ITEM No …3……..

REPORT TO: **POLICY & RESOURCES COMMITTEE - 18 NOVEMBER 2019**

REPORT ON: **DUNDEE'S RESPONSE TO THE CLIMATE EMERGENCY AND PREPARATION OF A CITY-WIDE CLIMATE ACTION PLAN**

REPORT BY: **EXECUTIVE DIRECTOR OF CITY DEVELOPMENT**

REPORT NO: **351-2019**

1 PURPOSE OF REPORT

1.1 This report seeks Committee approval for the Dundee Climate Action Plan (attached as Appendix 1) and discharges the Council's remit to explore the establishment of a citizens' assembly on climate change.

2 RECOMMENDATION

2.1 It is recommended that the Committee:

a approve the Dundee Climate Action Plan;

b agree that a high-level Dundee Climate Change Partnership be established to oversee the city's progress in meeting its emissions reduction target;

c request that the Chair of the Dundee Partnership convene a Dundee Climate Change Conference in November 2020 to coincide with Scotland hosting the UN Climate Change Conference (COP26).

3 FINANCIAL IMPLICATIONS

3.1 The successful delivery of the Climate Action Plan will depend on appropriate levels of funding and resources being in place. It is stressed that actions within the plan represent a mix of committed and desired interventions across stakeholders with many actions already having funding committed, whilst others will require feasibility studies or business cases in the first instance to determine their viability and funding subsequently secured to make them happen. Potential sources of funding will continue to be explored through existing avenues as well any innovative approaches to ensuring projects can be delivered.

3.2 It is recognised that significant additional investment will be required for projects if the city is to meet its net-zero greenhouse gas emissions reduction target by 2045 or sooner.

3.3 Officers have explored citizens' assemblies and similar approaches elsewhere, and concluded that, at an estimated cost of £77k-£95k, it would be unaffordable in the current financial situation. An alternative approach is therefore proposed that would offer many of the attributes of a citizens' assembly at an affordable budget and which could become an effective long-term tool to engage people in Dundee's response to the climate emergency and delivery of the Climate Action Plan.

4 BACKGROUND

4.1 In June this year, the Council's Policy and Resources Committee unanimously "recognised the serious and accelerating environmental, social and economic challenges faced by climate change and declared a climate emergency" (Article V of the Minute of the Meeting of Policy and Resources Committee 24 June 2019, Report 258-2019 refers).

4.2 To respond to this challenge, Committee "agreed a science-based target of working towards net-zero greenhouse gas emissions by 2045 or sooner for Dundee" and remitted the Executive Director of City Development to bring forward a partnership Climate Action Plan, carry out a

period of public consultation and report back within six months (Article V of the Minute of the Meeting of Policy and Resources Committee 24 June 2019, Report 258-2019 refers).

4.3 The Climate Action Plan is the culmination of a years' worth of collaborative work, led by the Council and co-designed with public, private and community organisations, recognising the fact that a concerted city-wide effort is required to reduce emissions. The Plan has been informed by a Baseline Emissions Inventory, Climate Risk & Vulnerability Assessment, statutory Strategic Environmental Assessment, partnership workshops and public consultation.

4.4 The Plan includes four themes of Energy, Transport, Waste and Resilience with each theme including an initial set of actions to reduce emissions or adapt to a changing climate, taking into account existing projects, stakeholder priorities and national initiatives. Sixty Four actions have been identified in the plan, including measures to:

- reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies;
- encourage active travel through walking, cycling and public transport and deploy sustainable alternatives to decarbonise transport;
- manage waste sustainably by reducing, reusing, recycling and recovering waste to improve resource efficiency whilst working towards a circular economy; and
- ensure our communities, green networks and infrastructure are adaptable to a changing climate and reduce the risks and vulnerability to unavoidable impacts.

4.5 It is essential that all stakeholders play their part in delivering actions and putting forward new initiatives that reduce emissions and promote behaviour change. Whilst the Council is committed to reducing its own carbon footprint year on year, emissions from its own buildings account for only 4% of the city's total. Emissions from the city's residential buildings (35%), commercial sector (26%) and transport sector (25%) have significant impacts and therefore involvement from our city's businesses, public sector bodies and the 3rd sector organisations is crucial to achieving a collective response. The Climate Action Plan will therefore evolve and change to reflect ongoing engagement and the adoption of further actions from other stakeholders to support further iterations of the Plan.

4.6 It should also be recognised that achieving net-zero emissions for Dundee will be extremely difficult and will require more systematic and wide ranging interventions both at a national and local level to ensure that the scale of challenge can be met.

5 COMMUNITY PARTNERSHIP AND ENGAGEMENT TO DEVELOP AND DELIVER THE CLIMATE ACTION PLAN

5.1 <u>Developing the Climate Action Plan</u>

a The Climate Action Plan has been developed alongside a series of workshops and preparatory reports that involved various teams within the Council and a great number partners across the city.

b In August 2018, fifty individuals representing twenty different public, private and community organisations came together in a workshop to contribute their ideas and knowledge to help shape the plan's development, arguably the most important step in the process, ensuring that the whole city is committed to the low carbon goal. This was the first stage in the co-designing process.

c Facilitated by Open Change, experts in design led change, the workshop took place in three stages; initially, participants envisioned what a low carbon Dundee might look like in the future. They were then asked to define long term actions that would help us to reach

that vision and short term actions to prepare the ground for these future actions and start the course of emissions reductions and building resilience.

d Through enthusiastic collaboration and discussion, over 100 ideas for actions were identified. These were then collated and further refined in one-to-one meetings with stakeholders to formulate an initial list of practical and feasible actions.

e In preparing the Climate Risk & Vulnerability Assessment, officers liaised with Adaptation Scotland for guidance and then held a series of themed group and one-to-one workshops to identify potential climate impacts on the city's buildings; transport; waste; energy; water; biodiversity and the environment; civil protection and emergency; health; tourism and land use planning. Participants included Council officers; Scottish Water; SEPA; University of Dundee; Scottish Natural Heritage; Urban Foresight; NHS Tayside; Resource Efficient Scotland and Zero Waste Scotland. The process highlighted how important collaboration was between sectors is (e.g. biodiversity/green infrastructure/health/flooding) and that adaptation requires a multi-disciplinary approach, where actions cannot be considered in isolation. Climate resilience actions aimed at ensuring the city's services, infrastructure and communities are able to adapt to a changing climate were then co-designed with stakeholders and incorporated into the Climate Action Plan.

f The draft Plan was prepared and issued for public consultation for a 6 week period between 25 June and 6 August 2019. The Plan and its statutory Environmental Report were also submitted to Scottish Environment Protection Agency (SEPA), Scottish Natural Heritage (SNH) and Historic Scotland (known as Consultation Authorities) for comment under Strategic Environmental Assessment legislative requirement.

g During the consultation period, the Sustainability and Climate Change team met with the Dundee's Green Groups (a network of environmental interest groups) to discuss the draft plan and elicit their views. Two follow up meetings were held to discuss specific aspects of the draft plan. A full list of the organisations, partnerships and forums that have contributed to the research, workshops, and action planning necessary to develop the Climate Action Plan are listed in the Plan's Acknowledgement page.

h All formal and informal comments received during the consultation were taken into consideration when preparing the final Climate Action Plan.

i To allow a coordinated approach for ongoing Climate Action Plan engagement and consultation and to ensure people can find out about climate change activities in Dundee the Sustainable Dundee brand has been developed.

sustainable DUNDEE

j It is intended to raise awareness of, and link up, sustainability and climate change issues and progress, both internally and to the wider community. The logo now features throughout internal and external webpages containing related information as well as printed publications from the various sections involved, acknowledging the position of such projects within a broader 'vision' or goal.

k The main platforms for communicating Sustainable Dundee are the Knowledge hub, Dundee City Council website (www.dundeecity.gov.uk/sustainable-dundee), and the Sustainable Dundee (@sust_dundee), and Dundee City Council (@dundeecouncil) Twitter accounts.

5.2 Dundee Climate Change Partnership and Climate Conference

a In light of the climate emergency and development of the Climate Action Plan it will be beneficial for the city's public bodies, businesses, institutions and organisations to work closer together to address this common challenge. The Council can play a key role in bringing these city-wide partners together.

b It is therefore recommended that a high-level Dundee Climate Change Partnership be established in order to provide oversight and review mechanisms to ensure progress towards net-zero greenhouse gas emissions by 2045 or sooner; to consider the effectiveness of planned activities to meet targets; and to propose new interventions that will accelerate change.

c In June this year, the Council's Policy and Resources Committee "agreed, in principle, to support the establishment of a Climate Change Citizens' Assembly in Dundee" and "remitted officers to engage with the Dundee Partnership, relevant professionals and organisations, including those already supporting citizens' assemblies elsewhere to determine best practice and the most appropriate vehicle for delivery" (Article V of the Minute of the Meeting of Policy and Resources Committee 24 June 2019, Report no. 258-2019 refers).

d Officers have explored different approaches to citizens' assemblies and how they have been used elsewhere to strengthen community engagement on climate change. In doing so, advice was sought on their benefits and limitations from Involve, a leading UK public participation charity, who have designed and delivered assemblies elsewhere in the UK.

e Whilst citizens' assemblies are a good way to elicit the views from local people who may not participate in established community planning structures, they were found to be a significant undertaking, can slow down the policy making process and unlikely to be cost-effective. Based on local assemblies held in Camden, Oxford and the Citizens' Assembly of Scotland, costs are estimated to be in the region of £77-£95k. These costs include:

- commissioning of research to develop policy options for assembly consideration;
- contracting an independent and professional body to project manage, design process, recruit participants and facilitate assembly meetings;
- payment of individual experts/stakeholders to present evidence to the assembly;
- payment of Assembly Members' time; and
- revenue costs for the co-ordinating/promotion role for Council officers.

f An alternative model is therefore proposed that would offer many of the attributes of a citizens' assembly at an affordable budget. The Dundee Partnership structure provides a long-standing and established platform for communities to participate in local democracy and the decision making process. It has a track record in organising well-attended, participative and influential events focusing on particular challenges and/or opportunities facing the city. Some of these have related directly to climate change such as transportation and fuel poverty and associated issues including health and wellbeing.

g It is proposed that the Dundee Partnership host a biennial Dundee Climate Change Conference to consider climate change matters and progress achieved towards meeting net-zero emissions. This would provide a forum to involve interest groups, communities, local and national partners and elected members in a regular review of climate change matters and Dundee's response and influence the direction, policies and investment of community planning partners. The first conference would be held in November 2020, one year on from the adoption of the Climate Action Plan and to coincide with the UN Climate Change Conference (COP26) to be held in Glasgow in November 2020.

h In addition to the Conference, the Scottish Government have been undertaking a national public engagement programme under 'The Big Climate Conversation' to gather communities thoughts on climate change and what steps need to be taken to reach national net-zero targets. As outlined in the Government's Programme for Scotland 2019-20, these events will help shape the creation of a National Forum on Climate Change to bring together Scotland's communities, businesses and public sector to continue the conversation. The Council will continue to support the Scottish Government's climate change engagement events and behavioural change campaigns. Where possible, the outputs from national events will also be used as background evidence to feed into ongoing local engagement.

i Most recently, the UK government announced that letters are to be sent to 30,000 households across the UK inviting people to join a citizens' assembly on climate change. From those who respond, 110 people will be chosen as a representative sample of the population and will meet over four weekends from late January 2020 to discuss topics ranging from household energy use, how people travel and what people buy. Six cross-party select committees at the House of Commons will then then use the assembly's conclusions as a basis for more detailed work.

6 POLICY IMPLICATIONS

6.1 This report has been subject to an assessment of any impacts on Equality and Diversity, Fairness and Poverty, Environment and Corporate Risk. A copy of the Impact Assessment is available on the Council's website at www.dundeecity.gov.uk/iia.

6.2 Strategic Environmental Assessment screening determined that the Climate Action Plan was likely to have significant environment effects and as a consequence an Environmental Report was prepared and submitted to the Statutory Consultation Authorities. The comments received were used to inform the final Climate Action Plan. The Environmental Report is copied to the Climate Action Plan.

7 CONSULTATIONS

7.1 The Council Management Team were consulted in the preparation of this report.

7.2 In addition to the engagement and consultation processes outlined in paragraphs 5.1 to 5.9 above, the Sustainability & Climate Change team liaised with Sustainable Scotland Network to ensure the Climate Action Plan aligns with national policy direction.

8 BACKGROUND PAPERS

8.1 None.

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APPENDIX 1

This document contains a number of graphs and charts and is best viewed in colour.

DUNDEE CLIMATE ACTION PLAN

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DUNDEE PARTNERSHIP

Contents

Foreword

In June this year, Dundee City Councillors declared a climate emergency, recognising the serious and accelerating environmental, social and economic challenges we face due to climate change.

In response, the Climate Action Plan has been prepared to set out a first set of ambitious actions in a long-term pathway to support Dundee in a just transition to a net-zero and climate resilient future by 2045 at the latest.

The plan builds on the considerable work achieved by our public, private and third sector organisations as we continue to shape our energy future by developing clean, low-cost solutions to energy supply and to reduce the city's carbon footprint.

Dundee already has much to be proud of. City partners are capitalising on opportunities for retrofit programmes for energy efficiency in homes and investment in low and zero carbon technologies across buildings to reduce energy costs. We have one of the most extensive electric vehicle charging infrastructures in the UK and are participating in the most ambitious hydrogen fuel deployment to date. Dundee City Council has an ongoing programme to reduce energy costs in buildings and infrastructure. This has included the installation of renewable energy on public buildings, an extensive programme to refurbish and upgrade the social housing stock and conversion to LED street lighting.

However, there is much work still to do if we are to make significant reductions in emissions and accelerate further transformational and preparatory change in the face of climate change. This transition can only be achieved with everyone's input. We need government, businesses, public sector, and individuals to play their part in delivering local solutions.

The Plan also needs to be flexible in order to adapt and respond to new technologies and knowledge of the most effective methods of reducing emissions. It is also essential that carbon management and energy efficiency become core values throughout the city and that everyone takes responsibility for reducing emissions.

As a Council, we are pleased to be in a position to lead this process on behalf of the Dundee Partnership. By working together to ensure that this plan is supported and implemented, we can become a driver for low carbon innovation and investment and show how our local economy can transition to net zero in a way that strengthens our local communities.

Councillor John Alexander
Chair of the Dundee Partnership Forum
& Leader of Dundee City Council

Welcome to Dundee 2045: A Sustainable City

Dundee is a truly SMART city with transformative innovations in energy, transport and waste.

Fuel poverty is a thing of the past with the energy grid now decarbonised through a mix hydrogen, solar and tidal power renewable technologies. The Dundee Energy Services Company (ESCO) provides a local delivery model for energy schemes in the city, managing energy supplies and ensuring fair prices for consumers in the city.

Behaviours have changed and, combined with technological innovations, residents are able to live within a smaller carbon footprint without compromising quality of life.

Early investment in energy efficiency measures to retrofit heating, lighting and insulation of properties has provided significant financial and carbon savings.

New buildings are designed to perform efficiently and older buildings are being retrofitted with adaptive technology such as ventilation, shading and greywater harvesting systems.

Commuters and visitors access Dundee's ShareMobility platform on their smartphones; presenting real-time information on ultra-low emission transport options, including car clubs, electric and hydrogen buses, taxis and bicycle hire.

Dundee's Low Emission Zone was a great success in encouraging infrastructure and behaviour changes required for the modal shift to low carbon transport.

Many commuters travel to work by electric bike from much further afield thanks to the integrated cycle network across Dundee, Perth and Angus.

The benefits of a low carbon Dundee are apparent – clean air, reduced fuel poverty and collaboration across sectors.

People are consuming less and sharing more; community Re-Use is integrated with the high street and recycling rates have exceeded the 70% target. The Circular Economy is now part of Dundee with businesses widely sharing resources and knowledge. Single use plastics are no longer produced and packaging is minimal. Deposit Return Schemes have helped to close the loop on drinks bottles, this along with the successful take Pride in Your City campaign, have resulted in, mostly, litter free streets and parks across Dundee.

Taking a path on the segregated cycle network to the award winning Broughty Ferry beach, lyme grass is abundant on the carefully maintained sand dunes, which provide a natural flood defence as well as protecting habitats for the many birds, bees and butterflies that are frequently spotted. Further along the coast, the set back wall protects communities from flooding events **on the Tay River.**

Wildlife corridors threading across the city are conserved through public and community partnerships; facilitating diverse flora and fauna, the resilience of the ecosystem as well as aiding surface water management, local air quality and general well-being.

Emission targets have been met, low carbon living is viable but challenges remain adapting to the ever changing climate.

The changing climate is becoming more apparent. Snow and ice were less frequent over the winter months, but rainy days were all too common! Recent severe storms, with record levels of rain and high wind speeds tested flood defences.

Robust Community Resilience Plans ensure vulnerable communities are supported with essential supplies delivered and health services prioritised to ensure help was targeted to the most vulnerable.

The consideration of climate-friendly planting and green spaces has greatly reduced the heat island effect from the regular summer heat waves whilst a wide diversity of community gardens, allotments and food growing networks integrate across the region to further increase sustainability and resilience.

Businesses, communities and public services co-designed the necessary adaptation of buildings, land, and infrastructure two decades ago; actions that have saved the city millions in potential repair costs and inflated bills.

Dundee Climate Action Plan provided a focus for the diverse challenges and activities required to urgently reduce and adapt to climate change. Although the work must continue, a solid foundation for future sustainability in Dundee has been created.

1. INTRODUCTION

In October 2018, the **International Panel on Climate Change** (IPCC) published its Special Report on Global Warming of 1.5°C, concluding that there is less than 12 years to act to avoid the worst impacts of climate change. The report describes the enormous harm that a 2°C rise is likely to cause compared to a 1.5°C rise and informed that limiting Global Warming to 1.5°C may still be possible, with ambitious action from national and local governments, the private sector and local communities.

The UK **Committee on Climate Change** published a landmark report in May 2019 which recommended that a 100% reduction in greenhouse gas emissions should be legislated by the UK Government "as soon as possible". Such a target would constitute the UK's "highest possible ambition" to combatting climate change and would "send a much stronger signal internationally". The report stated that this net-zero target could be achieved at the same cost that is currently put against achieving the current Climate Change Act, which is between 1-2% of GDP in 2050.

On the same day, the Scottish Government announced plans to amend its **Climate Change Bill** and commit to a legally binding target of reaching net-zero greenhouse gas emissions by 2045 at the latest which would see Scotland become carbon neutral by 2040.

Along with these reports and political commitments, there has been a groundswell of public concern and global activism on climate change and an increasing focus on broader sustainable development aims. In responding to the IPCC report and public calls for action, Dundee has declared a **climate emergency**, recognising that our city has a key leadership role to play in making significant reductions in emissions and building resilience to the unavoidable impacts of a changing climate.

Covenant of Mayors for Climate & Energy

Dundee is showing leadership in tackling climate change. In March 2018, the Lord Provost and Leader of Dundee City Council, signed the **Covenant of Mayors for Climate and Energy**, a global initiative that brings together local governments in a voluntary commitment to reduce emissions and develop an action plan that adopts a joint approach to tackling climate change mitigation and adaptation.

The Climate Action Plan is the culmination of collaborative work, led by Dundee City Council and co-designed with public, private and community organisations, recognising the fact that a concerted city-wide effort is required. It represents the first set of actions in a long-term pathway to first surpass the Covenant of Mayors target of **40% reduction in greenhouse gas emissions by 2030** and then to **achieve net-zero greenhouse gas emissions by 2045** or sooner. To achieve this target we will require local interventions identified in this Plan, alongside significant additional measures in order that Dundee benefits from the effects of national policies.

The plan is organised into the following sections:

- **Context:** Why do we need the plan; what are its key drivers and objectives?
- **Development**: How the plan was co-designed with stakeholders; the preparatory work to understand Dundee's emissions and climate risks; assessing the environmental impact of the plan.
- **Themes:** Energy, Transport, Waste and Resilience; why action is needed, what work is currently planned and what we want to achieve.
- **Delivery:** Deliverable actions for each theme; delivery mechanisms, including governance, communication, monitoring and reporting.

2. WHY DO WE NEED THE CLIMATE ACTION PLAN?

Situated on the Tay Estuary, covering 60km^2 and with a population of almost 150,000, Dundee is undergoing a major transformation, spearheaded by the £1 billion Dundee Waterfront project, spanning 240 hectares of land stretching 8km along the River Tay. Key economic sectors within Dundee include life sciences and healthcare, creative industries and digital media, tourism, energy, electronics, publishing, retail and education.

Visitor number are projected to increase with the opening of the V&A Museum of Design, attracting tourism revenue of £1billion within ten years, which is creating demand for hotels, hospitality, leisure and service businesses. In addition, two world-class universities and an award-winning college, museums and galleries, a captivating arts and science scene, over 3,000 businesses, a thriving port, beach, green and open spaces and internationally recognised biodiversity and habitats, all help Dundee to live up to its accolade of the "coolest little city".

Dundee is also a young city with 51% of its population under 40. With a student to population ratio of 1:6, the highest in Scotland, Dundee's talent pool is skilled, multicultural and highly educated and the general population is set to grow at 6% per annum for the next twenty years.

These factors provide both opportunities and challenges for Dundee. More visitors and an increasing population mean greater resource use and consequently increased energy demands, more waste, more greenhouse gas emissions resulting in reduced air quality and greater pressures on the resilience of the city. Conversely, in meeting these challenges great steps forward in sustainability and innovation can be achieved through increased use of renewables, more sustainable transport alternatives, smart options for waste reduction, integrated district heating systems and improved blue and green infrastructure. These all help to mitigate against and build resilience to the future impacts of climate change on our communities, buildings, land and wildlife.

One of the most difficult challenges facing Dundee and the wider city region is to achieve economic growth whilst reducing emissions. To do this we will need to achieve an absolute decoupling of emissions from economic growth, whereby emissions reduce whilst still supporting sustainable economic growth. This is a long term goal and will require the successful implementation of significant interventions.

Key Drivers

National and International Commitments

Scotland has some of the most ambitious climate change targets in the world. In May 2019, the Scottish Government announced that the Climate Change Bill will be amended so that the Scottish Parliament can vote on a new, bold target of achieving net-zero greenhouse gas emissions by 2045. In doing so, Scotland will become one of the first countries in the world to legislate to support the aims of the Paris Agreement which sets the standard for the international response to climate change.

Progress is underpinned by the **Climate Change Plan**, published in 2018, which is the Scottish Government's third report on proposals and policies (RPP3) for meeting its climate change targets. It sets out 64 policies and 31 proposals to reduce emissions from electricity generation, housing, transport, services, industry, land use, waste, and agriculture.

Alongside the Climate Change Plan, Scotland's first **Energy Strategy** was published in 2017, setting out the long-term vision for the future energy system in Scotland. With a strong focus on local energy systems and the adoption of a system wide approach, the strategy sets a target to supply 50% of Scotland's energy needs from renewable sources. In addition, it commits to increase the productivity of energy use across the Scottish economy by 30% by 2030.

Paris Agreement

The Paris Agreement, adopted by world leaders of 195 countries, is the first-ever universal, legally-binding global climate deal. The agreement sets out a global action plan to put the world on track to avoid dangerous climate change by limiting global warming to well below 2°C and to pursue efforts to limit the temperature increase even further to 1.5°C. However, scientists now agree that we actually need to keep temperature rises to below 1.5C.

In September 2019, the Scottish Government published the statutory **Climate Change Adaptation Programme**. Covering a five year period, it is designed to address climate risks for the country, with actions centred around communities, climate justice, infrastructure and the environment.

Scotland's public bodies are expected to lead by example in tackling climate and delivering national plans through influencing and enabling positive behaviours; driving change; and acting as exemplars of climate action and low carbon innovation. All public bodies in Scotland are now mandated under **Public Bodies Climate Change Duties** to report annually on action they are taking to reduce carbon emissions.

Annual reports from public bodies in Dundee can be viewed on the Sustainable Scotland Network website[1].

Other specific legislation and policy that relates to the Climate Action Plan is discussed under each of the four themes as well as in the 'Strategic Environmental Assessment – Environmental Report' which accompanies the Plan.

[1] Scottish Public Bodies Climate Change Reporting: https://sustainablescotlandnetwork.org/reports

Tackling Fuel Poverty

Climate change and fuel poverty are inextricably linked in that actions taken to mitigate against fuel poverty such as installing insulation (which reduces fuel bills and keeps the home warmer) also help mitigate against climate change by reducing heating use and emissions.

The **Fuel Poverty (Scotland) Bill** 2018 will set a new definition for fuel poverty recognising that it is caused by the interaction of a number of factors, most critically: the cost of energy; household income; the energy efficiency status of the property and how energy is used in the home. Under the current definition, a household is said to be in fuel poverty if it spends more than 10% of its income on all household fuel use.

According to the most recent Scottish House Condition Survey published in 2019[2], fuel poverty affects approximately 31% (22,000) of all households in Dundee (against 27% for Scotland as a whole)with numbers highest in homes built before 1945 (43%) and amongst those in the private rented sector (41%).

Whilst the long term trend continues downwards, the fact remains that more than **1 in 3 people in Dundee are still in fuel poverty**. These statistics reinforce the need for physical improvements to properties and the provision of energy advice through national and local advice agencies to assist the fuel poor.

Figure 1: National Fuel Poor Household Standards

Source: Draft Fuel Poverty Strategy for Scotland, June 2018

Maximising Economic Opportunities

Scotland's transition to a more prosperous, low carbon economy is already well underway with new markets, businesses and industries being established. The low carbon and renewable energy sector and supply chain supported over 49,000 jobs Scotland in 2016, generating over £11 billion in turnover[3].

Opportunities are emerging faster than ever for new and innovative solutions to **energy integration** as we continue to decarbonise our national energy use. In Dundee, this requires a greater level of 'connectability' in what we all do if we are to scale this work to a level that makes significant reductions in emissions and accelerates change. By doing so, the city can become a centre of green business, utilising the city's knowledge base, existing assets and low carbon infrastructure as a catalyst for inward investment, business growth, and the development of local supply chains.

The renewable energy sector is a particularly important part of our city's future and the broader local economy encompassing offshore wind, decommissioning (driven by the proximity of the Scottish Offshore Wind projects) and growing areas such as hydrogen, electric vehicles and a general market demand to lower energy costs and become more sustainable. The Climate Action Plan can be an asset in promoting the city to new investors and promoting its green credentials as a leader in renewable energy.

[2] Scottish House Condition Survey - Local Authority Analyses: https://www2.gov.scot/Topics/Statistics/SHCS/keyanalyses
[3] Climate Change Plan: third report on proposals and policies 2018-2032 (RPP3): https://www.gov.scot/publications/scottish-governments-climate-change-plan-third-report-proposals-policies-2018/

Case Study: UN Global Goals for Sustainability

In 2015, the world's governments came together to adopt 17 UN Sustainable Development Goals (SDG) and 169 associated targets forming a comprehensive description of the environmental and social challenges to overcome if greater sustainability is to be achieved.

Each goal has targets and indicators that UN member states are expected to use in setting their agendas over the next 15 years. These goals recognise that tackling climate change is essential for achieving sustainable development and as such, many of them address the core drivers of climate change. Scotland was one of the first nations to sign up to the goals and has a good history of policy as well as action in relation to sustainability issues.

At the local level, Dundee City Council has demonstrated its commitment to the goals through the Council Plan, City Plan and ongoing sustainability projects as well as being part of the Scotland Sustainable Development Goals network.

Decarbonising Energy

Carbon dioxide (CO_2) is the main greenhouse gas, responsible for over 80% of our emissions, which is why there is global effort to reduce emissions of this gas. Decarbonising energy supply means reducing its carbon intensity, which is necessary to achieve our city's emissions reduction targets.

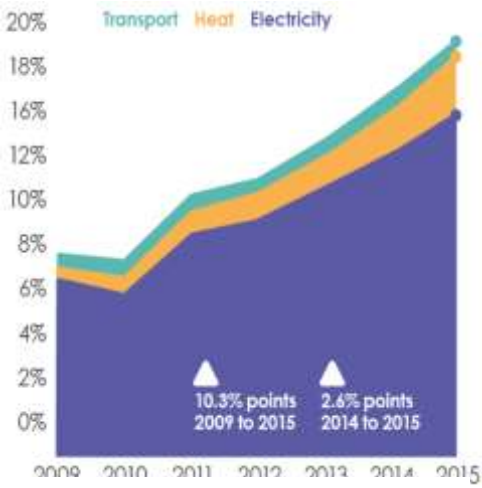
Dundee is a net-importer of energy and therefore our ability to achieve net-zero greenhouse gas emissions will rely heavily on a number of national policy and technology influences, including proposals for carbon capture and storage (CCS), future utilisation of the gas grid and the continued decarbonisation of electricity supply where energy from fossil fuels is replaced with renewables.

The share of renewable energy we generate and consume in Scotland has increased considerably over the past decade (figure 2) and, whilst the country is well on its way to generating 100% of its electricity demand from renewables by 2020, more needs to be done to tackle the challenges of decarbonising heat and transport.

This will require a major transformation of local energy systems, extending into people's homes, including the fabric and domestic heating systems of buildings. Supporting and delivering local solutions to meet local needs, linking local generation and use, can help create vibrant local energy economies. Yet the technological choices we make for heating buildings will impact electricity networks, as will the introduction of electric vehicles, and are likely to place extra pressure on the electricity network's ability to generate, store and deliver the capacity necessary to meet peaks in demand.

These significant developments will benefit from a 'whole systems' approach that considers heat, electricity and transport in planning future decarbonised energy systems.

Figure 2: Renewable Energy in Scotland



Source: Scottish Energy Strategy: The future of energy in Scotland, Dec 2017

City Resilience

Severe weather and climate impacts are already affecting communities and service delivery provided by organisations across Dundee, with operational, reputational, financial and legal consequences. The latest **UK Climate Projections (UKCP18) projections**[4] show that this trend is set to increase in the future and the impacts we see today may occur more frequently with higher average temperatures, increased flooding and more extreme, unpredictable weather patterns. The consequences will be more serious, compounding many of the other long-term challenges we face – rising energy prices, resource scarcity, ageing population, and social and economic inequalities.

We therefore need to plan and adapt to the increasingly apparent and inevitable impacts of climate change. By choosing a resilience pathway that takes a long-term view, organisations and communities can identify their climate risks and prioritise actions that will allow them to prepare, respond and recover from severe weather and climate change impacts.

Communities that are strong and well connected are not only more likely to respond better to the challenges of climate change, but are able to build on their assets and capabilities to help transform and adapt their surroundings for the benefit of the whole community, including those most vulnerable. For example, creating a green space in a neighbourhood may provide food growing opportunities and improve flood attenuation as well as creating a place for social interaction and community support.

Objectives

Whilst a number of significant challenges come with climate change, taking action to **mitigate** and **adapt** can bring multiple benefits for Dundee's environment, society and economy. Both pillars open up new opportunities to promote sustainable local development, enhance quality of life, stimulate investment and innovation, create jobs and reinforce stakeholder participation and co-operation.

The long-term vision is for Dundee to become a Sustainable City and in the coming decades to pass through a period of transition from a carbon-based economy to one that plays a leading role in Scotland's goal to achieve net-zero greenhouse gas emissions by 2045 or sooner. To do this, each of the four themes of the Climate Action Plan has a key objective:

- **Energy:** Reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies.
- **Transport:** Encourage active travel through walking, cycling and public transport and deploy sustainable alternatives to decarbonise transport.
- **Waste:** Manage waste sustainably by reducing, reusing, recycling and recovering waste to improve resource efficiency whilst working towards a circular economy.
- **Resilience:** Ensure our communities, green networks and infrastructure are adaptable to a changing climate and reduce the risks and vulnerability to unavoidable impacts.

[4] UK Climate Projections (UKCP18) projections: https://www.metoffice.gov.uk/research/collaboration/ukcp

3. DEVELOPING THE CLIMATE ACTION PLAN

The Climate Action Plan demonstrates how the city will meet its commitment to reduce emissions and adopt a joint approach to tackling climate change mitigation and adaptation.

To translate this commitment into action we have:

- Measured greenhouse gas emission levels for Dundee
- Assessed the climate risks and vulnerabilities for Dundee

Using the findings from the above, we have:

- Set an ambitious target for greenhouse gas reduction and a pathway for climate resilience
- Defined a set of initial actions that stakeholders plan to undertake to help reach the targets

Co-designing with stakeholders

The Climate Action Plan has been developed alongside a series of workshops and preparatory reports that involved various teams within the Council and a great many partners across the city, within the public, private and third sectors, who are also passionate about ensuring a low carbon future for Dundee.

At the initial stages of Plan development, a Strengths, Weaknesses, Opportunities & Threats (SWOT) analysis of sustainability in Dundee was carried out. Some of the main strengths highlighted were the city's compact size, its proactive approach and political will, without which progress would be much more difficult. There are many opportunities regarding its orientation and location (being south facing and on the estuary) and likely future investment due to the large-scale development of the waterfront. However many challenges were also presented, not least of which was lack of funding for sustainability projects and the high poverty levels in Dundee, with legislation, economic and political uncertainty and timescales for development seen as particular challenges.

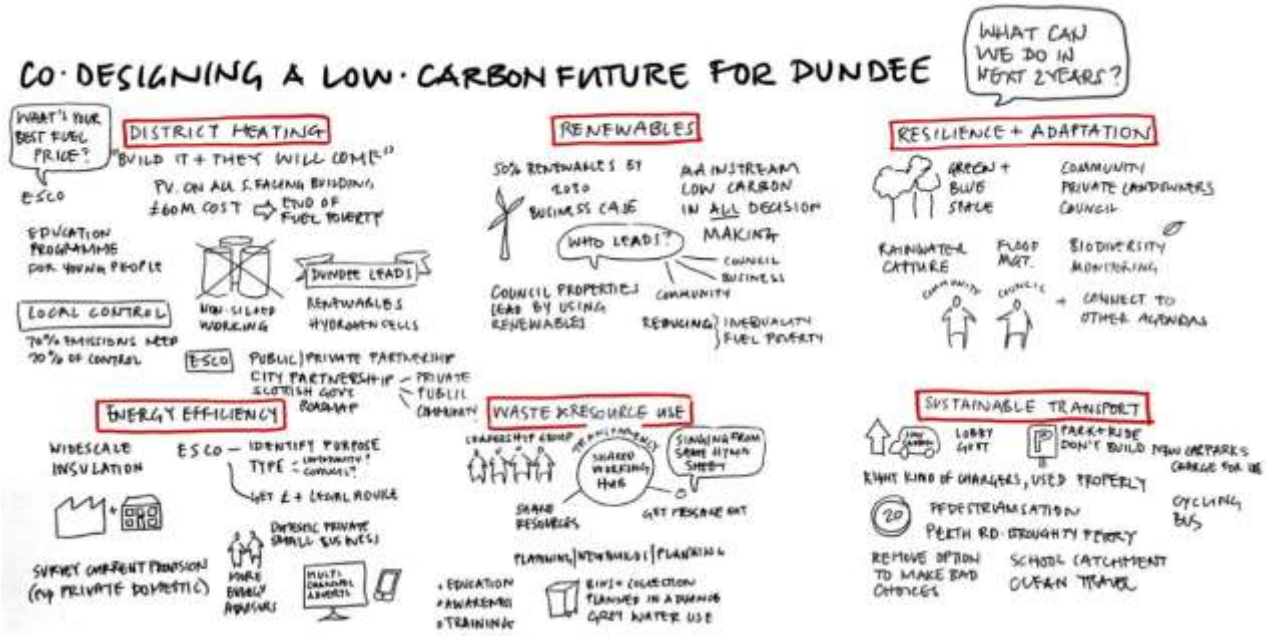
Dundee 2030
Envisioning a Low Carbon Future

In August 2018, fifty individuals representing twenty different public, private and community organisations came together to contribute their ideas and knowledge to help shape Dundee's transition to a low carbon city in a workshop titled **"Dundee 2030: Envisioning a Low Carbon Future"**, arguably the most important step in the process, ensuring that the whole city is committed to the low carbon goal.

Facilitated by Open Change, experts in design led change, discussions initially focused on six themes. The workshop took place in three stages; initially, participants envisioned what a low carbon Dundee might look like in 2030. They were then asked to define long term actions (2025 onwards) that would help us to reach that vision and short term actions to start the to prepare the ground for these future actions and start the course of emissions reductions and resilience building immediately.

Through enthusiastic collaboration and discussion, over 100 actions were identified. These were then collated and further refined in partnership with the stakeholders to formulate an initial list of practical and feasible actions to help Dundee meet its goals (see Annex 1).

Figure 3: Summary of Dundee 2030 workshop captured by Open Change



Climate Risk and Vulnerability Assessment

The Covenant of Mayors includes a commitment to strengthen resilience and capacity to adapt to adverse climate change impacts. As such, the preparation of a **Risk and Vulnerability Assessment** is a prerequisite to Plan elaboration. It determines the nature and extent of climate-related risks by analysing potential hazards and assessing the vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment of Dundee. A Risk and Vulnerability Assessment has been undertaken for the Plan and further details can be viewed in the Resilience theme below.

Strategic Environmental Assessment

The Climate Action Plan has been influenced by a Strategic Environmental Assessment (SEA), carried out in accordance with the **Environmental Assessment (Scotland) Act 2005**. The purpose of SEA is to minimise potential negative effects of plans, programmes and strategies on the environment and to enhance positive effects. The SEA Environmental Report and associated documents for the Plan are available on the Scottish Government's SEA database[5].

[5] Scottish Government SEA database: www2.gov.scot/seag/publicsearch.aspx

Dundee's Emissions

In order to set an emissions reduction target and actions for the Plan it was essential to collate the following information:

- An understanding of greenhouse gas emissions for Dundee at a set starting point (the **'Baseline Emissions Inventory' (BEI)**)
- An understanding of greenhouse gas emissions reduction for Dundee since the starting point (the **Monitoring Emissions Inventory (MEI)**')
- Consideration of future emissions projections.

BEI and MEI for Dundee

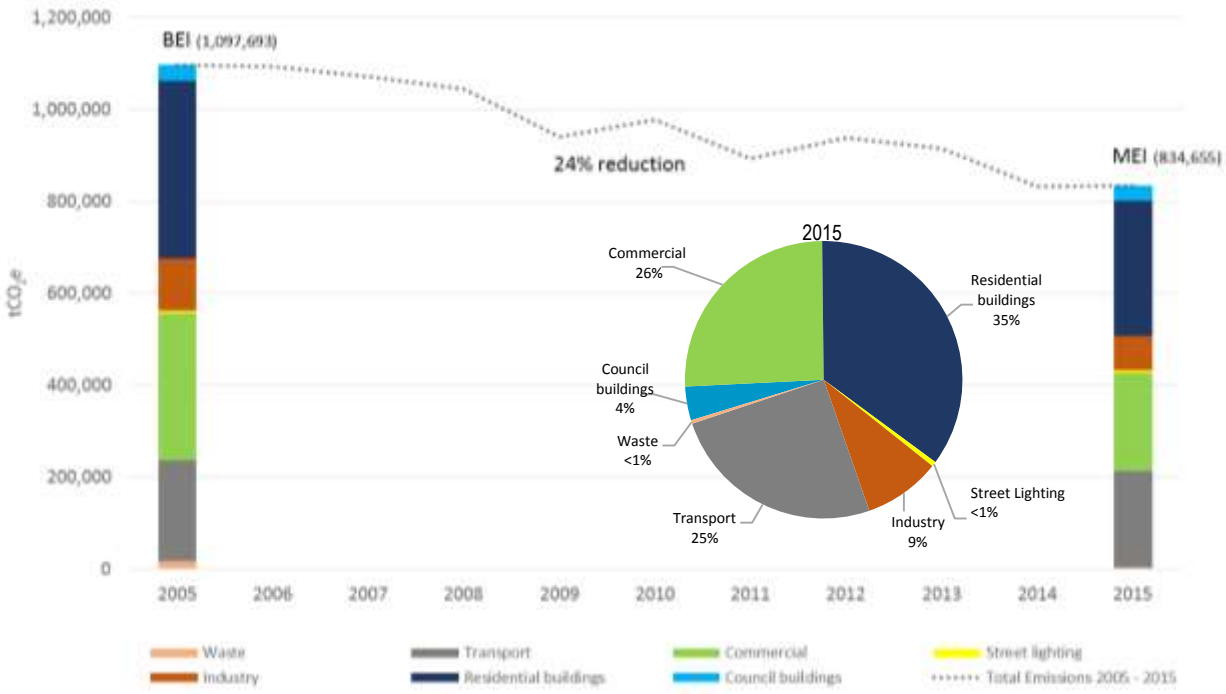
A baseline year of 2005 was selected to measure the starting point (BEI) for emissions reduction as this was the earliest year for which reliable data exists in the UK. The most recent year for which data was available when preparing the Emissions Inventories was 2015, therefore this year was selected to measure progress in reducing emissions to date (MEI).

The BEI and MEI study was carried out by Aether and used national energy data broken down by sector (domestic, industrial and commercial, transport and waste). In order to translate the energy and waste data into emission estimates, the data is multiplied by emission factors.

Figure 4 shows the emissions in the baseline year (2005) and monitoring year (2015), broken down by sector. As can be seen, residential buildings make up the largest source of emissions in Dundee, comprising 35% in total in both years. This is followed by the commercial (26%) and transport (25%) sectors. With around 75,000 residential properties, 5,500 commercial and industrial properties, as well as 600 public buildings, including 42 schools, it is not surprising that buildings make up the bulk of emissions in Dundee. Emissions from Council property account for less than 4% of total emissions which is why a city-wide approach is essential if we are to reach targets. Nonetheless, the Council is committed to reducing its own emissions year on year and has a long-term aspiration to set carbon budgets for its service areas.

Whilst being the largest emitters, a lot of work has taken place to reduce emissions from the residential and commercial sectors, achieving the greatest reduction between 2005 and 2015, accounting for 40% and 35% of the emissions reductions respectively. **Overall, emissions reduced by 24% from 2005 and 2015**.

Figure 4: Dundee greenhouse gas emissions 2005 and 2015 (By End Use)

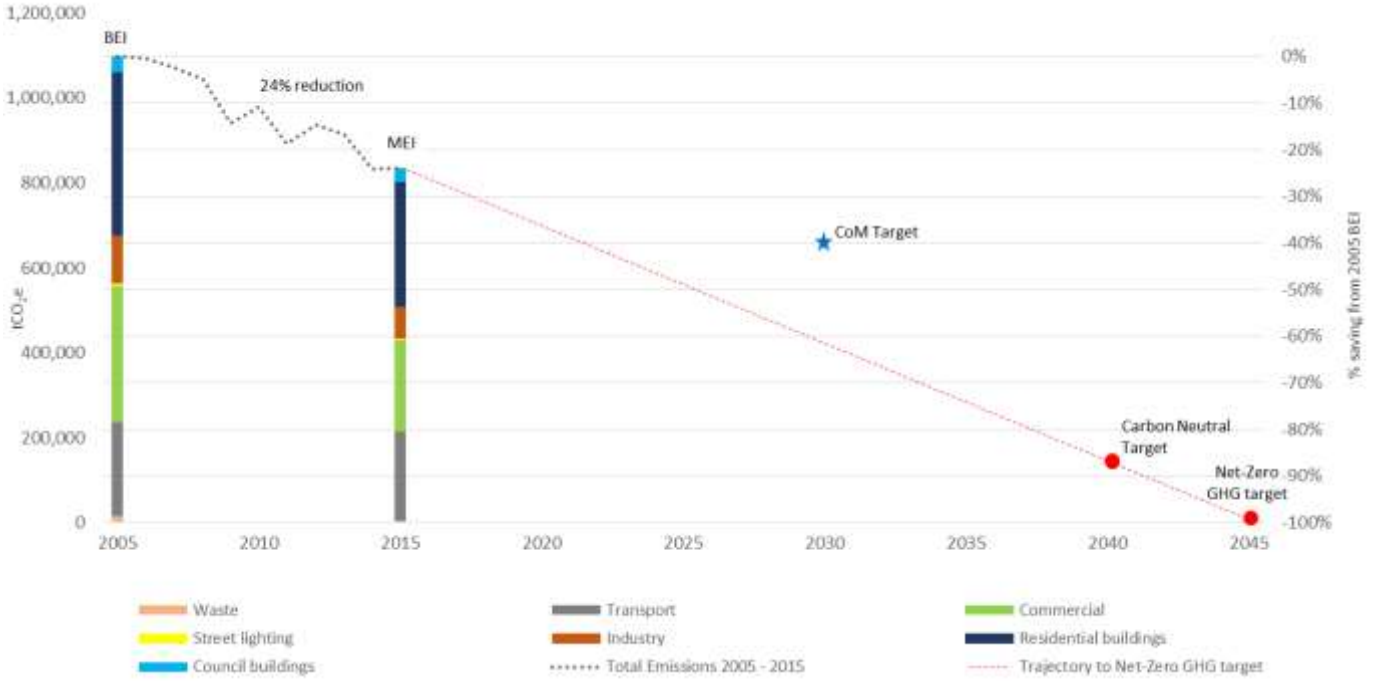


Source: Dundee GHG Inventories and future projections

Emissions Reduction Target

The Climate Action Plan commits to surpass the Covenant of Mayors target of 40% reduction in greenhouse gas emissions by 2030 and ultimately achieve a science-based target of **net-zero greenhouse gas emissions by 2045**, in line with the proposed targets of the Scottish Climate Change Bill (figure 5).

Figure 5: Emissions Reduction Targets



Meeting the Target

Meeting the target will be challenging and there are a number of external factors that will impact on this, including UK and Scottish Government policies and initiatives highlighted in the Plan. A key factor will be the decarbonisation of the electricity supply grid where energy from fossil fuels is replaced with renewables. This has a direct impact on determining the **Grid Emission Factor**[6] which is used to measure emissions reduction progress.

As far as possible, actions in the Climate Action Plan will be quantified in terms of their emissions reduction impact. For some initiatives, further development of business cases will be required with a more detailed project plan to provide a better measurement of impact. For others, the scale is likely to be the crucial factor and consequently only best estimates may be provided.

The following performance indicators will be used to measure emissions reduction progress against the target:

- Total carbon dioxide equivalent (CO_2e)[7] emissions (total and by end-use) in Dundee
- Per capita (person) CO_2e emissions in Dundee

Action G.1: Adopt an emissions modelling tool to quantify the impact of Climate Action Plan actions, to inform future targets and present data in an interactive way.

Action G.2: Develop and trial a carbon budget for Dundee City Council and encourage other organisations in the city to prepare carbon reduction plans.

[6] A measurement of CO_2 emissions intensity per unit of electricity generation in the grid system (tCO_2e/MWh).
[7] CO_2e is a commonly used way of presenting total greenhouse gas emissions as an equivalent amount of CO_2.

4. CLIMATE ACTION PLAN THEMES

ENERGY

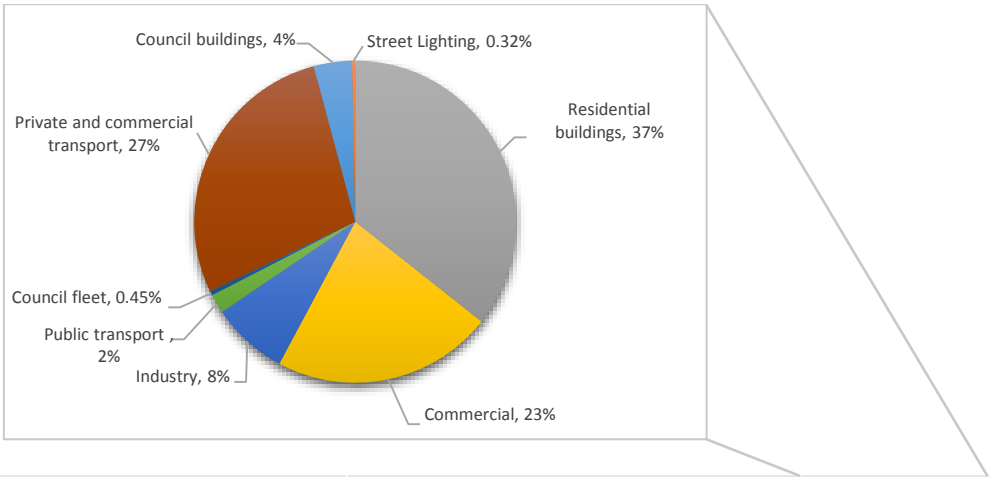
Objective: Reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies.

Why take action?

Energy consumption and emissions at the local level are dependent on many factors: economic structure (industry/service oriented and nature of the activities), level of economic activity, population, density, characteristics of the building stock, usage and level of development of the various transport modes, citizens' attitudes, climate etc. Some factors can be influenced in the short term (like citizens' attitudes), while others can only be influenced in the medium or long term (energy performance of the building stock). It is useful to understand the influence of these parameters, how they vary in time, and identify upon which partners can act (in the short, medium and long term).

Dundee's total energy usage in 2005 was estimated as 3,726,176 MWh and had reduced to 2,849,645 MWh by 2015. Just under three quarters of the energy consumed is used in buildings and over a quarter for transport. The detailed analysis is shown below:

Figure 6: Dundee energy consumption 2015 (By End Use)

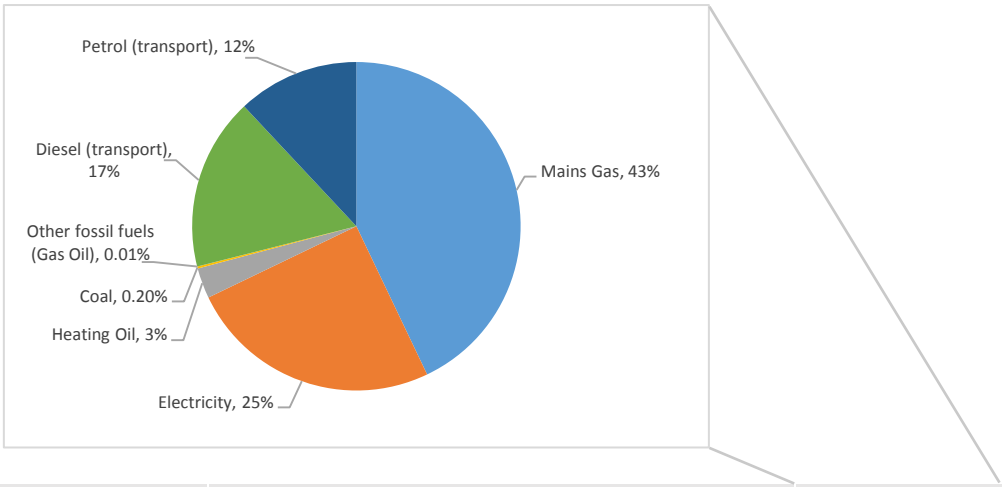


Category (End Use)	Energy Consumption in 2015 (MWh)	Contribution
BUILDINGS, EQUIPMENT/FACILITIES AND INDUSTRIES:		
Council buildings	107,256	4%
Commercial	642,504	23%
Residential buildings	1,041,500	37%
Street lighting	9,237	0.32%*
Industry	227,670	8%
Subtotal	2,027,585	71%
TRANSPORT:		
Council fleet	13,079	0.45%*
Public transport	42,788	2%
Private and commercial transport	766,193	27%
Subtotal	822,060	29%
TOTAL	**2,849,645**	**100%**

* Percentages of less than 1% are shown to two decimal places whilst the total figure is rounded to the nearest whole number.

The type of fuel used is also important as each type emits different amounts of carbon. Figure 7 shows that in terms of fuel usage, just under half of the energy used in Dundee in 2015 was from mains gas supplies and a quarter from electricity, indicating that heating and lighting of the city's domestic, commercial and industrial properties is a major contributor to emissions and significant reductions from these sectors will be required to meet the target.

Figure 7: Dundee energy consumption 2015 (By Fuel)



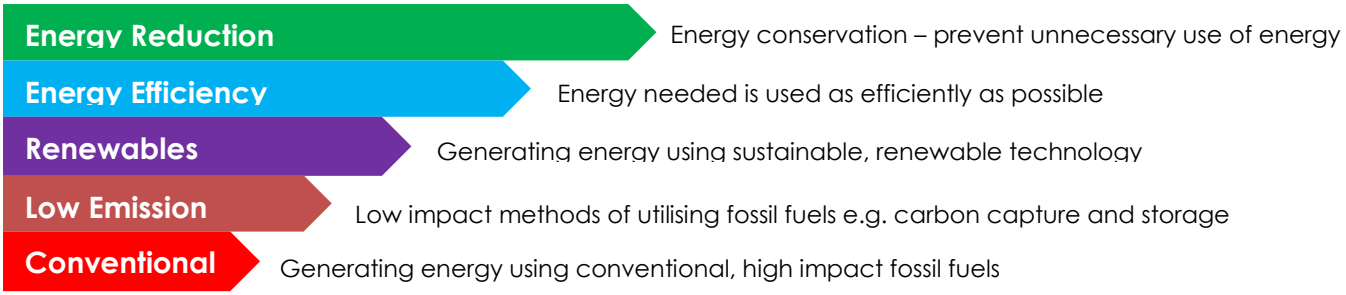
Fuel used	Energy Consumption in 2015 (MWh)	Contribution
Mains Gas	1,707,297	43%
Electricity	882,534	25%
Heating Oil	260,436	3%
Coal	5,200	0.20%*
Other fossil fuels (Gas Oil)	1,451	0.01%*
Diesel (transport)	412,389	17%
Petrol (transport)	456,870	12%
TOTAL	**3,726,176**	**100%**

* Percentages of less than 1% are shown to two decimal places whilst the total figure is rounded to the nearest whole number.

Energy in Dundee

The Energy Hierarchy

The Climate Action Plan was developed with the principles of the energy hierarchy, where the approach seeks to reduce the amount of energy used in the first place, before employing technologies to reduce energy, as shown below.



The Scottish Government has designated energy efficiency as a National Infrastructure Priority, the cornerstone of which is the **Energy Efficient Scotland** programme committing substantial annual funding to transform the energy efficiency of Scotland's buildings so that, wherever technically feasible, and practical, buildings are near zero carbon by 2035.

Energy efficiency is one of the most cost-effective ways of reducing costs and, in the process, emissions. Measures can include retrofitting properties with better insulation, installing more efficient boilers, controls and energy management systems. Typically, this will mean a shift towards renewable and low carbon energy sources; however, with this comes a risk of increased price rises due to the capital costs associated with deploying the associated infrastructure.

It is therefore important to consider both capital expenditure and operational expenditure through **Whole Life Costing**, so that the best approach can be taken when investing in new buildings and refurbishments. Often, capital expenditure and operational expenditure are separated so that the long-term cost-effectiveness of actions is not fully understood. Whole Life Costing refers to the total costs and benefits of ownership of a building, or other asset, and allows resource efficiency to be appropriately considered during the assessment of the true cost of design, construction and operation. This reduces designs that are influenced on the basis of short term capital financial outlays and that do not consider the longer term operation of the building, for example adding solar panels to a new housing development leading to a long term reduction in energy costs. Value for money can only be achieved if the costs associated with the life of the product are considered. It therefore makes economic sense for Dundee City Council to adopt this methodology for the sake of long term cost savings as well as reducing emissions.

Action E.1: Adopt a Whole Life Costing approach to ensure new developments achieve greater operational sustainability.

(This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste.)

Domestic Energy Efficiency

Increasing energy efficiency and reducing emissions of the **social rented sector** has been driven by the Scottish Housing Quality Standard and its successor, the Energy Efficiency Standard for Social Housing. The Council and Housing Associations are adhering to these standards to address fuel poverty via their continued energy improvement programme for domestic properties.

- By 2015, all Council housing stock reached required energy ratings, via replacement of all electric storage heating with gas central heating and ensuring all suitable properties had appropriate insulation.
- 3,500 hard-to-treat properties (Council and private) have had external wall insulation fitted, reducing carbon emissions.
- A further 1,300 properties will be completed by the end of 2019.
- Installation of photovoltaic panels installed on multi-story developments.

Energy Efficiency standards for social housing are expected to increase under national targets with the Scottish Government aiming to maximise the proportion of social housing stock achieving an Energy Performance Certificate (EPC) Band B by 2032. This higher standard is likely to result in an increase in the deployment of renewables. A longer term target is for properties to become carbon-neutral by 2040.

Action E.2: Complete fabric improvements to outstanding domestic Council (and ex-Council properties in mixed-tenure blocks) stock to achieve the Energy Efficiency Standard for Social Housing (EESSH) by 2020 and widen range of technologies (including renewables) under consideration to allow compliance with the more exacting EESSH2 standard by 2032.

Up until now, there has been no regulation of energy efficiency in the **private rented sector**. However, this is expected to change as legislation will require that only privately rented properties with an EPC Band of at least E (i.e. minimum rating of 39) can be let. The standard will then be stepped up so that only those dwellings with a Band of at least D (i.e. minimum rating of 55) can be let from 2022 onwards. A further proposal is that all privately rented properties achieve at least a Band C (minimum rating of 69) by 2030.

For the **owner-occupied sector**, there have been no previous proposals to regulate for energy efficiency. However, within the current Energy Efficiency Scotland consultation the proposal is for continuation of existing support programmes of grants and loans for energy efficiency measures until 2020, followed by a ten year period where these properties are encouraged to achieve an EPC Band C with the proposed mandatory phase requiring Band C in the subsequent 10 years.

Behaviour Change

The most cost-effective way to reduce emissions is to reduce the amount of energy used in the first place. This can be achieved by relatively small measures such as turning down controllers, reducing the temperature of clothes washing, insulating lofts, choosing energy efficient appliances, switching off appliances when not in use, changing to LED bulbs and many more actions. Despite their cost-saving benefits and simplicity, these actions often fail to be carried out. There are many initiatives in Scotland that provide advice and support to householders such as **Home Energy Scotland** and businesses such as **Resource Efficient Scotland**, as well as specific local advice services such as **Dundee Energy Efficiency Advice Project** (DEEAP).

Action E.3: Continue to deliver a city-wide energy awareness campaign to improve energy efficiency behaviour in all households.

Case Study: Local Energy Advice

DUNDEE ENERGY EFFICIENCY ADVICE PROJECT

DEEAP was established by the Council in response to the need to eradicate fuel poverty in Dundee. Its aim is to provide a service throughout the city advising householders on fuel tariffs, how to reduce bills, energy efficiency measures and referral or advocacy work to resolve individuals debts with energy suppliers. DEEAP carries out 4,000 energy advice home visits per year and their staff attend events across the city to raise awareness of the service.

Home Energy Scotland North East has expert advisors based in Dundee, offering free and impartial advice on energy saving, keeping warm at home, renewable energy, greener travel, cutting water waste and more. Home Energy Scotland is funded by the Scottish Government and managed by the Energy Saving Trust and has a mission to help people in Scotland create warmer homes, reduce their bills and help tackle climate change. Advisors support over 18,000 householders in the North East last year with energy saving advice, leading to carbon savings of over 60,000 tonnes of CO_2. Feedback from North East Customers shows customer satisfaction levels of over 98% for advice and support from the team. Advisors attended over 60 events in Dundee during 2018/19 with a full events programme planned for 2019/20.

Action E.4: Explore how the work of the Dundee Energy Efficiency Advice Project (DEEAP) can be maintained and delivered.

Non-Domestic Energy Efficiency

In order to accelerate progress in transforming the energy efficiency of public sector buildings, a national framework of **Non-Domestic Energy Efficiency (NDEE)** contractors has been put in place. The twelve appointed suppliers can deliver energy efficiency retrofit works and services at scale for all Scottish public sector organisations, registered social landlords and third sector organisations, rapidly delivering modern, efficient technology that supports Scotland's ambition on energy demand reduction, helping to cut costs and tackle climate change.

Dundee City Council is utilising this Energy Performance Contracting model, investing £1.7 million in the installation of energy efficiency measures in eight properties initially. This is guaranteed to achieve savings of at least £222,000 per annum and a further 1,000 tonnes of CO_2. Non-Domestic buildings involved in these initial energy efficiency improvements include Olympia Leisure Centre, Dundee Contemporary Arts and Dundee Ice Arena. The long term plan is to include more than 100 Council properties.

Action E.5: Complete phase 1 of the Non Domestic Energy Efficiency (NDEE) retrofit of Dundee City Council public buildings (Basket 1) before implementing subsequent phases (Baskets) annually until all prescribed measures are complete on all Council public buildings.

The Councils' first **carbon management plan** was adopted in 2009 to reduce CO_2 emissions from its operations. Since 2007/8, the total carbon footprint has reduced by 31%; 23% of this a result of improved energy efficiency in buildings, such as SMART metering, Building Energy Management Systems and behavioural changes. The Council will produce an updated Carbon Management Plan to reflect the ambitions of the Climate Action Plan as well as incorporate findings from the Public Bodies Climate Change Duties Reporting.

Action E.6: Update the Councils Carbon Management Plan, identifying new targets in line with the Public Bodies Climate Change Duties (PBCCD) and Climate Action Plan targets.

Dundee's public sector organisations will also be expected to inform and support the establishment of **Net Zero Carbon Standards for new public buildings**, announced by the Scottish Government in September 2019.

LED Street lighting

Dundee has more than 24,000 streetlights which use around 8.9GWh of power a year at a cost of £1.2 million. These lights also emit 3,980 tonnes of CO_2.

Since 2012/13 the Council has installed 5,000 LED street lights that have so far resulted in a 35% reduction in CO_2 emissions. By 2020, a further **£4.8 million will have been invested to complete the programme of converting all possible streetlights to LED.** This will significantly reduce running costs and is estimated to achieve a further 35% reduction in CO_2 emissions.

Action E.7: Replace all streetlights with energy efficient lighting systems by 2020 and explore opportunities for future smart intelligent lighting.

Business and Industry

Industry and commercial sectors are large emitters in Dundee and there is great potential to engage with businesses to reduce energy usage and emissions across the city.

Resource Efficient Scotland, in partnership with Dundee & Angus Chamber of Commerce, Scottish Enterprise and Business Gateway, funded by the Scottish Government and European Regional Development Fund, have worked closely with local businesses and the Council's Economic Development Service in Dundee since 2013 to provide advice and support in reducing emissions and saving costs. This has involved **advising 63 Small to Medium Enterprises** in Dundee, delivering **92 projects** identifying savings of £620k of energy (8,594 MWh) and £13,380 of waste (152 tonnes of waste).

Action E.8:	Provide advice and support on resource efficiency and climate risk management for businesses in Dundee.

Renewable and Low Carbon Solutions

Using renewable energy rather than fossil fuels can significantly decrease emissions. The pace of investment and share of renewable energy as a proportion of the energy we generate and consume in Scotland has increased considerably over the past decade as the cost of technologies fall and efficiencies continue to rise.

Renewable energy sources now supply the equivalent of almost 18% of Scottish final energy consumption, up from around 8% in 2009. In 2015, 77% of electricity generation came from zero or low carbon sources, and 27% from wind energy alone.

In Dundee, according to the 2015 MEI, **less than 1% of our locally generated electricity comes from renewable sources**. There is therefore great potential to increase the percentage of local electricity generation from renewable sources in Dundee to make a significant reduction in emissions.

Emerging energy technologies such as hydrogen are also likely to become increasingly important for meeting future energy demand from continued population growth and more use of electricity in other sectors (e.g. transport, industry). Changes to how we store energy across the system, and particularly in terms of electricity and heat, could have a profoundly important bearing on our low carbon future.

By 2032, 35% of Scotland's home are to be heated by low-carbon technologies.

Dundee is a compact city and the opportunities to deploy some renewable technologies such as large scale wind and solar farms are limited. Yet other renewable technologies, such as photovoltaics, are now well established and the challenge remains to scale up their use to a level that can make significant impact on reducing emissions.

Within Dundee's **Local Development Plan**, proposals for all new buildings will be required to demonstrate that a proportion of the carbon emissions reduction standard set by Scottish Building Standards will be met through the installation and operation of low and zero carbon generating technologies. Supplementary guidance will be kept under review to ensure the proportion of the carbon emissions reduction standard to be met by these technologies will increase over time.

In the Government's Programme for Scotland 2019-20, commitments are set out to ensure that, from 2024, all new homes must use renewable or low carbon heat. This is to be achieved through a fundamental overhaul in building regulations that aim to increase energy efficiency and the efficiency of construction from 2021.

Solar

Renewable technologies, in particular photovoltaics, have been included in the design of new build schools at Sidlaw View, Tayview, Coldside and the North East Campus, alongside three systems at DISC, Claverhouse and The Crescent. Further plans include a rolling programme of photovoltaic installation, covering all Council buildings.

Dundee is home to the UK's first **purpose-built electric vehicle charging hub** in Princess Street, featuring eighteen bays of **solar canopies**, rapid charging units and an integrated energy storage system utilising second-life Electric Vehicle (EV) batteries. Further solar canopies have been constructed at Queen Street, Broughty Ferry.

New EV charging hubs will also be developed at Dundee's three main multi-storey car parks – Greenmarket, Olympia and Bell Street. Each new hub will see the installation of ten charging posts with two connectors, doubling the number of public charging points in the city.

The installation of solar panels and a battery storage system will integrate more renewable energy and enable variable charging of vehicles when grid demand is lower, helping to reduce environmental impacts associated with electricity generation.

Action E.9: Identify solar PV opportunities across Dundee for public and private buildings and ensure all civic buildings have renewables where technically feasible.

Hydrogen

Dundee is supporting the Scottish Government's ambitions for the creation of a hydrogen economy in Scotland to attract investment into transport, manufacturing, engineering, energy and commercialisation of the technology. Replacing diesel with hydrogen as a fuel source in vehicles will result in better air quality, improved health, reduced noise levels and zero carbon emissions as well as providing the capacity for longer transport distances compared to other low carbon energy technologies.

A potential site has been identified in Dundee as a **National Hydrogen Knowledge Centre** for fuel generation, energy storage, vehicle research and development and manufacture together with a skills academy to support the wider hydrogen growth. It also has the potential to attract various associated businesses, including fuel cell development and transportation companies such as local bus and fleet networks, thus expanding out the wider low carbon sustainable transport market.

Dundee is one of 22 cities in the pan-European JIVE2 Project (Joint Initiative for Hydrogen Vehicles across Europe) which will see **12 new Hydrogen Fuel buses deployed in Dundee**. The underlying objective is to support the transition of fuel cell buses as a mainstream choice for public transport authorities and operators by demonstrating parity in cost and operation against using fossil fuels. The project is one of the early adopters in the Government's National Hydrogen Transport Objective.

Action E.10: Implement the Joint Initiative for Hydrogen Vehicles Across Europe (JIVE 2) hydrogen bus project, deploying 12 hydrogen fuel buses into operation in Dundee and creating a local fuel and maintenance station.

Geothermal

As part of the regeneration of Dundee's waterfront, the V&A Museum of Design aims to achieve the **BREEAM Excellent category** as a recognised measure of sustainability. The building itself runs solely on geothermal energy. Design includes thirty, 200-metre deep bore holes for heating and cooling of the building along with air source heat pumps on the roof. This form of renewable energy provides the building with 800,000 kWh/annum of heating and 500,000 kWh/annum of cooling.

Hydro

Generating power from the flow of water requires either a fast flowing water course with a high volume of water or a river with a significant change in levels. Dundee's location on the banks of the River Tay provide an opportune location for harnessing the energy of the tides to generate electricity. The city also has a long-history of utilising water and its Jute Mills were extracting water from the burns that run through the city in the 18th and 19th centuries. Hydro schemes could therefore offer another potential on and off-grid contribution to Dundee's energy mix.

Action E.11: Research opportunities to utilise local water bodies for renewables including local reservoirs, rivers and estuaries.

Offshore Wind

Dundee's geographical location (in close proximity to major Offshore Wind Farm locations), its unrestricted access to deep water port facilities, port side land assets and access to skilled labour provides a major platform to realise opportunities that will emerge in the coming years. Indeed, the Scottish Government's **National Renewables Infrastructure Plan** recognised Dundee as one of the most strategically important port locations for offshore renewables. The geographical location of Scottish consented wind farms such as Neart na Gaoithe (NNG), Seagreen and Inchcape to the Port of Dundee provides an ideal location for Construction/Assembly of turbines and the longer term Operations and Maintenance (O&M) work.

Dundee Port has ambition to secure assembly and construction work for the offshore wind sector and have invested over £10m to create a new quayside with an industry-leading "heavy lift" capability, coupled with a significant onshore operational area. Further investment will be forthcoming to enable offshore wind marshalling to be supported at the port should a suitable project be awarded.

Alongside investment in infrastructure, Dundee offers world leading research and development expertise and competencies across the supply chain to meet industry needs. Dundee's cluster approach brings together regional strengths in the engineering/manufacturing sectors via networks, such as **Energy Dundee** and the **Forth & Tay Offshore Cluster** to support the sector.

Action E.12: Develop a regional cluster approach to attract investment, support business growth and create jobs in the offshore wind sector; retaining more graduates and making the city a magnet for new talent.

Low Carbon Heat

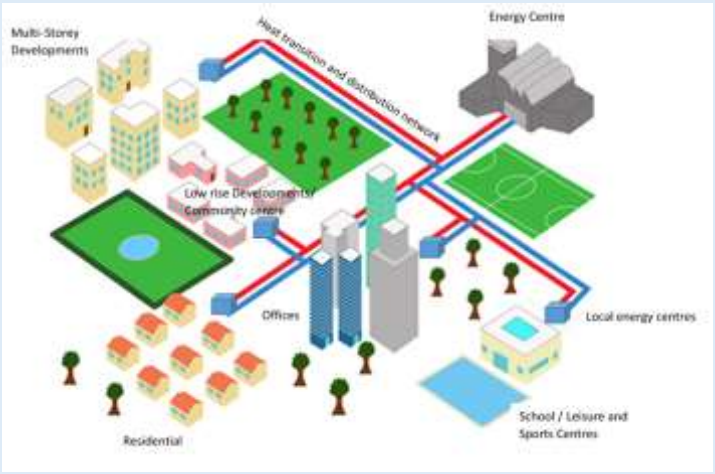
Heat accounts for more than half of the energy consumed in Scotland, with the majority of homes, businesses and public buildings using conventional gas boilers. This dependence on fossil fuels, coupled with old and poorly-insulated building stock, means that heating also accounts for half of Scotland's total CO_2 emissions. Heat must therefore be at the centre of our move to a low carbon economy.

District heating is the supply of heat by hot water to a number of buildings through a heat network of underground pipes. It is an effective method for reducing the carbon intensity of heat, reducing fuel costs and helping to tackle fuel poverty. The benefits of district heating derive from economies of scale. Even a local (building-scale) district heating system is usually operating at a greater scale than the alternative heating systems it replaces.

The Scottish Government recognise that district heating could make an important contribution to meeting Scotland's future heat demand in areas where heat density is sufficiently high to develop networks that can provide heat at an affordable cost. Where allied to a low carbon heat source, it also offers the potential to meet heat decarbonisation objectives[8].

How District Heating Works

Buildings are connected to the heat network through a substation where the heat used is metered. Buildings may have an associated energy centre which at times provides heat to the building, but at other times feeds heat into the wider district heating network. As the district heating network expands, higher levels of efficiency and resilience are achieved through the incorporation of multiple heat sources supplying multiple and varying demands.



Historically, the city has embraced energy conservation and generation, including district heating dating back to the first public sector social housing developments in the 1920's and 1930's. The Council at that time built the Logie Housing estate often referred to as "The Steamies" on account of the high temperature steam engines serving low rise units.

Public sector bodies in Dundee have a key leadership role to play in developing district heating through the actions they take on their own estates to minimise heat demand; transforming the district heating market by providing 'anchor' loads (buildings with major heat requirements); and identifying partnership opportunities for utilising unused excess heat.

[8] The Scottish Government, (2017) 'Consultation on Heat & Energy Efficiency Strategies, and Regulation of District Heating': www.gov.scot/Resource/0051/00513244.pdf

The **University of Dundee** has its own district heating system which has served their campus since the early 1970's. This scheme, considered as integral to a city-wide network, has four large engines with opportunities to expand to other feasible properties in the area.

More recently the City Council has delivered a number of domestic district heating installations within ten multi storey developments at Dallfield, Lansdowne, Lochee and Whorterbank, making homes warmer and more fuel efficient.

Dundee City Councils' **District Heating Strategy 2018-2028**, sets out a long term vision to support the city's growth and low carbon transition using decentralised energy and provides an evidence base to advance district heating network schemes in Dundee, informing both policy and delivery. It identifies potential district heating networks and sets out an indicative programme of short, medium and long-term network development and interconnections together with a deliverable action plan.

Action E.13: Explore options to further improve efficiencies in the Council's existing Multi-Storey domestic district heating schemes.

Case Study: Low Carbon District Energy Hub at Regional Performance Centre for Sport

The Council secured £2.9 million funding from the Scottish Government's Low Carbon Infrastructure Transition Programme (LCITP) together with capital investment to develop an innovative **Low Carbon District Energy Hub** at Caird Park Regional Performance Centre for Sport (RPCS). This multi-technology energy centre design combines heat pumps, gas Combined Heat & Power (CHP), solar thermal, photovoltaics, and large thermal stores combined with gas boilers for peak demand and backup.

By delivering a low carbon solution, the Energy Hub will be capable of generating 100% of its electrical demand and provide 85% of the site's heat demand from renewables with a reduction in carbon emissions of at least 536 tCO_2e per annum. The hub will provide key infrastructure that will act as the catalyst to accelerate the city's ambitions for the development of a city-wide energy network.

It has been designed in such a way to have future capacity to feed approximately 220 houses in Mill of Mains or Linlathen housing developments adjacent to the site over the next ten years and other possible interested parties.

Action E.14: Deliver the Low Carbon District Energy Hub at the Regional Performance Centre for Sports as a catalyst project; proving industry/technology programmes and projects.

The City Council were successful in an additional LCITP bid in 2018 to develop an investment-ready business case for the **Dighty Corridor project**. This long-term project would link the waste to energy facility at Baldovie to the Low Carbon District Energy Hub at the Regional Performance Centre for Sport, creating and energy corridor along the line of the Dighty Burn. Connections would then be taken from this main network pipe to serve homes in Douglas, Mid Craigie, Linlathen, Fintry and Whitfield.

Action E.15: Prepare an investment-ready business case that identifies district heating opportunities from the city's Energy from Waste Combined Heat and Power facility.

Action E.16: Engage with stakeholders and wider industry to promote district heating in Dundee and work with technology providers to explore the potential for integrating alternative fuels as a source of low carbon heat.

An **Energy Services Company** (ESCo) is a commercial structure created specifically to produce, supply and manage the local delivery of decentralised energy to a 'whole site' development allowing the generation of low carbon energy into the heart of communities. These can operate as a public-private partnership and provide a model with which to co-ordinate the planning, funding, operations, and delivery of low carbon energy production such as district heating networks. The City Council's recent heat network developments represent an investment of around £27m, which could potentially be transferred to an ESCo to operate, and form part of its asset base.

Action E.17: Investigate options to create a Dundee City Energy Services Company (ESCo) to help coordinate planning, funding, operations, and delivery of projects.

The Council has been working with the Scottish Cities Alliance and Resource Efficient Scotland to pilot a **Local Heat and Energy Efficiency Strategy** (LHEES) approach in the Lochee Community Planning Partnership area. Proposed by the Scottish Government, an LHEES is intended to establish geographical zones which set out the most appropriate energy efficiency, district heating and heat decarbonisation options for local areas. The study focuses on the step-by-step practicalities of developing a localised investment plan, the data requirements necessary to inform the plan, the technology solutions likely to be applicable in the area as well as an understanding of how an LHEES model could be replicated across the city.

Action E.18: Participate in the Scottish Governments pilot Local Heat and Energy Efficiency Strategy (LHEES) programme and respond to proposals to create a statutory framework for LHEES.

TRANSPORT

Objective: Encourage active travel through walking, cycling and public transport and deploy sustainable alternatives to decarbonise transport.

Why Take Action?

Unlike the dense smog and smoking chimneys of the past, today's air pollution is largely considered invisible; caused mainly by emissions from vehicles that can descend into the lungs and aggravate existing health problems such as asthma and heart and respiratory disease.

The Scottish Government acknowledges that local authorities are meeting their statutory responsibilities in actively working towards achieving air quality standards. However, across many areas of Scotland including Dundee, **the rate of progress must increase if air quality standards are to be met**.

The **Cleaner Air for Scotland Strategy – The Road to a Healthier Future** is being implemented to help meet these standards and sets out proposals to reduce air pollution further and fulfil Scotland's legal responsibilities. It has six main objectives on Transport, Health, Placemaking, Legislation & Policy, Communication and Climate Change, with sustainability as a common thread throughout. In addition, Scottish local authorities must consider air quality when developing a Climate Action Plan.

Dundee has an **Air Quality Action Management Area** covering the whole of the local authority area, as there are locations where the Scottish and UK Air Quality Standards and EU limits for nitrogen dioxide (NO_2) and fine particulates (PM_{10}) are being exceeded.

Placemaking is how we plan, design and manage our towns and cities. This can significantly impact air quality and is fundamental to both the Scottish Government's spatial planning policies and Dundee's Local Development Plan. For example, integrating greenspaces into existing developments can act as a buffer against noise and emissions from vehicles, whilst improving green spaces and active travel opportunities. New developments can be designed so that they generate less traffic, are well linked to public transport, walking and cycling routes and make it easier for people to make sustainable transport choices. This not only helps reduce air pollution but also creates attractive, healthy places to work and live in.

The new **National Planning Framework 3** and **Scottish Planning Policy** set out the Scottish Government's spatial strategy and planning policies to ensure more connected, sustainable places that reduce the need to travel; integrate different transport modes; and provide safe, convenient opportunities for active travel.

Transport in Dundee

Engage Dundee, a consultation process carried out in June 2017 to draw out the priorities of citizens to input to the City and Council Plan, received over 6,000 responses. It highlighted the importance of improving public transport and cycling and walking routes. Increasing sustainable transport options ensures streets are safer and less congested, air quality (and consequently, human health) improves and carbon dioxide emissions are reduced.

Active Travel

Cycling is the fastest growing mode of travel in Scotland and recent evidence from the Dundee Travel Active programme shows that communities from across Dundee respond positively to active travel initiatives by walking and cycling more. **However, only 25% of households in Dundee have access to an adult bike and, in 2017, only 1% of journeys in Dundee were made by bike** – that's a third less than the Scottish average on both scores and this despite the fact that 44% of Dundee households do not have access to a car for private use.

Dundee, being a small city, is perfectly suited to cycling around given the right infrastructure, although the hilly topography can pose challenges on some routes. Active travel is encouraged through provision of walking and cycling routes and various initiatives promoted to schools and communities. Additionally, the Council supports the Dundee Cycling Forum and publishes the Dundee Cycle Map. In line with the **Dundee Cycling Strategy 2019**, cycle paths are being systematically upgraded and extended where feasible; alongside changes in policy and promotion, this will enable more people to cycle more often.

A new major public bike hire scheme for the city will be launched shortly. Supported by the Council and operated by Ride-On Scotland, **350 e-bikes** will be provided at 40 docking stations in the city over the next 12 months.

Action M.1: Implement the Dundee Cycling Strategy and Councils Active Travel programme in partnership with community groups, improving and increasing cycling paths and infrastructure across the city to reduce the modal share of car based transport.

A new **Active Travel Hub** will be built in the heart of Dundee's Central Waterfront in 2020. It will be the only building set within a new landscaped and play/beach area sitting adjacent to the V&A Museum and alongside the River Tay and National Cycle Network. The Hub is expected to become a focal point for cycling, walking and sustainability in the city with the operator delivering multiple active travel services to residents of Dundee and visitors to the city.

Action M.2: Develop a Low Carbon Active Travel Hub in Dundee Waterfront to include bike hire, cycle parking, bike maintenance, electric vehicle (EV) charge points, an EV car club and community outreach.

Mobility Innovation Living Laboratory project (MILL), a public-private-people partnership led by Urban Foresight, strives to introduce shared mobility solutions that integrate with the transport network based on initiatives tested in the real world, namely Dundee city centre, under the banner ShareMORE (Shared Mobility and Resource Efficiency). This includes projects that improve the efficiency of parking infrastructure, implement easy to access cycle hire schemes, enhance public transport information and accessibility and encourage shared use of assets to reduce the number of vehicles on the road.

The MILL will lead a £3m Innovate UK project to develop a Clean Streets EV Infrastructure Toolkit Demonstrator project. Funding of £550,000 has been allocated to Dundee for the installation of the pop up electric vehicle chargers within the city.

Action M.3: Implement Shared Mobility and Resource Efficiency projects developed by the Mobility in Living Laboratory (MILL) to ensure Dundee remains in a position to take advantage of future innovative mobility solutions including autonomous vehicles.

A number of projects are being delivered to further support active travel:

- **Pedal to the Pool**, promoted by Leisure & Culture Dundee, is a family approach to active travel, offering free swimming for children who have cycled to their local swimming pool. Participants take a selfie next to their bike to show they have cycled and they can claim their free swim.

- The **'Get on the Go'** campaign was a joint radio and social media campaign between Dundee City, Perth and Kinross, and Angus Councils. The campaign was aimed at people driving in their cars, specifically single occupancy cars. The campaign promoted walking, cycling and park and stride, as well as car sharing schemes, with the aim of reducing the number of unnecessary cars on the road.

- **'Safer Routes to School'** leaflets have been designed and distributed to every primary school within Dundee. These school specific maps highlight the recommended safe routes for walking to school, as well as highlighting designated park and stride zones where parents can park up and pupils can walk the rest of the way (typically a ten minute walk is acceptable). These maps are intended to make it easy for families to choose active travel methods, providing information on safe crossings and less congested routes in their area.

Action M.4: Ensure safer streets that enable active travel in Dundee including assessing suitable locations for pedestrianisation, 20mph zones and off road/segregated active travel networks.

Buses

Given the low levels of car ownership, Dundee is probably the most bus dependent city in Scotland. The city is fortunate to have an extensive public transport network with high frequency routes and increasingly cleaner, quieter and attractive buses. The city has some of the best passenger waiting facilities in Scotland with a high quality real time information system providing accurate bus information to passengers. The cost of regular bus travel is very competitive and the ABC (All Bus Companies) ticket allows bus users to purchase a product that is valid on all services in the city.

Xplore Dundee, Stagecoach East Scotland and Moffat & Williamson continue to invest in their vehicles and are beginning to explore new technologies that will offer opportunities to decarbonise their fleets in future year.

In December 2018, Xplore Dundee, the city's largest public transport provider, invested £4m in 14 smart-hybrid 'Emerald' buses. Their arrival complemented previous investments in earlier Hybrid-technology with 9 electric-hybrids arriving in 2013, and 5 micro-hybrids in 2015. Low-emission vehicles are now the standard in their fleet. Xplore Dundee has participated in the Scottish Government's BEAR programme, a scheme which brings older buses up to modern standards. So far, 7 double-decks (currently deployed on services 28/29, which run via the Lochee Road due to its higher levels of NOx pollution) were upgraded in the project's first phase - with funding secured for a further 10 single decks in the second phase.

Action M.10: Explore options for increasing deployment of low emission buses in Dundee, including hybrid and hydrogen buses.

The provision of **Park & Ride** facilities on key commuting corridors into Dundee remains a strategic priority for TACTRAN and its Regional Transport Strategy. As our population and workforce grows, Park & Ride infrastructure can help deliver a modal shift in travel towards greater use of public transport, car sharing and cycling, thereby reducing traffic congestion and air pollution and supporting economic growth, connectivity and workforce mobility.

Action M.5: Develop and implement proposals for new Park & Ride sites to the south, west, east and north of Dundee and explore the provision of active travel options for these.

Trains

As well as the main railway station in the city centre, Dundee also hosts Broughty Ferry station and Scotrail's 'Rail Revolution' has seen a huge increase in the number of stopping trains there. The local train network now provides a very attractive, quick and affordable way to commute and travel in the city.

Electric Vehicles

To date, Dundee has one of the highest concentrations of Electric Vehicles (EVs) of any city in the UK, with the Council's fleet of over 100 EVs being the largest of any local authority.

The charging infrastructure in the city has continued to grow since it was first introduced in 2011 with a mixture of publically available and private chargers being installed. The 90 charging units across the city have generated over 191,500 charging sessions, totalling an estimated 5.4 million electric miles.

The **Drive Dundee Electric campaign** was launched in June 2017 to encourage and support the uptake of EVs in the area. It is now the face of all the latest news about charging infrastructure, regulation and events, and acts as a point of information and contact to ensure all responses are accurate and quick, providing the best experience to EV owners.

One of the most significant transport sectors to adopt electric vehicles in Dundee has been the taxi industry, with 18% (130 vehicles) of all taxis presently 100% electric. This transition to e-mobility has been achieved by progressive policy changes and continued Council/taxi trade engagement including a reduced price for taxi testing and all new private hire vehicles must be electric.

Co-wheels is a social enterprise car club scheme, allowing members to share the use of multiple cars parked in and around Dundee. Members can pair their NEC card to their account, book cars online and collect and return them to their dedicated parking bays, unlocking the cars with their own smartcard. The club has a current pool of 15 low and ultra-low emission vehicles, available to members 24/7. Around half of co-wheels cars are electric vehicles, meaning that the club is an important promoter of sustainable, clean transport and as the membership grows, hopefully the emissions within Dundee will continue to reduce. In 2019 Enterprise Car Club also arrived in the city.

Action M.6: Expand Electric Vehicle (EV) charging hubs and infrastructure across the city.

Action M.7: Increase EV uptake in Dundee via support and awareness provided by the Drive Dundee Electric campaign and local policy measures, including continued migration to low carbon vehicles within the council fleet.

Low Emission Zone

As air quality becomes an increasingly political issue, measures are being put in place to discourage more polluting vehicles from entering areas where air quality is poor. Dundee is one of four Scottish cities that will introduce a **Low Emission Zone** (LEZ) by 2020 in line with Scottish Government targets. An LEZ is a defined geographical area where access for high polluting vehicles is restricted by implementing a Penalty Charge. An LEZ is designed to improve air quality alongside other objectives such as promoting low emission vehicles, which are permitted to enter the zone without penalty.

The Council has setup a delivery group to manage the LEZ development process and this will steer the design and implementation of the LEZ. The delivery group consists of organisations such as SEPA, NHS, Dundee City Council, Transport Scotland, and TACTRAN the Regional Transport Partnership. The Dundee LEZ will use SEPA air quality modelling to provide an evidence base to determine the LEZ with further public consultation. The Scottish government are bringing forward legislation to support LEZs in the new Transport Act and a final LEZ proposal will be submitted to Scottish Ministers for approval in advance of its introduction.

Action M.8: Establish a Low Emission Zone in Dundee by 2020 to contribute to the broader city objectives and the vision to create a healthy, vibrant and attractive city by protecting public health through improving air quality.

Case Study: ECO Stars Dundee

Two ECO Stars schemes have been set up in Dundee to provide information and support to the city's fleet operators to help them improve vehicle efficiency, reduce fuel consumption and reduce emissions whilst rewarding them with a star rating and cost savings.

The first to launch was the Heavy Vehicles scheme in December 2013 (supported by TACTRAN), while the Taxi – Private Hire Vehicles scheme was launched in March 2015.

Action M.9: Continued promotion of ECOSTARS schemes to encourage Heavy Duty, Taxis and Private Hire vehicle companies to participate in air quality improvements in Dundee.

The **Michelin Scotland Innovation Parc** is a joint venture between Michelin, Scottish Government, Dundee City Council and Scottish Enterprise to deliver Scotland's centre for driving innovation and investment in sustainable mobility and low carbon energy, giving a significant boost to Dundee's and Scotland's journey to net zero emissions.

Artist's impression of Michelin Scotland Innovation Parc.

It will provide business and industry with support packages containing a mix of grants, loans and incentives as well as competitive rates, space and expertise for innovation and prototypes. To make sure that this support is at the cutting edge of technological and industrial expertise, it will be backed up by partnerships with academia and industry experts.

The Parc will also include an Advanced Skills Academy to help to develop the workforce of the future, delivering bespoke packages covering data, digital, creativity and innovation, as well as core technical skills.

WASTE

Objective: Manage waste sustainably by reducing, reusing, recycling and recovering waste to improve resource efficiency whilst working towards a circular economy.

Why Take Action?

The way we obtain, use and dispose of goods has a significant impact on our carbon footprint. The economy has continued to move from a manufacturing base towards the services sector and one of the consequences of this is that more of the goods we buy and use are now produced overseas. We are all consumers – of food and drink, personal travel, household products and travel tourism. As such, we are accountable to some degree for the pressures which our consumption puts on the environment. Changes in material consumption patterns and a shift towards more sustainable waste management not only saves money; they also have significant implications for reducing emissions.

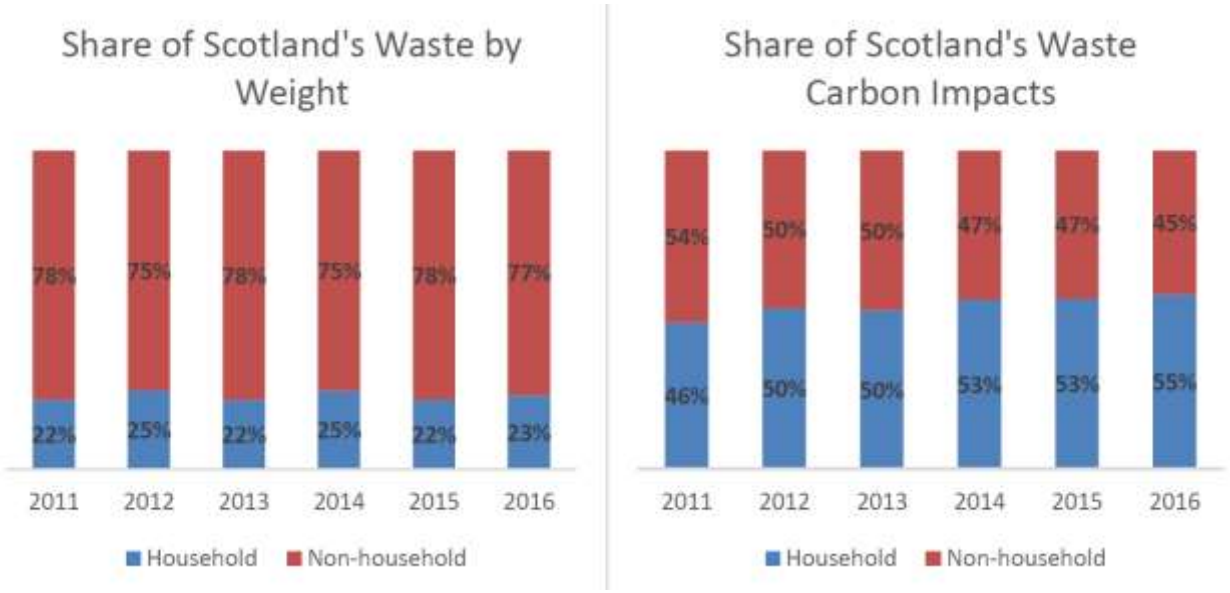
The five main policy drivers to reduce waste generation and increase recycling rates in Scotland are:

1. Ban on biodegradable municipal waste to landfill from 2025
2. Reduce waste arisings in Scotland by 15% against 2011 levels by 2025
3. Reduce food waste arisings in Scotland by 33% against 2013 levels by 2025
4. Achieve 70% recycle rate for all waste by 2025
5. Landfill no more than 5% of waste by 2025

Zero Waste Scotland has developed a Carbon Metric tool to help assess the carbon impacts for waste materials. The Carbon Metric quantifies the complete **lifecycle impacts** of more than 30 different common waste materials, providing policy makers and business leaders with an alternative to weight-based waste measurement, and allowing them to identify and focus specifically on those waste materials with the highest carbon impacts and greatest potential carbon savings.

Figure 8 shows that household waste accounts for less than 25% of all Scottish waste by weight, but a growing majority of the carbon impacts due to the high carbon value of household waste and more rapid impact reduction in the non-household waste stream. Food waste in particular has a high carbon impact, accounting for 2% of all waste but 22% of all carbon impacts.

Figure 8: Comparison of Weight and Carbon Impact of Scotland's waste



Source: www.zerowastescotland.org.uk/research-evidence/carbon-metric-summary-report

Circular Economy

A circular economy is an alternative to a traditional linear economy (make, use, dispose) aiming to keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life. This closed loop model can offer businesses new commercial opportunities, reduce resource costs and to reduce carbon emissions.

The Carbon Metric is helping to measure our progress towards a circular economy, proving that sustainable waste and resource policy can deliver major emissions savings across all economic sectors.

Local businesses are being supported to maximise circular economy opportunities through **Circular Tayside**, a joint Chamber of Commerce and Zero Waste Scotland initiative to deliver savings across the Food and Drink, Manufacturing, Energy/Oil and Gas and Manufacturing sectors.

Although much work is already taking place, many opportunities were identified in the action planning process that could accelerate our progress towards a more circular economy in Dundee. Opportunities will be identified and taken forward by Circular Tayside, with a city-wide circular economy education and awareness strategy to be developed.

Action W.1: Develop and implement circular economy projects identified by the Circular Tayside initiative and deliver a circular economy education strategy across the city.

Waste in Dundee

Scotland's Zero Waste Plan 2010 sets a municipal recycling target of 70% by 2025. Dundee City Council currently recycles 35% of household waste and is working on improving, enhancing and supporting these services further.

Comprehensive recycling collections have been rolled out across the city since 2012 and these services are now fully compliant with the **Charter for Household Recycling in Scotland** (a government initiative to bring consistency to recycling services across the country). Dundee is the first city in Scotland to achieve this and internal waste management practices are now also being aligned with the Charter. The Council's Waste team continually assesses collection routes, improving these where possible to avoid unnecessary trips, therefore reducing emissions and fuel costs as well as increasing resource efficiency.

Current waste education and awareness programmes include support on how to **'Reduce, Re-Use and Recycle'** to schools and community groups. Meaningful opportunities and activities are regularly offered to a variety of people, linking to the 'Take Pride in your City' campaign. The Council has been working with Zero Waste Scotland to develop a **Community Litter Prevention Action Plan**, made up of individual plans from each of the Council's services, businesses, schools, community groups and organisations.

With the ban on biodegradable waste going to landfill coming into force in Scotland in 2025, Dundee will support and participate in the national campaign to **reduce food waste** across businesses, schools and homes.

Technology is also playing its part in waste reduction. The **Smart Street Waste** project is trialling a mix of smart technology including solar-powered compactor bins, sensors in street and park area bins, electric industrial vacuum machines and the utilisation of hand held devices, which could lead to a reduction in journeys for emptying and efficient route planning, thereby reducing emissions.

Action W.2: Continue to communicate frequently with residents around waste/recycling services to improve participation/recyclate quantity and quality.

Action W.3: Zero Waste Scotland to pilot food waste reduction project in Dundee schools, hospitals and small businesses by December 2020.

Action W.4: Encourage citizens to take personal and shared responsibility for the environment through the Take Pride in Your City campaign.

Action W.5: Trial Smart waste technology to improve waste monitoring and collection efficiencies in the city.

Action W.6: Explore initiatives to significantly reduce the quantity of single-use plastics used in Dundee organisations including DCC premises and wider commercial establishments.

Action W.7: Continued delivery of sustained waste education campaign programme which aligns to the curriculum for excellence and embeds behavioural change at all stages of the educational journey.

Introducing a **deposit return scheme** is part of Scotland's ambitious plans to develop a circular economy. These schemes are used in lots of places around the world as a way of encouraging more people to recycle certain drinks containers, such as plastic, glass bottles and metal cans. They work by charging anyone who buys a drink a deposit for the bottle or can it comes in. They can get this money back when they return the bottle or can to a collection point to be recycled. Such schemes have been found to increase recycling of drinks containers to much higher levels than we have in Scotland at the moment.

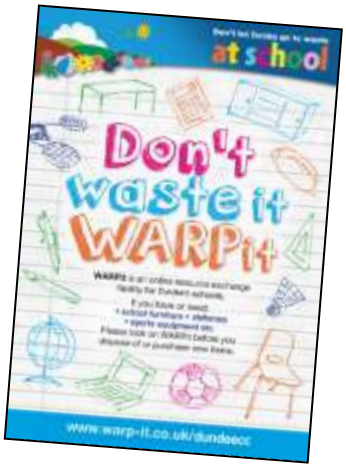
The public consultation on a deposit return scheme for Scotland received more than 3,000 responses from individuals and organisations, indicating the high level of public interest. The final scheme design has now been published and the Scottish Government laid the proposed Deposit and Return Scheme for Scotland Regulations 2020 before parliament in September 2019. It is anticipated that these regulations will be passed in early 2020 and that the Deposit Return Scheme will be operational by April 2021.

Action W.8: Support the Scottish Governments Deposit Return Scheme and other viable take back schemes.

Reuse and Repair

Thousands of tonnes of waste are thrown out by households each year and finding alternative uses by reusing and repairing can divert this waste and save carbon. There are a range of organisations in the city actively involved in re use and repair of a range of items including, textiles, furniture, bikes, electronic and white goods.

The **Baldovie Community Reuse Hub** was initially a pilot project between the Council, Tayside Re-Users, Transform and Dundee Social Enterprise Network. Items are saved from the skip and repaired, reducing waste. Since September 2015, approximately 238 tonnes of goods have been recovered. Following successful completion of the pilot, Tayside Reusers will be taking the project forward.



WARPit (Waste Action Re-Use Portal) is an online tool that makes it easy for organisations in Dundee to locate and obtain surplus resources (such as furniture, office consumables, electrical items, fixtures and fittings, books and technical equipment) thereby reducing procurement spend and waste disposal costs, as well as minimising waste and reducing associated carbon emissions.

Since launching in 2014, Dundee City Council's use of WARPit has saved over £320,000 in item replacement, waste disposal and procurement costs; 154 tonnes of CO_2 and 53 tonnes in waste disposal. Items totaling almost £69,000 have been donated to local charities.

A Tayside Charities WARPit account has also been established with over 20 members, through which charities and social enterprises across Dundee and the wider Tayside region can sign up, donate their surplus resources, and claim additional resources, for free. Not only is WARPit a great way to make the best of our region's resources through partnership working, but it will help to record and track our collective monetary and carbon savings.

Action W.9: Stimulate increased reuse as well as upcycling and repairing opportunities and the necessary skills and training to undertake these.

RESILIENCE

Objective: Ensure our communities, green networks and infrastructure are adaptable to a changing climate and reduce the risks and vulnerability to unavoidable impacts.

Why Take Action?

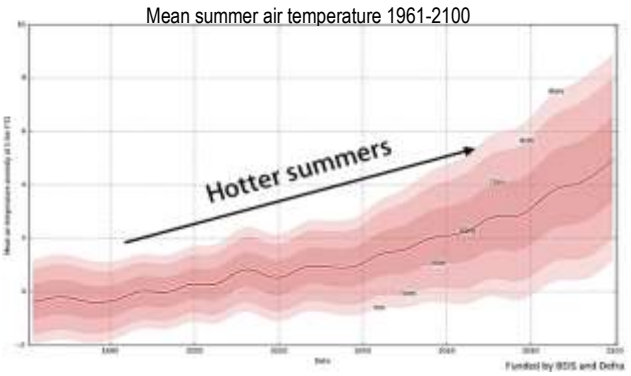
The experience of recent years has shown us that climate change and extreme weather events have already impacted many aspects of our natural environment and our society, including buildings and property, health, agriculture, forestry, transport, water resources and energy demand.

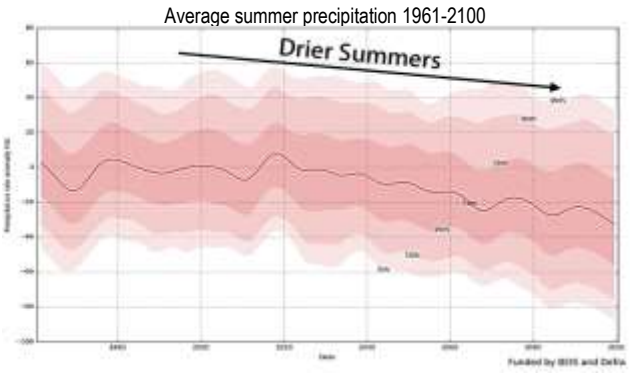
Climate Resilience concerns how we adjust these aspects to the impacts of climate change. This will require changes in processes, practices, and structures to moderate potential damages or to benefit from opportunities associated with climate change. Dundee will need to develop adaptation solutions and implement actions to respond to the impacts of climate change that are already happening, as well as prepare for future impacts.

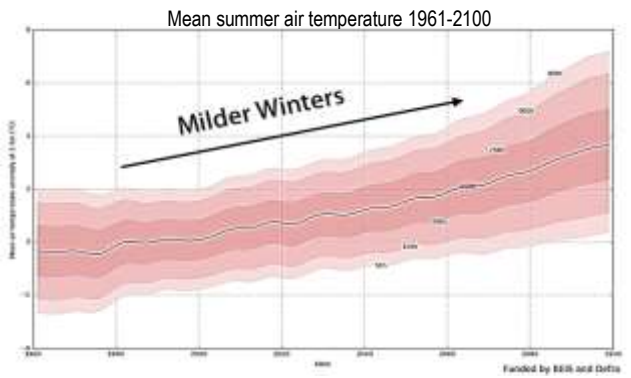
Future Climate in Dundee

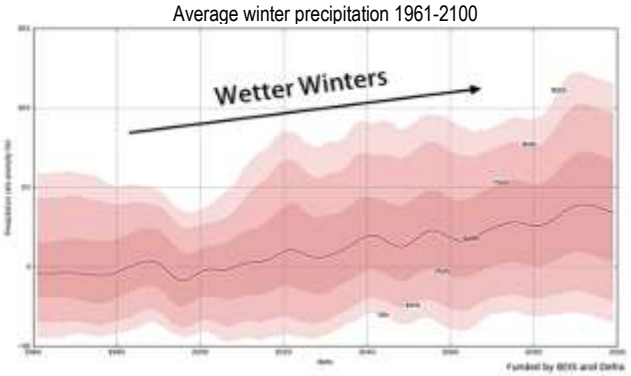
As shown in the graphs below, Dundee's climate is set to get warmer and drier in the summer and milder and wetter in the winter. It is also expected that Dundee will experience higher incidences of extreme weather events such as flooding and storms and a rise in sea level around the coast. What is considered a heatwave or extremely hot summer today will occur more frequently in future.

Figure 9: UKCP18 climate projections for Dundee









Climate Risk and Vulnerability Assessment

As required by the Covenant of Mayors, a Risk and Vulnerability Assessment of ten policy sectors was carried out in small workshops with key resources in each policy sector to determine the nature and extent of climate related risks in Dundee. Climate impacts were identified for each of the climate hazards/scenarios for the policy sectors with an estimate of how likely they are to occur, the level of impact and the timeframe for occurrence, short, medium or long term. The policy sectors and some examples of impacts are shown below.

Policy Sector	Examples of Impact(s)
Buildings	Increased demand for cooling and insulation, higher costs for repair and maintenance.
Transport	Damage to transport infrastructure, extreme weather impact on mobility, higher maintenance costs.
Energy	Damage to electrical infrastructure and power generation facilities.
Water	Increased water scarcity and drought, impacts upon flora and fauna, lower ground water recharge.
Waste	Damage to waste infrastructure and treatment facilities, site and access disruption, resource scarcity.
Land Use Planning	Urban heat island effect, erosion and floods, including coastal.
Environment & Biodiversity	Ecosystem degradation, species migration, insect infestation, habitat loss due to flooding, access to food.
Health	Increased disease and mortality rate, hygiene issues, increased incidence of injury.
Civil Protection & Emergency	Increased number of disasters/deployments, increased insurance costs.
Tourism	Decline in tourism and demand, closure of museums, increased maintenance costs, reduction in bathing water quality.

During this exercise, climate resilience actions were co-designed with stakeholders, including NHS Tayside, Scottish Water, SEPA and Scottish Natural Heritage. Many of the actions identified were already in progress by various organisations; some new actions were identified during the Climate Action Plan visioning event; and the remaining actions were devised in partnership with the stakeholders.

The full Risk and Vulnerability Assessment is available as a separate, supporting document to the Climate Action Plan.

The benefit of collaborating across sectors to co-design adaptation and resilience actions are that the actions are deliberated in a holistic, integrated manner, with due consideration given to "place". Going forward, this will mean designing urban areas with the people who use it, to creating a place with a strong identity, engaging successfully with its surrounding buildings, nature and activities. For example, when increasing green infrastructure, rather than designing this in isolation, this might be integrated with a new cycle route and contain planting that can withstand climate changes, increase biodiversity and reduce heat island impacts.

Resilience in Dundee

Infrastructure and Services

Designing infrastructure, building and services to be climate ready will involve **climate proofing** new developments as well as retrofitting adaptive measures, such as increasing cooling systems and protecting the built heritage of the city.

Since 2009, Councils in Scotland have had a duty to work towards a co-ordinated flood risk management plan. Studies have demonstrated that large areas of Broughty Ferry are at significant risk and during a 1 in 200 year event, extreme water levels in the River Tay would cause flooding. The estimated costs to residents, businesses and infrastructure would be in the region of £97 million with 450 properties at risk.

The £15m **Broughty Ferry Flood Protection scheme** is currently at detailed design stage and will see the construction of a new setback wall and gates along with a four metre wide combined cycle walkway running from Douglas Terrace to Broughty Castle. This scheme will also include soft flood protection measures utilising the existing sand dunes along Broughty Ferry Esplanade from the car park to the Glass Pavilion.

An investment of £6.9m has recently been made to construct set back walls and flood gates from the central waterfront to Dundee Airport which used local stone to minimise the carbon footprint and incorporated a combined cycle walkway.

Early collaboration with other sectors in the development of projects can ensure that opportunities to enhance biodiversity, water management and active travel are considered at the pre-design stage.

Dundee City Council is working closely with Scottish Water on an integrated catchment study to develop Surface Water Management Plans. This will include measures such as increasing permeability of surface, increasing blue and green infrastructure and improving urban drainage networks.

Scottish Water will increase their network to ensure sufficient drinking water is available, expanding to the River Tay in times of low flow. Rainwater harvesting and conservation techniques will help to provide additional back up, as well as help to reduce supply and treatment related carbon emissions and energy use. Increased use of renewables will ensure we are resilient to interruptions in energy supply and Business Continuity plans will be updated to incorporate climatic risks.

Action R.1:	Design a Dundee Surface Water Management Plan/Tayside Integrated Catchment Study that considers measures to reduce flood risk and protect buildings, infrastructure and people from flooding and includes blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Ecological solutions will be used where possible e.g. dune replenishment as part of Dundee Coastal Flood Protection Scheme.
Action R.2:	Undertake coastal and watercourse inspections and organise repairs and maintenance under current legislation and the Tay Estuary and Montrose Basin Local Flood Risk Management Plan.
Action R.3:	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via electronic display, SEPA website and Dundee City Council signage and social media.
Action R.4:	Scottish Water will review and develop its 25 Year Water Resource Plan to ensure projected drought conditions are included; incorporating reinforcement of reservoirs, expanding the supply network and developing mitigation measures as required.

Action R.5:	Monitor costs associated with climate change including heating and cooling costs as well as maintenance and repair costs or buildings and infrastructure.
Action R.6:	Promote efficient water use by businesses and the wider community and create a business case for rainwater capture and reuse capital investment.
Action R.7:	Implement 'Cleaner Air for Scotland - The Road to a Healthier Future' strategy and monitor guidance for developers to ensure air quality is taken into account for new developments.

Case Study: Broughty Ferry sand dune management

Soft engineering techniques are being utilised to restore and develop the dunes and act as a natural flood defence, avoiding the need for more costly wall structures or stone cores.

The height and width of the land side dunes will be increased at points to provide better flood protection. This involves removing the top layer of grasses and vegetation, importing sand and relaying the grasses which help stabilise the dune and provide a barrier to absorb wave energy.

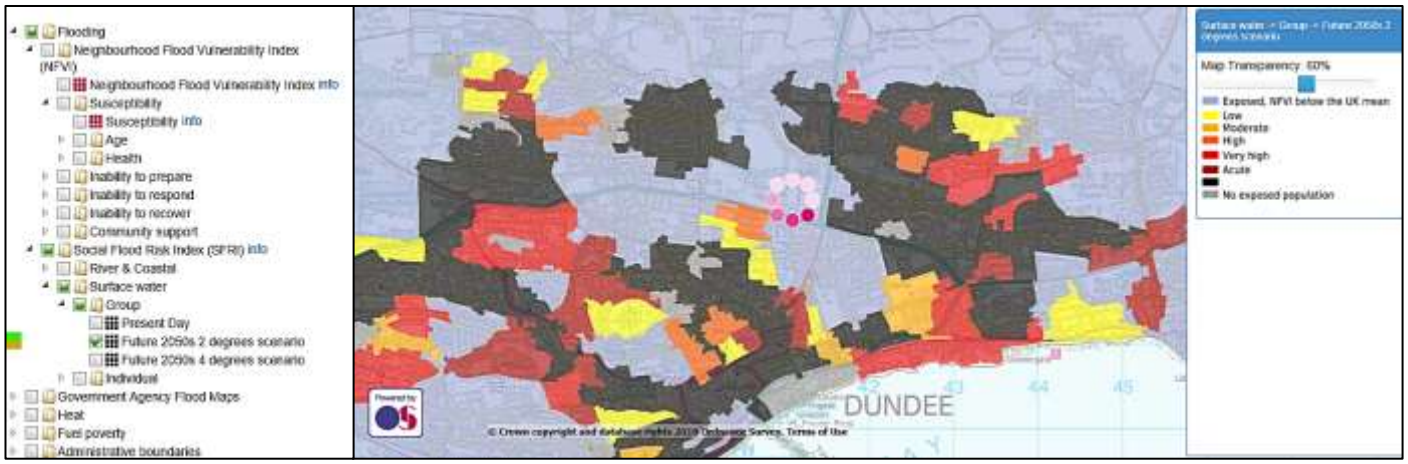
On the sea side of the dunes, chespale fencing will be used to trap moving sand and allow the dunes to grow out. It will also be used to create beach access points and prevent public access in order to help protect and stabilise the dunes and prevent erosion. These works will be complemented by a programme of planting new grasses and inspection regimes.

NHS Tayside are already experiencing increased demands on the service due to extreme weather events and a changing climate. Public health campaigns and regular testing and review of Winter Plans to prioritise services will be critical. The **Dundee Green Health Partnership** is one of four national pilot projects funded by Scottish Natural Heritage. In partnership with existing projects – Nature Based Interventions, NHS Tayside and developing referral pathways, it works on improving mental health and well-being using green spaces in Dundee.

Action R.8:	Public health information campaigns to address increase in sun/heat/air and water quality related illnesses and development of Green Health Partnership, linking health care and greenspace initiatives.
Action R.9:	Develop an interactive green map for Dundee to help visitors and residents identify sustainable options and information for travel, food, recreation and resource use.

SMART technology, such as that being developed for the waste and transport sectors in SMART cities, can help to ensure communication methods are prompt and wide-reaching, for example during transport interruptions, providing quicker demand response options for commuters and visitors to Dundee. New online tools such as **Climate Just** can also help us to identify vulnerable communities and future flood risk.

Figure 10: UKCP09 Climate Just mapping tool showing social flood risk in 2050 under a 2 degree warming scenario



If waste services are disrupted due to weather events there could be increases in litter and fly tipping and longer refuse runs. The **Take Pride in Your City campaign** will continue to encourage responsible litter behaviour whilst waste service operational contingencies will continue to be reviewed and updated. Waste reduction/circular economy education and activities will help to mitigate this.

Action R.10: SMART Mobility to include co-ordinated communication of transport information and quicker demand response options to keep visitors and residents informed of disruptions and alternatives.

Action R.11: Plan co-ordinated, prompt communication to inform residents of waste service disruptions, alternative options available and estimate of when normal services will resume; ensuring that operational contingencies are in place for extreme weather events.

Community Resilience

Ensuring Dundee is a truly resilient city, where communities feel empowered and connected, will be challenging. When broadening out from purely climatic impacts, resilience becomes even more challenging and complex, and will rely not only on our local communities working together but also on the emerging field of resilience science and the experience of other communities in order to find solutions that truly empower communities and do not just rely on physical adaptation measures.

Local Resilience Partnerships carry out considerable planning to ensure that communities, especially the vulnerable, are supported during events that may cause an interruption to services and utilities, e.g. storms and flooding. The Council also has robust Flood Emergency Plans in place and climate related risks are taken into account in the Council's Risk Register.

Communication will certainly be key to ensuring that Dundee is resilient to climate change. Whether it be engaging with communities to co-design resilient neighbourhoods or helping schools and businesses and communities prepare for future risks to health or climate hazards and possible interruptions to essential services, clever and effective methods of communication will be essential.

Action R.12: Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations.

Action R.13: Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services and regular testing and review of Local Resilience Partnership plans and NHS Winter Plans to prioritise services.

Action R.14: Update the Green Tourism accreditation to incorporate climate adaptation and increase the number of Green Tourism Award Holders in Dundee.

Case Study: Eco Schools

Eco-Schools is a global programme designed to encourage a whole-school approach to **Learning for Sustainability**, encouraging young people to engage in their environment by allowing them the opportunity to actively protect it. To earn a Green Flag Award, schools choose from 10 topics, ensuring that it is pupil-led, linked to the curriculum and the UN Sustainable Development goals.

Many schools in Dundee undertake wide-ranging activities related to sustainability and climate change, providing a significant opportunity to affect behaviour change as well as directly reducing resource use across buildings. Increasing Eco-Schools attainment has the potential to reap considerable benefits.

Dundee City Council is endeavouring to increase Eco-Schools Green Flag status by adopting a co-ordinated approach; ensuring schools are aware of local support available to them and how Eco-Schools can be easily integrated into their curriculum across many learning objectives. By supporting a small number of schools through the new process in a pilot project, we hope to encourage others to take part by demonstrating the new process and the benefits of taking part.

Action R.15: Increase participation in the Eco-Schools programme in Dundee via improved local support and pilot projects with appointed schools.

Green Networks and Biodiversity

The health of our natural environment is vulnerable to the effects of climate change with the delicate balance of ecosystems likely to be affected, transforming our habitats and biodiversity and adding to existing pressures. Some distinctive species may struggle and could be lost, invasive non-native species may thrive, while a degraded environment may not be able to sustain productive land or water supply if risks are not properly managed.

Over 40% of Dundee is publicly accessible greenspace, with our waterfront location stretching 16.5km along the Tay Estuary. The water quality of the Tay makes it one of the best major estuaries in Europe and supports biodiversity and habitats which have been recognised internationally and offered protection through a number of natural heritage designations.

One of our major underpinning aims is to care for the 'green lungs' of Dundee, to the benefit of citizens, visitors and biodiversity alike. More than 20 parks and greenspaces are annually assessed against the **National Green Flag criteria**, a number of which consider the impacts of climate change. 6 green spaces successfully attain a nation-wide Green Flag award.

It is important to ensure that as Dundee develops and adapts to change, people living, working, or visiting the city continue to have access to quality, connected, multifunctional and well managed green infrastructure.

This includes individual elements such as trees, woodlands, allotments, community growing spaces, sustainable drainage systems, waterways, footpaths, cycleways, parks and wildlife corridors.

The TAYplan and Local Development Plan for Dundee promote policies to connect these individual elements into a multifunctional green network in order to improve environmental quality, link and create wildlife habitats, protect existing features and provide a range of opportunities for leisure and recreation.

The **Dundee Green Network**, was identified in a collaborative project between the Council and Scottish Natural Heritage. The Dundee Green Circular and the Dighty Wildlife Corridor are important green assets in the City and essential parts of the Dundee Green Network.

New development offers an opportunity for the Council to work with its partners to strengthen and extend the network of green infrastructure. Developers will also be expected to play a key role in the improvement of the network by incorporating green and blue infrastructure into development which is consistent with the advice set out in the Dundee Green Network Planning Guidance.

Action R.16: Co-design blue/green infrastructure improvements in partnership with relevant departments and the wider community. Aligning with Dundee City Councils green networks supplementary planning guidance; improvements will into account flooding, heat island effect, active travel, biodiversity and including appropriate planting in urban areas, as well as community cohesion opportunities.

Action R.17: Produce an Open Space strategy based on collaboration and outcomes from workshops to include green infrastructure that helps Dundee's nature to adapt to changes in climate and supports the delivery of Dundee's green networks.

Preventing biodiversity loss as well as increasing biodiversity in the city will be the main objectives of the new Biodiversity Plan; and for this to happen, biodiversity needs to be incorporated into decision making across all sectors. Enhancing habitats, improving monitoring and changing green space maintenance regimes to favour biodiversity are one part of the picture.

Creating climate proof habitats will be taken into account in new developments and infrastructure improvements. For example, improving flood defences at Broughty Ferry will involve replenishing the dunes, thus enhancing coastal habitats.

Dundee's trees and woodlands have a multi-faceted role in helping to both mitigate carbon emissions and adapt to climate change by improving the quality of our air, cooling our warming city, reducing the risk of flooding as well being an excellent store of carbon. A warmer wetter climate will pose significant risks to

tree health through extreme weather events or increased spread of pest and diseases which highlight the importance of positive management of our trees and woodlands over the long-term.

Action R.18: Prepare a Biodiversity Plan that includes actions for safeguarding and enhancing existing habitats and species, ensures biodiversity is prioritised in green space maintenance and that new biodiversity developments are climate proof where possible.

Action R.19: Contribute to the enhancement and maintenance of the Tay River and coastal habitats. Identify opportunities for soft coastal management /managed realignment habitat creation and maintain the Beach Award for Broughty Ferry.

Action R.20: Monitor and review the Urban Tree Policy to identify suitable areas for tree planting with climate appropriate species and with consideration of how planting interacts with surroundings e.g. air quality, active transport, biodiversity etc.

Community food growing is one of the best ways to increase neighbourhood resilience, empowering people to work together to produce their own resources, share with others and build relationships and support networks.

In 2014, funding was made available to develop growing spaces, with local projects now established in Menzieshill, Douglas, Lochee, Ardler, Charleston and Maryfield and work ongoing with the local community to establish a growing space in Fintry.

Action R21: Develop a Local Food Growing Strategy and support and encourage communities to establish growing projects in their local areas.

5. DELIVERING THE CLIMATE ACTION PLAN

Action Plan

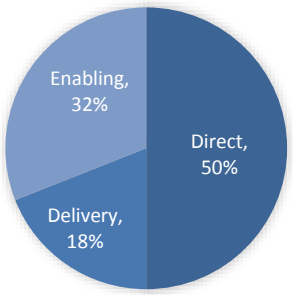
The Plan will be delivered through the four themes of Energy, Transport, Waste and Resilience with each theme including an initial set of actions (Annex 1) to reduce emissions or adapt to a changing climate, taking into account existing projects, stakeholder priorities and national initiatives.

Three types of actions have been defined:

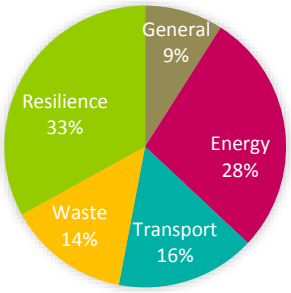
- Those that have **direct** impact on emissions and resilience, such as an energy efficiency programme.
- Those that help to **deliver** or implement the direct actions, such as undertaking research, securing funding, measuring and monitoring.
- Those that **enable** the delivery of actions such as developing governance and project management frameworks.

64 actions have been identified for the Climate Action Plan and are split as shown below:

Split of actions by type



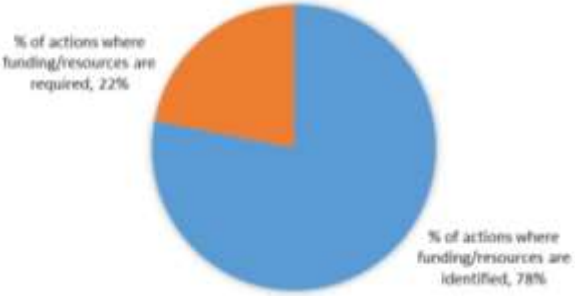
Split of actions by theme



Funding and Resourcing

The successful delivery of the Plan's actions will depend on appropriate levels of funding and resources being in place. It is stressed that these actions represent **a mix of committed and desired interventions** across stakeholders, with many actions already having funding committed, whilst others will require feasibility studies or business cases in the first instance to determine their viability and funding to be secured to make them happen. This is particularly the case for some of the larger projects.

What is clear is that significant additional investment will be needed for a number of projects if the targets are to be met. All stakeholders are therefore committed to exploring potential sources of funding through existing avenues as well any innovative approaches to ensuring projects can be delivered.



The Climate Action Plan is a city wide plan, not just a Council document. It is essential that all stakeholders play their part in proposing and taking forward actions. The action plan will therefore constantly evolve and change to reflect ongoing engagement and the adoption of further actions from other stakeholders to support the Plan.

Governance

Successful implementation of the Climate Action Plan will require governance at both strategic and action level. Dundee City Council's Sustainability and Climate Change Team will fulfil a co-ordinating role to oversee progress.

To ensure the Council is effectively contributing to the implementation of the Plan it has set up an internal Sustainable Dundee Working Group (SDWG) to encourage collaboration across its own services. With a large pool of expertise to draw upon, there is clear articulation of issues and opportunities with shared ownership of solutions and responses; providing a broader scope and greater momentum in support of sustainability projects.

It is proposed that an annual Climate Action Plan all-stakeholder day be organised, where the public, private, third sectors can meet to review the Plan, check progress with targets and actions and adopt any new measures that will help to meet the long term target.

Action G.3: Establish effective Climate Action Plan governance in partnership with public, private and community organisations and implement a system for monitoring and reporting progress.

Monitoring & Reporting

The Climate Action Plan sets out our long term pathway across the four themes and the action plan highlights the initial steps we will be taking along the way. However, we cannot be sure what the future of our energy system will look like, given emerging technologies and increasingly localised energy systems. To take account of the anticipated changes, we will review progress regularly and evolve the plan over time reflecting changes to legislation, best practice and attitudes.

Monitoring of individual projects will be undertaken by project leaders and reported on a six monthly basis via Dundee City Council's performance management system (PENTANA). Annual monitoring reports will be prepared for the Council's Policy and Resources Committee outlining progress on action plan projects.

We will also explore new carbon footprint visualisation tools that can be used to model future emissions scenarios and interventions in Dundee and help measure progress in meeting our targets.

For the Covenant of Mayors requirements, a more in-depth report will be prepared every two years accompanied by a MEI using latest data available. This will monitor every action for progress and evaluate the quantifiable reductions in carbon emissions where possible.

Communications

Stakeholder engagement and statutory consultations have been undertaken to develop the Climate Action Plan. Further engagement will be necessary to raise awareness to all stakeholders as it is implemented. We will develop a communications plan to allow a coordinated approach for ongoing engagement and consultation to ensure people can follow progress and find out about climate change activities in Dundee.

Our main platforms for communication will be the Knowledge Hub, Dundee City Council website (www.dundeecity.gov.uk/sustainable-dundee), and the Sustainable Dundee (**@sust_dundee**) and Dundee City Council (**@dundeecouncil**) Twitter accounts.

Sustainable Dundee is a brand and campaign developed by Dundee City Council to raise awareness of, and link up, sustainability and climate change issues and progress, both internally and to the wider community. The branding visibly demonstrates relationships between the four themes of the Plan.

The logo will feature throughout internal and external webpages containing related information as well as printed publications from the various sections involved, acknowledging the position of such projects within a broader 'vision' or goal. The brand retains its own individual Twitter account (@sust_dundee), allowing us to reach a wider audience.

Action G.4:	Develop the Sustainable Dundee communications strategy to raise awareness, communicate and engage people in the Climate Action Plan to promote prolonged behaviour change.
Action G.5:	Friends of the Earth Tayside will raise public awareness of the causes and implications of climate change, and seek to influence people's behaviour, through campaign activity, media coverage, and collaboration with other organisations.
Action G.6:	Friends of the Earth Tayside will lobby (with others where appropriate) for policies and actions by the public, private and voluntary sectors which will contribute towards reductions in greenhouse gas emissions and help build resilience to the impacts of climate change.

Contact

Email: sustainability@dundeecity.gov.uk
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Twitter: @sust_dundee
Knowledge Hub: .net/group/dundee-city-sustainable-energy-and-climate-action-plan

Annex 1: Action Plan

Targets with tbc are to be confirmed when potential carbon savings or other relevant factors have been assessed.

GENERAL

	Action	Lead Agency	Partners	Type of Action	Funding in Place
G.1	Adopt an emissions modelling tool to quantify the impact of Climate Action Plan actions, to inform future targets and present data in an interactive way.	Dundee City Council	Sustainable Scotland Network	Delivery	No
G.2	Develop and trial a carbon budget for Dundee City Council and encourage other organisations in the city to prepare carbon reduction plans.	Dundee City Council	Dundee Partnership	Delivery	No
G.3	Establish effective governance for the Climate Action Plan in partnership with public, private and community organisations and implement a system for monitoring and reporting progress.	Dundee City Council	Dundee Partnership	Enabling	Yes
G.4	Develop the Sustainable Dundee communications strategy to raise awareness, communicate and engage people in the Climate Action Plan to promote prolonged behaviour change.	Dundee City Council	Dundee Partnership	Delivery	Yes
G.5	Friends of the Earth Tayside will raise public awareness of the causes and implications of climate change, and seek to influence people's behaviour, through campaign activity, media coverage, and collaboration with other organisations.	Friends of the Earth Tayside	Dundee Green Groups, Dundee City Council	Delivery	Yes
G.6	Friends of the Earth Tayside will lobby (with others where appropriate) for policies and actions by the public, private and voluntary sectors which will contribute towards reductions in greenhouse gas emissions and help build resilience to the impacts of climate change.	Friends of the Earth Tayside	Dundee Green Groups,	Delivery	Yes

ENERGY

	Action	Lead Agency	Partners	Proposed Performance Indicators (where applicable)	Targets (where applicable)	Type of Action	Link to SDG's	Funding in Place
E.1	Adopt a Whole Life Costing approach to ensure new developments achieve greater operational sustainability. (This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste.)	Dundee City Council		• Number of new developments designed by whole life costing principles.		Enabling/ Delivery	9, 11, 12, 13	No
E.2	Complete fabric improvements to outstanding domestic Council (and ex-Council properties in mixed-tenure blocks) stock to achieve the Energy Efficiency Standard for Social Housing (EESSH) by 2020 and widen range of technologies (including renewables) under consideration to allow compliance with the more exacting EESSH2 standard by 2032.	Dundee City Council	Public and private partnerships	• Energy savings (kWh/a) attributed to External Wall Insulation (EWI) and other fabric improvements to domestic housing stock. • % council houses achieving Energy Efficiency Standard for social housing. • % Reduction in fuel poverty in all tenure households.	• 100% social housing to achieve EESSH.	Direct/ Delivery	1,7, 11,13	Yes
E.3	Continue to deliver a city-wide energy awareness campaign to improve energy efficiency behaviour in all households.	Home Energy Scotland	Housing Associations, Dundee City Council	• Number of households engaged. • Number of measures implemented. • Energy savings (kWh/a) attributed to improved energy efficient behaviour in households.	• tbc	Direct	1,7,11, 12,13	Yes
E.4	Explore how the work of the Dundee Energy Efficiency Advice Project (DEEAP) can be maintained and delivered.	Dundee City Council	Home Energy Scotland	• Number of home visits by DEAAP advisors.		Enabling	1, 13, 17	No
E.5	Complete phase 1 of the Non Domestic Energy Efficiency (NDEE) retrofit of Dundee City Council public buildings (Basket 1) before implementing subsequent phases	Dundee City Council		• Energy savings (kWh/a) attributed to NDEE measures.	• 5% reduction in energy use in public buildings	Direct	7, 11, 12, 13	Yes for Baskets 1 and 2.

	(Baskets) annually until all prescribed measures are complete on all Council public buildings.			• Number of non-domestic properties upgraded. • Energy consumption in Council buildings (tCO_2e)	per annum by 2020. • NDEE applied to all Council public buildings with significant energy use by 2030.			
E.6	Update the Councils Carbon Management Plan, identifying new targets in line with the Public Bodies Climate Change Duties (PBCCD) and Climate Action Plan targets.	Dundee City Council	Scottish Government	• % reduction in Council emissions.	• tbc	Delivery	1, 7, 9, 11, 12, 13	Yes
E.7	Replace all streetlights with energy efficient lighting systems by 2020 and explore opportunities for future smart intelligent lighting.	Dundee City Council		• Energy savings (kWh/a) attributed to conversion to LED streetlights. • % streetlights converted.	• Replace all streetlights with energy efficient lighting systems by 2020.	Direct	11, 12, 13	Yes
E.8	Provide advice and support on resource efficiency and climate risk management for businesses in Dundee.	Resource Efficient Scotland	Dundee and Angus Chamber of Commerce, Scottish Enterprise, Dundee City Council	• Number of businesses engaged. • Number of measures implemented. • Energy savings (kWh/a) attributed to improved energy efficient behaviour in businesses.	• tbc, (identify potential energy savings).	Direct	11, 12, 13	Yes
E.9	Identify solar PV opportunities across Dundee for public and private buildings and ensure all civic buildings have renewables where technically feasible.	Dundee City Council	Businesses, private energy companies	• Energy generation (kWh/a) attributed to solar PV in civic buildings. • KWp installed capacity in civic buildings. • Energy generation (kWh/a) attributed to solar PV in private buildings.		Enabling/ Direct	7, 9, 11, 13	No
E.10	Implement the Joint Initiative for Hydrogen Vehicles Across Europe (JIVE 2) hydrogen bus project, deploying 12 hydrogen fuel buses into operation in Dundee and creating a local fuel and maintenance station.	Dundee City Council	Scottish Government, Public and private partnerships	• Number of hydrogen fuel cell buses deployed in Dundee.		Direct/ Enabling	7, 8, 9, 11, 12, 13, 17	Yes
E.11	Research opportunities to utilise local water bodies for renewables including local reservoirs, rivers and estuaries.	Dundee City Council/ private energy sector				Direct/ Enabling	7, 9, 11, 13,	No
E.12	Develop a regional cluster approach to attract investment, support business growth and create jobs in the offshore wind sector; retaining more graduates and making the city a magnet for new talent.	Dundee City Council/ private enterprise			• tbc	Enabling	7, 8, 9, 11, 13, 17	Yes
E.13	Explore options to further improve efficiencies in the Council's existing Multi-Storey domestic district heating schemes.	Dundee City Council		• Energy savings (kWh/a) attributed to improvements in MSD DHS.		Direct	1, 7, 10, 13	No
E.14	Deliver the Low Carbon District Energy Hub at the Regional Performance Centre for Sports as a catalyst project; proving industry/technology programmes and projects.	Dundee City Council	Scottish Government	• Proportion of energy generation (kWh/a) at RPCS attributed to low carbon technology.		Direct	7, 8, 9, 10, 11, 13	Yes
E.15	Prepare an investment-ready business case that identifies district heating opportunities from the city's Energy from Waste Combined Heat and Power facility.	Dundee City Council	Scottish Government, MEB Environment Ltd	• Energy savings (kWh/a) realised by connected properties.		Enabling	7, 8, 9, 11, 13, 17	Yes

E.16	Engage with stakeholders and wider industry to promote district heating in Dundee and work with technology providers to explore the potential for integrating hydrogen fuel as a source of low carbon heat.	Dundee City Council/ private energy sector		• Number of district heating schemes in Dundee. • Energy generation (kWh/a) attributed to hydrogen fuel.		Direct/ Enabling	7, 8, 9, 10, 11, 13, 17	Yes
E.17	Investigate options to create a Dundee City Energy Services Company (ESCo) to help coordinate planning, funding, operations, and delivery of projects.	Dundee City Council/ private energy/ transport companies				Enabling	7, 8, 9, 10, 11, 13, 17	No
E.18	Participate in the Scottish Governments pilot Local Heat and Energy Efficiency Strategy (LHEES) programme and respond to proposals to create a statutory framework for LHEES.	Dundee City Council	Scottish Government, private energy sector	• Energy savings (kWh/a) attributed to implementation of LHEES interventions.		Direct	7, 10, 11, 13, 17	Yes for pilot.

TRANSPORT

	Action	Lead Agency	Partners	Proposed Performance Indicators (where applicable)	Targets (where applicable)	Type of Actions	Link to SDG's	Funding in Place
M.1	Implement the Dundee Cycling Strategy and Councils Active Travel programme in partnership with community groups, improving and increasing cycling paths and infrastructure across the city to reduce the modal share of car based transport.	Dundee City Council	Local community groups	• Active travel as a proportion of trips to work (as measured by the Scottish Household Survey).	• Increase no. of journeys made by bike annually in Dundee by 100% by 2021. • Increase the no. of children who cycle to school by 100% by 2021	Direct	3, 10, 11, 13	Yes
M.2	Develop a Low Carbon Active Travel Hub in Dundee Waterfront to include bike hire, cycle parking, bike maintenance, electric vehicle (EV) charge points, an EV car club and community outreach.	Dundee City Council/ private enterprise				Enabling	3, 10, 11, 13	Yes
M.3	Implement Shared Mobility and Resource Efficiency projects developed by the Mobility in Living Laboratory (MILL) to ensure Dundee remains in a position to take advantage of future innovative mobility solutions including autonomous vehicles.	Urban Foresight	Dundee City Council	• Number of innovative (shared mobility) services introduced in the city (Outcomes based indicators being developed).		Direct/ Enabling	3, 10, 11, 13	Yes
M.4	Ensure safer streets that enable active travel in Dundee including assessing suitable locations for pedestrianisation, 20mph zones and off road/segregated active travel networks.	Dundee City Council				Enabling	3, 10, 13	Yes
M.5	Develop and implement proposals for new Park & Ride sites to the south, west, east and north of Dundee and explore the provision of active travel options for these.	TACTRAN/Dundee City Council	Transport Scotland			Direct	3, 8, 9, 11, 13	No
M.6	Expand Electric Vehicle (EV) charging hubs and infrastructure across the city.	Dundee City Council	Transport Scotland	• (KWh/a) consumption at EV public charging points. Number of solar charging points.	• 7 charging hubs by the end of 2020.	Enabling	3, 11, 13	Yes
M.7	Increase EV uptake in Dundee via support and awareness provided by the Drive Dundee Electric campaign and local policy measures, including continued migration to low carbon vehicles within the council fleet.	Dundee City Council	Public and private sector	• KWh/a consumption at EV public charging points. • Number of solar charging points. • % EV's in Dundee	• 25% increase in electric fleet vehicles by the end of 2020.	Direct	3, 11, 13	Yes
M.8	Establish a Low Emission Zone in Dundee by 2020 to contribute to the broader city objectives and the vision to create a healthy, vibrant and attractive city by protecting public health through improving air quality.	Dundee City Council	Transport Scotland, SEPA, SYSTRA, TACTRAN, NHS Tayside	• NO_2, PM_{10} and $PM_{2.5}$ levels. • Compliance with regulatory thresholds.	• NO_2 – annual mean 40ug/m3 , hourly; mean 200ug/m3 (not to be	Direct	3, 11, 13	Yes

					exceeded > 18 times per yr) • PM_{10} – annual mean 18ug/m3, 24hour mean 50ug/m3 (not to be exceeded > 7 times per yr) • $PM_{2.5}$ – annual mean 10ug/m3			
M.9	Continued promotion of ECOSTARS schemes to encourage Heavy Duty, Taxis and Private Hire vehicle companies to participate in air quality improvements in Dundee.	Dundee City Council/ private vehicle companies		• Increase in ECOSTARS membership.		Delivery	3, 11, 13, 17	Yes
M.10	Explore options for increasing deployment of low emission buses in Dundee, including hybrid and hydrogen buses.	Dundee City Council, bus companies,	Transport Scotland, Scottish Cities Alliance	• Number of low carbon buses in operation in Dundee • CO_2 (tCO_2e) reduction as a result of low carbon buses		Direct	3, 11, 13, 17	No

WASTE

	Action	Lead Agency	Partners	Proposed Performance Indicators (where applicable)	Targets (where applicable)	Type of Actions	Link to SDG's	Funding in Place
W.1	Develop and implement circular economy projects identified by the Circular Tayside initiative and deliver a circular economy education strategy across the city.	Zero Waste Scotland	Dundee and Angus Chamber of Commerce, 3rd sector and private sector organisations			Direct	8, 9, 11, 12, 13	Yes
W.2	Continue to communicate frequently with residents around waste/recycling services to improve participation/recyclate quantity and quality.	Dundee City Council		• % Household waste recycled/composted.		Direct	11, 12, 13	Yes
W.3	Zero Waste Scotland to pilot food waste reduction project in Dundee schools, hospitals and small businesses by December 2020.	Zero Waste Scotland		• % (by weight) of biodegradable waste diverted from WtE for recycling. tCO_2e reduction due to waste disposal avoided).		Direct	11, 12, 13	Yes
W.4	Encourage citizens to take responsibility for the environment through the "Take Pride in Your City" campaign.	Dundee City Council		• Costs of clean-up and litter picking.		Enabling	3, 11, 12, 13, 15	Yes
W.5	Trial Smart waste technology to improve waste monitoring and collection efficiencies in the city.	Dundee City Council				Direct	9, 11, 12, 13	Yes
W.6	Explore initiatives to significantly reduce the quantity of single-use plastics used in Dundee organisations including DCC premises and wider commercial establishments.	Dundee City Council				Enabling	12, 13	No
W.7	Continued delivery of sustained waste education campaign programme which aligns to the curriculum for excellence and embeds behavioural change at all stages of the educational journey.	Dundee City Council				Enabling	11, 12, 13	Yes
W.8	Support the Scottish Governments Deposit Return Scheme and other viable take back schemes.	Scottish Government	Dundee City Council			Direct/ Enabling	11, 12, 13	Yes
W.9	Stimulate increased reuse as well as upcycling and repairing opportunities and the necessary skills and training to undertake these.	Dundee City Council, Tayside Reusers, public and 3rd sector organisations		• % (by weight) of materials diverted from disposal for re-use. (TBC) (CO_2 (tCO_2e) reduction due to waste disposal avoided).		Direct	8, 9, 11, 12, 13, 17	No

RESILIENCE

	Action	Lead Agency	Partners	Proposed Performance Indicators (where applicable)	Targets (where applicable)	Type of Action	Link to SDG's	Funding in Place
R.1	Design a Dundee Surface Water Management Plan/Tayside Integrated Catchment Study that considers measures to reduce flood risk and protect buildings, infrastructure and people from flooding and includes blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Ecological solutions will be used where possible e.g. dune replenishment as part of Dundee Coastal Flood Protection Scheme.	Dundee City Council	SEPA, Scottish Water, Scottish Natural Heritage	• Number of flood events. • Number of buildings impacted by flood events. • Number of people affected by flood events. • Infrastructure impacted by flood events.		Delivery	6, 9, 11, 13, 14, 15	Yes
R.2	Undertake coastal and watercourse inspections and organise repairs and maintenance under current legislation and the Tay Estuary and Montrose Basin Local Flood Risk Management Plan.	Dundee City Council	SEPA			Direct	6, 9, 11, 13, 14, 15	Yes
R.3	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via electronic display, SEPA website and Dundee City Council signage and social media.	SEPA	Scottish Water, Dundee City Council	• Reduction in number of storm sewer discharges to the water environment.		Direct/ Enabling	6, 9, 11, 13, 14, 15	Yes
R.4	Scottish Water will review and develop its 25 Year Water Resource Plan to ensure projected drought conditions are included; incorporating reinforcement of reservoirs, expanding the supply network and developing mitigation measures as required.	Scottish Water		• % increase in supply network.		Direct	6, 9, 11, 13, 14, 15	Yes
R.5	Monitor costs associated with climate change including heating and cooling costs as well as maintenance and repair costs or buildings and infrastructure.	Dundee City Council		• Costs associated with heating and cooling.		Delivery	11, 13	Yes
R.6	Promote efficient water use by businesses and the wider community and create a business case for rainwater capture and reuse capital investment.	Scottish Water	Resource Efficient Scotland, Dundee City Council	• % reduction in water consumption. • Grey water recycling / rainwater harvesting per % of total consumption. • Water consumption in litres and associated supply and treatment energy savings (kWh/a) generated by water efficiency campaign.	• tbc awaiting SW/carbon assessment	Direct	12	Yes
R.7	Implement 'Cleaner Air for Scotland – The Road to a Healthier Future' strategy and monitor guidance for developers to ensure air quality is taken into account for new developments.	Dundee City Council		• Reduction in NO2, PM2.5 and PM10. • Percentage of the total planning applications responded to with air quality conditions/ assessments.	• Annual mean PM2.5 concentration • 10 µg/m3 by the end of 2020.	Direct	3, 11, 13	Yes
R.8	Public health information campaigns to address increase in sun/heat/air and water quality related illnesses and development of Green Health Partnership, linking health care and greenspace initiatives	NHS Tayside	Green Health Partnership	• Number of water quality related illnesses. • Number of heat related illnesses. • Number of air quality related illnesses. • Number of sun related injuries/illnesses. • Increase in reported atopic diseases.	• No more than 10% increase in any one year.	Direct	3, 11, 13, 17	Yes
R.9	Develop an interactive map for Dundee to help visitors and residents identify sustainable options and information for travel, food, recreation and resource use.	Dundee City Council				Delivery	3, 11, 12, 13	Yes

R.10	SMART Mobility to include co-ordinated communication of transport information and quicker demand response options to keep visitors and residents informed of disruptions and alternatives.	Urban Foresight	Private transport companies, Dundee City Council	• Number of climate related transport disruptions that require a response. • Average time taken to disseminate transport updates to multiple channels.		Enabling	11, 13, 17	Yes
R.11	Plan co-ordinated, prompt communication to inform residents of waste service disruptions, alternative options available and estimate of when normal services will resume; ensuring that operational contingencies are in place for extreme weather events.	Dundee City Council				Enabling	12, 13	Yes
R.12	Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations.	Dundee City Council	Dundee Partnership	• Number of engagement events/activities. • Number of people engaged. • Positive feedback from events.		Delivery	10, 11, 13, 17	No
R.13	Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services and regular testing and review of Local Resilience Partnership plans and NHS Winter Plans to prioritise services.	Local Resilience Partnership				Enabling	3, 11, 13, 17	Yes
R.14	Update the Green Tourism accreditation to incorporate climate adaptation and increase the number of Green Tourism Award Holders in Dundee.	Green Tourism Accreditation Scheme		• Number of businesses provided with climate adaptation support/information. • Number of Green Tourism Award holders in Dundee.		Enabling	11, 12, 13	No
R.15	Increase participation in the Eco-Schools programme in Dundee via improved local support and pilot projects with appointed schools.	Dundee City Council	Keep Scotland Beautiful	• % of schools participating in Eco-Schools in Dundee.	• tbc	Enabling	4, 5, 6, 7, 10, 11, 12, 13, 14, 15, 16	Yes
R.16	Co-design blue/green infrastructure improvements with relevant Council departments, partners and the wider community. Aligning with Dundee City Councils green networks supplementary planning guidance; improvements will into account flooding, heat island effect, active travel, biodiversity and including appropriate planting in urban areas, as well as community cohesion opportunities.	Dundee City Council	Dundee Partnership	• Evaluate success of co-designing and delivering better quality blue/green infrastructure.	• tbc	Delivery	3, 9, 11, 13, 15, 17	Yes
R.17	Produce an Open Space strategy based on collaboration and outcomes from workshops to include green infrastructure that helps Dundee's nature to adapt to changes in climate and supports the delivery of Dundee's green networks.	Dundee City Council	Dundee Partnership	• % of residents who were satisfied with the quality and maintenance of open spaces		Delivery	3, 9, 11, 13, 15, 17	Yes
R.18	Prepare a Biodiversity Plan that includes actions for safeguarding and enhancing existing habitats and species, ensures biodiversity is prioritised in green space maintenance and that new biodiversity developments are climate proof where possible.	Dundee City Council	Scottish natural heritage, local community groups	• Actions implemented from the biodiversity plan.		Enabling	11, 13, 14, 15	Yes
R.19	Contribute to the enhancement and maintenance of the Tay River and coastal habitats. Identify opportunities for soft coastal management /managed realignment habitat creation and maintain the Beach Award for Broughty Ferry.	Dundee City Council	Scottish natural heritage, local community groups	• Area of river/coastal habitat enhanced/managed for biodiversity and flood management. • Actions implemented from the Biodiversity Plan.		Direct	11, 13, 14, 15	Yes

R.20	Monitor and review the Urban Tree Policy to identify suitable areas for tree planting with climate appropriate species and with consideration of how planting interacts with surroundings e.g. air quality, active transport, biodiversity etc.	Dundee City Council				Enabling	3, 11, 13, 15	Yes
R.21	Develop a Local Food Growing Strategy and support and encourage communities to establish growing projects in their local areas.	Dundee City Council	Community groups	• Number of community food growing projects in Dundee.		Direct	1, 2, 3, 10, 11, 12, 13, 15, 16, 17	Yes

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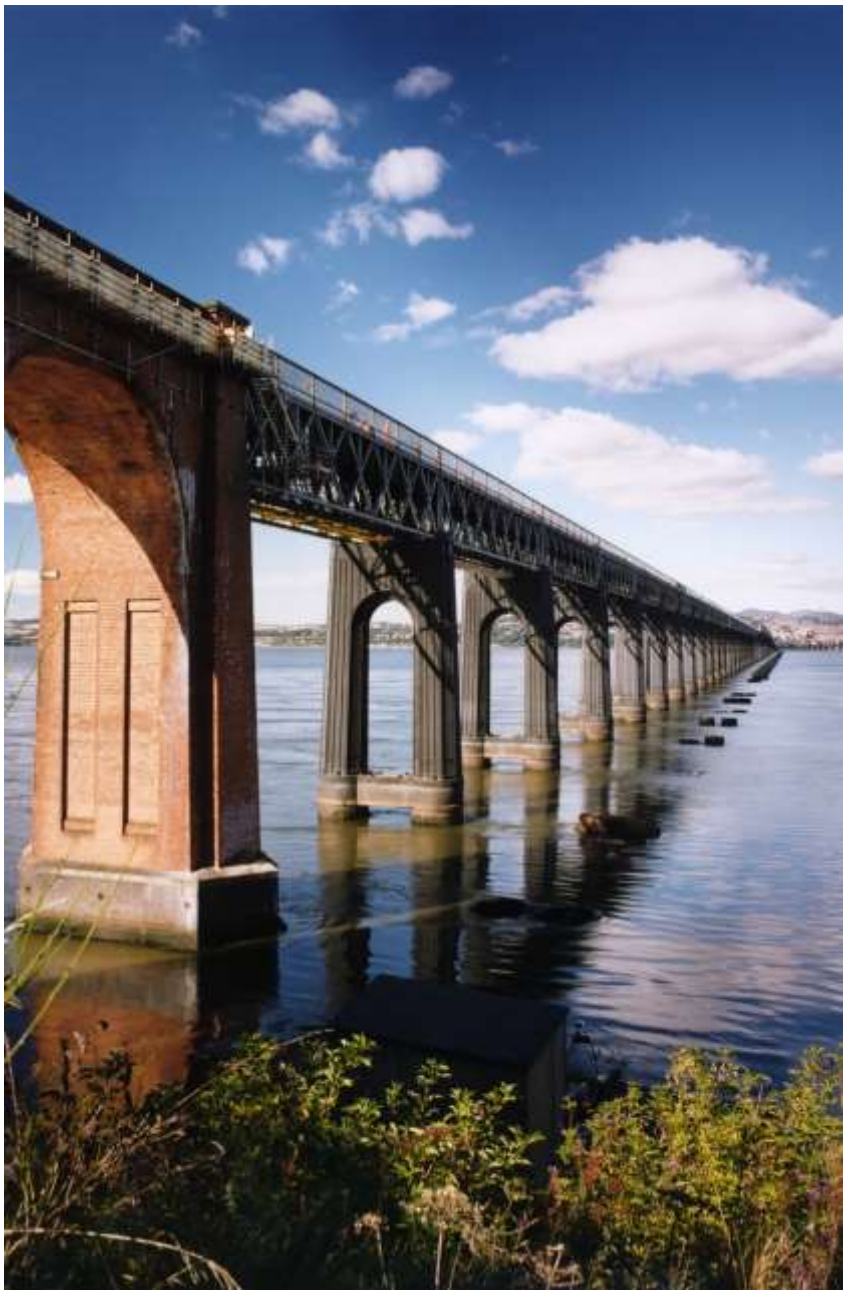
Adaptation Scotland
Aether
Dundee & Angus Chamber of Commerce
Dundee and Angus College
Dundee City Council
Dundee Naturalists' Society
Dundee Resource and Re-use Centre
Dundee Voluntary Action
Extinction Rebellion Dundee
Friends of the Earth Tayside
Forth Ports
Gate Church Carbon Saving Project
Green Health Partnership
Hillcrest Housing Association
Home Energy Scotland
Kirkton Community Partnership
Leisure & Culture Dundee
Michelin
NHS Tayside
Open Change
Scottish Cities Alliance
Scottish Enterprise
Scottish Environment Protection Agency
Scottish Hydrogen & Fuel Cell Association
Scottish Natural Heritage
Scottish Water
Scottish Wildlife Trust
SNIFFER
Stagecoach East Scotland
Sustainable Scotland Network
TACTRAN
Tayside Re-Users
University of Abertay
University of Dundee
Urban Foresight
Xplore Dundee
Zero Waste Scotland



Glossary

Adaptation	The adjustment in economic, social or natural systems in response to actual or expected climatic change, to limit harmful consequences and exploit beneficial opportunities.
BEI	Baseline Emissions Inventory. Identifies and quantifies the main sources of greenhouse gas emissions in a starting year.
Biodiversity	The variety plant and animal life on the planet and the surroundings they live in.
Carbon capture and storage	A process of capturing waste carbon dioxide usually from large point sources, such as a cement factory or biomass power plant, transporting it to a storage site, and depositing it where it will not enter the atmosphere, normally an underground geological formation. The aim is to prevent the release of large quantities of carbon dioxide into the atmosphere from heavy industry.
Carbon emissions	Release of CO_2 into the atmosphere.
Carbon footprint	A measure of the carbon emissions produced as a result of an organisation's or service's activities.
Carbon intensity	The emissions per unit of electricity generated (often given in grams of CO_2 per kWh).
Carbon neutral	Achieved when CO_2 emissions are balanced by CO_2 removals over a specified period.
Committee on Climate Change.	An independent, statutory body established under the Climate Change Act 2008 to advise the UK Government and Devolved Administrations on emissions targets and report to Parliament on progress made in reducing greenhouse gas emissions and preparing for climate change.
CHP	Combined Heat and Power.
Circular economy	An alternative to a traditional linear economy (make, use, dispose) in which resources are kept in use for as long as possible, the maximum value is extracted from them whilst in use, then products and materials are recovered at the end of each service life.
Climate change	Any change in climate over time, whether due to natural variability or as a result of human activity.
Covenant of Mayors for Climate and Energy	An international alliance of cities and local governments with a shared commitment to accelerate ambitious, measurable climate and energy initiatives that lead to a low-emission and climate resilient future, helping to meet and exceed the Paris Agreement objectives.
CO_2	Carbon Dioxide. The most common greenhouse gas contributing to human made climate change.
CO_2e	Carbon Dioxide equivalent. A commonly used way of presenting total greenhouse gas emissions as an equivalent amount of CO_2. Most typically, the CO_2e emission is obtained by multiplying the emission of a greenhouse gas by its global warming potential (GWP) for a 100-year time horizon.
Decarbonisation	The reduction or removal of carbon dioxide form energy sources.
Ecosystem	A biological community of interacting organisms and their physical environment.
EfW	Energy from Waste.
Emission factor	A measurement of CO_2 emissions intensity per unit of electricity generation in the grid system.
EPC	Energy Performance Certificate. Shows the current energy rating and potential energy rating of a property.
ESCo	Energy Services Company.
EV	Electric Vehicle.
Fossil fuel	Non-renewable energy sources formed from fossilised plants and animals over millions of years such as coals, oil and gas.
GDP	Gross Domestic Product. A measure of the value of goods and services produced in the UK. It estimates the size of and growth in the economy.
GHG	Greenhouse Gas that enhances the greenhouse effect and thus climate change.
Heat island effect	Also referred to as the urban heat island effect, whereby the average temperature of an area is higher than nearby rural areas. It is mostly caused by the fact that the materials in urban areas, like concrete, absorb and retain much more heat energy from the sun and then takes much longer to dissipate.
Infrastructure	Physical structures and facilities need to operate a functional society such as roads, utilities, water, sewage etc.
IPCC	International Panel on Climate Change. A United Nations body which evaluates climate change science.
KWh	Kilowatt Hour. A unit of energy equivalent to one kilowatt of power expended for one hour of time (1,000KWh = 1MWh). Commonly used in energy use billing.
LCITP	Low Carbon Infrastructure Transition Programme.
LED	Light-emitting diode. An LED is an electronic device that emits light when an electrical current is passed through it. LEDs are energy efficient and have a long life span.
LEZ	Low Emission Zone. An area where access by some polluting vehicles is restricted or deterred with the aim of improving air quality.
LHEES	Local Heat and Energy Efficiency Strategy.
Low carbon	Causing or resulting in only a relatively small net release of carbon dioxide into the atmosphere.
Low carbon economy	An economy that produces goods and services of increasing value while reducing the associated carbon dioxide in their production, use and disposal.

MEI	Monitoring Emissions Inventory. Identifies and quantifies the main sources of greenhouse gas emissions at a point in time after a baseline year.
Mitigation	The attempt to lessen future climate change and its social, economic and environmental consequences by reducing the greenhouse gas emissions.
MWh	Megawatt Hour. A unit of energy use equivalent to one megawatt of power expended for one hour of time. Used for metering larger amounts of electrical energy and power generation.
NDEE	Non-Domestic Energy Efficiency.
Net zero CO_2 emissions	Achieved when CO_2 emissions are balanced by CO_2 removals over a specified period. Also referred to as being carbon neutral.
Net zero GHG emissions	Achieved when anthropogenic (i.e. as a result of human activity) emissions of greenhouse gases to the atmosphere are balanced by anthropogenic removals over a specified period.
NOx	Nitrogen Oxide. Gases which are formed whenever combustion occurs in the presence of nitrogen - e.g. in vehicle exhausts.
Photovoltaic	The method used to convert sunlight into electricity.
Resilience	The capacity of a system to absorb the stresses imposed by climate change. When change occurs, resilience provides the components for renewal and reorganisation.
RPCS	Regional Performance Centre for Sport.
RPP	Report on Policies and Proposals.
RVA	Risk and Vulnerability Assessment. Exercise to determine the nature and extent of climate-related risks by analysing potential hazards and assessing the vulnerability that could pose a potential threat or harm to people, property, livelihoods and the environment.
SDG	Sustainable Development Goals.
SEA	Strategic Environmental Assessment. An assessment of the significant environmental impacts of a qualifying plan, programme or strategy.
Sustainable development	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs. Its three core elements of economic growth, social inclusion and environmental protection are interconnected and all must be harmonised for the well-being of individuals and societies.
TAYplan	TAYplan sets the overall planning vision for the next 20 years for the whole Dundee and Perth area, including North Fife and parts of Angus.
UKCP18	UK Climate Projections 2018 (UKCP18).
UN	United Nations. An intergovernmental organisation dedicated to improving global economic and social conditions on a global scale.
Vulnerability	The degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes.

DUNDEE Climate Action Plan

Supplementary Document:
Climate Risk and Vulnerability Assessment

June 2019

sustainable DUNDEE

DUNDEE PARTNERSHIP

DUNDEE Climate Action Plan: Risk and Vulnerability Assessment

The Climate Risk and Vulnerability Assessment (RVA) was conducted as a prerequisite to developing the city's Climate Action Plan.

The assessment was conducted across 10 policy sectors:

- Buildings
- Transport
- Energy
- Water
- Waste
- Land Use Planning
- Environment & Biodiversity
- Health
- Civil Protection and Emergency
- Tourism

Small workshops with Dundee City Council officers and key partners, including NHS Tayside, Scottish Water, SEPA, Scottish Natural Heritage, Urban Foresight, Dundee University, Friends of the Earth Tayside and Tayside Reusers identified climate impacts for each of the climate hazards/scenarios for the policy sectors with an estimate of how likely they are to occur, the level of impact and the timeframe for occurrence, short, medium or long term.

Climate resilience actions were then co-designed with stakeholders. Many of the actions identified were already in progress by the various organisations; some new actions were identified during the visioning event and the remaining actions were devised in partnership with the stakeholders during these RVA workshops. Some actions apply to several different impacts.

Impacted Policy Sector	Expected Impacts	Likelihood of Occurrence (Unlikely, Possible, Likely, Not known)	Expected Impact Level (Low, Moderate, High, Not known)	Timeframe (Current, ST, MT, L, Not known)	Proposed Indicators	Proposed Actions
Buildings Refers to municipal, residential, tertiary, public/private) structure or group of structures, surrounding spaces, permanently constructed or erected on its site.	1. Higher cooling demands in the summer months as temperatures rise	Likely	Moderate	LT	Number of buildings retrofitted for adaptive resilience e.g. ventilation Average daily air temperature.	Design brief for new council led developments and infrastructure to take into account whole life costing. This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste. Council led development and infrastructure projects must include early collaboration to ensure opportunities for the project to enhance biodiversity, water management and active travel are considered at the pre-design stage.

	2. Higher costs associated with higher energy demands for cooling, including capital costs, maintenance and running costs	Likely	Moderate	LT	Costs associated with heating and cooling	Scale up solar PV implementation across Dundee for public and private buildings and ensure all civic buildings have renewables where technically feasible. Monitor heating costs and cooling costs to assess impact of changing temperatures.
	3. Additional repair and maintenance costs due to greater runoff e.g. water ingress, improving drainage around buildings	Possible	Moderate	LT	Climate related repair and maintenance costs	Create a business case for rainwater capture and reuse capital investment. Design brief for new developments and infrastructure to take into account whole life costing. This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste. Council led development and infrastructure projects must include early collaboration to ensure opportunities for the project to enhance biodiversity, water management and active travel are considered at the pre-design stage.
	4. Flood damage to homes, businesses, schools and community	Possible	High	MT	Number of flood events. Number of buildings impacted by flood events. Number of people affected by flood events. Infrastructure impacted by flood events.	Design a Dundee Surface Water Management Plan/Tayside Integrated Catchment Study that considers measures to reduce flood risk and protect buildings from flooding. Including blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used. Design brief for new developments and infrastructure to take into account whole life costing. This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste. Council led development and infrastructure projects will include early collaboration to ensure opportunities for the project to enhance biodiversity, water management and active travel are considered at the pre-design stage.
	5. Storm damage to homes, businesses,	Possible	Moderate	ST	Number of public/residential/tertiary	Monitor climate related maintenance cost of buildings and structures.

	cultural heritage sites, schools and community e.g. roofs and structures				buildings damaged by extreme weather conditions/events	Design brief for new developments and infrastructure to take into account whole life costing. This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste. Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations. Work with Resource Efficient Scotland and the Chamber of Commerce to assist local business planning for climate risk management.
	6. Increased insurance costs	Likely	Moderate	MT	Increase in insurance costs	Work with Resource Efficient Scotland and the Chamber of Commerce to assist local business planning for climate risk management.
	7. Climate impacts on business and local economy e.g. material damage, increased cooling costs	Likely	High	ST	Costs associated with climate adaptation	Work with Resource Efficient Scotland and the Chamber of Commerce to assist local business planning for climate risk management.
Transport Includes road, rail, air and water transport networks and related infrastructure. It comprises an extensive range of both public and private assets and services and excludes all related vessels, vehicles (and related parts and processes).	1. Flooding impact on road network	Likely	High	ST	Speed restrictions	Design a Dundee Surface Water Management Plan/Tayside Integrated Catchment Study that considers measures to reduce flood risk and protect buildings from flooding and includes blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used.
	2. Flooding (extreme weather) impact on public transport services	Likely	High	ST	Number of days with public service interruptions.	Dundee Surface Water Management Plan/Tayside Integrated Catchment Study will consider measures to reduce flood risk and protect public transport infrastructure from flooding. Including blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used.
	3. Flooding (extreme weather) impact on sustainable transport	Likely	High	ST	% increase in blue/green infrastructure. Number of flooding events.	Dundee Surface Water Management Plan/Tayside Integrated Catchment Study will consider measures to reduce flood risk and protect public transport infrastructure from flooding. Including blue-green

	e.g. cycling and walking					infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used.
	4. Flooding (extreme weather) impact on the rail network	Likely	Moderate	MT	Number of days with public service interruptions.	Dundee Surface Water Management Plan/Tayside Integrated Catchment Study will consider measures to reduce flood risk and protect public transport infrastructure from flooding. Including blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used. SMART Mobility to include co-ordinated communication of transport information and quicker demand response options.
	5. Higher maintenance costs for transport infrastructure	Likely	Moderate	LT	Costs associated with climate related transport infrastructure maintenance costs	Review transport management plans
	6. Higher temperatures affecting transport use e.g. less walking and cycling,	Possible	Low	LT	% increase in blue/green infrastructure.	Co-design blue/green infrastructure improvements in partnership with community. Aligning with Dundee City Councils green networks supplementary planning guidance; improvements will into account flooding, heat island effect, active travel, biodiversity and including appropriate planting in urban areas, as well as community cohesion opportunities.
	7. High winds impacting Tay Road Bridge and knock on effect of traffic congestion on alternative routes.	Likely	High	ST	Number of wind-related closures per annum	SMART Mobility to include co-ordinated communication of transport information and quicker demand response options. Install traffic signalling at Riverside Roundabout to ensure continued flow of traffic
	8. Extreme weather impact on mobility e.g. flooding, high temperatures, high winds	Likely	High	ST	% increase in blue/green infrastructure. Average time taken to disseminate transport updates to multiple channels.	Emergency response plans to include transport. (Covered in civil protection) SMART Mobility to include co-ordinated communication of transport information and quicker demand response options.

	9. More water on surfaces generally	Likely	High	ST	% increase in blue/green infrastructure	Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface runoff. Where possible, ecological solutions to SUDs will be used. Create a business case for rainwater capture and reuse capital investment.
	10. Poor road conditions leading to increased occurrence of cyclist accidents	Possible	Moderate	ST	% increase in weather related incidents.	Planned road and cycle network maintenance programmes. Continue to implement and expand the Councils extensive Active Travel programme to reduce the modal share of car based transport. Develop strategic active travel/green network between Perth, Dundee and Angus to provide safe, segregated cycling/walking as proposed in the TAYplan.
	11. Warmer, sunnier summers bringing greater numbers of visitors to the City increasing pressure on road and public transport infrastructure	Likely	Moderate	ST	% increase in visitor numbers.	Develop an interactive green map for Dundee to help visitors and residents identify sustainable options and information for travel, food, recreation and resource use. Create new off road/segregated active travel networks integrated with green networks where possible. Develop strategic active travel/green network between Perth, Dundee and Angus to provide safe, segregated cycling/walking as proposed in the TAYplan. Develop car parking model to encourage efficient use of space for coaches and cars.
Energy Refers to the energy supply service and related infrastructure. It includes coal, crude oil, natural gas liquids, refinery feedstocks, additives, petroleum products, gases, combustible renewables and waste, electricity and heat.	1. Damage to electrical/gas infrastructure and power generation facilities by flooding or storms	Likely	High	ST	Number of service interruptions.	Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services. Continuously review and monitor the plans of the Local Resilience Partnership to ensure changing climatic conditions are factored in.
	2. Damage to IT infrastructure by high temperatures/storms resulting in interrupted business continuity and	Possible	High	ST	Number of service interruptions.	Regular review and updating of the IT Business Continuity Plan to take account of climatic conditions. Increase back up capacity of Council servers or move servers and data to an industrial external data centre.

	associated economic impacts					
	3. District Heating failure due to extreme weather	Possible	High	MT	Number of service interruptions.	Formalise support in event of District Heating failure.
	4. Increased viability/generation of renewable energy due to changing climatic conditions	Possible	Moderate	LT	% Increase in renewables	Scale up solar PV implementation across Dundee for public and private buildings and ensure all civic buildings have renewables where technically feasible. Develop a regional cluster approach to attract investment, support business growth and create jobs in the offshore wind sector; retaining more graduates and make the city a magnet for new talent. Research potential for other renewable energy options e.g. heat pump/cooling integrated systems, geothermal. Consider integration of heat networks with green networks.
	5. Increased cooling energy demand	Likely	Moderate	LT	% Degree days (cooling)	Research potential for other renewable energy options e.g. heat pump/cooling integrated systems, geothermal.
Water Refers to the water supply service and related infrastructure. It also covers water use (e.g. by households, industry, energy production, agriculture etc.) and (waste-, rain-) water management system, that includes sewers, drainage and treatment systems.	1. Higher temperatures leading to water shortages and higher water demand	Possible	High	LT	Grey water recycling / rainwater harvesting per % of total consumption.	Scottish Water will continue to review and develop their 25 year Water Resource Plan to ensure it can cope with projected drought conditions; including reinforcement of reservoirs and expanding the supply network. Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services. Continuously review and monitor the plans of the Local Resilience Partnership to ensure changing climatic conditions are factored in. Regularly review and monitor the Waterwatch Protocol to support homes with a private water supply in times of drought. Develop an adaptation engagement strategy to support community capacity building, including visual and

						interactive tools, workshops and collaboration with community organisations. Rainwater harvesting/increase water conservation education
	2. Higher treatment costs/emissions/maintenance due to hotter drier weather in summer	Likely	Moderate	MT	Costs associated with climate related maintenance	Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used. Enter shared surface water drainage system maintenance agreements with Scottish Water where appropriate. Create a business case for rainwater capture and reuse capital investment.
	3. Flooding of sewers due to heavy rainfall and sea level rise	Likely	High	MT	Number of water quality warnings	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.
	4. Flooding/drought causing water quality problems	Likely	High	MT	Number of water quality warnings	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.
	5. Damage to infrastructure due to flooding, storm surges and high winds	Likely	High	MT	Average length (in hours) of supply interruptions	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.
	6. Threat of cracked pipes and leakages caused by high temperatures and drought					Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.

						Scottish Water to monitor pipes for heat damage as part of the Water Resources Plan, adding in mitigation measures as required.
	7. Reduction of recreational bathing water quality	Likely	Moderate	MT	Number of water quality warnings	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.
	8. Risks to business operations from water scarcity	Likely	Moderate	LT	Number of days with water scarcity warnings	Work with Resource Efficient Scotland and the Chamber of Commerce to assist local business planning for climate risk management.
	9. Sea level rise risk on waterfront based businesses	Likely	High	MT	% change in sea level	Undertake coastal and Watercourse inspections and organise repairs and maintenance under current legislation and the Tay Estuary and Montrose Basin Local Flood Risk Management Plan. Managed realignment and soft engineering sea defence options will be considered where possible.
Waste Includes activities related to the management (including collection, treatment and disposal) of various forms of waste, such as solid or non-solid industrial or household waste, as well as contaminated sites.	1. Energy from Waste Plant inoperable due to storm or water damage means more waste to landfill	Possible	High	LT	Number of days with waste service interruptions	Regularly review and maintain waste service operational contingencies for extreme weather events.
	2. Site and access disruption e.g. no access to bulking of recycling leading to more vehicles on the road as need to put forward direct deliveries to reprocesses, increased overtime/staff costs	Likely	Moderate	MT	Number of days with waste service interruptions	Regularly review and maintain waste service operational contingencies for extreme weather events
	3. Facilities damaged due to extreme weather, e.g. flooding, storms	Likely	High	ST	Number of days with waste service interruptions	Regular review and remediation of facilities to ensure secure and watertight.

	4. If site access disrupted, residents need to make multiple trips to different sites and may lead to great incidence of fly-tipping and litter, increasing costs for clean- up and reducing environmental quality	Likely	Moderate	MT	Costs of clean-up and litter picking	Improve infrastructure, including more bins, higher frequency of collection, review DRS, educate and inform through Take Pride in Your City. Regular review of Deposit Return Schemes (DRS) to monitor impact on litter More bins provided and more litter picking. Increase water refill points and access information
	5. Increased food waste – more food damaged	Possible	Moderate	LT		Food Waste Reduction Officers (ZWS) carry out food waste reduction campaign for schools and businesses.
	6. Interrupted collections due to more extreme events impact on road network	Likely	Moderate	MT	% Change in solid waste collected / recycled / disposed of	Plan co-ordinated, prompt and effective communication to inform residents of service disruptions, alternative options available and estimate of when normal services will resume.
	7. Higher incidence of windblown litter or litter caused by more people being out in warmer weather (increased picnics, barbeques)	Likely	Moderate	MT	Costs of clean-up and litter picking	Improve infrastructure, including more bins, higher frequency of collection, review DRS, educate and inform through Take Pride in Your City.
	8. Decrease in garden waste due to less growth in summer due to hotter, drier conditions leading to vehicle inefficiencies	Likely	Moderate	LT	Volume of garden waste collected	Conduct annual participation surveys to elicit volume of garden waste collected per annum
	9. Increased storm damage to trees, increased branches and plant debris strewn across city requiring collection and disposal/chipping	Likely	Moderate	ST	Volume of storm damaged vegetation collected	Ensure funding available to cope with extra collection and disposal of windblown vegetation.
	10. Leachate	Possible	Moderate	LT		Regular review of leachate monitoring regime, taking into account changing climatic conditions such as increased flooding.

	11. Construction waste containment failure	Possible	Moderate	LT	Construction waste quantities	Design brief for new developments and infrastructure to take into account whole life costing. This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are with minimal waste.
Land Use Planning Processes undertaken by public authorities to identify, evaluate and decide on different options for the use of land, and the subsequent formulation and promulgation of plans or regulations that describe the permitted or acceptable uses.	1. Increased surface runoff under normal conditions	Likely	High	ST	% change in runoff of rainwater overflows (due to change in soil infiltration)	Increase blue/green infrastructure and or retrofit SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used. Flood risk and surface water drainage designs for new developments assessed/reviewed during the planning process with presumption against development in flood risk areas and to ensure surface water drainage systems designed appropriately. Create a business case for rainwater capture and reuse capital investment.
	2. Heat island effect impact on air quality	Likely	Moderate	MT	% of grey/blue/green areas affected by extreme weather conditions/events (e.g. Heat Island Effect	Co-design blue/green infrastructure improvements in partnership with community. Aligning with Dundee City Councils green networks supplementary planning guidance; improvements will into account flooding, heat island effect, active travel, biodiversity and including appropriate planting in urban areas, as well as community cohesion opportunities. The planning process must ensure that air quality is considered at a very early stage in the development process to ensure that any mitigation can be included at the design stage.
	3. Heat Island effect on water quality	Possible	Moderate	MT	% of grey/blue/green areas affected by extreme weather conditions/events (e.g. Heat Island Effect)	Co-design blue/green infrastructure improvements in partnership with community. Aligning with Dundee City Councils green networks supplementary planning guidance; improvements will into account flooding, heat island effect, active travel, biodiversity and including appropriate planting in urban areas, as well as community cohesion opportunities.
	4. Coastal Flooding	Likely	High	MT	% of coastline designated for managed realignment	Undertake coastal and Watercourse inspections and organise repairs and maintenance under current legislation and the Tay Estuary and Montrose basin Local Flood Risk Management Plan.

						Latest available climate data used when assessing land for new developments.
	5. Surface Flooding	Likely	High	MT	% change in green & blue infrastructure/areas (surface)	Tay Estuary and Montrose Basin Local Flood Risk Management Plan to be updated in line with flood risk management legislation and Dundee Surface Water Management Plan to be prepared and subsequently updated to reflect Dundee's changing climate. Review the Councils Risk Register and include climate-related risks where appropriate.
						Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface water runoff. Where possible, ecological solutions to SUDs will be used. Create a business case for rainwater capture and reuse capital investment. Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations.
	6. Long term positive impact on reduced freeze thaw cycle, therefore less road maintenance and less salt use.	Possible	Moderate	LT	% change in salt use and road maintenance due to freezing conditions	Monitor freeze-thaw related road maintenance requirements.
Agriculture and Forestry Includes land classified or designated for agriculture & forestry use, as well as organisations and industries linked to creation and production within and surrounding the boundaries of the municipality.	e.g. crop yield, degradation, livestock production degradation, forest health and productivity degradation Not Applicable – no commercial forestry or agriculture in the city. Any forestry operations fall under Environment and Biodiversity.	n/a	n/a	n/a	n/a	n/a
Environment and Biodiversity	1. Altered flora and fauna due to changes in water and air	Likely	High	MT	Number of actions implemented from the Biodiversity Duty Plan	Prepare a Biodiversity Plan that includes actions for safeguarding and enhancing existing habitats and species as well as actions on potential sites and

Environment refers to green and blue landscapes, air quality, including urban hinterland; biodiversity refers to the variety of life in a specific region, measurable as the variety within species, between species, and the variety of ecosystems.	temperature, increased drought, storm and flood events.					projects. The plan should be integrated across sectors and the broader green network and adopted corporate-wide to ensure biodiversity protection and enhancement are prioritised in all relevant projects and developments. Contribute to the enhancement and maintenance of the Tay river and coastal habitats in order to ensure resilience. Identify opportunities for soft coastal management /managed realignment habitat creation. Work with local natural heritage groups to increase areas of 'wild' habitats, to include biodiversity recording and monitoring schemes and changes to green space maintenance regimes to reduce intensive methods and machine use in parks and green spaces where possible. Develop an interactive green map for Dundee to help visitors and residents identify sustainable options and information for travel, food, recreation and resource use. Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface runoff. Where possible, ecological solutions to SUDs will be used.
	2. Loss of trees due to increased occurrence of high winds and increasing diseases.	Likely	High	MT	Number of climate appropriate trees planted.	Identify suitable areas for tree planting with climate appropriate species and with consideration of how planting interacts with surroundings e.g. air quality, active transport, biodiversity etc. Monitor and review the Urban Tree Policy to include consideration of place making.
	3. Coastal flooding and sea storm surges	Likely	High	MT	% Sea level rise.	Contribute to the enhancement and maintenance of the Tay river and coastal habitats. Identify opportunities for soft coastal management /managed realignment Maintain the Beach Award for Broughty Ferry beach. Undertake coastal and Watercourse inspections and organise repairs and maintenance under current legislation and the Tay Estuary and Montrose Basin Local Flood Risk Management Plan.

Health Refers to the geographical distribution of dominance of pathologies, information indicating effect on well-being of humans linked directly/indirectly to the quality of the environment. It also includes the health care service and related infrastructure.	1. Increase in illness due to hygiene issues as a consequence of water shortages.	Likely	High	ST	Number of illnesses related to personal and food hygiene related to water shortage events.	Early intervention to prevent/reduce the impact of outbreaks and environmental hazards. Disseminate lessons learned and adjust systems to prevent spread of infection. Public health information campaigns to address increase in sun/heat/air and water quality related illnesses.
	2. Increase in water borne illnesses as contaminants entering the system due to flooding events.	Likely	High	ST	Number of water quality related illnesses.	Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface water runoff to reduce flood risk/water accumulation on roads. Activate Scottish Water Borne Hazard Plan (Scottish Water) Public health information campaigns to address increase in sun/heat/air and water quality related illnesses.
	3. Increase in heat related illness e.g. Lyme Disease, and food poisoning (due to production, storage and preservation issues in higher temperatures and storm events)	Likely	High	ST	Number of climate related illnesses.	Public health information campaigns to address increase in sun/heat/air and water quality related illnesses.
	4. Increased storms leading to higher injury risk e.g. falling branches, roof tiles, debris	Likely	High	ST	Number of A&E attendances related to people injured due to extreme weather events.	Continuous review and update of emergency response plans.
	5. Increased demands on NHS services from all climate related health impacts	Likely	High	ST	Number of calls/bed days.	Regular testing and review of Winter Plan to prioritise services

	6. Access to fresh food/food shortages/food supply interruptions	Likely	High	ST	Number of community growing projects. Cost of essential food items.	Work with Greenspace Scotland to develop a Local Food Growing Strategy and expand the number of innovative growing projects and support them with skills training, materials, access to funding opportunities and capacity building. Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations. Develop a growing hub at Camperdown that provides social enterprise opportunities.
	7. Decline in mental health and well-being especially due to life circumstance disruption (flood events etc.), isolation	Likely	Moderate	MT	Mental health illness referrals.	Work with NHS Tayside and Scottish Natural Heritage to develop a Green health partnership, linking health care and greenspace initiatives
	8. Increased sun exposure related illness such as sunburn/stroke and skin cancer	Likely	High	ST	Heat/sun related health care contacts.	Public health information campaign including early warning systems – e.g.readyscotland.org Public health information campaigns to address increase in sun/heat/air and water quality related illnesses. Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations.
	9. Increased incidence of air quality illness (indoor and outdoor)	Possible	Moderate	MT	Illness related to poor air quality.	Work with NHS Tayside and Scottish Natural Heritage to develop a Green Health Partnership, linking health care and greenspace initiatives Implement 'Cleaner Air for Scotland - The Road to a Healthier Future' strategy and monitor guidance for developers to ensure air quality is taken into account for new developments. Improve sustainable transport options.

	10. Increase in atopic disease due to longer pollen seasons	Possible	Moderate	LT	Increase in reported atopic diseases.	Public health information campaigns to address increase in sun/heat/air and water quality related illnesses.
Civil Protection & Emergency Refers to the operation of the civil protection and emergency services by or on behalf of public authorities and includes local disaster risk reduction and management (i.e. capacity building, coordination, equipment, emergency planning etc.).	1. Increased flooding/storm/extreme weather risk to human health and safety	Likely	High	LT	Number of climate related emergencies that require a response.	Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services. Continuously review and monitor the plans of the Local Resilience Partnership to ensure changing climatic conditions are factored in. Review and update High Impact Weather plans/food supply plans Continue to update Flood Emergency Plan. Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface water runoff. Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations.
	2. Increased risk of coastal flooding	Possible	High	LT	Number of climate related emergencies that require a response.	Continue to update Flood Emergency Plan. Increase blue/green infrastructure and/or retrofit SUDS to store and manage surface water runoff.
	3. Increased insurance costs	Possible	Low	LT	Increase in climate related insurance costs.	Monitor insurance costs to identify any climate related increases and adjust budgets accordingly.
	4. Loss of services e.g. water, power	Likely	High	LT	Duration without service/utility.	Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services. Continuously review and monitor the plans of the Local Resilience Partnership to ensure changing climatic conditions are factored in. Review and update High Impact Weather plans/food supply plans

Tourism Refers to the activities of person travelling to and staying in places outside their usual environment for not more than 1 year for leisure, business and other purposes not related to the exercise of an activity remunerated from within the place visited.	1. Extreme weather impacting tourist activities due to closure of buildings related to tourism such as museums	Likely	Moderate	MT	% change of tourist activities.	Develop an interactive green map for Dundee to help visitors and residents make sustainable choices for food, travel, recreation and resource use. Develop a communication plan to keep visitors informed of disruptions and alternative options available via the Association of Scottish Visitor Attractions and Dundee Cultural Agencies Network. SMART Mobility to include co-ordinated communication of transport information and quicker demand response options.
	2. Climate impacts on tourist related businesses such as hotels & hospitality, retail and attractions including weather proofing, transport disruptions, disruption to suppliers, higher maintenance and cooling costs.	Likely	Moderate	MT	Number of weather related attraction closures.	Update the Green Tourism accreditation to incorporate climate adaptation to ensure businesses are climate ready. Work with the Dundee Tourism Action group to help business prepare for climate change. Support local community growing hubs and local food businesses. Issue design guidelines for buildings and new builds to incorporate climate adaptation measures e.g. rooftop gardens.
	3. Higher water demand due to drier summers and increased population	Likely	Moderate	MT	% water use increase.	Strategic water refill points installed and promoted.
	4. Higher costs for maintenance and repair due to higher rainfall, extreme heat and storms	Likely	Moderate	MT	Increased maintenance costs for tourism related industry.	Enter shared surface water drainage system and maintenance agreements with Scottish Water where appropriate.
	5. Sea level rise risk on waterfront tourist venues e.g. V&A	Likely	Moderate	MT	% change in sea level.	Maintenance of coastal flood defences (raised sea wall) designed for protection of the waterfront.
	6. Loss of beach cover	Likely	High	MT	% beach cover change	Replenish and recreate dunes as part of the Dundee Coastal Flood Protection Scheme.

	7. Reduction of bathing water quality	Possible	Moderate	MT	Number of water quality warnings.	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.
	8. Tourist sector opportunities from increased numbers of visitors due to warmer, sunnier climate.	Likely	Moderate	ST	Visitor numbers. Number of Green Tourism Award holders in Dundee.	Update the Green Tourism accreditation to incorporate climate adaptation to ensure businesses are climate ready. Work with the Dundee Tourism Action group to help business prepare for climate change.

DUNDEE
Climate Action Plan

Supplementary Document: Environmental Report

October 2019

Dundee City Council CHANGING FOR THE FUTURE

sustainable DUNDEE

Contents

1. INTRODUCTION

1.1. Purpose the Environmental Report

Dundee City Council (as lead partner) has carried out a Strategic Environmental Assessment (SEA) as part of the preparation of the Dundee Climate Action Plan (the Plan). SEA is a systematic method for considering the likely environmental effects of certain Plans, Programmes and Strategies (PPS). SEA aims to:

- integrate environmental factors into PPS preparation and decision-making;
- improve PPS and enhance environmental protection;
- increase public participation in decision making; and
- facilitate openness and transparency of decision-making.

The SEA has been prepared in accordance the Environmental Assessment (Scotland) Act 2005. The key SEA stages are:

Screening	Determining whether the PPS is likely to have significant environmental effects and whether an SEA is required.
Scoping	Deciding on the scope and level of detail of the Environmental Report, and the consultation period for the report – this is done in consultation with Scottish Natural Heritage, The Scottish Ministers (Historic Scotland) and the Scottish Environment Protection Agency.
Environmental Report	Publishing an Environmental Report on the PPS and its environmental effects, and consulting on that report.
Adoption	Providing information on: the adopted PPS; how consultation comments have been taken into account; and methods for monitoring the significant environmental effects of the implementation of the PPS.
Monitoring	Monitoring significant environmental effects in such a manner so as to also enable the Responsible Authority to identify any unforeseen adverse effects at an early stage and undertake appropriate remedial action.

The purpose of this Environmental Report is to:

- provide information on the Dundee Climate Action Plan;
- identify, describe and evaluate the likely significant effects of the Plan and its reasonable alternatives;
- provide an early and effective opportunity for the Consultation Authorities and the public to offer views on any aspect of the Environmental Report.

1.2. SEA Activity to Date

An initial SEA Screening report was submitted to the Scottish Government's SEA Gateway on 17th May 2018 and comments from the Consultation Authorities were received on 14th June 2018, recommending that a full environmental assessment be undertaken for the preparation of the Plan.

A full Scoping report was then prepared and submitted to the SEA Gateway on 26th June 2018 and comments from the Consultation Authorities were received on 31st July 2018. These comments were taken into account in the preparation of the Environmental Report.

The Environmental Report was submitted to the SEA Gateway on 23rd July 2019 together with the consultative draft Plan and comments from the Consultation Authorities were received on 13th September 2019. These comments were taken into account in the preparation of the final Plan submitted to the Council's P&R Committee for approval.

Once the Plan has been approved, an SEA Post-Adoption statement will be prepared and submitted to the SEA Gateway.

1.3. Key Facts

Name of Responsible Authority:	Dundee City Council
Title of the PPS	Dundee Climate Action Plan
What prompted the PPS	The preparation of a Climate Action Plan is a requirement of becoming a signatory to the EU Covenant of Mayors for Climate and Energy (CoM).
Subject	Energy, Sustainability and Climate Change
Period covered by the PPS	2019-2030
Frequency of updates	The Plan will be a flexible document which should be reviewed continuously. The CoM requires reporting every 2 years including submission of a Monitoring Emissions Inventory (MEI) which reports progress against the Baseline Emissions Inventory (BEI). Annual reporting will be undertaken as part of this governance. Interim progress will be reported as part of the Scottish Public Bodies Climate Change Duties required and recommended reporting.
Area covered by the PPS	Dundee City boundary 
Purpose and/or objectives of the PPS	The Plan is a partnership document that provides a first set of ambitious actions in a long-term pathway to support Dundee in its obligations under the global Covenant of Mayors for Climate and Energy and its transition to a net-zero and climate resilient future by 2045 at the latest. It covers four programme areas of Energy, Transport, Waste and Resilience and includes baseline data, progress so far and actionable projects at their appropriate scale to address future challenges.
Contact point	Bryan Harris, Sustainability and Climate Change Manager Dundee City Council, City Development Department, Dundee House, 50 North Lindsay Street, Dundee DD1 1QE E-mail: bryan.harris@dundeecity.gov.uk

1.4. Dundee Climate Action Plan Objectives

The Plan sets out the challenges and opportunities for Dundee's sustainable energy and low carbon future and contains a strategic vision, objectives, targets, action plan, governance arrangements, measuring progress and reporting.

Four Strategic Programme Areas have been identified which combine to form a single integrated plan. These work programmes reflect the priorities of the Plan to maximise emissions reduction and tackling climate change across the sectors in table 1.

Table 1: Plan Objectives

Strategic Programme Area	**Objective**
Energy	Reduce the consumption of energy, promote energy efficiency and increase the proportion of power and heat from low and zero carbon technologies.
Transport	Encourage active travel through walking, cycling and public transport and deploy sustainable alternatives to decarbonise transport.
Waste	Manage waste sustainably by reducing, reusing, recycling and recovering waste to improve resource efficiency whilst working towards a circular economy.
Resilience	Ensure our communities, green networks and infrastructure are adaptable to a changing climate and reduce the risks and vulnerability to unavoidable impacts.

2. RELATIONSHIP WITH OTHER PLANS, PROGRAMMES AND STRATEGIES

The Environmental Assessment (Scotland) Act 2005 requires that the Environmental Report includes an outline of the PPS relationships with other relevant PPS and how environmental protection objectives have been taken into account in the PPS preparation.

These relationships are summarised in Table 2 below. Figure 1 illustrates where the Plan places within the Dundee Partnership plans hierarchy.

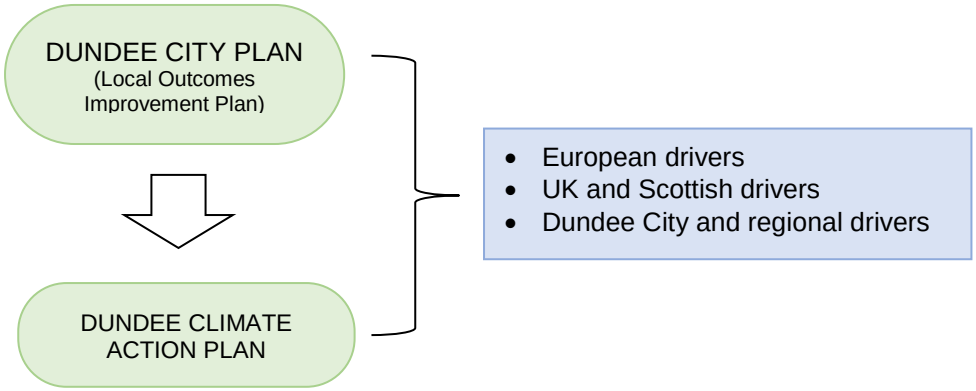
Appendix 2 provides a more detailed analysis of each relevant PPS and how their objectives have been taken into account during plan preparation.

Table 2: Relevant PPS and environmental protective objectives of the Plan

	Name of PPS or Environmental Protection Strategy
International Level	
Sustainability, Climate Change and Energy	
1.	Europe 2020 Strategy
2.	EU 2030 Climate & Energy Framework
3.	EU Cohesion Policy 2014-2020
4.	The Energy Performance of Buildings Directive
5.	Directive 2009/28/EC (Renewable Energy)
6.	Energy Efficiency Directive 2012/27/EU
Nature Conservation	
7.	Habitats Directive 92/43/EEC
8.	The Birds Directive 2009/147/EC
9.	EU Biodiversity Strategy
Water	
10.	Water Framework Directive 2000/60/EC
11.	Nitrates Directive 91/43/EC
Waste	
12.	Directive 99/31/EC (waste management of landfills)
13.	Waste Framework Directive 2008/98/EC
National Level	
Planning Policy	
14.	National Planning Framework 3 [Scotland] and Scottish Planning Policy 2014
15.	National Renewables Infrastructure Plan
16.	Scotland's Land Use Strategy (2016)
17.	Historic Environment Scotland Policy Statement (2016)
Cross-Sectoral	
18.	Local Government (Scotland) Act 2003
19.	Choosing Our Future: Scotland's Sustainable Development Strategy (2005)
20.	Scotland's Economic Strategy (2015)
Sustainable Transport	
21.	Scotland's National Transport Strategy (2016)
22.	A Long-Term Vision for Active Travel in Scotland 2030 (2014)
23.	Let's Get Scotland Walking – The National Walking Strategy (2014)
24.	Cycling Action Plan for Scotland 2013
Air and Climate Change	
25.	Climate Change (Scotland) Act 2009
26.	Climate Change Plan: The Third Report on Proposals and Policies (2018)
27.	Scottish Energy Strategy: The future of energy in Scotland (2017)
28.	Energy Efficiency Scotland Programme (2018)
29.	Scottish Government Heat Policy Statement (2015)
30.	Cleaner Air for Scotland Strategy (2015)

Nature Conservation	
31.	The Nature Conservation (Scotland) Act 2004
32.	Scotland's Biodiversity Strategy- It's in your hands (2004)
33.	The Conservation (Natural Habitats) Amendment (Scotland) Regulations 2007
34.	Making the Links: Greenspace for a more successful and sustainable Scotland (2009)
Water	
35.	Water Environment and Water Services (Scotland) Act 2003
36.	Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended)
37.	Flood Risk Management (Scotland) Act 2009
38.	Scotland's River Basin Management Plan (2015)
Waste	
39.	Scotland's Zero Waste Plan (2010)
40.	Scottish Government Charter for Household Recycling (2016)
41.	Making Things Last: A Circular Economy Strategy for Scotland (2016)
Marine and Coastal	
42.	Marine (Scotland) Act 2010
43.	Scotland's National Marine Plan (2015)
Regional Level	
44.	TAYPlan (2016)
45.	Tay Estuary and Montrose Basin (TEAMB) Local Flood Risk Management Plan
46.	Tay Cities Regional Economic Strategy (2017)
47.	TACTRAN Regional Transport Strategy (2015)
Local Level	
48.	Dundee City (LOIP) Plan (2017)
49.	Dundee City Council Plan (2017)
50.	Dundee City Council – Capital Investment Strategy (2018)
51.	Dundee City Council – District Heating Strategy (2018)
52.	Dundee Local Development Plan (2014)
53.	Proposed Local Development Plan 2 (2017)
54.	The Dundee Green Network – Non-Statutory Planning Guidance (2017)
55.	Local Housing Strategy (2013)
56.	Dundee Fairness Action Plan (2016)
57.	Air Quality Action Plan (2011)
58.	Dundee Public Open Space Strategy (2008)
59.	Dundee Coastal Study Stage 2 (2013)
60.	Dundee Cycling Strategy (2019)
61.	Biodiversity Action Plan *(in development)*

Figure 1: Plan placing within plans hierarchy



3. STATE OF THE ENVIRONMENT

3.1. Baseline Environmental Data

The collation of baseline environmental data is an important part of the SEA process as it provides a snapshot of the environment at that point in time; highlights existing environmental issues; and can be used to predict the future impacts that the implementation of the Plan will have on the environment. It also directly informs the development of SEA objectives which the Plan will be assessed against.

The Environmental Assessment (Scotland) Act 2005 Schedule 3 requires that the Environmental Report includes a description of the relevant aspects of the current state of the environment and the environmental characteristics likely to be significantly affected. The SEA Scoping Report for the Plan listed nine environmental issues for assessment. These are outlined in table 3 below, together with the environmental protection (SEA) objectives and proposed data sources which might allow analysis and monitoring of the baseline.

Table 3: Environmental Characteristics and Issues

Env. Issue	SEA Objective	Description	Impact	Dataset (*Source*)
Biodiversity, flora, fauna	To conserve, protect and where possible enhance the diversity of species and habitats.	Dundee has a rich and varied natural heritage with an enviable waterfront location that stretches 16.5km along the Tay Estuary. The Tay's water quality makes it one of the best major estuaries in Europe and supports biodiversity and habitats which have been recognised internationally and offered protection through a number of natural heritage designations. The city is host to 35 locally important nature conservation sites and 3 Local Nature Reserve's which are significant for environmental education. Wildlife corridors on Riverside Drive and The Dighty promote habitat continuity and support biodiversity conservation. Dundee has more green and open spaces and parks per head of population than any other Scottish city, occupying 28% of the urban area.	• Impact of individual and cumulative development pressure on biodiversity and blue/green infrastructure. • Existence of non-native invasive species along watercourses. • Effect of development pressures on habitats and species including international, national and local designated sites and European Protected Species. • Potential loss of wildlife corridors and species. • Future severe storm damage likely to affect woodlands.	• National and International important nature conservation sites - SAC, SPA, RAMSAR, SSSI; Local Nature Reserves; Locally Important Nature Conservation Sites *(Scottish Natural Heritage)* • Open space, wildlife corridors and Green Flag Parks *(Dundee City Council - Local Development Plan 2)* • Percentage of residents who were satisfied with the natural environment in their neighbourhood *(Dundee City Council – Pentana database)*
Population and human health	To improve the health and wellbeing of communities in Dundee and reduce inequalities.	The most recent estimate of Dundee's population is 148,270 (National Records of Scotland 2016 Mid-year population estimate). The population of Dundee is expected to rise by 5.9% by 2039. 28.6% of the population live within a data zone which is ranked within the 15% most deprived in Scotland. Of those who live within these areas, 65% are of working age. 35% of children in Dundee live within one of the 15% most deprived data zones. There are also wide divisions in health and life expectancy between the richest and the poorest communities in the city.	• Dundee's population is increasing and ageing. • Population may be adversely affected by climate change. • Levels of fuel poverty rising to 37% across all housing tenures in the city. • Impact on health in air quality management area. • Quality, accessibility and distribution of open space, play areas, sports pitches and playing fields.	• Mid-2016 Population Estimates by Local Authority Area *(National Records of Scotland)* • SIMD datazone profiles *(Dundee City Council - GIS)* • % of all tenure households which are fuel poor *(Dundee City Council – Pentana database)* • Household waste generation and management inc. Arisings, Landfilled, Energy from Waste,

				Recycled/ Composted. (*Scotland's Environment web)*
Soil and land	Protect greenfield land and reduce brownfield, derelict and contaminated land.	Brownfield land is generally more sustainable but does raise issues such as a need for contaminated land treatment in some cases. Dundee's administrative boundaries are such that there exists relatively little quantities of greenfield land and development of such land must therefore be strictly controlled. As the quantity of land being developed increases this can give rise to other effects such as additional flood risk and pollution through increased transportation requirements. The surface area of vacant and derelict land although falling reasonably steadily since 1998 currently stands at 212ha or 1.95% of the area.	• Pockets of vacant and derelict land. • Impact of run off from newly developed hard surfaces and compacted land. • Contamination/loss of soil from previous, current and future development. • Effects of future coastal erosion.	• Vacant and Derelict land *(Scottish Government - Scottish Vacant and Derelict Land Survey 2016)*
Water	To avoid flood risk, prevent deterioration and enhance natural water systems and quality of the water environment.	Six water courses run through Dundee some of which are subject to localised flooding. The flood plain mainly affects residential and other property at Broughty Ferry, along the River Dighty and at the Central Waterfront. A wastewater treatment plant is in place at Hatton and water quality improvements in the Tay means Broughty Ferry beach has regularly achieved excellent water quality status. Sustainable Urban Drainage Systems are now a standard feature of new development. There are no major strategic issues with regard to water infrastructure available now or in the foreseeable future.	• Increased threat of flooding from rising coastal and fluvial water levels. • Varying ecological status of water courses including Dighty Water, Fithie Burn and Dronley Burn.	• Dighty Water, Fithie Burn, Dronley Burn and Murroes Burn (lower Section) river classifications *(Scotland's Environment Web)* • Tay Flood Risk map (*SEPA Flood Map)* • Bathing Water Quality at Broughty Ferry Beach *(SEPA Bathing Water Data: 2018)*
Air	To protect and enhance air quality.	Dundee's air quality is reported as being generally good, with the majority of pollutants present at concentrations below their respective risk thresholds with a few exceptions in certain areas. An Air Quality Management Area has been declared as a result of exceedances in Nitrogen Dioxide (NO_2) and particulate matter (PM_{10}). The main source contributing to these exceedances is road traffic.	• Potential negative impact on human health and the limitation of residential development in certain areas of the City. • Increase in PM_{10} and NO_2 exceedances at several junctions/areas within the City. • Need to ensure operational synergy in tackling air quality and carbon reduction. • Establishment of Low Emission Zone by 2020.	• Air quality (NO_2) in ($\mu g/m^3$) and (PM_{10}) in ($\mu g/m^3$) *(Dundee City Council Air Quality Update Report 2017)*
Climatic factors	To reduce greenhouse gas emissions and ensure climate change adaptation.	Under a medium emissions scenario, the central estimate for increases in summer temperatures by the 2050's may be 2.3°C in eastern Scotland. Precipitation may become greater in winter months whilst summers are predicted to will be drier. Climate change is predicted to result in more summer heat waves, extreme temperatures and drought, sea level rise, increased frequency and intensity of extreme precipitation events, and reduced occurrence of frost and snowfall. City-wide CO_2 emissions reduced by 24% between 2005-2015. The Plan target aims to achieve a 50% reduction by 2030.	• Increased energy consumption with new development. • Need for greater pace and scale of renewable energy development and resource efficiency. • Individual technologies can have negative environmental impacts such as localised visual effects, changes in landscape/land use and impacts on biodiversity, water and air quality. • Continuing car dependence with associated emissions.	• UKCP09 climate projections for East Scotland *(UK Climate Projections/ Met Office/Scotland's Env. web)* • Total CO_2 emissions (kt), Per Capita CO_2 emissions (kt), Industry and Commercial CO_2 emissions (kt), Domestic CO_2 emissions (kt), Road transport CO_2 emissions (kt), LULUCF CO_2 emissions (kt) *(UK Government - Local Authority CO_2*

			• Risk of exceeding current capacity to deal with severe rainfall events leading to increased occurrences and duration of localised flooding.	*emissions estimates 2005-2015 (kt CO_2) – Subset dataset (i.e. Local Authority influence)*
Material assets	To develop and promote a more efficient and sustainable use of material assets.	Many of the policies pertaining to material assets are aligned with Scottish climate change legislation and policy. Collectively, these policies largely aim to contribute to core planning objectives and support sustainable development, reduce greenhouse gas emissions, and make the best use of Dundee's resources and existing infrastructure. Investment is ongoing in various areas including: transport infrastructure, central waterfront, cultural quarter, city centre and district centres, regeneration areas and education. The city benefits from a high level of open space which accounts for 28% of the urban area. A developing network of core paths which extends throughout the Council administrative area is being further enhanced through additional paths and an expanding system of dedicated cycle ways and greenways. Dundee's green circular is a 27 mile long footpath/cycleway around the city linking open space and areas of interest.	• Current land uses have the potential to be affected by changes to policy on renewable energy. • City infrastructure requires continued investment and improvement. • Without action the car will remain as the dominant method of transport. • Need for higher quality in the private rented sector and more affordable housing options. • Potential conflict between development and maintenance of open space and urban woodland. • Quality, accessibility and maintenance of open space is a growing concern.	• Active Travel (walking and cycling) as a proportion of trips to work *(Dundee City Council - Pentana database)* • Percentage of residents who were satisfied with public transport in their area *(Dundee City Council - Pentana database)* • Number of District Heating schemes *(Dundee City Council - Pentana database)*
Cultural heritage (inc. architectural and archaeological heritage)	To protect and where appropriate, enhance the historic environment.	The quality of the local environment is widely recognised as one of the City of Dundee's main strengths. A wide range of grants and enhancement schemes have been highly successful in conserving and improving the built heritage of Dundee.	• Development on sites/land adjacent to protected sites can have direct and indirect impacts upon the site or setting if not mitigated and stresses on the historic environment could lead to degradation/loss.	• Number of listed buildings/ Scheduled Ancient Monuments/ Conservation Areas *(Historic Environment Scotland – spatial downloads)*
Landscape	To protect and promote the character, diversity and special qualities of Dundee landscape.	Dundee is one of the most constrained Local Authority areas in Scotland due to its tight administrative boundary. It benefits from little of the surrounding countryside particularly to the north and has limited allocation to the east and west. The River Tay to the south comes hard up against the urban area giving the city its riverfront location. Landscape features are contained primarily within the city itself the most significant of which include Dundee Law and Balgay Hill. Other than around these two features, the landform generally slopes north west to south east with exposed slopes particularly in the eastern and western extremities. Its major parks and cemeteries are also significant landscape features. Major parks and woodland areas are to be found in the north western approach to the city. The linear park and wildlife corridor that follows the line of the Dighty Water provides a continuous green wedge stretching from the northern suburbs towards the Tay at Broughty Ferry.	• The constrained city boundary gives little scope in resolving landscape and development conflict. • Increased pressure from new development which may be pushed towards the exposed eastern and western extremities. • Opportunities to take advantage of southern facing aspect for solar PV. • Cumulative impact of direct, mitigation, and adaptation effects is likely to be most obvious in coastal areas. • Ongoing adaptation measures includes demands for engineered flood defences.	• Percentage of residents who were satisfied with the quality and maintenance of open spaces *(Dundee City Council - Pentana database)*

3.2. Evolution of the Environment in the Absence of the Plan

The SEA process is required to assess the likely impact on the environment if the Plan was not implemented. It is considered that, in the absence of the Plan, the reduction of carbon dioxide could only be progressed through a review of several documents. This is considered to be a disjointed approach and may not lead to integrated and co-ordinated action which is vital to drive down carbon emissions across Dundee.

Existing strategies have environmental protections policies within them which would ensure that the current environmental issues and problems are not exacerbated. Without the implementation of the Plan, there would be little or no co-ordinated action for environmental improvement and enhancement, relevant to carbon dioxide emissions which would have the potential to reduce the enthusiasm to make behavioural and sustainable changes to current practices. Potential changes to the environmental baseline without the Plan are listed in Table 4 below.

Table 4: Potential changes to the environmental baseline

Env. Issue	**Possible Changes without the Plan**
Biodiversity, flora & fauna	The Plan, once agreed and adopted, will increase awareness of the role biodiversity has in adapting to a changing climate and improve the way it is viewed between the partnership organisations. Without impetus for co-ordinated action via the Plan, opportunities to promote and demonstrate better practice in biodiversity and blue/green infrastructure as important contributors to local climate change mitigation and adaptation may be lost.
Population and human health	Actions within the Plan have the potential to improve the impact of the environment on human health. These range from improving the collection, handling and treatment of waste, development of open space infrastructure, promotion of cycling infrastructure, and improvement in the quality of residential, business and cultural environments. Without the Plan there is likely to be a neutral impact on the population with regards to open space, employment, sport and tourism facilities. Without the Plan's impetus to reduce emissions there could be a negative impact on human health through impacts of flooding, extreme weather events and air quality. Without the Plan there would be little or no co-ordinated action for environmental improvement related to emissions reduction which may reduce the opportunities to make behavioural and sustainable changes to current practices.
Soil and land	Without the Plan the effect is likely to be neutral as developments will continue to be built around the city under existing policies and regulations which control the release of substances during construction, remediation of contaminated land and the production and disposal of waste.
Water	Without the Plan in place the increasing effects of climate change could result in less awareness and community resilience to more frequent extreme weather events and higher incidences of flooding. Renewable technology developments if processed on an ad-hoc basis could have greater negative impacts on watercourses and the coastline.
Air	Without the Plan there would be a neutral impact on air and climatic factors. The Cleaner Air for Scotland Strategy (CAFS) draws together Scottish Government policies which impact upon air quality into a single framework and sets out a series of actions for delivering further improvements to air quality. This continues to be delivered in Dundee through an Air Quality Action Plan. Without the Plan the release of particulate matter through construction and traffic will be monitored/controlled through other strategies that are developed in isolation. However, this is considered to be a disjointed approach and would not meet the CAFS expectation for effective co-ordination of climate change and air quality policies to deliver co-benefits.
Climatic factors	Without the Plan there would be a significant negative impact on climatic factors. Existing climate action within the city is fragmented and an opportunity would be lost to ensure synergies between interventions and scale up activity in order to achieve the required emissions reduction target.

Material assets	Without the Plan there would be a neutral impact on material assets. There is existing work happening throughout Dundee City Council and other organisations with regards to sustainable transport, waste management and provision of safe pedestrian links and core paths. Adequate employment land and community facilities are already designated through the Local Development Plan 2.
Cultural heritage	Without the Plan there would be limited impact on the conservation and enhancement of historic buildings, archaeological sites and conservation sites. There could however be a negative impact on the landscape setting of Dundee's historic features or sites as without the Plan's co-ordinated approach ad-hoc renewable technology projects could cause a greater impact on the surrounding landscape through an inefficient use of land and poor design.
Landscape	Without the Plan's joined up approach ad-hoc renewable technology projects and development could take place, this could cause a greater impact on the surrounding landscape through an inefficient use of land and poor design.

4. ASSESSMENT

4.1. Assessment Methodology

In accordance with Schedule 2 of the Environmental Assessment (Scotland) Act 2005, this Environmental Report considers the positive and negative environmental impacts of the Plan's **Alternatives** and **Actions** and whether they are likely to be significant. As prescribed in Schedule 3 of the Act, the following Environmental Issues will be considered systematically within an assessment matrix:

- **Biodiversity, flora and fauna; Population and human health; Soil and land; Water; Air, Climatic Factors; Material Assets; Cultural Heritage and Landscape**.

Additionally, the following impacts will also be considered:

- **Short, medium and long-term effects; Permanent and temporary effects; Secondary, cumulative and synergistic effects.**

To assist in determining the environmental impact of the Plan, assessment questions have also been devised.

Each assessment will provide an overall score described in the table below:

Symbol	Assessment
++	Significant positive impact
+	Moderate positive impact
--	Significant negative impact
-	Moderate negative impact
o	No impact
?	Unknown or indeterminate impact

Additional commentary will provide a textual description for the reason for the impact selection.

It should be noted that a difficulty encountered in preparing the Environmental Report has been that the Plan is a high level, multi-organisation strategy document and therefore does not go into detail on every individual project that is intended to be delivered. This results in the assessment of impacts being carried out at a strategic level.

4.2. Assessment Results – Plan Alternatives

In developing this PPS, we have considered and assessed the environmental impacts of three alternative approaches described under table 5. The preferred option (Option 3) is chosen as it offers the most positive effects on the environment. Producing a coherent, long-term vision across multiple organisations will require joined up working, increase impetus to reduce emissions and help to avoid ad-hoc individual development projects, ensuring that development is well planned and has the least possible impact on the environment.

Table 5: Plan Options

Option 1: Do Nothing Under this option, stakeholders do nothing but carry on business as usual. The opportunity for collaboration and transparency around actions from partner organisations, accountability and measurement of progress is not conducted in a systematic manner. Environmental impacts would not be managed and potential benefits would be lost.				
Env. Issue	**SEA Objective**	**Assessment Question** (will the Plan Option …?)	**Score** (+, -, o, ?)	**Commentary** (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
Biodiversity, flora, fauna	To conserve, protect and where possible enhance the diversity of species and habitats.	– Protect the diversity of species and habitats? – Impact on any international, national or locally designated sites? – Avoid habitat fragmentation and increase green network connectivity? – Benefit natural heritage in the built environment and open countryside (e.g. improve biodiversity/ blue/green infrastructure)? – Impact on areas of existing native trees, woodlands and hedges? – Seek to promote watercourses as valuable landscape features and wildlife habitats?	-	Negative impact on biodiversity through climatic and emission impacts on greenspace, designated sites, protected habitats and species. Without impetus for co-ordinated action via the Plan, opportunities to promote biodiversity and habitats as important contributors to local climate change mitigation and adaptation may be lost.
Population and human health	To improve the health and wellbeing of communities in Dundee and reduce inequalities.	– Support identified population needs? – Exacerbate or improve air, water or noise pollution in communities? – Contribute towards the improvement of the environment of communities? – Improve and make provision of open space? – Impact on waste?	o/-	This option is unlikely to have an effect on population and there would be a neutral effect on the provision of open space. Possible negative effect on human health as without the impetus of the Plan to reduce emissions and improve resilience to climate change, the impacts of extreme weather events, flooding and air quality may affect the most vulnerable in the city.
Soil and land	Protect greenfield land and reduce brownfield, derelict and contaminated land.	– Protect soil quality and geodiversity? – Impact on Vacant and Derelict Land? – Result in the release of substances during construction, cleaning or redevelopment that could potentially contaminate the soil? – Ensure that possible contamination will be properly remediated and not impact upon sensitive receptors such as human health or the water environment? – Increase in the amount of waste produced?	o	This option would have a neutral impact on soil. Without the Plan, development will continue within the city under existing policies and regulations which control the release of substances during construction, remediation of contaminated land and the production and disposal of waste.
Water	To avoid flood risk, prevent deterioration and enhance natural water systems and quality of the water environment.	– Impact on water quality? If so, is this likely to be positive, negative, direct or indirect impacts or a combination? – Increase the area at risk from flooding, or result in increased flooding in other areas? – Create opportunities to promote flood management? – Directly or indirectly result in positive or negative changes of water bodies?	-	This option is likely to have a negative effect on water. Without the Plan in place, the increasing effects of climate change could result in less awareness and community resilience to more frequent extreme weather events or higher incidences of flooding. Renewable technology

		– Increase the amount of surface water run-off into water bodies? – Ensure adequate space is provided for surface water drainage including SUDS to be implemented?		developments if processed on an ad-hoc basis could have greater negative impacts on watercourses and the coastline.
Air	To protect and enhance air quality.	– Impact on or be affected by the Air Quality Management Area? – Result in the temporary release of particulate matter in constructing new development? – Increase vehicle traffic increasing carbon footprint and negatively impacting on air quality? – Encourage and promote mobility and active travel?	o	This option is likely to have a neutral impact on air. There is an existing national Clean Air Strategy, Regional Transport Strategy and Local Air Quality Action Plan which, without the Plan, will continue to positively influence air quality. Without the Plan the release of particulate matter through construction and traffic will be monitored/controlled through other strategies that are developed in isolation.
Climatic factors	To reduce greenhouse gas emissions and ensure climate change adaptation.	– Contribute towards climate change reduction targets? – Significantly increase energy consumption? – Contribute to the promotion of renewable energy development and energy efficiency within new and existing buildings? – Promote local heat network opportunities?	-	This option is likely to have a negative impact on climatic factors. Existing climate action is taking place across organisations in the city, however this is fragmented and the opportunity would be lost to ensure synergies between interventions and scale up activity in order to achieve the required emissions reduction target.
Material assets	To develop and promote a more efficient and sustainable use of material assets.	– Allow for the sustainable use of resources including waste and energy? – Contribute to the national and local recycling targets? – Provide suitable infrastructure: transport, education, health, water, waste management, sports, business, flood prevention and regeneration programmes? – Provide improved access to natural and built assets?	o	This option would have a neutral impact on material assets. There is existing work happening across Dundee with regards to sustainable transport, waste management and provision of safe pedestrian links and core paths. Adequate employment land and community facilities are already designated through the Local Development Plan 2.
Cultural heritage	To protect and where appropriate, enhance the historic environment.	– Affect any Conservation Areas, Listed buildings, Scheduled monuments, Archaeological sites, Garden and Designed landscapes, and/or their settings? – Result in the opportunity to enhance or improve access to the historic environment?	o/-	This option would have both a neutral/negative impact on cultural heritage. The business as usual scenario is unlikely to have any impact on the conservation and enhancement of historic buildings, archaeological sites and conservation sites. There could however be a negative impact on the landscape setting of Dundee's historic features or sites as without the Plan's partnership approach projects could cause a greater impact on the surrounding landscape through an inefficient use of land and poor design.
Landscape	To protect and promote the character, diversity and special qualities of Dundee landscape.	– Impact on riverfront landscape, cityscape or peripheral countryside landscape?	-	This option would have a negative impact on landscape. Without the Plan's partnership approach, ad-hoc renewable technology projects could cause a greater impact on the surrounding landscape through an inefficient use of land and poor design.

Option 2: Do Minimum

Under this option, stakeholders implement their individual plans and strategies to drive emission reduction and alternative forms of energy which do not go far enough in reducing emissions. Dundee City Council would produce a limited plan covering mainly its own activities. These would be delivered and measured, however the scale of carbon reductions and climate adaptation would be much less significant, especially as the Council's activities account for a small proportion of Dundee's local authority area-wide emissions. There would be minimum management of environmental impacts and potential benefits would be lost.

Env. Issue	**SEA Objective**	**Assessment Question** (will the Plan Option …?)	**Score** (+, -, o, ?)	**Commentary** (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
Biodiversity, flora, fauna	To conserve, protect and where possible enhance the diversity of species and habitats.	– Protect the diversity of species and habitats? – Impact on any international, national or locally designated sites? – Avoid habitat fragmentation and increase green network connectivity? – Benefit natural heritage in the built environment and open countryside (e.g. improve biodiversity/ blue/green infrastructure)? – Impact on areas of existing native trees, woodlands and hedges? – Seek to promote watercourses as valuable landscape features and wildlife habitats?	+/-	Potential for individual stakeholders' strategies and management plans to have a positive impact on emissions, greenspace, designated sites, habitats and species and habitats. Individual organisations may however, implement projects that have the potential to negatively affect biodiversity and habitats. This option does not consider the city-wide cumulative positive impacts and synergies that the Plan would provide.
Population and human health	To improve the health and wellbeing of communities in Dundee and reduce inequalities.	– Support identified population needs? – Exacerbate or improve air, water or noise pollution in communities? – Contribute towards the improvement of the environment of communities? – Improve and make provision of open space? – Impact on waste?	+/o/-	This option is unlikely to have an effect on population and there would be a neutral effect on the provision of open space. Possible negative effect on human health as without Plan impetus to reduce emissions and improve resilience to climate change, the impacts of extreme weather events, flooding and air quality may affect the most vulnerable in the city.
Soil and land	Protect greenfield land and reduce brownfield, derelict and contaminated land.	– Protect soil quality and geodiversity? – Impact on Vacant and Derelict Land? – Result in the release of substances during construction, cleaning or redevelopment that could potentially contaminate the soil? – Ensure that possible contamination will be properly remediated and not impact upon sensitive receptors such as human health or the water environment? – Increase in the amount of waste produced?	o	This option would have a neutral impact on soil. Without Plan, development will continue within the city under existing policies and regulations which control the release of substances during construction, remediation of contaminated land and the production and disposal of waste.
Water	To avoid flood risk, prevent deterioration and enhance natural water systems and quality of the water environment.	– Impact on water quality? If so, is this likely to be positive, negative, direct or indirect impacts or a combination? – Increase the area at risk from flooding, or result in increased flooding in other areas? – Create opportunities to promote flood management? – Directly or indirectly result in positive or negative changes of water bodies? – Increase the amount of surface water run-off into water bodies? – Ensure adequate space is provided for surface water drainage including SUDS to be implemented?	+/-	This option could result in positive and negative impacts on water. Individual stakeholders focus on lowering emissions and adapting to effects of climate change. Some abstraction of water could be required for any renewable energy projects related to the Tay and there could be an impact on watercourses.
Air	To protect and enhance air quality.	– Impact on or be affected by the Air Quality Management Area? – Result in the temporary release of particulate matter in constructing new development?	+/o	This option is likely to have a positive impact on air whereby individual stakeholders are promoting projects to reduce emissions and improve air quality. However, this is considered to be a disjointed approach and would

		– Increase vehicle traffic increasing carbon footprint and negatively impacting on air quality? – Encourage and promote mobility and active travel?		not meet the CAFS expectation for effective co-ordination of climate change and air quality policies to deliver co-benefits.
Climatic factors	To reduce greenhouse gas emissions and ensure climate change adaptation.	– Contribute towards climate change reduction targets? – Significantly increase energy consumption? – Contribute to the promotion of renewable energy development and energy efficiency within new and existing buildings? – Promote local heat network opportunities?	+	This option is likely to have a positive impact on climatic factors whereby individual stakeholder plans are being implemented with expected reductions in energy consumption, carbon emissions and an increase in the use of renewables. This would be a fragmented approach however and an opportunity would be lost to ensure synergies between interventions and scale up activity in order to achieve the required emissions reduction target.
Material assets	To develop and promote a more efficient and sustainable use of material assets.	– Allow for the sustainable use of resources including waste and energy? – Contribute to the national and local recycling targets? – Provide suitable infrastructure: transport, education, health, water, waste management, flood prevention and regeneration programmes? – Provide improved access to natural and built assets?	o/+	Potential for individual stakeholders' strategies and action plans to have a positive impact on material assets. There is a significant amount of existing work going on already to address issues such as sustainable transport, waste management and flood prevention. However, an opportunity would be lost to ensure collaboration and economies of scale in implementing projects such as waste reduction initiatives.
Cultural heritage	To protect and where appropriate, enhance the historic environment.	– Affect any Conservation Areas, Listed buildings, Scheduled monuments, Archaeological sites, Garden and Designed landscapes, and/or their settings? – Result in the opportunity to enhance or improve access to the historic environment?	o/-	This option would have both a neutral and negative impact on cultural heritage. The carbon reduction/low emission goals of individual organisations would be unlikely to have an effect on the conservation and enhancement of historic buildings, archaeological sites and conservation sites. The implementation of some projects on an ad-hoc basis such as renewable technologies may have a negative impact on the surrounding landscape through an inefficient use of land and poor design.
Landscape	To protect and promote the character, diversity and special qualities of Dundee landscape.	– Impact on riverfront landscape, cityscape or peripheral countryside landscape?	+/o	This option may have both positive and negative impacts on landscape as ad-hoc renewable energy projects are developed and the character of the area may change over time to adapt to the effects of a changing climate. The implementation of some projects on an ad-hoc basis such as renewable technologies may have a negative impact on the surrounding landscape through an inefficient use of land and poor design.

Option 3: Do Optimum *(preferred)*

Under this option, stakeholders work in partnership across all sectors to develop an action plan that tackles the emissions and energy issues across the whole city. A city-wide Plan would be developed to realise the greatest environmental benefits due to the strategic, co-operative and partnership approach to the development of the Plan. The Plan would set out the approach that Dundee intends to take to meet its commitments on reducing energy use and carbon emissions. It is intended that the impact of delivering the Plan would have a positive significant impact on the environment.

Env. Issue	**SEA Objective**	**Assessment Question** (will the Plan Option …?)	**Score** (+, -, o, ?)	**Commentary** (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
Biodiversity, flora, fauna	To conserve, protect and where possible enhance the diversity of species and habitats.	– Protect the diversity of species and habitats? – Impact on any international, national or locally designated sites? – Avoid habitat fragmentation and increase green network connectivity? – Benefit natural heritage in the built environment and open countryside (e.g. improve biodiversity/ blue/green infrastructure)? – Impact on areas of existing native trees, woodlands and hedges? – Seek to promote watercourses as valuable landscape features and wildlife habitats?	++/-	This option is likely to have a significant positive impact on biodiversity. The Plan aims to promote biodiversity and habitats as important local contributors to climate mitigation and adaptation. Actions will provide joined-up project opportunities and offer a means of promoting best practice in designing, constructing and operating projects. Some actions (e.g. change in land use or renewable energy projects) have the potential to create negative impacts including loss or change of habitat, fragmentation or disturbance and would require early and detailed assessment as part of the planning process to substantially reduce the risk of negative impacts.
Population and human health	To improve the health and wellbeing of communities in Dundee and reduce inequalities.	– Support identified population needs? – Exacerbate or improve air, water or noise pollution in communities? – Contribute towards the improvement of the environment of communities? – Improve and make provision of open space? – Impact on waste?	+	The Plan aims to provide multiple benefits in adapting to climate change impacts and moving towards a sustainable low carbon economy energy system, (e.g. helping to tackle fuel poverty). Changes in how we use and generate energy locally and become more resilient to climate change impacts can positively benefit our buildings, infrastructure and services. Long-term improvements to human health are expected through reducing harmful emissions to air, increasing active travel and creating more usable open/green spaces.
Soil and land	Protect greenfield land and reduce brownfield, derelict and contaminated land.	– Protect soil quality and geodiversity? – Impact on Vacant and Derelict Land? – Result in the release of substances during construction, cleaning or redevelopment that could potentially contaminate the soil? – Ensure that possible contamination will be properly remediated and not impact upon sensitive receptors such as human health or the water environment? – Increase in the amount of waste produced?	+/-	This option is likely to have a positive impact on soil and land. Through joined up working, the Plan aims to increase impetus, awareness and see more stakeholders reaching higher environmental/sustainability standards. Climate adaptation actions may create temporary or permanent disturbance to soils. Soil degradation or restoration, soil contamination and the loss of soil may occur during development activity or changed approaches to flood management and would require early and detailed assessment as part of the planning process.
Water	To avoid flood risk, prevent deterioration and enhance natural water systems and quality of the water environment.	– Impact on water quality? If so, is this likely to be positive, negative, direct or indirect impacts or a combination? – Increase the area at risk from flooding, or result in increased flooding in other areas? – Create opportunities to promote flood management? – Directly or indirectly result in positive or negative changes of water bodies? – Increase the amount of surface water run-off into water bodies? – Ensure adequate space is provided for surface water drainage including SUDS to be implemented?	+/-	This option could result in positive and negative impacts on water. The Plan aims to achieve a low emission society and which is resilient to the effects of climate change, extreme weather and incidents of flooding. Actions may have temporary to longer term impact on water quality if used as an energy source or energy store. Water and groundwater quality may be affected by developments and detailed impact assessments for any such projects would be required.

Air	To protect and enhance air quality.	– Impact on or be affected by the Air Quality Management Area? – Result in the temporary release of particulate matter in constructing new development? – Increase vehicle traffic increasing carbon footprint and negatively impacting on air quality? – Encourage and promote mobility and active travel?	++/-	This option is likely to have a positive impact on air quality. The Plan, once agreed and adopted, would provide a joined up approach that would ensure the CAFS expectation for effective co-ordination of climate change and air quality policies to deliver co-benefits. Some actions may influence air quality, including, renewable energy (both positively and potentially adversely) and the transition to low carbon fuels (reduced particulates).
Climatic factors	To reduce greenhouse gas emissions and ensure climate change adaptation.	– Contribute towards climate change reduction targets? – Significantly increase energy consumption? – Contribute to the promotion of renewable energy development and energy efficiency within new and existing buildings? – Promote local heat network opportunities?	++	The Plan will have a positive cumulative impact on climatic factors whereby the opportunity to ensure synergies between interventions and scale up activity in order to achieve the required emissions reduction target is captured. The Plan emphasises a shift to a low carbon economy for Dundee and partnership actions give rise to opportunities to both harness the benefits of, whilst also offsetting the negative effects of, climatic change. Actions are expected to achieve reductions in energy consumption, carbon emissions and increase the use of renewables within the city.
Material assets	To develop and promote a more efficient and sustainable use of material assets.	– Allow for the sustainable use of resources including waste and energy? – Contribute to the national and local recycling targets? – Provide suitable infrastructure: transport, education, health, water, waste management, sports, business, flood prevention and regeneration programmes? – Provide improved access to natural and built assets?	+	This option is likely to have a positive impact on material assets. A joined-up approached would promote the sustainable use of resources, construction and circular economy opportunities, active travel networks, electric vehicle/hydrogen infrastructure and renewable energy/heating technologies.
Cultural heritage	To protect and where appropriate, enhance the historic environment.	– Affect any Conservation Areas, Listed buildings, Scheduled monuments, Archaeological sites, Garden and Designed landscapes, and/or their settings? – Result in the opportunity to enhance or improve access to the historic environment?	o	This option is likely to have a neutral and impact on cultural heritage. Many of the objectives of the Plan such as policy change, energy efficiency and resource efficiency are unlikely to have an effect on the conservation and enhancement of historic buildings, archaeological sites and conservation sites. However, development activities can potentially impact historic features, affecting local identity or the setting of important cultural heritage.
Landscape	To protect and promote the character, diversity and special qualities of Dundee landscape.	– Impact on riverfront landscape, cityscape or peripheral countryside landscape?	-/o	Possible developments may change the landscape and character of the area and there may be impacts on important views and areas of value. In particular climate adaptation may include policies and actions that help manage or zone for unavoidable changes to landscape and natural heritage.

4.3. Assessment Results – Plan Actions

As part of the Plan development process, stakeholder engagement events were held to prepare a proposed action plan comprising Direct Actions: (measures that will directly reduce emissions/embed resilience); Enabling Actions: (measures to support the delivery of direct actions); and Delivery Actions: (measures that will implement the plan). Table 6 below documents the assessment of proposed actions and themed into General, Energy, Waste, Transport and Resilience.

Table 6: Actions contained within the Consultative Draft Plan

Action	**Environmental Issue**									**Commentary** (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
	Biodiversity, flora, fauna	Population and human health	Soil and land	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	
GENERAL										
G1. Establish effective governance for the Plan in partnership with public, private and community organisations and implement a system for monitoring and reporting progress.	o	o	o	o	o	o	o	o	o	Administrative action with no discernible environment impact.
G2. Adopt an emissions modelling tool to quantifying the impact of the Plan's actions and to inform future targets.	o	o	o	o	o	o	o	o	o	Administrative action with no discernible environment impact.
G3. Develop the Sustainable Dundee communications strategy to raise awareness, communicate and engage people in the Plan to promote prolonged behaviour change.	+	+	+	+	+	+	+	+	+	Positive cumulative impact expected through influence of the Plan to promote sustainable practices and behaviours.
G4. Develop and trial a carbon budget for Dundee City Council.	o	o	o	o	o	+	+	o	o	Targeted at reducing carbon emissions, energy use and raising awareness within the Council. Impact can be quantifiable, dependent on type of carbon budget selected.

Action	Environmental Issue									Commentary (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
	Biodiversity, flora, fauna	Population and human health	Soil and land	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	
ENERGY - Energy Efficiency										
EE.1. Complete fabric improvements to outstanding domestic Council (and ex-Council properties in mixed-tenure blocks) stock to achieve the Energy Efficiency Standard for Social Housing (EESSH) by 2020 and widen range of technologies (including renewables) under consideration to allow compliance with the more exacting EESSH2 standard by 2032.	o	++	o	o	?	+	+	+/-	o	Focused on energy efficiency improvements (inc. renewables), with expected reductions in energy use and carbon emissions from investment in city's housing stock. Installation may have impact on traditional and culturally significant buildings.
EE.2. Continue to deliver a city-wide energy awareness campaign to improve energy efficiency behaviour in all households.	o	++	o	o	o	+	+	o	o	Positive benefits in tackling fuel poverty and promoting sustainable practices within homes and workplaces.
EE.3. Explore how the work of the Dundee Energy Efficiency Advice Project (DEEAP) can be maintained and delivered.	o	++	o	o	o	+	+	o	o	Positive benefits in tackling fuel poverty and promoting sustainable practices within homes and workplaces.
EE.4. Complete phase 1 of the Non Domestic Energy Efficiency (NDEE) retrofit of Dundee City Council public buildings (Basket 1) before implementing subsequent phases (Baskets) annually until all prescribed measures are complete on all Council public buildings.	o	o	o	o	?	+	+	+/-	o	Focused on energy efficiency improvements, with expected reductions in energy use and carbon emissions from investment in building stock. Installation may have impact on traditional and culturally significant buildings.
EE.5. Update the Councils Carbon Management Plan, identifying new targets in line with the Public Bodies Climate Change Duties (PBCCD) and Plan targets.	o	o	o	o	o	+	+	o	o	Targeted at reducing carbon emissions, energy use and raising awareness within the Council.
EE.6. Replace all streetlights with energy efficient lighting systems by 2020.	o	+	o	o	o	++	+	o	+	Long-term positive impact on reducing carbon emissions, energy use and light pollution.
EE.7. Provide advice and support on resource efficiency and climate risk management for businesses in Dundee.	o	o	o	o	o	+	+	o	o	Positive benefits to city's business sector.
ENERGY – Renewables										
RE.1 Adopt a Whole Life Costing approach to ensure new developments achieve greater operational sustainability.(This will include analysis of maintenance burdens, end of life use, outputs and performance to ensure resilient, efficient buildings are designed with minimal waste.)	o	o	o	o	o	+	+	o	o	Positive benefits to city's renewables infrastructure, demonstrating sustainable construction practices to reduce carbon emissions and energy use.
RE.2 Research opportunities to utilise local water bodies for renewables including local reservoirs, rivers and estuaries.	o/-	o	o	+/-	o	o	o	o	o	Action itself will not have a direct environmental impact. Secondary actions, if delivered, may have negative environmental impacts through potential land use change, although level of impact difficult to quantity at this stage.
RE.3 Identify solar PV implementation across Dundee for public and private buildings and ensure all civic buildings have renewables where technically feasible.	o	++	o	o	?	++	++	+/-	?	Focused on renewables roll out, with expected reductions in energy use and carbon emissions from investment in city's buildings. Installation may have impact on traditional and culturally significant buildings.
RE.4 Progress an Integrated Energy Park/ Centre of Excellence concept.	o	+	o/-	o	+/-	++	+/-	o	+/?	Positive benefits to city's renewables infrastructure and generation to reduce carbon emissions. Possible temporary disturbance to soils and release of particulate matter during construction. Emissions due to construction and operation of new infrastructure.

Action		Environmental Issue									Commentary (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
		Biodiversity, flora, fauna	Population and human health	Soil and land	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	
RE.5	Explore potential for Integrating hydrogen fuel into heating and transport technologies where feasible.	o	+	o	o	+	+	+	o	?	Positive cumulative impact expected.
RE.6	Develop a regional cluster approach to attract investment, support business growth and create jobs in the offshore wind sector; retaining more graduates and making the city a magnet for new talent.	o	+	o	o	?	+	o	o	?	Positive benefits for city's workforce.
ENERGY – District Heating											
DH.1	Explore options to further improve efficiencies in the Council's existing Multi-Storey domestic district heating schemes.	o	+	o/-	o	+	+	+	o	o	Focused on delivery of low carbon heat projects, with expected reductions in energy use and carbon emissions from investment in city's domestic building stock.
DH.2	Deliver the Low Carbon District Energy Hub at the Regional Performance Centre for Sports (RPCS) as a catalyst project; proving industry/technology programmes and projects.	o	+	o	o	+/-	++	++	o	o	Positive impact on renewable generation capacity and decarbonising heat within city. Temporary disturbance to soils and release of particulate matter during construction.
DH.3	Prepare an investment-ready business case that identifies district heating opportunities from the city's Energy from Waste Combined Heat and Power facility.	o	o	o	o	+/-	++	++	o	o	Action itself will not have a direct environmental impact. Secondary actions, if delivered, may have positive environmental impacts although level of impact difficult to quantity at this stage. Possible temporary release of particulate matter during construction.
DH.4	Engage with stakeholders and wider industry to promote district heating in Dundee and work with technology providers to explore fuels for district heating integration.	o	+	o	o	+	+	+	o	o	Positive impact on delivery of low carbon heat networks and cumulative benefits from scaled up activity in order to achieve the required emissions reduction target.
DH.5	Investigate options to create a Dundee City Energy Services Company (ESCo) to help coordinate planning, funding, operations, and delivery of projects.	o	+	o	o	+	+	+	o	o	Action itself will not have a direct environmental impact. Secondary actions, if delivered, likely to have positive, long-term environmental impacts through co-ordination of project investment and delivery, although level of impact difficult to quantity at this stage.
DH.6	Participate in the Scottish Governments pilot Local Heat and Energy Efficiency Strategy (LHEES) programme and respond to proposals to create a statutory framework for LHEES.	o	+	?	o	+/-	+	+	+/-	?	Focused on energy efficiency and district heating investment, with expected reductions in energy use and carbon emissions. Installation may have impact on traditional and culturally significant buildings. Temporary release of particulate matter during construction.
MOBILITY											
M1.	Implement the Dundee Cycling Strategy and Councils extensive Active Travel programme in partnership with community groups, improving and increasing cycling paths and infrastructure across the city to reduce the modal share of car based transport.	+/o	++	+	o	+	+	+	o	+	Positive cumulative impact expected through investment active travel and benefits to air quality and emissions reduction. Possible temporary disturbance to soils.
M2.	Develop a Low Carbon Active Travel Hub in Dundee Waterfront to include bike hire, cycle parking, bike maintenance, electric vehicle (EV) charge points, an EV car club and community outreach.	o	++	+	o	+/-	+	+	o	+	Positive cumulative impact expected through the campaign to promote sustainable transport alternatives and reduce reliance on car. Possible temporary disturbance to soils and release of particulate matter during construction.

Action		Environmental Issue									Commentary (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
		Biodiversity, flora, fauna	Population and human health	Soil and land	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	
M3.	Implement Shared Mobility and Resource Efficiency projects developed by the Mobility in Living Laboratory (MILL) to ensure Dundee remains in a position to take advantage of future innovative mobility solutions including autonomous vehicles.	o	+	o	o	+	+	+	o	o	Positive cumulative impact expected from low carbon, mobility interventions.
M4.	Ensure safer streets that enable active travel in Dundee including assessing suitable locations for pedestrianisation, 20mph zones and off road/segregated active travel networks.	o	++	o	o	+	+	o	o	o	Action focused on improvements to safety. Positive secondary impact on air quality.
M5.	Expand Electric Vehicle (EV) charging hubs and infrastructure across the city.	o	+	+/-	o	+	+	++	o	+	Positive benefit to city's EV charging infrastructure with long-term benefits to air quality and climatic factors. Temporary disturbance to soils.
M6.	Increase EV uptake in Dundee via support and awareness provided by the Drive Dundee Electric campaign and local policy measures, including continued migration to low carbon vehicles within the council fleet.	o	+	o	o	+	+	+	o	o	Positive cumulative impact through the campaign to promote sustainable transport alternatives.
M7.	Establish a Low Emission Zone in Dundee by 2020 to contribute to the broader city objectives and the vision to create a healthy, vibrant and attractive city by protecting public health through improving air quality.	o	++	o	o	++	++	o	o	o	Positive effect on air quality and climatic factors expected, with effective co-ordination of climate change and air quality policies to deliver co-benefits.
M8.	Continued promotion of ECOSTARS schemes to encourage Heavy Duty, Taxis and Private Hire vehicle companies to participate in air quality improvements in Dundee.	o	+	o	o	+	+	+	o	o	Positive impact on air quality and reducing emissions from transport.
M9.	Explore options for increasing deployment of low emission buses in Dundee, including hybrid and hydrogen buses.	o	+	o	o	++	+	+	o	o	Positive cumulative impact expected through investment in sustainable transport infrastructure and benefits to air quality and emissions reduction.
WASTE											
W1.	Develop and implement circular economy projects identified by the Circular Tayside initiative and deliver a circular economy education strategy across the City.	o	+	o	+	+	+	++	o	o	Positive cumulative impact expected through waste reduction and increase of re-use opportunities within city.
W2.	Continue to communicate frequently with residents around waste/recycling services to improve participation/recyclate quantity and quality.	o	+	+	o	o	+	++	o	o	Positive benefits in reducing city's waste generation and promoting sustainable practices within homes and workplaces.
W3.	Zero Waste Scotland to pilot food waste reduction project in Dundee schools, hospitals and small businesses by December 2020.	o	+	+	+	o	+	++	o	o	Positive benefits in reducing city's food waste generation and promoting sustainable practices within homes and workplaces.
W4.	Encourage citizens to take responsibility for the environment through the "Take Pride in Your City" campaign.	o	+	+	+	+/o	+	++	o	o	Positive benefits in reducing city's waste, litter and promoting sustainable practices.
W5.	Trial Smart waste technology to improve waste monitoring and collection efficiencies in the city.	o	+	o	o	o	+	++	o	o	Positive benefit to increase waste collection efficiencies and reduce littering.
W6.	Explore initiatives to significantly reduce the quantity of single-use plastics used in Dundee organisations including DCC premises and wider commercial establishments.	o	+	+	+	o	+	++	o	o	Positive impact on the sustainable use of resources, recycling and educational opportunities.

Action		Environmental Issue									Commentary (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
		Biodiversity, flora, fauna	Population and human health	Soil and land	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	
W7.	Continued delivery of sustained waste education campaign programme which aligns to the curriculum for excellence and embeds behavioural change at all stages of the educational journey.	o	+	+	+	o	+	++	o	o	Positive impact on the sustainable use of resources, recycling and educational opportunities.
W8.	Support the Scottish Governments Deposit Return Scheme and other viable take back schemes.	o	+	+	o	o	+	+	o	+	Positive cumulative impact expected through waste reduction and increase of re-use opportunities.
W9.	Stimulate increased reuse as well as upcycling and repairing opportunities and the necessary skills and training to undertake these.	o	+	+	o	o	+	+	o	+	Positive cumulative impact expected through waste reduction and increase of re-use opportunities.
RESILIENCE											
R.1	Design a Dundee Surface Water Management Plan/Tayside Integrated Catchment Study that considers measures to reduce flood risk and protect buildings, infrastructure and people from flooding and includes blue-green infrastructure across the city and/or retrofitting SUDS to store and manage surface water runoff. Ecological solutions will be used where possible e.g. dune replenishment as part of Dundee Coastal Flood Protection Scheme.	+/-	+	+/-	+	+/o	+	+	+	+	Temporary disturbance to soils and habitats. Positive impacts from increased green networks, greater protection of buildings, communities, biodiversity and land from reduced flooding.
R.2	Undertake coastal and watercourse inspections and organise repairs and maintenance under current legislation and the Tay Estuary and Montrose Basin Local Flood Risk Management Plan.	+/-	+	+/-	+	o	+	+	+	+	Possible temporary negative impacts on biodiversity, soil and land whilst repairs carried out. Overall positive environmental benefits associated with reduced flood risk.
R.3	Improve Dundee's Public Sewer and Mains Water systems to improve drinking water quality and reduce sewage discharge to the water environment; continued communication of water quality information via the electronic display at Monifieth, SEPA website and Dundee City Council signage and social media.	o	+	+/-	+	o	+	o	+/o	o	Possible temporary disturbance to soils and release of particulate matter during construction. Positive impact on water quality.
R.4	Scottish Water will review and develop its 25 Year Water Resource Plan to ensure projected drought conditions are included; incorporating reinforcement of reservoirs, expanding the supply network and developing mitigation measures as required.	+/-	+	+/-	+	o	+	o	o	+/-	Positive impacts from securing water resources, potential temporary disturbance to soils landscape and habitats.
R.5	Monitor costs associated with climate change including heating and cooling costs as well as maintenance and repair costs or buildings and infrastructure.	o	o	o	o	+	+	+	o	o	Positive benefits to assessing impacts and costs and allowing decisions to be made on energy efficiency and renewable.
R.6	Promote efficient water use by businesses and the wider community and create a business case for rainwater capture and reuse capital investment.	o	+	o	+	o	+	+	o	o	Positive impacts from securing water resources and improving water efficiency and therefore, reducing emissions.
R.7	Implement 'Cleaner Air for Scotland - The Road to a Healthier Future' strategy and monitor guidance for developers to ensure air quality is taken into account for new developments.	o	+	o	o	+	+	o	o	o	Positive benefits to human health, air quality and reduced emissions.
R.8	Public health information campaigns to address increase in sun/heat/air and water quality related illnesses and development of Green Health Partnership, linking health care and greenspace initiatives	o	+	o	o	o	+	o	o	o	Positive benefits to human health and increased resilience to climate change.

Action		Environmental Issue									Commentary (inc. short/med/long-term reversibility/irreversibility of affects, risks, permanent/temporary duration)
		Biodiversity, flora, fauna	Population and human health	Soil and land	Water	Air	Climatic factors	Material assets	Cultural heritage	Landscape	
R.9	Develop an interactive green map for Dundee to help visitors and residents identify sustainable options and information for travel, food, recreation and resource use.	o	+	o	o	+	+	o	+	+	Encouraging people in Dundee to make sustainable choices regarding mobility, waste and energy will help to reduce emission and improve air quality. Encouraging access to green spaces and cultural sites will help to improve human health.
R.10	SMART Mobility to include co-ordinated communication of transport information and quicker demand response options to keep visitors and residents informed of disruptions and alternatives.	o	+	o	o	o	+	o	o	o	Positive benefits to human health and increased resilience to climate change.
R.11	Plan co-ordinated, prompt communication to inform residents of waste service disruptions, alternative options available and estimate of when normal services will resume; ensuring that operational contingencies are in place for extreme weather events.	+	+	+	o	+/-	+/-	+	o	o	Ensuring waste operations continue reduces the chance of waste and litter causing pollution and harming habitats and human health. Contingencies may require longer journeys to alternative sites, therefore increasing emissions from transport fuel.
R.12	Develop adaptation engagement tools to support community capacity building, including visual and interactive tools, workshops and collaboration with community organisations.	+	+	+	+	+	+	+	+	+	Positive impact from educating and mobilising communities into action on resilience and climate change.
R.13	Develop a Persons at Risk Register in partnership with the NHS to help identify members of the community vulnerable to interruptions in supply of power, heating, water and other essential services and regular testing and review of Local Resilience Partnership plans and NHS Winter Plans to prioritise services.	o	+	o	o	o	+	o	o	o	Positive benefits to human health and increased resilience to climate change.
R.14	Update the Green Tourism accreditation to incorporate climate adaptation and increase the number of Green Tourism Award Holders in Dundee.	+/o	+	+/o	+	+	+	+	+	+/o	Multiple benefits may include measures to conserve water, improve energy efficiency, incorporate renewables, planting climate appropriate species, protecting the fabric of buildings and provide health (e.g. sun protection) and travel advice to visitors.
R.15	Increase participation in the Eco-Schools programme in Dundee via improved local support and pilot projects with appointed schools.	+	+	o	+	+	+	+	o	o	Positive cumulative impact expected through influence of the Plan to promote sustainable practices and behaviours.
R.16	Co-design blue/green infrastructure improvements with relevant Council departments, partners and the wider community. Aligning with Dundee City Councils green networks supplementary planning guidance; improvements will into account flooding, heat island effect, active travel, biodiversity and including appropriate planting in urban areas, as well as community cohesion opportunities.	+	+	+/-	+	+	+	+	+	+/-	Action will ensure community skills, knowledge and needs are taken into account when designing blue green infrastructure; some decisions may prioritise one environmental issue over another.
R.17	Produce an Open Space strategy based on collaboration and outcomes from workshops to include green infrastructure that helps Dundee's nature to adapt to changes in climate and supports the delivery of Dundee's green networks.	+	+	+/-	+	+	+	+	+	+	An open space strategy will identify opportunities to improve green spaces and green infrastructure which will contribute to improved health, air and water quality, increase biodiversity and growing spaces and improving resilience. Any landscaping may cause temporary disturbance to soils.
R.18	Prepare a Biodiversity Plan that includes actions for safeguarding and enhancing existing habitats and species as well as actions on potential sites and projects. The plan should be integrated across sectors and the broader green network and adopted corporate-wide to ensure biodiversity protection and enhancement are prioritised in all green space maintenance regimes, relevant projects and developments.	+	+	+	+	+	+	+	+	+	Measures to protecting and enhance habitats and increase biodiversity will create impacts across all environmental issues.

R.19	Contribute to the enhancement and maintenance of the Tay River and coastal habitats. Identify opportunities for soft coastal management /managed realignment habitat creation and maintain the Beach Award for Broughty Ferry.	+	+	+/-	+	o	+	o	+/o	+	Positive impacts on biodiversity as natural landscape features and habitats recreated. Temporary disturbance of soils.
R.20	Monitor and review the Urban Tree Policy to identify suitable areas for tree planting with climate appropriate species and with consideration of how planting interacts with surroundings e.g. air quality, active transport, biodiversity etc.	+	+	+	+	+	+	+	+	+	Suitable tree planting has the potential to increase biodiversity and habitats, improve soil, air and water quality as well as landscapes, reduce runoff and heat island effect and protect material assets and health.
R.21	Develop a Local Food Growing Strategy and expand the number of community growing projects and support them with skills training, materials and capacity building.	+	+	+	+	+	+	o	o	+	Local food growing builds community resilience, reduces emissions from food miles, can improve soils, landscape and biodiversity as well as contribute towards water and air quality when compared with other land uses.

5. MITIGATION

In accordance with Schedule 3 of the Environmental Assessment (Scotland) Act 2005, mitigation measures to prevent, reduce and fully as possible offset any significant adverse effects on the environment of implementing the Plan have been considered and outlined in table 7 below.

Table 7: Mitigation Measures

Environmental Issue	Possible Impacts	Relevant Actions	Mitigation Measures	When should Mitigation be considered?	Who is responsible for undertaking mitigation?
Biodiversity, flora & fauna	Some projects may directly affect habitats and species through disturbance/fragmentation or result in land use change.	RE.2, R.1, R.2, R.4,	Individual development projects will require Habitats Regulations Assessment where a proposal is likely to affect a protected European site. This measure is consistent with LDP2 policy. A design statement and ecological assessment may be required for any development in the open countryside or urban fringe which potentially effects protected designations.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Population and human health	Potential for increased environmental degradation through littering and fly-tipping.	W13, W14	Promote available services including reuse and recycling facilities to encourage sustainable behaviours.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Soil and land	Infrastructure related projects are likely to result in temporary disturbance to soils or a change in land use.	RE.4, DH.1, M.5, R.1, R.2, R.3, R.4, R.16, R.17, R.19	The promotion of good planning and design and construction management of individual projects to be adopted to minimise environmental impacts. LDP2 policies to be followed to ensure compliance.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Water	There is potential for any energy installation facilities and ancillary structures to use water thereby necessitating the need for water abstraction or use.	RE.2	Projects to comply with the Water Environment (Controlled Activities) (Scotland) Regulations 2011 and also ensure Habitats Regulations Assessment are carried out where required to address any effects of water abstraction on protected habitats.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Air	It is likely that short term emissions will occur through the construction phases of any development projects.	RE.4, DH.2, DH.3, DH.6, M.2, R.11	Apply LDP2 Air Quality Policy, which states general presumption against development proposals that could significantly increase air pollution or introduce people into areas of elevated pollution concentrations unless mitigation measures are adopted to reduce the impact to acceptable levels.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Climatic factors	It is likely that short term emissions will occur through the construction phases of any development projects.	R.11,	The promotion of good planning and design and construction management of individual projects to be adopted to minimise unavoidable carbon emissions. Development proposals should also avoid any direct or indirect impact on areas at risk of flooding. This measure is consistent with LDP2 policy.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.

Environmental Issue	Possible Impacts	Relevant Actions	Mitigation Measures	When should Mitigation be considered?	Who is responsible for undertaking mitigation?
Material assets	Potential for impacts on resource use and unsustainable practices arising from construction projects.	RE.4,	The promotion of good planning and design and construction management of individual projects to be adopted to minimise environmental impacts.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Cultural heritage	The installation of energy efficiency, renewables or district heating measures may have a mixed visual impact on traditional and culturally significant buildings associated with the retrofitting of measures to existing building stock.	EE.1, EE.4, RE.3, DH.6,	Specific environmental effects will be considered through the planning process such as Listed Building Consent, and on a site by site basis, and the use of appropriate construction management measures such as Environmental Management Plans.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.
Landscape	There is potential for visual impact of projects if they involve construction and development on the landscape character.	R.4, R.16	Landscape impact to be mitigated through screening or sensitive siting within the landscape where appropriate. Projects will also be required to improve the visual amenity and landscape character consistent with LDP policy.	Project design and implementation.	Various stakeholders, with lead project managers taking overarching responsibility.

6. MONITORING

Section 19 of the Environmental Assessment (Scotland) Act 2005 requires the Responsible Authority to monitor significant environmental effects of the implementation of the Plan to ensure that any adverse and unforeseen impacts do not arise or can be identified and remedied.

A monitoring approach is outlined within the Plan in order to clarify how progress will be measured:

- Monitoring of individual actions will be undertaken by project leads and communicated on a six monthly basis. Dundee City Councils' performance management system (PENTANA) will be used to recorded progress of action implementation.
- An annual monitoring report will be prepared for Dundee City Council's Policy and Resource Committee outlining progress on action plan projects.
- A report to the Covenant of Mayors for Climate and Energy on the progress of the Plan will be prepared and submitted every two years, to include a Monitoring Emissions Inventory (MEI).
- Carbon Reporting Tools will be explored to help track city-wide emissions.
- A communications strategy will be developed to allow a coordinated and structured approach to communicating the Plan. Communications will be conducted via the Knowledge hub, the Sustainable Dundee (@sust_dundee), and Dundee City Council (@dundeecouncil) Twitter accounts.

A wide range of other plans, programmes and strategies, presented in Appendix 2 are also in place at the national and local level aim to monitor environmental status and assess performance against established environmental indicators.

7. CONSULTATION AND KEY DATES

The Plan has been co-designed with stakeholders from across Dundee and a number of meetings and workshops have taken place to prepare the draft document. On the 23rd August 2018, 50 individuals representing 20 different public, private and community organisations came together to contribute their ideas and knowledge to help shape Dundee's transition to a low carbon city in a workshop titled "Dundee 2030: Envisioning a Low Carbon Future". Over 100 actions were identified and further refined in partnership with stakeholders to formulate a list of practical actions to help the City meet its goals.

As proposed in the SEA Scoping Report and agreed with the Consultation Authorities, a six week consultation period took place for interested parties to make representations on both the Plan and the SEA Environmental Report. The consultation period ran from Tuesday 25th June 2019 until Tuesday 26th August 2019.

How to comment on the report:

Consultees were asked to express their views on the contents of the Environmental Report or the Plan, by:

Online: https://www.dundeecity.gov.uk/consultations-and-surveys

By e-mail: sustainability@dundeecity.gov.uk

By post: Sustainability and Climate Change Team, Dundee City Council, City Development, Department, Dundee House, Floor 5, 50 North Lindsay Street, DUNDEE DD1 1QE

Documents were advertised on Dundee City Council's consultation page and promoted via the Sustainable Dundee twitter account (@sust_dundee). Any comments/observations received in

respect of the Environmental Report were taken into account before the Plan was finalised and submitted to Dundee City Council's Policy & Resources Committee.

Key dates are for preparing the Plan are outlined in table 8 below, although may be subject to change.

Table 8: Plan Preparation: Key Dates

Activity	**Date**
Covenant of Mayors (CoM) signing – commitment to the Plan	Mar 2018
CoM Prerequisite task 1 - Commission Baseline and Monitoring Emissions Inventories	Mar 2018
Submit SEA Screening Report to Consultation Authorities	May 2018
Plan Stakeholder workshop – Dundee City Council officers	May 2018
Submit SEA Scoping Report to Consultation Authorities	June 2018
Plan Stakeholder workshop – City stakeholders	Aug 2018
Issue draft Plan actions for stakeholder comments	Oct 2018
CoM Prerequisite task 2 – Risk & Vulnerability Assessment (RVA) Workshops and prepare RVA narrative	Oct-Nov 2018
Prepare SEA Environmental Report	Dec 2018
Prepare Plan narrative and finalise action plan	Dec 2018-Mar 2019
Publish Draft Plan, RVA and SEA Environmental Report for consultation	June-Aug 2019 (6 weeks)
Final Plan to Dundee City Council Committee for adoption	Oct/Nov 2019
Publish Plan	Nov/Dec 2019
Publish SEA Post-Adoption Statement	Nov/Dec 2019
Submit Plan papers to Covenant of Mayors office	By March 2020

APPENDIX 1

Dundee City Council's Responses to the Comments Received from the Consultation Authorities on the Scoping Report

List of Respondents

Name and Address of Respondent	Ref
Scottish Environment Protection Agency, per Silvia Cagnoni-Watt, Senior Planning Officer, Perth Strathearn House, Boxden Business Park, Perth, PH1 1RX	SEA 001
Scottish Natural Heritage, per Brendan Turvey, Operations Manager, Battleby, Redgorton, Perth, PH13EW	SEA 002
Historic Scotland, per Alison Baisden, Longmore House, Salisbury Place, Edinburgh, EH91SH	SEA 003

Ref	Issue Raised	Observations and Recommended Course of Action
SEA 001	Thank you for your Scoping consultation submitted under the above Act in respect of the [Plan]. This was received by SEPA via the Scottish Government SEA Gateway on 26 June 2018. As required under Section 15(2) of the Act, we have considered the document submitted and comment as follows in respect of the scope and level of detail to be included in the Environmental Report (ER). Generally, we are satisfied that the scoping report for the [Plan] provides sufficient information on the proposed scope and level of detail for the assessment. The Scottish Government SEA Guidance provides guidance to Responsible Authorities about the type of information that is expected to be provided at each SEA stage; we have also produced SEA topic guidance for those issues which fall within our remit. We have used the guidance to inform our detailed scoping response which is attached as an appendix. On completion, the Environmental Report and the plan to which it relates should be submitted to the Scottish Government SEA Gateway (SEA_Gateway@gov.scot) which will forward it to the Consultation Authorities.	The comments of the respondent are noted.
	General Comments	

	Generally, we are satisfied that the scoping report for the [Plan] provides sufficient information on the proposed scope and level of detail for the assessment. Please note that for the purpose of brevity and proportionality we have only concentrated on issues which require further action. Please also refer to the SEA topic guidance for those issues which fall within SEPA's remit.	Noted and welcomed.
	Detailed Comments	
	Relationship with other Plans, Policies and Strategies (PPS) – Some of the PPS included have themselves been subject to SEA. Where this is the case you may find it useful to prepare a summary of the key SEA findings that may be relevant to the [Plan]. This may assist you with data sources and environmental baseline information and also ensure the current SEA picks up environmental issues or mitigation actions which may have been identified elsewhere.	Noted.
	Baseline information – SEPA holds significant amounts of environmental data which may be of interest to you in preparing the environmental baseline, identifying environmental problems, and summarising the likely changes to the environment in the absence of the PPS, all of which are required for the assessment. Many of these data are now readily available on SEPA's website. Additional local information may also be available from our Access to Information unit at our Corporate Office (Telephone 01786 457700 or email dataenquiries@sepa.org.uk). Other sources of data for issues that fall within SEPA's remit are referenced in our SEA topic guidance notes for air, soil, water, material assets and human health.	The comments of the respondent are welcomed and appreciated.
	In particular, we recommend that the Soil and Land section in Table 5 considers peat and carbon rich soils as these are a considerable source of issues in relation to carbon emissions. Although it may that there are no carbon rich soils in the Dundee area, due to this being mainly an urban area, as this aspect is particularly relevant to the type of plan under consideration, we recommend consulting the maps currently available and stating as part of the assessment if any proposals (e.g. from buildings, transport and/or wind farms) are likely to have an effect in relation to this.	The Carbon and peatland 2016 map has been analysed to determine the presence of carbon-rich soils, deep peat and priority peatland habitat within the Dundee City area. The majority of the city was found to be categorised as 'Non-Soil' with peripheral land categorised as 'Mineral Soil'. Given the absence of peat and carbon rich soils, this will not be included as a data source for monitoring.
	We consider the SNH carbon rich soil and peat map 2016 the most up to date source of information on carbon rich soils (CRS). Please note that the SNH map shows all of the classes of CRS which includes category 5 soils which the information contained in table 4 of the consultation analysis report identifies as being all carbon rich soils and deep peat, (the same as category 1 and 2). The difference to categories 1 and 2 is that these soils do not support peatland habitat at this time which means they are not identified as priority peatland habitat. They are however carbon stores and given the right restoration may become category 1 and 2 again and sequester further carbon in the future. The same information is also available in the http://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/	
	Environmental problems – We consider that the environmental problems described generally highlight the main issues of relevance for the SEA topics within our remit.	Noted.

<table>
<tr><td></td><td></td><td></td></tr>
<tr><td></td><td>Alternatives –
We are satisfied with the alternatives outlined. These should be assessed as part of the SEA process and the findings of the assessment should inform the choice of the preferred option. This should be documented in the Environmental Report.</td><td>Noted. The alternatives identified will be assessed as part of the SEA process and will inform the choice of the preferred option. This will be noted in the Environmental Report.</td></tr>
<tr><td></td><td>Scoping in / out of environmental topics –
We agree that in this instance all environmental topics should be scoped into the assessment.</td><td>Noted.</td></tr>
<tr><td></td><td>Methodology for assessing environmental effects –
Including a commentary section within the matrices in order to state, where necessary, the reasons for the effects cited and the score given helps to fully explain the rationale behind the assessment results. This allows the Responsible Authority to be transparent and also allows the reader to understand the rationale behind the scores given.</td><td>Noted and agreed. The assessment matrices will include a commentary section.</td></tr>
<tr><td></td><td>Where it is expected that other plans, programmes or strategies are better placed to undertake more detailed assessment of environmental effects this should be clearly set out in the Environmental Report.
We would expect all aspects of the PPS which could have significant effects to be assessed.
We support the use of SEA objectives as assessment tools as they allow a systematic, rigorous and consistent framework with which to assess environmental effects.</td><td>Noted. The SEA Environmental Report for the Dundee Local Development Plan 2 has been reviewed and utilised to inform the preparation this report.</td></tr>
<tr><td></td><td>When it comes to setting out the results of the assessment in the Environmental Report please provide enough information to clearly justify the reasons for each of the assessments presented. It would also be helpful to set out assumptions that are made during the assessment and difficulties and limitations encountered.</td><td>Noted. The assessment matrices will include a commentary section.</td></tr>
<tr><td></td><td>It is helpful if the assessment matrix directly links the assessment result with proposed mitigation measures such as in the example below:

<table>
<tr><th>SEA issues - Checklist Question</th><th>Yes or No</th><th>Effect</th><th>Comment and opportunities to mitigate or improve</th></tr>
<tr><td>Is the allocation at risk from fluvial or coastal flooding?</td><td>Y</td><td>Negative</td><td>Part of site found to be at risk now removed from allocation.</td></tr>
<tr><td>Could the allocation have a physical impact on existing watercourses?</td><td>Y</td><td>Negative</td><td>Site dissected by watercourse. Developer requirements includes statement "watercourse to be integrated as positive feature of the development. No culverting."</td></tr>
<tr><td>Can the allocation currently be connected to the public sewerage system?</td><td>Y</td><td>Positive</td><td>Developer requirement includes statement "connect to public sewer"</td></tr>
</table></td><td>Noted. An assessment matrix and scoring system will be presented in the Environmental Report. A separate section will detail required mitigating actions to prevent, reduce and fully as possible offset any significant adverse effects on the environment of implementing the preferred option and Plan actions.</td></tr>
</table>

	We are content with the proposed detailed assessment matrix and particularly welcome the commentary box to fully explain the rationale behind the assessment results. We also welcome the link between effects and mitigation / enhancement measures in the proposed assessment framework and the consideration of mitigation of impacts.	Noted and welcomed.
	Comments on wording of proposed SEA objectives - We would recommend that the wording of the following SEA objective(s) be revised as follows: WATER – change the wording to: *"to avoid flood risk and prevent deterioration and enhance natural water systems and quality of the water environment".* The principle of flood avoidance is the cornerstone of sustainable flood risk management (as mentioned in Scottish Planning Policy). We also consider that not just water quality need consideration, but the quality of the water environment, which is wider in its definition than just water quality, and other pressures to the water environment which may arise from the plan. The plan could have significant environmental effects on the ecological status of the water environment. The term ecological status includes water quality, water quantity, ecology and physical impacts (including culverting and engineering of watercourses) and the water environment includes all surface waters (including wetlands and transitional waters) and groundwater (including drinking water supplies).	Agreed. This SEA objective will be amended accordingly and assessed as per the revised wording. Noted. Assessments will consider both water quality and the wider water environment.
	SOIL AND LAND – we would recommend adding the following text to the objective, *"to minimise disturbance to carbon rich soils, in particular peat".* Please see our previous comments in relation to the carbon rich soils maps. In general wind farms and wind turbines associated with the strategic programme area of renewables or other development could cause disturbance to carbon rich soils.	The Carbon and peatland 2016 map has been analysed to determine the presence of carbon-rich soils, deep peat and priority peatland habitat within the Dundee City area. The majority of the city was found to be categorised as 'Non-Soil' with peripheral land categorised as 'Mineral Soil'. Given the absence of peat and carbon rich soils, the proposed additional text will not be added to the objective.
	Mitigation and enhancement – We would encourage you to use the assessment as a way to improve the environmental performance of individual aspects of the final option; hence we support proposals for enhancement of positive effects as well as mitigation of negative effects. It is useful to show the link between potential effects and proposed mitigation / enhancement measures in the assessment framework. We would encourage you to be very clear in the Environmental Report about mitigation measures which are proposed as a result of the assessment. These should follow the mitigation hierarchy (avoid, reduce, remedy or compensate). One of the most important ways to mitigate significant environmental effects identified through the assessment is to make changes to the plan itself so that significant effects are avoided. The Environmental Report should therefore identify any changes made to the plan as a result of the SEA. Where the mitigation proposed does not relate to modification to the plan itself then it would be extremely helpful to set out the proposed mitigation measures in a way that clearly identifies: (1) the measures required, (2) when they would	Noted. The assessment methodology enables positive environmental effects of the Plan to be identified. The Environmental Report will include a framework detailing recommended mitigation measures to prevent, reduce or compensate for any negative effects of implementing the Plan.

<table>
<tr><td></td><td>be required and (3) who will be required to implement them. The inclusion of a summary table in the Environmental Report such as that presented below will help to track progress on mitigation through the monitoring process.

<table><tr><th>Issue / Impact Identified in ER</th><th>Mitigation Measure</th><th>Lead Authority</th><th>Proposed Timescale</th></tr><tr><td>Insert effect recorded in ER</td><td>Insert mitigation measure to address effect</td><td>Insert as appropriate</td><td>Insert as appropriate</td></tr><tr><td>etc</td><td>etc</td><td>etc</td><td>etc</td></tr></table></td><td>Agreed. Mitigation measures, timescales and responsibilities will be outlined in the mitigation section of the Environmental Report.</td></tr>
<tr><td></td><td>Monitoring –
Although not specifically required at this stage, monitoring is a requirement of the Act and early consideration should be given to a monitoring approach particularly in the choice of indicators. It would be helpful if the Environmental Report included a description of the measures envisaged to monitor the significant environmental effects of the plan.</td><td>Arrangements for how the Plan and delivery of its actions will be monitored are to be set out in the Environmental Report.</td></tr>
<tr><td></td><td>Consultation period –
We are satisfied with the proposal for a six weeks consultation period for the Environmental Report.</td><td>Noted.</td></tr>
<tr><td></td><td>Outcomes of the Scoping exercise -
We would find it helpful if the Environmental Report included a summary of the scoping outcomes and how comments from the Consultation Authorities were taken into account. We welcome proposals for the inclusion of a summary of how the comments provided by the Consultation Authorities at the Scoping stage have been taken into account in the preparation of the Environmental Report.</td><td>This information is presented as Appendix 1.</td></tr>
<tr><td>SEA 002</td><td>Thank you for your scoping report, sent to the Scottish Government SEA Gateway on 26 June 2018. We have reviewed this in our role as a Consultation Authority in accordance with Section 15(2) of the Environmental Assessment (Scotland) Act 2005. Our comments on the scope and level of detail to be included in the Environmental Report and on the duration of the proposed consultation period are provided below and in the Annex.</td><td>The comments of the respondent are noted.</td></tr>
<tr><td></td><td><u>General Comments</u></td><td></td></tr>
<tr><td></td><td>Scope of assessment and level of detail –
Subject to the specific comments set out below and in the Annex, we are content with the scope and level of detail proposed.

We recommend further consideration of climate change impacts and how the plan’s actions can contribute through adaptation measures such as green networks and active travel, the inclusion of key baseline information which can be used to measure change, and mitigation measures.</td><td>Noted.

As a requirement of the EU Covenant of Mayors for Climate and Energy, preparation of the Plan requires the Council to undertake a Climate Adaptation ‘Risk & Vulnerability Assessment (RVA). This process to identify climate-related risks with local stakeholders has been used to directly inform actions for the</td></tr>
</table>

		Plan's Resilience section. The final RVA will be published as part of the Plan.
	Consultation period for the Environmental Report – We are content with the 6 week period proposed for consultation on the Env. Report (section 9).	Noted.
	Habitats Regulations Appraisal (HRA) – There may be potential for some of the actions (for example those relating to renewables or other developments) to have implications for Natura sites. Plans are subject to the Conservation (Habitats &c) Regulations 1994, as amended, which may mean that the [Plan] should undergo a Habitats Regulation Appraisal (HRA) to consider this further. Please see datasets held by SNH which can be found on the Natural Spaces pages of our website: http://gateway.snh.gov.uk/natural-spaces/	The Plan impacts on biodiversity, flora and fauna has been scoped in for assessment. Noted and welcomed.
	This consultation response provides a view solely on the potential for the plan or programme to have significant environmental effects. SNH cannot comment on whether or not the plan meets other criteria determining the need for SEA as set out in the Act. We understand that we will be separately consulted on our views regarding the Environmental Report and on the Strategy.	Noted. The draft Plan and Environmental Report will be submitted to the Consultation Authorities for comment.
	Should you wish to discuss this scoping response, please contact Carolyn Deasley in the first instance on 01738 458583 or via SNH's SEA Gateway at sea.gateway@snh.gov.uk	Noted and welcomed.
	Detailed Comments	
	Relationship with other Plans, Programmes and Strategies (Section 5 and Appendix 1) – Table 3: We suggest consideration of the following national PPS to inform the 'Sustainable Transport' Strategic Programme Area: Let's Get Scotland Walking – The National Walking Strategy. Cycling Action Plan for Scotland 2013. A Long-Term Vision for Active Travel in Scotland 2030. While we welcome the reference under (48) to the Proposed LDP (Appendix 1), we recommend specific consideration of green networks in delivering this Plan and recommend adding 'Dundee Green network planning guidance' under local level PPS: https://www.dundeecity.gov.uk/sites/default/files/publications/Dundee%20Green%20Network%2016.12.2016_A.pdf	Agreed. The three documents listed have been incorporated into Appendix 2 as relevant national PPS and will be used to inform the development of the Plan. Agreed. The document listed has been incorporated into Appendix 2 as relevant local PPS and will be used to inform the development of the Plan.
	Scope of the Environmental Report (section 6) – We agree with the scoping in of the SEA issues for the Plan (Table 4). Biodiversity, flora and fauna: please amend to reflect that climate change will have significant adverse effects on this SEA issue. We consider this to be the single greatest threat to Scotland's habitats and species – please see our website for more information: https://www.nature.scot/climate-change/climate-change-impacts-scotland	Noted. Agreed.

	Landscape: please add that climate influences landform processes - these shape Scotland's landscapes and help maintain our habitats, ecosystems and landscapes. Thus climate change will affect the dynamics of all these processes.	The Plan impacts on Landscape will be assessed for the Dundee City boundary as identified in the Scoping Report.
	Baseline information (section 7) – This takes the form of commentary in Table 5 summarising environmental characteristics and issues. Description and datasets: we suggest the description could usefully be augmented with key statistics from the sources in the 'datasets' column, and recommend links to these sources are provided in the ER. We welcome the references to Dundee LDP but suggest drawing upon the most relevant baseline data contained in the SEA for Dundee LDP2. For example we recommend key information on the type and quantity of green space and green networks is provided. Issues: Biodiversity, flora and fauna and 'population and human health': The provision of green infrastructure is a key adaptation measure and we recommend specific reference to this, as well as inclusion of active travel routes as modes of sustainable transport.	Noted. The baseline information descriptions include key statistics. Noted. The SEA Environmental Report for the Dundee Local Development Plan 2 has been reviewed and utilised to inform the preparation this report. Noted. The importance of these issues will included in the Environmental Report.
	Proposed Assessment Methodology (Section 8) – We note that the Action Plan will contain Direct Actions, Enabling Actions and Delivery Actions which will be assessed against the scoped in SEA issues. We support this proportionate approach and the assessment scoring proposed. We note the reference to 'the assessment matrix' - it would be helpful to provide a draft template of how this will be presented prior to the assessment commencing.	Noted and welcomed. The Action plan will identify each action as either Direct, Enabling or Delivery. Noted. An assessment methodology will be presented in the Environmental Report prior to the assessments.
	Mitigation measures – The scoping report does not mention mitigation measures to prevent, offset or reduce any negative effects from the plan. We consider this to be a key stage of the SEA process and recommend an approach that provides separate assessment scores for pre-mitigation effects and residual effects post-mitigation.	Noted. The Environmental Report will include a framework detailing recommended mitigation measures to prevent, reduce or compensate for any negative effects of implementing the Plan.
	Monitoring – Please provide details of monitoring to gauge effectiveness of mitigation proposed, identify unforeseen environmental effects and manage uncertainty.	Arrangements for how the Plan and delivery of its actions will be monitored are to be set out in the Environmental Report.
SEA 003	Thank you for your consultation which we received on 26 June 2018 about the above scoping report. We have reviewed this in our role as a Consultation Authority under the above Act. This letter contains our views on the scope and level of detail of the information to be included in the Environmental Report. Please note that our view is based on our main area of interest for the historic environment.	The comments of the respondent are noted.
	General Comments	
	Scope and level of detail –	

	It is our understanding that the [Plan] will provide a route map to demonstrate how Dundee will meet its obligations under the EU Covenant of Mayors for Climate and Energy and deliver an emissions reduction of at least 40% by 2030. We note that the historic environment (under cultural heritage) has been scoped into the assessment. On the basis of the information provided, we are content with this approach and are satisfied with the scope and level of detail proposed for the assessment, subject to the detailed comments provided in the attached annex.	Noted. Noted and welcomed.
	Consultation period for the Environmental Report – We note that *Section 9: Consultation, Next Steps and Timeline* of the Scoping Report sets out that Dundee City Council intends to consult on the Environmental Report in October-November 2018 for a period of six weeks. We are content with this. Please note that, for administrative purposes, we consider that the consultation period commences on receipt of the relevant documents by the SEA Gateway.	Noted. Consultation on the Plan and Environmental Report will now commence in early 2019 with a six week consultation period.
	We hope this is helpful. Please contact us if you have any questions about this response. The officer managing this case is Alison Baisden who can be contacted by phone on 0131 668 8575 or by email on Alison.Baisden@hes.scot	Noted.
	Detailed Comments	
	Overall, we are broadly content with the SEA Scoping Report and welcome the scoping-in of the historic environment (under Cultural Heritage) as an SEA assessment topic. We understand that, at this stage, the approach to the Strategic Environmental Assessment will be flexible until further detail is known about the future shape, strategy and content of the Plan. It is also understood that the Plan will focus on Six Strategic Programme Areas including Energy Efficiency, District Heating, Renewables, Sustainable Transport, Waste & Resource Efficiency and Resilience & Adaptation. We note that the consideration of relevant Plans, Programmes and Strategies does not include relevant documents for the historic environment such as the *Historic Environment Scotland Policy Statement (HESPS, 2016)*, and would recommend that these are considered as part the forthcoming Strategic Environmental Assessment. We note the baseline information at Section 7 includes SEA objectives and therefore understand that these will be used as an assessment tool. We support this and consider that reviewing each alternative against a set of SEA objectives presents a robust and transparent framework for carrying out and documenting the assessment. In line with this, we welcome the objective identified for the cultural heritage topic area 'to protect and, where appropriate, enhance the historic environment.'	Noted. Noted. Agreed. The document listed has been incorporated into Appendix 2 as relevant national PPS and will be used to inform the development of the Plan. Noted and welcomed.

	We note the methodology at Section 8 proposes to assess the planned actions against the SEA objectives. We support this and, additionally, would recommend considering the below questions for the cultural heritage topic area when assessing the effects of any deliverables associated with the plan. This will ensure that effects are tested against each designation type. • Will the action affect any scheduled monuments or their setting? • Will the action affect any locally important archaeological site? • Will the action affect any listed buildings and/or their setting? • Will the action affect any Conservation Areas? (e.g. will it result in the demolition of any buildings) • Will the action affect any Inventory Garden and Designed Landscape? • Will the action affect any Inventory Battlefield? • To what extent will the action result in the opportunity to enhance or improve access to the historic environment?	Agreed. These questions to support assessment of the Plan will be included.
	We note at Section 9 that it is proposed to consult on the draft [Plan] and Environmental Report for 6 weeks from October to November 2018. We support this approach.	Noted. Consultation on the Plan and Environmental Report will now commence in early 2019 with a six week consultation period.

APPENDIX 2

Plans, Programmes and Strategies to be used to inform the development of the Plan

	Name of PPS	Main Requirements of the PPS	Implications for Plan development
International Level			
Sustainability, Climate Change and Energy			
1.	Europe 2020 Strategy	Looks toward smart, inclusive, sustainable growth with targets of 20% reduction in emissions, 20% energy produced from renewables, 20% improvement in energy efficiency by 2020.	The Plan includes a detailed Baseline Emissions Inventory to assist in identifying local GHG reduction measures that will contribute to these goals.
2.	EU 2030 Climate & Energy Framework	Sets targets of achieving at least 40% GHG reduction compared to 1990 and indicative target of at least 27% energy efficiency improvement compared to baseline.	The Plan will identify GHG reduction measures which will help to achieve these goals.
3.	EU Cohesion Policy 2014-2020	Principle investment tool for delivering the Europe 2020 goals: creating growth and jobs, tackling climate change and energy dependence, and reducing poverty and social exclusion.	The Plan will identify GHG reduction measures which will help to achieve these goals.
4.	The Energy Performance of Buildings Directive	Directive sets minimum energy performance requirements for new buildings, for the major renovation of buildings and for the replacement or retrofit of building elements (heating and cooling systems, roofs, walls, etc.).	The Plan should support initiatives to improve the energy performance of buildings.
5.	Directive 2009/28/EC (Renewable Energy)	Establishes an overall policy for the production and promotion of energy from renewable sources. Sets the foundations of the role of hydrogen in linking renewable power, renewable heat and renewable fuels of non-biological origin.	The Plan should support initiatives to deliver renewable energy expansion.
6.	Energy Efficiency Directive 2012/27/EU	Establishes a common framework for the promotion of energy efficiency in order to meet energy efficiency target of 20% by 2020. Also introduces a legally binding measures to encourage efforts to use energy more efficiently in all stages and sectors of the supply chain.	The Plan should support energy efficient retrofit initiatives.
Nature Conservation			
7.	Habitats Directive 92/43/EEC	The Directive ensures the conservation of a wide range of rare, threatened or endemic animal and plant species.	The Plan should promote biodiversity as a key component in climate change adaptation.

8.	The Wild Birds Directive 2009/147/EC	The Directive protects all wild birds, their nests, eggs and habitats and gives the basis to classify Special Protection Areas; Special Areas of Conservation and European Protected Species.	The Plan should promote the protection of all wild, rare and vulnerable birds, their nests, eggs and habitats.
9.	EU Biodiversity Strategy	Aims to halt the loss of biodiversity and ecosystem services in the EU and help stop global biodiversity loss by 2020.	The Plan should promote biodiversity as a key component in climate change adaptation.
Water			
10.	Water Framework Directive 2000/60/EC	This Directive has the objective of safeguarding the sustainable use of surface water; transitional waters, coastal waters and groundwater. It supports the status of aquatic ecosystems and environments and addresses groundwater pollution; flooding and droughts; river basin management planning.	The Plan should consider sustainable use of water and mitigate the effects of floods and droughts.
11.	Nitrates Directive 91/43/EC	This Directive has the objective of reducing water pollution caused or induced by nitrates from agricultural sources; and preventing further such pollution.	Plan actions should not increase water pollution caused or induced by nitrates from point source pollution sources.
Waste			
12.	Directive 99/31/EC (waste management of landfills)	The Landfill Directive has derived a waste hierarchy, which starts at waste minimisation and increasing the levels of recycling and recovery, and facilitates a move towards sustainable waste management. It also sets out demanding targets to reduce the amount of biodegradable municipal landfilled up to 2020.	The Plan should reflect the needs of the Directive, including the infrastructure required to meet the municipal biodegradable waste targets.
13.	Waste Framework Directive 2008/98/EC	The revised Directive lays down a number of requirements in relation to waste management and planning. These include the requirement that Member States take appropriate measures to establish an integrated and adequate network of waste disposal installations and of installations for the recovery of mixed municipal waste collected from private households. The revised WFD also requires Member States to produce a National Waste Management Plan or Plans.	The Plan will have a role in implementing key aspects of the Directive in relation to waste management infrastructure.
National Level PPS			
Planning Policy			
14.	National Planning Framework 3 [Scotland] and Scottish Planning Policy 2014	Both bring together plans and strategies in economic development, regeneration, energy, environment, climate change, transport, and digital infrastructure to provide a coherent vision of how Scotland should evolve over the next 20 to 30 years. Ensures that planning will play a key role in delivering on the commitments set out in the Scottish Government's low carbon ambitions and action set out in the Reports on Proposals and Policies. It provides a direction of travel consistent with Scottish climate change legislation.	The Plan should take account of the spatial and environmental issues set out in the NPF, including promoting the concepts of sustainable development, community regeneration, transportation infrastructure, and other environmental issues.

15.	National Renewables Infrastructure Plan	Describes a number of key sites identified for investment, and which will play a key role in the expanding offshore renewables market. The plan has identified Dundee as one of the most strategically important and suitable port locations for marine renewables.	The Plan may have a role in promoting aspects of the Plan in relation to marine renewables.
16.	Scotland's Land Use Strategy (2016)	Strategy is a key commitment of Section 57 of the Climate Change (Scotland) Act 2009 and sets out continued policy direction for sustainable land use. Principles include that "land use decisions should be informed by an understanding of the opportunities and threats brought about by a changing climate. Greenhouse gas emissions associated with land use should be reduced and land should continue to contribute to delivering climate change adaptation and mitigation objectives."	The Plan should take account of relevant spatial and environmental issues set out in the Land Use Strategy.
17.	Historic Environment Scotland Policy Statement (2016)	The Policy Statement sets out how Historic Environment Scotland fulfils its regulatory and advisory roles and how it expects others to interpret and implement Scottish Planning Policy. It is a material consideration in the Scottish planning system.	The Plan should support the Policy's principles.
Cross-Sectoral			
18.	Local Government (Scotland) Act 2003	The Local Government in Scotland Act 2003 introduced statutory duties relating to Best Value and Community Planning, one of which - s1(5) - specifically requires that: "The local authority shall discharge its duties under this section in a way which contributes to the achievement of sustainable development."	The Plan should directly support the sustainable development aims of the Act.
19.	Choosing Our Future: Scotland's Sustainable Development Strategy (2005)	It highlights the need to build a sustainable future taking account of pubic well-being (e.g. quality of life, food, economic opportunities), travel, natural resources and waste.	The Plan should consider objectives that will lead to sustainable communities.
20.	Scotland's Economic Strategy (2015)	Sets out the Scottish Government's vision for Scotland's economy and society, focusing on tackling inequality. Includes the following four priorities: - Investing in our people and our infrastructure in a sustainable way; - Fostering a culture of innovation and research and development; - Promoting inclusive growth and creating opportunity through a fair and inclusive jobs market and regional cohesion - Promoting Scotland on the international stage to boost trade and investment, influence and networks.	The Plan should consider actions that will support sustainable economic growth and tackle inequalities in Dundee.
Sustainable Transport			
21.	Scotland's National Transport Strategy (2016)	Sets a long term vision for transport policies. Includes three strategic key outcomes, one of which includes "[a] reduc[tion] in emissions to tackle the issues of climate change, air quality and health improvement which impact on our high level objective for protecting the environment and improving health."	The Plan should promote reducing emissions from transport as a key component in climate change mitigation.

22.	A Long-Term Vision for Active Travel in Scotland 2030 (2014)	Aims to encourage more people to walk and cycle for everyday shorter journeys. Focuses on areas such as infrastructure, transport integration, cultural and behaviour change, community ownership and planning.	The Plan should support the aims of the long-term active travel vision.
23.	Let's Get Scotland Walking – The National Walking Strategy (2014)	The National Walking Strategy outlines the Scottish Government's vision of a Scotland where everyone benefits from walking as part of their everyday journeys, enjoys walking in the outdoors and where places are well designed to encourage walking. It sits within the context of the long-term vision for Active Travel in Scotland 2030 and is a key step in the delivery of the National Physical Activity Implementation Plan (NPAIP).	The Plan should promote active travel actions to reduce emissions from transport as a key component in climate change mitigation.
24.	Cycling Action Plan for Scotland 2013.	Sets out nineteen actions on how partnership working can achieve a shared vision that by 2020, 10% of everyday journeys taken in Scotland will be by bike.	The Plan should promote active travel actions to reduce emissions from transport as a key component in climate change mitigation.
Air and Climate Change			
25.	Climate Change (Scotland) Act 2009	Creates the statutory framework for greenhouse gas emissions reductions in Scotland by setting an interim 42% reduction target for 2020 and an 80% reduction target for 2050. Part 4 of the Act places duties on public bodies relating to climate change.	The Plan should ensure compliance with the duties of the Act.
26.	Climate Change Plan: The Third Report on Proposals and Policies (2018)	Details how Scotland will achieve its emissions reduction target of 66% by 2032. It sets out policies and proposals to reduce emissions from electricity generation, housing, transport, services, industry, land use, waste, and agriculture. Includes goals for 35% of homes to be heated by low-carbon technologies (including heat supplies by low-carbon electricity) and a 15% reduction in residential heat demand through energy efficiency measures.	Plan actions should contribute to national carbon reduction targets.
27.	Scottish Energy Strategy: The future of energy in Scotland (2017)	Sets out Scottish Government's long-term vision for the future energy system in Scotland with 50% of energy for Scotland's heat, transport and electricity consumption to be supplied from renewable sources. Renewed focus on energy efficiency; and a target of 30% energy efficiency improvement by 2030.	The Plan should support the aims of the Strategy.
28.	Energy Efficiency Scotland Programme (2018)	A 20 year programme containing a set of actions aimed at making Scotland's existing buildings near zero carbon wherever feasible by 2050, and in a way that is socially and economically sustainable.	The Plan should identify opportunities to deliver local actions from the programme.
29.	Scottish Government Heat Policy Statement (2015)	The Heat Policy Statement sets out the Scottish Government's future policy direction for addressing the three key aspects of the Heat system including how it's used (heat demand and its reduction); how it's distributed and stored (heat networks and heat storage) and where heat comes from (heat generation).	The Plan should support heat network opportunities.
30.	Cleaner Air for Scotland Strategy (2015)	The Strategy draws together Scottish Government policies which impact upon air quality into a single framework and sets out a series of actions for delivering further improvements to air quality. The approach also highlights the opportunities to generate efficiencies and	The Plan should ensure synergies between climate change and air quality actions.

		cost savings by linking air quality to other areas, such as climate change adaption and mitigation, transport and planning.	
Nature Conservation			
31.	The Nature Conservation (Scotland) Act 2004	Sets out a series of measures, which are designed to conserve biodiversity and to protect and enhance the biological and geological natural heritage of Scotland. It also places a general duty on all public bodies to further the conservation of biodiversity.	The Plan should promote and protect biodiversity in support of adaptation action.
32.	Scotland's Biodiversity Strategy- It's in your hands (2004)	A long-term strategy that sets out a vision for the future health of Scotland's biodiversity to 2030. It highlights the need to: • look at the bigger picture: reconnecting and extending habitats and reducing barriers; • think in terms of landscapes and ecosystems (not just in terms of species and habitats), which it says can be better delivered through strategic planning; and • encourage more engagement with people in biodiversity conservation. The Strategy is supplemented by the Scottish Government's 2020 Challenge for Scotland's Biodiversity.	The Plan should support the aims of the Strategy in support of climate change adaptation action.
33.	The Conservation (Natural Habitats)Regulations 1994 (as amended)	Regulations implement the Habitats and Wild Birds Directives and provide for the: • Designation and protection of 'European sites' (e.g. SACs); • Protection of 'European protected species' from deliberate harm; and • Adaptation of planning and other controls for the protection of European sites.	The plan should not adversely affect habitats and species protected under the Wild Birds and Habitats Directives.
34.	Making the Links: Greenspace for a more successful and sustainable Scotland (2009)	Sets out the key actions that are needed to ensure that greenspace delivers for people, communities and places across the whole of urban Scotland.	The Plan should take account of the actions required to deliver quality greenspace.
Water			
35.	Water Environment and Water Services (Scotland) Act 2003	Makes provision for protection of the water environment and implementing European Parliament and Council Directive 2000/60/EC.	The Plan should not promote development that would have adverse impacts on the water environment.
36.	The Water Environment (Controlled Activities) (Scotland) Regulations 2011 ("CAR") (as amended)	Provides a regulatory framework for controlling activities which could have an adverse effect on Scotland's water environment, including abstraction, impoundments, engineering, dredging, surface water drainage, and pollution, with the aim of protecting, and restoring, the water environment.	The Plan should not promote development that would have adverse impacts on the water environment.
37.	Flood Risk Management (Scotland) Act 2009	The Act creates a framework in which organisations involved in flood risk management can co-ordinate actions to deliver sustainable and modern approaches to flood risk management.	The Plan should actively promote sustainable flood risk management.

38.	Scotland's River Basin Management Plan (2015)	The Plan details the strategy and requirements for River Basin Management Planning in Scotland.	The Plan should align with River Basin Management Plan for the area (Tay Estuary).
Waste			
39.	Scotland's Zero Waste Plan (2010)	The plan outlines Scotland's key objectives in relation to waste prevention, recycling and reducing the amount of waste sent to landfill on the journey to a zero waste Scotland. The plan proposes targets for Scotland's waste.	The Plan should have regard to the Scottish Governments recycling targets.
40.	Scottish Government Charter for Household Recycling (2016)	Sets out a number of requirements that signatories are expected to follow to improve household waste and recycling services to maximise the capture of, and improve the quality of, resources from the waste stream.	The Plan should align with and contribute to the commitments of the Charter.
41.	Making Things Last: A Circular Economy Strategy for Scotland (2016)	Sets out Scotland's ambitions for changing how waste is seen in our economy. It seeks to reduce waste lost from the economy, and retain the value of materials through repair, reuse, recycling, and remanufacturing via a range of policies and proposals. This is noted as fundamental to helping tackle climate change and preserve natural capital.	The Plan should consider actions that will support circular economy opportunities in Dundee.
Marine and Coastal			
42.	Marine (Scotland) Act 2010	Provides a framework to help balance competing demands on Scotland's seas. It introduces a duty to protect and enhance the marine environment and includes measures to help boost economic investment and growth in areas such as marine renewables.	The Plan should promote objectives that promote clean, safe, healthy and productive coastal and water environments.
43.	Scotland's National Marine Plan (2015)	Sets out how Scotland's marine resources are to be used and managed out to 200 nautical miles. It supports development and activity in Scotland's seas while incorporating environmental protection into marine decision-making to achieve sustainable management. The Plan applies to all decisions taken by public authorities which affect this marine area.	The Plan should promote objectives that promote clean, safe, healthy and productive coastal and water environments.
Regional Level PPS			
44.	TAYPlan 2016	Recognises the long term implications of climate change and sea level rise. It supports the switch to a low carbon economy and zero waste economy by providing for appropriate infrastructure and improvements in our resilience to climate change and other potential risks. It seeks to deliver better quality development and places which respond to climate change by ensuring resilience built into the natural and built environments through a presumption against development in areas vulnerable to coastal erosion, flood risk and rising sea levels.	The Plan should support the provisions of the TAYplan.
45.	Tay Estuary and Montrose Basin (TEAMB) Local Flood Risk Management Plan	The plan details the actions adopted to reduce the impact of flooding in the Tay Estuary and Montrose Basin (TEAMB) local plan district (LPD) as required by the Flood Risk Management (Scotland) Act.	The Plan should contribute to the delivery of actions proposed the plan.

46.	Tay Cities Regional Economic Strategy (2017)	A multi-organisation strategy for the long-term economic investment in the Tay region, focusing on inclusive growth and tackling challenges around innovation, internationalisation and connectivity.	The Plan should support actions that contribute to sustainable economic growth.
47.	TACTRAN Regional Transport Strategy (2015)	The Strategy sets out a vision for improving the region's transport infrastructure, services and other facilities to 2036. It identifies 31 Strategic Actions which are aimed at supporting regional economic prosperity; connecting our communities and being socially inclusive; and promoting environmental sustainability and improved health and wellbeing.	The Plan should support the aims of the RTS.
Local Level PPS			
48.	Dundee City (LOIP) Plan (2017)	The City Plan outlines the key strategic priorities, opportunities and challenges ahead to improve the city over the next ten years with sustainability recognised as a cross-cutting theme, identifying the development of a city-wide [Plan] as a priority action.	The Plan should demonstrate how it will contribute to achieving the outcomes of the City Plan.
49.	Dundee City Council Plan (2017)	The Plan sets out the Council will play its part in achieving the vision set out in the City Plan. It identifies the main priorities and how the Council will approach them – including a route map to deliver actions and scorecards to measure progress. Energy and Sustainability are included with a central focus on the investment and delivery of district heating networks across the city.	The Plan should demonstrate how it will contribute to achieving the outcomes of the Council Plan.
50.	Dundee City Council – Capital Investment Strategy (2018)	The Strategy is a key Council document that integrates with the delivery mechanism required for both the City and Council Plan. It identifies the investment required to achieve outcomes over a ten year period across the themes of Work and Enterprise, Children and Families, Health Care and Wellbeing, Community Safety and Justice and Building Strong Communities and Service Provision.	The Plan should demonstrate how it will contribute to delivery of relevant capital plan projects.
51.	Dundee City Council – District Heating Strategy (2018)	The Strategy sets out a long term vision to support the City's growth and low carbon transition using decentralised energy and provides an evidence base to advance district heating network schemes in Dundee, informing both policy and delivery. It identifies potential district heating networks and sets out an indicative programme of short, medium and long-term network development and interconnections together with a deliverable action plan.	The Plan should demonstrate how it will contribute to delivery of relevant district heating projects.
52.	Dundee Local Development Plan (2014)	Local Development Plan contains a number of policies that act as enablers to the development and generation of renewable energy and low carbon heat technologies: - Policy 29:Low and Zero Carbon Technology in New Development - Policy 30: Biomass Energy Generating Plant - Policy 31: Wind Turbines These policies are to be reviewed as part of the new LDP2 in line with Scottish planning policy.	The Plan should conform to the LDP and influence future local plan policies.

53.	Proposed Local Development Plan 2 (2017)	The Proposed Local Development Plan seeks to deliver the TAYplan vision in relation to climate change resilience. Climate change policies have been strengthened with an emphasis on delivering green networks and supporting heat networks in the City. It should be noted that the content of the Proposed Plan is subject to consultation and examination and therefore may change.	The Plan should conform to the LDP and influence future local plan policies.
54.	The Dundee Green Network – Non-Statutory Planning Guidance (2017)	Identifies the city's existing green network and promotes key Development Principles to ensure high quality, multi-functional green infrastructure is delivered in new development that is well connected into the existing network to be enjoyed, cared for and valued. The Council's adoption of the planning guidance gives it authorisation to be a material consideration in decision making.	The Plan should promote green infrastructure investment as a key component in climate change adaptation and resilience.
55.	Local Housing Strategy (2013)	The LHS is the primary strategy for the provision of housing and associated services to address homelessness, meeting housing support needs and tackling fuel poverty. Tackling climate change has been identified as one of a number of main areas for consideration within the strategy given the major role housing can play in reducing emissions.	The Plan should demonstrate how it will contribute to achieving the outcomes of the Housing Strategy and influence future direction.
56.	Dundee Fairness Action Plan (2016)	The Plan sets out a programme of actions to deliver the Dundee Fairness Commission recommendations aimed at tackling Stigma and Social Inclusion; Work and Wages; Reducing the Education Gap; Benefits, Advice and Support; Housing and Communities (including fuel and food poverty) and Improving Health. The Dundee Fairness Commission identifies district heating as a means to provide affordable energy and recommended that Dundee should "expand the availability and viability of district heating systems" to help address fuel poverty within the city.	The Plan should assist in tackling fuel poverty within the city.
57.	Air Quality Action Plan (2011)	The plan defines the scope for the Air Quality Management Area (AQMA) and sets out measures together with targets and indicators to achieve the compliance with the objectives for PM_{10} and NO_2. It supports the integration of local air quality considerations within the Council's wider policies, strategies and plans to deliver co-benefits, particularly those relevant to sustainable development, reduction in greenhouse gases and carbon emissions.	The Plan should align with and contribute to delivering the Air Quality Action Plan in order to improve air quality.
58.	Dundee Public Open Space Strategy (2008)	The Strategy sets out the strategic vision of open space in Dundee and is accompanied by a three year rolling Action Plan programme. It sets out a vision whereby open spaces contribute to a high quality of life throughout the City, and which help to deliver environmental benefits, economic prosperity, a sustainable future and best value for all citizens and communities in Dundee.	The Plan should demonstrate how it will contribute to achieving the vision.
59.	Dundee Coastal Study Stage 2 (2013)	The Study sets out a strategy for developing Dundee's flood defences promoting varying solutions for different sections of the coastline. It identifies a framework within which local flood alleviation and coastal erosion defence schemes are developed at different locations along Dundee's 16.9km of coastal frontage.	The Plan should utilise the findings of the study in relation to climate impacts on Dundee's coastline.

60.	Dundee Cycling Strategy (2016)	The Strategy has been prepared in response to 2013 Cycling Action Plan for Scotland (CAPS) which recommended that every local authority in Scotland develop an Active Travel or Cycling Strategy. It sets out how the Council, working in partnership, will deliver its duties, powers and policies to enable and encourage more people to cycle more often.	The Plan should support active travel in pursuit of reducing carbon emissions in the city.
61.	Biodiversity Action Plan *(in development)*	A new plan is to be prepared that will deliver biodiversity action and set the context for Biodiversity Duty reporting.	The Plan should promote biodiversity as a key component in climate change adaptation.