Agenda Item 6

Climate Emergency Update

Falkirk Council

Title: **Climate Emergency update**
Meeting: **Executive**
Date: **22 February 2021**
Author: **Director of Place Services**

1. Purpose of Report

1.1 Falkirk Council declared a Climate Emergency in 2019. Since this declaration, various actions have been implemented to achieve the targets set, and progress has been made against future targets. This report provides an update on the work undertaken to date and seeks agreement in relation to implementation of future actions.

1.2 The report includes the latest position on the following key areas:

- Carbon Budgeting
- Climate Emergency Action Plan 2022-2030
- Progress toward Net Zero Targets
- Falkirk Council LCLIP (Local Climate Impact Assessment)
- Forth Valley Climate Forest

2. Recommendations

2.1 It is recommended that the Executive:

(1) notes the ongoing work across the Council linked to Carbon Budgeting.
(2) agrees the Climate Emergency Action Plan 2022-2030 (Appendix 1).
(3) notes the work outlined in the Climate Change Project Register (Appendix 2).
(4) notes the new Falkirk Council Local Climate Impact Assessment (Appendix 3).
(5) agrees to participate in the Forth Valley Climate Forest project.

3. Climate Change Impact

3.1 Information within this report sets out how Falkirk Council is currently performing against national and organisational targets.

4. Background

4.1 Falkirk Council has recently undergone an extensive analysis of new legislative targets and how these apply to Council service delivery. Falkirk Council must meet the national target of net zero by 2045 for all carbon emissions, as well as the Council's own net zero carbon target, for its activities, by 2030.

4.2   In December 2020 the Scottish Government updated the Climate Change Bill 2019, to reflect the scale and pace of change required for Scotland to reach these targets. This update included 100 new targets and policies to build into how our organisation delivers its core services. These targets and policies are currently being reviewed to define how to apply these to allow achievement of our overarching Net Zero targets.

5.   Climate Emergency Update

5.1   **Carbon Budgeting**

5.1.1 The intended Carbon Budget concept will be to allocate an allowance of tonnes Carbon Dioxide Equivalent (tCO2e) emissions annually for each Service area. Services will then be required to keep within their allocated Carbon Budget over the financial year allowing the Council to better manage progress towards meeting its emission reduction targets. The Carbon Budget will relate to Falkirk Council's own emissions only and not to the wider community or business emissions.

5.1.2 By implementing carbon budgeting Council wide, we will have an organisational mechanism for monitoring and reporting progress toward national and organisational targets.

5.1.3 Work is currently under way to align the outcomes required by each Service in carbon emission reductions, with the capital and revenue programmes. It is anticipated that by aligning these requirements carbon reduction will become as intrinsic to future decision making and project implementation as financial budgeting.

5.1.4 Service areas will be provided with a carbon budgeting tool which will record project deliverables, financial particulars and carbon emissions. This will then be reported back to the Energy and Climate Change team where it will be amalgamated in a Council wide climate change project register. This register will then be used to provide the necessary performance management and reporting data moving forwards.

5.1.5 Carbon budgeting implementation is due to begin in Q1 2022/23, aligning with the Council's financial programmes. The first year (2022/23) will be seen as a transitional year, building capacity (in the development of a carbon budgeting tool, where each service will be able to record projects and their associated carbon impacts in order to measure performance) and collating data over the first year to form a realistic baseline in which to begin the monitoring process from Q1 2023/24.

5.1.6 Next steps are:

- Embed carbon budgeting into Capital Strategy document to guide decision-making.

- Produce an outline carbon budgeting process explanatory paper for the Council meeting, 30th March with nominal service carbon budgets (where possible).

- Develop carbon budgeting tool to help services monitor performance against their carbon budget.

5.2   Climate Emergency Action Plan 2022-2030 & Project Register

5.2.1   Following the Council declaring a climate emergency it is crucial to define our priorities and agree appropriate action towards achieving national and local climate emergency targets. This is particularly the case for the pathway to Net Zero emissions attributed to the Council's use of gas, electricity, and fuel by 2030.

5.2.2   Appendix 1 outlines the Climate Emergency Action Plan for approval. This key document outlines Council priorities/key actions to tackle climate change, such as:

- A review of the vehicle replacement programme to move towards a more sustainable fleet
- Improving energy efficiency in residential housing through the Housing Investment Programme
- Reducing waste to landfill

5.2.3   It is anticipated that the Climate Emergency Action Plan will be a live document outlining all obligatory areas of climate change action including governance; mitigative action and targets, engagement, adaptation and climate change action area wide.

5.2.4   The Action Plan is supported by the Council's Project Register (Appendix 2). The Project Register illustrates the actions/projects that the Council can implement to realise the reduction in carbon emissions required to meet the Net Zero Targets.

5.3   Current Progress toward Net Zero Targets

5.3.1   Climate change has been declared one of the top 10 Council of the Future priority projects for the Council. A one Council approach is required to address the climate emergency, adapt to a changing climate and de-carbonisation where possible. To achieve this, large scale transformation is required at pace.

5.3.2   More work is required to identify the required number and scale of potential projects to enable services to meet statutory targets. Climate Change must be incorporated into all strategies/plans/projects going forward, requiring a change in mindset, processes, governance, and decision making within the Council. This will allow the organisation to plan and deliver action against these targets.

5.3.3   Difficult decisions must be taken, and action not delayed, or we risk failing to act in time to mitigate the worst of the effects from climate change for the organisation and our communities and stakeholders.

5.3.4   The following graph is an updated outline showing the Council's current carbon footprint (blue bars) against both the national target (blue line) and the organisation target (yellow line) with business as usual/no change (orange

line).   By 2030, the yellow line should reach zero and the blue line should reach where the yellow currently stops (75%tCO_2e reduction).
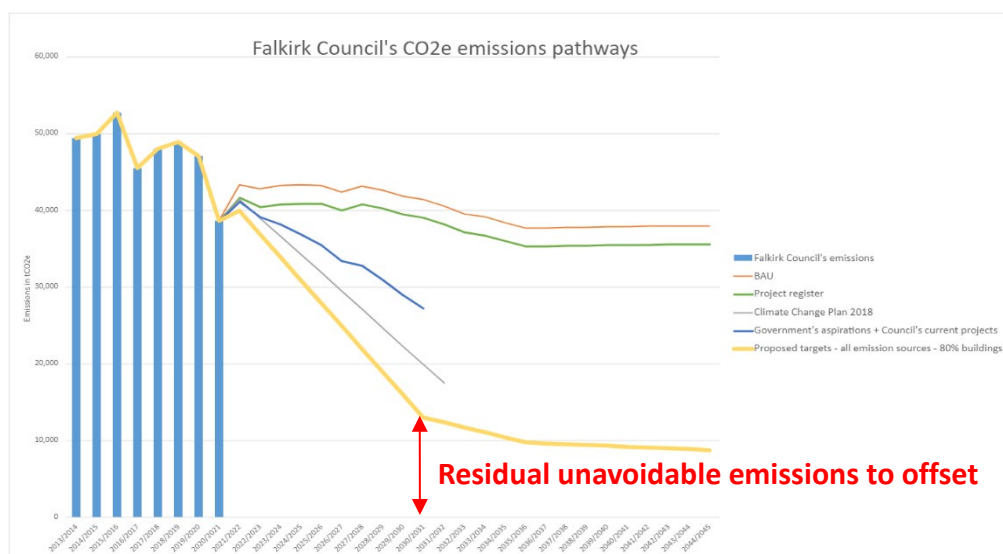

Figure 1: Falkirk Council's CO2e emissions pathways 2021

5.3.5   As can be seen, neither line falls upon its designated target. As such, the red arrow depicts the amount of carbon emissions remaining which the Council will need to offset by whatever means possible, e.g., planting trees or installing green roof/walls. This is called carbon sequestration.

5.3.6   As outlined in the report in June 2021, if we can enact the projects outlined in figures 2-4, we will be required to sequestrate circa 13,000 tCO2e. Following an extensive analysis of our ability to sequester within the Falkirk area, we identified the ability to sequester circa 5,000 tCO2e. This leaves a significant shortfall, meaning efforts must be re-doubled to ensure mitigative action is a priority. Moving forward officers will need to present recommendations to Council for decisions on reducing our emissions and then enact them at pace.

5.3.7   To outline the scale of change required the following graphs outline where we need to be for both our national (Figure 2) and organisational (Figure 3) targets and what action we currently have committed to undertake (Figure 4).
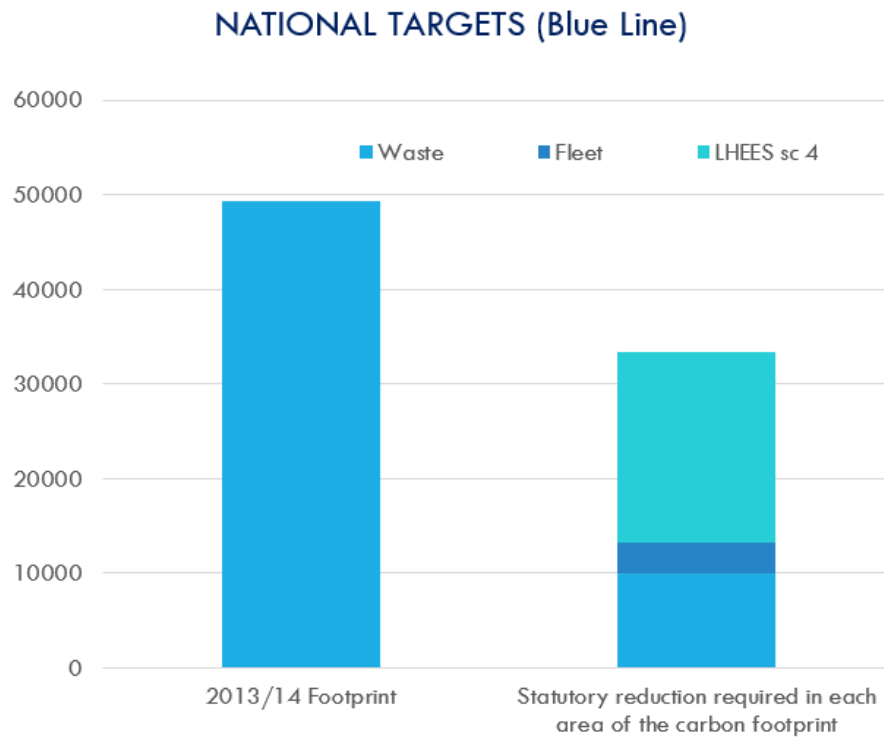
NATIONAL TARGETS (Blue Line)

Figure 2: Statutory reduction required by 2030 to meet National Targets (tCO2e)

*LHEES Sc4 – Local Heat and Energy Efficiency pilot scenario 4 listed out options for decarbonising Falkirk Councils top 70 worst energy performing buildings.

5.3.8 Figure 2 above, shows the carbon footprint for 2013/14 (National target baseline) as the bar on the left, with the required reductions, as outlined through policy and regulations dictated by the Scottish Government. As shown above, if we were able to implement this level of action, we would achieve the required 75% reduction by 2030. This would put us well on the path to achieving Net Zero by 2045 and be in line with statutory requirements placed on the Local Authority.
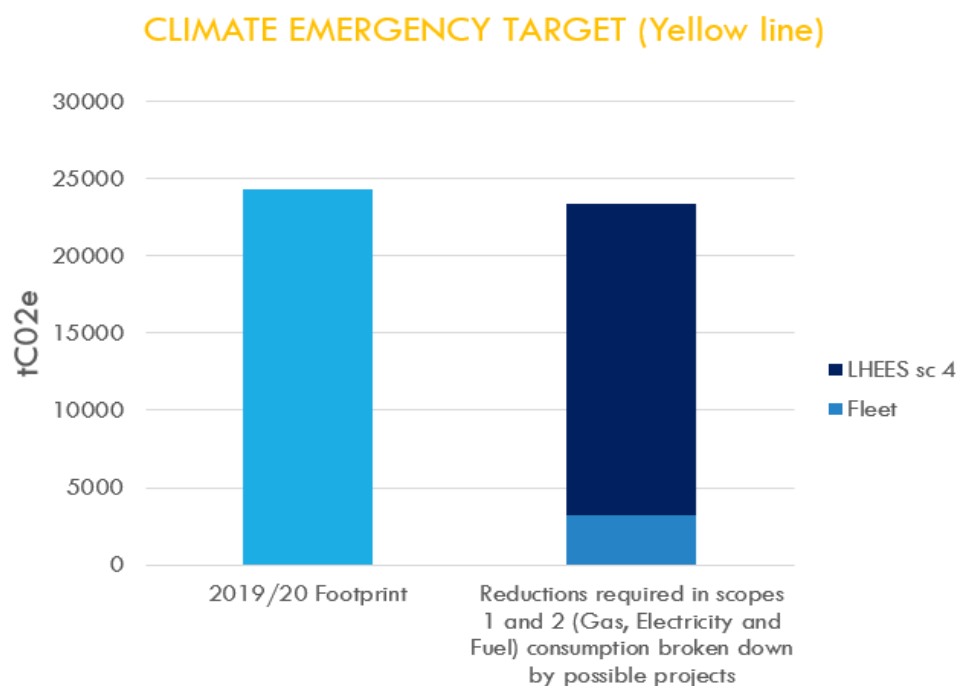
CLIMATE EMERGENCY TARGET (Yellow line)

Figure 3: Reductions required to achieve organisational Net Zero by 2030 target broken down by potential projects

5.3.9 Figure 3 above, shows the carbon footprint for 2019/20 (Organisational target baseline) as the bar on the left, with the required reductions, as outlined in the climate emergency declaration published by Falkirk Council in 2019. As shown above, if we were able to implement this level of action, we would come very close to achieving Net Zero on emissions related to gas, electricity, and fuel consumption by 2030.

5.3.10 It is important to note there may be some residual unavoidable emissions to offset but this would be far reduced from the anticipated requirement based on current projections.
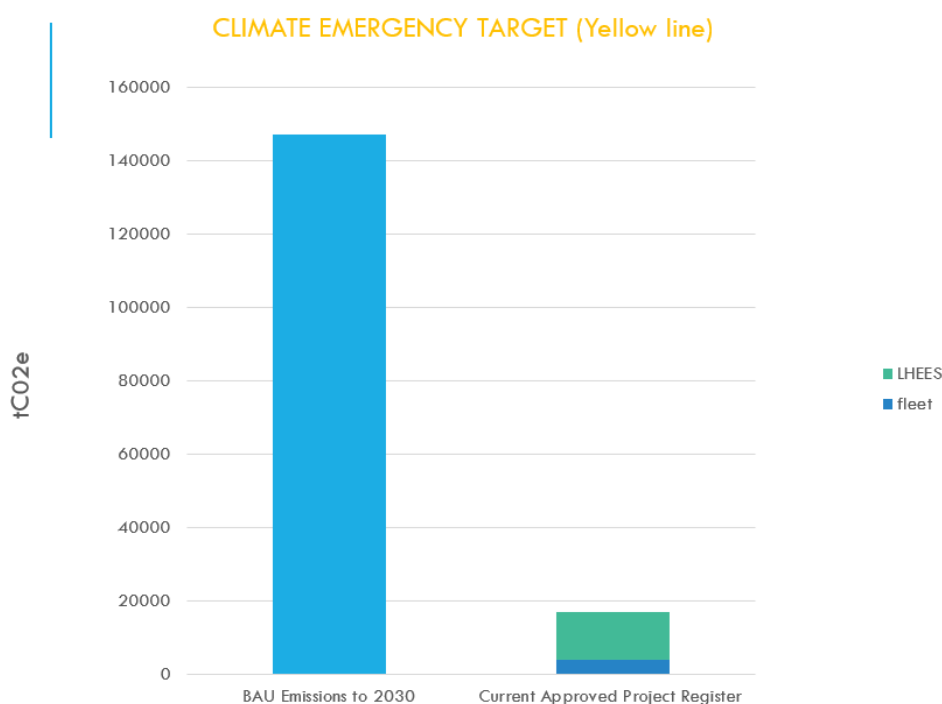
Figure 4: Reductions capable with current level of action recorded within climate change project register

5.3.11 Figure 4 above however, shows the same carbon footprint for 2019/20 (Organisational target baseline) as figure 3. Instead of showing the required level of action, the bar on the right depicts the current reductions anticipated considering current projects captured within the climate change project register. As can be seen, unless drastic change such as reducing the building stock and investing heavily in energy efficiency with the remaining buildings is implemented, we will fall significantly short of our required targets.

5.3.12 Significant commitment must be made to enhance the current level of action targeting carbon reduction. If we do not meet both our national and organisational targets the council risks significant financial and reputational damage as well as failing to adequately prepare for the worst consequences of a changing climate and ensuring we can still deliver key services.

5.4 Falkirk Council LCLIP

5.4.1 In 2020 the Energy and Climate Change Team updated and developed a new Local Climate Impact Profile (LCLIP) (Appendix 3).

5.4.2 An LCLIP is a snapshot in time which assesses the anticipated weather patterns and how they may adversely affect the organisational service delivery. The outcomes of this study feed into risk assessments and are used to ensure future service provision accounts for these changes and makes the appropriate adjustments to ensure services can still be delivered despite the changing climate.

5.4.3 The Covid pandemic pushed back the delivery of the LCLIP. Following the Executive meeting the document will be published on the Falkirk webpages in accordance with standard practice.

5.5 Forth Valley Climate Forest

5.5.1 The Woodland Trust has launched an Emergency Tree Fund, for applications of between £50,000 to £300,000, to help local authorities address the climate emergency, overcome potential barriers, stimulate activity in tree planting, and provide exemplars of innovation and inspiration that can be applied.

5.5.2 The Forth Climate Forest will be a ten-year project that will harness current urgency and enthusiasm for tree planting to build momentum across communities and regions. It will carefully consider tree planting projects for a range of wellbeing, climate and ecological benefits within the Forth Valley Area of Central Scotland.

5.5.3 The scope of the Forth Valley Area for this project is comprised of Stirling, Clackmannanshire and Falkirk Council areas as well as part of the Loch Lomond and Trossachs National Park (Stirling portion)) with Scotland's International Environment Centre (SIEC) submitting a bid to the Emergency Tree Fund on behalf of the three Councils and the National Park.

5.5.3 The Forth Climate Forest draws heavily on the successful Clyde Climate Forest which was launched in June 2021 with support from the Emergency Tree Fund. The Forth Climate Forest looks to extend the concept and delivery of a 'Climate Forest' into the neighbouring region. By capitalising on this existing model and making habitat connections between the two networks at local to regional scales, the award of Emergency Tree Fund funding to the Forth Climate Forest will enable us to substantially scale up climate forest delivery across Scotland's Central Belt from Forth to Clyde, thereby delivering far more together than would be possible with either network in isolation.

5.5.4 The Forth Climate Forest shall have 3 main objectives:

- Canopy
- Connectivity
- Carbon

5.5.5 In order to progress and benefit from potential sequestration, as well as the many biodiversity and adaptation outputs, Falkirk Council is asked to contribute £15k each year to the project, for the next two years as part of an equal contribution made in line with the two other Local authority partners. It is expected funding for this shall come from the Energy and Climate Change Revenue budget. With this budget the Forth Climate Forest project will begin feasibility and implementation of land management to plant a significant number of trees. The funds will secure a project manager to drive and deliver the outputs set out by local authority partners.

6. Policy Context

6.1 The Council's commitment to achieving the national targets are set out in the Climate Change Bill 2019. The Council's commitment to achieving its organisational target of Net Zero is set out in the Climate Emergency Declaration 2019.

6.2 The recommendations and action outlined in this report has been endorsed by the cross-party Climate Change Action Stakeholder Working Group, and the Corporate Sustainability Working Group.

7. Implications

7.1 Financial

There are significant financial, legal and resource implications for Falkirk Council associated with meeting Climate Change Obligations and Targets.

This is also the case for the Climate Change Action Plan 2022-2030 which contains a number of actions that are currently unfunded by the Council. Officers will come forward over the lifetime of the next Council (2022 – 2027) with costed proposals to deliver on these actions for Elected Members to consider.

As part of this activity it is noted that the Energy and Climate Change team has already secured a £10million capital investment to undertake work required under the Local Heat and Energy Efficiency Strategy (LHEES). Whilst this is a positive first step in LHEES implementation (a statutory requirement) pilot studies have identified that the minimum amount required to decarbonise the Council's worst performing buildings (which must happen prior to 2030) will be around £60 million which must be sourced, or inefficient buildings removed from the Council's portfolio. The Strategic Property Review – Next Steps report, agreed in May 2021, provides the starting point to take this work forward.

It is important to note that this £60m only relates to property. It does not cover any costs that may be required to change service delivery models in transport, waste and other services across the Council to be more efficient. There may be opportunities, as part of the carbon budgeting process to review and mitigate where possible the impacts of initial capital and revenue outlays.

7.2 Resources

The Energy and Climate Change team have recently appointed an Energy and Climate Change Co-ordinator and have 2 vacant posts due to be recruited for imminently. The Climate Change remit is significant and impacts all areas of council delivery. The Energy and Climate Change team will facilitate implementation but will require significant input from all services areas. This structure is already in place with service representation at the Corporate Sustainability Working Group.

7.3   Legal

Failure to meet statutory targets presents significant legal implications from Scottish Government; as well as potential litigation arising from area-based stakeholders such as residents or businesses. The Council reports annually to Scottish Government on progress made and several policies/strategies are expected to be developed in response to recent regulations and will be available for public scrutiny. Failure to enact actions outlined within this report and produce meaningful outputs would increase the likelihood of potential litigation.

7.4   Risk

Increasing focus is directed from Government and other stakeholders in the Council's ability to implement action at pace to meet both national and organisational targets. Failure to decarbonise, adapt and mitigate our impact regarding climate change considerations shall expose the Council to significant reputational damage, both nationally but also with area wide stakeholders.

Scottish Government has reinforced through recent regulation that Local Authorities should take climate change seriously, encouraging them to embed it in all areas of service delivery. It is likely to impose financial penalties for non-conformance to targets reported within the Public Bodies Duty Report. A review and potential timeline for penalty implementation is in March 2023. Several key outputs are required from the Council at this point to anticipate the commitment needed and take appropriate action.

7.5   Equalities

Whilst there are no equality issues with the content of this report there are potential equality issues with actions detailed within the Climate Emergency Action Plan. Full EPIA's will be developed as appropriate.

7.6   Sustainability/Environmental Impact:

The work and aims expressed within this report are ultimately in line with Just Transition principles to enable the Council to undertake and maintain current levels of service delivery whilst reducing its climate negative impact on the surrounding area and nationally.

7.7   Council of The Future

Climate Change is one of the 10 priority projects within the Council of the Future initiative. Action outlined within this report help achieve key milestones. Actions outlined within this report also form dependencies with other key COF workstreams such as community engagement/equalities projects and realisation of the actions within this report will aid delivery of other COF projects.

8   Conclusions

8.1   The work of the Energy and Climate Change team will continue in the areas as noted above as well as development of further work on carbon reduction as these are defined through evolving Scottish Government and national directions.

8.2   Current commitments to reduce carbon emissions for both the national and organisational targets fall short of the required level of action. Significant effort must be given to ensure action to redress this is increased at pace.

8.3   Carbon budgeting is a significant tool for the Council and Services to allow greater consideration and control of our carbon footprint.

8.4   There is a significant shortfall in the amount of Carbon Sequestration available to the Council to offset its residual carbon emissions. Further study and investigation is required into how sequestration can be extended. At the same time further, urgent review is required of how we aim to cut our actual emissions to lessen this residual which requires to be sequestered.

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Director of Place Services

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Date: 10 February 2022

APPENDICES

Appendix 1 -Climate Change Action plan 2022-2030
Appendix 2 - Climate Change Project Register
Appendix 3 - Local Climate Impact Profile

Climate Emergency Action Plan 2022-2030

Section 1: Building organisational capacity

Task 1.1: Cross-cutting: Embed robust understanding, responsibility and accountability for the Council associated with climate change throughout all Council Services

Actions	Timescale	Resources	Progress	Additional comments
Strongly reflect climate change in all committee reports, including quantification of carbon impact	Ongoing	All council staff/Elected members Existing revenue budget and capital programme. Carbon Budgeting tool	In Progress	Amended report format agreed. Climate Change team consulted on all reports to advise on carbon impact. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Appoint Climate Change Graduate to assist with meeting Climate Change Local Heat and Energy Efficiency Strategy (LHEES) milestones.	June '21	Energy and Climate Change Team Existing revenue Budget	Complete	
Appoint Energy and Climate Change Co-ordinator	Dec 2021	Energy and Climate Change Team	Complete	

Adapt Council policies to ensure these acknowledge the imperative of a just transition to carbon reduction and adaptation including in social impacts of Green Recovery	Ongoing	Energy and Climate Change Team/All report leads Existing revenue budget and capital programme	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Adapt revenue budgeting and capital bid processes to take account of the requirement to reduce carbon	Ongoing	Energy and Climate Change Team/Carbon budgeting stakeholder group/Elected members Existing revenue budget and capital programme	In Progress	Carbon budgeting model to be embedded in capital and revenue programmes. Outputs will be monitored and measured within the council's carbon budgeting process.
Introduce Carbon Budgeting	Q1 22/23	£95K Existing capital programme	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Pupil involvement with Cross Party Working Group	Ongoing	Energy and Climate Change Team/Children's Services	In Progress	
Deliver organisational Carbon Literacy Training (includes train the trainer)	Ongoing - 2023	Energy and Climate Change Team Existing revenue	In Progress	Initial carbon budgeting programme completed. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Develop and implement Climate Change staff induction module	Nov 2022	Energy and Climate Change Team	In Progress	

Complete Annual Climate Change and Adaptation Tool Climate Change Assessment Tool (CCAT)	Ongoing	Energy and Climate Change Team /Corporate Sustainability Working Group	Not started for 2022	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Publication of annual Climate emergency action plan	Annually from November 2022	Energy and Climate Change Team	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Annual Public Body Duty Report (PBDR) submission	Annually from November 2022	Energy and Climate Change Team /Health and Social Care Partnership	Not started for 2022	
Engagement with Adaptation Scotland to undertake necessary engagement stages with wider Falkirk area	Ongoing	Energy and Climate Change Team	Planned Q2 22/23	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Maintain up to date organisational understanding of climate change trends, projections, risks, and opportunities	Ongoing	Energy and Climate Change Team	In Progress	Report to Executive February 2022. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Adaptation Scotland Capability Benchmarking	Ongoing	Energy and Climate Change Team	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Provide advice on climate change aspects of flood risk management system services and coastal management	Ongoing	Energy and Climate Change Team/ Flood management team/ Environmental team	In Progress	

Embed climate change adaptation considerations, and potential responses such as habitat networks and green networks, into wider land use planning decisions using Forestry and Woodland Strategies, regional land use strategies, and Strategic and Local Development Plans and development masterplans	Ongoing	Energy and Climate Change Team /Environmental team	In Progress	

Targets (not including interim targets): Net Zero on scope 1 and 2 emissions by 2030; Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019); Requirement to support the Scottish Climate Change Adaptation Programme

Task 1.2: Community: Partnership working and engagement to help people and organisations to reduce the carbon footprint of Falkirk District and to adapt to climate change

Actions	Timescale	Resources	Progress	Additional comments

Local Heat and Energy Efficiency Strategy (LHEES) engagement tool – development of interactive engagement resource to effectively communicate requirements to achieve decarbonisation targets to external stakeholders.	Ongoing – 2022- 2023	Energy and Climate Change Team / Local Heat and Energy Efficiency Strategy Stakeholder group Link to Energy Eff & Carbon F/prints Capital Improvements funding to develop engagement platform	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Publication of Local Climate Impacts Profile (LCLIP) and associated engagement	Q1 2022	Energy and Climate Change Team /Committee	In Progress	Report to Executive February 2022.

Targets (not including interim targets): Net Zero on scope 1 and 2 emissions by 2030: Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019)

Section 2: Meeting the Council's 2030 Net Zero Target

Task 2.1: Transport emissions; (council fleet)

Actions	Timescale	Resources	Progress	Additional comments
Review Vehicle Replacement Programme – to move towards a greener more sustainable council fleet including electric vehicle (EV) and Hydrogen potential	2021 - 2026	Fleet Services in conjunction with all Service areas £600k Capital Funding in 21-22 £8m Vehicle Replacement Programme/ 5 yrs.	In progress	Initial review undertaken and capital submission made for 2022-27 capital programme. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Install electric vehicle (EV) charging points/infrastructure	Ongoing	Transport Planning/Fleet Services £90K capital p.a. for electric vehicle (EV) infrastructure	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Support development of hydrogen fuel infrastructure	Ongoing	Fleet Services/Economic Development/Sustainable transport/Energy and Climate Change Team Potential for capital funding required	In progress	Discussions underway involving FC/Scottish Government.
Review policy of allowing fleet vehicles to be taken home by staff overnight	Ongoing	Fleet Services/Building Maintenance Division Building Maintenance Division (BMD)	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Hydrogenated Vegetable Oil (HVO) fuel trial for Heavy Goods Vehicles (HGVs)	Ongoing	Fleet Services	In progress	Pilot ongoing.

| Monitor and consider opportunities to use e-bikes | Ongoing | Sustainable Transport Team/ Energy and Climate Change Team | In progress | |

Targets (not including interim targets): Net Zero on scope 1 and 2 emissions by 2030; Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019); all fleet < 3.5t Ultra Low Emissions Vehicles by 2025 (Climate Change Plan Update)

Task 2.2: Public sector buildings; Significantly reduce emissions arising from energy use within operational council buildings

Actions	Timescale	Resources	Progress	Additional Comments
Implement Property Strategy and findings of Strategic Property Review	Ongoing	Existing revenue budget and capital programme submissions.	In progress	Implementation Plan agreed and initial capital funds identified. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Non-domestic building upgrades to comply with Local Heat and Energy Efficiency Strategy (LHEES)/Net Zero goal Some delivery through Non-Domestic Energy Efficiency Framework (partnership approach)	Ongoing	Energy and Climate Change Team /Building Design unit staff resource required Energy and Climate Change Team / Local Heat and Energy Efficiency Strategy (LHEES) Stakeholder group Energy Efficiency Loan Fund (EELF) and capital are only existing funds available ~£60 MILLION Capital required for 70 worst	In Progress Feasibility study complete – procurement process to be carried out by Building Design Unit	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

		preforming building to meet targets. £10.5 million capital awarded until 25/26. Future bid required to secure remaining funds £1 million ringfenced energy loan fund, called the Energy Efficiency Loan Fund (EELF) will contribute to this for the projects that fall within the parameters of this fund.		
Install solar PV in Denny, Falkirk, and Grangemouth High Schools	Ongoing - 2023	Energy and Climate Change Team Gateway funds – awaiting final agreements from lenders	In Progress Currently with external legal adviser to get agreements	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Install LED lighting in Grangemouth, Denny, St Mungo's and Falkirk High Schools.	– 21/22 and 22/23	Energy and Climate Change Team/ Children's services/Building Design Unit Gateway funds – awaiting final agreements from lenders	In Progress Currently with external legal adviser to get agreements Starting in 21/22 subject to legal agreement	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Actions	Timescale	Resources	Progress	Additional Comments
Development of heat networks	Expected locations by 2024	Teams to be confirmed Significant capital required	Not Started	
Net zero public sector building standards	Ongoing	Planning/Building Design Unit/Building standards/Invest Falkirk	Guidance available	FC participation in national working group. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Schools' power management programme	To be confirmed	Children's Services	Awaiting buy in from IT/Children's Services to progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero on scope 1 and 2 emissions by 2030; Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019); Scotland's buildings near net zero by 2050 (Energy Efficiency Scotland); 50,000 non-domestic buildings to convert to zero or low emissions heating systems by 2030 (Heat in Buildings Strategy); improve Energy Performance Certificate (EPC) as much as is feasible by 2040 (Scotland's Energy Efficiency Programme); all buildings insulated to maximum feasible level by 2032 (Climate Change Plan)

Task 2.3: Street lighting: Direct emissions associated with street lighting will be significantly reduced

Actions	Timescale	Resources	Progress	Additional Comments
Replacement of streetlights with LED lanterns.	By March '22	Street lighting team £1.4m capital funding	In progress – 98.9% complete as of 5/01/22	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report. Reduced energy costs

Targets (not including interim targets): Council target: Net Zero on scope 1 and 2 emissions by 2030

Task 2.4: Offsetting/NET: Offset residual emissions required to meet this target via the Council's estate

Actions	Timescale	Resources	Progress	Additional Comments
Undertake Carbon Sequestration quantification study: identifying how much carbon we need to sequester and how much land we have available to do so	Ongoing-2030	Energy and Climate Change Team/Environmental team £15k revenue (phase 1)	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Increase Carbon Sequestration via Forest Estate and Urban Woodlands – planting of c 40,000 new trees	April 21/ ongoing	Energy and Climate Change Team /Environmental team £15K capital sought for implementation of Forth Valley Forest £1.5m (external)	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Carry out second phase of carbon sequestration study –update of potential offset value across Scotland and habitat type at various locations	Ongoing	Energy and Climate Change Team /Planning & Environment team £50k Capital funding	Not started - tender process underway	

Targets (not including interim targets): Council target: Net Zero on scope 1 and 2 emissions by 2030; 56% waste compared to 2020, 52% reduction in Greenhouse Gas emissions from waste compared to 2018, end landfilling of biodegradable municipal waste by 2021, 33% reduction in food waste, reduce all waste sent to landfill by 5% by 2025, recycle 70% of waste by 2025, establish a more circular economy, reduce emissions from closed landfill sites (Climate Change Plan update)

Section 3: Decarbonisation of Falkirk Council assets and service delivery in areas not included in the 2030 Net Zero Target

Task 3.1: Public sector buildings: Make significant reductions in emissions associated with construction and the maintenance of Council buildings, including a reduction in embodied emissions

Actions	Timescale	Resources	Progress	Additional Comments
Falkirk-Grangemouth Investment Zone	2022-2032	Heads of terms for £90m UK/SG growth deal funds agreed. Includes £10m allocation for green recovery and Just Transition at Grangemouth	In progress. Heads of terms agreed. Work underway on final business cases.	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report and Investment Zone progress reports to UK/Scottish Government.
Council HQ and Arts centre	2022-25	£45m capital allocation agreed.	Feasibility studies underway on options agreed by Council September 2021.	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report

Building construction and upgrades to comply with Local Heat and Energy Efficiency Strategy (LHEES) - including fabric improvements	Ongoing – strategy and delivery plan	Energy and Climate Change Team / Building Design Unit / External	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019); Scotland's buildings near net zero by 2050 (EES); 20% heat demand reduction by 2032, 70% heat from low carbon sources by 2032 Energy Efficiency Scotland (EES); 50,000 non domestic buildings to convert to zero or low emissions heating systems by 2030 (Heat in Buildings Strategy); all buildings insulated to maximum feasible level by 2032 (Climate Change Plan Update)

Task 3.2: Local Authority-domestic properties: Reduce emissions associated with Local Authority Housing

Actions	Timescale	Resources	Progress	Additional Comments
Energy saving advice for Council tenants	Ongoing	Home Energy Officer & Home Energy Scotland	Ongoing	Information on the Council's website which also signposts tenants to Home Energy Scotland.
Development of Heat Network Zones	2024	Energy and Climate Change Team	Not Started	
Council housing new-builds and maintenance to comply with Local Heat and Energy Efficiency Strategy (LHEES)	2024	TBC	Not Started	

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019)); Scotland's buildings near net zero by 2050 Energy Efficiency Scotland (EES); 15% heat demand reduction by 2032, 35% heat from low carbon sources by 2032, all Scottish homes Energy Performance Certificate (EPC) C by 2040 where feasible Energy Efficiency Scotland (EES); all buildings insulated to maximum feasible level by 2032, 60% of walls will be insulated and 70% of lofts in homes to have at least 200mm of insulation where technically feasible by 2020 (Climate Change Plan Update); New homes to use zero direct emissions heating and feature high levels of fabric energy efficiency from 2024 (Heat in Buildings Strategy); All social housing to meet or be treated as meeting Energy Performance Certificate (EPC) B or be as energy efficient as practically possible (Heat in Buildings Strategy); Maximise the number of social rented homes achieving Energy Performance Certificate (EPC B) and no social housing should be let if the energy efficiency rating is lower than Energy Performance Certificate (EPC) D by 2032 (Scotland's Energy Efficiency Programme); All homes with households in fuel poverty to reach Energy Performance Certificate (EPC) C by 2030 where technically feasible and cost effective (Scotland's Energy Efficiency Programme)

Task 3.3: Transport: Make significant reductions in emissions associated with construction and maintenance of transport infrastructure within the Councils direct responsibility

Actions	Timescale	Resources	Progress	Additional Comments
Introduce Sustainable Transport	By June '21/ongoing	£2.5m electric vehicle (EV) ChargePoint funding & ChargePoint Scotland funding	In Progress Local Transport Strategy in development.	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Minimise embodied energy in the construction and maintenance associated with Introducing Sustainable and active travel infrastructure	April '21 to March '26	£2.5m capital funding but with potential for matched Sustrans funding. Potential funding from Bus Partnership Fund bid.	In progress	
Implement Grangemouth Flood Protection scheme	2022-2035	Scottish Government/Falkirk Council to agree approach to funding this major scheme *InvestFalkirk* team to deliver.	In Progress	Report to Executive 18 January 2022 advised approach to delivery of this major project.

Implement Tax Incremental Financing (TiF) projects increase infrastructure capacity for sustainable solutions area wide	Ongoing	£67m TIF funds agreed Additional £20m secured for delivery of A9/A904 upgrade *InvestFalkirk* team to commission delivery.	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019));

Task 3.4: Transport: Significantly reduce embodied emissions associated with Council fleet

Actions	Timescale	Resources	Progress	Additional Comments
Reduce miles travelled by council staff commuting to and between office locations/meetings	Ongoing	Energy and Climate Change Team/Fleet management/Human Resources	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019))

Task 3.5: Waste and Resources: Significantly reduce all emissions associated with waste management

Actions	Timescale	Resources	Progress	Additional Comments

Consider options for waste to energy – reducing waste sent to landfill	Ongoing – business case to be developed and procurement of revised service model	Waste services	In progress	Report to Executive February 2022. Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Implement Deposit Return Scheme	From Aug 2023	Scottish Government/Waste services	Not started	
Reduce waste & litter - Engagement to influence behaviour change- organisations	Ongoing – Litter Strategy	Waste services	In progress	
Reduce waste & litter - Engagement to influence behaviour change- members of the public	Ongoing – Litter Strategy	Waste services	In progress	

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019)); 56% waste compared to 2020, 52% reduction in GHG emissions from waste compared to 2018, end landfilling of biodegradable municipal waste by 2021, 33% reduction in food waste, reduce all waste sent to landfill by 5% by 2025, recycle 70% of waste by 2025, establish a more circular economy, reduce emissions from closed landfill sites(Climate Change Plan Update); 90% collection rates by 2024 for Deposit Return Scheme.

Task 3.6: Procurement: Significantly reduce all emissions associated with council procurement

Actions	Timescale	Resources	Progress	Additional Comments
Utilisation of Scottish Government's sustainable procurement tool	Ongoing	Finance/Procurement teams	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019))

Section 4: Adaptation and area-wide decarbonisation

Task 4.1: Energy: Support development of renewable energy within the Council area by third parties

Actions	Timescale	Resources	Progress	Additional Comments
Explore a community owned solar- Growth Deal project	2022-32	Project to proceed as part of £80m Growth Deal package agreed with UK/Scottish Government	Initial appraisal and outline business case completed.

Full business case to be undertaken. | Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report. |
| Explore/ implement Grangemouth Hydrogen Project | To be confirmed | Project to proceed as part of £80m Growth Deal package agreed with UK/Scottish Government

Ineos have announced £1bn investment in hydrogen plant by 2030 | Initial appraisal and outline business case completed.

Full business case to be undertaken. | Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report. |

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019); 35% heat from low carbon sources by 2032 (Energy Efficient Scotland); by 2030 renewable energy generation in Scotland will account for the equivalent of 50% of our energy demand across electricity, heat and transport (Climate Change Plan Update).

Task 4.2: Other Residential Buildings: Falkirk Council to support significant reductions in all emissions associated with the construction and maintenance of residential buildings beyond the Council's direct control within the Council area

Actions	Timescale	Resources	Progress	Additional Comments
Improving Energy Efficiency and installing low carbon heating in residential housing 5 year Housing Investment Programme including:- Window/door and heating replacement plus renewables), a proportion of external fabric works which contribute to insulation improvement	April 21 – March 2026	£96m Capital investment/ 5 yrs.	In Progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019); Scotland's buildings near net zero by 2050 (Energy Efficient Scotland); 15% heat demand reduction by 2032, 35% heat from low carbon sources by 2032, all Scottish homes Energy Performance Certificate (EPC) C by 2040 where feasible (Energy Efficient Scotland); all buildings insulated to maximum feasible level by 2032, 60% of walls will be insulated and 70% of lofts in homes to have at least 200mm of insulation where technically feasible by 2020 (Climate Change Plant Update); New homes to use zero direct emissions heating and feature high levels of fabric energy efficiency from 2024 (Heat in Buildings Strategy); All social housing to meet or be treated as meeting Energy Performance Certificate (EPC B) or be as energy efficient as practically possible (Heat in Buildings Strategy); Maximise the number of social rented homes achieving Energy Performance Certificate (EPC B) and no social housing should be let if the energy efficiency rating is lower than Energy Performance Certificate (EPC D) by 2032 (Scotland's Energy Efficiency Programme); Private rented homes to achieve equivalent of Energy Performance Certificate (EPC C) by 2038 (Heat in Buildings Strategy); Private rented homes to be Energy Performance Certificate (EPC C) where technically feasible and cost effective by 2030 (Scotland's Energy Efficiency Programme); All owner occupied homes to reach equivalent of Energy Performance Certificate (EPC C) by 2035 (Heat in Buildings Strategy); All homes with households in fuel poverty to reach Energy Performance Certificate (EPC C) by 2030 where technically feasible and cost effective (Scotland's Energy Efficiency Programme)

Task 4.3: Community: Support reductions in all emissions associated with energy use within non-LA residential buildings within the Council area

Actions	Timescale	Resources	Progress	Additional Comments
Create an integrated approach to carbon reduction via the Council of the Future Climate Change project, involving the Community Participation Team	Ongoing	SG14 Supplementary Guidance SG14: Renewable and Low Carbon Energy agreed at November 2021 Executive.	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019)); Scotland's buildings near net zero by 2050 (Energy Efficient Scotland); 15% heat demand reduction by 2032, 35% heat from low carbon sources by 2032, all Scottish homes Energy Performance Certificate (EPC C) by 2040 where feasible (Energy Efficient Scotland); all buildings insulated to maximum feasible level by 2032, 60% of walls will be insulated and 70% of lofts in homes to have at least 200mm of insulation where technically feasible by 2020 (Climate Change Plan Update); New homes to use zero direct emissions heating and feature high levels of fabric energy efficiency from 2024 (Heat in Buildings Strategy); All social housing to meet or be treated as meeting Energy Performance Certificate (EPC) B or be as energy efficient as practically possible (Heat in Buildings Strategy); Maximise the number of social rented homes achieving Energy Performance Certificate (EPC) B and no social housing should be let if the energy efficiency rating is lower than Energy Performance Certificate (EPC) D by 2032 (Scotland's Energy Efficiency Programme); Private rented homes to achieve equivalent of Energy Performance Certificate (EPC) C by 2038 (Heat in Buildings Strategy); Private rented homes to be Energy Performance Certificate (EPC) C where technically feasible and cost effective by 2030 (Scotland's Energy Efficiency Programme); All owner occupied homes to reach equivalent of Energy Performance Certificate (EPC) C by 2035 (Heat in Buildings Strategy); All homes with households in fuel poverty to reach Energy Performance Certificate (EPC) C by 2030 where technically feasible and cost effective (Scotland's Energy Efficiency Programme)

Task 4.4: Other Non-Residential Buildings: Falkirk council to support significant reductions in all emissions associated with construction and maintenance of non-domestic buildings out with the Councils direct control within the Council area

Actions	Timescale	Resources	Progress	Additional Comments

| Local Heat and Energy Efficiency Strategy (LHEES) | 2024 | Energy and Climate Change Team/Building Design Unit/Housing Planning/Building control.

SG14 Supplementary Guidance SG14: Renewable and Low Carbon Energy agreed at November 2021 Executive. | Not started | Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report. |
|---|---|---|---|---|

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019)); 20% heat demand reduction by 2032, 70% heat from low carbon sources by 2032 (Energy Efficient Scotland); all buildings insulated to maximum feasible level by 2032; services sector - 53% GHG emissions compared to 2018 (Climate Change Plan Update); 50,000 non-domestic buildings to convert to zero or low emissions heating systems by 2030 (Heat in Buildings Strategy); improve Energy Performance Certificate (EPC) rating as much as is feasible by 2040 (Scotland's Energy Efficiency Programme)

Task 4.5: Transport: Falkirk Council to support significant reductions in, and development of plans to further reduce: all emissions associated with transport beyond the Council's direct control within the Council area

Actions	Timescale	Resources	Progress	Additional Comments
Support development of hydrogen fuel infrastructure; Monitor and consider case for implementing low emission zones; Installation of electric vehicle charging points	Ongoing	Project being considered as part of £80m Growth Deal package agreed with UK/Scottish Government	Business case to be developed.	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Co-wheels project	Nov '21 - Oct 23	£150k funding from Transport Scotland Switched on towns and Cities Project	Project launched Nov 21	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Tamfourhill active travel route	To be confirmed	To be confirmed	Not started	
Introduce Sustainable and active travel:- cycling, walking and bus infrastructure initiatives supporting sustainable travel area-wide	April '21 to March '26	£2.5m capital funding but with potential for matched Sustrans funding. Potential funding from Bus Partnership Fund bid.	Business cases in development.	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets)(Scotland) Act 2019)); phase out the sale of new petrol and diesel vehicles by 2030 (Climate Change Plan Update); reduce car kms by 20% by 2030 (Climate Change Plan Update), 10% of Everyday journeys by bike by 2020 (Climate Change Plan Update); Electrify 35% of the rail network by 2032 and decarbonise the rail network by 2035 (Climate Change Plan Update);

Task 4.6: Industry: Falkirk Council to support significant reductions in industrial emissions within the Council area

Actions	Timescale	Resources	Progress	Additional Comments

Work with industry partners to support sustainable development, carbon capture/utilisation and hydrogen related opportunities	Ongoing	Liaison with industry via Falkirk Economic Partnership and implementation of Investment Zone measures.	Underway. Business cases in development for Low Carbon manufacturing campus and carbon capture scheme.	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Engage with Forth Valley for Net Zero to support carbon reduction throughout the area.	Ongoing	Energy and Climate Change Team/InvestFalkirk team	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.

Targets (not including interim targets): Net Zero by 2045 (Climate Change (Emissions Reduction Targets) (Scotland) Act 2019))

Task 4.7: Adaptation: Improve resilience to climate change

Actions	Timescale	Resources	Progress	Additional Comments
Flood Risk Management- interventions	Ongoing	Flooding Team	In progress	Outputs will be monitored and measured within the council's annual climate change report to Scottish Government, the Public Bodies Duty Report.
Promote bio-diversity and eco-system services- maintenance and development	Ongoing	Planning and Environment Biodiversity pilot schemes underway adopting new approaches to grassland management.	In progress	

Manage coasts, promoting adaptive coastal management that works with natural processes.	Ongoing	Planning and Environment	In progress	
Supporting Home Energy Efficiency Programme for Scotland. Delivering heating and insulation measures across Scotland to help improve energy efficiency and reduce energy demands of existing housing stock in the most fuel poor areas.	Ongoing	Housing	In progress	
Deliver heating and insulation measures across Falkirk area to help improve energy efficiency and reduce energy demands of existing housing stock in the most fuel poor areas.	Ongoing	Housing; Building Design Unit	In progress	
Improve Housing Quality by ensuring all houses meet the tolerable standard, and that all social housing meets the Scottish Housing Quality Standard (SHQS) by 2015.	Ongoing	Housing	In progress	

Targets (not including interim targets): Requirement to support the Scottish Climate Change Adaptation Programme

Appendix 2: Climate Change Project Register

Sector	Projects	stage	Net Increase/Decrease	*Average CO2e savings/increase (tonnes) p.a	Cost (£)	When	Comments	Total emissions saved/increased by 2030
	New care home facility	Awaiting funding	Increase	+130		TBC - possibly built by 2024/25	Used energy use example from another care home facility for 19/20. The emissions increase is from electricity (including transmission and distribution loses), gas and water. Water is outside of scope for 2030 target.	+910
	Extension at Maddiston Primary School	Awaiting funding	Increase	+8		TBC - possibly built by 2024/26	We have assumed a 5% increase in electricity, gas and water usage. Used 2019/20 figures to base this assumption on as 2020/21 doesn't accurately reflect the situatuion due to COVID-19.	+56
	Extension at Kinnaird Primary School	Awaiting funding	Increase	+9		TBC - possibly built by 2024/27	Have assumed a 5% increase in electricity, gas and water usage. Used 2019/20 figures to base this assumption on as 2020/21 doesn't accurately reflect the situatuion due to COVID-20	+63
	Extension at Larbert High School	Awaiting funding	Increase	+106		TBC - possibly built by 2024/28	Have assumed a 10% increase in electricity, gas and water usage due to the high school being larger than primary schools. Used 2019/20 figures to base this assumption on as 2020/21 doesn't accurately reflect the situatuion due to COVID-21	+742
	Extension at Denny Primary School	Awaiting funding	Increase	+6		TBC - possibly built by 2024/29	Have assumed a 5% increase in electricity, gas and water usage. Used 2019/20 figures to base this assumption on as 2020/21 doesn't accurately reflect the situatuion due to COVID-19	+42
Buildings	Extension and Westquarter Primary School	Awaiting funding	Increase	+7		TBC - possibly built by 2024/30	Have assumed a 5% increase in electricity, gas and water usage. Used 2019/20 figures to base this assumption on as 2020/21 doesn't accurately reflect the situatuion due to COVID-20	+49
	Extension at Bankier Primary School	Awaiting funding	Increase	+6		TBC - possibly built by 2024/31	Have assumed a 5% increase in electricity, gas and water usage. Used 2019/20 figures to base this assumption on as 2020/21 doesn't accurately reflect the situatuion due to COVID-20	+42

Project	Status	Direction	Saving	Cost	Year/Date	Notes	CO2
LED Streetlighting replacements	In progress	Decrease	-1089	£3,930,000	98% complete as of 5th January 2022	project started 2016/17 so CO2 savings gradually achieved from this year, first year of full savings 2022/23	-9802
Grangemouth High School LED lighting	Funding approved	Decrease	-27	£393,135	2023/24	Getting final agreements from the Gateway lenders for getting implemented	-246
Denny High School LED lighting	Funding approved	Decrease	-35	£493,168	2022/23	Getting final agreements from the Gateway lenders for getting implemented	-317
St Mungos High School LED	Funding approved	Decrease	-30	£432,579	2023/24	Getting final agreements from the Gateway lenders for getting implemented	-273
Falkirk Schools PV Proposals - Denny High	Funding approved	Decrease	-79	£108,802	2022/23	Getting final agreements from the Gateway lenders for getting implemented	-707
Falkirk Schools PV Proposals - Falkirk High	Funding approved	Decrease	-88	£115,388	2022/23	Getting final agreements from the Gateway lenders for getting implemented	-788
Falkirk Schools PV Proposals - Grangemouth High	Funding approved	Decrease	-61	£81,055	2022/23	Getting final agreements from the Gateway lenders for getting implemented	-553
Solar PV at Inchyra depot	Funding approved	Decrease		TBC	2023/24	Awaiting some figures to calculate a saving	
IT Power Management Project	Full details developed	Decrease	Difficult to quantify at the moment	TBC	2021/22	Awaiting buy in from IT/Children's Services to progress	
New NDEE phase 2 (5 sites)	Funding approved	Decrease	-137	£1,500,000	2023/24	Potential works have been identified. Need to go through two Procurement stages next.	-1094
NDEE Partner Approach (2024 onwords)	Funding approved	Decrease	-255	£8,000,000	2025/26	This requires the first stage above done first, for Procurement purposes, to do a Partnership approach for these sites.	-1276
Balance of LHEES work in Public Buildings	Awaiting funding	Decrease	-5000	£51,000,000	2030/31	This is the balance of the non-domestic buildings energy works, which needs funding and resourcing to progress.	-0
SEEP bid - Callendar Park - Private Wire	Funding approved	Neutral	0	TBC	2021/22	Installed, but has issues with electricity network approvals	
Falkirk High School LED lighting	Funding approved	Decrease	-69	£459,083	2021/22	Getting final agreements from the Gateway lenders for getting implemented	-621
EV Charge point installations	Funding approved	Increase	Factored into EV replacement	TBC	Ongoing	Installed in various locations. Increase use in electricity but will be offset by more EV added to fleet. Savings not captured from public use of charge points e.g. Falkirk Stadium.	

Transport	<3.5 tonne fleet replacement with EVs	Full details developed	Decrease	-526		£9,884,763	2024/25	296 vehicles to be replaced, average distance of each vehicle is 15,600 km so that is 4,617,600 km of emissions displaced through this programme. Calculation factors in charging the vehicles. This project includes cars and vans and using average car unknown engine size	-3892
	Hydrogenated Vegetable Oil (HVO) trial with HGV's	Full details developed	Decrease	-15	TBC		TBC - possibly beginning 2023/24	CO2e saved is an assumption based on 5 HGV's each consuming 1200 litres of fuel each year. This has been based off of consumption (20/21) of an HGV in the Council's fleet. The saving is taken from the difference between emissions from consuming 1200 litres of diesel and 1200 litres of HVO.	-120
	Review policy of allowing fleet vehicles to be taken home by officers overnight	Full details developed	Decrease	-115		£0	TBC - possibly beginning 2023/24	20 vehciles from BMD currently taken home by staff. Mileage figures based on average from the known annual milege from 6 of these vehicles. A total of 14,872 driven by each vehicle (using emissions factors for average van <3.5 tonnes) and extrapolating this up to 20 vehicles.	-920
	HGV fleet replacement with Evs	Full details developed	Decrease	-1241	TBC		2030/31	Saving doesn't include charging these HGV's, no suitable data for this.	-9928
Waste	Reduction in Waste to landfill - energy from waste project	Business case under development	Decrease	-10000	TBC		2025/26	Looking at joint project with other LA	
Area wide	Road building project A9/A904 Westfield	Funding approved	Increase	Don't currently report on emissions from projects like this.	TBC		2025/26	Will result in increase in emissions through building materials required for road and also electricity for lighting; however, will help reduce area wide emissions as part of the project will take cyclists away from traffic meaning a cycle route will be created. Electricity will also be 100% renewable in future and so zero emissions then associated with lighting.	
	Community owned solar company	Funding approved	Decrease	Difficult to quantify at the moment	TBC		2025/26	Emissions details will be recorded as soon as more information provided. Will not count towards council reduction. Project funded through growth deal.	
	Grangemouth Hydrogen Project	Under development	Decrease	Difficult to quantify at the moment	TBC		TBD	A reduction in FC's emissions may be included if we utilise the hydrogen produced.	

Co-wheels project	Funding approved and project underway	Decrease	Difficult to quantify at the moment	TBC	Ongoing	Decrease in area wide emissions from service users using EV instead of having a second family vehicle or owning their own vehicle	
Decontamination of land and infrastructure project at Tamfourhill	Funded	Decrease	Difficult to quantify at the moment	TBC	TBD	When operational there will be an active travel route and marina. Decrease only for area wide and not quantified in Falkirk Council's emissions	

*Average savings are taken from project list tab in CFPR tool by adding up the years to 2030

Appendix 3: 2020 LCLIP

2020 Local Climate Impacts Profile

For Falkirk District
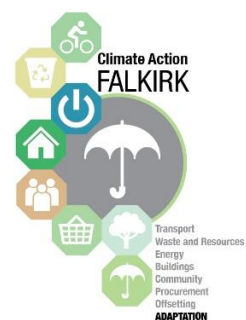
1   Executive summary

Weather can affect everything from transport, to buildings, to crops. In fact, it may be more difficult to identify things that are not affected by weather in one way or another than those which are. Therefore, as weather patterns change as a result of climate change, the implications for the Council, communities and organisations in Falkirk District are vast.

This is the second Local Climate Impacts Profile (LCLIP) produced by Falkirk Council, the first one having been published in 2010. It helps to identify appropriate ways to adapt to the changing climate. It does this by:

- Presenting climate change trends and projections for Falkirk District,
- Detailing the ways in which the effects of weather were managed or were planned to be managed in Falkirk District at the time of writing, and
- Gathering ideas for further actions which could be taken.

It was informed by both

- the latest climate change trends and projections from the Met Office (UKCP18), and
- other changes in the way we work, play, access services, socialise and consume, particularly due to restrictions in place relating to the Covid-19.

Due to the nature of the subject covered the LCLIP has a wide range of findings; some key highlights are given below:

- Summers becoming hotter and drier may pose a particular set of challenges with less experience of issues associated with these conditions relative to experience of weather related issues experienced over winter months. This may be particularly so given the tendency to manage weather reactively and develop approaches iteratively.
- Work, access to services and other aspects of life increasingly happening away from dedicated physical locations (for example, working from home and shopping online) represents a significant increase in resilience to
    o weather related transport disruption as a travel can more often be avoided and
    o weather related impacts on buildings for organisations as these changes mean that organisations can increasingly give up their ownership and/or lease holding of buildings and other physical locations.
- Flooding related issues will become increasingly frequent and severe.
- Nature based solutions- including Sustainable Urban Drainage systems (SUDS) can and often do provide multiple benefits in terms of resilience to weather simultaneously including: natural flood protection during wet periods; shading, cooling and retaining water during hot, dry periods; and providing alternative habitat to species whose former habitat has become untenable as a result of weather related events or gradual changes in conditions.
- While the changing climate presents numerous challenges and is broadly undesirable, there will also be positive aspects too. Particularly, less disruption due to snow, ice and cold weather over winters can generally be expected; and hotter, drier summers may encourage increases in outdoor activity.

2   Introduction

2.1   Relevance to the Falkirk Community Planning Partnership's priorities

In providing information and analysis which helps the council adapt successfully to the changing climate, the LCLIP aims to in turn support the delivery of the Falkirk Community Planning Partnership's Strategic Outcomes and Local Delivery (SOLD) Plan priorities[1]. This will also be true of the outcomes which will be set out in the Falkirk Plan which will replace the SOLD Plan.

National guidance on climate change adaptation set out in the UK Climate Change Risk Assessment, the second Scottish Climate Change Adaptation Programme (SCCAP) and Adaptation Scotland resources are consistent with these priorities; these each reflecting far-reaching social, economic and environmental risks and opportunities associated with climate change, drawing from national and international guidance on these issues[2].

Below is a summary of the relevance of managing the effects of weather to each of the SOLD Plan priorities and key elements of national adaptation guidance which explicitly reflect these.

Improving mental health and wellbeing

- Risk to health and wellbeing as a result of climate change is noted as a key area where further research is required in the UK Climate Change Risk Assessment with regards to Scotland;
- SCCAP sub-outcome 2.2 is that "Scotland's health and social care is ready and responding to changing demands as a result of the changing climate" and notes under sub-outcome 5.2.2 (5.2 "Scotland's natural environment and its contribution to wider societal adaptation is enjoyed, valued and maintained) that the eco-systems play an important role in mental health and wellbeing; and
- Adaptation Scotland note the relevance of climate change to 'The health and wellbeing of people'.

Weather and climate change impacts to individuals may affect mental health and wellbeing both as they are experienced and in anticipation of these. On the other hand, the changing climate offers some opportunities for improved mental health and wellbeing, for example, warmer, drier summers are likely to increase rates of outdoor activity[3].

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[1] SOLD Plan 2016-2020

[2] UK Climate Change Risk Assessment: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-risk-assess-2017.pdf ; Second Scottish Climate Change Adaptation Programme (SCCAP): https://www.gov.scot/publications/climate-ready-scotland-second-scottish-climate-change-adaptation-programme-2019-2024 ; Adaptation Scotland: Impacts in Scotland: https://www.adaptationscotland.org.uk/why-adapt/impacts-scotland

[3] Our Natural Health Service: https://www.nature.scot/professional-advice/contributing-healthier-scotland/our-natural-health-service

Maximising job creation and employability

- SCCAP Outcome 3 is that "Our inclusive and sustainable economy is flexible, adaptable and responsive to the changing climate" and
- Adaptation Scotland note the relevance of climate change to 'The productivity of agriculture and forests', 'The resilience of our businesses' and 'The performance of our business'.

Organisations are affected by weather and climate change in a multitude of ways from impacts on supply chains and logistics to production of goods to sell for businesses reliant on natural resources. As such improving resilience to weather and climate change supports the economy.

Similarly, the changing climate presents opportunities for new and altered business practices. For example, again, it is likely that warmer, drier summers will support outdoor activities, recreation and tourism.

Minimising the impact of substance misuse

While there is not a direct and tangible connection between weather and climate change and substance misuse, less direct connections can be identified; for example, weather and climate change are relevant to other priorities as discussed here, which are relevant to issues of substance misuse.

Addressing the impact of poverty on children

- SCCAP Outcome 2 is that "the people in Scotland who are most vulnerable to climate change are able to adapt and climate justice is embedded in climate change adaptation policy" and
- Adaptation Scotland note the relevance of climate change to 'The security of our food supply' (with implications in terms of cost of food).

The negative impacts of weather disproportionately affect some groups more than others, particularly with those less affluent being more affected; this is seen particularly in issues around families living in fuel poverty and lack of weather-appropriate clothing owned by school-age children. As such,

- work to reduce poverty and inequality intrinsically increases resilience to weather and climate change,
- targeted work to increase resilience to weather and climate change has the potential to at least mitigate a growth in poverty and inequality and at best reduce these.

2.2   Timing and Scope

The Council's first LCLIP in 2010 provided an overview of the impact of severe weather events on Falkirk District. The intention of this help the Council and its partners to assess their vulnerability to

climate change and considered options for improving service resilience while raising awareness of climate change issues[4].

Since then, climate change has been taken increasingly seriously by the Council and its partners and work to adapt to its effects has become more embedded in policy and operations. This reflects a number of developments in terms of national policy and society's concern for climate change between 2010 and the time of writing; particularly in response to:

- The 2016 international Paris Agreement to limit global warming to below 2°C and to aim for 1.5°C.
- The international schools' strike movement and subsequent Climate Emergency declarations by government organisations throughout the world in 2019.

To reflect these changes, while the 2020 LCLIP follows the 2010 LCLIP in also providing an overview of the impacts of weather and highlighting vulnerabilities to climate change within Falkirk District, it differs by:

- considering the long term impacts of weather which is relatively benign in the immediate term as well as immediate impacts of 'severe weather',
- rather than tending to support the initial development of approaches to deal with the impacts of weather and climate change, it tends more to record solutions already in place, in development and being considered, and seeking to support further development of these,
- assuming a greater level of awareness of climate change issues among stakeholders than was the case a decade ago and seeking to build on this with a focus on adaptation strategies and solutions.

As well as coinciding with a marked increase in the profile of climate change, the 2020 LCLIP was written at a time of significant and comprehensive change at the Council being brought forward through the Council of the Future (COTF) programme of change and as result of the Covid-19 pandemic. Although extremely difficult for many and often catastrophic in its consequences, the pandemic offers some opportunities in terms of:

- catalysing an escalation of the rate of positive change being made through COTF, and
- the ability to capture lessons learned across the Council which is helping to inform improved processes and refined project scopes and has already informed a new set of Council priorities which includes specific focus on climate change[5].

As a result, the 2020 LCLIP comes at a particularly opportune moment to support bringing forward measures to adapt to the changing climate in line with Falkirk Community Planning Partnership's priorities as discussed.

For brevity, relevant detail on key policy, guidance, other sources of information, and statutory duties at the time of writing is given in Appendix 2 and relevant detail on responsible Parties and Stakeholders is given in Appendix 3, rather than being included comprehensively in the main body of LCLIP.

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[4] Falkirk Council's 2010 LCLIP: https://www.falkirk.gov.uk/services/environment/environmental-policy/climate-change/docs/adaptation-framework/Local%20Climate%20Impact%20Profile.pdf?v=202002031506

[5] Council of the Future: https://www.falkirk.gov.uk/employees/cotf/

2.3 Developing Adaptation Capabilities

The 2020 LCLIP fits within broader efforts to improve the council and its' partners' capabilities in terms of adapting to the changing climate. This is being taken forward with reference to Adaptation Scotland's Capability Framework- which is standard across Scottish local authorities[6]. This comprises of:

- four 'capabilities' ('Organisational Culture and Resources', 'Understanding the Challenge', 'Planning and Implementation', and 'Working Together',
- stages of development of these from 'starting out' to 'mature', and
- suggested tasks to help develop these.

This is illustrated below:
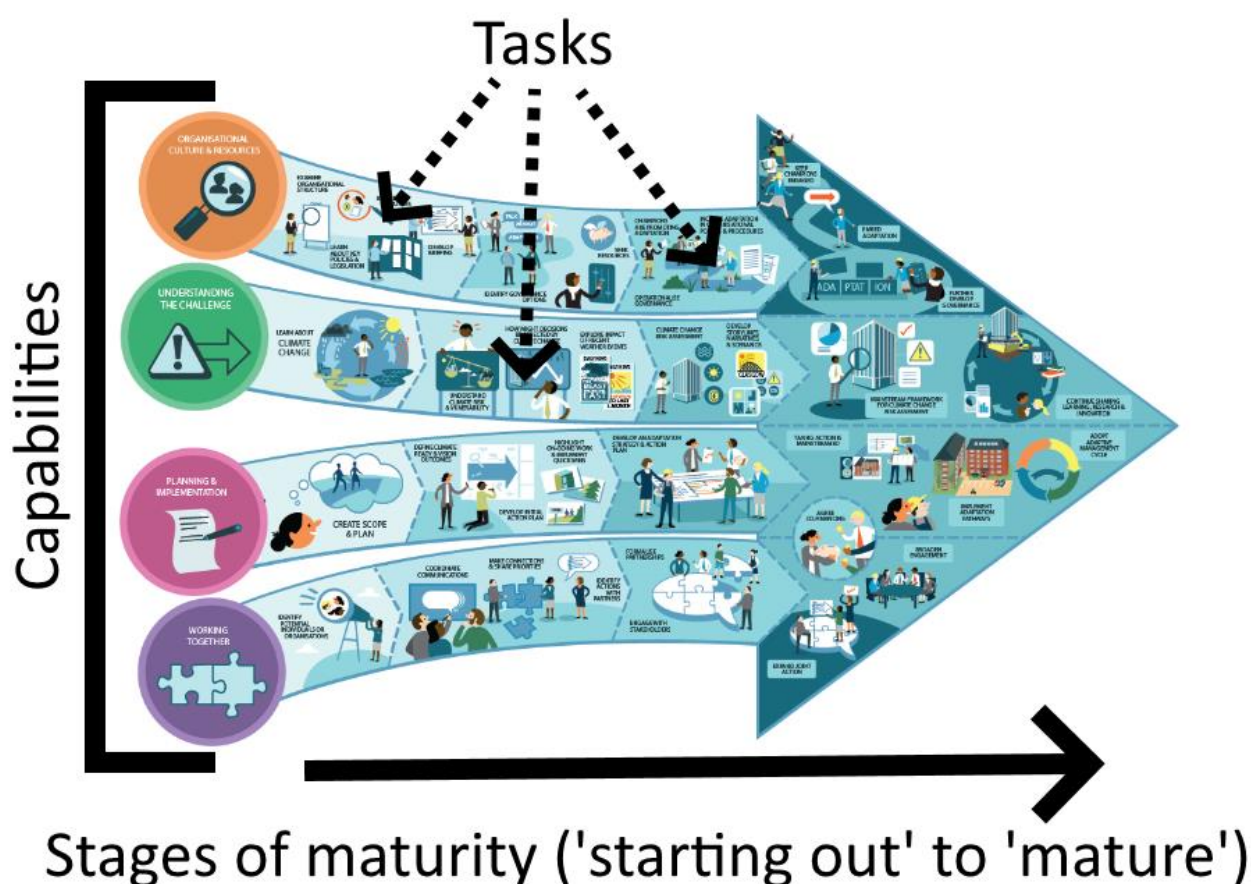
Figure 1: Adaptation Scotland Capability Framework

The LCLIP broadly fits within the 'Understanding the Challenge' capability at the 'starting out' to 'intermediate' stages, while helping to identify current 'stages of maturity' with regards to each of the 'capabilities' and informing potential actions to develop these.

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[6] Adaptation Scotland Capability Framework: https://adaptationscotland.org.uk/how-adapt/your-sector/public-sector/framework

3 Summary of Methodology

The 2020 LCLIP was produced with reference to UKCIP and Adaptation Scotland guidance[7]. The research comprised of:

- Interrogation of the latest authoritative climate trends and projections using the UKCP18 suite of tools and data produced by the UK Met Office in partnership with other agencies to identify ways in which weather patterns have changed in recent years and changes that can be expected[8].
- a media search of reports of weather related impacts on Falkirk District to cautiously indicate key 'severe' events, media priorities and by extension public attitudes to weather events, and actual events,
- gathering data regarding insurance claims made against the Council where the impacts of weather was or may have been a factor in incidents,
- interviewing colleagues throughout the Council as well as staff at Forth Environment Link
- Desk research, primarily on relevant policy and guidance.

The process of putting together the 2020 LCLIP has been tailored to develop capabilities outlined in the Adaptation Scotland Capability Framework as described.

See appendix 1 for more detail on the methodology.

4 Climate Trends and projections

Global warming has intensified in recent years. with the warmest five years in over a century in the UK all having occurred since 2006, as shown below.
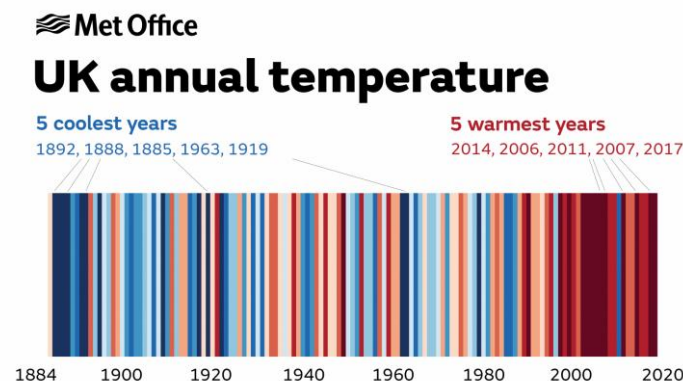
Figure 2: UK annual temperature 1884-2020[9]

2019 was particularly noteworthy in including a large number of UK high temperature records[10].

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[7] UKCIP LCLIP Guidance: https://www.ukcip.org.uk/wizard/current-climate-vulnerability/lclip/

[8] UKCP18: https://www.metoffice.gov.uk/research/approach/collaboration/ukcp/index

[9] UK Warming Stripes:
https://www.metoffice.gov.uk/binaries/content/gallery/metofficegovuk/images/weather/maps-and-charts/climate-stripes.png

[10] 2019 temperature records: https://www.metoffice.gov.uk/about-us/press-office/news/weather-and-climate/2019/weather-overview-2019

The climate trends and projections detailed here are mostly derived from the Met Office's most recent UK climate dataset (UKCP18) relating to the area shown below as a proxy for Falkirk District:

Figure 3: Grid Square trends and projections applied to (grid reference 287500, 687500)

4.1   Sea level rise

As a result of global warming, sea levels are rising. UK sea level has risen by 16cm since the start of the 20th century. For Falkirk's shoreline on the Firth of Forth estuary, between 8 and 90cm sea level rise can be expected by the year 2100 compared to the 1981-2000 average (depending on future emissions scenarios) as shown below[11].
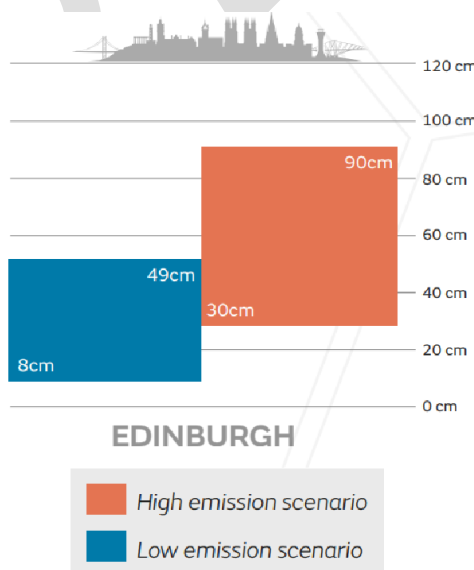
Figure 4: Projected sea level rise at Edinburgh[12]

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[11] UKCP18- Headline Finding- Marines: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-infographic-headline-findings-marine.pdf
[12] UKCP18- Headline Finding- Marines: https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-infographic-headline-findings-marine.pdf

4.2   Temperature rise

Average temperatures in Falkirk District have been increasing in all seasons and projected to increase further. Similarly, summer heatwaves have been getting hotter and cold snaps in winter becoming less cold, and these trends are projected to continue.

This is true in all climate change scenarios projected in the Met Office's most recently released dataset (UKCP18). However it is significantly more so in higher emissions scenarios than in lower emissions scenarios from around the 2030s. The graphs below show this for both the RCP8.5 high emissions scenario- where greenhouse gas concentrations continue to increase as they have done in recent decades- and the RCP2.6 low-emissions scenario where global heating is limited to 2°C as per the Paris Agreement.

Average winter temperature: change from 1981-2000 baseline (°C)

(Seasonal average Mean air temperature anomaly for December January February at 1.5m, 50th Percentile, for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario
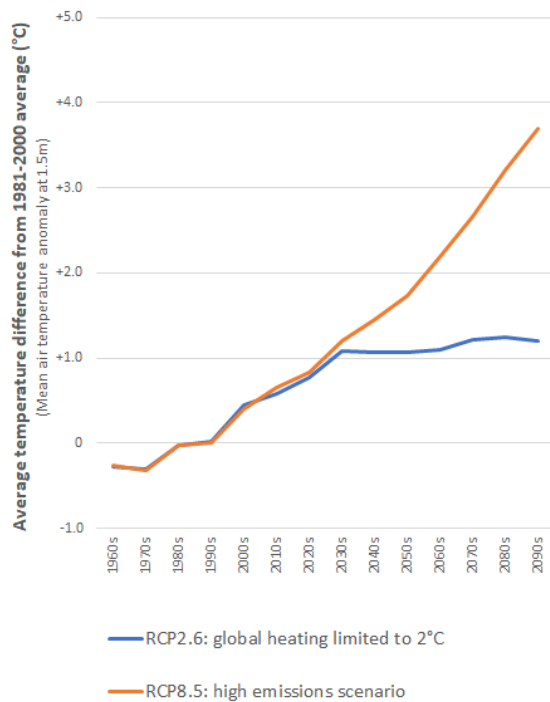
Average spring temperature: change from 1981-2000 baseline (°C)

(Seasonal average Mean air temperature anomaly for March April May at 1.5m, 50th Percentile for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario

Average summer temperature: change from 1981-2000 baseline (°C)

(Seasonal average Mean air temperature anomaly for June July August at 1.5m, 50th Percentile, for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario
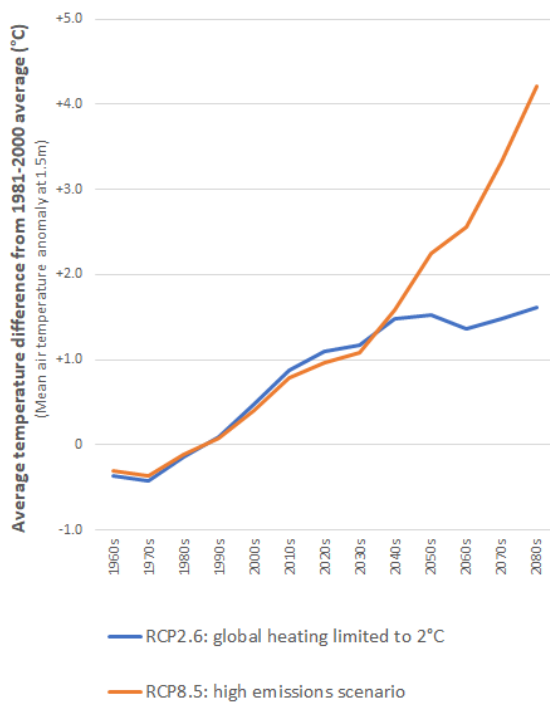
Average autumn temperature: change from 1981-2000 baseline (°C)

(Seasonal average Mean air temperature anomaly for September October November at 1.5m, 50th Percentile for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario

Lowest temperature in a winter: compared to 1981-2000 baseline (°C)
(Lowest air temperature anomaly for Decmber January February at 1.5m, 50th Percentile for grid square 287500, 687500, using baseline 1981-2000)

Highest temperature in a summer: compared to 1981-2000 baseline (°C)
(Highest Maximum air temperature anomaly for June July August at 1.5m, 50th Percentile for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario

4.3   Precipitation: changing patterns

Average precipitation levels in Falkirk District have fluctuated in recent decades, with winters tending to get wetter. Winters- and to a lesser degree autumns- are projected to continue to get wetter and summers are projected to get drier on average. As with temperatures, these projected changes are greater in the high emissions scenario (RCP8.5) than in the low emissions scenario (RCP2.6) from around the 2030s onwards as shown in the following graphs.

Average winter precipitation: change from 1981-2000 baseline (%)
(Seasonal average precipitation rate anomaly for December January February, 50th Percentile, for grid square 287500, 687500, using baseline 1981-2000)
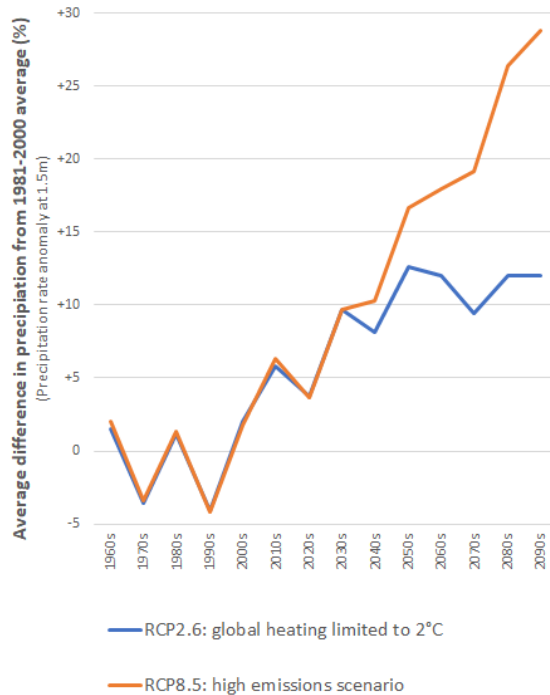
Average spring precipitation: change from 1981-2000 baseline (%)
(Seasonal average precipitation rate anomaly for March April May, 50th Percentile, for grid square 287500, 687500, using baseline 1981-2000)
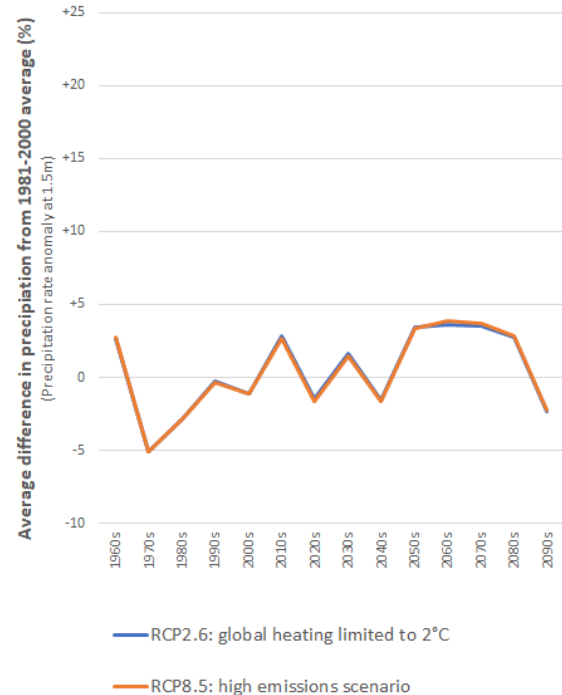
Average summer precipitation: change from 1981-2000 baseline (%)
(Seasonal average precipitation rate anomaly for June July August, 50th Percentile, for grid square 287500, 687500, using baseline 1981-2000)
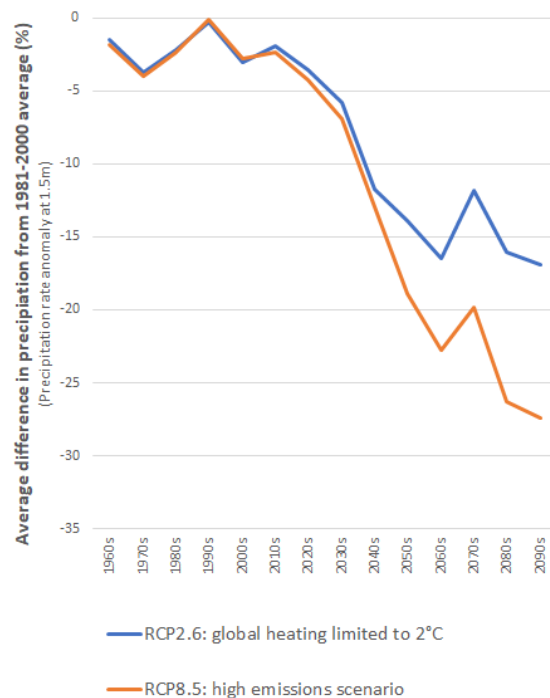
Average autumn precipitation: change from 1981-2000 baseline (%)
(Seasonal average precipitation rate anomaly for September October November, 50th Percentile, for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario
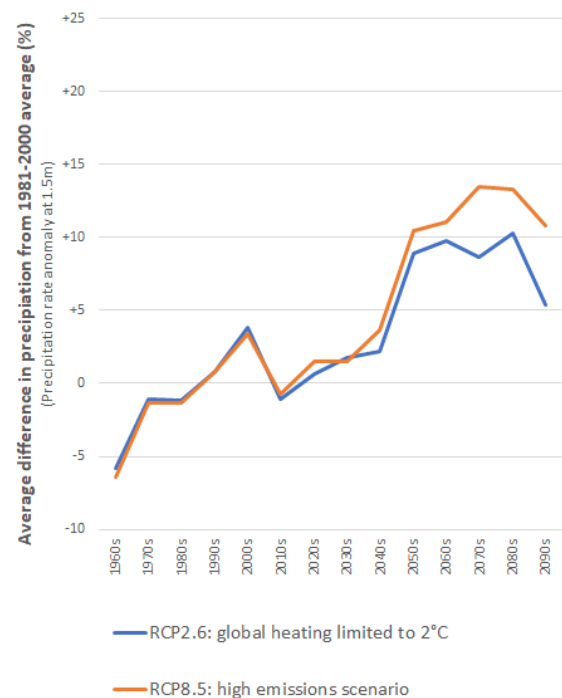
Unlike the trends and projections for average precipitation, the trends and projections for maximum rainfall in a five-day period are for steadily rising or relatively consistent rainfall intensity across all seasons.

Summers are projected to continue to come a close second behind autumns in terms of rainfall intensity. Coupled with reduced average precipitation and increasing average temperature over summers, this has particular implications for flash flooding at this time of year as dry ground absorbs water more slowly than wet ground (unless it is waterlogged).

The following graphs show a greater increase in precipitation intensity under a high emissions scenario from around the 2030s, with less increase or relative consistency under a low emissions scenario:

Maximum rainfall within 5 days during a winter (mm)

(5-day total precipitation for December January February (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario
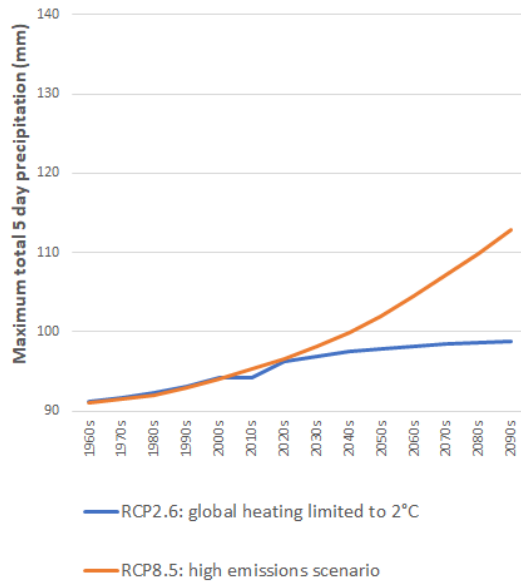
Maximum rainfall within 5 days during a spring (mm)

(5-day total precipitation for March April May (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario
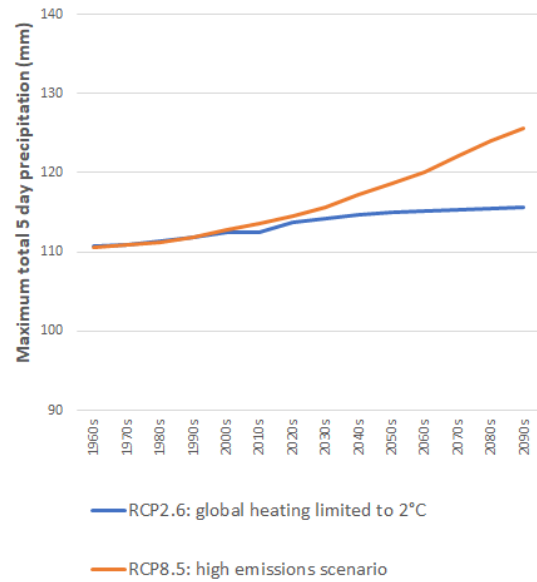
Maximum rainfall within 5 days during a summer (mm)

(5-day total precipitation for December January February (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario

Maximum rainfall within 5 days during an autumn (mm)

(5-day total precipitation for September October November (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C
RCP8.5: high emissions scenario
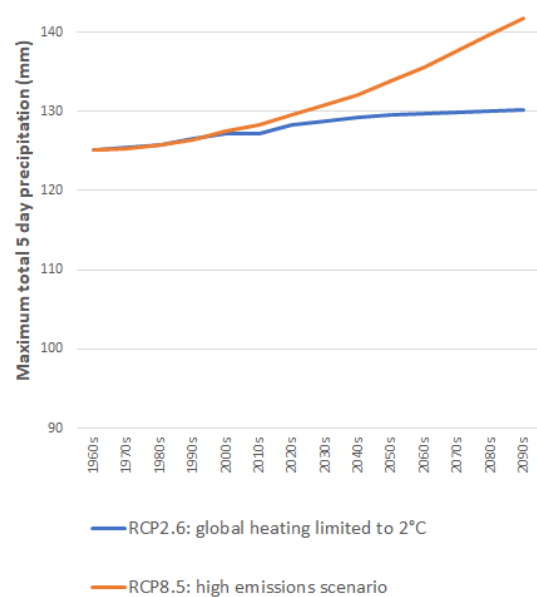
Maximum rainfall within 1 day during a winter (mm)

(5-day total precipitation for December January February (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C

RCP8.5: high emissions scenario
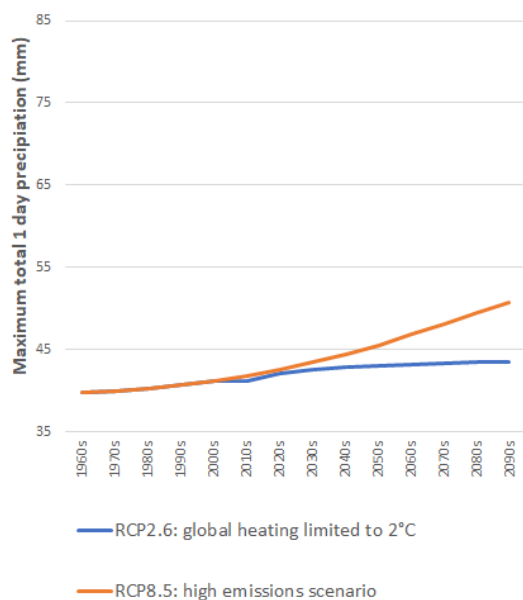
Maximum rainfall within 1 day during a spring (mm)

(5-day total precipitation for March April May (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C

RCP8.5: high emissions scenario
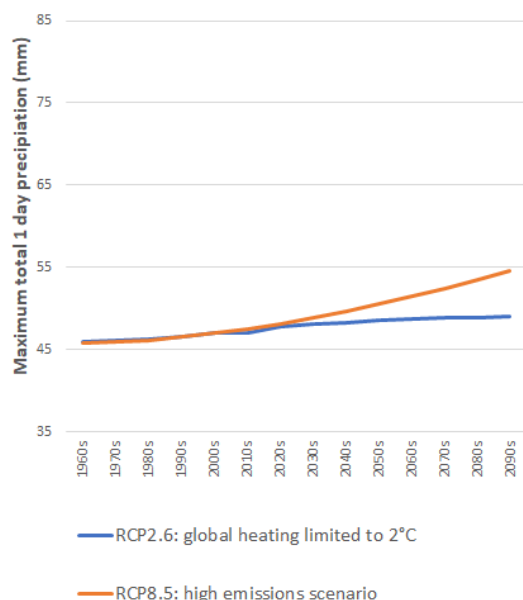
Maximum rainfall within 1 day during a summer (mm)

(5-day total precipitation for June July August(50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C

RCP8.5: high emissions scenario
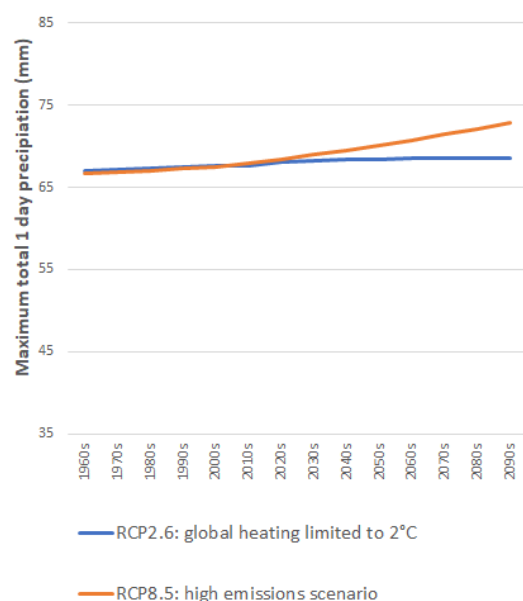
Maximum rainfall within 1 day during an autumn (mm)

(5-day total precipitation for September October November (50th Percentile), for grid square 287500, 687500, using baseline 1981-2000)

RCP2.6: global heating limited to 2°C

RCP8.5: high emissions scenario
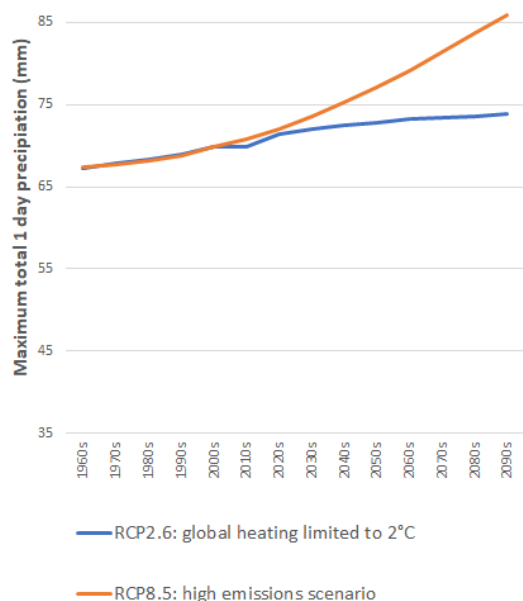
4.4   Impact on rivers from neighbouring areas

Water levels in and therefore flood risk from rivers in Falkirk District are affected by precipitation and temperature- along with topography, land cover and features which manage water- across river basins which have portions both within and outside the area. Climate trends and projections covering parts of these river basins outside Falkirk District are broadly the same as those detailed for Falkirk District[13].

4.5   Wind

The Met Office:

- do not consider there to have been any compelling trends in terms of storminess over the past four decades,
- predict only a slight increase in near-surface wind from the middle of the 21st century, and
- state that there is 'inconclusive' evidence on whether extreme wind storms in the UK are linked to climate change or whether these are likely to increase or decrease in future. [14]

4.6   Variation from projected trends

Regular variation from the projected trends should continue to be expected, including over whole seasons[15]. This includes Sudden Stratospheric Warming events which can produce particularly cold, stormy and snowy winter weather such as in the winter of 2010 and the 'Beast from the East' in March 2018[16].

4.7   Summary charts

The following chart gives a summary of key statistics from the trends and projections outlined:

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[13] Climate Trends and Projections interface: https://www.adaptationscotland.org.uk/why-adapt/climate-trends-and-projections
[14] UKCP 18 Factsheet- Wind:
https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-fact-sheet-wind.pdf
[15] UKCP 18 Science Overview- Executive Summary:
https://www.metoffice.gov.uk/binaries/content/assets/metofficegovuk/pdf/research/ukcp/ukcp18-overview-summary.pdf
[16] Sudden Stratospheric Warming: https://www.metoffice.gov.uk/weather/learn-about/weather/types-of-weather/wind/sudden-stratospheric-warming

	Summer precipitation change		Winter precipitation change		Summer temperature change		Winter temperature change	
	Mean (% change*)	1 day max (mm)	Mean (% change*)	1-day max (mm)	Mean (+°C change*)	Max (+°C change*)	Mean (+°C change*)	Min (+°C change*)
2020s	4 % drier	68	4 % wetter	42-43	1- 1.1	1.6	0.8	0.6- 0.7
2040s	6-7 % drier	68-69	8-10 % wetter	43-44	1.5- 1.6	1.9- 2.3	1.1- 1.5	0.9- 1.2
2060s	16-23 % drier	68-71	12-18 % wetter	43-47	1.4- 2.6	1.6- 3.2	1.1- 2.2	1- 2
2080s	16-26 % drier	69-72	12-26 % wetter	43-50	1.6- 4.2	2.1- 4.8	1.2- 3.2	1.2- 2.7

*change from 1981-2000 baseline

The following chart gives an overview of Met Office projections regarding the future likelihood of extreme weather:

		Changes in frequency/ intensity so far?	Is this likely linked to climate change?	What is most likely in future?
UK	UK Warm Spells	Increase	Yes	Increase
	UK Cold Spells	Decrease	Yes	Decrease
	UK Heavy Rain	Increase	Inconclusive	Increase
	UK Dry Spells	No trend detected	Inconclusive	Increase (summer)
	UK Wind Storms	No trend detected	Inconclusive	Inconclusive
Global	Global Heatwaves	Increase	Yes	Increase
	Global Cold Events	Decrease	Yes	Decrease
	Global Heavy Rain	Increase	Yes	Increase
	Global Drought	Increase*	Yes*	Increase
	Global Tropical Storms	No trend detected	Inconclusive	Increase and decrease**

* Marvel et al 2019 provides new evidence drought increased in some regions during specific periods since 1900 (with aerosols possibly masking the trend when it is not detectable), and that this is connected to climate change.
**Possible decrease in frequency and possible increase in intensity (and associated rainfall)

Figure 5: Likelihood of extreme weather in future (Met Office graphic)[17]

5 Management of the impacts of weather in 2020

This section covers the LCLIP's findings in terms of the ways in which the council, its partners and Falkirk's residents:

- Manage the impacts of weather currently, including how this is changing in response to climate change
- Are planning to manage the impacts of weather in the future, taking into account projected climate change.

5.1 Overarching principles

5.1.1 Pursuing Falkirk Community Planning Partnership's Priorities

As with everything that the council does, the way in which work relating to climate change adaptation is delivered seeks to embody Falkirk Community Planning Partnership's priorities detailed in the introduction.

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[17] Met Office: Weather Extremes and Climate Change:
https://www.metoffice.gov.uk/research/climate/understanding-climate/weather-extremes-and-climate-change

5.1.2 Community Involvement and Council's reputation

Firstly, the Council and many of its partners are accountable to the public so their role in managing the impacts of weather is significantly influenced by public opinion. Therefore, effective community engagement is key to designing, and gaining approval, for development and implementation of strategies and measures to manage the impacts of weather.

Secondly, due to reductions in public sector funding, Council services are increasingly being rationalised and often a way to maintain desired outcomes on a tight budget is to ask community groups and individuals to take on additional voluntary responsibilities, particularly in areas where the Council is not statutorily obligated to provide a service. This includes reinforcing the message that individuals have a responsibility to protect their own property from the impacts of weather and supporting them to do so. This can be effective and empowering, supporting work reflecting SOLD priorities as discussed. However there is also often a lack of public acceptance of this principle and an enduring expectation that the Council should do more, for example to directly protect individuals' property and maintain neighbourhood transport routes. Effective engagement and support is therefore fundamental in supporting community resilience efforts and managing expectations in this regard.

Thirdly, the Council is committed to community engagement both to meet its statutory duty in this regard as per the 2015 Community Empowerment Act (Scotland) and to realise the benefits of community engagement for local communities[18].

This is reflected by SCCAP Outcome 1: "Our communities are inclusive, empowered, resilient and safe in response to the changing climate".

The nature of this engagement has changed dramatically in the past decade with the use of mobile internet connected devices now a ubiquitous part of life and blurring of the lines between news reporting and open discussion as a result of social media. The result of these changes is a dramatic improvement in communication overall, however maintaining this requires more resource, given higher levels of expectation with regards to responsiveness and the need to quickly and effectively deal with dis-information.

The introduction of Participatory Budgeting (PB) may also facilitate discussions within our communities around this topic, whereby 1% of Council budget has been allocated for PB to allow communities to be involved in deciding how this money will be spent on capital assets in communities.

The COTF Enabled Communities workstream is reviewing all types of consultation required in communities to align this and will be the driving force behind opportunities to enable and empower our communities.

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[18] Falkirk Council's Strategy for Community Engagement 2019-2024: https://www.falkirk.gov.uk/services/council-democracy/policies-strategies/community-engagement.aspx#itisastatutoryrequirement

5.1.3   Climate change mitigation

Global action on climate change mitigation will not alleviate the need to adapt to the effects of climate change in the immediate and short to medium term. However it has the potential to reduce the extent of adaptation required in the longer term. This is illustrated in the variation in climate change projections between the RCP8.5 high emissions scenario and RCP2.6 scenario whereby global heating is limited to 2°C as per the Paris Agreement, as detailed previously. As such the requirement for work relating to adaptation highlights tangibly the need for mitigation.

Action relating to climate change adaptation should seek to come with a minimal carbon footprint, or ideally be carbon neutral or negative. Nature based solutions offer particularly good opportunities in this regard; for example natural flood protection involving increased biomass also sequesters (stores away) more carbon.

5.2   Governance, overall approach and strategic risk and opportunities management

Strategic level

Policy, guidance, corporate aims and objectives and statutory duties set the framework in which the impacts of weather are managed by the Council and its partners. These are ultimately directed by political decision making at local and national level. These are discussed in relation to specific areas of work throughout the LCLIP.

Key factors in this regard which relate to all areas of work discussed are as follows:

- The Council and many of its stakeholders declared a Climate Emergency in 2019, raising the profile and increasing prioritisation of work associated with climate change.
- The Council is duty bound to report on and take reasonable measures to manage risk, including risk relating to weather as the climate changes; there are particular requirements in this regard in terms of emergency incidents as per the 2004 Civil Contingencies Act. Following the Climate Emergency declaration, the risk profile of climate change has been raised from 'medium' to 'high' in the Council's Corporate Risk Register and an additional Climate Change Risk and Opportunities Register is being developed.
- The Council is duty bound to report on its actions in terms of adaptation to the effects of climate change[19].
- The Council has included climate change in its corporate priorities as of 2020[20].
- Key guidance on adaptation to climate change is provided by Adaptation Scotland, the Association for Public Sector Excellence (APSE)[21], and SCCAP.
- An important principle in the guidance above is that work to adapt to the effects of climate change simultaneously pursues other aims and objectives reflected in the previous section on 'overarching principles'

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[19] Climate Change Reporting Duties: http://www.legislation.gov.uk/ssi/2015/347/contents/made
[20]Falkirk Council Business Plan (2021-2024): https://www.falkirk.gov.uk/services/council-democracy/policies-strategies/business-plan.aspx#enterprise
[21] Association of Public Sector Excellence: https://www.apse.org.uk/apse/

A responsive and proactive culture

The work of the Council and its partners relating to managing the impacts of weather often takes the form of responding dynamically to events. An important element of this is the use of ever improving weather forecasting and conditions monitoring systems. This is often the most appropriate approach given the changeability of weather conditions.

This ranges from 'call-outs' to assess and bring forward relatively minor repair work to multi-agency response efforts to weather related emergencies co-ordinated via the Forth Valley Local Resilience Partnership. This is achieved through development and maintenance of plans, protocol and capabilities, and measures to ensure preparedness such the requirement for certain teams to be available 24 hours a day, every day. Such responsive work in itself seeks a return to 'business as usual' as opposed to proactively changing 'business as usual'.

Instead, changes to 'business as usual' tend to be based more on lessons learned iteratively. For example in the past decade lessons learned from severe weather during the winter of 2010 and 'Beast from the East' in March 2018 have been particularly instrumental in providing lessons. This is often achieved through recording of impacts and actions which feeds in to review.

This approach is generally found to be effective.

More proactive work in terms of changing the nature of 'business as usual' in this regard also takes place and this is increasingly so as the need to adapt to climate change is recognised. Key highlights include:

- Flood management interventions- including significant infrastructure projects- which consider future conditions as the climate changes being developed through the flood risk management planning process.
- efforts are being made nationally with regards to Emergency Planning to focus more on prevention of incidents[22], and
- work explicitly on adaptation to climate change (such as this LCLIP) is intrinsically concerned with the implications of predicated climate change and promoting proactively making appropriate changes.

Seasonality

Challenges associated with weather tend to be more significant during winter months. This is generally due to higher levels of precipitation (including sleet and snow), windier conditions and low temperature at this time of year. This is reflected in the data shown below.

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[22] Preparing Scotland: Page 12- Prevention: https://www.readyscotland.org/media/1496/preparing-scotland-hub-updated-published-version-may-2019-new-h-s-diagram.pdf#page=12
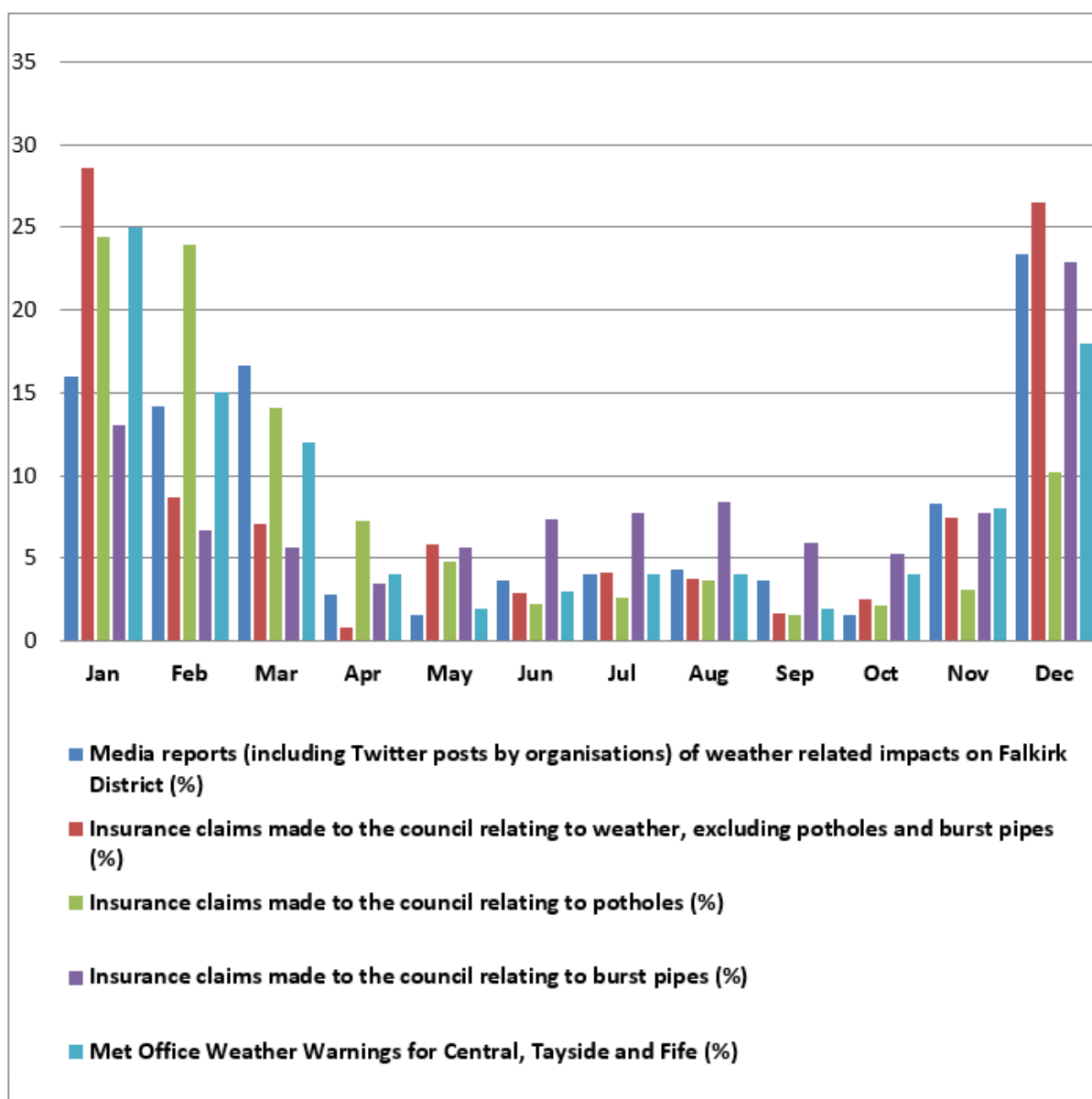
Figure 6: Indicators of weather-related impacts on Falkirk District by month (2010-2019)

This is reflected in policies and practices which are specific to winter, most notably the Winter Service Plan which comes into force over winters- primarily to keep transport routes clear[23] and annual intensification of work addressing the effects of fuel poverty such as in the provision of food boxes to those in need.

This pattern of impacts is likely to broadly continue over coming years however the distribution of impacts throughout the year may change to some extent as weather patterns change with implications discussed in the following sections.

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[23] Winter Service Plan: https://www.falkirk.gov.uk/services/roads-parking-transport/policies-strategies/winter-service-policy.aspx

5.3 Transport

As Falkirk District is traversed by nationally significant roads and railways and contains several busy locations, most notably the industries and port at Grangemouth, the area is particularly vulnerable to 'spill-over' of transport disruption from elsewhere in the Central Belt of Scotland and vice-versa.

Travel disruption was the most widely reported impact of weather in recent years by Council officers interviewed, affecting work, service delivery and other aspects of life. This is reflected by the results of the media search carried out, where 56% of the 346 reports of weather impacting on Falkirk District between 2010 and 2019 were explicitly related to this, as illustrated below.

Media reports (including tweets by organisations) of weather related impacts on Falkirk District (2010-2019) by impact type

all other impact types, 153, 44%

transport, 193, 56%
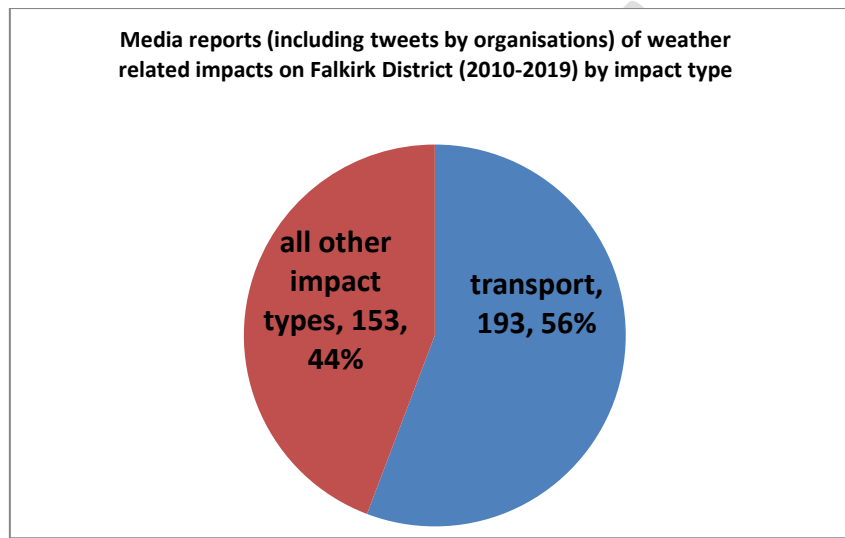
Figure 7: Media reports of transport disruption vs other impacts

However, the extent of disruption from weather affected transport routes had reduced dramatically from the severely snowy winter of 2010 to the 'Beast from the East' period of heavy snowfall in March 2018. This was particularly due to (1) an increase in the extent to which remote and flexible work and public services (which is being developed via the COTF programme of change) were available to people, and (2) broader shifts to leisure and retail being available and taking place online rather than in physical locations, meaning that travel could more often be avoided.

And secondly, for those who had to travel, a system of prioritising clearing the most strategically important routes implemented following the winter of 2010 meant that the road network was less severely affected overall.

There has been a drastically reduction in levels of commuting and in travel for shopping and leisure as a result of measures in place to reduce the spread of Covid-19; these changes are expected to remain to varying degrees post-pandemic.

This changes represent a step-increase in resilience to weather related transport disruption.

In addition to further discussion relating to the need and ability to travel as above, this section shall discuss other aspects of the management of impacts of weather in relation to transport identified through the research.

5.3.1 Travelling Less and avoiding weather-effected routes

The following measures further reduce the impact of weather related travel by minimising the need for travel:

- Minimising travel required to and from new building developments through Transport Impact Assessment favouring development of housing, retail, leisure, workplaces and services in close proximity to one another,
- The use of journey planning and work scheduling software,
- Live gritter tracking introduced in 2019 whereby it is possible to follow in real time which roads have been treated and to plan journeys accordingly. This is augmented by the naming of gritters by school children as a means to encourage engagement.
- Taking collected waste short distances to either remain on a site within Falkirk District or to be 'bulked' before being taken further afield,
- On very rare occasions delaying Council bin collection where it was felt that the weather related risks involved with travel are greater than the negative implications of not collecting bins,
- Work to reduce waste generated by households and businesses increasing capacity to delay Council bin collection as above and reduce collections overall,
- Maintaining spare capacity in Council waste management depots to park lorries so that if severe weather means that one depot cannot be accessed, vehicles can go to another one, as was the case when the Grangemouth depot flooded,
- Some operational Council staff starting and ending days' work at home rather than at a depot where practical (not possible for large vehicles due to practical and legal HGV restrictions, and often impractical where colleagues would have to be picked up)
- Increasing use of tele and video conferencing are reducing the need to travel for meetings
- Tele-care increasingly being used, as a partial solution, recognising the importance of face-to-face meeting/ care provision,
- Capacity to deliver education remotely via online digital platforms is rapidly increasing (particularly through changes necessitated during the Covid-19 lockdown),
- Increasing service availability through the MyFalkirk platform and encouragement to use this from the Customer First call centre (however many residents still preferred to phone)
- Decentralising the availability of services at physical locations through development of local 'hubs' (locations such as shops and post offices taking on these functions) which particularly supports access to services for those with lower levels of IT literacy; and availability of public WIFI and internet connected computer access at locations shown on the Fairer Falkirk map, which particularly supports those with limited or no internet access and often includes both formal and informal IT support[24]. The availability of these services has been significantly reduced at the time of writing due to social distancing measures required due to the Covid-19 pandemic.
- Phased roll out of office 365 to allow enhanced collaborative working opportunities and reduce the need to travel for meetings
- Development of a green travel plan to underpin travel within the Council

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[24] Fairer Falkirk map: https://falkirk.gov.uk/maps-local/our-falkirk.aspx
Community advice and support Hubs: https://www.falkirk.gov.uk/places/oss-ash/

An issue which remains is a reduction in coaches available for hire in recent years resulting from economic recession and stagnation, which means that these often come to collect groups from further afield, increasing the risk of weather-related transport disruption to coach trips.

5.3.2   Keeping routes clear and passable

5.3.2.1   *All weather impacts*

The following measures reduce the impact of all forms of weather-related travel disruption by keeping routes clear and passable:

- A limited number of 4x4s available to access areas that have been cut off- with parts of the Braes area most often affected
- Priority route clearing ensuring the most crucial strategic routes are cleared before others
- Issues in the short term to be addressed are indicated by contracted bespoke weather forecasts tendered on a 3-5 year basis shared with Clackmannanshire and Stirling Councils and by road sensors which give details of temperature, moisture and salinity;
- The Council's Roads team liaise closely with Transport Scotland to ensure an effective interface between local roads and the trunk road network.
- Modal shift from private motor vehicles to active travel and public transport is pursued; such modal shift at scale would free capacity in transport networks and so reduce the severity of weather related transport disruption as these modes take up less space
- Investment in suitably durable materials in repair work and new development to withstand weathering and damage caused indirectly by weather (e.g. by wind-blown or flood debris)
- Consideration of vulnerability to the impacts of weather in designing and siting new routes (including as an element of building developments).
- Access to and from sites resulting from and to address weather issues (for example for emergency vehicles) and for evacuation, is considered for new developments through Strategic Environmental Assessments carried out.

It is also noted that getting on and off of public transport- particularly busses- can be made significantly more challenging for certain passengers such as wheelchair users and the elderly when surface conditions are more challenging as a result of weather conditions.

5.3.2.2   *Rainfall and Flooding*

Flooding is currently a particularly significant issue affecting transport at certain 'hotspots'. Without sufficient mitigation this shall become more so at those locations and new 'hotspots' may appear as flood risk increases as described, and is exacerbated to an extent by the lengthening growing season resulting in an increase in leaves, branches etc being washed onto surfaces and potentially blocking drains.

Flood risk management issues, strategy and actions for Falkirk District are detailed in and developed through the following multi-agency Flood Risk Management Plans:

- The Forth Estuary Flood Risk Management Plan (for which Falkirk Council is the 'lead authority')- covering the majority of Falkirk District
- The Forth Flood Risk Management Plan- covering the Dunmore and South Alloa area in the east of Falkirk District, and to a lesser extent

- The Cylde and Loch Lomond Flood Risk Management Plan- which covers two small areas in the south west of Falkirk District. [25]

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Sustainable Urban Drainage Systems (SUDS)
and other Natural Flood Management

Natural flood management, including SUDS- which store, release and treat water naturally above and through the ground- complements existing 'traditional' flood management infrastructure based on conveyance, particularly as the latter can be overloaded or blocked during severe rainfall events.

These are increasingly being developed as part of broader flood risk management efforts in Falkirk District via the Flood Risk Management Strategies outlined, particularly as SUDS are required in new housing developments.

As well as helping to manage flooding, these help in other areas of adapting to climate change:

- By retaining water they can reduce the impact of drought conditions,
- Evaporation and transpiration from these can help to minimise overheating during hot spells,
- They can provide additional habitat which supports biodiversity as former habitats become untenable as a result of weather events and/or longer term changes in conditions.

They also provide wider benefits in terms of placemaking and amenity which benefit people and help to mitigate climate change by sequestering (storing) carbon from the atmosphere where they feature vegetation.

SUDS schemes must comply with the CIRIA SUDS Manual and, where the scheme is to be vested by Scottish Water, Sewers for Scotland (current edition). SUDS that are intended to drain water from an adopted road must be designed in accordance with 'SUDS for Roads'. The Council provides support to developers regarding SUDS requirements and best practice through 'Planning Application Advice on Flood Risk and Surface Water Drainage'.[26]

The role of greenspace in providing natural flood management is acknowledged and strategy to realise this benefit- along with others as above- is outlined in the Council's Greenspace Strategy.[27]

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[25] SEPA Flood Risk Managements Plans
- Forth Estuary: https://www2.sepa.org.uk/frmstrategies/forth-estuary.html
- Forth: https://www2.sepa.org.uk/frmstrategies/forth.html
- Clyde and Loch Lomond: https://www2.sepa.org.uk/frmstrategies/clyde-loch-lomond.html

[26] SUDS guidance and support
- Cira SUDS manual: https://www.ciria.org/ItemDetail?iProductCode=C753F&Category=FREEPUBS
- Sewers for Scotland: http://www.scottishwater.co.uk/-/media/ScottishWater/Document-Hub/Business-and-Developers/Connecting-to-our-network/All-connections-information/SewersForScotlandv4.pdf
- SUDS for Roads: http://www.scotsnet.org.uk/assets/sudsforroads.pdf
- Planning Application Advice on Flood Risk and Surface Water Drainage: https://www.falkirk.gov.uk/services/planning-building/development-management/docs/flood-risk/Planning%20application%20advice%20on%20flood%20risk%20and%20surface%20water%20drainage.pdf?v=202006030943

[27] Falkirk Greenspace: A strategy for our green network: https://www.falkirk.gov.uk/services/environment/environmental-policy/docs/green-network/Falkirk%20Greenspace%20-%20A%20Strategy%20for%20our%20Green%20Network.pdf?v=201702161345

5.3.2.3 Snow, ice and cold weather

Snow, while already relatively rare, is generally considered to be the most disruptive form of weather for transport networks. Therefore, the predicted reduction in snowfall in coming years will be significant in reducing the challenges posed by weather overall. However, less frequent snowfall events are likely to present an additional challenge in ensuring preparedness for these events when they do occur (particularly, as noted, extreme events associated with 'sudden stratospheric warming' can still be expected on occasion).

Rising winter temperatures are likely to reduce the number of days where ice can form. However, where periods of prolonged sub-zero temperatures are replaced by periods of freeze-thaw, ice may be more difficult to deal with, particularly as increasing levels of precipitation wash away salt and grit and wet surfaces which then re-freeze.

To manage the effects of snow, ice and cold weather:

- The Council's Winter Service Plan outlines the actions taken at this time of year to address the particular challenges posed by winter weather, particularly in regards to maintaining the function of transport networks; the core of this is carrying out salting, gritting and snow shovelling based on the defined hierarchy of route priority.
- The Council's Waste Management team are prepared to grit and clear snow when required and keep grit and shovels for this purpose
- The Criminal Justice Unit deploy community service workers to help with snow shovelling
- Staff across the council whose roles are generally less physical have supported response and recovery efforts during adverse weather in the past
- Community grit bins are provided and kept stocked
- Members of the public provide valuable support in terms of snow clearing and gritting efforts
- Live gritter tracking is now available whereby it is possible to follow in real time which roads have been treated and to plan journeys accordingly.
- A programme of more formalised community volunteer snow shovelling and gritting efforts is being considered.

It is also noted that when roads are particularly affected by snow, transport is often more disrupted by abandoned vehicles than by the snow itself and that in the past there have been particular issues with snow cleared from roads being piled up around bus stops.

5.3.2.4 Wind/storms

The following measures mitigate the impact of wind on transport networks:

- Wind-blown debris is removed by or its removal paid for by landowners of locations from which debris blew. The extent to which this is likely to be required in future may increase with more frequent overlap between leaf cover on trees (leaves acting like 'sails'), and the windier winter months as growing seasons lengthen. This may be further exacerbated by the age and condition of trees.
- Trees provide shelter from wind in places,

- Double decker busses are not allowed on certain routes which are particularly exposed to wind.

High winds and storms when trees are in full leaf, increase the chance of trees being blown over or damaged as leaves act as 'sails'.

5.3.3 Repair, maintenance and upgrade

In extreme cases weather related degradation of transport routes may also disrupt passage along them, however more often their impact is in damaging vehicles and contributing to injuries in terms of trips and falls and road accidents.

Repair work to routes under the Council's responsibility (which does not include canals or their towpaths, trunk roads or railways) is informed by Well Managed Highway Infrastructure: a Code of Practice and response levels set within Roads and Grounds' approved Safety Inspection Procedures Manual[28].

Resilience to weather- and therefore long term value for money- is an important factor, alongside initial cost and environmental impact, in decision making regarding the choice of materials used in the repair and maintenance of transport routes. For example, the Council is increasingly investing in more robust- generally tarmac- paths, and recycled plastic is being trialled as an alternative road filling material.

Repair and maintenance often represents upgrading of infrastructure as sections of routes are improved.

Potholes

Moistures level on hard surfaces resulting from rainfall and flooding, and "freeze/thaw" conditions in terms of temperature are significant contributing factors to pothole formation. Moisture levels on hard surfaces are likely to increase as winter precipitation increases if mitigation is not sufficient. Rising winter temperatures may reduce freeze-thaw where and when temperatures tend to stay above zero degrees Celsius; however there may also be times where freeze-thaw replaces prolonged cold.

Potholes can contribute to road accidents and trips and falls and have financial implications in terms of their repair, associated vehicle repair, and insurance pay-outs in addition to the immediate implications of these to individuals and their property. With regards to insurance payouts, there were 1209 insurance claims made against the council between 2010 and 2019, costing the Council £265,266.

Issues related to high temperature

During the 2018 heatwave other Local Authorities in the Central Belt of Scotland experienced overheating roads (at around 50 degrees Celsius), requiring sand to stop material from "bleeding". Similarly, railway lines can 'buckle' in extreme heat[29]. Without sufficient mitigation, such as the use of additional vegetation to provide cooling, the likelihood of such issues affecting Falkirk District increases as summers get hotter.

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[28] Well Managed Highway Infrastructure: a Code of Practice: http://www.ukroadsliaisongroup.org/en/codes/
[29] Buckled Rail and Summer Heat: https://www.networkrail.co.uk/running-the-railway/looking-after-the-railway/delays-explained/buckled-rail-and-summer-heat/

5.3.4   Road Going Motor Vehicles

In addition to being affected by road conditions as above, extreme temperature, moisture and grit and salt used to treat roads can affect the condition of vehicles. On one hand less frequent periods of extreme cold over winters and associated likely reduction in the use of salt and grit to treat roads may ease the burden of repair and maintenance on vehicles; on the other hand, more frequent periods of high temperature in summer and precipitation in winter may increase it. Where the balance lies is unclear at this stage.

The cost and environmental impact of repair and maintenance of the Council's fleet necessitated by weather is being minimised through ongoing investment in newer more resilient vehicles where this is cost effective in comparison to maintaining older vehicles (this includes vehicles used to address weather related issues, such as gritters), and by reductions in travel and measures to reduce transport disruption discussed elsewhere.

Similarly, running costs and environmental impact of vehicles used to address weather related issues are being reduced through significant ongoing investment in low and zero emission fleet- most notably electric pool cars and efficient diesel working vehicles- as well as specialist equipment such as Exactrak gritting technology which calculates and delivers gritter spray appropriate for the width of road whereas this was previously guessed. It is expected that electric vehicles which are large and/or require high levels of traction will be cost effective by the mid 2020s and the development and cost of hydrogen vehicles and infrastructure is being followed with interest.

In terms of the scheduling of vehicle repair and maintenance: Maintenance required for vehicles used to address the impacts of weather varies according to the timing and extent to which they are required. This subsequently affects the resource available to maintain other vehicles. This is most notable in terms of the maintenance requirements of gritters and snow-ploughs during winter months but this may become less so as winters become milder.

Installation of cameras and sensors on vehicles is reducing accident rates and provide clarity as to fault in accidents where weather conditions are a factor, which as a result also mitigates associated financial costs.

Rising temperatures during summer months will increase the need for drivers and passengers to take measures to avoid overheating and dehydration during spells of hot weather and require additional focus on ensuring vehicles are prepared for hot weather (for example, that oil and other fluids are topped up). This is particularly so with developments in remote and flexible working meaning that Council staff whose roles involve multiple site visits increasingly complete 'paperwork' using tablets 'on site'- often in stationery vehicles- rather than returning to offices. Advice on suitable measures for motorists to take is given through communication channels.

5.3.5   Modal choice

As shown below, in 2011 travel by private motor vehicle was more common in Scotland than travel by other modes, and this was even more so Falkirk District compared to the Scottish average. This is likely to be more pronounced at the time of writing due to reduced use of public transport as a result of the pandemic.

Percentage of journeys made by mode by 16-74 year-olds in employment (from 2011 census)

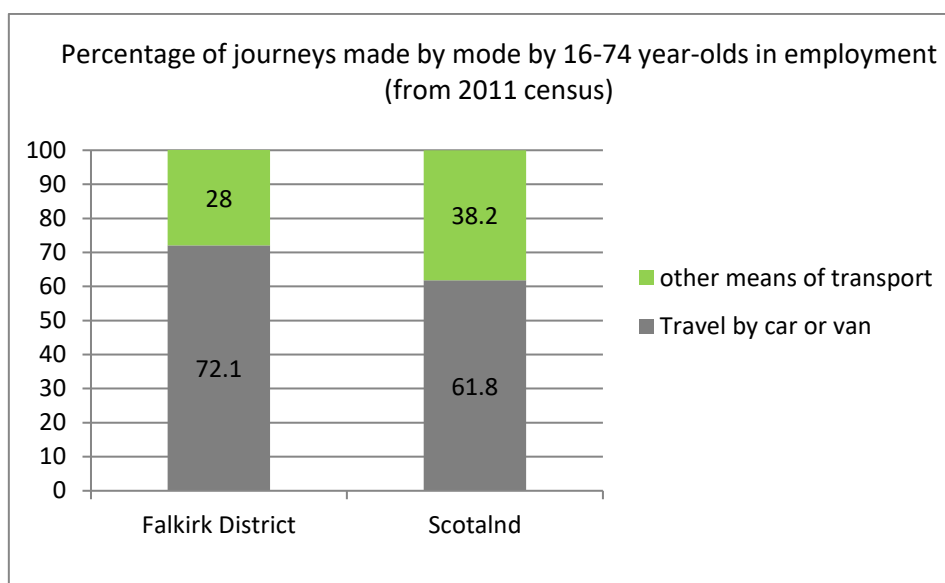|	Travel by car or van	other means of transport
Falkirk District	72.1	28
Scotalnd	61.8	38.2

Figure 8: Modal Choice in Falkirk District and Scotland based on 2011 Census results

Weather related disruption to travel by private motor vehicle would tend to result in higher costs and environmental impact than travel by other modes as more engines run for longer periods of time (although this may be mitigated to an extent where new, lower emission vehicles replace older higher emission ones as noted in the previous section). Also, as noted, efforts to encourage a mass shift from private motor vehicle use to travel by other modes reduce the extent and impacts associated with weather related transport disruption as private motor vehicles take up more space on roads than other modes, meaning that the high proportion of journeys made by private motor vehicle exacerbates the extent of weather related transport disruption and by extension the issues above.

In the council and its partners' efforts to promote this shift (mostly for reasons associated with health, wellbeing and the environment), weather presents a range of challenges and opportunities:

- Less clement weather tends to have a discouraging effect, particularly with regards to travel by foot and bicycle. This presents a negative feedback loop whereby a higher proportion of journeys made by private motor vehicle during periods of adverse weather exacerbates weather related transport disruption, and more private motor vehicles on the road is another significant factor in discouraging cyclists.
- On the other hand more clement weather tends to have an encouraging effect.

Predicted warmer temperatures year round and drier summers are therefore likely to generally encourage modal shift away from private motor vehicles whereas wetter winters are likely to discourage this.

Strategy and work underway to encourage a shift away from private motor vehicles is detailed in the council's Local Transport Strategy[30]; further and more up to date information will be found in the

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[30] Local Transport Strategy: https://www.falkirk.gov.uk/services/roads-parking-transport/policies-strategies/docs/transport-policy/Local%20Transport%20Strategy%202014.pdf?v=201906271131

Green Transport Strategy in development at the time of writing, and on the Falkirk Active Travel Hub's website[31]. Key themes of this work with regards to managing the impacts of weather are:

- seeking to capitalise on the encouraging effect of more clement weather- particularly over summers,
- encouraging the retention of more environmentally sustainable habits gained during periods of more clement weather,
- supporting the development of 'personal resilience' to less clement weather (considering both psychological factors such as habit and motivation and material factors such as suitability of clothing and equipment); this shall be discussed further with regards to outdoor work and activities
- keeping routes clear and passable as discussed
- improving infrastructure for modes other than private motor vehicle
- building development supporting modes other than private motor vehicle, including through Transport Impact Assessments and incorporation of transport upgrades in projects,
- latterly, seeking to build on the increase in active travel during the Covid-19 pandemic to encourage lasting behaviour change in terms of modal choice.

5.4   Buildings and Outdoor Structures

5.4.1   Reducing reliance on specific buildings

Just as the shift to remote and flexible work and service access is reducing the risk of weather-related transport disruption by reducing the need to travel, it is also:

- reducing the impact of temporary weather-related closure of Council workplaces and service delivery buildings,
- facilitating- through the Council's Strategic Property Review- a reduction in non-domestic buildings held by the Council which will in turn free up resources to improve those remaining buildings and to build a new headquarters, so reducing vulnerability of the council's non-domestic building stock to weather in the ways described throughout this section

As such, a number of the specific measures noted previously with regards to 'travelling less and avoiding weather-effected routes' equally apply to reducing reliance on buildings as above (for example use of tele-care and video-conferencing). Again, the Covid-19 pandemic has produced a step-change in the development of these practices.

5.4.2   Building Performance and Occupant Behaviour

A key function of buildings is to shield their occupants from weather conditions outside and to create a comfortable indoor environment. As such building performance is largely a function of weather conditions and so affected by the changing climate.

Buildings which are less able to manage the effects of weather can be described as being less 'energy efficient', often to a greater or lesser extent as a result of their state of repair (discussed in the following section). These are more expensive to run, produce higher carbon emissions, and are less comfortable and in some cases may pose health risks for their occupants.

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[31] Falkirk Active Travel Hub: http://www.falkirkactivetravelhub.org/what-we-do/

A key factor in the performance of buildings is the behaviour of occupants. In this regard, the Council's (draft) Building Temperature Policy states that Council staff should take a reasonable degree of responsibility for their own thermal comfort, for example in clothing choices.

Historically heating non-domestic Council buildings during the winter months to maintain thermal comfort and to reduce the impacts of damp in the rare instances where this is an issue has been the most significant aspect of maintaining building performance. During summers, by contrast, heating systems have been turned off and cooling only required on rare occasions.

Similarly, the cost for households of heating over winter months relative to income is the most significant contributing factor to the fuel poverty issues as experienced by 22% of Falkirk residents between 2015 and 2017 (based on the definition of fuel poverty used by the Scottish Government at the time of writing)[32]. Efforts are made to address this through specific measures to reduce the cost of maintaining building performance such as the energy saving advice available to all households[33], and to tackle poverty in general- as noted.

It is likely that requirements for heating buildings will tend to reduce as winter temperatures rise, apart from where issues with damp are present, particularly as these are likely to be exacerbated by increased average winter precipitation and increasing precipitation intensity year round.

As summers become hotter the risk of buildings overheating will increase and cooling is likely to be increasingly required at this time of year; this may be exacerbated by air-tightness requirements for buildings posing a challenge in terms of providing adequate natural ventilation.

As work and service access is increasingly remote from specific buildings, people spend increasing amount of time at home- particularly as required at the time of writing due to Covid-19 related social distancing measures required. This tends to mean that the financial burden of maintaining building performance is shifting to individual householders and away from employers and operators of public buildings, which has social justice implications. However it should be noted that for those who previously commuted to work or did so more regularly, additional home energy costs will be offset to a greater or lesser degree by savings on transport costs. Also, at the time of writing, the Council and it is likely many other organisations continue to maintain agreed temperature levels in their buildings.

The Local Heat and Energy Efficiency Strategy (LHEES) in development also seeks to reduce the greenhouse gas emissions associated with the Council's building stock, with energy efficiency of buildings being a key aspect of that.

5.4.3 Repair, maintenance, upgrades and new developments

As noted, buildings' state of repair is a significant factor, alongside weather, in determining performance. Similarly, the financial and environmental costs, temporary visual impact and loss of access associated with maintaining that state of repair is also largely a function of weathering and weather related damage, and as such, is also affected by the changing climate. This is also the case for outdoor structures.

As with building performance, these costs tend to be higher for buildings and outdoor structures which are in a poorer state of repair overall.

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[32] Scottish Government Fuel Poverty Statistics: https://www.gov.scot/publications/latest-estimates-fuel-poverty-extreme-fuel-poverty-under-proposed-new-definition-following-stage-2-fuel-poverty-targets-definition-strategy-scotland-bill/pages/5/

[33] Energy saving advice: https://www.falkirk.gov.uk/services/homes-property/housing-support/repairs-maintenance/energy-advice.aspx

Improvements to Council buildings are often made iteratively, including through ongoing recording and review of repair and maintenance feeding into Asset Management Plans on a five-yearly basis. In this respect, as with transport routes as discussed, repair and maintenance of buildings can often represent modest upgrading of infrastructure. This can range from minor interventions to more significant purchases such as in new components or assets replacing buildings which have reached the end of their useful lifecycle.

Weather can also affect building works, for example in requiring the delay of scaffolding construction.

Efforts are made to ensure that new building developments and upgrades are suitable in terms of their performance and structural resilience to weather now and in the future- as discussed. This is driven largely by ever improving criteria set in terms of Planning and Building Regulations and additional criteria set in the Council's Local Development Plan, itself informed by national planning policy[34].

As noted, building development and upgrade can support a reduction in travel and use of modes other than private motor vehicle- which can each improve and maintain resilience to weather as discussed. This includes

- Aligning transport and building development
- Prioritising building locations which facilitate reduced travel and use of modes other than private motor vehicle
- Incorporating facilities for those travelling by active means in buildings; for example: bike racks, showers and changing rooms.

Similarly, as discussed, access and evacuation during and/or as a result of weather is considered.

A particularly significant new building development is planned in the form of a new Council headquarters and arts centre. This will seek to be an exemplar in terms of resilience to weather and significantly improve the overall resilience of the Council's building stock to the effects of weather.

Energy saving advice available to all Falkirk residents includes advice on building upgrades[35].

The effects of weather on the temporary condition and state of repair of outdoor surfaces within the curtilage of buildings and measures taken to address these are broadly the same as those discussed previously in relation to transport routes.

Bringing forward pilot schemes to test and demonstrate relatively novel built solutions which increase resilience to weather can be challenging given, most notably, financial constraints and competing demands for land-take. However, the Council is taking measures to become more innovative through the Council of the Future programme, which will support such projects.

Below in an overview of impacts and solutions associated with different weather types in relation to buildings' repair, maintenance and new developments:

5.4.3.1 *Flooding/rain*

Without sufficient mitigation, overall increase in winter precipitation and extreme rainfall events year round will increase the repair and maintenance burden associated with the following:

- flooded outdoor features
- rain coming in damaged roofs (including flat roofs which crack under heat stress during summers)

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[34] Falkirk Council Local Development Plan: https://www.falkirk.gov.uk/services/planning-building/planning-policy/local-development-plan/

[35] Energy saving advice via Falkirk Council website: https://www.falkirk.gov.uk/services/homes-property/housing-support/repairs-maintenance/energy-advice.aspx

- treating damp,
- Exacerbation of freeze-thaw effects,

While instances of buildings being inundated by flood water have tended to be very rare, increasing precipitation and rising sea level will increase the risk of this if mitigation measures are not sufficient. Flood risk management strategy referred to previously with regards to roads also seeks to manage the risk of building inundation; this includes the use of SUDS which are incorporated into new building developments as per statutory requirements.

The national Flood Re scheme provides flood insurance cover to owner-occupiers of homes built before 2009 as other insurers reduce the cover available in terms of flood damage as the risk increases[36].

The increasing extent of areas of land identified as being at risk of flooding is a key factor in the reduction of already scarce suitable land available for new development (as identified at a strategic level as well as on a case-by-case basis through the Strategic Environmental Assessment stage of Planning). This has particular implications in terms of capacity for house building and housing provision.

5.4.3.2   Snow/ice and Cold weather

The initial onset of cold weather is often the most disruptive period in terms of building maintenance, particularly due to large numbers of minor repairs to heating systems being required simultaneously- creating a situation where not enough workers are available (both internally and in terms of external contractors) and work has to be prioritised; issues in this regard are exacerbated due to difficult decisions having been made due to financial constraints to not replace back up boilers.

Similarly, freeze-thaw can cause and worsen cracks in external masonry due to ice formation and can affect pipes.

As such, where rising average winter temperature means that temperatures stay above freezing level, the burden of repair and maintenance is likely to lessen; however where prolonged cold is replaced by freeze-thaw, the burden of repair and maintenance may increase.

5.4.3.3   Wind/storms

Wind rarely adversely affects buildings. However, particularly strong winds during storm/hurricane events can have severe impacts- mostly affecting roofs.

Wind blown debris can damage outdoor structures and pose a health and safety risk, both directly and by making structures unsafe.

High winds can require scaffolding to be secured more firmly, removed or its assembly delayed.

Wind loads are factored into solar panel installation. This is particularly pertinent for new building developments as these are required to incorporate low and/or zero carbon energy generation to provide 10% of the energy they consume. *Note: energy generation and transmission shall be discussed later.*

Strong wind could exacerbate the spread of fire outbreak in a building.

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[36] Flood Re insurance: https://www.floodre.co.uk/

5.4.3.4 High temperature/ drought

Some issues currently exist relating to materials contracting, expanding and cracking under high temperatures and drought. For example, some flat roofs already crack under high temperatures and become less water-tight, and there was a recent incident where the town hall window shattered due to heat stress, exacerbated by stick-on window decals not allowing this to happen evenly. These issues are likely to become more significant and frequent as summers become hotter and drier.

Solar blinds have been installed at one of the Council's buildings- the Forum- to avoid it overheating.

As noted SUDS incorporated into buildings and their curtilage and natural 'eco-system service' provided by greenspace and the natural environment can also have a cooling effect through the absorbing heat, retention of water, function of flora and water to cool the surrounding area, and shade provided. This will become increasingly pertinent as summers become hotter and drier.

5.5 Emergencies

As noted, specific statutory duties exist for the Council with regards to emergencies, which includes those relating to weather. To honour these duties the Council works as part of multi-agency resilience partnerships to co-ordinate work in this regard; at a local level this takes place through the Forth Valley Local Resilience Partnership, at a regional level through the East of Scotland Resilience Regional Resilience Partnership, and at national level with the Scottish Resilience Partnership[37].

Many of the impacts of weather and responses to these discussed in the LCLIP may be addressed as part of these emergency response efforts when they are individually and/or collectively particularly severe.

Emergency planning is largely based on an 'all risks' basis whereby the necessary components of effective response and recovery to incidents are the same regardless of what the incident is (for example an evacuation necessitated by flooding would be largely the same as one necessitated by terrorist threat). As such, development of capabilities in terms of dealing with emergencies in general and/or non-weather-related-emergencies supports resilience to weather-related-emergencies, and vice versa.

Figure 10 below illustrates the overlap in work relating to adaptation to climate change and work relating to civil contingencies:

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[37] Resilience Planning Partnerships which Falkirk Council is a member with/engages with:
- Forth Valley Local Resilience Partnership: https://www.firescotland.gov.uk/media/880149/forth_valley_lrp_crr_v1.2.pdf
- East of Scotland Regional Resilience Partnership: https://www.readyscotland.org/get-involved/ready-in-your-area/east-rrp/
- Scottish Resilience Partnership: https://www.readyscotland.org/ready-government/scottish-resilience-partnership/
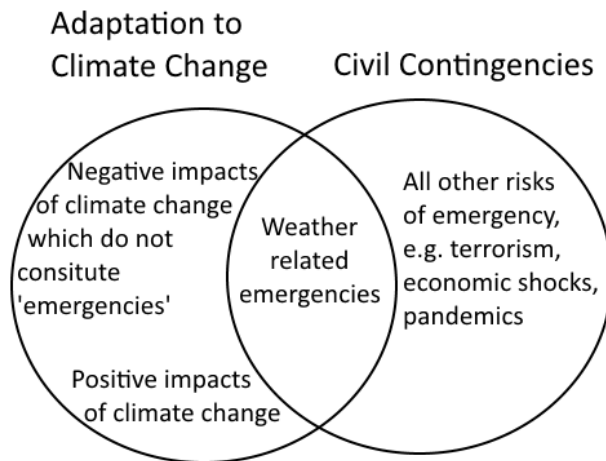
Figure 9: Venn diagram showing overlap in work related to adaptation to climate change and work relating to civil contingencies

Multi-faceted incidents often require prioritisation of efforts according to statutory duties and key objectives. For example a Vulnerable Persons' database is used to ensure that those with the greatest need are supported sufficiently.

Effective communication is a particularly important element of emergency planning as this helps support appropriate community responses and minimises queries received from members of the public which can present a significant burden on urgently required resources at these times. As noted the growth in recent years of the use of mobile internet devices and social media has produced significant improvements in terms of capabilities in this regard.

Similarly, ongoing Community Resilience campaigns seek to build community preparedness for emergency events in advance of their occurrence; for example members of the public are encouraged to be prepared with a 'grab bag' of essential items in preparation for emergency evacuation.

Businesses and other organisations are advised and supported to build resilience to emergencies through business continuity planning[38]

Advice on action that can be taken before, during and after weather related emergency events is given on the Council's website and the Forth Valley Local Resilience Partnership Community Risk Register[39].

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[38] Falkirk Council: A Guide to Business Continuity Planning: https://www.falkirk.gov.uk/services/business-investment/business-development-advice/docs/business-continuity/Guide%20to%20Business%20Continuity%20Planning.pdf?v=201906271131

[39] Advice on weather related emergencies:
- Forth Valley Local Resilience Planning Partnership Community Risk Register: https://www.firescotland.gov.uk/media/880149/forth_valley_lrp_crr_v1.2.pdf
- Falkirk Council website: https://www.falkirk.gov.uk/services/council-democracy/policies-strategies/emergency-planning/severe-weather.aspx

5.6   Energy generation and transmission

Weather can adversely affect energy transmission. Particularly, severe wind can affect overhead cables and other infrastructure and freeze-thaw can affect gas networks, as noted. These risks are increasingly pertinent as work and service delivery become increasingly reliant on ICT as discussed.

Also, as noted with regards to solar generation, wind may affect generation plant.

For renewable energy generation, changing weather patterns have direct impacts on generation- both positive and negative:

- Increasing temperatures year round will benefit ground, water and air source heating,
- Clearer skies during summer months associated with less frequent precipitation and the opposite during winter months are likely to affect solar generation
- Average precipitation increasing over winter months and decreasing over simmer months are likely to affect hydro electric generation.

With regards to these issues, the Council had the following measures are in place at the time of writing:

- Risk of outage mitigated by measures such as keeping files backed up in case of internet connection failure, and the requirement of certain Council staff to be contactable by mobile phone and measures to ensure that outages do not occur,
- New building developments are required to meet at least 10% of their energy needs through low and zero carbon generation technologies,
- Wind loads are factored into the design and siting of solar panels,
- A Gas Database Project is improving the efficiency and effectiveness of response to weather related issues regarding the gas heating systems,
- Engagement with Greenspace Scotland's Park Power project, which seeks to support the development of renewable energy in park-land and distribution to buildings in parks' vicinity[40].

Decarbonisation of the energy grid will reduce the extent to which increased energy requirements associated with weather conditions (for example air conditioning as summers become warmer) will have an adverse impact in terms of greenhouse gas emissions.

5.7   The natural environment

The UK Climate Risk Assessment highlights that for Scotland:

- More action is needed in relation to species and habit,
- More action is needed in relation to soils and carbon stores,
- Further research is required regarding risks to marine species as a result of changes in oceans[41].

The impacts of weather and climate change amplify and are amplified by other impacts on the natural world resulting from human activity. These other issues include loss and fragmentation of

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[40] Park Power: https://www.greenspacescotland.org.uk/pages/category/energy
[41] UK Climate Change Risk Assement:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/584281/uk-climate-change-risk-assess-2017.pdf

habitat as a result of land use change, introduction and spread of problematic non-native species, unsustainable exploitation of natural resources, pollution and predation by household pets[42].

The principle of "biodiversity net gain" in place in England- whereby development should seek to improve biodiversity overall, is expected to come into effect in Scotland through National Planning Policy 4 when it is published.

Climate impacts globally may affect supply of products derived from the natural world as harvests are adversely affected. The Council supports community action on local food growing, which increases resilience to this as well as other potential impacts on the commercial food market, for example relating to transport logistics and/or the economy[43].

Also, as discussed with regards to transport routes and buildings, the natural environment including greenspace which is managed to varying degrees (including more formal 'SUDS' features)- also plays a role in regulating the effects of weather as the climate changes. This is both developed through new features and spaces and protecting and enhancing existing 'eco system service'; this' is considered in any potential interventions by the Council relating to the natural environment, for example in tree removals.

5.7.1 Flooding/rainfall

Flooding and rainfall can spread contamination over ground and into watercourses, causing significant negative impacts on biodiversity and water quality. Without sufficient mitigation, overall increase in winter precipitation and extreme rainfall events year round will exacerbate this. Contaminants include:

- Ground contamination brought to the surface
- Litter and landfill
- Soil erosion and sediment run-off
- Oil and fuel which has leaked from motor vehicles
- Settled particles from vehicle exhaust and industrial chimneys
- Herbicides and fertiliser
- Sewerage overflow (although rare and localised)

Flooding at Grangemouth is of particular concern in this regard due to high levels of ground contamination and particularly sensitive land, marine and wetland eco-systems nearby.

Current actions which may mitigate these impacts to an extent by reducing contamination include

- the Council increasingly allowing 'weeds' to grow and less ecologically damaging forms of weed-killer than the strong varieties currently used are being researched,
- increasing switch to electric and low emission vehicles, as discussed, which are less polluting at the point of use (although there are broader implications with electric vehicles in terms of the polluting effects elsewhere in the extraction of raw materials and electricity generation)

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[42] UN Report: Nature's Dangerous Decline 'Unprecedented'; Species Extinction Rates 'Accelerating': https://www.un.org/sustainabledevelopment/blog/2019/05/nature-decline-unprecedented-report/

[43] Dig In Falkirk: Falkirk Council's Draft Community Food Growing Strategy (2019-2024): https://www.falkirk.gov.uk/services/people-communities/docs/growing/Draft%20Food%20growing%20strategy.pdf?v=201906271131

- efforts to reduce and clear up litter, including community action such as is carried out by the G.Litter team of volunteers in Grangemouth.

The natural environment itself provides an 'eco-system service' by filtering contamination through certain forms of SUDS, and natural filtration of contaminants through reeds has been observed.

Flooding and heavy precipitation can also have a direct impact on

- species, by making former habitat untenable- affecting their access to food, shelter and ability to breed (for example very high water levels can wash out water vole and kingfisher burrows),
- soil health, particularly where waterlogging is coupled compaction from heavy vehicles such as ride on lawnmowers; this has particular implications for agriculture

Efforts to reduce flooding discussed with regards to transport routes and buildings mitigate these impacts to some extent, including through the use of the natural environment itself in providing 'natural flood protection', again, both in the form of engineered SUDS and in more 'natural' green landscapes.

5.7.2   Wind/storms

Smell, air pollution and debris- including waste- are carried by wind, and particularly as summers become hotter and drier wind may exacerbate the spread of fire.

Bins being blown over in the wind can be an issue. The council takes the following action to avoid this during windy spells:

- advising residents on suitable places to put bins
- returning bins to secure and sheltered locations after collection
- in extreme cases delaying bin collection- and advising residents in advance

The 're-naturalisation' of the former landfill site in Bo'ness will reduce the amount of litter blown from it, and efforts are ongoing to reduce and clean up litter as noted.

As discussed in regards to wind blown debris and treefall on transport routes, the lengthening growing season is likely to mean that leaf cover is increasingly likely to coincide with the windier winter months, increasing the vulnerability of trees to the effects of wind.

However, trees also provide shelter from wind, which supports biodiversity by providing habitat.

5.7.3   High temperature (including longer growing seasons)/ drought

Extended periods of hot dry weather increase the risk of dust and air pollution.

Issues with food waste rotting or attracting pests during periods of warm weather are avoided through weekly collections; it is anticipated that this will continue to be sufficient as summer temperatures rise, particularly due to ongoing work to improve waste management and reduce household waste generation.

High temperatures and drought can have a direct impact on wildlife. Plants may die and animals can struggle to find water (particularly in more urban areas). Some species may become more prevalent or occur in Falkirk District for the first time as they spread their range north with warmer weather (e.g. comma butterfly, nuthatch) while other hand species adapted for cooler climates may struggle to survive and be forced to away to move away to more northerly latitudes and into higher altitudes.

Warmer temperatures and the associated lengthening of growing seasons will also:

- Similarly, increase potential crop yields and viability of some crops but reduce the viability of others (other issues discussed in this section notwithstanding),
- increase the maintenance requirement of managing greenspace, including its cost and environmental impact (although this may be mitigated to an extent by a relaxation of the extent to which greenspace is kept 'formal' as discussed),
- disrupt species and their interconnected eco-systems in general as patterns of feeding, nesting, hibernating etc., and resources available for these are all affected by altered seasonal patterns,

Below freezing winter temperatures help to control some pathogens and pest species. An increase in temperatures may mean more pest and invasive, non-native species can survive the Scottish winters and spread further north.

As discussed in relation to impacts on the built environment, plants and trees provide cooling through evapotranspiration and shade. This function is particularly pertinent in terms of maintaining water levels and chemical balance in bodies of water for species which rely on them; this will be increasingly so as summers become warmer and drier and the risk of water contamination increases, as discussed.

5.8 Outdoor Work and Activities

Time spent outdoors can have multiple benefits on health and wellbeing, however direct exposure to the elements can also pose risks ranging from mild discomfort to more serious health risks.

Individuals' ability to realise these benefits and avoid these adverse effects varies according to a number of factors, most significantly, financial means; for example outdoor activity leaders often encounter children from disadvantaged backgrounds who do not own a water-proof jacket.

During winter months:

- milder temperatures will generally be more comfortable,
- preparedness for less frequent periods of cold weather and snow will become more challenging as these become less common,
- increased precipitation will make conditions more challenging,
- The direct effects of wind and wind-chill will continue to be an issue.

During summer months:

- Warmer, drier weather will generally encourage outdoor activity and make outdoor work more pleasant,
- Extreme heat and direct exposure to the sun- associated with less cloud cover- will have increasingly adverse effects related to overheating and other issues ranging from sunburn to skin cancer.

Aside from direct impacts to individuals, conditions can affect whether and how work and activities take place in other ways. For example, waterlogged ground- which will occur increasingly without sufficient mitigation can affect grass cutting, horticulture and agriculture, and sports and recreation locally, and less snow in the mountains is increasingly affecting winter sports and activity trips.

At all times of year variable weather conditions can pose challenges in terms of preparedness.

Measures taken by the council and its partners to mitigate the adverse effects of weather and realise positive aspects in this regard include:

- Prior planning and preparation based on weather forecasts, which may include altering schedules
- Advice is given to members of the public via communication channels.
- Facilitating wearing appropriate clothing and protective equipment; in this regard the Council have a relaxed dress code and issue appropriate uniform and PPE where appropriate and a clothing bank operated by the charity One Parent Families Scotland seeks to supply suitable outdoor clothing to children who lack it.
- Use of other personal protection such as sun cream is promoted
- Actions such as drinking water regularly when weather is hot and taking breaks away from the elements to avoid overheating or becoming too cold are promoted
- A key element of outdoor education and training is development of skills and strategies to deal with varying weather conditions as above.

6   Proposed measures

As well as identifying current action to manage the effects of weather, research for the LCLIP sought proposed measures to do so in future. These included potential measures which are being, or have been, actively discussed within the Council as well as novel ideas. The ideas identified can be broadly categorised as

- Measures to maintain and develop Adaptation Capabilities in terms of potential tasks identified in the Adaptation Scotland Capability Framework, and
- Specific measures to mitigate specific risks and realise specific opportunities

Rather than list these comprehensively here, they are being used to inform further work on climate change adaptation, most notably an Adaptation Strategy and Action Plan.

7   Appendix 1: Methodology

7.1   General approach and limitations

The 2020 LCLIP takes a slightly different approach to the 2010 LCLIP and most other LCLIPs produced previously by:

- Rather focussing only on the impacts of what is considered to be the most "severe" weather, considering the impacts of weather more generally. It does so in order to take into account those impacts which are more the result of longer term patterns of weather- and are often less immediately apparent- as well as those which are the result of isolated events- which are generally easier to recognise.
- Similarly, rather than necessarily framing action to manage the impacts of weather and climate change as 'deviation from the status-quo', it also considers how 'the status quo' is changing. When work began on the LCLIP this reflected ongoing and wide-ranging changes at the Council being brought forward through the Council of the Future programme of

change and escalation of the profile of climate change following from the Council's 2019 climate emergency declaration. Latterly, this become even more so as response to COVID-19 precipitated an accelerated rate of change and further increased focus on climate change due to ongoing national efforts in terms of a 'green recovery' from the pandemic.

Ultimately the LCLIP aims to bring forward work relating to climate change adaptation through use of Adaptation Scotland resources both in the process of its development and as a 'final product'.

Work on the LCLIP is informed particularly by:

- Specific UKCIP guidance and templates for formulating LCLIPs,
- Resources from Adaptation Scotland- which supports holistically embedding work on adaptation to climate change throughout councils' operations and beyond through developing capabilities- including specific guidance on LCLIPs,
- The previously published LCLIP for Falkirk District (seeking to provide useful comparison through time),
- Input from colleagues.
- Flexibility as to how to produce the LCLIP as one sees fit;
- Ample time allocated to develop it as part of a graduate placement;
- Compared to LCLIPs which were produced a decade ago, more widespread awareness of, and developed action to, address changing weather patterns and sea level rise at a societal level,
- Greater formal recognition of these issues within the council- most notably in the recent Climate Emergency declaration and raising the threat level identified with Climate Change from 'medium' to 'high' in the corporate risk register- and official targets set relating to these, and
- other significant changes affecting and being delivered by the council through the Council of the Future programme of change

7.2   Interrogation of **UKCP18 climate projections**

The Met Office UKCP18 User Interface was used to produce high resolution climate projections covering a pre-set 25 square-kilometre area including Falkirk, Clackmannanshire and Stirling city. While finer resolution was available it was felt that using this grid square was most appropriate given the data available at this scale, which is not available for smaller areas. It is a 'happy coincidence' that this covers the city of Stirling and the majority of Clackmannanshire, meaning that results can be usefully shared with Stirling and Clackmannanshire Councils.

These are based on the RCP-8.5 high-emissions scenario and RCP-2.6 scenario where emissions are limited enough to ensure that global warming is kept below 2°C rise from pre-industrial levels as per the international Paris Agreement.

These projections took data from 1981-2010 as a baseline and projected to 2100.

The results of this exercise provide context with regards to the other research in terms of changes in the local climate that can be expected.

Other Met Office resources and The Scottish Government Scotland's Environment website were also referred to.

7.3   Media search

Online news articles (by Falkirk Council and Falkirk Herald) and Twitter posts by organisations reporting weather-related-impacts on Falkirk District were collated and codified covering the period 2010-2019. This was intended to provide qualitative data with regards to the most significant events, weather types and impacts to provide a starting-point with regards to the research rather than to be considered as quantitative data, particularly given significant limitations in terms of the reliability of the data collected when considered as such, for example:

- codifying reports as being related to particular types of weather or impacts often required judgements to be made as to which were most pertinent (e.g. where multiple weather types and/or impacts), similarly resulting in numerous instances of double-counting
- it appeared to be the case that some older articles may have been removed from websites
- the shift from traditional media to social media over the time period further reduced the reliability of the data in terms of indicating trends
- the labour-intensive nature of the research created high possibility for human error

None-the-less, the quantitative results are consistent with results from other sources- discussed below. This consistency is seen to represent a positive result of a 'sense check', suggesting that despite weaknesses in the data, it is at least indicative of what has been reported over the time period, with that indicating by proxy- public priorities, and to a lesser extent weather and impacts in real terms. As such, quantitative media search results have been used to illustrate other findings throughout the LCLIP.

7.4   Interrogation of weather related insurance claim data

Data for insurance claims received by Falkirk Council over the past 10 years was received and interrogated where it related:

- directly to weather,
- to potholes (where weather is a factor) or
- to burst pipes (where weather may or may not be a factor)

7.5 Interrogating data from the council's Customer First Contact Centre,

Monthly data on calls, emails, customer survey returns and complaints were received for the period April 2014 to December 2019 (data covering 2010-2014- to cover the same time-frame as other datasets- was not available).

7.6 Interviews

Interviews with colleagues throughout the Council and with staff at Forth Environment Link were carried out; in some cases returning a questionnaire and/or conversations by email took the place of this. This is the most important part of the LCLIP- not only generating results to be included in the report but:

- taking forward work relating to adaptation to climate change
- informing the development and approach taken to producing the LCLIP with interviewees advising on ways that it and the process of putting it together could be useful to their work
- it is hoped, stimulating useful discussions on the issues which may to a greater or lesser extent inform actions in future.

Requests to meet were made to people based on the teams, departments and organisations represented in the previous LCLIP, and recommendations from colleagues as to who should be interviewed.

While not every key team or department within the council were represented, it is felt that a large enough number were and those who were involved were able to report on others' work to the extent that a reasonably comprehensive overview of how weather and climate change affect and are being dealt with by the council was gained.

As priorities within the council are largely defined by decision making by locally elected councillors, and by policies, guidance and duties set nationally, it is felt that many of the responses by colleagues within the Council also serve as indicators of the views of local and national decision makers and capture the policy and guidance response of the civil service nationally to a reasonable extent. Similarly, while Forth Environment Link were the only organisation from outside the council represented, those interviewed were able to report on impacts experienced by and actions taken forward by other organisations that they work in close partnership with and by the general public.

From within the council, the following teams and departments were represented in interviews or completed questionnaires and/or discussed matters by email:

- Facilites
- Programme Management Office for 'Council of the Future'
- Planning and Environment
- Flooding
- Resilience Planning

- Transport Planning
- Building Design
- Development Planning (Policy)
- Customer First Contact Centre
- Fleet Management
- Waste Strategy
- Environmental Protection
- Building Standards
- Roads and Grounds
- Procurement and Housing (Policy)
- Corporate Risk Management
- Health and Social Care
- Communications
- Capital and Treasury
- Insurance
- Procurement
- Falkirk Community Trust

The interviews took a 'loose', discursive form so as to allow interviewees freedom to discuss issues as they saw fit. The following list of questions was however referred to as a guide in the discussions:

- For an overview of the team/department being represented.
- "Does your work involve reacting to the impacts of weather events and if so how?"
- "Does your work involve preparing for or building resilience to the impacts of weather events/ climate change and if so how?"
- "If applicable, which other teams/departments/organisations/people do you work with in these regards and how do you work with them?"
- "If applicable, what challenges do you experience in going about this work and what solutions are being pursued/considered?"
- "How do you think your work in terms of responding to and preparing for the impacts of weather and climate change might change in the future?"
- "What do you feel would help you/your team do this work more effectively?"
- "How is your ability to work and deliver services affected by weather events and what solutions are being pursued/considered to minimise this?"
- "How might weather events affect your ability to work in the future?"
- "What do you feel would help in minimising disruption to your work resulting from weather events and climate change?"
- "Please describe how your work and ability to do your work were affected by the weather during the winter of 2017/18 (including the Beast from the East period of stormy weather around March 2018). Please include lessons learned informing actions going forward."
- "Please describe how your work and ability to do your work were affected by the weather during the winter of 2018/19 (last year's mild winter). Please include lessons learned informing actions going forward."

- "Please describe how your work and ability to do your work were affected by the weather during any other period/ periods over the past 10 years. Please include lessons learned informing actions going forward."
- *"If you are you involved with one or more Council of The Future project:*
    - "What project/s are you involved with
    - How do you think Adaptation to climate change could fit in to this/these?
    - Which other teams or external parties should be interviewed for the LCLIP?"
- "How can work on this Local Climate Impacts Profile and specific activities relating to adaption to climate change more generally help you in your work?"
- "Any other comments/feedback/requests/suggestions?"

Comments made were synthesised using a matrix table to avoid repetition; these form the basis of the results presented throughout the LCLIP.

7.7   Other data gathered

Other data was gathered in preparation for and following other stages:

- Research on the council's work and policies,
- Research on government and other agencies' work and policies,
- Historic weather and Met Office weather warning data were gathered.

8   Appendix 2: Key policy, guidance, other sources of information, and statutory duties
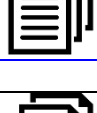
This appendix lists key policy, guidance, other sources of information, and statutory duties noted in and particularly relevant to discussion in the 2020 Local Climate Impacts Profile (LCLIP) for Falkirk District. While some nationally relevant documents and sources are listed, others have been omitted for brevity; for a more comprehensive directory of these see the second Scottish Climate Change Adaptation Programme (SCCAP)[44].

This appendix has been structured in such a way as to correspond to the structure of the LCLIP for easy cross-referencing.

8.1   Governance, overall approach and strategic risk management

Statutory Duties	Summary	Hyperlinks

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[44] The Second Scottish Climate Change Adaptation Programme (SCCAP): https://www.gov.scot/publications/climate-ready-scotland-second-scottish-climate-change-adaptation-programme-2019-2024/

Risk management	The Council's CRM Policy & Framework sets out the Council's approach to managing risks. Climate Change is listed on the Corporate Risk Register (CRR), and also impacts on many other corporate risks – assets, project, and people risks (e.g. poverty, equalities, safety / harm, and communities / participation) The CRR takes account of a wide range of statutory duties, and consequences of risks – including legal, harm (to people / assets), financial, and reputational. There is no specific statutory duty on risk management, but it is a key part of Best Value and good governance.	
Climate change reporting duties	The Council is duty bound to report on its work relating to adaptation to climate change	
Community Empowerment (Scotland) Act 2015	The Council must fulfil its statutory duties regarding community empowerment.	
Strategy for Community Engagement 2019-2024	The Council's strategy regarding community engagement.	
Strategic Outcomes and Local Delivery Plan (SOLD) 2016-2020	The Falkirk Community Planning Partnership's strategic outcomes inform everything that the council and its key partners do. This document shall be superseded by the Falkirk Plan, due to be released in 2021	
Local Development Plan 2	The Falkirk Local Development Plan 2 (LDP2) is the statutory document which guides future development in the Council area for the period 2020-2040.	
Corporate Priorities	The Council's corporate priorities, re-designed in 2020 via the Council of the Future programme of change reflecting Covid recovery as well as other developments. Action on climate change is formally recognised within the Enterprise priority.	
Environmental Assessment (Scotland) Act 2005	Requirements to consider environmental impact of developments. This may include management/exacerbation of weather related impacts which are changing as the climate changes.	

Adaptation guidance		
Documents/ web pages	**Summary**	**Hyperlinks**
Adaptation Scotland website	Guidance and resources to support adaptation to climate change.	
United Kingdom Climate Impacts Programme (UKCIP) website	Guidance and resources to support adaptation to climate change, particularly in supporting development of LCLIPs	

The second Scottish Climate Change Adaptation Programme (SCCAP)	Scottish climate change adaptation outcomes.	
UK Climate Change Risk Assessment	Key risks and priorities in terms of climate change and adaptation to it, including specific points for Scotland	
The Association for Public Sector Excellence (APSE) website	APSE provide guidance on adaptation among other matters of relevance to public sector organisations	

Falkirk Council and partners' strategic direction		
Documents/web pages	**Summary**	**Hyperlinks**
Council of the Future Work-streams	Wide ranging programme of change underway at Falkirk Council	
Strategic Outcomes and Local Delivery Strategy (SOLD)	Outcomes and priorities of the Falkirk Community Planning Partnership which 'sit above' all other policy and action. This will be replaced by the 'Falkirk Plan' in development	
Climate emergency declaration	Falkirk Council declared a 'climate emergency' in 2019.	
Second Local Development Plan (LDP)	The Falkirk Local Development Plan (LDP) is the statutory document which guides future development in the Council area for the period 2020-2040. The second Local Development Plan for 2020-2040.	
National Planning Policy and Guidance	This sets the framework in which the built and natural landscape is developed. National Planning Policy 4 is expected to bring a stepped increase in the extent to which adaptation to climate change is supported	
Strategy for Community Engagement 2019-2024	This strategy will drive change in the way the Council engages with people and communities. This means changing not only the way we take decisions but the way all of our officers and services engage and support people.	

8.2 Transport and flooding

Note: Flooding is included within the Transport section for brevity in the LCLIP, as this is the area in which the impacts of flooding were most often identified through the research.

Statutory Duties	**Summary**	**Hyperlinks**
Winter service	Roads (Scotland) Act, 1984 (Section 34): 'take such steps as it considers reasonable to prevent snow and ice endangering the safe passage of pedestrians and vehicles over public roads'.	

Transport policy, guidance and other sources of information (not including flood-specific documents and sources)		
Documents/web pages	**Summary**	**Hyperlinks**
Local Transport Strategy	Outlines the Council's strategy regarding transport	
Green Transport Strategy	A green transport strategy is in development	
ScotRail Adaptation Action Plan (in development)	Adaptation action plan for railway infrastructure and operations delivered by ScotRail	
Scottish Canals Asset Management Strategy	Scottish Canals Asset Management Strategy includes details of weather/climate resilience/adaptation	
Network Rail Weather Resilience and Climate Change Adaptation Strategy	Adaptation action plan for railway infrastructure and operations delivered by Network Rail	
Live Gritting Map	Map showing which roads and paths have been gritted in real time and location of public and community grit bins.	
Fairer Falkirk Map	Map showing public internet availability (digital access may take the place of physical access)	
Winter Service Policy	Policy which sets out what the council does (in partnership with Clackmannanshire and Stirling Councils) to manage the immediate effects of weather on transport routes over the winter months.	
Society of Chief Officers of Transportation in Scotland (SCOTS) website	Guidance and resources relating to transport, including specifically on managing the effects of weather.	
Falkirk Active Travel Hub website	Information and resources to encourage active travel.	
Designing Streets	Designing Streets provides guidance on alignment of development with sustainable transport options and minimising travel distances.	

Flooding		
Documents/web pages	**Summary**	**Hyperlinks**
Grangemouth Flood Protection Scheme	Large programme of works planned to install flood protection measures in and around Grangemouth	

Forth Estuary Flood Risk Management Plan	Multi-agency plan for flood risk management covering the Forth Estuary (which covers the majority of Falkirk District).	
Forth Flood Risk Management Plan	Multi-agency plan for flood risk management covering the river Forth (which includes part of Falkirk District).	
Clyde and Loch Lomond Flood Risk Management Plan	Multi-agency plan for flood risk management covering the Clyde and Loch Lomond area (which includes a very small part of Falkirk District).	
Surface Water Management Plan	The Council will publish its surface water management plan in 2021.	
Flooding page on Council Website	Advice on emergency flood response	
SG05 –Green Infrastructure and New Development	The council will soon publish supplementary guidance on many aspects of green infrastructure including SUDS design and watercourse restoration	
Planning application advice on flood risk and surface water drainage	Technical requirements for flood risk and surface water drainage developers must comply with for new planning applications.	
Scottish Water: Sewers for Scotland	Guidance on drainage, including SUDS requirements where schemes are to be vested by Scottish Water	
SUDS for Roads	Requirements for SUDS which manage water drained from adopted roads.	
Well Managed Highway Infrastructure: a Code of Practice	Guidance on keeping transport infrastructure passable and in an adequate state of repair.	

8.3   Buildings and outdoor structures

Statutory Duties	Summary	Hyperlinks

Documents/web pages	Summary	Hyperlinks
Falkirk Council (draft) Building Temperature Policy	Draft policy on maintaining thermal comfort for occupants in buildings	
Building Standards technical handbook	Sets out building standards requirements	

National Planning Policy and Guidance	This sets the framework in which the built landscape is developed. National Planning Policy 4 is expected to bring a stepped increase in the extent to which adaptation to climate change is supported	
Energy saving advice on council website	Energy saving advice on council website	
The Local Heat and Energy Efficiency Strategy (LHEES)	LHEES in development will make recommendations on energy efficiency in council buildings	
Strategic Property Review	The SPR will rationalise and re-invest in our assets enabling services to be delivered from a smaller number of buildings, better suited to service and customer needs.	
Historic Environment Scotland- Climate Change Impacts Guide	Guidance on historic buildings' adaptation to climate change	

8.4 Emergencies

Statutory Duties	Summary	Hyperlinks
Civil Contingencies act 2004	The Council has specific duties to manage risks associated with emergency situations	

Documents/web pages	Summary	Hyperlinks
Forth Valley Local Resilience Partnership Risk Register	Information on risks of emergency situations (including related to weather), solutions in place, advice and signposts to sources supporting personal and organisational resilience, and an outline of the multi-agency partnership which co-ordinates work in this regard.	
Ready Scotland website	Resources and information to support resilience to emergencies.	

8.5 Energy generation and transmission

Statutory Duties	Summary	Hyperlinks
	The Falkirk LDP has a policy requiring all new buildings to meet a specified proportion of their reduction in carbon emissions through LZCGT.	

Documents/web pages	Summary	Hyperlinks

Renewables supplementary guidance		
ParkPower web pages	Greenspace Scotland project promoting and seeking to support installation of renewable energy generation in parks and district heating for buildings in and around parks	

8.6 The natural environment

Statutory Duties	Summary	Hyperlinks

Documents/web pages	Summary	Hyperlinks
Falkirk Greenspace: A Strategy for our Green Network	Council strategy for all aspects of the natural environment in Falkirk District	
Dig In Falkirk: Falkirk Council's Draft Community Food Growing Strategy (2019-2024)	Draft strategy on community food growing in Falkirk District	
Historic Environment Scotland- Climate Change Impacts Guide	Guidance on historic environments' adaptation to climate change	
Scotland's Environment website	The Scotland's Environment website gives information on issues affecting ecosystems.	

8.7 Outdoor work and activities

Statutory Duties	Summary	Hyperlinks

Documents/web pages	Summary	Hyperlinks

9   Appendix 3: Responsible Parties and Stakeholders

This appendix lists the responsible parties and stakeholders referred to in and particularly relevant to discussion in the 2020 Local Climate Impacts Profile (LCLIP) for Falkirk District.

Similarly, while some nationally relevant stakeholders are listed, others have been omitted for brevity; for a more comprehensive directory of these see the second Scottish Climate Change Adaptation Programme (SCCAP)[45].

This appendix has been structured in such a way as to correspond to the structure of the LCLIP for easy cross-referencing.

9.1 Governance, overall approach and strategic risk management

Teams and departments within Falkirk Council		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**
Energy and Climate Change Team	The Energy and Climate Change team contributes to policy and guidance relating climate change mitigation and adaptation and energy, and provides expertise in these areas to support the work of others throughout the council and beyond.	Yes
Corporate Risk Management (CRM)	CRM supports CRM Group to implement and monitor the CRM Policy across all Services and Partnerships, and provide risk and assurance updates to CMT, Audit Committee, and Executive. This includes developing Services Assurance Statements, the council's Risk Register, Governance Groups' Assurance and considering emerging risks/ lessons learned. Risk Specialists and Governance Groups (including Climate Change Team and Corporate Sustainability Group) are a key source of risk knowledge and they contribute to CRMG agenda and CRM updates to CMT, Audit Committee, and Executive. CRM Team / Group rely on these Risk Specialists highlighting emerging risks which need to be given more attention in corporate risk reports to CMT and Members – but CRM/G provide high level oversight of risks, and they rely on Risk Specialists and Governance Groups to lead on assessing the risks, developing and monitoring mitigation plans / projects, and provide assurance (through the Council Risk Register).	Yes
Council of the Future	Council of the Future is a programme of change and is the core delivery of our Council of the Future Vision. It links investment for this with our capital strategy and delivering on the Council's Medium Term Financial Plan. Through 5 key work-streams, the Council of the Future Programme will: •Help us work better with our communities to understand their needs and aspirations. • Deliver a range of enabling projects which give us a set of systems, processes, behaviours and activities identified as important enablers of our change and transformation. •Redesign and implement modern, responsive, and future-proofed service delivery models that break the mould, for example shared services, community empowerment. Support the development of digital infrastructure to work	Yes

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[45] The Second Scottish Climate Change Adaptation Programme (SCCAP): https://www.gov.scot/publications/climate-ready-scotland-second-scottish-climate-change-adaptation-programme-2019-2024/

	smarter in any location to benefit residents, businesses and employees. •Embed a commercially focussed approach to how we run our business to maximise our income generation. This will ensure that the Council is able to meet the changing requirements of customers, transform and improve service delivery and meet the financial savings set. • Work has begun to align climate change recommendations with Council of the Future to ensure an integrated approach and maximise the impact of our change and transformation.	
Development Plans Team	Development Plans Team is tasked with the preparation of the Council's Local Development Plan, which sets out a vision, spatial strategy and planning policies guiding future development across the Council area. The plan is supplemented by Supplementary Guidance which provide detailed guidance on the application of the policies.	Yes
Capital and Treasury	Capital and treasury builds budgets for the creation of new assets and rennovation of new assets and carry out financial monitoring and reporting.	Yes
Communications	The Communications team work corprately accross services in: communicating important information; supporting the delivery of campaigns; facilitating dialogue with and supporting service delivery to citizens; and supporting internal communications. This involves use the use of webpages, social media, and design.	Yes
Governance		No
Elected Members	Councillors elected to represent the public, holding various portfolios	No

Partnerships with representation from Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Community Planning Partnership	Community Planning brings representatives from the public, private third and community sectors together to endeavour to deliver better public services to the area. Community Planning Partners: • Falkirk Council • CVS Falkirk & District • Falkirk Community Trust • Forth Valley College • Falkirk Health & Social Care Integration Joint Board • NHS Forth Valley • Police Scotland • The Scottish Fire and Rescue Service • Scottish Enterprise • SEStran	No

Party/stakeholder	Overview	Consulted on 2020 LCLIP
	• Skills Development Scotland • The Scottish Government	
Association for Public Sector Excellence	Provides support and guidance, including in relation to adaptation to climate change	No

Other Groups and Organisations		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Adaptation Scotland	Adaptation Scotland support adaptation to climate change by public sector organisations and others	Yes
UK Climate Impacts Programme (UKCIP)	UKCIP support adaptation to climate change	No
The Met Office	The Met Office provide information and resources on weather and climate	No
Scottish Government	National governance and resources relating to adaptation	No
UK Government	National governance and resources relating to adaptation	No

9.2 Transport and flooding

Note: Flooding is included within the Transport section for brevity in the LCLIP, as this is the area in which the impacts of flooding were most often identified through the research.

Teams and departments within Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Transport Planning	Transport Planning oversee the operation of services relating to public and active travel, produce transport planning strategy in liaison with the Planning department, and have an operational role in terms of delivering school busses, social work taxis and other contracted transport.	Yes
Roads and Grounds	Roads and Grounds: - Maintains open spaces- particularly in terms of grass cutting - Maintains roads, including their drainage at surface level - Fills potholes - Grits roads and clears snow - Maintains street lighting - Supports other services through direct labour - Are responsible for drainage from roads and flooding affecting local roads	Yes
Environmental Planning	Environmental Planning has responsibility for both built and natural environment, including outdoor access. This includes the formation of strategies, remedial works and providing support to relevant community and third-sector organisations.	Yes

Development Planning (Policy)	Development Planning (Policy) set out strategic guidance to inform planning decisions and designate long-term land use going forward. This is done mostly through the Local Development Plan (LDP).	Yes
Flooding	The Flooding team oversees flood risk management, including protection, mitigation, preparation and recovery. This tends to take the form of giving advice and instruction to others where their work relates to flooding, and feeding into relevant policy and strategy.	Yes
Fleet Services	Fleet services buy and maintain vehicles for all services and hold the operator license for the council's HGVs (this includes ensuring proper maintenance, parking, etc)	Yes
Roads Development Control	Roads Development Control consult on planning regarding road design, including flood risk and drainage- in liason with Flooding team.	Yes
IT		No

Partnerships with representation from Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Grangemouth Flood Protection Scheme Groups	Two groups of stakeholders including Falkirk Council, Jacobs Consultants, and a range of others	No
The Society of Chief Officers for Transportation in Scotland (SCOTS)	SCOTS provides guidance and examples of reacting to weather events and best practice regarding climate ready transport.	No
Forth Estuary Flood Risk Management Strategy contributors	- Falkirk Council (lead local authority), The City of Edinburgh Council, Clackmannanshire Council, East Lothian Council, Fife Council, Midlothian Council, North Lanarkshire Council, Perth and Kinross Council, Scottish Borders Council, Stirling Council and West Lothian Council; - Scottish Water; and, - SEPA.	N/A
Forth Flood Risk Management Plan contributors	- Stirling Council (lead local authority), Clackmannanshire Council, Falkirk Council, Fife Council and Perth and Kinross Council; - Loch Lomond and Trossachs National Park Authority; - Scottish Water; and, - SEPA.	N/A
Clyde and Loch Lomond Flood Risk Management Strategy contributors	- Argyll and Bute Council, East Dunbartonshire Council, East Renfrewshire Council, Glasgow City Council (lead local authority), Inverclyde Council, North Lanarkshire Council, Renfrewshire Council, South Lanarkshire Council, Stirling Council and West Dunbartonshire Council; - Scottish Forestry - Loch Lomond and the Trossachs National Park;	N/A

	- Scottish Water; and,	
	- SEPA.	

Other Groups and Organisations		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**
Forth Environment Link	Forth Environment Link is an environmental charity which seeks to increase levels of active travel, local food growing, and the lifespan of products, mostly through community engagement projects seeking to change behaviour.	Yes
Transport Scotland	The national transport agency for Scotland, delivering the Scottish Government's vision for transport. Also specific responsibilities on maintaining trunk roads	No
Network Rail	Network rail are responsible for railway infrastructure	No
ScotRail	ScotRail deliver rail travel services	No
Scottish Canals	Scottish canals are responsible for canals and towpaths in Scotland	No
SEPA	SEPA provide data, advice and strategic support	No
Scottish Water	Scottish Water are responsible for drainage from within the curtilage of a property and occasionally from roads and for sewerage	No
Forth Ports	Management of port at Grangemouth	No

9.3 Buildings and outdoor structures

Teams and departments within Falkirk Council		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**
Building Standards	Building Standards ensure that building regulations are adhered to and that buildings and their curtliage are safe; this is primarily to ensure health and safety in and around buildings. They do so through the processing of building warrants and site inspections (including call-outs to assess suspected danger which can lead to other teams and departments being brought in). When inspections are required to determine whether or not a building is safe, Building Standards are "the first port of call", and bring in others as required.	Yes
Environmental Planning	Environmental Planning has responsibility for both built and natural environment, including outdoor access. This includes the formation of strategies, remedial works and providing support to relevant community and third-sector organisations.	Yes
Facilities	The Facilities team is responsible for co-ordinating ongoing maintenance, repairs and improvements to all 339 non-housing buildings owned by Falkirk council on behalf of services, arms-length companies and external tenants.	Yes

	The buildings are diverse in their function and nature- ranging from large office blocks to small public conveniences- and include a number of sites which are important from a cultural and historical perspective such as Calendar House.	
Procurement Housing Property	Procurement Housing Property • manages the council's new build housing programme of capital investment, • manages and carries out repairs and maintenance for the housing stock, • supports others by providing direct labour, • provides energy advice in conjunction with Home Energy Scotland to all Falkirk residents • bids for funding for HEEPS-ABS funding for insulation- mostly for private home owners • manages and carries out repairs and maintenance for the housing stock, • supports others by providing direct labour,	Yes
Development Planning (Policy)	Development Planning (Policy) set out strategic guidance to inform planning decisions and designate long-term land use going forward. This is done mostly through the Local Development Plan (LDP).	Yes
Building Managers	Larger buildings have building managers who are responsible for minor repairs and liaise with Facilities.	No
Asset Management Team	Determine strategic direction in terms of building asset management	No
Housing Operations		No
Building Design Unit		No
Housing Area Hubs		No

Partnerships with representation from Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP

Other Groups and Organisations		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
External Contractors	External contractors are procured for jobs by the Council where it lacks resources 'in-house'	No

Private Building Developers		No
Energy Saving Trust	Information and support for energy saving in buildings	No
Historic Environment Scotland	Historic Environment Scotland is the lead public body set up to investigate, care for and promote Scotland's historic environment.	No

9.4 Emergencies

Teams and departments within Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Resilience Planning	Resilience Planning plan for and mitigate risk, including assisting the public in developing personal resilience, chairing safety advisory process meetings, supporting businesses to develop business continuity plans, and writing emergency plans.	Yes
Health and social care	Health and Social care oversee care at home and at residential facilities and deliver the majority of this.	Yes
Communications	The Communications team work corprately accross services in: communicating important information; supporting the delivery of campaigns; facilitating dialogue with and supporting service delivery to citizens; and supporting internal communications. This involves use the use of webpages, social media, and design.	Yes
Customer First Contact Centre	The Customer First Contact Centre is the first point of contact for all enquiries to the council by phone and emails (while social media is handled by the Communications team). Data is recorded, information is signposted and enquiries are re-directed as appropriate.	Yes

Partnerships with representation from Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Forth Valley Local Resilience Partnership	The Forth Valley Local Resilience Partnership includes but is not limited to: • Clackmannanshire Council • Falkirk Council • Stirling Council • Scottish Fire and Rescue Service • Police Scotland • Scottish Ambulance Service • NHS Forth Valley • Scottish Environment Protection Agency (SEPA)	No

Party/stakeholder	Overview	Consulted on 2020 LCLIP
	• HM Coast Guard (MCA) • Met Ofce • Utility companies • Industry and Commerce • Voluntary organisations	
East of Scotland Regional Resilience Partnership	The East of Scotland Regional Resilience Partnership includes but is not limited to: • Police Scotland • Scottish Fire and Rescue Service • Clackmannanshire Council • City of Edinburgh Council • East Lothian Council • Falkirk Council • Fife Council • Midlothian Council • Scottish Borders Council • Stirling Council • West Lothian Council • NHS Borders • NHS Fife • NHS Lothian • NHS Forth Valley • Tactran Connect	No
Scottish Resilience Partnership	The Scottish Resilience Partnership (SRP) acts as a strategic policy forum for resilience issues, providing collective assurance to Ministers that statutory responders and key resilience partners are aware of significant resilience gaps and priorities, and are addressing these in line with appropriate and available resources. It also provides advice to the resilience community on how best to ensure that Scotland is prepared to respond effectively to major emergencies. A core group of the most senior statutory responders and key resilience partners form the SRP.	No

Other Groups and Organisations		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Forth Valley Incident Assistance Team	Volunteer team supporting response to emergencies	No

9.5 Energy generation and transmission

Teams and departments within Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP

		Yes
Development Planning (Policy)	Development Planning (Policy) set out strategic guidance to inform planning decisions and designate long-term land use going forward. This is done mostly through the Local Development Plan (LDP).	Yes

Partnerships with representation from Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP

Other Groups and Organisations		
Party/stakeholder	Overview	Consulted on 2020 LCLIP

9.6   The natural environment

Teams and departments within Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP
Environmental Planning	Environmental Planning has responsibility for both built and natural environment, including outdoor access. This includes the formation of strategies, remedial works and providing support to relevant community and third-sector organisations.	Yes
Development Planning (Policy)	Development Planning (Policy) set out strategic guidance to inform planning decisions and designate long-term land use going forward. This is done mostly through the Local Development Plan (LDP).	Yes
Waste Management	Waste Management oversees the collection and processing of waste, including liaison with private sector partners who play a part in this.	Yes
Environmental Health	Environmental Health react to public enquiries and ensure public health and safety with regards to contaminated land, noise, air quality and public health.	Yes
Falkirk Community Parks and Sustainability	Falkirk Community Trust Parks and Sustainability manage a number of parks and seek to deliver sustainability through strategy and projects	Yes
Roads and Grounds	Roads and Grounds: - Maintains open spaces- particularly in terms of grass cutting	Yes

	- Maintains roads, including their drainage at surface level - Fills potholes - Grits roads and clears snow - Maintains street lighting - Supports other services through direct labour	
Energy and Climate Change Team	The Energy and Climate Change team co-ordinate efforts to reduce carbon emissions from within Falkirk District; have a statutory duty to report on these efforts; and co-ordinate efforts to reduce the council's carbon footprint as per Climate Emergency targets set.	Yes

Partnerships with representation from Falkirk Council		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**

Other Groups and Organisations		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**
Forth Environment Link	Forth Environment Link is an environmental charity which seeks to increase levels of active travel, local food growing, and the lifespan of products, mostly through community engagement projects seeking to change behaviour.	Yes
Let's get Grangemouth Clean/ G.Litter	Litter picking community group in Grangemouth	No
Sustainable Thinking Scotland	Charity in Bo'ness whose primary work is in food growing for the local foodbank, and a range of other activities which address environmental and societal challenges.	No
Scottish Water	Scottish Water are responsible for sewerage treatment and discharge	No
Scottish Canals	Scottish canals are responsible for canals and towpaths in Scotland	No
Historic Environment Scotland	Historic Environment Scotland is the lead public body set up to investigate, care for and promote Scotland's historic environment.	No
Scottish Natural Heritage	Scotland's nature agency	No
Central Scotland Green Network Trust	The Central Scotland Green Network Trust (CSGNT) is driving forward the delivery of the Central Scotland Green Network (CSGN).	No

9.7 Outdoor work and activities

Teams and departments within Falkirk Council		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**
Environment Team (Planning and Environment)	The Environment Team has responsibility for both built and natural environment, including outdoor access. This includes the formation of strategies, remedial works and providing support to relevant community and third-sector organisations.	Yes
Falkirk Community Trust Outdoor Activities	Falkirk Community Trust Outdoor Activities lead groups in outdoor activities within and beyond Falkirk	Yes
Falkirk Community Trust Active Schools	Falkirk Community Trust Active Schools deliver sport and other activies to schools in Falkirk District	Yes
Roads and Grounds	Roads and Grounds: - Maintains open spaces- particularly in terms of grass cutting - Maintains roads, including their drainage at surface level - Fills potholes - Grits roads and clears snow - Maintains street lighting - Supports other services through direct labour	Yes

Partnerships with representation from Falkirk Council		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**

Other Groups and Organisations		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**
Forth Environment Link	Forth Environment Link is an environmental charity which seeks to increase levels of active travel, local food growing, and the lifespan of products, mostly through community engagement projects seeking to change behaviour.	Yes

9.8 Other

Teams and departments within Falkirk Council		
Party/stakeholder	**Overview**	**Consulted on 2020 LCLIP**

Health and social care	Health and Social care oversee care at home and at residential facilities and deliver the majority of this.	Yes
Falkirk Community Trust Libraries service		Yes
Customer First Contact Centre		Yes
Insurance		Yes
Children's services		No
IT		No

Partnerships with representation from Falkirk Council		
Party/stakeholder	Overview	Consulted on 2020 LCLIP

Other Groups and Organisations		
NHS Forth Valley	Health care covering Falkirk District, Clackmannanshire and Stirling Council areas	No
Forth Valley College	College with campuses in Falkirk District, Clackmannanshire and Stirling Council areas	No