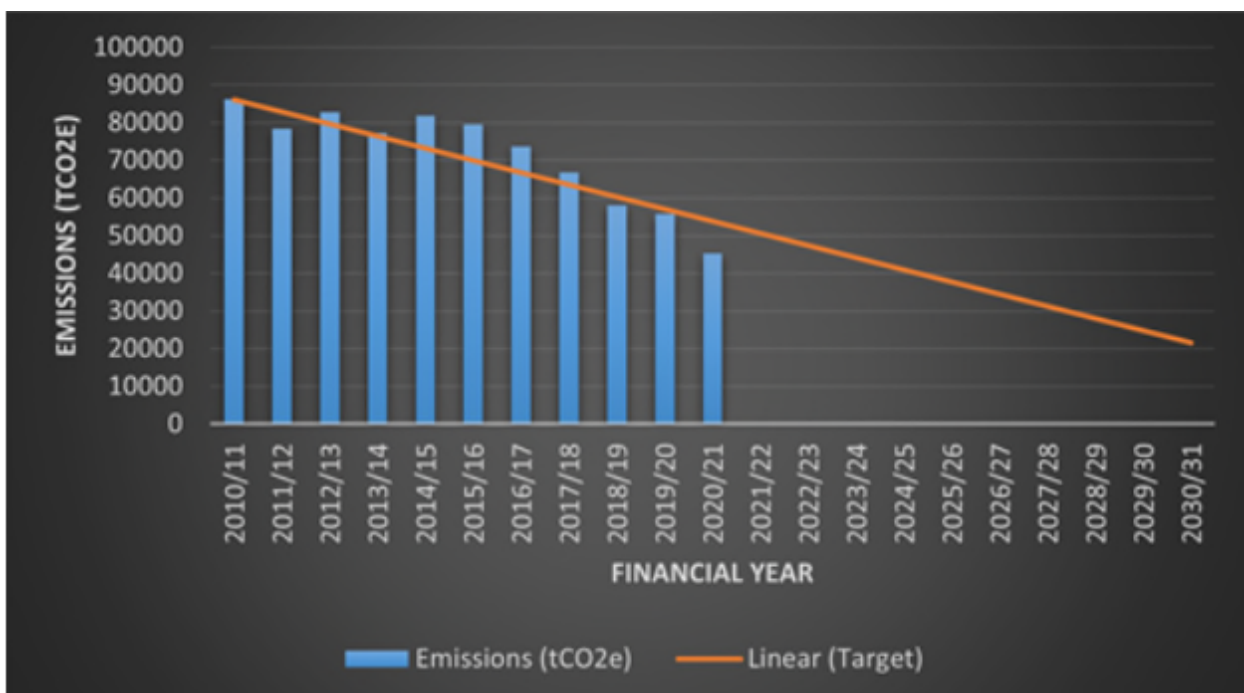## 3 Future Carbon Budgets

3.1 Introduction

The formal adoption of the Carbon Budget process in 2017 marked one of the most significant shifts and since then there has been reasonable progress. As an organisation, Aberdeenshire Council have taken positive steps such as the establishment of the Carbon Budget process, establishing the Sustainability Committee as a full Committee in 2017 and development of this Route Map and a Carbon Budget Toolkit to support teams to build up their respective future Carbon Budgets.

The annual Carbon Budget figure is set each year to keep the Council on track for its commitment to reduce emissions by 75% by 2030 and be Net Zero by 2045 using 2010/11 as a baseline year. Management of the necessary annual reduction in emissions is the responsibility of the Senior Leadership Team with support from key services and the Sustainability and Climate Change Team.

The Carbon Budget is set in February/March each year at the same time as the Council's Revenue and Capital budgets and is monitored throughout the year by the Sustainability Committee and other relevant Policy Committees.

The table and visuals below (figures 3 and 4) demonstrate the level of direct influence of respective Directorates to support the delivery of the decarbonisation target of 21,539 tonnes Carbon Dioxide Equivalent (tCO2e) to meet the 75% reduction target by 2030/31.

Figure 3 Aberdeenshire Council 2030/31 Target Trajectory Graph

The Directorates are provided with annual CO2e reduction targets to support the identification and cost interventions needed to decarbonise their services to form the Authority's Carbon Budget. These targets are presented by the new Carbon Budget tool and take into consideration and are reduced by the appropriate estimate of grid decarbonisation (tCO2e) in that year.
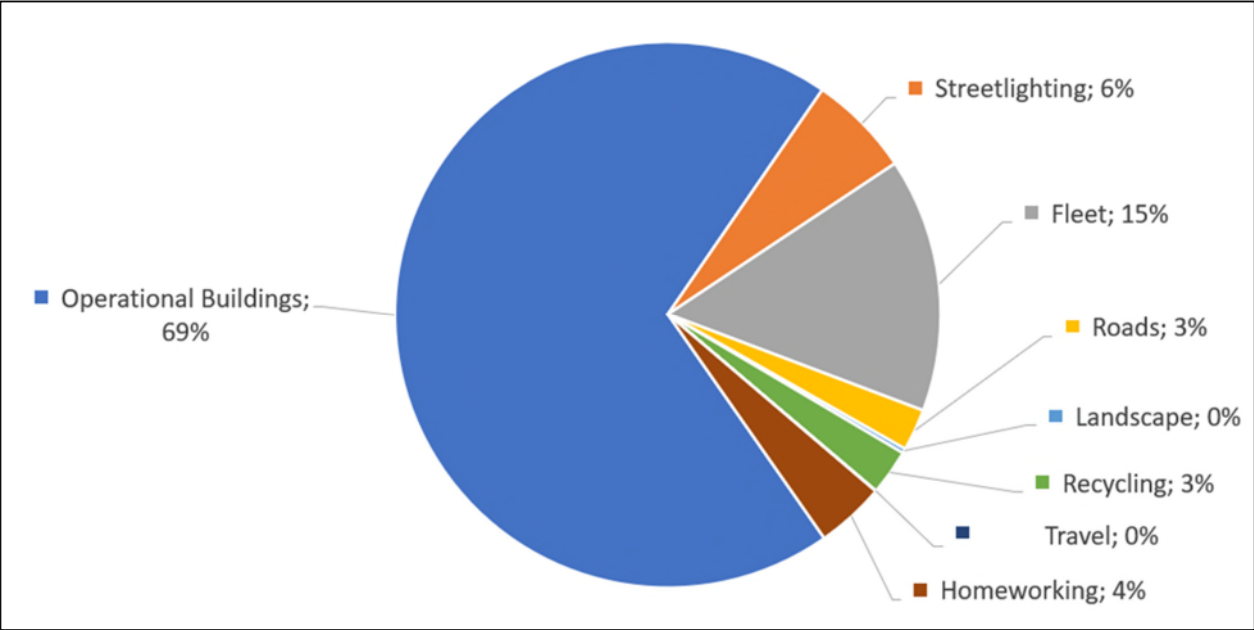
The direct level of influence the respective Directorates must support to deliver on the Council's decarbonisation targets in 2030 and beyond differs as presented by the visual. Appropriate budgets, resources and support from key services are key to support them to plan, design, procure and deliver the hard interventions on the ground working closely with the user community. The emissions data below (figure 4) was sourced from the 2015/16 Aether report.

Figure 4: Annual Proportion of tCO2e contribution by Directorate
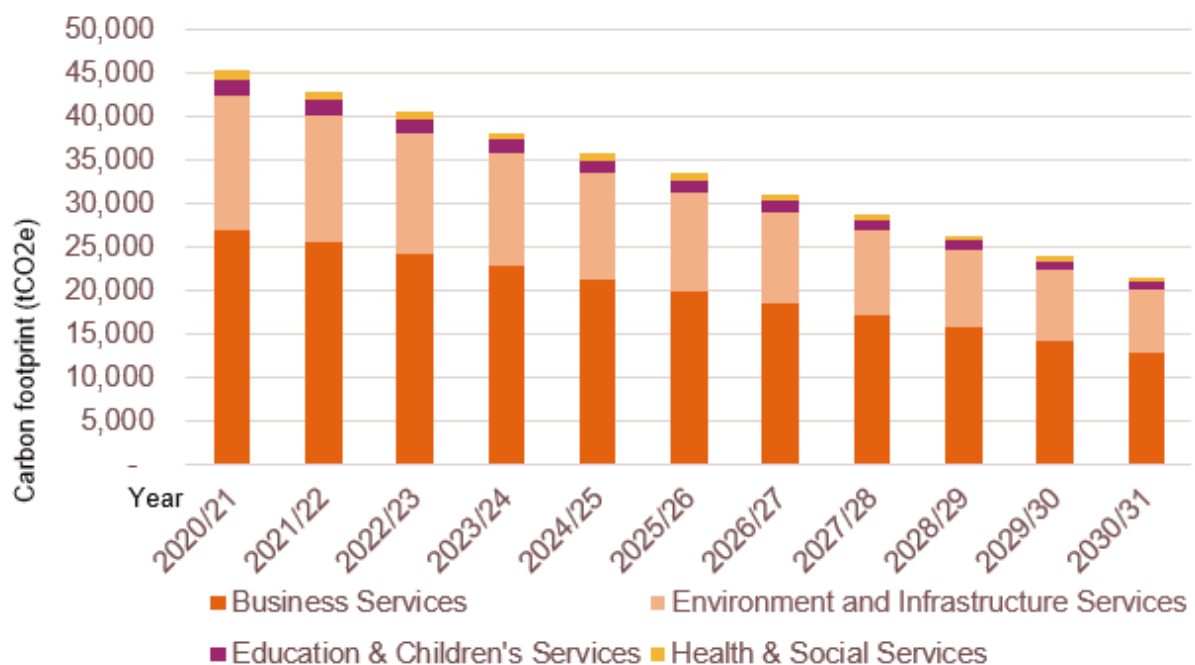
In 2020-21 the Council's footprint was 45,282 tCO2e which was split up as per the visual overleaf (figure 5). Operational buildings, street lighting and fleet represent 90% of the Authority's carbon footprint as presented by figure 5. This clearly demonstrates the key role for the Property Management team who influence over 65% of the total footprint. Part of this is making sure that the user communities are clear and are taking the necessary steps to change how stakeholders use and operate the buildings to minimise energy and contribute to reduce the carbon footprint. The new Carbon Budget toolkit was used to calculate the indicative future Carbon Budget required for each of these key teams to deliver on the vision as presented below.

Figure 5: Proportion of tCO2e contribution by Service

- Streetlighting; 6%
- Fleet; 15%
- Operational Buildings; 69%
- Roads; 3%
- Landscape; 0%
- Recycling; 3%
- Travel; 0%
- Homeworking; 4%

3.2 Operational Non Domestic Buildings

We have provided below a future Carbon Budget for Property & Facilities Management (Table 1) to implement retrofit interventions to Council owned non domestic buildings with a view to improve efficiency and deliver the targeted of 75% carbon reduction.

The proposed retrofit work includes a balanced set of measures to save energy, decarbonise heat and generate and store energy with a view to reduce to net or near net zero emissions.

The future budget is generated using the new carbon toolkit. The numbers in table 1 are based on an example programme of interventions on a range of typical sites in line with the heat decarbonisation decision tree in figure 6 below. It should be noted that the actual approach to selection and delivery of interventions will probably be different which will impact the indicative numbers presented. However, it is unlikely that the current front loading of the programme in the first three years can be avoided.

Figure 6: Property Service heat decarbonisation decision tree to implement decarbonisation interventions
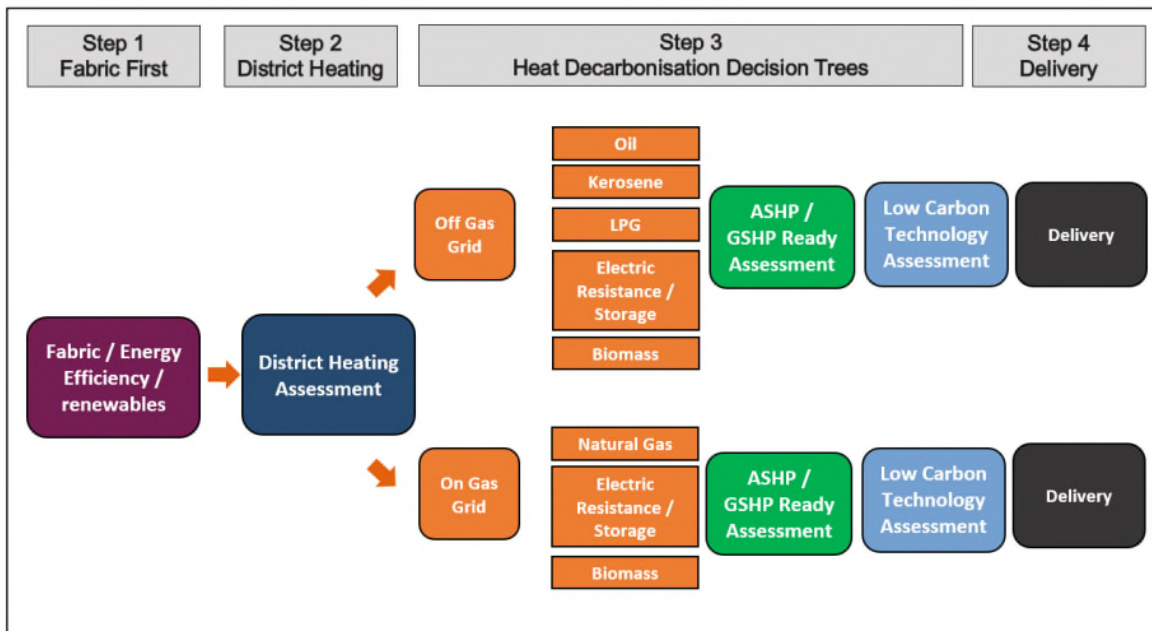
Table 1: Property annual targets (tCO2e) and related capital expenditure (£)

Year	Reduction target (tCO2e)	Capital Expenditure (£)
2023/24	9,349.43	£12,647,543
2024/25	5,252.55	£20,469,455
2025/26	2,595.87	£9,369,369
2026/27	100.06	£554,344
2027/28	456.33	£3,026,648
2028/29	26.60	£791,596
2029/30	35.71	£935,038
Total	**17,816.53**	**47,103,863**

We have included an extract of the Route Map 2030 Marginal Abatement Cost Curve (MACC) for the Property Management team (figure 7).

This figure presents the cost of proposed emission reductions in £/tCO2e on the y-axis, alongside emission reduction potential in tCO2e per annum on the horizontal x-axis. In this context, 'abatement' means 'reducing'.

For the benefit of this report, we included a small sample of the proposed retrofit interventions to the buildings required to reach the 2030/31 targets. A full and interactive version is available in the Carbon Budget Toolkit to support the Council's teams in identifying interventions with the highest savings to build an annual programme and future Carbon Budgets.

The MACC visual supports teams to compare financial costs and/or cost reductions as a result of a vast range of possible retrofit interventions to existing public sector buildings which are presented as coloured vertical columns.

This visual presents the cost and carbon impact of these retrofit measures for a wide range of typical Aberdeenshire sites including primary schools, academies, leisure centres, care homes, depots, and offices. The estimated costs and impact of the interventions in the Carbon Budget Tool are calculated by the new Council's Carbon Budget Toolkit using a large set of benchmark data of similar buildings throughout the UK.

Figure 7: Extract from Property's 2030 Route Map Marginal Abatement Cost Curve (MACC)

MACC for a selection of the property interventions necessary to achieve 75% reduction by 2030
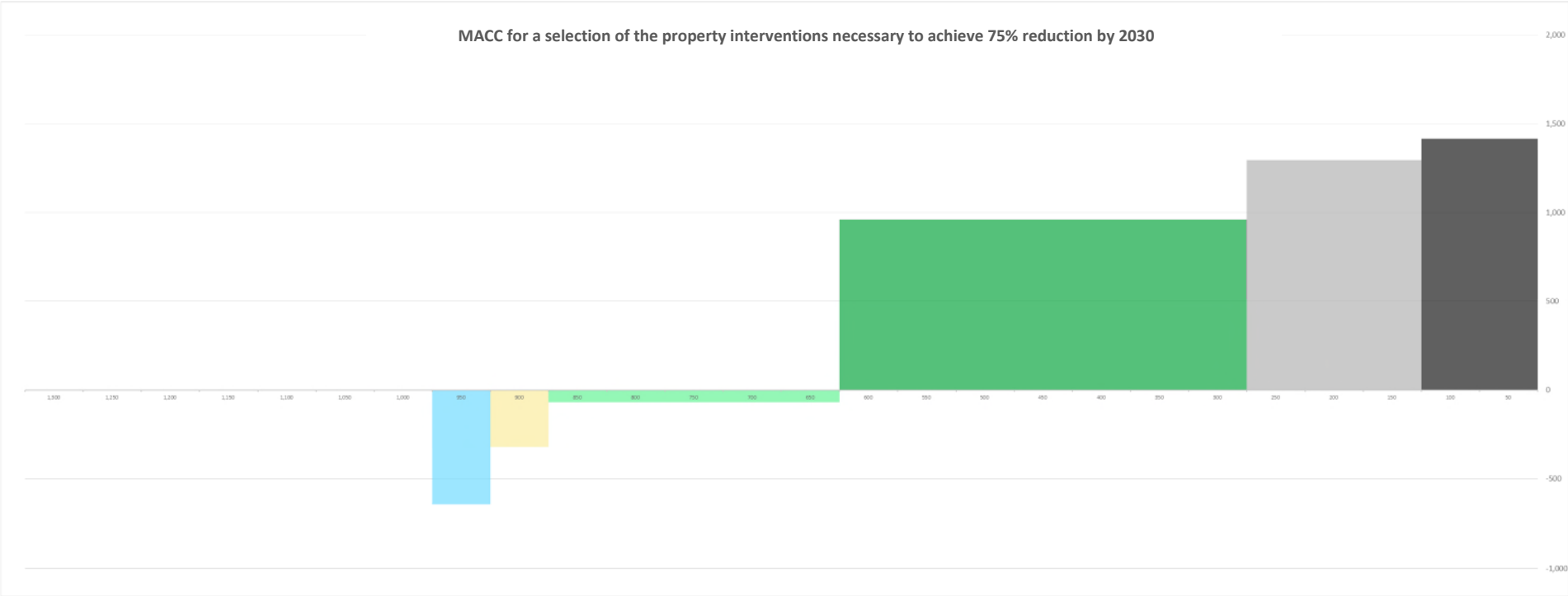
Example Primary School Air Source Heat Pump (realising 600 tCO2e reduction at a cost of 961 £/tCO2e)

Example Primary School Double Glazing (realising 100 tCO2e reduction at a cost of 1416 £/tCO2e)

Example Academy LED replacement programme (realising 200 tCO2e reduction at a cost of 1295 £/tCO2e)

Example Swimming Pool LED replacement programme (realising 950 tCO2e reduction at a saving of 643 £/tCO2e)

Example Swimming Pool LED replacement programme (realising 900 tCO2e reduction at a saving of 320 £/tCO2e)

Example Swimming Pool Double Glazing (realising 850 tCO2e reduction at a saving 70 £/tCO2e)

3.3 Fleet

This paragraph presents the costs of decarbonisation of Aberdeenshire Council's commercial fleet. The data excludes the cost of installation of necessary charging and refuelling infrastructure. Due to the limited availability of hydrogen fuel cell vehicles, this analysis focusses on the transition into a fleet of electric vehicles. It would still be our strategic intent to adopt hydrogen alongside EV in the period to 2030.

Current analysis demonstrates that the maximum fleet decarbonisation from the current carbon footprint of 6536 CO2e is approximately 55%. This is based on current Government's 'Environmental reporting guidelines' which state electric vehicles available in today's market cannot yet be considered net zero due to the electricity supplied to the grid not being carbon neutral.

Table 2 and table 3 have been presented below for fleet replacement up to 2030/31 (target year for 75% reduction and focus for this Route Map report) and the second table presents the cost for full electrification of the commercial fleet. It is anticipated that the fleet's footprint by 2030/31 will have reduced by an estimated 45% and from 2032/31 by an estimated 55% respectively from the current carbon footprint.

Due to given constraints in the vehicle market, the Council is over the next 2 years replacing like-for-like (diesel with diesel vehicles) and will continue decarbonisation of its fleet from 2025/26.

The tables below present the impact of electrification of the fleet as

- Anticipated carbon footprint of the commercial fleet in tCO2e
- Estimated increase of the cost of ownership of the fleet

The planned transformation is based on the currently planned programme of vehicle replacements year by year as presented in Cenex report 'Zero Emission Fleet and Infrastructure Review' which was issued to Aberdeenshire Council in October 2021.

Table 22: Planned fleet electrification trajectory and carbon reduction (tCO2e) versus additional cost of ownership (£) per annum to 2030/31

Year	Planned reduction - realised by fleet electrification (tCO2e)	Increased cost of ownership as a result (£)
2025/26	523	1,455,692
2026/27	839	3,882,912
2027/28	447	5,459,129
2028/29	203	6,081,665
2029/30	380	7,402,341
2030/31	509	8,413,674
Total	**2,091**	**£32,695,412**

Table 33: Full fleet electrification trajectory and carbon reduction (tCO2e) versus additional cost of ownership (£) per annum

Year	Planned reduction - realised by fleet electrification (tCO2e)	Increased cost of ownership as a result (£)
2025/26	523	1,455,692
2026/27	839	3,882,912
2027/28	447	5,459,129
2028/29	203	6,081,665
2029/30	380	7,402,341
2030/31	509	8,413,674
2031/32	365	9,222,870
2032/33	263	9,794,830
Total	**3529**	**£51,713,112**

3.4 Street Lighting

The programme of streetlight replacements to date has successfully exceeded annual decarbonisation targets year-on-year. The cost and decarbonisation impact of the planned remaining interventions next year are presented below (table 4).

Table 44: Street lighting annual targets (tCO2e) and related capital expenditure (£)

Year	Reduction Target (tCO2e)	Planned reduction - realised by the interventions (tCO2e)	Capital Expenditure (£)
2023/24	141	322	£500,000

3.5 Aberdeenshire future indicative carbon budget

To meet the target of 75% decarbonisation against the baseline of a footprint of 86,155 tCO2e in 2010/11, Aberdeenshire Council requires to decarbonise to 21,539 tCO2e by 2030/31 (table 5).

Table 55*: Aberdeenshire carbon baseline and targets (tCO2e) to achieve 75% reduction

Year	Annual emissions (tCO2e)	Annual reductions (tCO2e)
• 2010/11	• 86,155	• 3,231 (linear)
• 2020/21	• 45,281	• 2,374 (based on 2021 footprint)
• 2030/31	• 21,539	

Property, Street lighting and Fleet account for over 90% over the current footprint. On that basis, we have calculated Aberdeenshire's indicative future Carbon Budget as the sum of the Capital expenditure of these 3 Services to deliver a 75% carbon reduction plus an additional 10% to account for projects by other teams including Waste, Roads and Infrastructure, Landscaping, Business Travel and Homeworking (table 6).

The cumulative Carbon Budget investment required by Property, Street lighting and Fleet to deliver the target is £80,989,406. We have allowed an estimated 10% or £8,098,940 (or £1,012,367 per annum) to design, procure and deliver projects of other services. However, it should be highlighted that this is an estimation of cost based on current thinking, the further studies will provide more detailed and robust whole life costings.

A total Carbon Budget investment of around £89,088,347 to deliver on Aberdeenshire's vision and meet Scottish Government national targets set for 2030/31.

It is important to highlight that this expenditure is front loaded to reach the 2030/31 reduction target with approximately 60% of the interventions delivered within the first three years.

Table 66: Aberdeenshire indicative future carbon budget required to deliver 75% by 2030/31*

Year	Total Capital Expenditure (£)	Property	Fleet	Street lighting	Other Services (10% contribution)
2023/24	£14,159,911	£12,647,543		£500,000	£1,012,367.58
2024/25	£21,481,823	£20,469,455			£1,012,367.58
2025/26	£11,837,429	£9,369,369	1,455,692		£1,012,367.58
2026/27	£5,449,624	£554,344	3,882,912		£1,012,367.58
2027/28	£9,498,145	£3,026,648	5,459,129		£1,012,367.58
2028/29	£7,885,629	£791,596	6,081,665		£1,012,367.58
2029/30	£9,349,747	£935,038	7,402,341		£1,012,367.58
2030/31	£9,426,042		8,413,674		£1,012,367.58
Total	**£89,088,347**	**£47,793,993**	**£32,695,413**	**£500,000**	**£8,098,940**

Please note that currently all text and cost data in this Route Map 2030 report and benchmark data in the Carbon Budget is going through a final review - which may lead to further updates.

Appendix A - Summary of key targets outlined by policy

Table 77: Summary of key targets outlined by policy

Topic	Target	Implementation Date	Legislation, policy or guidance (plus reference)
Legislation			
Key Targets	Scottish target to reach Net Zero by 2045.	• 75% reduction by 2030 • 90% reduction by 2040 • Net zero by 2045	Climate Change (Scotland) Act 2009 - *The 2050 and interim targets* Climate Change (Emissions Reduction Targets) (Scotland) Act 2019 (asp 15),
	Consult in 2022 on a series of phased targets and new funding to support all publicly owned buildings meeting net zero heating requirements.	• By 2038	Heat Networks Delivery Plan - Page 23 Heat Buildings Strategy Page 74
	20% reduction in car kms driven. Phasing out of all petrol and diesel cars from public sector fleets - removing need for new petrol or diesel light commercial vehicles by 2025, and to phase out need for all new petrol and diesel vehicles in Scotland's public sector fleet by 2030.	• 2025 • 2030	National Transport Strategy (NTS2) Delivery Plan: Page 19
	The Scottish Government is committed to all buildings achieving net zero emissions by 2045.	• 2045	Net Zero Public Sector Buildings Standard – page 2 Scottish Futures Trust Net Zero Public Sector Buildings Standard

Food waste reduced by 33% from the 2013 baseline by 2025. 70% of all waste recycled by 2025. Landfilling of biodegradable municipal waste has ended by 2025. Reduce use of energy, water, and natural resources in support of circular economy principles and zero waste.	• 2025	Climate Change Plan 2018 – 2032 Securing a Green Recovery on a Path to Net Zero- Page 159 Aberdeenshire Climate Change Policy Aberdeenshire Council Resources and Circular Economy Commitment
All new homes shall use renewable or low carbon heating - it is imperative that new homes consented from 2024 use zero direct emissions heating and cooling, + feature high levels of fabric energy efficiency to reduce overall heat demand.	• From 2024	New Build Zero Emissions from Heat Standard – page 2
35% of domestic and 70% of non-domestic buildings' heat to be supplied using low carbon technologies.	• 2032	Climate Change Plan 2018–2032 page 19

Policy and Guidance

Energy Efficiency	All homes to achieve equivalent to EPC C by 2033, where technically and legally feasible and cost-effective.	• 2033	Scottish Government Energy efficiency policy – page 1 Energy Efficiency Standard for Social Housing (EESSH2)
	68% reduction of emissions for homes and non-domestic buildings.	• 2030	Protecting Scotland's Future: The Government's Programme for Scotland 2019-2020

	All rented non-domestic buildings will be EPC Band B.		
District Heating	Low-carbon district heat networks should provide a significant share of public and commercial heat demand. "The Scottish Ministers may by regulations modify subsection (1) so as to specify an additional target relating to the output from the combined supply of thermal energy by heat networks in Scotland to be reached by 2035."	• 22% by 2035 • 42% by 2050 • Combined supply of thermal energy by heat networks to reach 2.6 TWh of output by 2027 and 6 TWh of output by 2030.	The Heat Networks (Scotland) Bill 2021 Heat Networks Strategy page 25

Technology	Target	Key Date	Legislation, policy or guidance
Heat pumps	The zero-emissions heat transition will involve changing the type of heating used in homes and non-domestic buildings, moving from high emissions heating systems, reliant on fossil fuels, to low and zero emissions systems such as heat pumps, heat networks and potentially hydrogen.	• 2 million homes and 100,000 non-domestic buildings by 2045	Climate Change Plan 2018–2032 page 92
Hydrogen	Boilers should be hydrogen ready.	• 2025	Climate Change Plan 2018–2032 page 219
	Increase hydrogen mixing into the gas system to be at least 20% green gas Production capacity of 5GW of low carbon hydrogen 100% hydrogen to become available	• 2030	Climate Change Plan 2018–2032 page 146 Heat Buildings Strategy page 57
	Production capacity of 25GW of low carbon hydrogen.	• 2045	Hydrogen Policy Statement – page 7
Bioenergy Review Scottish Heat and buildings strategy	Increase of biomethane injection into the gas system to be at least 20% green gas.	• 2030	Heat Buildings Strategy page 17
	Combined supply of thermal energy by heat networks to reach 2.6 TWh of output by 2027 and 6 TWh of output by 2030 - 3% and 8% respectively of current heat demand.	• 2030	Heat Networks Strategy page 25