SHETLAND
ISLANDS COUNCIL

Climate Change Strategy

2023-27

Foreword

The Scottish Government has placed a legal requirement on local authorities across Scotland of reaching net zero by 2045. This document, Shetland Island Council's Climate Change Strategy and implementation plan, represents a year of work by our Climate Change team and lays out the next steps towards following the approval of the net zero route maps at the end of 2022. Key staff from across the organisation have been involved in its development and prior to its publication those employees whose role it is to move ahead with each action have already been identified and engaged to ensure that it has the best chance of being accomplished.

As the local government in Shetland, it is essential that the Council takes leadership on climate action. To meet our legal obligations, we will need to be ambitious in our climate goals and transparent about how we will achieve them. This Strategy will be the Council's guide towards decarbonisation and resilience, providing a path forward through a coordinated and effective response to the acknowledged climate crisis.

There are many co-benefits to undertaking climate action, including a healthier population, safer and more efficient transportation, a reduction in fuel poverty and investment in our local skills and economy. The Strategy will position Shetland Islands Council to be a leader within Shetland and Scotland. We will work with regional and national partners to achieve the objectives laid out in the Strategy and contribute to global climate change efforts. The measures in this Strategy will aid in creating the conditions for a thriving Shetland in the decades ahead.

As an island community, climate change poses a unique challenge to Shetland. We're highly reliant on our natural environment for our key economic sectors, such as fishing, aquaculture, agriculture and tourism. We also have a high reliance on hydrocarbons for our industry and for our lifeline services. It is therefore paramount that we prepare proactively through both mitigation and adaptation to minimise the expected impacts and to transition coherently to the new ways. Addressing climate change and reaching net zero will require transformational change. If this is not well planned, certain groups within society will experience the consequences of the transition to net zero more acutely than others. Through a well-planned transition, with a focus on tackling inequality and injustice, there is the opportunity to maximise social, economic and environmental benefits to the Shetland community.

Councillor Moraig Lyall
Chair of Environment and Transport Committee

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Executive
SUMMARY

Climate change is the long-term shift in global climate patterns, including extreme weather events and rising sea levels, linked directly with the warming of the Earth's atmosphere.

The impacts of climate change are, and will continue to be, significant and wide reaching, with the most vulnerable in society likely to suffer the worst.

With the changing climate, there are numerous risks we are likely to be exposed to in Shetland. These include; increased frequency in extreme weather events, increased rates of flooding, ocean acidification and warming, increased pests, pathogens and invasive species and disrupted supply chains. All of these will influence our health and wellbeing, infrastructure, economy, and environment. It is therefore essential that we proactively act to address climate change, through both mitigation and adaptation, to minimise the worst effects and to be prepared for a changing climate.

Scotland has set a target of being net zero by 2045, with interim emissions reduction targets of 75% by 2030 and 90% by 2040 against 1990 emissions levels, based on advice from the independent UK Climate Change Committee. As a Local Authority, Shetland Islands Council has a statutory duty to reduce greenhouse gas emissions in line with Scotland's national target of 2045, and to demonstrate we are working towards this. This is set out within section 44 of the Climate Change (Scotland) Act 2009. Shetland Islands Council acknowledged a Climate

Emergency in January 2020, prompting the creation of the Climate Change Programme, with the purpose to minimise the risks of climate change to the Shetland community as far as possible, and to make the transition to net zero as beneficial as possible. At this time, the mandate was set to establish an appropriate and informed target date for Shetland Islands Council to be net zero as an organisation, and for Shetland to be net zero as an area. The first step in determining an appropriate target was to develop Net Zero Route Maps, for which consultancy 'Ricardo Energy and Environment' was appointed.

The purpose of each route map was to establish a scope and methodology of measuring greenhouse gas (GHG emissions, establish a baseline for emissions and develop pathways for what measures need to be taken for the council as an organisation and Shetland as an area to reduce emissions and reach net zero. For the council, pathways included measures around decarbonising the fleet, vessels, estate, operations and land holdings.

In November 2022, the Shetland Islands Council Full Committee approved the Net Zero Route Maps and set the mandate to develop a Shetland Islands Council Climate Change Strategy and Action Plan, with a framework to allocate responsibility for actions and to measure, monitor and report on progress, using data and recommendations gained through the Net Zero Route Map project and report.

The Council's Climate Change Strategy and Action Plan is built upon data, information and insights gained through the Net Zero Route Map project, guidance from relevant government, authorities and bodies and best practice from other public bodies.

It was developed in line with the Design Council's framework for innovation design methodology; the 'Double Diamond' design process. Logic modelling was utilised during development of each strategy section to aid in providing focus to work towards achieving the outcomes.

The Climate Change Strategy sits across the entire council, touching on every service area. It was therefore important it was developed through a systems approach, in collaboration with all service areas.

Co-development ensured it was suitable for, and could be aligned to, council service plans and operations. It also ensured it was fit-for-purpose and had the endorsement of service areas to work towards the objectives. During the development phase, an Elected Members seminar was held to present the strategy and framework and gain feedback to ensure input from political leadership and community interests.

The purpose of the strategy is mitigation and adaptation, encompassed by the need for a Just Transition. Central to delivering the strategy is maximising the social, economic and environmental co-benefits to the council and the community.

The body is comprised of 'Enablers', which provide the drive and framework for climate action, and 'Themes' which will guide council operations towards decarbonisation sector-by-sector.

The 'Enablers' are; Leadership & Governance, Alignment, Money, Empowerment, and Communications.

The 'Themes' are; Energy, Buildings, Transport, Resources & Waste, Business & Industry, and Nature-based Solutions.

The Strategy is paired with an Action Plan. Each Strategy section contains Strategic Objectives with the Action Plandetailing the measures, policies, and plans that will be put in place to achieve these.

THE CLIMATE CHANGE STRATEGY AIMS ARE:

- We are an organisation and community that is resilient to our changing climate.

- We are a net zero organisation and community.

- Equality and fairness are at the heart of the transition to net zero.

- Opportunities to maximise the social, economic and environmental benefit to the community are optimised.
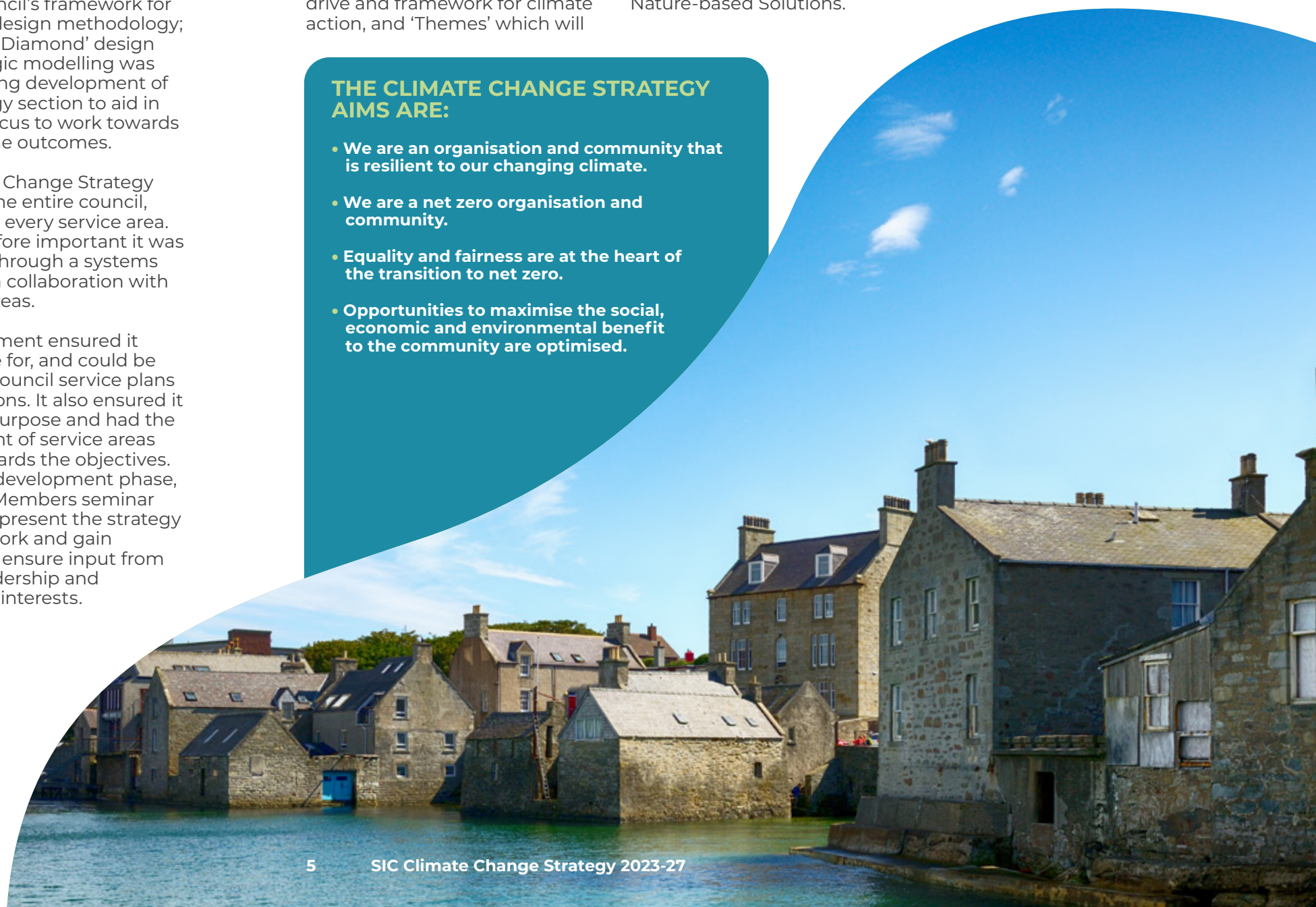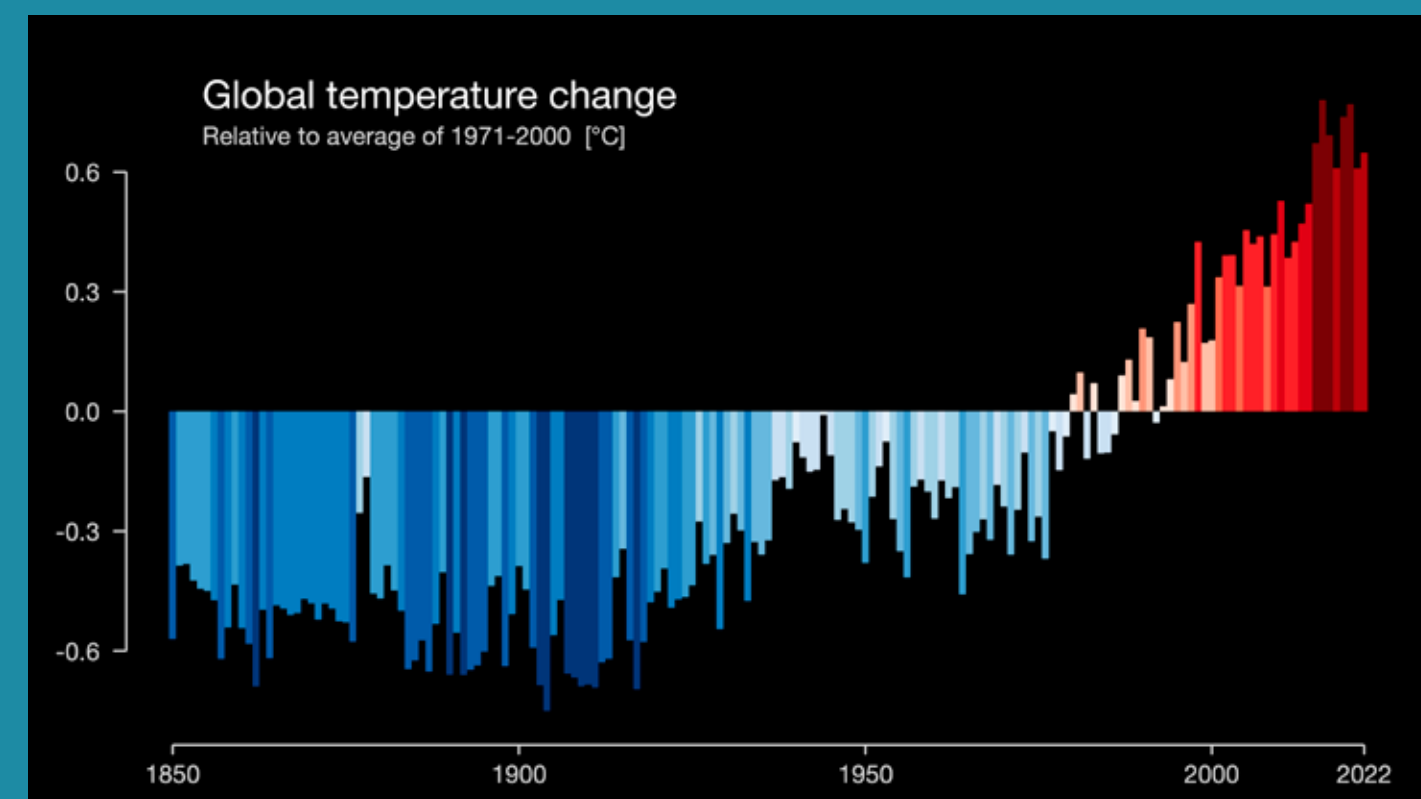
ClimateChange

Climate change is the long-term shift in global climate patterns,including extreme weather events and rising sea levels, linked directly with the warming of the Earth's atmosphere.

The planet goes through natural cycles of warming and cooling, but it usually takes thousands or even millions of years for even a small shift in temperature. We have now seen 1.2 degrees of global warming in the last century because of certain human activities, predominantly the extraction and burning of hydrocarbons and global farming practices. This leads to the release of greenhouse gas emissions into the atmosphere, which acts as a blanket wrapped around the Earth, trapping heat and warming it up.

CO_2 (carbon dioxide) is the most common greenhouse gas and is where the term 'carbon emissions' comes from. Other greenhouse gases include methane, nitrous oxides and fluorinated gases (f-gases).

The impacts of global warming and climate change will vary globally, with the worst impacts affecting those most vulnerable. This can be seen globally through more frequent and severe droughts, flooding and wildfires in areas that haven't been significant contributors to global warming, and don't have the resources to adapt. The same will be seen locally, where those who have the money and resources to adapt will do so, whereas those who don't will suffer the most.

Global Temperature Change

Source:
University of Reading
#ShowYourStripes

Climate Change
Risks to Shetland

With the changing climate, there are numerous risks we are likely to be exposed to in Shetland. These include;

- **Increased frequency in extreme weather events.**
- **Increased rates of both coastal and surface flooding.**
- **Ocean acidification and warming.**
- **Increased pests, pathogens and invasive species.**
- **Disrupted supply chains.**

We have numerous flooding hazards in Shetland, with coastal flooding historically resulting in the greatest impacts, followed by burn flooding and then surface/flash flooding.

Coastal flooding comes from the sea and may be caused by storms or sea level rise.

Burn flooding happens when a lot of rain falls in a short period of time and causes burns to overflow.

Surface/flash flooding also occurs when a lot of rain falls in a short time. This either overwhelms drainage systems or the rainfall is too high to fully seep into the ground.

Other hazards for Shetland include ocean acidification, ocean warming and pests, pathogens and invasive species. Ocean acidification is where carbon dioxide in the air dissolves into the ocean, making the ocean more acidic. This is bad, as fish and other species aren't used to this type of environment. Species with shells are particularly affected, as acidic water can cause their shells to dissolve.

In Shetland, our key economic sectors and lifeline services are highly susceptible to climate change.

Transport infrastructure is sensitive to flooding and severe wind in particular, as these hazards have the potential to cause physical damage and disruption. Our remote location means damage to transport infrastructure and disruption to services can have significant impacts on inter-island transport, on transport to the mainland and so on our supply chains.

Severe wind, flooding, and extreme temperatures can result in injury, ill health, or even loss of life. Furthermore, our health infrastructure is sensitive to physical damage, and health services are also sensitive to transport disruption. We rely on patient travel to the mainland for certain treatments, and for specialised health professionals to visit Shetland.

Similarly, the built environment is sensitive to flooding in particular, as this hazard has the potential to cause significant structural damage. This also includes risk to the wider historic environment, including natural heritage sites and areas of significant natural value. Ocean acidification, ocean warming, and the introduction of pests, pathogens and invasive species will negatively impact the marine ecosystem, and therefore negatively impact the fishing and aquaculture industry. Similarly, changes to weather patterns and the increase in pests, pathogens and invasive species will negatively impact agriculture in Shetland.

Our tourism industry is heavily dependent on the natural environment in Shetland, with many tourists visiting specifically to see our wildlife. The British Trust for Ornithology project a decrease in puffin population of 89% across the UK by 2050, due to climate change.
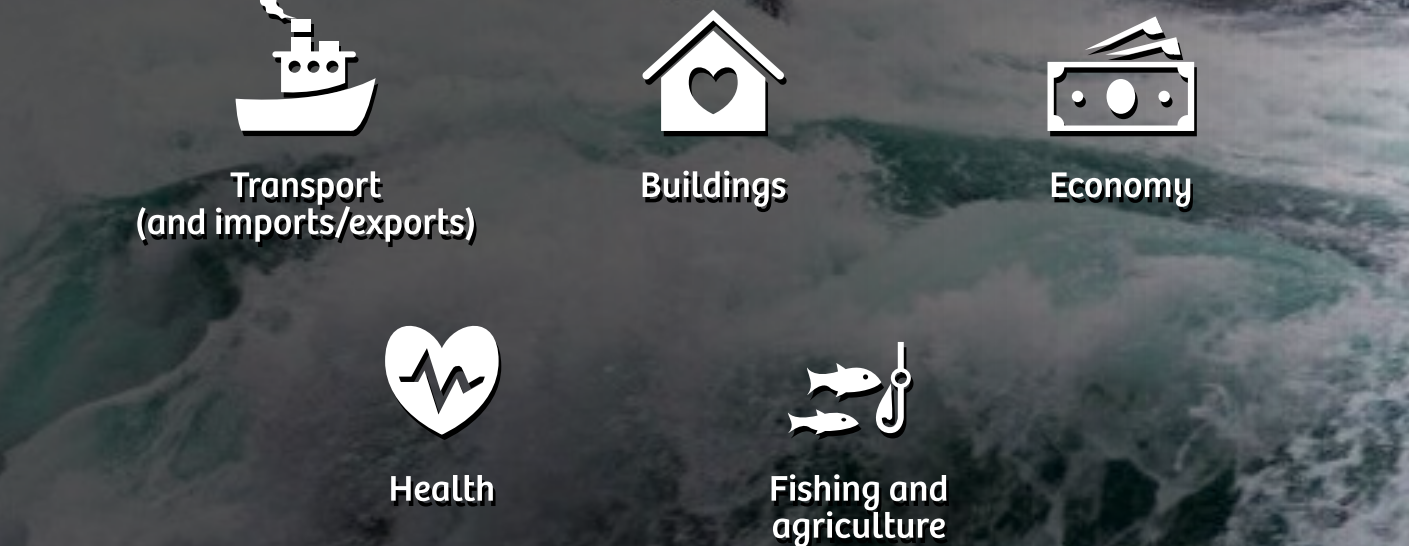
Our remote location puts us at the end of a long global and national supply chain, so we are also more vulnerable to climate-related shortages.

When considering the potential risks from climate change, it is natural to feel overwhelmed. It's important to remember that we do still have time to limit the worst impacts by taking strong action, and to push forward for the positives and opportunities that can come from undertaking climate action.

Climate Related Hazards Facing Shetland

Coastal Flooding (Storms, sea level rise)

Surface flash Flooding (Extreme rainfall)

Extreme temperatures

Burn/stream flooding (Extreme rainfall)

Ocean acidification & ocean warming

More storms

Pests, pathogens and invasive species

Sectors and activities that may be affected by climate change

Transport (and imports/exports)

Buildings

Economy

Health

Fishing and agriculture

Climate Change Targets

The Paris Agreement is a legally binding international treaty on climate change. It was adopted by 196 Parties at the UN Climate Change Conference (COP21) in Paris, France, on 12 December 2015. It states that globally we must limit global warming to 'well below 2 degrees centigrade' to have a liveble future. It was agreed to pursue limiting the temperature increase to 1.5 degrees centigrade above pre-industrial levels of warming in order to avoid climate change tipping points; the threshold at which the Earth's natural systems stop regulating themselves and begin to exacerbate change. To meet this target, the world is required to have 'net zero emissions' by 2050.

The UN's Intergovernmental Panel on Climate Change (IPCC) has said emissions must peak before 2025 and drop sharply to keep even the more conservative Paris Agreement warming goal of two degrees centigrade in play. We are now at a crossroads where the 2020's must be a decade of action to keep this target within reach.
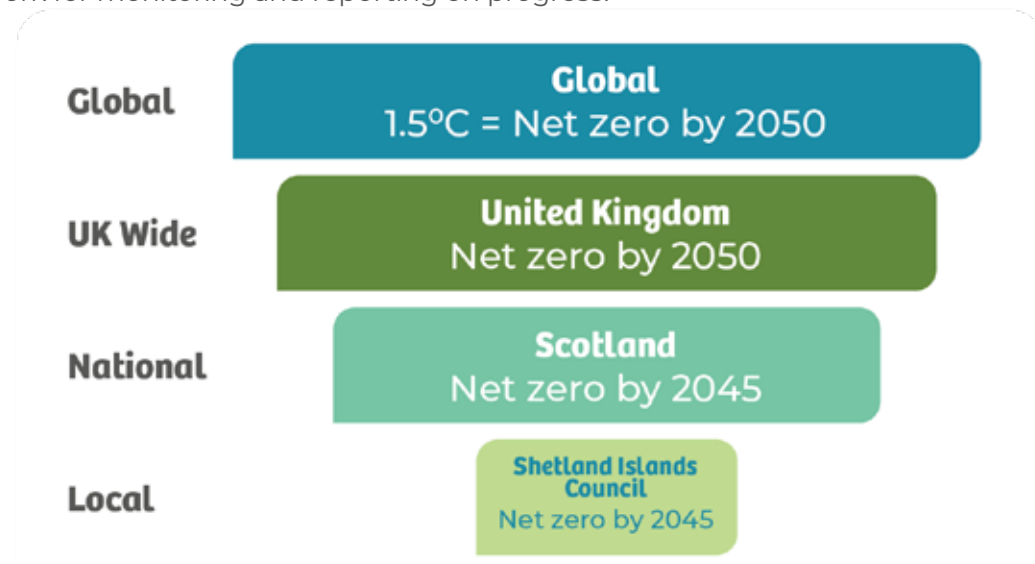
The UK has set a target date of net zero by 2050, in line with the Paris Agreement. Scotland has set a more ambitious target of net zero by 2045, with interim emissions reduction targets of 75% by 2030 and 90% by 2040 against 1990 emissions levels, based on advice from the independent UK Climate Change Committee.

As a Local Authority, Shetland Islands Council has a statutory duty to reduce greenhouse gas emissions in line with Scotland's national target of 2045, and to demonstrate we are working towards this. This is set out within section 44 of the Climate Change (Scotland) Act 2009.

The Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Order 2015 requires local authorities to report annually on their corporate carbon emissions in compliance with their Section 44 duties since 2015-16.

Strengthened reporting requirements were introduced by the Climate Change (Duties of Public Bodies: Reporting Requirements) (Scotland) Amendment Order 2020. This updated legislation provides a consistent approach and requires that, by November 2022, all local authorities, where applicable, report a target date for achieving zero direct emissions and targets for reducing indirect emissions.

The Shetland Islands Council Climate Change Strategy and Action Plan will provide a mechanism for the council to comply with legislation through setting out robust actions to meet climate targets, with a framework for monitoring and reporting on progress.

Global	**Global** 1.5°C = Net zero by 2050
UK Wide	**United Kingdom** Net zero by 2050
National	**Scotland** Net zero by 2045
Local	**Shetland Islands Council** Net zero by 2045

Mitigation & Net zero

Mitigation is reducing, eliminating, or offsetting the greenhouse gas emissions generated by human activity, minimising the possible impacts of climate change.

When thinking of climate action, mitigation measures are usually the first ones that come to mind. Consuming less energy and replacing fossil fuels with renewables are popular actions that organisations and individuals can take to mitigate their contribution to climate change.
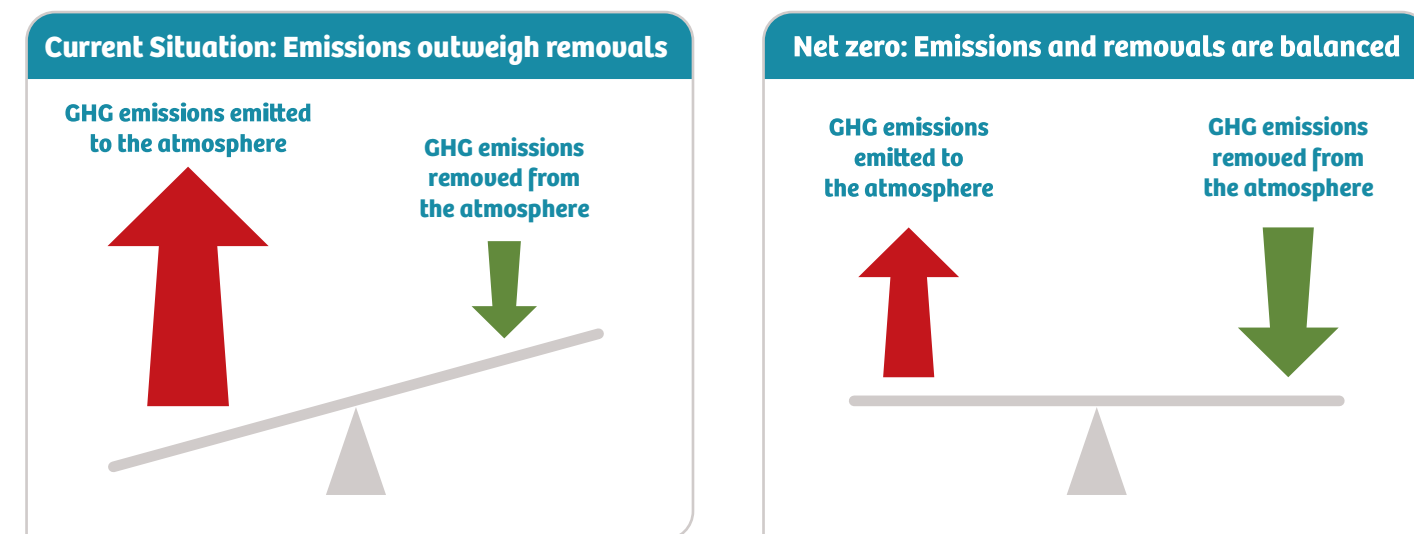
Mitigation also includes actions such as undertaking peatland restoration or shortening supply chains. These actions often have co-benefits, such as creating jobs or improving health, and should always be undertaken in a way that is considerate of the historic and natural environment.

When speaking about climate change, there is often a lot of jargon used. One frequently used jargon, which is central to addressing climate change, is 'Net Zero.'

We undertook a survey of the Shetland community in 2021, and one result that stood out was the response to the question 'are you clear on what net zero means?' Almost half of respondents said 'no,' with 49% of the 848 respondents stating they were not clear on what net zero meant.
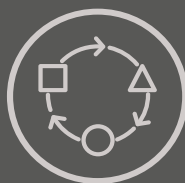
Net zero refers to a situation where there is a balance between greenhouse gas emissions being emitted into the atmosphere, and greenhouse gas emissions being removed from the atmosphere at any given time. This is the point where human activity stops contributing to additional global warming.

This underpins everything that is required for mitigation. We must reduce our emissions to the point where we can balance any residual emissions by natural means, or through Carbon Capture and Storage (CCS).

Current Situation: Emissions outweigh removals

GHG emissions emitted to the atmosphere

GHG emissions removed from the atmosphere

Net zero: Emissions and removals are balanced

GHG emissions emitted to the atmosphere

GHG emissions removed from the atmosphere

Photo Credit: SSEN

Adaptation

Adaptation is about responding to and preparing for changes in climate. Even if we cut greenhouse gas emissions today, historical emissions mean the climate is changing, and will continue to do so for decades to come, which can already be seen. We therefore need to understand and prepare for potential changes to Shetland's climate to reduce the negative effects of climate change.

'Scotland's climate is already changing. Over the last century temperatures have increased, sea levels have risen, and rainfall patterns have changed, with increased seasonality and heavy downpours. These changes are projected to continue and intensify over the coming decades. We can expect future changes in climate to be far greater than anything we have seen in the past.' Adaptation Scotland.

Climate Change is already impacting people and places in Shetland, with a number of recent extreme weather events occurring. This will continue to intensify over the coming decades, and so taking early action to adapt will help to increase resilience and to reduce risks and impacts of events.

Adaptation goes hand-in-hand with mitigation, as by reducing our greenhouse gas emissions we can reduce the amount of climate change that we will have to adapt to.

Photo Credit: The Orcadian

Just Transition

'For the Scottish Government a just transition is both the outcome – a fairer, greener future for all – and the process that must be undertaken in partnership with those impacted by the transition to net zero. It supports a net zero and climate resilient economy in a way that delivers fairness and tackles inequality and injustice.' Scottish Government, Just Transition Commission.

Addressing climate change and reaching net zero is going to require transformational change, and certain groups within society will experience the consequences of the transition to net zero more acutely than others.

Here in Shetland, we have a high reliance on hydrocarbons for our key economic sectors and for our lifeline services. We also have higher-than-average levels of fuel poverty, due to high energy costs, harsher climate and longer heating season. Affordable clean energy for the Shetland community is essential in achieving a just transition.

History has shown that areas which have experienced poorly-managed and unplanned transitions in the past remain disadvantaged compared to the rest of the country. It tends to be that, in times of unplanned change and crises, the most vulnerable in society will feel the worst effects of it, and they don't have the means to be prepared for, or to react effectively to the change. This is why it is so important that all sectors of our community, and local businesses and organisations, are involved in planning for the transition, and in developing the solutions for the transition; participation, co-design and collaboration are key.

If planned and implemented in a way that considers all sectors of the community, with tackling inequality and injustice at its heart, there are many significant benefits that can be realised from this transition, making it a truly just transition.

The United Nations' Sustainable Development Goals (SDGs) set out how communities, organisations, and governments everywhere in the world can progress towards better lives for themselves and their children, without leaving anyone behind.

All the SDGs have targets that are directly or indirectly related to the daily work of local and regional governments. Local authorities should not be seen as mere implementers of the agenda. Local authorities are policy makers, catalysts of change and the level of government best placed to link global goals with local communities.

The UN goals fit with the council's own needs and priorities. Many communities and industries are already striving for sustainability, and these efforts are paying dividends to the health and connectedness of the community. Actions within the Climate Change Action Plan have been mapped against the UN Sustainable Development Goals to ensure no one is left behind with economic progress, social justice and inclusion, protection of the climate, environment and biodiversity.

To ensure the Shetland community is engaged in climate change and represented within actions to address it, the Shetland Climate Conversation was established. This initiative provides opportunity and space for a flow of communication between the community, the council and partner organisations

Co-benefits

Climate change has complex causes and effects, touching nearly every area of society. This however means that mitigating and adapting to a changing climate will also provide opportunities, opening doors for brand new industries and new ways of living that provide an array of social benefits incidental to avoiding the worst effects of climate change. These are usually called "co-benefits."

This strategy seeks to maximise and highlight the co-benefits of climate action to the organisation and to the community. Many of the low-carbon investments and behavioural changes required to address climate change will make living and travelling on Shetland healthier and more affordable.

Examples of co-benefits to the council and to the community are as follows:

SOCIAL

- Facilitating uptake and encouraging active travel, such as walking or cycling, will also improve the health and wellbeing of those who are able to do so.
- Improving public transport to increase uptake improves equality.
- By investing in green jobs and development, the transition to net zero will provide opportunities for employment, education, up-skilling, re-skilling, training and attainment that will increase social mobility.
- Investing in energy efficiency will improve the supply of warm and affordable housing, which alleviates fuel poverty, and improves health and wellbeing.

ECONOMIC

- Fossil fuels are a finite resource, which are becoming less politically and economically palatable. By maximising socio-economic opportunity from renewable energy, Shetland's energy industry will have better longevity.
- Many of Shetlands key economic sectors rely on the natural environment, which is sensitive to the effects of climate change. Understanding and planning for climate risks will help to minimise negative impacts, and to benefit from potential opportunities.
- Many climate actions create efficiencies, which pay for themselves long before they must be renewed.
- Potetial for local or community ownership of future revenue generating energy projects.
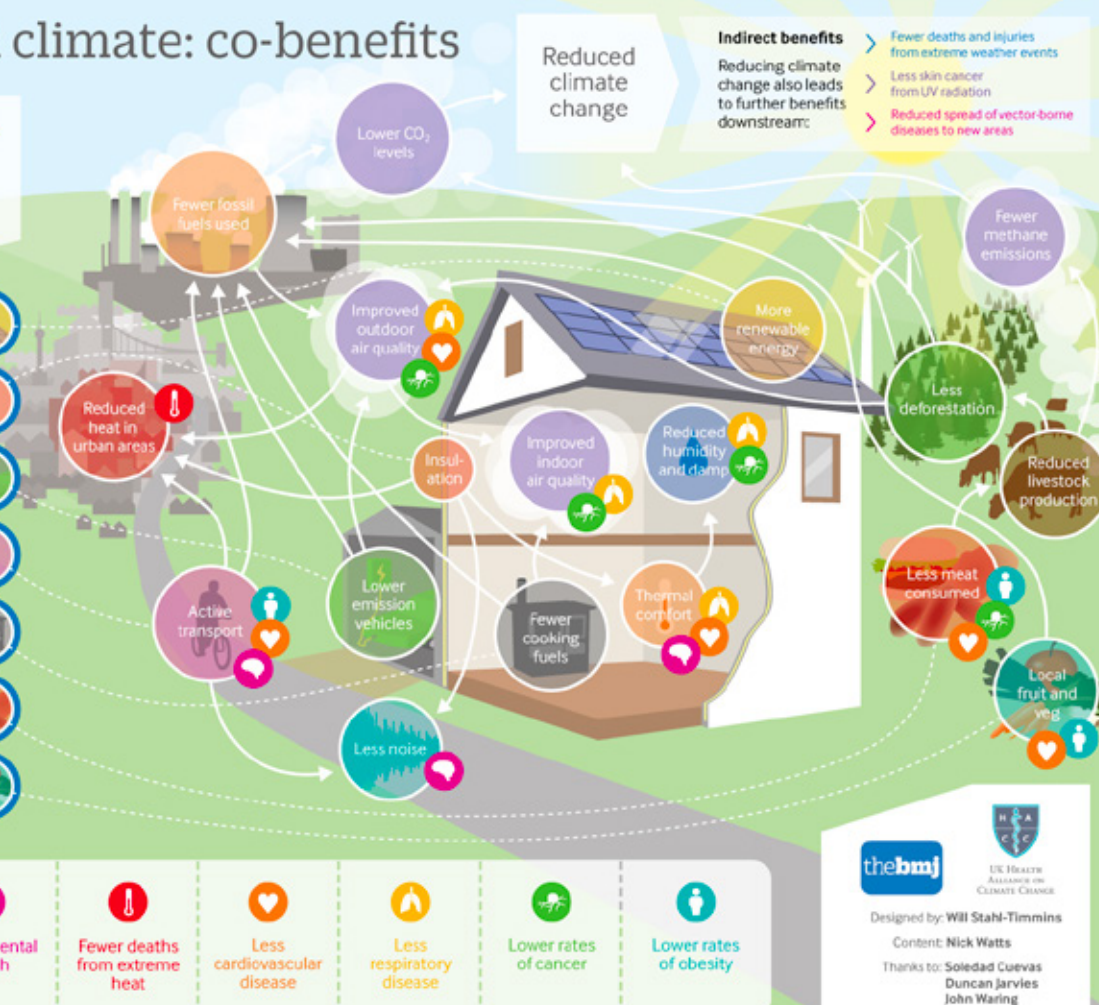
ENVIRONMENTAL

- Mitigating Shetland's contribution to climate change will make the isles a cleaner place to live and work. Taking petrol and diesel vehicles off the road and decarbonising the ferry routes will reduce air pollution, decreasing the risk of cardiovascular disease.
- Shetland has a unique ecological and geological landscape, with internationally important numbers of breeding seabird colonies. Climate action helps to protect our natural landscape and as a result brings tourism to Shetland.

Health and climate: co-benefits

Climate Change Programme

Shetland Islands Council acknowledged a Climate Emergency in January 2020. In response the Climate Change Programme was established, with the purpose to minimise the risks of climate change, and to make the transition to net zero as beneficial as possible to the Shetland community.

Examples of co-benefits to the council and to the community are as follows:

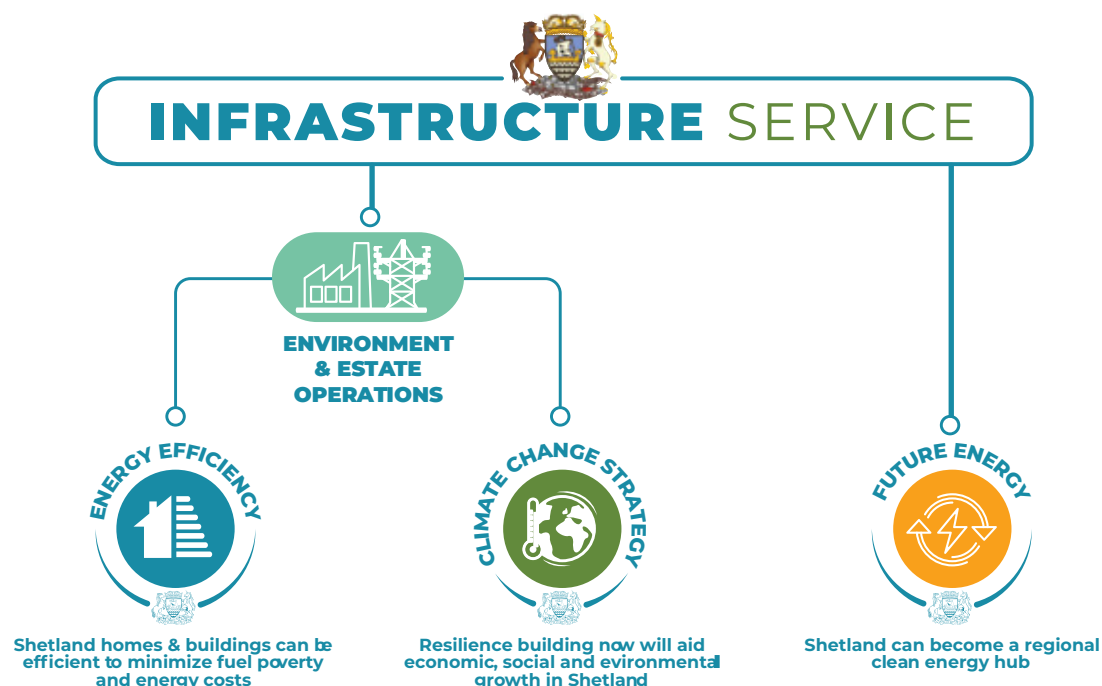**The approach of the Climate Change Programme is to:**

- Be proactive in addressing Climate Change mitigation and adaption in Shetland.
- Progress a range of immediate actions and priority areas.
- Act in partnership with other agencies, business and communities.

The objectives of the Climate Change Programme are:

- Development of the strategy, governance arrangements, target development and action planning required to adapt to, and mitigate, climate change in Shetland.
- Contribute to an effective Scotland, UK and international response.
- Inform the identification of issues and options
- Assist in evidence-based planning and decision making so that environmental, economic and social needs are recognised, balanced and met.

Three teams were set up under the Climate Change Programme:

- The newly formed team, Climate Change Strategy.
- The newly formed team, Future Energy.
- The Energy Efficiency Team (re-banded from the Carbon Management Team)

INFRASTRUCTURE SERVICE

ENVIRONMENT & ESTATE OPERATIONS

ENERGY EFFICIENCY

Shetland homes & buildings can be efficient to minimize fuel poverty and energy costs

CLIMATE CHANGE STRATEGY

Resilience building now will aid economic, social and evironmental growth in Shetland

FUTURE ENERGY

Shetland can become a regional clean energy hub

Net zero
Route Maps and Data

When Shetland Islands Council acknowledged a Climate Emergency in 2020, a mandate was set to establish an appropriate and informed target date for the Council to be net zero as an organisation, and for Shetland to be net zero as an area. The first step in determining an appropriate target was to develop a Net Zero Route Map for the Council and a Net Zero Route Map for Shetland, for which consultancy, 'Ricardo Energy and Environment' was appointed.

The purpose of each route map was to establish a scope and methodology of measuring GHG emissions, establish a baseline for emissions and develop pathways for what measures need to be taken for the Council as an organisation and Shetland as an area to reduce emissions and reach net zero.

Shetland Islands Council Net Zero Route Map

This route map looks at the challenges and priorities facing the Council in reaching net zero, including:

- **Confirming the boundary for appropriate emissions reporting as the Council has a vast array of assets.**
- **Examining the current pipeline of projects and programmes already planned for identifying key mitigation measures that the Council must implement at a minimum to achieve net zero.**
- **Understanding the costs of potential measures, in the context of limited capital and revenue resources.**
- **The requirement for a framework and key considerations to allow the Council to develop a robust implementation plan and deliver on their net zero commitments.**
- **Many low carbon technologies are currently in their infancy and as such, it is not yet clear how technologies will develop, and therefore which will be the most appropriate for the Council to adopt.**

The starting point in developing the Council route map was to understand drivers and boundaries, and then to establish the 2019/20 emissions baseline. The emissions sources included in the baseline are heating fuels, transport fuels, electricity, district heating, refrigerant gases, water supply and treatment, the Council's landfill site, the energy recovery plant (ERP), waste sent to recycling centres, business travel and employee commuting.

Emissions were calculated in line with ISO 14064, with all emissions sources owned or controlled by the Council included in the baseline.

Emissions for the Council baseline have been calculated by scope, as defined below:

Description		Emissions examples
Scope 1	GHG emissions arising from sources that are owned or controlled by the organisation. These emissions result from activities that the organisation has direct influence over through its actions	Diesel and gas oil for vehicles and vessels Burning and gas oil for building heating Refrigerant gas leakage Waste sent to landfill or incineration*
Scope 2	GHG emissions associated with the use of electricity imported from the grid or from a third-party supplier of energy in the form of heat or electricity.	All grid supplied electricity Heat provided by the Lerwick district heating network
Scope 3	GHG emissions arising as an indirect consequence of the use of goods or services provided to or by the reporting organisation, i.e. across its value chain, both upstream and downstream of its operations.	Supply and treatment of water Business travel Waste sent to recycling centres*

*Note that waste sent to landfill or incineration are scope 1 emissions as these are Council owned and controlled operations.

In 2019/20, the Council was responsible for an emissions total of 65,875 tCO_2e, which is projected to decrease by 47% under the business as usual for the Council to 34,674 tCO_2e.
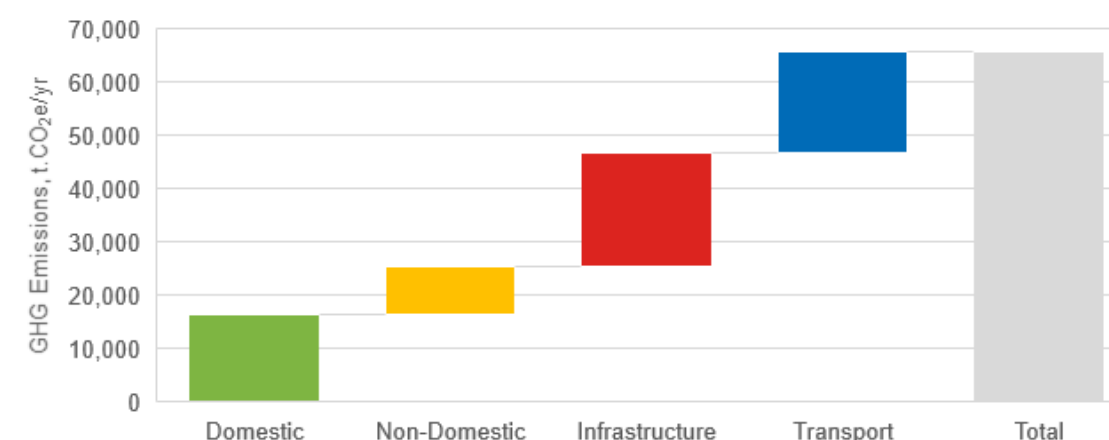
Shetland Islands Council 2019/2020 GHG Emissions Baseline - Emissions Breakdown by Sector
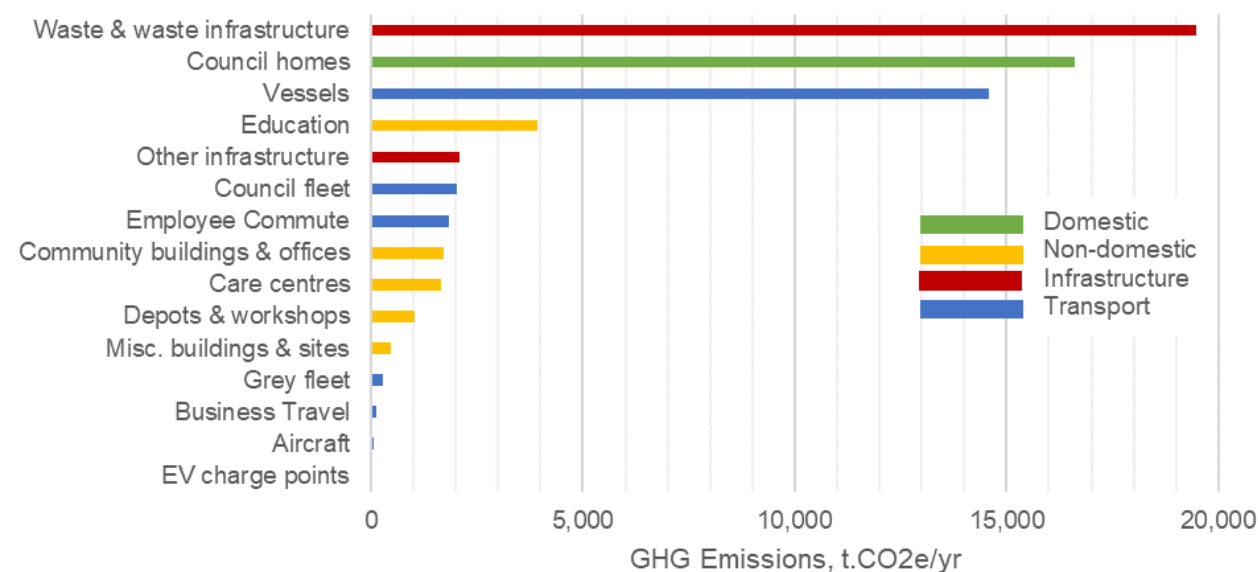
**Shetland Islands Council 2019/2020 GHG Emissions Baseline
Emissions Breakdown by Sub-sector**

Emissions pathway projection by sector

After defining the emissions baseline, extensive stakeholder engagement was undertaken across all service areas of the Council to discuss and outline appropriate measures and timelines for implementing emissions reductions.

Three net zero pathways were then modelled:

- 2030 ambitious pathway – assumes that significant resources and budget are made available to allow the rapid implementation of measures by 2030. This approach looks to minimise carbon emissions by 2030 with technologies available over that time frame, though does not look at decarbonisation beyond 2030 other than through factors outside of the Council's control, e.g. decarbonisation of the national electricity grid. For some emissions sources therefore, the selection of decarbonisation technologies is restricted by technology maturity.

- 2040 pragmatic pathway – assumes a pragmatic approach to the selection of decarbonisation measures whereby assets are replaced with low-carbon alternatives at their end of life, and more cost-effective technologies and approaches are preferred and therefore modelled. All assets that approach their end of life within the scenario timeframe are assumed to be replaced with low carbon alternatives.

- 2040 ambitious pathway - assumes that significant resources and budget are made avaiable to minimise the Council's emissions by 2040. For several emissions sources therefore, this is likely to require significant transformation to current services and operations.

The recommended pathway for Shetland Islands Council to follow was the 2040 ambitious pathway, which addresses all major emissions sources, achieving a 92% reduction in emissions from the 2019/20 baseline by 2040.
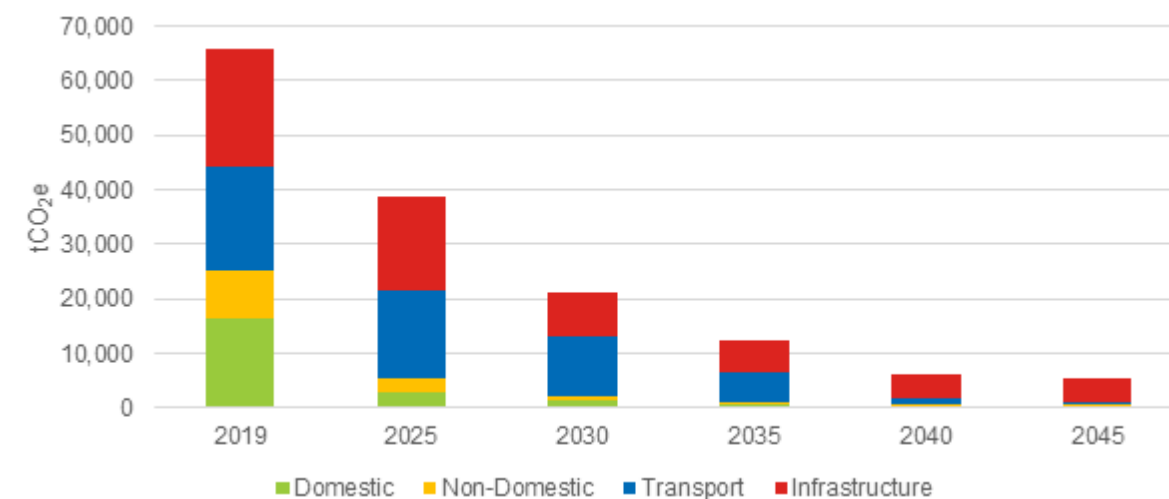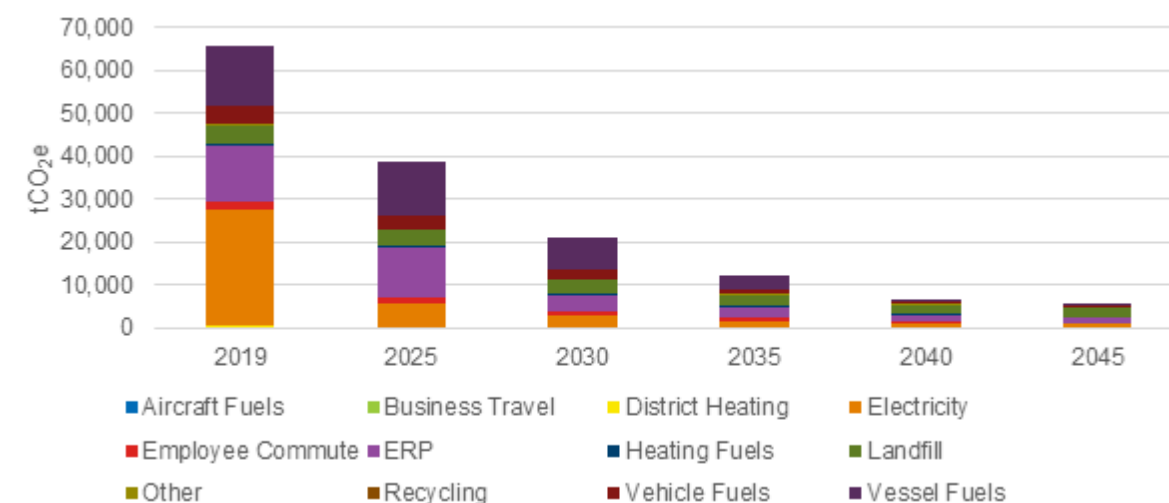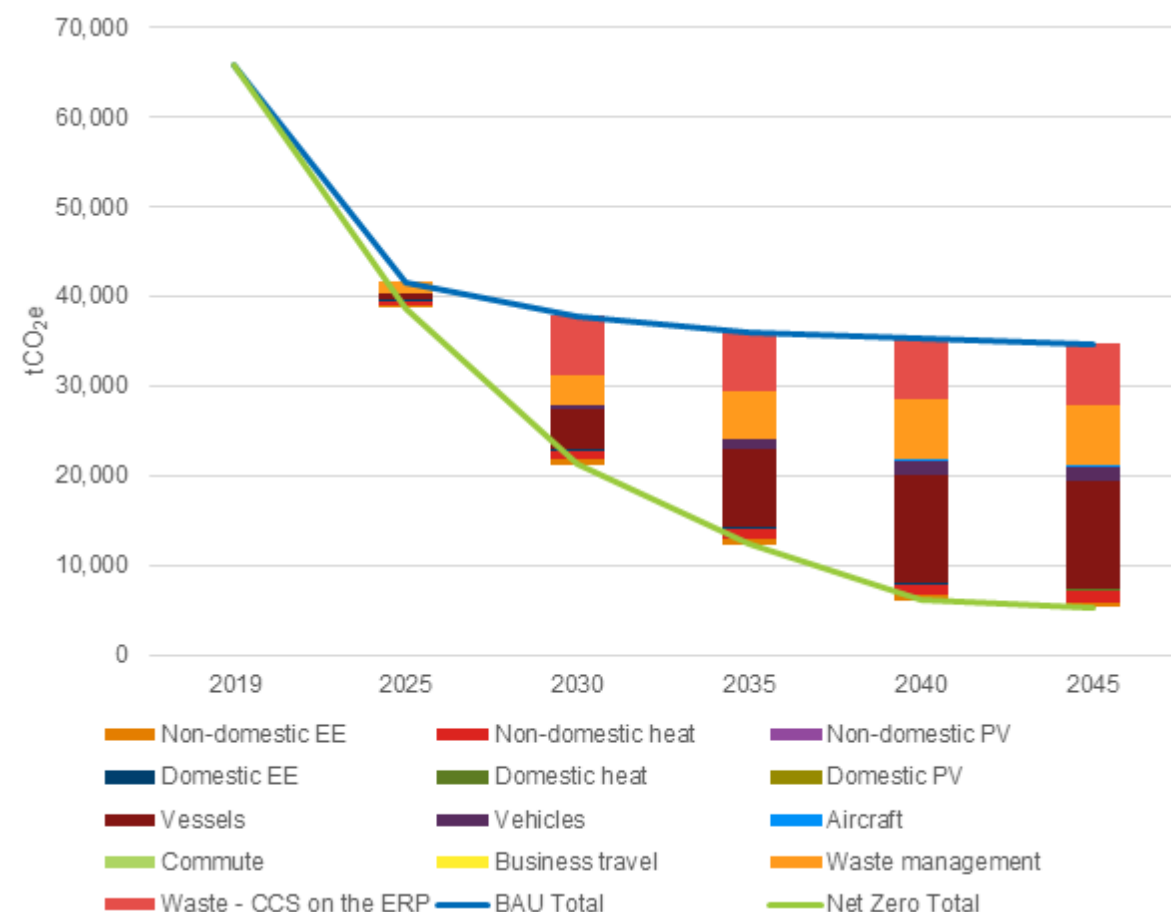

Emissions pathway projection by fuel type

Contribution of measures to net zero pathway

This Net Zero Route Map process has shown the Council has a strong opportunity to achieve net zero by 2045. To achieve net zero through divestment from all fossil fuels, it was recommended that the Council implements/reviews the following measures at a minimum whilst continuing to investigate other technologies & emissions reduction opportunities where full information is not currently available.

GENERAL

Develop an action plan for the implementation of measures outlined in the 2040 ambitious pathway, and set up strong internal governance by:

- Setting up a 'Net Zero Taskforce' within the Council that has responsibility for driving the implementation of the measures outlined in the pathway, as well as monitoring the outcomes of these measures to continually provide lessons learned.
- Mandating climate impact assessments at key project milestones to ensure that projects are in line with the Council's broader suitability objectives.
- Maintain the route map and action plans as live documents, with regular reviews of the measures recommended within the report, at major investment decision points that would have a significant impact on emissions and ahead of reaching major milestones.
- Setting a carbon budget for the Council to regularly reports progress against.

NON-DOMESTIC BUILDINGS

- Replace fossil fuel heating systems with low carbon alternatives. The 2040 ambitious pathway models the impact of electric heating systems such as heat pumps, electric storage heaters or a district heat network connection. However, over the next 20 years, emerging technologies such as hydrogen boilers are likely to become more competitive. Therefore, the Council must continue to monitor developments in low-carbon heating systems.
- Strategically upgrade building fabric to minimise heat loss. This is particularly important where potential low carbon heating systems would not perform effectively without fabric upgrades.
- Replace all fossil fuels used for catering, likely with electric systems.

DOMESTIC BUILDINGS

- Replace fossil fuel heating systems with low-carbon alternatives. The 2040 ambitious pathway models the impact of electric heating systems such as high retention storage heaters, heat pumps or a district heat network connection. However, over the next 20 years, there may be other technologies which emerge as alternative options. The Council must continue to monitor developments in low carbon heating systems.
- Strategically upgrade building fabric to minimise heat loss.

TRANSPORT

- Replace all fleet vehicles with low carbon models such as EVs or hydrogen fuel cell vehicles aligned with Scottish Government public sector fleet decarbonisation targets.
- Replace the Council marine fleet with low- carbon alternatives. The market for low-carbon vessels is emerging, however it is likely that alternatives utilising either hydrogen fuel cell, hydrogen derivative fuel, hydrogen derivative fuel, battery electric or dual fuel propulsion systems will be developed.
- Either replace aircraft with battery electric or hydrogen fuel cell alternatives or begin using a sustainable aviation fuel blend.
- Ensure there is sufficient charging and hydrogen storage, transportation and refuelling infrastructure to enable the above.

INFRASTRUCTURE

- Target significant levels of waste reduction both within the Council and across the Shetland Islands to minimise emissions from landfill.
- Continue investigating the opportunity to install carbon capture on the exhaust from the ERP.

Other identified measures across all three potential pathways are aimed at reducing absolute emissions through efficiency improvements, better operating practices through implementation of policies, generating electricity from renewable sources, or replacement of existing equipment with high-efficiency models.

SHETLAND NET ZERO ROUTE MAP

When undertaking the Council's organisational route map, it was decided to also undertake an area wide Net Zero Route Map for Shetland. It is not an obligation for a local authority to undertake an area wide route map but was seen as a proactive and essential step in understanding the scale and profile of emissions across Shetland, to set up the networks required to undertake action and to begin to collaboratively work towards net zero as an area.

The Shetland Net Zero Route Map covers the sectors of energy, transport, buildings, business and industry, waste and nature-based solutions.

Establishing the boundary and scope of emissions for the Shetland Net Zero Route Map was challenging. Compared with other Local Authorities, Shetland is unique in terms of its geography and economy, so the common approaches to GHG reporting exclude some activities and sources of emissions that are highly relevant to Shetland; the major examples being aviation and the entire marine industry.

It was essential that a credible baseline was developed for Shetland and so the principles of ISO 14064 were used, where the emissions baseline should seek to be as complete and as relevant as possible. Therefore, sources of emissions that are not typically included in area-wide inventories were scoped in, such as aviation, ferries, the marine industry and all emissions from land.

Emissions for the Shetland baseline have been calculated by scope, as defined below:

Type	Definition	Examples
Scope 1	Direct emissions from fuel combustion and fugitive emissions within the Local Authority's geographic boundary	• Fuel combustion in buildings and road vehicles • Emissions from agriculture, waste and wastewater treatment, or landfill activities taking place within the Shetland region
Scope 2	Indirect emissions from purchased electricity, heat, steam or cooling that is generated elsewhere	• Typically, electricity would be generated outside the area boundary and therefore classed as Scope 2 - whereas in Shetland, at present the fuel combustion to produce electricity would be classed as Scope 1, but that will change (post-2024) when there is an interconnector to the UK grid
Scope 3	Other indirect emissions	• Journeys to/from the region that are outside the Local Authority boundary - by ferry or domestic aviation • Harbour tugs • Sullom Voe Port and vessels • Fishing, aquaculture and other marine sector emissions Other indirect emissions, such as supply chains for food, products and materials, are not included in this study. Emissions from the offshore oil and gas industry are also not included as these would be allocated to the end users of the oil and gas.

Large point sources of emissions in Shetland have also been shown against the baseline to provide context, these are however not considered part of Shetland's baseline as the end user of products from these facilities are wider than Shetland for example Sullom Voe Terminal and Shetland Gas Plant. An end-user methodology has been used in calculating the Shetland baseline.

In 2019/20, Shetland was responsible for emissions totalling 764,200 tCO_2e from Scope 1 and 2 emissions and 174,500 tCO_2e from Scope 3 emissions, totalling 938,700 tCO_2e.

Shetland Islands GHG Emissions Baseline for 2019/2020 (ktCO2e)
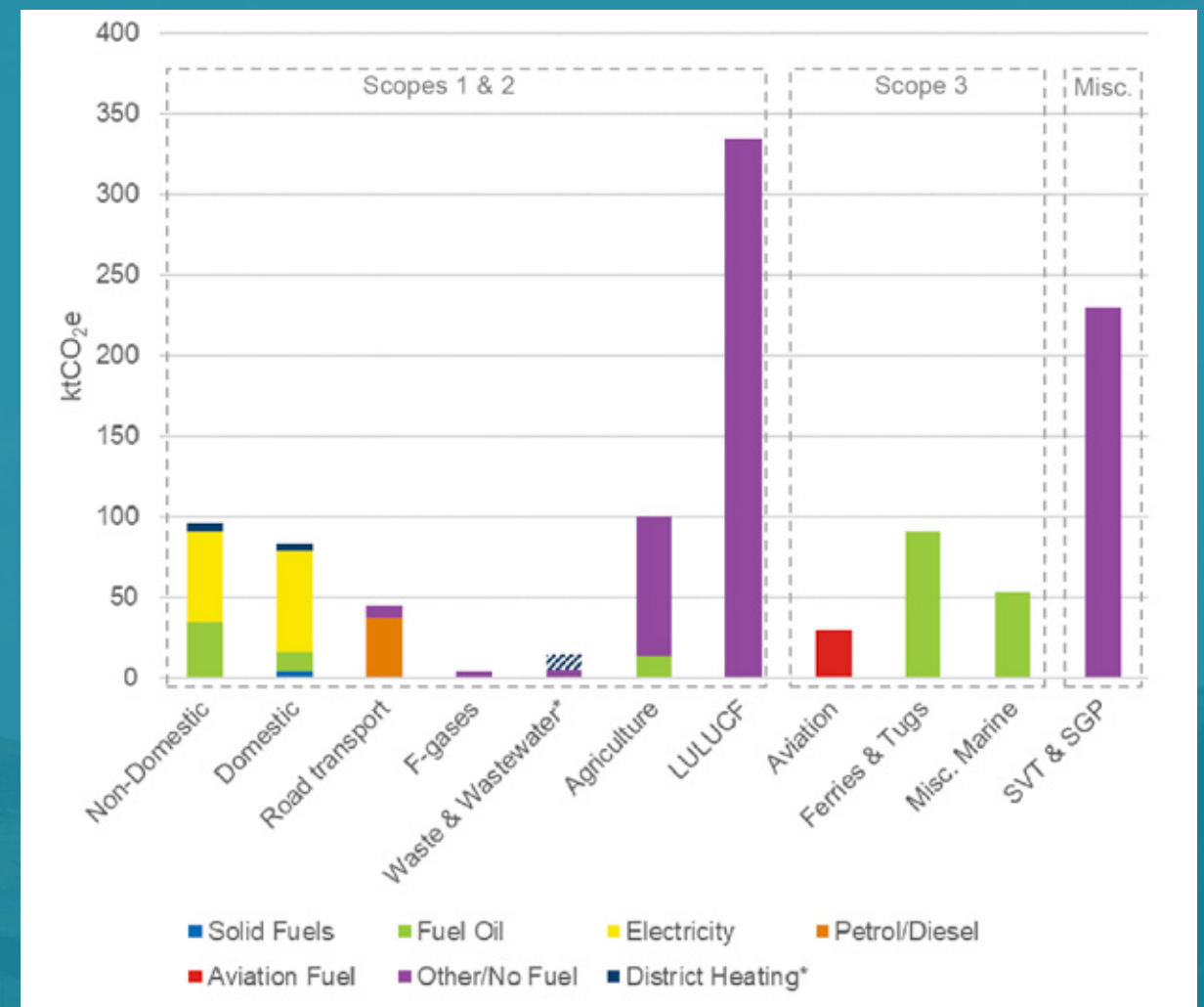
Emissions from the ERP, which incinerates waste, could arguably be included in the 'Waste & Wastewater' category or in the domestic and non-domestic buildings category as it is used as a heat source. It is shown in both categories to provide scale.

The GHG emissions profile for Shetland is highly unusual. In contrast to most Local Authorities, where emissions are dominated by energy use in buildings and road transport, some of Shetland's largest sources of emissions are from land use, energy industries and agriculture.

Following establishment of Shetlands emissions baseline, the following methodology was used to develop the net zero pathways:
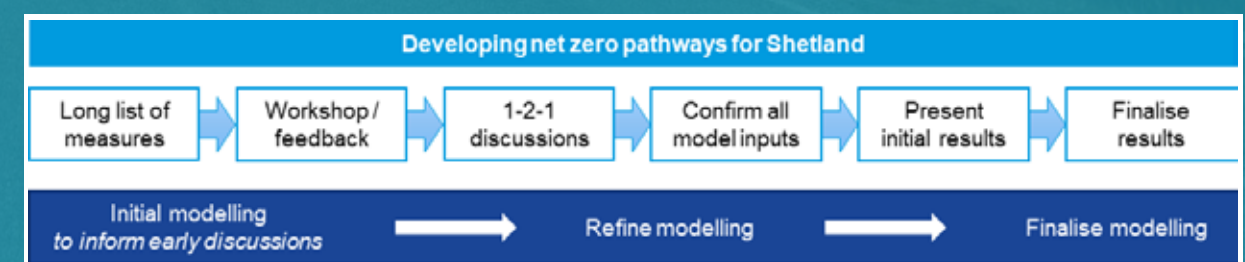
Several stakeholder events were held during the development of the Net Zero Route Maps, engaging over 100 stakeholders across Shetland. Stakeholder involvement and partnership working is particularly strong in Shetland, which is absolutely essential in having a co-ordinated and collaborative approach to addressing climate change and accelerating progress.

This process identified a variety of GHG mitigation measures that can deliver important economic, social and environmental co-benefits. Some of the major opportunities identified included:

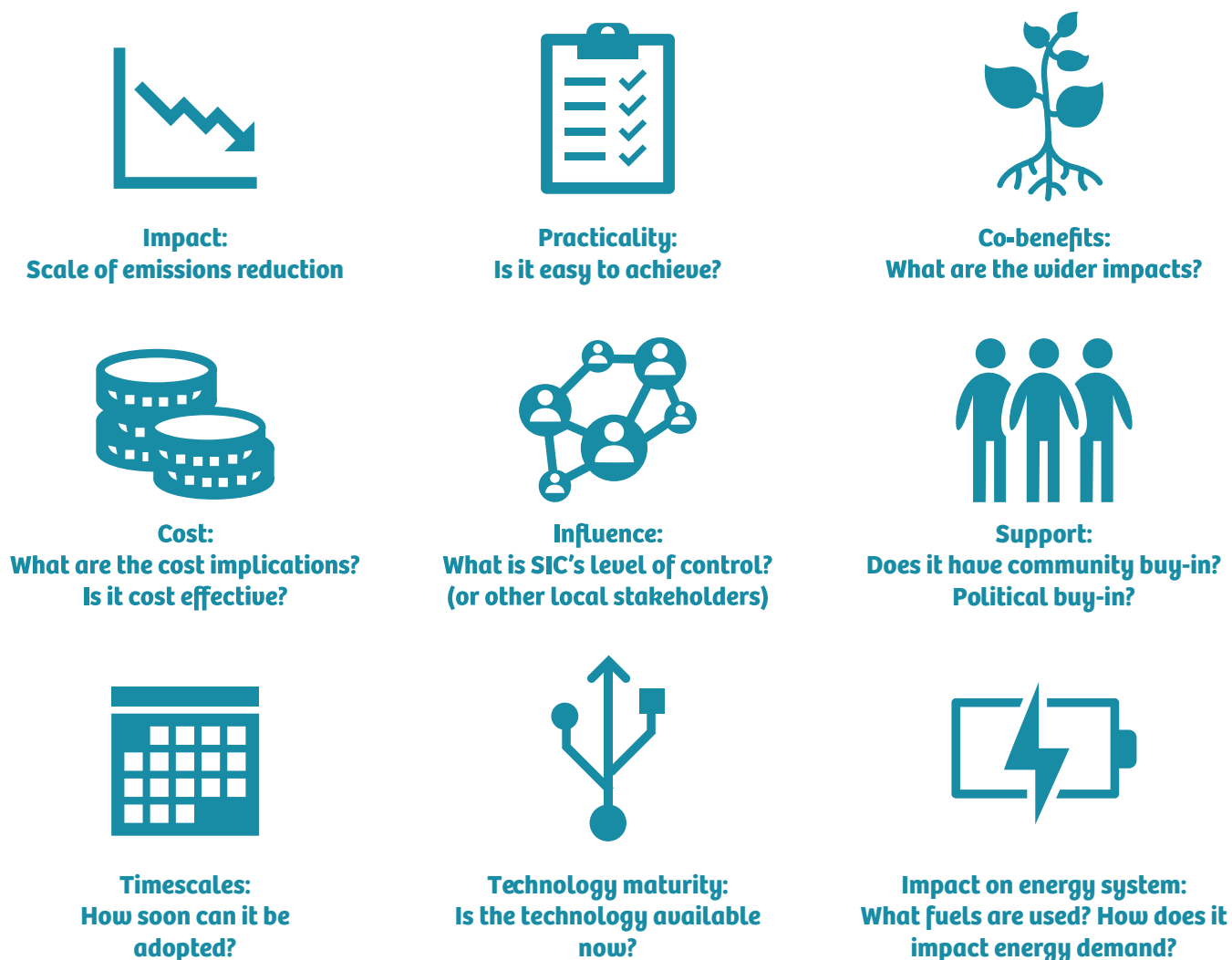- Peatland restoration – this is the single most impactful mitigation measure for Shetland.
- Improving standards of living, lowering fuel bills by retrofitting buildings and ensuring that everyone has access to affordable, low carbon heating and energy.
- Leading the way on sustainable agricultural practices and paludiculture.
- Contributing towards the decarbonisation of the wider UK energy system via large-scale renewable energy technologies and storage systems.
- Becoming a hub of innovation for technologies such as green hydrogen, CCS and tidal power, which could include a micro-CCS pilot project at the Lerwick ERP.

The other measures evaluated for each sector covered a range of options relating to energy efficiency, behaviour change, and low or zero carbon technologies.

When prioritising measures, consideration was given to:

Impact:
Scale of emissions reduction

Practicality:
Is it easy to achieve?

Co-benefits:
What are the wider impacts?

Cost:
What are the cost implications?
Is it cost effective?

Influence:
What is SIC's level of control?
(or other local stakeholders)

Support:
Does it have community buy-in?
Political buy-in?

Timescales:
How soon can it be adopted?

Technology maturity:
Is the technology available now?

Impact on energy system:
What fuels are used? How does it impact energy demand?

Once ambitious but appropriate measures and timescales were developed through stakeholder engagement, pathway projections were modelled for Shetland's journey to net zero, as can be seen in the graphs below:

Projected all GHG emissions reductions following implementing pathway measures:

Approximately 65% reduction
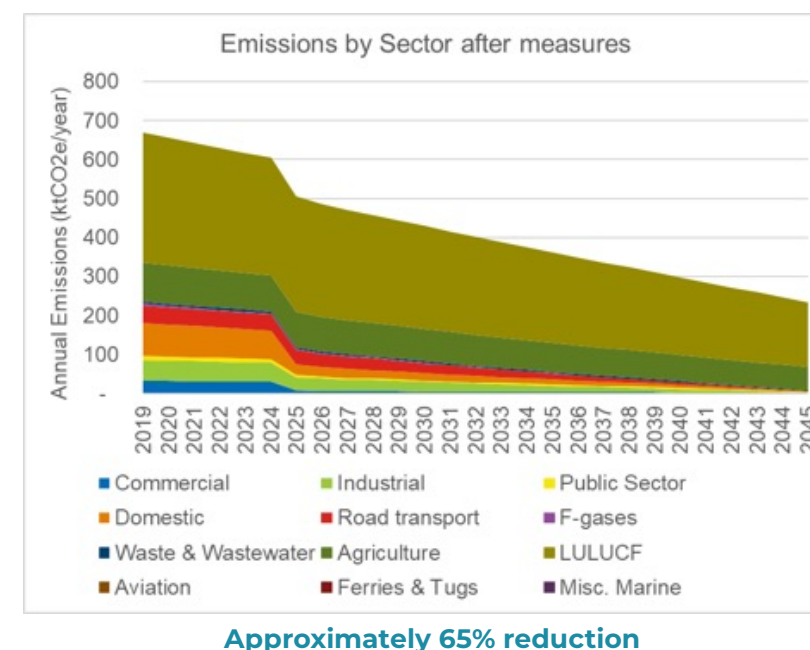
Projected fuel only GHG emissions reductions following implementing pathway measures:

Approximately 95-100% reduction
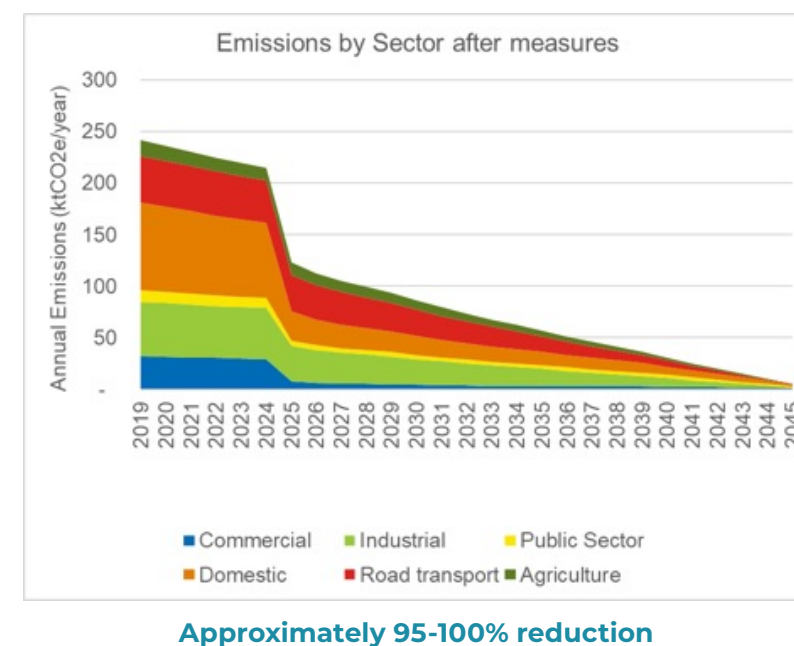
Changes in fuel consumption following implementation of measures:

Energy use by fuel type, 2019-2045

The GHG baseline assessment, pathways analysis and stakeholder engagement process undertaken during the Net Zero Route Map project highlighted important mitigation measures that must be adopted in Shetland to reduce emissions. In very broad terms, the key components to achieving this are:
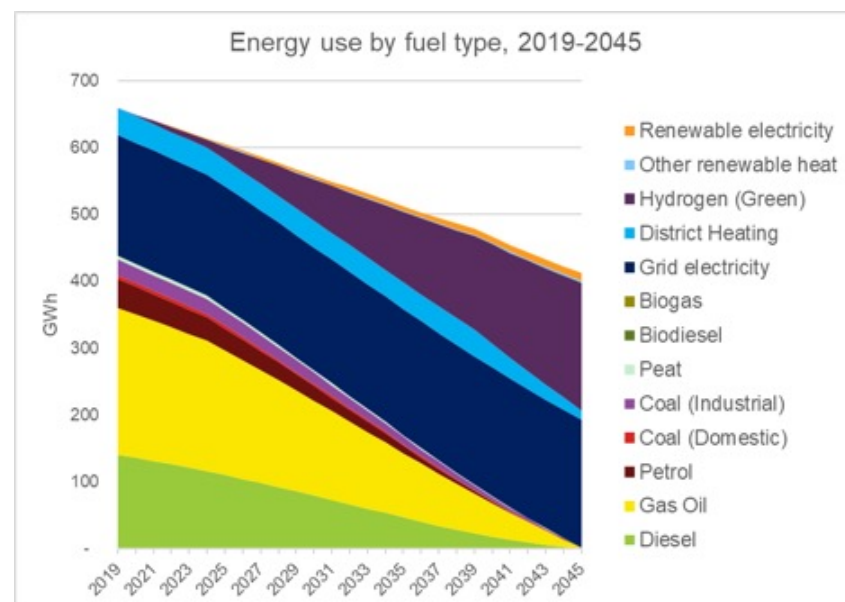
- **Phasing out the use of fossil fuel.**
- **Working towards changing the way that land is used and managed in order to tackle non-energy-related emissions.**

Both require close engagement with the local community to ensure that the transition is fair and avoid any unintended negative social, economic or environmental consequences.

Key messages from the pathways modelling are as follows:

- **Electrification of buildings and transport, and connection to the mainland electricity grid, will have a very important role to play in reducing emissions from energy use in Shetland. These could feasibly be reduced to net zero by 2045 if all fossil fuels are replaced with zero-emission alternatives, such as decarbonised grid electricity or green hydrogen.**
- **A significant portion of emissions are associated with sectors that are difficult to electrify (e.g.aviation, marine vessels, etc.) or are not associated with energy use at all (e.g. land use and agriculture). At present it is not clear whether there will be technologies available by 2045 that can mitigate these sources of emissions.**
- **It is likely to be difficult or impossible for area-wide emissions in Shetland to get to net zero by 2045 based on currently available technologies or mitigation methods, barring a systemic overhaul of the economy, land uses, consumer habits and social engagement.**

The emissions profile in Shetland makes it unlikely that net zero can be achieved across all sectors without CCS. With that in mind, it will be important to:

- **Maintain high levels of ambition while focusing on measures that can definitely be adopted by 2045.**
- **At the same time, plan ahead to take advantage of new technologies or solutions that may become available in future years.**
- **Work with the local community and businesses to ensure that the economy and society are prepared for the wider-scale changes that will take place as the UK and the world transition to a net zero future.**

Whilst there are a huge number of actions that will need to be taken to transition to net zero, they can be simplified into four main areas:

- **Start mainstreaming carbon neutrality considerations into all activity.**
- **Accelerate activities to reduce emissions immediately.**
- **Plan for larger emissions reductions longer-term.**
- **Increase visibility of action on carbon neutrality to enhance and support buy-in.**

These measures offer the potential to transform the way that people live in Shetland for the better, improving standards of living and further strengthening Shetlands unique, highly resilient community.

In November 2022, the Full Committee of Shetland Islands Council approved the Council and Shetland Net Zero Route Maps, and the following mandate:

SET an organisational Net Zero target of 2045 for Shetland Islands Council

COMMIT to addressing climate change and working towards a Net Zero target as a key priority for Shetland Islands Council.

INSTRUCT the Director of Infrastructure Service or his nominee(s) to:
- Develop a Shetland Islands Council Climate Change Strategy and Action Plan, with a framework to allocate responsibility for actions and measure, monitor and report on progress, using the data and recommendations gained through the Net Zero Route Map project and report.
- Prepare and publish annual progress reports.

PROMOTE, at a national level, the scale of the challenge for Shetland as an area in reaching Net Zero emissions due to our unique location, environment, economy, underlying geology and soil conditions

SUPPORT the Shetland Partnership Climate Change Steering Group in developing a Shetland Climate Change Strategy for all Shetland Partnership organisations to adopt.

Strategy Development & Structure

In November 2022, The Shetland Islands Council Full Committee set the mandate to develop a Shetland Islands Council Climate Change Strategy and Action Plan, with a framework to allocate responsibility for actions and to measure, monitor and report on progress, using data and recommendations gained through the Net Zero Route Map project and report.

The Climate Change Strategy sits across the entire council, touching on every service area. It was therefore important it was developed through a systems approach, in collaboration with all service areas. Co-development ensured it was suitable for, and could be aligned to, council service plans and operations. It also ensured it was fit-for-purpose and had the endorsement of service areas to work towards the objectives. During the development of the strategy, an Elected Members seminar was held to present the strategy and framework and gain feedback to ensure input from political leadership and community interests.

The Climate Change Strategy and Action Plan was developed in line with the Design Council's framework for innovation design methodology; the 'Double Diamond' design process.
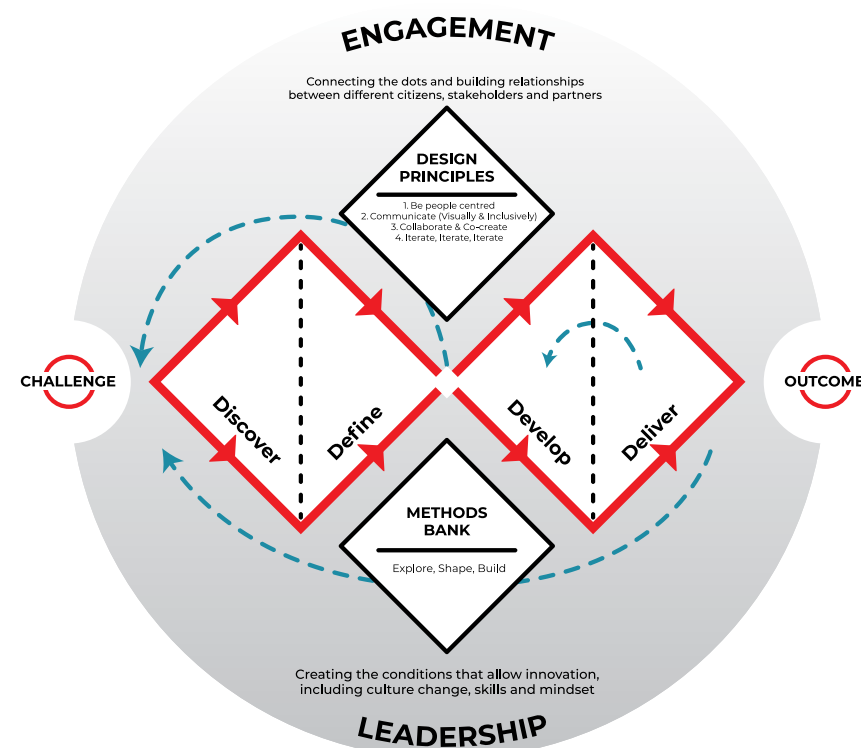
**Design Council Double Diamond Design Process
Source: Design Council (2023)**

Stages of development of the strategy within the council:

DISCOVER

The Net Zero Route Maps project provided the base of data and initial stakeholder engagement upon which to build a strategy and action plan. It told us what measures needed to be implemented, but not how to do it. The purpose of the strategy and action plan is to set in place an ambitious, achievable and approved plan in place to work towards net zero targets, and to maximise the social, economic and environmental benefits of undertaking action.

To supplement local data gained through the Net Zero Route Map project, research was undertaken to determine:

- Best practice by other Local Authorities on climate action.
- National policy and guidance which the strategy should be built upon, including guidanc from; Audit Scotland, Scottish Government, Sustainable Scotland Network, Public Bodies Climate Change Duties Reporting and Climate Emergency UK.
- Regional policy and guidance including; Our Ambition and The Shetland Partnership Plan Workshops were then held with the limate Change Programme and stakeholders from across the council service areas to explore what a framework for the strategy might entail and to gather information to develop a prototype framework.

The aims for the strategy and action plan were agreed as:

- **We are a net zero organisation and community.**
- **We are an organisation and community that is resilient to our changing climate.**
- **Equality and fairness are at the heart of the transition to net zero.**
- **Opportunities to maximise the social, economic and environmental benefit to the community are optimised.**

DEFINE

An analysis of the data gathered was then undertaken to collate the information into themes and to begin to put a framework on the strategy and action plan.

Open user interviews were conducted with council officers and community members to gain an understanding of what they would like to see from a council climate change strategy. Frequently recurring feedback included that it should be clear and succinct, with allocated responsibility and measurable outputs.

Using information gained, the first iteration of the strategy framework and action plan was created, and the first draft of each section of the strategy and action plan was developed. The purpose of the strategy is mitigation and adaptation, encompassed by the need for a Just Transition. Central to delivering the strategy is maximising the social, economic and environmental co-benefits to the council and the community. The strategy was split into 5 'Enablers' and 6 'Themes' to deliver this.

Enablers; Leadership and Governance, Alignment, Empowerment, Money, Communications Themes; Energy, Buildings, Transport, Resources and Waste, Business and Industry, Nature Based Solutions.

DEVELOP

Workshops with all relevant stakeholders from across the Council were held for each of the sections of Strategy and Action Plan. The draft sections were issued to stakeholders in advance of the multi-disciplinary workshops for review and comment. The purpose of the workshops was to review and develop each section individually, providing a space for relevant stakeholders to discuss actions as a group, and to agree and allocate responsibility for individual actions.

The Strategy and Action Plan sections were updated throughout each workshop with the group, and detailed notes were taken. Following each workshop, sections were updated to reflect comments, then circulated around the group for further feedback.

Logic modelling was utilised to ensure each section of the strategy and action plan was outcome-focussed. A logic model tells the story of each section in a diagram with a few simple words and describes the journey of change we want to make. It shows the connection between the need identified, what must be done to address this, and how this makes a difference for individuals and communities. This keeps us focussed on working towards achieving the outcomes.

DELIVER

Once feedback from workshops was collated, and responsibility for actions allocated, individual meetings were held with service areas to refine wording of the strategy and actions, confirm allocation of responsibility for actions and set appropriate timelines. As actions within the climate change action plan will sit within the service plans of the responsible service areas, it was important that wording was aligned with existing service actions, to improve the actions becoming embedded, and avoid duplication of reporting.

Following this, the first draft of strategy and action plan was created, and a seminar held with Elected Members to review and gain feedback. The same format was used for this workshop, as was adopted for the officer workshops earlier in the process, providing time for reviewing documents ahead of the workshop, and time for discussion during the workshop.

Finally, the Strategy and Action Plan were updated again, leading to council wide, co-developed Shetland Islands Council Climate Change Strategy and Action Plan.
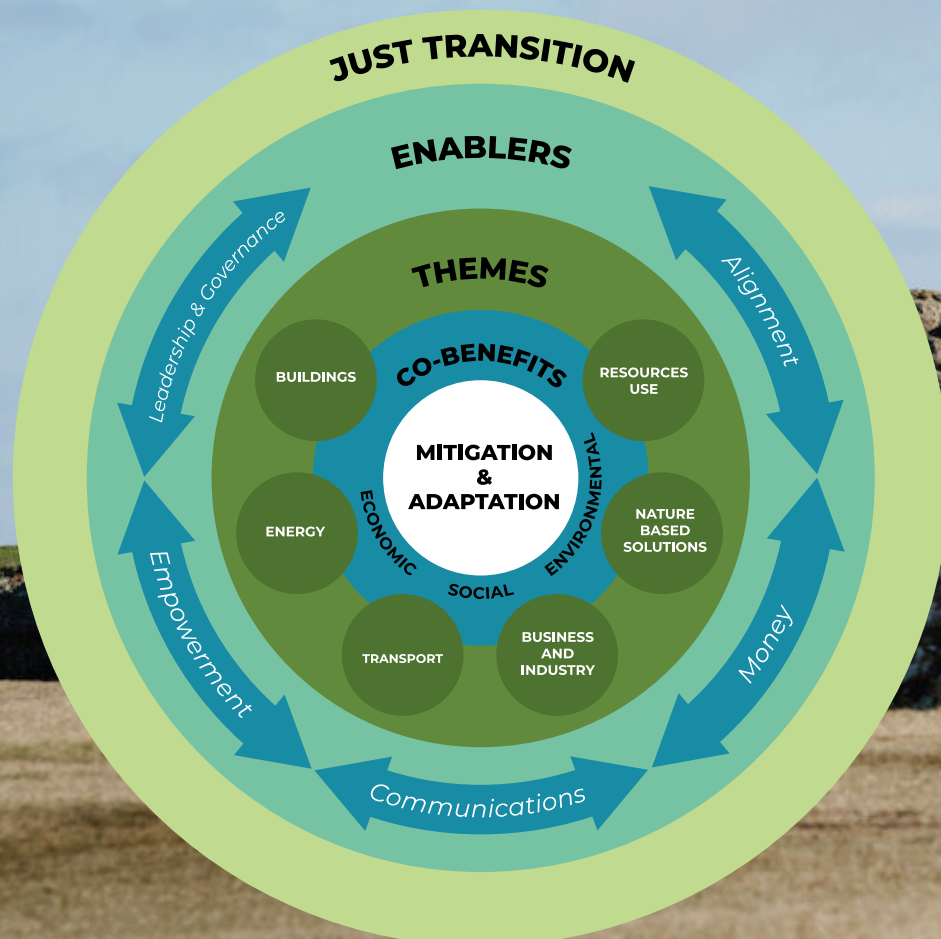
Monitoring & Reporting

MONITORING AND REPORTING

For the Climate Change Strategy and Action Plan to be successful, effective monitoring and reporting frameworks must be in place. Monitoring and reporting are intended to:

- Understand the rate of progress being made
- Increase accountability and transparency
- Drive action and incentivise change
- Encourage the sharing of learning, best practice and innovative approaches
- Review and update targets and actions, and determine new targets and actions as required

Progress on the climate change action plan will be monitored through the council's performance management software, currently a system called 'Pentana Performance'.

All service areas already report on progress of their service plans and actions through the Pentana Performance system and so are familiar with this as a form of monitoring and reporting.

Embedding the actions of the Climate Change Action Plan into service area reporting will ensure that reporting on climate action becomes business as usual across service areas.

Each individual action will sit with the 'Lead' service area on the Pentana Performance system and will require a quarterly update of progress made on the action. These actions and updates can then be collated under the umbrella of the 'Shetland Islands Council Climate Change Report' to create quarterly progress reports.

An annual report will be generated on 'Shetland Islands Council Climate Change Progress.' This will involve analysis of progress on actions against climate change targets, data related to annual GHG emissions and commentary on how we are doing as an organisation in working towards targets and addressing climate change.

Enablers

Climate Change Strategy

Enablers
Leadership and Governance

BACKGROUND

Tackling climate change will require the Council to place net zero and climate resilience at the heart of strategic decision-making. Each of the Council's strategies, policies and action plans needs to be aligned with climate targets, with responsibility clearly allocated across the organisation.

The Council has shown commitment to climate action by developing an organisational Net Zero Route Map and demonstrated proactive leadership by developing a Net Zero Route Map for Shetland. This is further shown by developing and committing to implement and report on this Climate Change Strategy and associated Action Plan.

We must lead by example and hold ourselves and our partners to high standards of integrity regarding climate consciousness and sustainability.

DRIVERS FOR CHANGE

1. Public bodies have a wide range of functions that can influence emissions. These include planning, development, funding, regulation, education, community development, and partnership working.
2. To meet targets, climate consciousness must be embedded across all service areas.

   Good governance can enable this by creating frameworks for setting actions, allocating responsibility, measuring, monitoring, and reporting on progress, with appropriate scrutiny, against climate targets.
3. Climate change needs to be considered as a priority at all levels of decision-making, to ensure decisions made and actions taken are compatible with achieving climate targets.
4. Climate leadership must be demonstrated from Council leaders to inspire, encourage and expect robust climate action from partners, organisations, businesses and the community across Shetland.
5. Increased awareness and understanding are required around the need to adapt to climate change; the risks to our services, infrastructure and communities and how to mitigate these risks.

WHAT WE WANT TO ACHIEVE:

- **Lead by example and make climate change and sustainability a core value and key outcome of Shetland Islands Council policies and operations.**
- **Establish a strong governance structure with senior management responsibility allocated to the implementation, monitoring and reporting of the objectives andmeasures outlined in the**
- **Climate Change Strategy and the Climate Change Action Plan.**
- **Lead and inspire collaborative climate action across Shetland, providing social, economic and environmental benefits to local organisations, businesses and the community.**
- **Promote at a national level the scale of the challenge for Shetland in reaching net zero emissions.**
- **Work with Partners to develop a Shetland Climate Risk Assessment and Adaptation**
- **Plan involving community planning partners, businesses, organisations and the community.**

Climate Change Strategy
Enablers

Alignment

BACKGROUND

Alignment is ensuring the Council's actions and policies are compliant with statutory duties set by the Scottish and UK governments to address climate change. To achieve this, alignment is also required across the Council and its partners to maximise efficiency through collaborative working and to avoid duplication of effort.

This Strategy and Action Plan will provide a framework to bring together climate action across the Council, for service areas to integrate climate action into their activities and to report progress made towards achieving climate targets.

DRIVERS FOR CHANGE:

1. To most effectively progress climate action, the goals and principles of a Local Authority climate strategy must align with existing corporate and regional plans, relevant Scottish Government strategies and policies, and with the UN Sustainable Development Goals.
2. All Council strategies, policies and plans will have a direct or indirect effect on climate change. It is therefore essential to make consideration of that impact, positive and negative, common practice in all works.
3. Alignment of climate action within the Council and with partners will avoid duplication of work, increase efficiency and accelerate climate action.
4. Applying a consistent approach across Council services will aid in improving community and partner engagement, understanding and expectations. This will make the Council a more effective local leader.
5. Having a clear and accessible Climate Change Strategy and Action Plan demonstrates climate credibility and will aid services to more easily track their progress and report against climate targets.
6. Alignment with national and international policies is essential for auditing and funding. National and International policies may not always be "islands-proof" however, so alignment across Shetland, and other islands such as Orkney and the Western Isles is important to add weight in highlighting these incompatibilities.

WHAT WE WANT TO ACHIEVE:

- **We will ensure alignment with national and regional climate change targets and best practice.**
- **Work collaboratively across the Council and with partner organisations to maximise efficiency and the impact of climate action.**
- **Ensure policy alignment across all service areas with the Climate Change Strategy and Action plan.**
- **Embed climate change and sustainability into the mainstream of Council decisions, creating a culture where climate change is considered as a part of everyday decision making.**
- **Align the Council's resilience efforts internally and externally to facilitate efficient and effective climate adaptation.**

Money £

BACKGROUND

Money has a key role in addressing climate change. Delivering net zero targets and ensuring we are resilient to a changing climate will require update to existing services and infrastructure, which will in turn require significant investment within a relatively short timeframe. As a Local Authority we must understand the climate impacts of our financial decisions and the need to embed, or account for, the implications on future emissions and resilience. All service activity and new projects seeking funding should consider climate change and align with emissions reductions targets.

Much of the Council's emissions come from purchased goods, works, and services, so procurement also has an important role to play.

DRIVERS FOR CHANGE:

1. Delivering net zero targets and ensuring we are resilient to a changing climate requires alignment of budget and spend to climate goals. The Council must consider climate impact with its distribution of money through purchases, investments, and grants.

2. The Council has a large economic footprint in Shetland and can affect change by setting expectations of sustainability in external contracts. It can also set these expectations when distributing grants or financial incentives by requiring climate consideration as a key outcome.

3. Currently, financial priorities encourage pursuit of the most affordable option. This should be shifted to a more holistic "best value" approach where "whole-life cost" and climate impact are key priorities. This should include buying locally, which has the co-benefit of supporting the Shetland economy.

4. Our Net Zero Route Map estimates approximately 24% of our organisational emissions to come from purchased goods and services. To address this, climate targets should be integrated into the Procurement Strategy, which can use mechanisms such as a "quality-price assessment" to include climate impact as part of budget and spend.

5. Climate action can save money or even increase revenue by:
   a. doing less.
   b. spending to save, such as on energy efficiency measures; climate targets will become more stringent and investing early will save money in the future.
   c. or investing in green projects and increasing access to national funding streams.

WHAT WE WANT TO ACHIEVE:

- **Integrate climate change into finance strategy, communications, financial planning and reporting. Ensure our budgets, spend and use of resources align with climate change ambitions and targets.**

- **Ensure funding and investments are prioritised against climate outcomes and their contribution to the delivery of an inclusive net zero carbon economy.**

- **Ensure a strategic approach to our sustainable procurement duty aligning to circular economy principles.**

- **Raise awareness throughout Shetland Islands Council of the importance of sustainable procurement in addressing climate change, working towards creating a culture that supports a circular economy.**

Empowerment

BACKGROUND

Empowerment is equipping staff and the community with the power and resources to undertake and accelerate climate action. Building climate knowledge, understanding, skills and capacity within the community will enable groups and individuals to undertake and accelerate their own climate activities.

Everyone, especially those more vulnerable to the effects of climate change, such as young people, should have a voice at the table when it comes to climate change. The Shetland Partnership's shared priority of 'Participation' where 'people participate and influence decisions on services and the use of resources' is integral to empowering communities to be involved in the decision-making process and lead on action to tackle climate change. Empowerment requires education, training, and boosting public participation and access.

During Covid-19 lockdowns, many behavioural changes were made which were beneficial to emissions reductions. These included remote working, replacing business travel with video conferencing, better online collaboration and broader lifestyle choices including more walking and cycling. It is important to recognise the benefits for staff in these behaviour changes and maximise these as we move forward.

DRIVERS FOR CHANGE:

1. National policies and actions to address climate change sometimes have an unequal impact on island communities. Empowerment is important to enable localised, placed-based approaches. Encouraging transformational change across all our communities and supporting them to be climate ready is vital in a just transition to net zero.

2. Involving the community in making decisions and taking the lead in action will give a greater sense of ownership, increasing community buy-in and significantly improves the chances of success.

3. The Council and partner organisations, such as the Shetland Partnership, have a key role to play in driving community empowerment and community led action. A co-ordinated approach will maximise the effectiveness of programmes of empowerment, such as encouraging green skills, providing resources to local organisations and businesses, and tailoring climate action for the needs of the Shetland community.

4. Empowering staff and the community to take strong climate action will help maximise the socio-economic benefits of climate action for everyone. As the Council is a significant employer on the isles, empowering staff will also boost the community's capacity.

5. Equipping staff and community with climate knowledge, understanding and skills will be critical in response to the changing climate and conditions around Shetland, which may include sudden events such as storms and flooding that require fast and flexible action.

WHAT WE WANT TO ACHIEVE:

- **Empower staff by raising awareness and understanding of climate change to enable staff to undertake informed, climate-conscious decision-making and service delivery.**

- **Empower the community through raising awareness and understanding of climate change and facilitating and supporting community-led climate action, building capacity within the community.**

- **Provide the Shetland community with the opportunity to influence council decision-making related to the climate.**

- **Encourage the development and promotion of green jobs and skills across Shetland.**

Communications

Clear and effective communication is essential to accelerate climate action to meet targets. It is required to raise understanding and awareness, to increase commitment and to manage expectations.

WHO
The Council must ensure that messaging to the public, other authorities, partners and the Scottish Government is clear and consistent.

Communication to staff and the community on climate change works should be consistent across departments, regular and transparent.

There will be an adapted approach and medium of communication with different groups, but the core messaging will remain aligned to effectively manage expectations around the Council's climate actions.

WHAT
The core messaging of the council's climate action is divided by sector, as follows:

SINGLE OVERARCHING COMMUNICATION OBJECTIVE (SOCO)
Climate change is/will highly impact Shetland, but if we act now and in the right way, Shetland can benefit

Environmental	Social	Economic
Shetland: a thriving ecosystem with biodiversity net gains	**Shetland**: home of secure and affordable clean energy	**Shetland**: an adapted economy to maximise opportunities

Transport	Energy	Resource Use
Shetland: co-created decarbonisation of all modes for equality & equity	**Shetland**: home of secure and affordable clean energy	**Shetland**: optimising use and minimising waste through circular economy

Business & Industry	Buildings	Nature-based Solutions
Shetland: creating & retaining wealth through net zero transitions	**Shetland**: upgrade, retrofit & build to optimal efficiency	**Shetland**: restoring the health of our natural environment

WHY
Raising awareness about how to mitigate climate change and prepare for its worst effects is critical. We also want to broadcast what the council is doing to combat climate change to inform Shetlanders and the Government; providing transparency and compliance with reporting duties.

- **Drive awareness of climate change and its impacts on Shetland.**
  Raise awareness of climate change actions and decarbonisation efforts to achieve the goal of a net zero Shetland.
  Communicate what actions are being taken by Council departments.

- **Work in partnership with and empower the people of Shetland, industry and stakeholders.**
  Ensure there are opportunities for the public(s), organisations, and Council departments to consult, participate, and collaborate on climate action planning.

- **Deliver council led climate change strategies to mitigate, adapt, and build resilience in Shetland.**
  Support the public(s) in their ambitions to drive climate action and decarbonisation through business, industry, and lifestyle change.

WHAT WE WANT TO ACHIEVE
Internal Communication (staff & services)
- **Empower**
  Empowering staff to take their climate change measures beyond their service areas and lead their own projects on the net zero pathway.

- **Involve**
  Involving staff in the decisions that will impact how they provide services (co-develop solutions).

- **Inform**
  Informing staff about the ways their work impacts climate change (and vice versa).

External Communication (community & businesses)
- **Inform**
  Increase knowledge of climate change and net zero goals through positive messaging.

- **Involve**
  Incorporate public opinion and suggestions into Council led projects and strategies for adaptation and mitigation of climate change impacts on Shetland Islands Council.

- **Empower**
  Build community confidence in steps taken to decarbonise Shetland through Climate Conversations.

Task	Explanation
Stakeholder Engagement and outcomes	Identify levels of engagement and best approaches to reaching a range of audiences with specific objectives
Sharing the Narrative	Expand on the scenarios used in the net zero Route Map to produce a detailed vision for Shetland's net zero future

OTHER

- We will have a dedicated climate website with information, events, and opportunities.
- We have a Climate Change Team within the Council that coordinates and communicates messages within the organisation.
- We will create campaigns for the climate change themes & objectives in this strategy as needed.
- We will use active communities on Council Facebook and Twitter to distribute messages and engage the community.
- The Council will focus on distributing messages of positive and imminent action – important to spread the message about what can be done rather than what can't (most folk are clued up on climate change, don't need to be told how bad it is but rather what they can do).

ACTION FOR INDIVIDUAL CAMPAIGNS

Engagement	Content	Digital	Media	Community
Deliver a comprehensive stakeholder engagement and events programme	Create high quality content to bring the project to life	Develop a strong digital presence on social media and a project website	Design a media relations and editorial campaign to drive awareness	Involve the local community to shape and develop the project
• Industry engagement	• Films and Animations	• Website pages	• Press briefings	• Community briefing events
• Government engagement	• Graphics and infographics	• Social media campaigns	• Local media engagement	• Establish feedback channels
• Investor engagement	• Visualisations and maps	• Facebook, Twitter, Instagram	• Scottish media engagement	• Regular updates
• NGO engagement	• Presentation and speeches	• Virtual events	• Blogs and best practice pieces	• Strong leadership
• Stakeholder events	• Pamphlets and literature	• Climate Simulations	• Editorial and opinion content	• Education and STEM
• Consultation activities	• Event and exhibitions	• Resource hub	• Creating a drumbeat of news	• Training & skills development

Themes

Themes

Energy ⬡

THE CHALLENGE

The remote location and climate of Shetland, along with decades of infrastructure designed around oil and gas, mean it will be challenging for the Council and for Shetland to transition to net zero. This includes the challenges that all Local Authorities face, such as decarbonising heat, in addition to unique 'island-based' ones such as aviation and a diverse fleet of marine vessels.

The oil and gas sector has a large presence in Shetland and has played an important part in our development. Therefore, facilitating a just transition to an energy system powered by renewables is not straightforward. We must also ensure that energy is secure and affordable, and that we create and retain local wealth. This will require an increase in the capacity and skills to work in the emerging renewables and clean energy sectors. The hydrogen economy is being investigated for Shetland, which has the potential to provide significant benefit, although is still in the initial stages.

Key action areas include aligning supply and demand of energy across Shetland. Shetland's remote location and climate, as well as being a challenge, mean we have wealth of natural resource and immense potential for renewable energy generation. We must advocate for Shetland residents to fully benefit from this locally, including upgrading our local networks to adequately serve Shetland's population, and advocating for Shetland residents' energy prices to be reflective of the scale of energy produced in Shetland.

WHERE WE ARE

Some of these challenges can be re-framed as opportunities, and Shetland once again has exceptional opportunities to benefit from large scale energy hub development.

The 443MW Viking Wind Farm is nearing completion, which will enable Shetland to become a net exporter of enough renewable energy to power hundreds of thousands of homes. The project will connect Shetland to the mainland UK electricity grid via a subsea interconnector, which will significantly decrease emissions from electricity produced and used in Shetland.

The Council is also developing Shetland's Energy Strategy. The Energy Strategy has 4 objectives:

- Reduce emissions
- Facilitate secure, affordable energy for all of Shetland
- Create and retain local wealth
- Skills and capacity development to sustain jobs

The Council cannot achieve these objectives on its own, but as the Local Authority for Shetland, the Council can facilitate them through partnership working and leadership to support and coordinate the strategic planning necessary to accelerate the energy transition.

By working in partnership with other communities, such as Orkney and the Western Isles, we can share learning from successes and challenges and accelerate islands in becoming hubs of climate innovation.

In December 2022, the Council approved a set of Energy Development Principles. The main driver behind these is that the Council is not the consenting authority for many of the energy generation projects that will come forward in and around Shetland. It does however have an important role in community leadership including the obligation to promote and represent the Islands interests; and facilitate and support all sectors of the community to understand and contribute to the energy transition we all have to make.

The principles are based on the following four themes:

- Environmental Protection
- Co-Existence
- Supply Chain Integration
- Benefits to the Shetland Community

WHAT WE WANT TO ACHIEVE

- **Bring local emissions associated with energy generation and use to net zero and contribute to national targets with the export of clean energy.**
- **Planning and decision-making which favours renewables within a holistic power system.**
- **Facilitate secure affordable energy for all of Shetland through islands-based generation.**
- **Maximise the socio-economic potential of energy development in Shetland with a particular focus on low income households; broaden opportunities, sustain jobs and improve skills.**

CO-BENEFITS

Social:
- High quality jobs, diversity in employment.
- Higher standard of living through reduced energy bills.

Economic:
- Support the creation and retention of local wealth.
- Lower energy bills for Shetland residents through secure, affordable energy.
- Lower energy bills through the decarbonisation of industry.

Environmental:
- Reduced air pollution from GHG emissions.
- Reduced environmental impact through reuse of brown field sites and a holistic approach to developments to encourage co-operation and collaboration, thus avoiding stranded assets and duplicate infrastructure.

Buildings 🏠

THE CHALLENGE

Much of the Council's building stock is energy-inefficient in both construction and heating system. This, combined with the harsh climate, long winter and strong, cold winds, mean Shetland residents use 50% more energy heating their home than a typical UK household.

Fuel poverty in Shetland is calculated to affect approximately 66% of households, with around 33% in extreme fuel poverty. Some Shetland residents have found the cost of energy so unaffordable they have opted not to heat or ventilate their properties. This can increase the likelihood of damp forming, which can result in damage to the property as well as to the health of building occupants. With the current cost of living crisis and high cost of energy, improvements in energy efficiency to bring down ongoing costs and carbon emissions, are more important than ever.

A challenge to improving energy efficiency in the Council's estate is the high number of individual building types; not many buildings are the same. This reduces the ability to benefit from an economy of scale in rolling out programmes of energy efficiency works, exacerbating the already higher-than-average prices of labour and materials.

Currently there are not enough contractors in Shetland to undertake the scale of energy efficiency works required. Additionally, there is a shortage of local contractors having the required accreditations to access certain grant funding for energy efficiency works. It is time-consuming and costly for contractors to gain these accreditations and isn't a priority for local contractors who have no shortage of work in the short and medium-term. This restricts Shetland residents from accessing funding which would otherwise be available to them.

Climate change will result in more extreme weather events in Shetland. As part of a Just Transition in decarbonising our built environment, it is essential we understand the likely risks to our built environment and ensure we are resilient to the changing climate.

WHERE WE ARE

Across the council estate, a significant programme of building fabric upgrades, energy efficiency and energy transition works are required to facilitate decarbonisation. Decarbonisation of the council estate has been implemented as per the Council Carbon Management Plan 2016-2020 and our previous Council Housing Strategy. Examples of works in the non-domestic building estate include high-efficiency lighting being installed to approximately 73% of buildings and Building Energy Management Systems installed from as far back as 2003.

With the recent change in focus to reach net zero emissions however, updates are required to key council strategies and plans to ensure energy efficiency works to the council estate occur in line with climate change targets. To meet these targets, decarbonisation works require acceleration, which will be a challenge to resource. Currently the Local Heat and Energy Efficiency Strategy and the Energy Efficiency Standard for Social Housing 2 strategy are being developed to drive forward these works.

With the Shetland electricity grid joining the UK electricity grid via the interconnector, connected in 2024/2025, Shetlands emissions factors from electricity will become the same as the UK electricity grid. This will result in a large drop in greenhouse gas emissions from electricity in comparison to our current diesel-powered electricity generation. The UK electricity grid has a target to have net zero emissions by 2030. Electricity is the most common use of heating source in Shetlands buildings, and so when the interconnector is in place, Shetlands emissions from buildings will decarbonise substantially. Despite this, it is important to maintain a focus on improving the energy efficiency of buildings across Shetland, taking the fabric first approach, as energy efficiency measures will reduce energy consumption and improve comfort. This will contribute towards reducing energy bills and help to alleviate fuel poverty.

Lerwick benefits from an excellent district heating system, run by Shetland Heat Energy and Power (SHEAP). Most of the energy for this system comes from waste heat from the Council's ERP. The district heating system utilises waste heat from burning Shetland's rubbish to heat over 1,200 properties. The ERP is one of the most efficient waste incinerators in the UK and has recently undergone works to further improve its efficiency. The district heating system provides a significantly lower-cost energy source to its customers than electricity, gas or oil energy providers

WHAT WE WANT TO ACHIEVE

- **Reduce carbon emissions across the estate in line with net zero targets through estate rationalisation, reduction of energy use, energy efficiency improvements with a fabric first approach and a transition to zero carbon energy sources.**
- **All new buildings will be net zero in operation with minimum emissions during construction.**
- **Promote heat decarbonisation and energy efficiency across Shetland and increase levels of energy efficiency and net zero works occurring across Shetland buildings through skills development, building capacity, raising awareness and streamlining access to available funding.**
- **Prepare our infrastructure for the effects of a changing climate.**

CO-BENEFITS

Social:
- More comfortable internal environmental for housing is beneficial to health and wellbeing, improving the mental and physical wellbeing of occupants.

Economic:
- More efficient, insulated buildings will reduce energy demand and alleviate fuel poverty.
- When occupants can afford to ventilate and maintain their houses at comfortable temperatures, there is less likely to be issues with damp, leading to greater longevity of building fabric.
- More efficient use of buildings, reducing the required estate footprint, could result in economic savings from operation, maintenance and ongoing costs.

Environmental:
- Biodiversity can be maintained and enhanced through well planned infrastructure projects.

Transset

THE CHALLENGE

Travel to, from and around Shetland is more carbon-intensive than on mainland Scotland. To reach Shetland requires travel by aircraft or ferry. Once on Shetland, common modes of travel include car, bus, ferry and even internal aircraft to reach our outer islands.

Ferries and aircraft provide vital services for Shetland's Island populations. Currently there are few 'tried and tested' zero-emissions replacements available, which makes decarbonisation a challenge. Over the years there has been support from island residents for fixed links to connect Shetland's most populated islands to the mainland, replacing the need for ferry services. This would improve connection for the islands as well as reducing operational carbon emissions. However, challenges to be considered include the high capital investment and embodied carbon emissions during construction.

Shetland residents have a high dependency on private car use due to our dispersed population, topography and harsher climate. Active travel methods, such as walking and cycling, are often less attractive options due to weather, including strong winds. Safety concerns are also cited as strong reasons to make Shetlanders less likely to travel by foot or bike. Our dispersed population makes running effective bus services more challenging. Bus usage across Shetland dropped during the Covid pandemic and is still much lower than pre-Covid levels.

Decarbonisation of heavy vehicles, such as buses, essy kerts (Refuse Collective Vehicles), trucks and diggers, which make up a significant part of the Council's fleet, are not 'tried and tested' in a climate such as Shetland's. Most data sources are based on urban trials. It is also not yet fully clear what the most appropriate energy source, such as electricity or hydrogen, would be for these vehicles.

WHERE WE ARE

The Shetland Regional Transport Strategy and Action Plan is currently under development and will be implemented over the next 5 years. These documents outline many of the bespoke transportation challenges in Shetland and detail our plan to tackle them. There is also an Active Travel Strategy, which lays the groundwork to place more walking and cycling routes around Shetland.

Work is underway on the 'Pathfinder Places' project to develop and implement rural energy and transport hubs across Shetland. These hubs would be facilities powered by renewable energy sources, such as wind and solar, that provide services for the community. The services provided would add to existing facilities within local areas and could include; EV charging, a community car club, e-bike rental, secure cycle storage, EV transition support service, district heating and office workspace.

Works are currently underway to plan for the decarbonisation of the Council's fleet in line with Scottish Government targets, with 4 hybrid hydrogen-ready essy kerts and several electric cars and vans already part of the fleet, with fleet electric charge points in place to serve these.

The Council's ongoing LED streetlight replacement programme intends to replace all of the road networks 4,000 conventional lanterns with their LED equivalent. To date (December 2023) more than 90% of the streetlights have been fitted with the LED lanterns.

In March 2023, a budget of £700,000 was allocated to develop business cases for inter-islands transport, which will include the possibility of fixed links and ferry replacements. The options analysis will consider the emissions implication of fixed links, considering both the growing zero-emissions fleet of vehicles and the possibility of zero-emissions ferries. The financial and environmental sustainability of these options will have an impact on the outcome of this business case.

Photo Credit: Shetland News

WHAT WE WANT TO ACHIEVE

- **Fully decarbonise the entire Council fleet by 2045, including heavy-duty vehicles, vessels, and aircraft.**
- **Reduce emissions from business and commuter travel by 30% by 2030 from the 2019 baseline.**
- **Increase active travel infrastructure and encourage uptake of active travel for Council employees and the Shetland community.**
- **Work towards developing a public transport system that is affordable and attractive to residents, which will increase use and efficiency.**
- **Support the transition to zero-emissions vehicle use and transport infrastructure.**
- **Prepare our transport networks and infrastructure for the effects of climate change.**

CO-BENEFITS

Social:
- Improved health and wellbeing from active travel and reduced air pollution.
- Greater convenience for Council employees and residents to travel around the islands.
- Increased equality through reduced need for car ownership to travel.

Economic:
- EV charging infrastructure is a revenue stream.
- Car club and improved public transport reduces need to own one or more cars.
- Greater efficiencies in vehicle use – fewer vehicle hours unused and more rapid travel.

Environmental:
- Reduction in air pollution.
- Reduction in vehicle travel as a benefit to local wildlife.

Resources and Waste ♲

THE CHALLENGE

Waste is one of the most difficult sectors of Council operations to decarbonise. Currently, there is no way to mitigate GHG emissions from landfill. Shetland has a very low amount of waste that diverts to landfill however, due to our ERP as described in the buildings section. The waste incineration serves to heat homes across Lerwick, but is still a source of emissions, which will need Carbon Capture and Storage technology to reduce. To reach net zero for residual emissions from waste, the Council would need negative-emissions technologies, which are not yet commercially viable, or to offset from local nature-based solutions.

The Council aims to reduce waste generation within its operations and around Shetland, and to comply with national schemes and targets around waste reduction. Complying with national schemes around waste reduction can be challenging for Shetland due to our remote location and dispersed population. Waste reduction must be accompanied by a plan to maintain the ERP operation at maximum efficiency. We currently import waste from Orkney to ensure there is sufficient fuel for the ERP and may need to look at widening our import of waste to other areas in future.

WHERE WE ARE

In October 2016, the Council signed up to the Household Recycling Charter and implemented a new kerbside collection scheme in line with the Charter's code of practice, these works continue to be advertised and promoted across the isles to increase recycling uptakes with householders, with our recycling rate more than doubling. The Council implemented commercial recycling after the domestic rollout, however not every Council premises is set up for recycling separation and collections.

The ERP handles most of Shetland's waste, and underwent a refit in 2021 to upgrade the facilities which will extend the lifespan of the plant, increase the capacity and waste types, and reduce the number of shutdowns and overall emissions. This upgrade has increased the efficiency of heat generation, resulting in the total heat provided by the ERP to the District Heating Network increasing from 85% of total heat demand to 93%, with no change to the total amount of waste incinerated.

In 2020, our current waste management performance stood at:

- 18.4% recycled
- 57.6% other diversion from landfill (i.e. ERP)
- 24% landfilled
- Waste emissions are 16,980 tCO_2e (18% of the Council's total emissions)

In May 2023, Shetland Islands Council's catering team won a national award from Assist FM for its excellence in local procurement of food. Thoughtful food policies reduce food waste which means less emissions are wasted growing uneaten food and less emissions are generated in landfills. The Council already has a Fair Food policy framework, which should be expanded upon to include a climate change focus going forward.

Photo Credit: Shetland News

WHAT WE WANT TO ACHIEVE

- **Promote efficient resource and waste management across Shetland through the development of a Shetland Resource and Waste Strategy and begin its implementation.**
- **Reduce emissions from the Council's waste operations in line with net zero targets.**
- **Improve Council resource management through reducing waste generated by 50% and increasing recycling of remaining waste by 50% by 2040.**
- **Support communities to reduce amount of waste generated in Shetland and increase recycling of remaining waste, encouraging the transition to a local, circular economy.**
- **Promote and support the development of local produce networks, including 'Grow Your Own' and 'Buy Local' initiatives, with an aim to increase the amount of local produce consumed in Shetland, increase local food security and reduce food and product miles.**

CO-BENEFITS

Social:
- Use of waste heat from the ERP contributes to lower cost alternative energy source for households in Lerwick.
- Increased circular economy encourages greater social inclusion through volunteer schemes and training opportunities.
- Food strategies will increase food security and improve health and wellbeing for Shetland community.
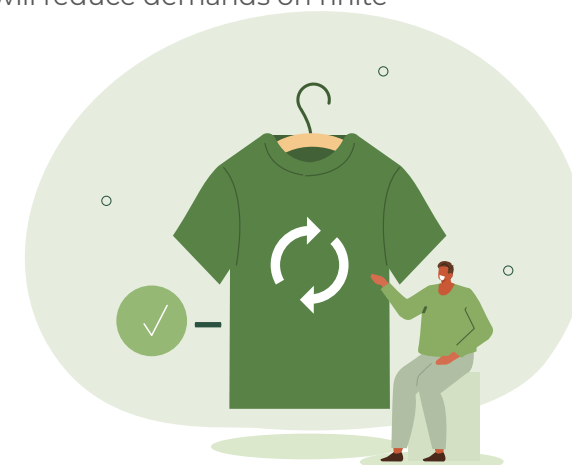
Economic:
Delivering a circular economy provides:
- Local employment opportunities, creation of jobs in repair and reuse.
- Lower cost options to access the goods we need.
- Keeps valuable materials flowing through our economy, driving greater resource productivity and decreasing costs for businesses, the public sector and households in buying new.

Environmental:
- Improved waste management leads to a reduced level of waste, causing less potential harm for wildlife and livestock.
- Better use of waste through a circular economy model will reduce demands on finite natural resources.

Business and industry

THE CHALLENGE

Shetland's key economic sectors of fishing, aquaculture, agriculture and tourism are heavily reliant on fossil fuels, and on the natural environment.

There is also an acknowledgement that many industries in Shetland are small, independent enterprises that do not have the capital for still-costly decarbonisation measures.

All businesses in Shetland are reliant on aviation or shipping to import and export goods, materials, and labour. There are currently no mainstream technologies available to reduce these emissions.

WHERE WE ARE

Shetland's businesses and key industry sectors are increasingly aware of climate change policy and the need to reach net zero. Some businesses have been incentivised to invest in energy efficiency measures, waste reduction or greener product offerings to improve their own business performance but very few will have emission reduction plans or have plans to adapt to the impacts of climate change.

The Council's Economic Development Service works alongside key local, regional and national partners to develop local business and social enterprise sectors. It operates services including Business Gateway, financial support for startups and development projects, destination marketing through Promote Shetland, and coordinating business and industry forums.

While some economic development activities are carried out to support the just transition to net zero, more is required to support the development of new low-carbon businesses. As well as supporting our existing industries to deliver a net zero economy, we also need to foster an innovative business environment in which local enterprises have opportunities to explore climate solutions that will work for Shetland. By driving change and embracing new opportunities, Shetland can become a leader in new markets and industries, achieving net zero and delivering economic prosperity at the same time.

WHAT WE WANT TO ACHIEVE

- **Work with partners to support decarbonisation, adaptation and a circular economy by supporting long term, sustainable business models where people and the environment are key priorities.**
- **Support the embedding of community wealth building principles where progressive procurement, socially productive land and property use, and approaches to business development are directed towards a place-based approach to economic development.**
- **Make Shetland a hub which attracts citizens to learn, develop and utilise green skills within our business and industry sectors.**

CO-BENEFITS

Social:
- Stable, future-proof, and high-quality jobs in emerging industries.
- Increased circular economy encourages greater social inclusion through volunteer schemes and training opportunities.
- Food strategies will increase food security and improve health and wellbeing for Shetland community.

Economic:
- Uplift to Shetland businesses, creating more jobs and generating revenue for the Council and the region.

Environmental:
- Less emissions from importing labour and materials through increased use in local services, materials and goods.

Photo Credit: Cooke Aquaculture

Nature-based solutions

THE CHALLENGE

Nature-based solutions refers to ways of working with nature to address our societal needs and challenges, providing benefits to both community and biodiversity. Our land and natural surroundings are essential to achieving climate change targets due to its ability to absorb excess GHG emissions from the atmosphere, and to build physical resilience to storms or flooding.

Roughly half of Shetland's land cover is peatland, and 79% of this is severely or partially degraded, due to historical overgrazing and drainage. Within the Council land holdings, most of this land type sits within croft sites, which are still leased for crofting including sheep farming. While peatland restoration options are available in Shetland, their success relies on fundamental changes to traditional livestock practices. Coupled with the ongoing issues concerning funding and subsidy loss when undertaking restoration, this has meant that uptake of peatland restoration schemes remains far lower than that needed to significantly reduce emissions by 2045.

An increase in native tree planting is also required. It is a common belief that trees don't grow in Shetland, however this is not the case. In seeking areas for tree planting, it is important to understand the soil composition, to locate areas to give trees the best chance of reaching maturity. Other council owned land includes maintained grounds around the council managed estate, including schools, housing, burial grounds, playgrounds and social spaces. Currently the grass is cut and treated in these spaces to maintain aesthetics, which has a financial, carbon and biodiversity cost. Financial and environmental benefits could be gained from reducing this grass cutting and working towards increased biodiversity in these areas.

It is imperative that we protect, restore, enhance and manage our natural or semi-natural habitats and ecosystems across Shetland, both terrestrial and aquatic, to both bring down carbon from the atmosphere and to protect biodiversity and rare species.

WHERE WE ARE

Land Use

Nature-based solutions often forms the strategic response to tackling emissions from Land Use, Land Use Change, and Forestry, otherwise known as 'LULUCF'. The baseline data and modelling undertaken to produce the Shetland Island Council Net Zero Route Maps highlighted LULUCF to be our largest-emitting sector across Shetland, with emissions totalling approximately 334.5 Kt CO_2e per year. Most of these emissions were attributed to the high prevalence of degraded, drained or modified peatlands.

The Net Zero Route Map development has allowed us to visualize the Council's land cover in much greater detail than before. Detailed assessments will need to be conducted at each site ahead of any proposed works such as peatland restoration and native tree planting projects.

It is due to the extent of degraded peatland emissions that Shetland's area wide emissions will likely not be net zero by 2045. In November 2022, it was agreed by Council that we would promote at a national level the scale of the challenge in Shetland reaching net zero due to our land make up, as this is not something that can be achieved by Shetland alone.

The Council currently participates in collaborative partnership working with an aim to accelerate peatland restoration across Shetland and aims to continue to contribute to these works.

Biodiversity

Any discussion of nature-based solutions and land use must include biodiversity and the wider natural world. Shetland is home to some special and rare habitats and species, which must be protected and supported. There are several initiatives across Shetland aimed at monitoring the health of different habitats and the abundance of specific species, which can include a diverse variety of participants, including young people. The Council has a key role to play in ensuring the effectiveness and longevity of these initiatives.

In November 2022 the Council signed the Edinburgh Declaration, which demonstrates our commitment to supporting biodiversity and halting and reversing species decline. There is also growing recognition from local, national and international bodies that biodiversity decline must not only be halted but that action is needed to begin to reverse it.

Dual benefits

There are many aspects of work focused on reducing GHG emissions from land and efforts to improve biodiversity that cross over one another. Land use and land use change is an area that can profit greatly from the co-benefits relating to positive actions in both areas. For example, reducing the fuel used for grass cutting programs and instead sowing native species and creating wildlife ponds can lower carbon emissions and improve the biodiversity of an area through habitat creation and expanding the food web.

WHAT WE WANT TO ACHIEVE

- **Facilitate, support and promote a reduction in greenhouse gas emissions from land and sea across Shetland, a reduction in biodiversity loss and an increase in biodiversity gain, mitigating ecological risk.**

- **Support an increase in levels of peatland restoration and tree planting works occurring across Shetland through skills development, building capacity, raising awareness and streamlining access to available funding.**

- **Work with Partners to ensure nature-based solutions are considered and implemented to mitigate damage to land and coastlines from the future physical risks related to climate change.**

- **Aspire to protect peatland habitat, carbon-rich soils, wild land and coastal landscapes from planned development.**

- **Explore the role of blue carbon and marine carbon sequestration.**

Nature-based solutions

CO-BENEFITS

Social:
- Increased resilience of our land, soils and infrastructure against risks such as flooding and land slides.
- Health and wellbeing benefits from a protected natural environment.

Economic:
- Improvement of crofters ability to diversity their produce and methods of growing or rearing.
- The beauty of Shetland's natural landscape draws visitors from across the globe, so promoting its care and enhancement will likely boost tourism and related industry.
- Protection of our natural resources in alignment with enhancement of Shetland's key economic sectors, which rely on the natural environment.

Environmental:
- Promoting the use and care of our semi-natural or natural grasslands as carbon sequestering habitats, as well as fertile areas for grazing, will allow more carbon to be absorbed and reduce carbon emissions from peatlands made available for restoration.

Photo Credit: Andi Grochowski

Glossary

Active travel
Travelling by walking, cycling, wheeling or other methods of getting around that do not involve motorised transport.

Adaptation
Preparing for the effects of climate change, such as changing rainfall and rising sea levels. It is often paired with 'mitigation' because the less the climate changes, the less adaptation will be required.

Baseline
An exercise which establishes the level of emissions in a given year. Statutory emissions reductions of 50% by 2030 are measured against the baseline of 1990.

Biodiversity
The variety of living things in the natural environment. Improved biodiversity leads to stable ecosystems and a more suitable living condition for human beings.

Carbon Emissions
The release of carbon dioxide (CO_2) emissions, the most prevalent greenhouse gas in the atmosphere which causes global warming and climate change.

Carbon capture and Storage
Removing carbon dioxide from the atmosphere and storing it underground. The aim is to prevent the release of large quantities of carbon dioxide into the atmosphere from heavy industry.

Carbon footprint
The emissions generated by an organisation, activity or product. Usually measured in kilotons of carbon dioxide or carbon dioxide equivalent (Kt CO_2e).

Carbon negative
Also 'emissions negative.' An activity or product that removes greenhouse gases such as carbon dioxide from the atmosphere and reverses the causes of global warming.

Carbon neutral
Achieved when CO_2 emissions are balanced by CO_2 removals over a specified period.

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.

Clean energy
Energy, such as electricity or hydrogen fuel, that is produced without emitting greenhouse gases and therefore does not contribute to climate change.

Climate Change
The long-term shift in global climate patterns, including extreme weather events and rising sea levels, linked directly with the warming of the Earth's atmosphere. Climate change is rapidly accelerating due to human activities, such as burning hydrocarbons for transportation and energy.

Climate-conscious
Activities or products that try to limit their contribution to climate change and have the knowledge to do so effectively.

Climate impact assessments
Reports completed at key project and plan milestones which estimate the effect the project or plan will have regarding contributing to or adapting to climate change.

CO_2
Carbon dioxide, often referred to as just 'carbon,' is the greenhouse gas most responsible for causing climate change when it proliferates in the atmosphere. It is released into the atmosphere primarily by burning hydrocarbons for transportation and energy.

CO_2e
Carbon dioxide equivalent. A holistic way of measuring climate impact which accounts for other greenhouse gases, such as methane and nitrous oxide, which have varying warming effects. The warming effect of carbon dioxide is well-understood, so impact is often expressed as an equivalent of kilotons of carbon dioxide (Kt CO_2e).

Co-benefits
Social, environmental, and economic benefits that arise from undertaking climate action that are incidental to avoiding the worst effects of climate change. For example, undertaking more active travel will result in improved cardiovascular health for the populace.

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.

Decarbonise
Altering an organisation, product, service, or investment so that it is delivered producing less emissions. Carbon is used as a stand-in for all greenhouse gas emissions.

Embodied carbon
The greenhouse gas emissions generated from manufacturing materials, including extraction and transport of raw materials and manufacturing. It is usually used in construction and means that the structure has an emissions impact just by having been built.

(Greenhouse gas / GHG) Emissions
Gases which, when dispersed in the atmosphere, trap the Sun's radiation within the Earth's atmosphere and cause global warming. This achieves a similar effect to a greenhouse, hence the name. Greenhouse gases include carbon dioxide, methane, nitrous oxide, and water vapour.

Emissions factor
The emissions, usually expressed as kilotons of carbon dioxide equivalent, which are generated by producing a unit of energy. This will vary depending on the fuel used and type of energy produced.

Empowerment
Empowerment is equipping staff and the community with the power and resources to undertake and accelerate climate action. Building climate knowledge, understanding, skills and capacity within the community will enable groups and individuals to undertake and accelerate their own climate activities.

Essy kert
The Shetland term for a refuse collection vehicle.

Estate rationalisation
Selling land or property owned by the Council which is not needed or used.

EV
Electric vehicle. Usually powered by a rechargeable battery and therefore a BEV (Battery Electric Vehicle).

Fixed links
Bridges or tunnels which connect islands, reducing or eliminating the need for inter-island ferries.

Fossil fuels
Fuels such as oil, coal, and natural gas which derive from decomposed organic material – hence 'fossil' fuel. This organic matter is primarily made of carbon, therefore burning it releases carbon dioxide. See: hydrocarbons.

Fuel poverty
A household that spends more than 10% of its income on fuel costs is in fuel poverty. If this rises to more than 20%, the household is in extreme fuel poverty.

Generation
How energy is made before it is distributed, such as from wind turbines turning or hydrocarbons burning in a power plant.

Global warming
An increase in the world's average temperature as a result of greenhouse gases trapping the Sun's heat in Earth's atmosphere. Global warming causes more extreme weather and chemical changes, and melts polar ice caps causing sea level rise.

Green hydrogen
Hydrogen fuel which is produced using electricity from renewable generation, such as wind or tidal sources. It is the only sustainable hydrogen fuel bcause, while burning hydrogen is zero-emissions, producing hydrogen fuel using other means creates emissions.

Green skills / jobs
Skills and jobs which are related to renewable energy, climate change adaptation, or the circular economy. These are seen as future-proof skills and jobs because every industry will need to decarbonise in the coming years.

Hydrocarbons
An organic compound consisting of the elements hydrogen and carbon. These compounds are energy-dense when burned and have powered most human activity, such as transportation and energy, since the industrial revolution. See: fossil fuels.

Hydrogen (fuel)
Fuel which uses the element hydrogen and produces only water when burned. It is seen as a viable option for clean energy if it can be produced using electricity from renewable sources (see: Green hydrogen) and is suitable in a wide variety of applications where electricity is not.

Hydrogen economy
A system in which employment and economic activity is based on the production of hydrogen fuel rather than fossil fuels. It is more future-proof than a fossil fuel economy because changing legislation and technology mean that every industry will need to decarbonise in the coming years.

Islands-proof
A policy or plan that is suitable for the unique challenges faced by islands communities and is not reliant on connectivity and resources which are available only on the mainland.

Just Transition
A just transition is both the outcome – a fairer, greener future for all – and the process that must be undertaken in partnership with those impacted by the transition to net zero. The benefits of a transition should be shared widely, without unfairly burdening those who are least able to pay or benefitting those most well-off.

LULUCF
Land Use, Land Use Change, and Forestry. Refers to emissions from land and the way it is used, both historically and currently.

Mitigation
Reducing, eliminating, or offsetting the greenhouse gas emissions generated by human activity, minmising the possible impacts of climate change. This includes using less energy and replacing fossil fuels with renewables. Mitigating climate change is crucial to avoiding its worst effects.

Nature-based solutions
Nature-based solutions refers to ways of working with nature to address our societal needs and challenges, providing benefits to both community and environment. Our land and natural surroundings absorb excess greenhouse gas emissions from the atmosphere and build physical resilience to storms or flooding.

Net Zero
A balance between the emissions generated and those removed from the atmosphere – this means the activity is does not contribute to climate change. This can be achieved by making the activity or product zero-emissions or by offsetting the emissions generated with another activity or product.

Ocean acidification
When carbon dioxide in the atmosphere dissolves in the ocean, the water becomes more acidic. This is damaging to marine ecosystems. Shellfish are damaged in particular, as their shells dissolve in acidic water.

Ocean warming
As the world's average temperatures rise due to global warming, the ocean warms and becomes a more hostile environment for fish and other marine ecosystems. Ocean warming could also weaken or collapse the Gulf Stream, which would result in much lower temperatures in Europe.

Pests, pathogens and invasive species
Warming temperatures globally and changing seasonality may cause pests and non-native species to travel to areas where they are not endemic and force out native species, disrupting local ecosystems. Diseases can also spread for these same reasons

Renewable(s) energy
Energy, usually electricity, which is generated using equipment that harnesses natural resources that are virtually limitless such as wind or tidal energy. Contrast with fossil fuels, which are a finite resource and release greenhouse gases when burned.

Resilience
Preparing for and working around the impacts of climate change. This includes having knowledge of climate change's effects and having plans in place to ensure services continue despite the challenges.

Re-skilling
Acquiring skills for careers and industries that are net zero by leaving behind old practices that are emissions-intensive and acquiring new ones that are suitable for future industries.

Scope 1, 2 and 3 emissions
Scope 1 emissions are those for which an organisation or individual are directly responsible, such as those from driving a vehicle. Scope 2 emissions are those produced from generating purchased energy. Scope 3 emissions are emissions produced further up and down the supply chain due to decisions made by those other than the consumer, but still resulting from purchases or decisions made by the consumer.

SDGs
The United Nations Sustainable Development Goals.

Sustainability
In an environmental context, sustainability means that no more resources are used by human activity than can be regularly replenished by Earth's natural systems.

Tipping points
The threshold at which the Earth's natural systems stop regulating themselves and begin to exacerbate change. For example, global temperatures may reach a point where trees release more carbon dioxide from burning in wildfires than they absorb by growing.

Transition (net zero / energy)
The energy transition or net zero transition is the shift in energy systems and global production to be zero emissions. This transition will necessarily mean that some industries, such as petrochemicals and fossil fuels, will be phased out. See: Just Transition.

Up-skilling
Acquiring skills for careers and industries that are net zero, ideally by adapting skills that have already been learned and are applicable to new jobs and needs.

Whole-life cost
The total cost of an asset over its life, from purchase and operation to disposal. Green and energy-efficient assets may have a higher purchase cost, but often save money over their entire life.

Zero-emissions
A product or activity that produces no greenhouse gas emissions and does not contribute to climate change.

SIC Climate Change Strategy
Relevant Policies, Plans and Strategies

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