

the power to change

Edinburgh's Sustainable
Energy Action Plan
2015 – 2020



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Foreword

Energy matters to everyone and particularly to those in our city who struggle with rising energy costs. Achieving a sustainable energy future for Edinburgh will require a transformational change in the way we generate and use energy. I am pleased to introduce the first sustainable energy action plan for the city that sets out an ambitious programme to bring about that transformation and reduce carbon emissions. Implementing this Plan has the potential to provide more affordable energy for residents, create new jobs and generate significant investment for the city as well as other substantial social and environmental benefits.

As a signatory to the Covenant of Mayors, Edinburgh joins thousands of European towns and cities in a commitment to reducing carbon. But we go beyond the required 20% target with an ambitious pledge to reduce emissions by 42% by 2020. This will be challenging and will require initiatives on a major scale. The Council will provide the leadership and commit resources for this to happen, but it will need all of us in Edinburgh to come together and work in partnership. It will need large organisations and companies to play their part and it will need citizens and businesses looking at how they use energy in the home, at work and throughout the day.

We will build on the momentum that has been evident during the consultation on this Plan, and engage all communities and groups across the city, to meet Edinburgh's target. It is ambitious but I am confident that we can meet this challenge and deliver the benefits of sustainable energy for all.



Cllr Andrew Burns
Leader
The City of Edinburgh Council

Executive Summary

The Sustainable Energy Action Plan (SEAP) is the first energy action plan for Edinburgh with the aim of reducing carbon emissions across the city by 42% by 2020. The vision is that Edinburgh will transform its energy use by reducing demand and encouraging local generation. These benefits will also help alleviate fuel poverty and create local jobs and more sustainable communities.

Why we need a SEAP

- alleviating fuel poverty
- protecting the environment
- ensuring supply
- reducing costs
- creating new jobs and skills
- meeting energy regulations

Emissions and Target

Emissions in 2005 were 3,283 kt CO₂.

The target is a 42% reduction in emissions by 2020 equating to a reduction of 1,379kt CO₂.

Baseline

The Baseline Year for the SEAP is 2005.

The latest DECC data (2014) indicates that between 2005 and 2012, emissions in Edinburgh reduced by nearly 9.5%.

Challenges and Opportunities

The city will face a number of challenges in its move to a low carbon future.

Population and housing – Edinburgh's population is expected to grow at a faster rate than the Scottish average. This will require homes and associated infrastructure which could increase carbon emissions.

Buildings – Edinburgh has a very mixed property portfolio with a high percentage of tenements, listed and historic buildings which present significant challenges with regard to energy retrofitting buildings.

Behaviour change – The challenge of encouraging consumers and employees to reduce and change their patterns of energy use and travel could make a significant contribution to reducing carbon emissions.

Low carbon infrastructure and technology – The move to a low carbon city creates opportunities for low carbon solutions and for trialling new technologies.

Sustainable transport – Edinburgh now boasts the highest share of travel to work in Scotland by foot, cycle and bus and the highest share in the UK for bus; the challenge will be to build on this trend in the city.

The opportunity to decentralise energy – Decentralised energy systems could make a significant contribution to supplying Edinburgh's energy needs and reducing carbon emissions from its buildings.

Edinburgh's carbon emissions originate from three key sectors in the city:

Industry and Commercial (43%), Domestic (36%) and Transport (21%).

The total carbon reduction target equates to reductions across these sectors of:

- 592 kt of CO₂ from industry and commercial users;
- 497 kt of CO₂ from domestic users; and
- 290 kt of CO₂ from transport.

The Approach to the SEAP

The SEAP will build on existing activities. Edinburgh is not starting from scratch in developing energy projects and aims to build on this but in a way that accelerates change.

The feedback from the formal consultation with a range of stakeholders across the city demonstrated support for the aims of the SEAP, the proposed programmes and a desire to become involved. Although the Council is the lead partner in implementing the SEAP, it cannot deliver the action plan on its own. Working in partnership with public and private sectors and community groups and other organisations is crucial to achieving the targets.

The SEAP will aim to increase the involvement of community and voluntary organisations that are already engaged in the low carbon agenda and look to support local energy projects and initiatives. Although the SEAP focuses on energy and carbon, the outcomes will also include a range of strategic outcomes including social, environmental and economic benefits. A key element of the approach will be to continually review and monitor projects to assess their progress in reducing carbon emissions.

Developing the Actions

The SEAP will be delivered through five programmes. These are energy efficiency, district heating, renewables, resource efficiency and sustainable transport. Each programme will have a number of actions reducing carbon emissions.

Priorities for actions include addressing emissions from existing buildings both in the domestic and non domestic sectors and substantially expanding district heating networks across the city and creating new networks. However a focus will also be not just on technical solutions but on approaches such as behaviour change and working with communities to raise awareness and promote efficiencies. In particular working to provide other direct benefits such as more affordable energy for consumers will be a specific priority.



The Route Map

2015 Ground Work Phase

1. Developing the necessary plans and policies to support SEAP.
2. First stage of the energy retrofit programme for non-domestic buildings is launched.
3. The Council's Carbon Management Plan is operational.
4. The Council's District Heating Strategy and Heat Map is published.
5. The new HEEPS (Home Energy Efficiency Programmes for Scotland) national scheme goes live.
6. The Council has fully assessed its own estate for potential renewable installation.
7. Energy for Edinburgh (ESCO) is launched and operational.
8. The Council's Electric Vehicle Strategy is launched.
9. Engagement with stakeholders and gaining endorsement.

2017 Scaling Up

1. The Anaerobic Digestion facility at the Zero Waste Parc is scheduled to become operational.
2. 50% of Lothian Buses fleet to EURO V or better.
3. Travel planning has been rolled out to all organisations to help minimise staff travel.
4. Bio-fuel (B30) trial is completed.
5. The Council in partnership with Scottish Water is ready to launch a pilot scheme to capture waste heat from sewage pipes.
6. Stage three of the energy retrofit programme for non-domestic buildings is launched.
7. Review of EESSH (Energy Efficient Standard for Social Housing) to be completed.

2019 Acceleration

1. The Local Transport Strategy is delivered having encouraged more active travel and decarbonisation of transport.
2. The UK government's Smart Meter programme is completed having installed smart meters in every home.
3. Stage four of the energy retrofit programme for non-domestic buildings is launched.
4. Lothian Buses have electric charging facilities available to the public from infrastructure put in place for the Electric Plug-In Hybrids.
5. The replacement of all street lights with energy efficient lights and stair lights in communal tenement properties with energy efficient lighting is nearing completion.
6. The Millerhill residual waste management facility is scheduled to become operational.



2016 Scaling Up

1. The SEAP now moves from feasibility to delivery stage identifying the projects that provide the biggest carbon savings and scaling those projects up.
2. Stage two of the energy retrofit programme for non-domestic buildings is launched.
3. Roll out travel planning to help all organisations to minimise staff travel.
4. The ten largest employers in the city have implemented staff travel plans.
5. Implementation of the EU Biofuels Target through the UK Renewable Transport Fuel Obligation (RTFO).
6. SEAP Gateway Review 1 is completed.

2018 Acceleration

1. The acceleration phase begins with smaller schemes now gaining momentum and the further development of projects and initiatives.
2. The University of Edinburgh's Smart Sensors project is completed.
3. Lothian Buses have introduced the Electric Plug-In Hybrid (Euro 6) into their fleet.
4. A number of district heating schemes have come online, with the further potential for connecting and expanding this developing network.
5. All new buildings will be completed to the Scottish Government's Domestic Buildings Energy Standards (2014) New Build Properties.
6. SEAP Gateway Review 2 is completed.

2020 Acceleration

1. 15% of all journeys in Edinburgh are now made by bicycle in line with the Charter of Brussels cycling commitment.
2. The District Heating scheme at the BioQuarter is fully operational.
3. Energy for Edinburgh is now delivering on a number of major energy initiatives.
4. The energy retrofit programme for non-domestic buildings has installed improvements across the Council's estate providing impressive energy savings.
5. A final review of the SEAP will be produced detailing the impact the plan has had over the last five years.

The Five Programmes



Energy Efficiency

Energy efficiency is where the biggest reduction in emissions is possible with a key focus on existing buildings. Some of the actions that will be taken forward include: developing a major energy retrofit programme for non domestic buildings to be rolled out city wide; working with the largest employers to set targets for energy reduction; working with Commercial Property owners to reduce carbon; developing a home energy forum and continuing with initiatives to reduce energy in homes and construct new energy efficient ones; develop a smart energy business district; implementing new technologies for monitoring energy in buildings and retrofitting street and stair lights. Behaviour change will be an important component of this programme.



District Heating

A key objective of the SEAP is to decentralise energy. This programme aims to increase the use of district heating in the city, evaluating the potential for expanding existing schemes. Activities will focus on the opportunities to create new heat networks across the city providing locally generated heat for residential and commercial properties. Actions will include: publishing an Edinburgh District Heating Strategy and heat maps; evaluating the potential from its own estate; providing guidance for developers and engaging with the Edinburgh Developers forum; working with partners to assess opportunities from new developments and taking forward at least three major schemes including district heating at the BioQuarter and Fountainbridge.



Renewables

The renewables programme aims to increase the use of renewables in both the domestic and non domestic sectors and encourage innovation in adopting new technologies. The programme will be supporting groups to do this, identifying opportunities for local projects. Actions to be taken forward include: publishing a new policy on renewables; in partnership with Greenspace Scotland pilot ground source heat pumps in parks; assessing the potential for renewables in the Council estate; providing new guidance for community groups and householders; and assessing opportunities for a number of specific renewables projects such as biodiesel, solar P.V. and microhydro.



Resource Efficiency

The inefficient use of resources causes carbon emissions. This programme will encourage resource efficiency across the city with businesses and consumers. Actions will include: in partnership with Midlothian Council progressing the Zero Waste project and evaluating opportunities for capturing waste heat and power; delivering the Sustainable Food City Action Plan; joining the Scottish Circular Economy 100 programme; promoting the Resource Efficient Scotland advisory and support service; engaging with organisations involved in reuse and repair activities in the city and working in partnership with Scottish Water piloting waste heat from sewage pipes.



Sustainable Transport

The programme on transport will support the Local Transport Strategy, aiming to reduce the need to travel, encourage active travel and decarbonising travel. This includes a range of measures in the Active Travel Action Plan, walking and cycling including meeting the Charter of Brussels commitment to get 15% of commutes taken by bike by 2020. Other initiatives include: working with large employers to set travel targets ; promoting Green Fleet Health checks; working with the City Car Club; supporting Lothian Buses on decarbonising public transport and engaging with other transport providers and publishing an electric vehicle strategy aiming to substantially increase the number of charging points across the city.

Energy for Edinburgh

The Council is setting up an energy services company, Energy for Edinburgh, to be launched in 2015. This will deliver a range of key energy projects in the city.

The Council will ensure the resources are in place to deliver the SEAP. This will include ensuring that project plans are in place that are resourced and funded.

Measuring Progress

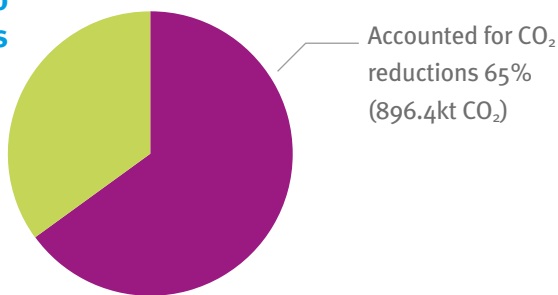
An annual report will be provided to Transport and Environment Committee every year outlining progress on projects and the target. For the Covenant of Mayors requirements a more in depth report will be needed every two years.

A key component of monitoring the plan will be to carry out gateway reviews to account for any changes in technological advances or fundamental changes in government policies and practices that might impact on progress. These reviews will highlight risks and issues. A particular focus will be the progress towards the carbon targets and the performance of projects in reducing emissions. In monitoring progress, initiatives may be reviewed and modified with new projects added to the action plan as required.

Two Gateway Reviews will be carried out at the end of Year 1 and Year 3.

Known Projects to Reduce Emissions

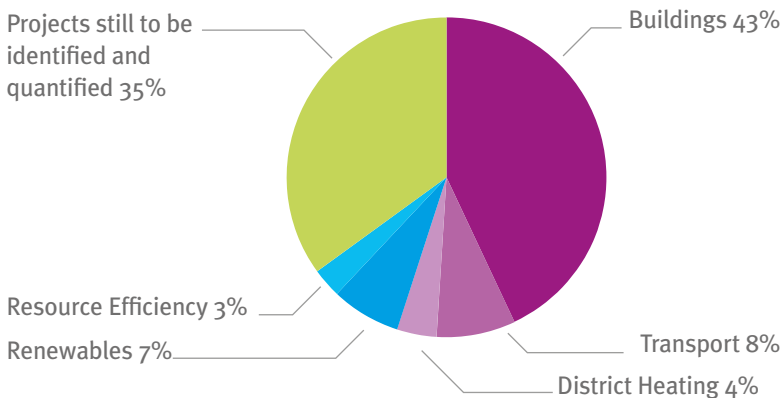
Projects still to be identified and quantified 35% (482.6kt CO₂)



It's everyone's challenge to reduce carbon emissions. A new Communications Plan will be produced setting out how all stakeholders and groups in the city can be involved.

Getting to 2020

Projects still to be identified and quantified 35%



The graph shows the contribution from each of the five programmes. 65% of emissions can be addressed through the existing action plan predominantly from addressing emissions from existing buildings. A number of projects still have to have their carbon reduction assessed. Work will be ongoing to identify new initiatives and scale up projects.

1. Introduction

This is the first Sustainable Energy Action Plan (SEAP) for the city of Edinburgh required under the European Commission Covenant of Mayors initiative. Setting out the Council's aspirations to reduce carbon emissions across the city by 42% by 2020[†], it is a major strategic programme, and an important part of the Council's overall sustainability strategy.

The SEAP aims to transform energy use across the city and empower its communities to make informed and sustainable choices regarding their energy consumption. It will provide the leadership, commitment and planning necessary for the transition to a low-carbon Edinburgh. It will reduce the city's dependence on fossil fuels and support Edinburgh's citizens and businesses to reduce their energy costs.

By guiding future energy policies and initiatives across the city, the SEAP will create new governance arrangements and delivery mechanisms that ensure energy actions are co-ordinated and strategic. These will be integrated so they are mutually reinforcing and cost-effective.

Edinburgh's ambitious actions will be delivered within a UK energy market which is complex and where there is uncertainty about the implementation of new policies and regulation. However, many of the technologies and practices needed for sustainable energy in Edinburgh are successfully implemented in other UK and European cities. The SEAP will aim to build on that expertise and knowledge and develop that within the city.

Covenant of Mayors

This initiative involves over 6,000 councils across Europe working together to reduce their carbon emissions and increase the generation of local energy to achieve at least a 20% reduction by 2020.

By signing up to the Covenant of Mayors programme the Council commits to producing a SEAP within two years.

The programme requires any signatory to set out their baseline emissions and produce a plan that shows how the minimum reduction in carbon emissions will be met.

Taking part in the scheme will also allow the Council to benefit from EU funding schemes and share best practice with other European cities.



[†]On a 2005 baseline

A Plan for All

This is a challenging and ambitious plan. The SEAP will be city wide, led by the Council but designed for all who live and work in Edinburgh. There are a number of actions that will be taken forward by the Council but many can only be delivered in partnership with other organisations and communities in both the public and private sectors.

There is a wealth of expertise in the city that can be used to deliver sustainable energy solutions. The SEAP will seek to develop that. The Council will work with local partners including neighbouring councils as well as a range of partners at Scottish, UK and European levels to develop projects.

Edinburgh's SEAP will support co-operative and community-led sustainable energy projects enabling local communities to have a greater role in energy generation and use across the city. There is a wide range of community, voluntary sector and charity groups across the city active in low-carbon projects and initiatives. This wealth of experience and knowledge will be invaluable in developing new initiatives and projects.



The Energy Hierarchy

In developing a strategic energy plan, an important element is to follow the energy hierarchy.

This works by taking a logical approach to energy management; seeking to reduce energy demand first before meeting the remaining demand through the cleanest means possible. This is the most practical and cost-effective way of meeting carbon targets. This approach will be applied to the SEAP with the five components to this hierarchy seen in Figure 1.

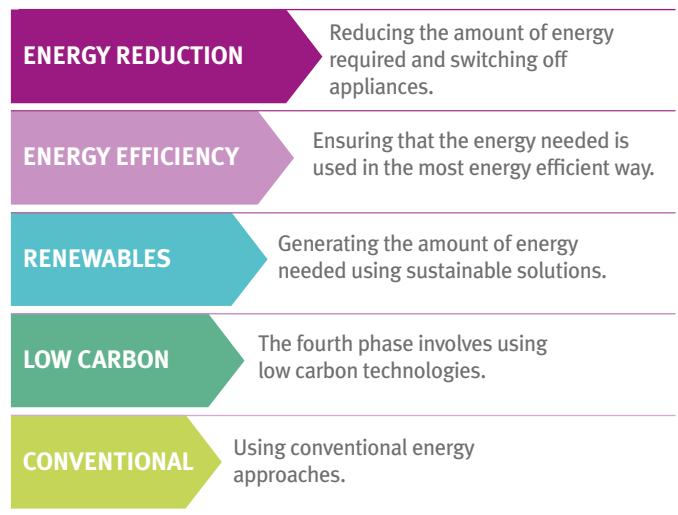


Figure 1: The Energy Hierarchy

The Vision

For any plan there should be a vision. Edinburgh's SEAP is about transforming the city's energy consumption, supply and generation across the city for the benefit of all consumers.

Vision

By 2020 Edinburgh will be on the path to transforming its energy use. Energy demand and consumption will have been reduced, renewable energy will increase and energy distribution networks will be reformed to be more locally based.

This will have been achieved through integrated and innovative solutions in partnership with communities, businesses and key stakeholders across the city. There will be a range of benefits including lower energy costs, eliminating fuel poverty, creating new

jobs and enterprises, more sustainable transport and, strengthened community organisations developing energy initiatives. Ultimately Edinburgh will be one of the most energy-efficient cities in Europe.

2. Why we need a Sustainable Energy Strategy

This section sets out the reasons why we need an energy strategy for the city and highlights some of the key policy and legislative drivers in energy and carbon management.

Alleviating Fuel Poverty

The percentage of households in Edinburgh now living in fuel poverty has risen to 26%.

Between 2008 and 2013, average household energy bills have increased by 30% and this cost is likely to increase further. Around 18% of Edinburgh's private rented households and 28% of owner occupiers are in fuel poverty. The SEAP will develop actions to specifically address fuel poverty¹.

Fuel Poverty

The cost of energy has impacts on communities, particularly those in fuel poverty.

Rising prices in recent years have led to increasing energy costs. Figure 2 shows the increased number of Edinburgh households in fuel poverty which has significantly risen since 2007.

It is estimated that 58,500 households in Edinburgh experienced fuel poverty in 2013 with some 7% in extreme fuel poverty spending more than 20% of their income on energy. The detrimental health and social impacts of fuel poverty are well known.

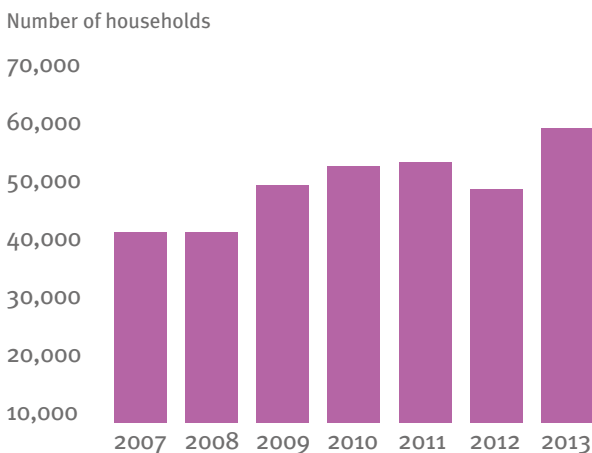


Figure 2: Edinburgh Households in Fuel Poverty

Source: Scottish Neighbourhood Statistics and City of Edinburgh Council

Protecting the Environment

The extraction and use of fossil fuels as an energy source results in a number of adverse environmental impacts. These include greenhouse gas emissions, air pollution, potential contamination of surface and ground water, and potential habitat and biodiversity loss through infrastructure and land use. Minimising the amount of energy required and increasing the amount of energy from renewable and low-carbon sources can help reduce the environmental impacts on scarce resources.

Ensuring Supplies

It is unsustainable in the long term to rely on resources such as oil, gas and coal, which are finite.

Ensuring energy supply is increasingly seen as an important issue due to political instability in oil-producing nations, scarcer oil supplies and perceived concerns about the safety of nuclear power and other technologies such as fracking.

In 2013, the UK's dependence on energy imports increased to its highest-ever level, reaching 51% at the same time as the regulator Ofgem warned that the country's dependence on imported fuels could drive up consumer bills. The UK is heavily dependent on fuel supplies from abroad including gas and coal. Diversifying energy supplies by using alternative sources, decreases the reliance on a single fuel, protecting against the risks associated with only one fuel supply.

Having strategies to decentralise energy supplies will lead to an increase in the use of renewables, localised energy generation and alternative fuels. Cities that diversify their energy supplies are effectively building resilience and helping future generations deal with environmental impacts and over-dependence on fossil fuels.

¹Scottish Housing Condition Survey, 2014

Reducing Costs

Although there have been a few fluctuations, the overall trend for energy costs has been to increase.

Currently, large public and private organisations incur financial costs for the carbon dioxide they emit. The Carbon Reduction Commitment (CRC) Energy Efficiency Scheme aims to incentivise large organisations to implement energy efficiency measures by charging them for the carbon dioxide they produce – currently £12 per tonne with potential increases up to £16 per tonne in 2020.

Figure 3 below shows the projections from the Department of Energy and Climate Change (DECC) over a 20-year period. What is significant from the graph is the projected increase in the cost of carbon from 2020, making emissions significantly more expensive. Actions in the SEAP will help support organisations and businesses to be more energy efficient thus saving money and remaining competitive.

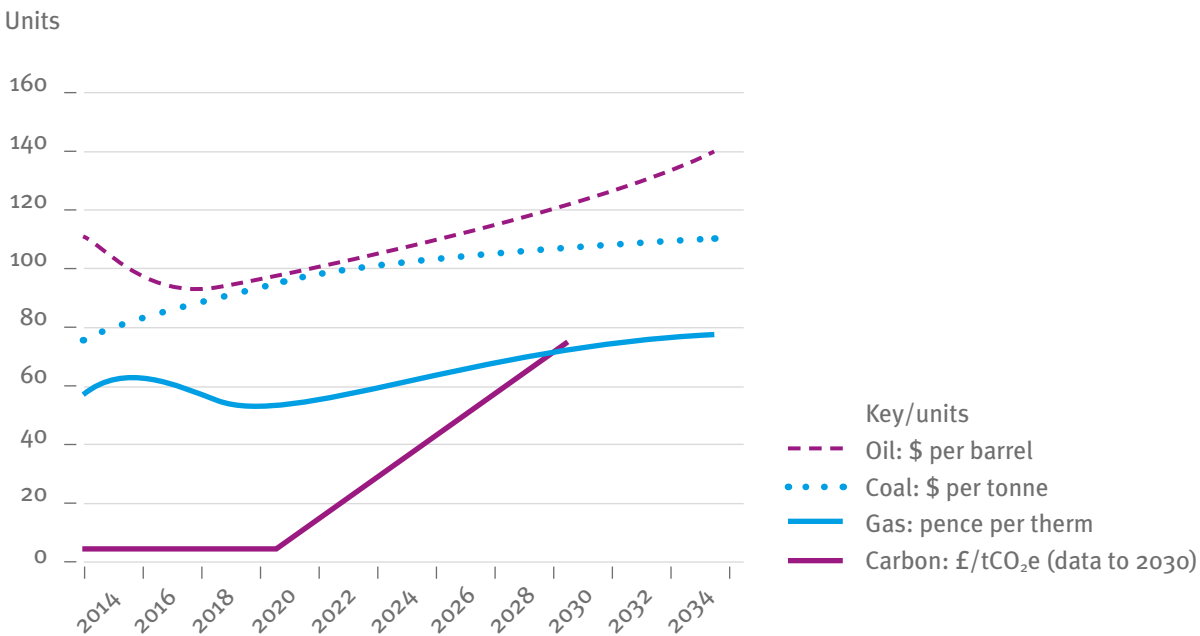


Figure 3: Energy and carbon price forecasts
 Source: DECC, September, 2014. Based on 3,800 kWh/year consumption

Maximising Economic Development Opportunities

A SEAP can capitalise on the wide range of opportunities for Edinburgh's economic development through the expansion of the sustainable energy sector.

This could include creating new businesses in energy efficiency and renewable technologies, and developing local supply chains and new markets. In addition a plan can support Edinburgh's businesses to become more energy and resource efficient.

The Scottish Government estimates that by 2020, renewable energy in Scotland could provide up to 40,000 jobs². Having a single co-ordinated programme, with concrete actions, supported by the Council can provide confidence to potential investors and an expectation of market demand for particular methodologies and technologies.

²Scottish Government, Low Carbon Economic Strategy, 2010

Meeting Energy Regulation

Legislation and initiatives relating to energy and low carbon are increasingly complex. Figure 4 below highlights some of the key Scottish, UK and European policy directives as well as the incentives, subsidies and grant schemes available for communities, public and private sectors.

Many of these requirements such as the EU Energy Efficiency Directive will have a direct reduction in energy consumption and therefore reduce carbon emissions.

For example, the Energy Performance in Buildings Directive will require increasing standards of energy efficiency in both the public and private sectors.

Other key legislation such as the Building Standards will also require buildings to have significantly lower carbon emissions by as much as 43% (Section 6 of the Building Regulations). Having a single action plan where all energy initiatives can be co-ordinated will enable compliance with legislation and better monitoring of performance.



Figure 4: Policy and Legislative Landscape

Impacts of Energy Policy

The Scottish Government estimates that decarbonisation of the UK electricity grid will see Scottish greenhouse gases fall from 23 million tonnes of equivalent carbon dioxide in 2010 to over 15 million tonnes by 2020³. This will result in Edinburgh's carbon dioxide emissions reducing considerably.

Other measures that can contribute include adopting EU standards for emissions from new vehicles. This will drive down transportation emissions by ensuring new vehicles have much lower emissions than those they replace. The EU requirement for increased use of biofuels will also reduce emissions.

There are differing views on how much grid decarbonisation will contribute in meeting not just Edinburgh's targets but also national targets; as much depends on future energy policy, infrastructure and government support (including subsidies) for energy efficiency and renewables. The impacts of proposed reforms to the electricity market will also have a bearing on meeting carbon targets by 2020.

It is also difficult to determine the future contributions from specific Government policy measures. For example *Green Deal* was launched as a flagship initiative by the UK Government particularly for domestic energy. However that particular scheme has had very low uptake meaning that the predicted reduction in energy consumption has not occurred.



³ Scottish Government (2013) Low Carbon Scotland: Meeting our Emissions Reduction Targets 2013-2027. The Second Report on Proposals and Policies.

3. Edinburgh's Carbon Emissions

While there are a range of greenhouse gases responsible for climate change impacts, the SEAP focuses only on carbon as the major contributor. This section provides information and context on Edinburgh's carbon emissions and energy consumption profile, identifying the main sources and users of energy.

Baseline Year

While 1990 is the recommended year for carbon baselines, the Covenant of Mayors guidance states that a local authority should choose the closest year for which the most comprehensive and reliable data can be collected. In the UK, consistent and local energy data was not available before 2005. However since then, DECC has been publishing a range of energy statistics for local authorities. **The baseline for this SEAP is therefore 2005.** It is worth noting that DECC regularly review and update their methodology to improve accuracy so in future SEAP progress reports there may be some revisions to older data including the baseline data.

Edinburgh's Carbon Emissions

DECC provides a comprehensive set of carbon emissions for every local authority broken down into the main sectors: industry and commercial, domestic and transport. Figure 5 below shows the average percentage contribution from each between 2005 and 2012. Industry and commercial accounts for the largest proportion of emissions at 43%, while domestic energy averages around 36% and transport at 21%. (This position has been fairly consistent since 2005). Tackling emissions in the industrial and domestic sectors will make the greatest contributions to meeting the SEAP targets.

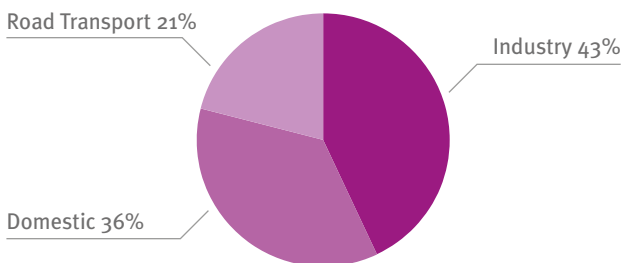


Figure 5: Breakdown of CO₂ emissions by sector (average 2005-12)

Source: DECC, 2014.

In 2005 Edinburgh's emissions were 3,283 kilo-tonnes of carbon dioxide (KtCO₂) with per capita footprint of 7.3 tonnes. By 2012 this had reduced to 2,982 a reduction of over 9%, with a corresponding reduction in the per capita footprint to 6.2 tonnes.

Fuel Type

The type of fuel used is important with respect to carbon emissions. This is because each fuel type emits different amounts of carbon. For example, using electricity will produce more carbon emissions than gas.

Figure 6 details the three largest sectors further subdivided into fuel type. This shows that there have been reductions in energy consumption across the major fuel types since 2005. By far the largest fuel type used is electricity in the industrial sector with gas the largest consumed fuel in the domestic sector suggesting that heating is the main activity. Meeting the targets will mean major reductions in emissions from existing homes and businesses.

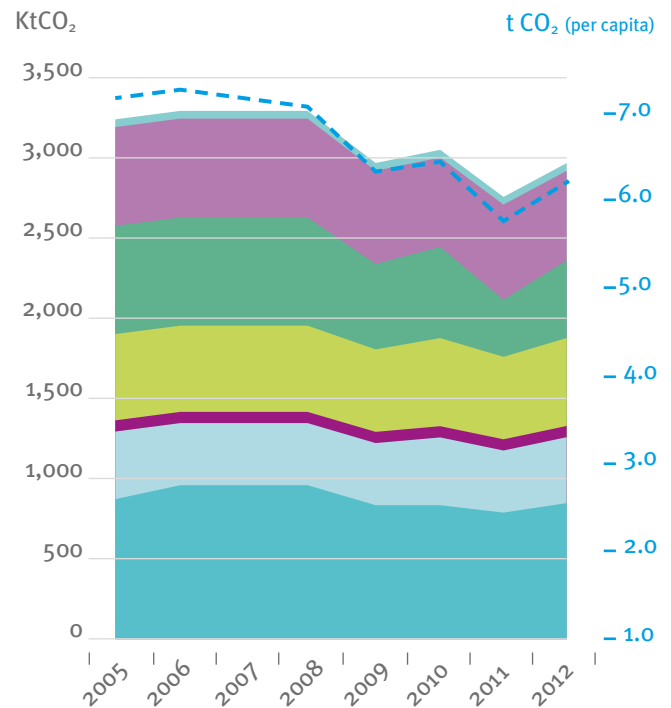


Figure 6: Detailed emissions by sector and type of energy plus per capita emissions.

Source: DECC, 2014.

- Industry & commercial electricity
- Industry & commercial gas
- Industry & commercial other fuels
- Domestic electricity
- Domestic gas
- Road transport
- Other
- Per capita emissions t CO₂ (right axis)

Year	A. Industry and Commercial Electricity	B. Industry and Commercial Gas	Sub Total (including other fuels)	F. Domestic Electricity	G. Domestic Gas	Sub Total (including other fuels)	Transport Sub Total (including other fuels)	Grand Total KtCO ₂
2005	891	438	1,391	538	642	1,203	689	3,283
2006	985	404	1,446	562	615	1,200	686	3,332
2007	985	379	1,422	552	611	1,185	700	3,307
2008	973	391	1,413	530	619	1,172	657	3,243
2009	853	354	1,249	472	555	1,050	644	2,943
2010	861	405	1,310	478	613	1,115	632	3,057
2011	776	362	1,177	456	508	987	618	2,782
2012	840	391	1,272	514	566	1,102	607	2,982

Table 1 provides more details on the total amounts for all the larger fuel types. A small percentage of “other fuels” is also included in the total. Reductions in consumption can be seen in the gas and transport energy.

Table 1: Total Carbon Emissions by Fuel Type in Kilo Tonnes of Carbon Kt CO₂

Source: DECC, 2014

The SEAP Target and Trajectory

Signing up to the Covenant of Mayors requires a commitment to reduce carbon emissions by 20%. For this SEAP this equates to a reduction of 656 kt CO₂ by 2020. However the Edinburgh SEAP aims to exceed this figure and is aiming to meet the current national target of a 42% reduction in carbon emissions by 2020.

Since 2005 the trend has been for decreasing emissions although there has been some variability due to colder winters. Between 2005 and 2011 reductions in carbon had been of the order of 15.3% however latest figures produced by DECC showed an increase in 2012 reducing the overall figure to 9.2%. As can be seen from Figure 7 below the 42% target is much more challenging.

The SEAP target is:

42%

A 42% reduction in carbon emissions by 2020 equating to a reduction of 1,379kt CO₂ against a 2005 baseline of 3,283kt CO₂

The SEAP will be implemented over five years. Taking a simplistic pro rata reduction across the three main sectors the carbon reductions are of the order of:

592kt CO₂
Industry and Commercial

497kt CO₂
Domestic

290kt CO₂
Transport

Edinburgh emissions: actual to 2012, target thereafter

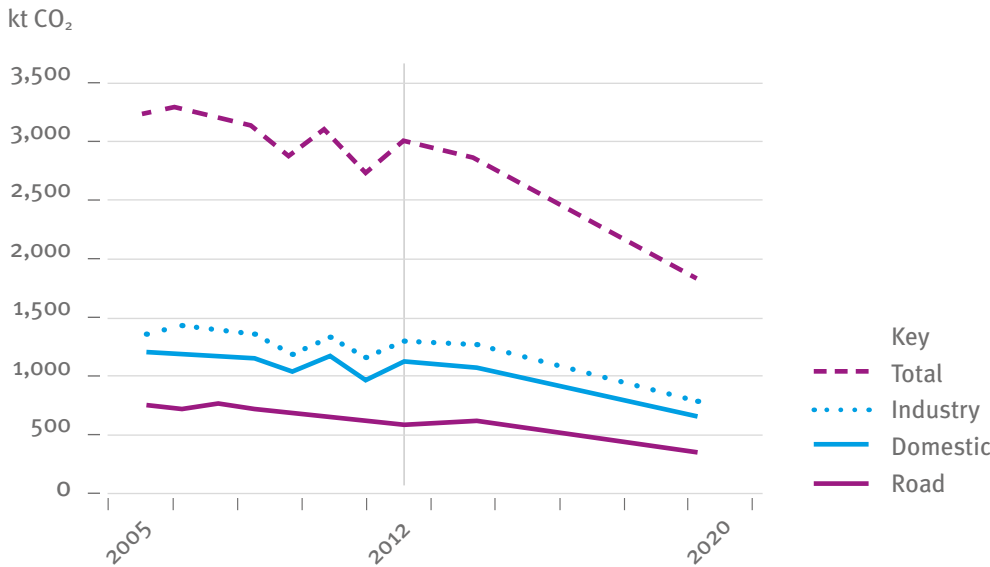


Figure 7: Target Trajectory for the Sectors in Edinburgh

Source: DECC, 2014 and City of Edinburgh Council target projections.

Meeting the Target

As far as possible, the actions across the five programme areas have been quantified in terms of their carbon reduction potential. This has not been possible for every action. Figure 8 below shows that 65% of emissions can be approximated from the range of SEAP actions, including direct actions as well as government initiatives. This provides an indicative assessment of carbon reduction recognising that further work will be undertaken to quantify actions further. This will be an important element of the monitoring and review.

Known Projects to Reduce Emissions

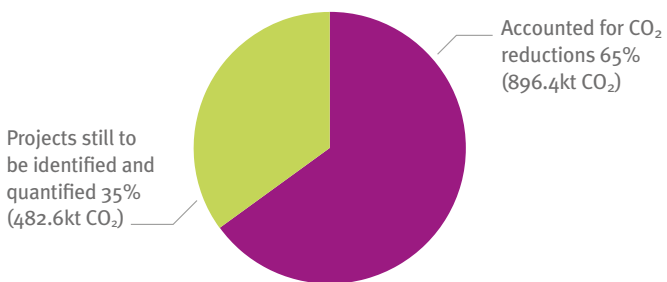


Figure 8: Total Carbon Reduction from SEAP Actions

Breaking down the emissions further across the five programmes in Figure 9, it can be seen that the greatest reduction is from actions to reduce carbon emissions in buildings. This includes both domestic and non-domestic properties. District heating is a smaller component however as schemes are developed it is anticipated that emissions from this programme will be reduced further. A number of actions will require feasibility studies to assess the carbon potential, while others are more difficult to quantify such as initiatives aiming to raise awareness.

Getting to 2020

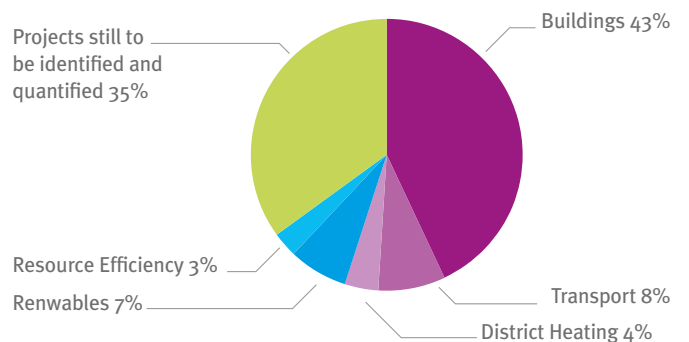


Figure 9: Breakdown of Reductions in Carbon Emissions from SEAP Actions

4. Challenges and Opportunities

Edinburgh will face many challenges in its move to a low-carbon future. However with the challenge can come opportunities to develop innovative solutions to the carbon-reduction agenda creating a new low carbon future that allows citizens and businesses to benefit. This section identifies some of Edinburgh's particular challenges and opportunities in reducing emissions.



It's Everyone's Challenge!

The biggest challenge is the scale of what needs to be done to achieve the carbon reductions by 2020. This requires action from all stakeholders in the city.

Population and Housing

Edinburgh's population is expected to grow at a faster rate than the Scottish average. The number of people in the city is projected to increase by 28.2% from 482,640 in 2012 to 618,278 in 2037⁴. The impacts from population growth include not just new homes and associated infrastructure upgrades (such as roads and lighting) but potential increases in consumption and travel. All of these will increase carbon emissions in the city and potentially affect any reductions achieved by 2020. However this presents an opportunity for low-carbon developments.

With the expected growth in population, there will be a need for new housing. The number of households in Edinburgh is projected to increase at a faster rate than any other Scottish city from 217,650 in 2008 to 293,150 in 2033. Housing assessments indicate that Edinburgh would need 36,000 new homes over the next 10 years if all housing need and demand is to be met⁵. An opportunity does however exist to build on the work carried out by the 21st Century Homes programme and by housing associations to construct energy efficient, low carbon housing. A challenge will be for private house builders to do the same.



Creating Energy Efficient Communities of the Future: 21st Century Homes

The award-winning 21st Century Homes programme will deliver 1,400 new highly insulated and energy efficient homes in the Gracemount, Sighthill and Pennywell areas of the city. Over 200 homes have been built.

Developments incorporate carbon reduction features such as mechanical ventilation with heat recovery and combined heat and power. One tenant has said "The heating and energy system is fantastic -in the private sector I was spending £85 per month on gas and £65 on electricity, but I'm now spending £5 per week on both."



Award Winning Gracemount Housing

⁴National Record of Scotland, 2014

⁵National Record of Scotland, 2014

Buildings

Edinburgh has particular challenges in addressing carbon emissions from its built environment. There are over 235,000 homes in the city and around 18,800 non-domestic buildings including 2,000 public-sector buildings. This presents a very mixed property portfolio with a high percentage of tenements as well as large numbers of historic and listed buildings. This presents significant challenges in energy retrofitting buildings of this type.

For domestic properties especially, there will be specific issues given that 65% of Edinburgh homes are flats. A quarter of these are pre-1919 traditional stone-built tenements which are commonly known as 'hard to treat' properties. There is also a high percentage of private rented flats. These account for 22% of Edinburgh's homes and can present issues with fuel poverty and multiple ownership⁶.

However energy solutions for buildings do not always need to rely on technology and systems. Many solutions can be simple and there is great potential to reduce consumption and minimise total costs by using existing technologies and raising awareness.



Behaviour Change

Evidence shows that people are concerned about energy costs but this does not always translate into practical steps to reduce energy consumption. Less frequent energy bills means that domestic consumers have less knowledge of what contributes to reducing their energy bills or what behavioural changes they can make to save energy. Yet the simplest of steps can save carbon. Smart meters may make a difference but consumers need to understand how best to use these.

In terms of installing energy or renewable measures, research has shown that consumers can become confused about the plethora of information from energy companies. The so-called 'hassle' factor (the perceived disruption caused by installing energy systems) is also another barrier to motivating consumers to be efficient. The same can apply to workplace energy consumption, where energy costs not met by the users, the employees, but by the company.

This challenge of encouraging consumers and employees to change their patterns of energy use could make a significant contribution to reducing carbon emissions. Providing information may be important but not enough on its own to change behaviours. The challenge is to encourage energy conscious behaviour in a way that is simple and sustained so that good practice becomes a habit.

⁶City of Edinburgh Council, Housing Strategy

Low Carbon Infrastructure and Technology

The move to a low-carbon city creates opportunities for trialling new technologies. Retrofitting existing buildings, and constructing new homes and community facilities presents the city with an opportunity to require sustainable building design for developments in Edinburgh. The energy needs of consumers can be met through more decentralised energy solutions such as district heating which will require new infrastructure to be put in place.

Edinburgh is a city that already has much of the expertise needed to create a low-carbon economy. The city and wider region, is home to a growing cluster of 140 businesses and researchers engaged in sustainable energy solutions. The Edinburgh Centre for Carbon Innovation works to bring together those with the knowledge, innovation and skills required to create a low-carbon economy; and the city is also home to the UK Green Investment Bank, the first bank of its kind in the world with £3.8 billion to invest in sustainable projects.



Sustainable Transport

Edinburgh now boasts the highest share of travel to work in Scotland by foot, cycle and bus and the highest share in the UK for bus.

The city has also gone against Scottish and UK trends in car ownership; despite increasing affluence, a lower percentage of Edinburgh households owned a car in 2011 than 2001⁷. Edinburgh's urban form, the concentration of jobs and services in the city centre and a high-quality bus service all result in public transport being an attractive choice for many journeys in and around the city.

The arrival of new trams has also contributed positively to more sustainable choices of transport as well as reducing carbon emissions in the city. The challenge will be to build on these trends in the city.

⁷Scottish Household Survey, 2012

⁸www.greenpeace.org.uk/files/pdfs/migrated/MultimediaFiles/Live/FullReport/8056.pdf

Smart Grids and Integrated Energy

A 'smart grid' is a system that can connect and switch between different energy sources including renewables. It can assess demand and switch off supplies when demand is low (saving consumers money in the process) and increase supply from stored energy when demand is high. It provides more flexibility in the system and can 'talk' to different components. Figure 10 below provides an image of a smart grid and integrated energy system. The challenge is to make this a reality.

- Processors
- Sensors (on standby)
- ⦶ Sensors (activated)
- Ⓢ Smart appliances
- ⚠ Demand management
- ▨ Generators
- ▭ Storage
- ⚡ Disturbance in the Grid

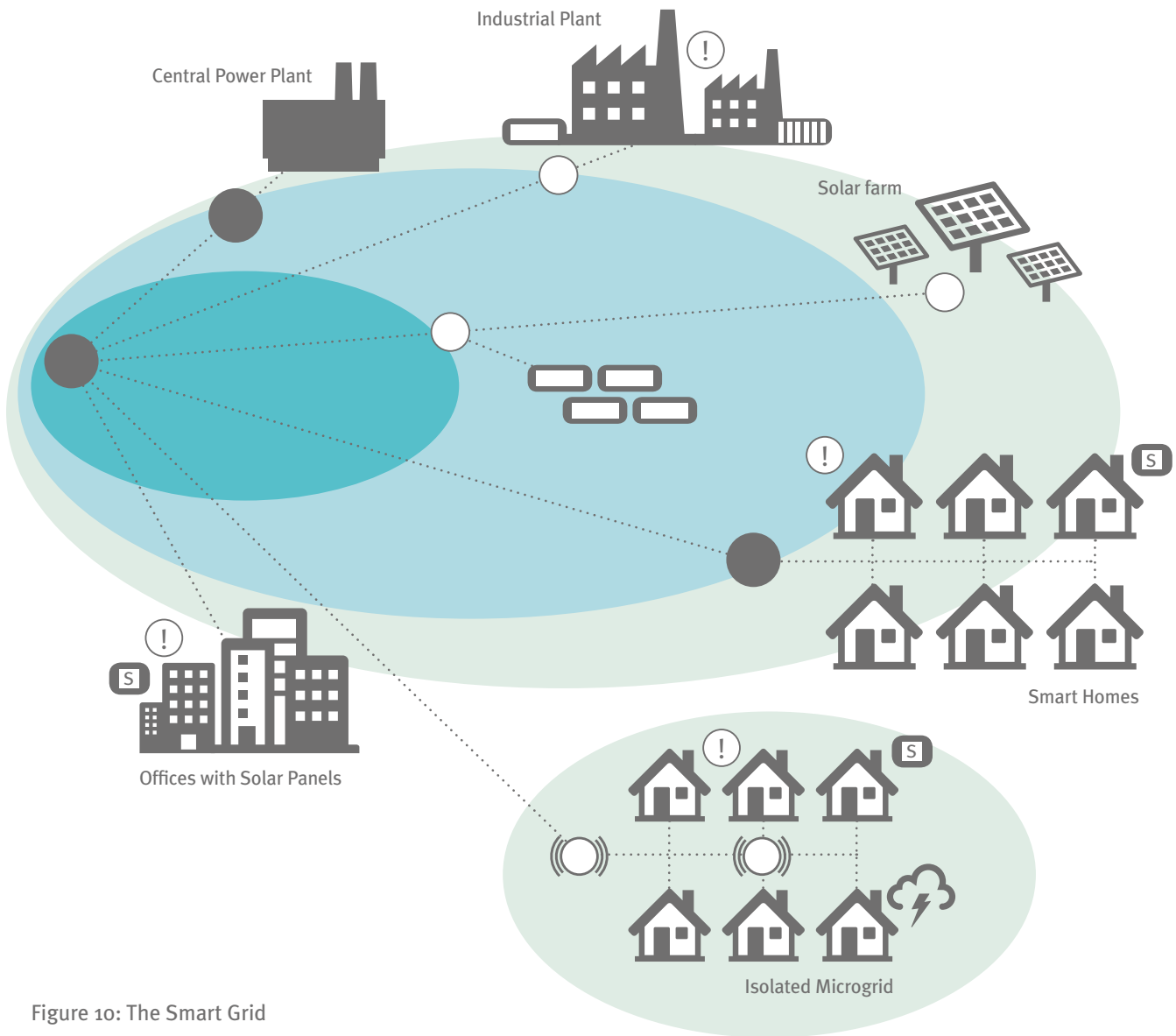


Figure 10: The Smart Grid

5. The Strategy

An important element in taking a strategic approach is defining the outcomes and objectives and then the route by which those can be achieved. This section sets out the strategic approach being taken to develop the SEAP. This provides the rationale for how the actions have been developed.

Building on Existing Activities

Edinburgh is not starting from scratch in developing energy projects. There has been considerable work underway by community organisations and other groups as well as the Council. The SEAP aims to build on this but in a way that accelerates change. This needs effective co-ordination of individual projects, resources and skills into a single integrated programme and better communication across the different sectors in the city.

Some of the key Council plans and strategies that influence the SEAP include the Sustainable Edinburgh 2020 Strategy, the Local Development Plan, the Local Transport Strategy and the City Housing Strategy. Key plans and strategies involving other organisations, such as the Community Plan will also be important for the SEAP.

Consultation

Formal consultation on the SEAP took place over a four month period with a range of stakeholders across the city. This exercise set out a suggested vision, aims and proposed programme areas. There was support for these as well as a recognition of the challenges and opportunities a sustainable energy programme might deliver.

Constructive feedback focused on the challenge of meeting the 42% target and the scale or number of projects required to meet this. Suggested priorities included ensuring effective leadership and having a detailed action plan with clear responsibilities and accountabilities. Building community capacity and sharing good practice was also an emerging theme in the delivery of the plan.



The SEAP consultation provided support for the Council's aims while acknowledging the scale of the challenge. Many organisations want to be involved. The SEAP will build on that offer.

Working in Partnership

Although the Council is the lead partner in implementing the SEAP, it cannot deliver the action plan on its own. Other public and private sector partners are crucial to achieving the targets. These partners need to engage with the SEAP, and in particular develop their own actions and contributions to the plan. Academia has a particular role in research and development and Edinburgh's Universities will be key contributors. The private sector especially needs to be targeted to bring the necessary skills and investment to enable the plan to happen. Additionally, partnership working needs to take place with the enthusiasm and local knowledge of the wide range of community groups in the city.

A key aim of the SEAP is to work in partnership, engaging with all the sectors, developing actions and reporting on progress. The Edinburgh Community Planning Partnership (CPP) has a range of key partners as members and has established a number of strategic partnerships in the city. One of these, the Edinburgh Sustainable Development Partnership (ESDP) has the remit for sustainability including energy and carbon. It is expected that this group will have an important role in overseeing the progress of the SEAP.

Strengthening Community Involvement and Co-operatives

The SEAP will need to increase the involvement of community and voluntary organisations that are already engaged in the low-carbon agenda. Strengthening community involvement in the SEAP is important as local community groups and residents can play a key role in encouraging energy efficiency measures and behaviour change. In particular communities can become directly involved in energy co-operatives owning assets such as community renewables. The UK has seen a significant increase in the number of energy co-operatives being established with benefits including cleaner energy, funding for community projects and revenue being retained and reinvested in the local economy. The role of Neighbourhood Partnerships in developing energy projects will also be developed.



Harlaw Hydro Ltd is an Industrial and Provident Society that has developed a 65KW micro hydro scheme at Harlaw Reservoir. Operational in 2015, the scheme will generate approximately 260,000kWh (units) of green electricity per year – enough for approximately 56 average houses – saving 129 tonnes of carbon dioxide per year.



The Approach

While larger energy infrastructure projects such as district heating will be part of any sustainable solutions, they can be complex and long term. The action plan needs to include early wins to encourage participation and provide confidence to stakeholders that the Council is leading this agenda and building momentum.

Figure 11 below shows the approach suggested in delivering the SEAP. Year 1 will set the groundwork for the plan focussing on early wins i.e. those that can be delivered within 12 months, engagement with key sectors, strengthening community involvement and developing the tools and measures to ensure implementation. It will also focus on the mechanisms needed to deliver projects such as an energy services company. Years 2-3 will focus on delivering the bigger infrastructure projects such as district heating and solar farms. Smaller projects will be scaled up and planning underway for larger projects. Years 4-5 will focus on accelerating change.

The 42% reduction target for Edinburgh is clearly ambitious in the timescale and a challenge for the city and all its partners. The first two years of the plan will have detailed project plans with the key aim of accelerating investment in how we heat and power the city, create more renewable energy and improve the way we get around. Thereafter, project plans will need to be developed further to provide a more accurate measurement of carbon impact. A pragmatic approach is needed given all the variables that may influence energy policy in the future primarily the political and economic landscapes. This, combined with emerging technologies that offer yet more solutions will certainly affect the rate of reduction.

It is also important to note that due to the range of uncertainty in some of the projects, there can only be a best estimate given in terms of the carbon reduction. As projects are developed in more detail further calculations can be given.

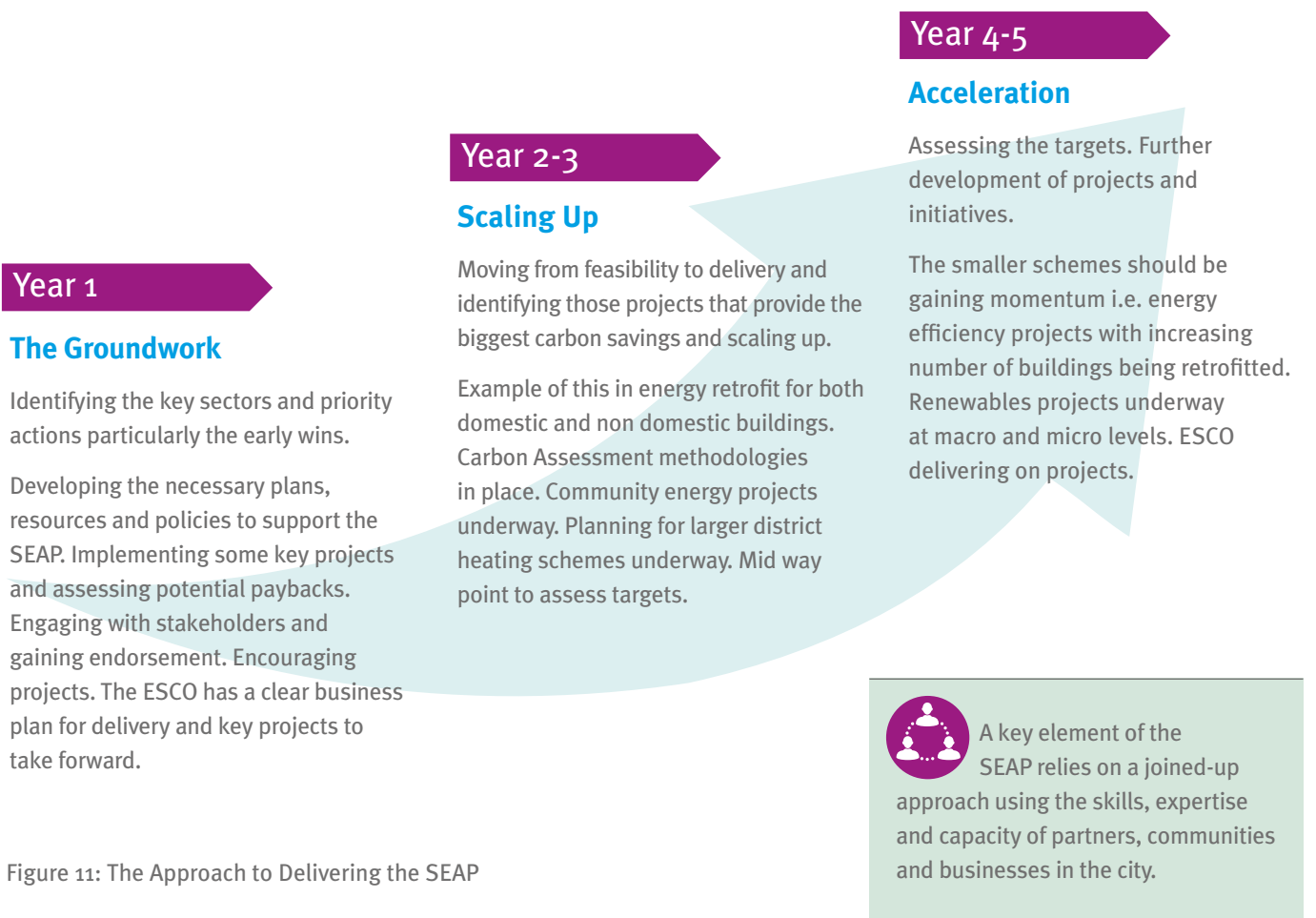


Figure 11: The Approach to Delivering the SEAP

In addition to meeting targets, any plan should lead to clear benefits and outcomes for all the stakeholders involved. Although the SEAP focuses on energy and carbon, the outcomes should include a range of social, environmental and economic benefits. There are a number of strategic outcomes of the SEAP which will be delivered by the actions. These are:

Strategic Outcomes

- Delivering affordable energy and alleviating fuel poverty.
- Ensuring that energy is used efficiently across all sectors in Edinburgh.
- Increasing the amount of energy generated by renewables.
- Reducing energy demand across all sectors by encouraging changes in behaviour.
- Developing local energy infrastructure.
- Creating new jobs and businesses in the sustainable energy sector.
- Strengthening communities and businesses to manage their own energy needs.
- Exploring opportunities for using alternative fuels which are clean and efficient.
- Working in partnership with all stakeholders in Edinburgh.



6. The Action Plan

This section sets out a summary of the specific energy actions for the city. It takes into account any Council priorities, existing projects and national initiatives. Some actions are already underway while others will need further development and in some cases funding to progress. For a number of actions there has been an attempt to quantify the carbon savings however there are some where this is difficult to predict without further development.

A more detailed action plan is in Appendix 1.

The Council is proposing delivering the SEAP through a number of programmes that seeks to provide a single but integrated energy programme. There will be three categories of action for the SEAP:

Direct	Measures that will directly reduce carbon emissions.
Enabling	Actions support the delivery of the direct actions.
Delivery	Measures that will implement the SEAP.

Leading by Example: the Council's own Activities

Although less than 2% of the city's total carbon footprint, the Council recognises the importance of leading by example. Its existing carbon management plan covers energy in buildings, municipal waste, street lighting and emissions from fleet. Figure 12 shows the breakdown of the Council's current carbon emissions totalling 133,196t CO₂e. The largest proportion of carbon emissions is from buildings, followed by emissions from waste.

A new Carbon Management Plan will set out a five-year plan for the reduction of carbon dioxide emissions from the Council's own activities. This plan will include specific projects across all areas of the Council's day-to-day business, including buildings, street lighting, transport, Information and communications technology and energy awareness.

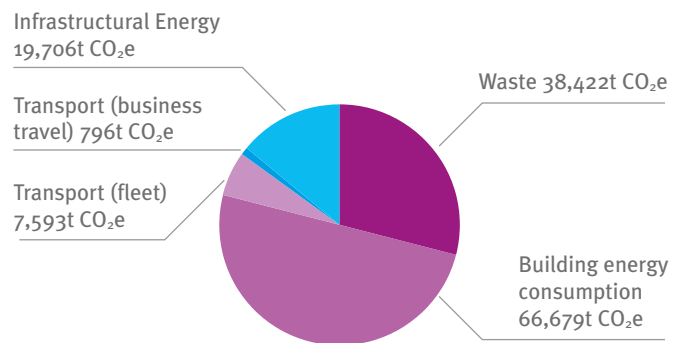


Figure 12: City of Edinburgh Council's Carbon Emissions in 2013/2014. In addition to its own activities, the Council will ensure that the SEAP is integrated with other key strategies such as those for transport, housing, planning, economic development etc. All Council services will be expected to comply with the SEAP and ensure that the targets and relevant actions are incorporated into their own strategies. The Council will also use its wider role in reducing carbon emissions. The relationships with key partners for example, will be essential in developing actions as will the Council's role with communities and neighbourhoods.

Actions

- The Council will publish a five-year Carbon Management Plan in 2015 aiming for a 2% reduction in energy consumption per annum from its own activities.
- The Council will ensure that the aims of the SEAP are integrated across all major strategies.

The Five Programmes

There will be five programmes of activity for the SEAP representing the priorities for action. Figure 13 details the programmes along with each aim. Under each programme there are a number of actions. Some of these are already underway while others require further development.



Figure 13: The SEAP Programme Areas

Programme 1: Energy Efficiency



Over 40% of the UK's energy consumption is from the way our buildings are lit, heated and used. Energy use in existing residential and commercial buildings in Edinburgh is a major contributor to carbon emissions and therefore represents the biggest opportunity for reduction.

Energy efficiency is one of the most cost-effective ways of reducing carbon emissions. This includes a range of retrofit measures for both domestic and non-domestic properties including boiler efficiencies, insulation, controls and energy management systems as seen in Figure 14 below.

This programme will focus on retrofitting existing buildings both domestic and non domestic. Awareness and behaviour change will be an important component of this as will working with partners and communities.

The priority for non domestic buildings will be a major energy efficiency retrofit programme targeting the public sector and aimed at the highest consuming buildings.

Actions for public buildings will start with the Council's own properties. Commercial buildings will also be targeted and early actions will focus on raising awareness of energy efficiency legislation and working with the largest businesses in the city. For domestic buildings, a specific energy strategy to tackle energy efficiency will be developed bringing together all the complexities of mixed tenures, hard-to-treat properties, funding streams and behaviour change. The energy efficiency programme will also cover infrastructure such as street and stair lighting.

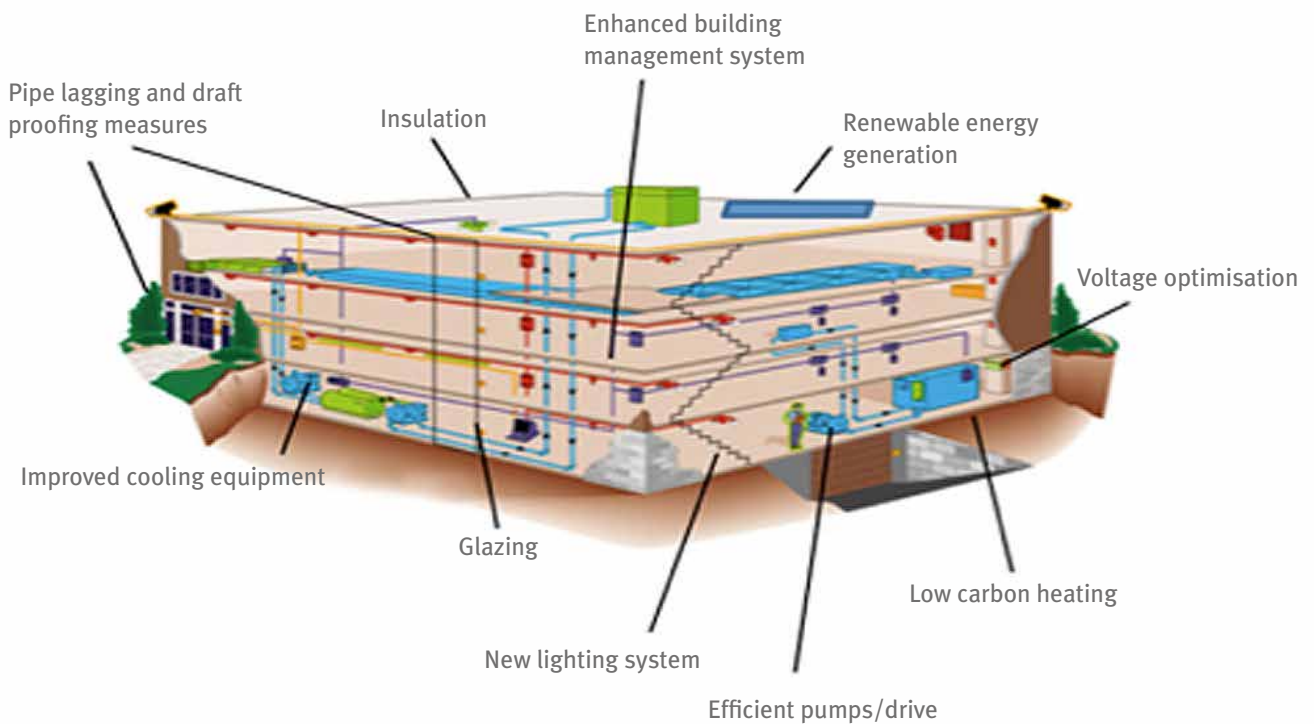


Figure 14: Energy Efficiency Measures in Non-Domestic Properties

Non-Domestic Buildings

Public-Sector Buildings

There are nearly 2000 public buildings in Edinburgh, ranging from hospitals to schools, leisure centres, offices, health centres, warehouses, depots and museums. These represent a significant percentage of the city's carbon footprint not just because of their large size but also because of their use. Many are open for long periods of time, or in the case of hospitals constantly. Many are also listed and complex which can make retrofitting energy efficiency measures challenging.

Some organisations, for example universities, have developed and published their own carbon management plans. These plans usually feature energy efficiency in buildings as a key activity and can have a three to five year timeline (well within the timeline of the SEAP) with annual targets for carbon reduction. A key action will be to build on these plans across the wider public sector encouraging other organisations to develop similar plans and approaches. Another important sector also to engage with is schools. The Council will expand on its energy awareness programme with schools to encourage energy efficiency behaviours which can also be replicated at home.

Edinburgh has a high percentage of schools registered with the Eco-Schools Programme. An important element of this is energy efficiency. The Council has piloted its "Small Steps" campaign which aims to raise awareness of energy consumption and change behaviours at school and hopefully at home.



⁹City of Edinburgh Council Planning, 2012

Commercial Buildings

Shops, hotels, supermarkets and restaurants will be significant users of energy. However offices will be a key early priority for the SEAP as Edinburgh is one of the UK's most important office hubs with an economy highly dependent on office accommodation.

Edinburgh city centre remains the primary office location and is home to nearly half of the city's office space. In 2010, there were over 300 large office buildings in the city⁹. Engaging with these companies to address energy efficiency will be a key action for this programme. The retail sector makes a significant contribution to carbon emissions. This sector has been developing voluntary schemes to reduce carbon and address resource efficiency. The SEAP will aim to engage with the retail sector in the city to develop joint approaches.

Section 63 of the Climate Change (Scotland) Act 2009 is particularly significant for commercial buildings requiring owners of larger non-domestic buildings to improve the energy performance of their properties and reduce carbon emissions. This legislation will be consolidated with the new requirements for the Energy Performance Certificates (EPC) due to come into force in autumn 2015 and apply to any buildings that have an EPC rating below an E. This is set to be a powerful driver for retrofit in the non-domestic property sector. The SEAP will develop a programme to raise awareness of this legislation in commercial properties and promote the benefits of energy efficiency.

Green leases have been recognised as a mechanism to drive carbon savings in commercial properties. A green lease is an agreement between commercial landlords and tenants that obliges both parties to minimise adverse environmental impact in areas such as energy, water and waste. The Council will trial the use of the Better Buildings Partnership 'Green Lease Toolkit' to assess its practical potential in reducing carbon.

Targeting the Biggest Users

Five of the largest organisations in the city contribute the equivalent of 12% to the total city carbon emissions through emissions from buildings.

Well over one-third of the total floor space in the city is occupied by just 16 large private and public sector organisations¹⁰. Targeting the biggest users of energy represents a key opportunity to make significant carbon reductions. It also presents an opportunity to contribute to other energy initiatives such as district heating networks where large organisations are clustered together.



Energy Retrofit for the Public Sector

The London RE:FIT programme is an award-winning energy retrofit scheme designed to help public sector organisations achieve substantial carbon savings, improve the energy performance of their buildings and reduce their energy bills.

The scheme uses an Energy Service Company (ESCO) to implement energy efficiency measures and guarantee the level of energy savings. The programme can be used for a broad range of measures including insulation, fabric improvements, replacement of mechanical and electrical services equipment and can also cover the installation of CHP.

The Council has signed up to the scheme and has launched a project to retrofit a number of its largest energy consuming buildings. At the same time a second tranche of buildings will be selected potentially including buildings from other public sector partners to evaluate other retrofit options. The project will be supported in partnership with Scottish Government and Scottish Futures Trust to assess the potential for accelerating a retrofit scheme across the whole public estate in Edinburgh. Ultimately the programme will target all non domestic buildings in the city by 2020.



¹⁰City of Edinburgh Council, 2012

Smart Buildings

A three year partnership project with the University of Edinburgh will focus on ICT and energy efficiency. Using buildings in both the University and the Council, this innovative project will look at the role of ICT in informing building users of energy efficiency enabling them to control consumption.

Using building sensors and correlating with demand-related patterns and behaviours can enable building managers to monitor energy. Ultimately the project will deliver recommendations to improve public sector building energy consumption and help to meet carbon targets. One of the key outcomes of the project will be the creation of a "Living Lab for Energy". This will be established with building users to create solutions for energy reduction. The project has received funding and will start in April 2015.

Other Measures

The energy efficiency programme will also target businesses particularly small ones and develop programmes to assist with energy management. The Council runs the Business Gateway service which provides advice, support, workshops and events for new and existing businesses. Specific advice aimed at reducing energy consumption in small businesses will be developed and supported through targeted information.

Actions

Non-Domestic Energy Efficiency

- The Council will lead a large-scale energy retrofit programme targeted initially at the largest public sector buildings in the city and ultimately applying to all non-domestic buildings. The five year programme will aim to tackle all buildings in the city by 2020.
- In the first year of the plan work with the ten largest public and private sector organisations in the city and encourage the development of energy reduction targets. A programme will be rolled out over the five years of the plan.
- Expand the Schools Small Steps Programme and roll out to 20 schools in the city in the first year and then accelerate the programme.
- Profile and raise awareness of the implications of the EPC and Section 63 legislative requirements with commercial property owners in the city and trial a reporting system.
- Trial a system of green leases as an incentive to retrofit and share the benefits between landlords and tenants.
- Work with Resource Efficient Scotland to provide advice and support on energy efficiency to small businesses through the Business Gateway.
- Pilot a smart energy business district to test out the application of a number of energy efficiency measures such as smart meters.
- Implement the Smart Sensors project led by the University of Edinburgh.

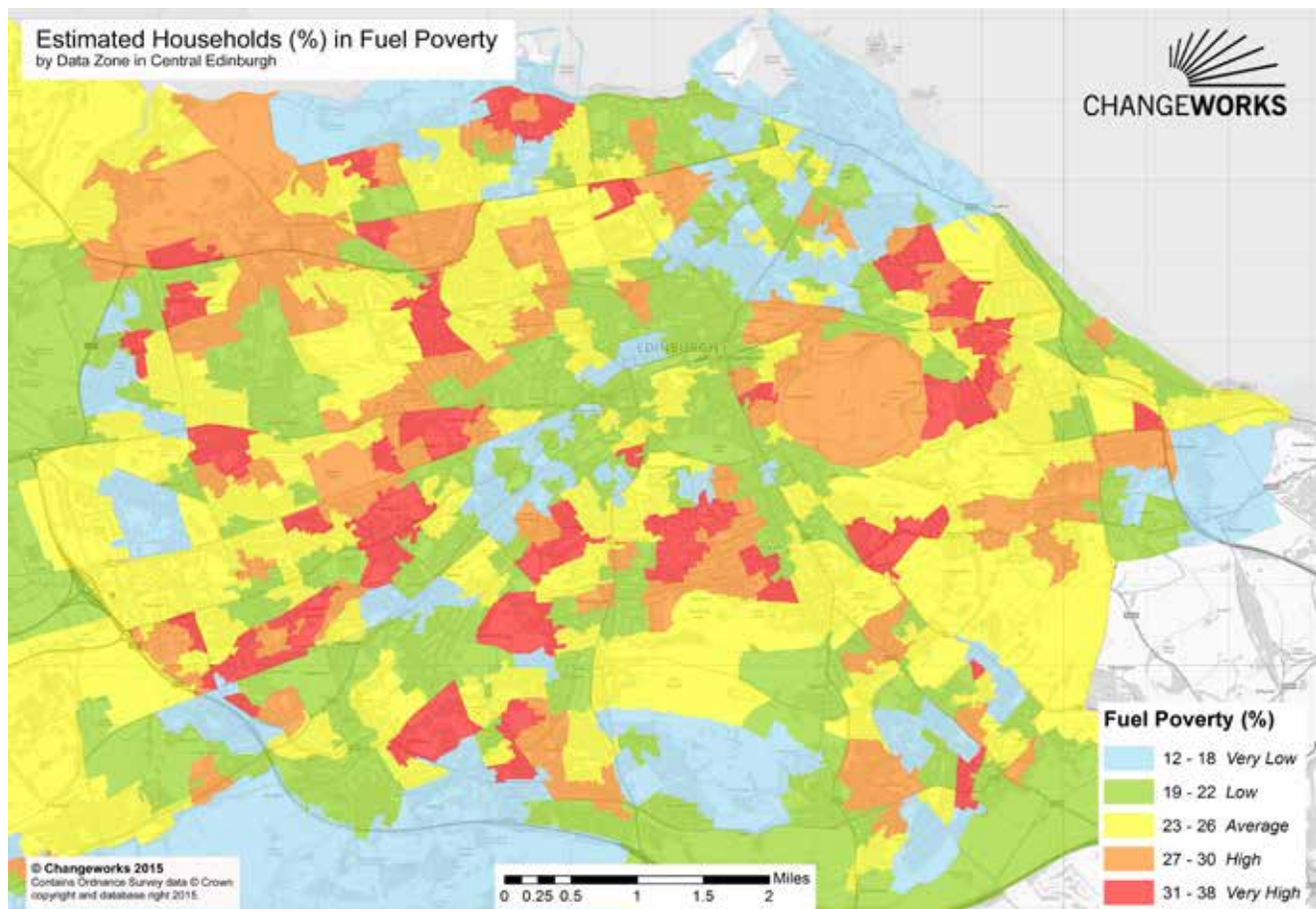
Domestic Buildings

The Council works with a range of partners including Changeworks, housing associations, the Energy Saving Trust and the Scottish Government to improve the quality of housing in the city, reduce carbon emissions and alleviate fuel poverty. The City Housing Strategy (CHS) has two key priorities – energy efficiency and fuel poverty.

A survey carried out in 2013 has shown that energy efficiency and the cost of energy are priority concerns for many tenants. An Energy Efficiency Standard for Social Housing (EESH) has to be met by 2020.

The 224,000 homes in Edinburgh are responsible for around 36% of carbon emissions and some 60% of those are privately owned. Some considerations are:

- Half of Edinburgh's homes were built before 1945.
- 66% of homes in the city are flats.
- A quarter of private homes in Edinburgh have a below average Energy Performance Certificate.
- Edinburgh has the highest number of private rented homes in Scotland at 25%.¹¹



Fuel poverty map

Council Housing

Over the last five years the Council has invested £30 million on improving the energy efficiency of existing Council homes, including insulation, double glazing windows and doors, upgrading heating systems and introducing district heating

systems to certain high-rise blocks. Further substantial investment of nearly £25million will replace or install heating systems in over 5,000 homes including further insulation and glazing.

¹¹ City of Edinburgh Council, City Housing Strategy, 2012-17

The Role of Housing Associations

The housing association sector in Edinburgh is very active in energy efficiency and in addressing fuel poverty. A range of projects have been developed which benefit tenants through energy efficient homes and lower energy bills. Some of the associations have piloted new technologies and schemes including the use of renewable energy.



Energy Advisers

Energy Advisers at three Edinburgh-based housing associations help their tenants to save money and energy through advice, support and events. Two advisers at Dunedin Canmore, two at Castle Rock Edinvar and one at Hillcrest have supported tenants over the last few years. The energy advisers from these organisations meet regularly to share good practice and experience. During 2013/14, one Housing Association reported that their adviser had visited around 360 of their 6,000 tenants and saved them a total of £43,605 through successful applications for the Warm Home Discount. The energy advice also helps tenants to stay energy efficient.

Private Housing

The City Housing Strategy aims to raise awareness of energy efficiency and fuel poverty across all housing including private sector homes, students and landlords. It will focus on promoting the Scottish Government's schemes such as the Home Energy Efficiency Programmes for Scotland (HEEPS). Edinburgh has been awarded £3.3 million for 2015/16 to fund schemes for lower-value homes and in fuel-poor areas.

The Importance of Behaviour Change

The Council works closely with Home Energy Scotland (HES), a free and impartial service, funded by the Scottish Government and managed by the Energy Saving Trust. These advice centres offer free advice to all types of households.

The Warm Your Home campaign started in early November 2014 to raise awareness with Council tenants of the existing advice available from HES and other sources.

The new Council campaign encourages people to get in touch with Home Energy Scotland for advice and help with energy efficiency, renewable energy, fuel debt and behaviour change.



The programme of training, advice and awareness-raising focuses on fuel poverty. However, consumers also have a very important role in emissions reduction and improving energy efficiency through avoiding unnecessary waste. The way in which energy is used in the home and at work for example, switching off lights and appliances when not in use has the capacity to save up to 20%¹² of total energy consumption.



¹²www.eea.europa.eu/highlights/can-we-save-energy-by

Actions

Energy Efficiency for Homes

- Build new energy efficient homes through 21st Century Homes, the Affordable Housing Investment Programme and the National Housing Trust scheme.
- Improve existing privately owned homes through the HEEPS:ABS programmes and promote free insulation to qualifying homes in the city.
- Improve Council homes through the capital programme to meet the Energy Efficiency Standard for Social Housing by 2020, following on from SHQS achievements.
- Raise awareness of grants, loans and incentives available to private landlords to improve their properties.
- Raise awareness of Home Energy Scotland and other advice resources through the 'Warm Your Home' campaign. Evaluate the effectiveness of this campaign and involve tenants in future communications planning.
- Consult the Tenants' Panel, Registered Tenants Organisations and Edinburgh Tenants Federation to gather tenants' views on investing in energy efficiency and tackling fuel poverty.
- Develop collaborative projects through the Housing & Energy Forum which brings together housing associations, the Energy Saving Trust, Changeworks, Council staff, tenant organisations and industry representatives.
- Explore options for renewable energy and low-carbon distribution for homes in Edinburgh.
- Smart Meter Street – a plan for trialling smart meters in streets across the city to demonstrate where and how to save energy.

Street Lighting

Replacing existing street lights with more energy efficient systems is a practical way of achieving carbon savings. The Council has responsibility for managing the 63,418 street lights across the city. These use over 300,000 kilowatts of energy per annum. A successful application for Salix funding in 2013 secured over £1.2 million to replace 7,200 street light units. This Phase 1 is underway and due to be completed by summer 2015. The Council will aim as part of the SEAP to retrofit the rest of the street lighting estate by 2020 in four further phases.

Stair Lighting

The Council currently has responsibility for providing a stair lighting service to 14,000 tenement blocks in the city serving up to 84,000 residents. The Council has agreed to install new energy efficient lighting systems in communal stairs across the city. This work will be carried out over the next few years replacing almost 90,000 fittings and bulbs.

Actions

Street and Stair Lighting

- The Council will replace all street lights with energy-efficient lighting systems by 2020.
- The Council will replace all stair lights in communal tenement properties with energy efficient lighting by 2020.

Programme 2: District Heating (DH)



A key objective of the SEAP is to develop a decentralised approach to energy.

A key component of this is district heating (DH), a highly efficient way of providing locally generated heat for

residential and commercial properties (seen in Figure 15). Modern systems allow heat to be effectively transported up to 30km from the heat source. The key benefit of installing a DH network is that it allows multiple buildings to be connected to a single boiler system and enables flexibility in heat provision.

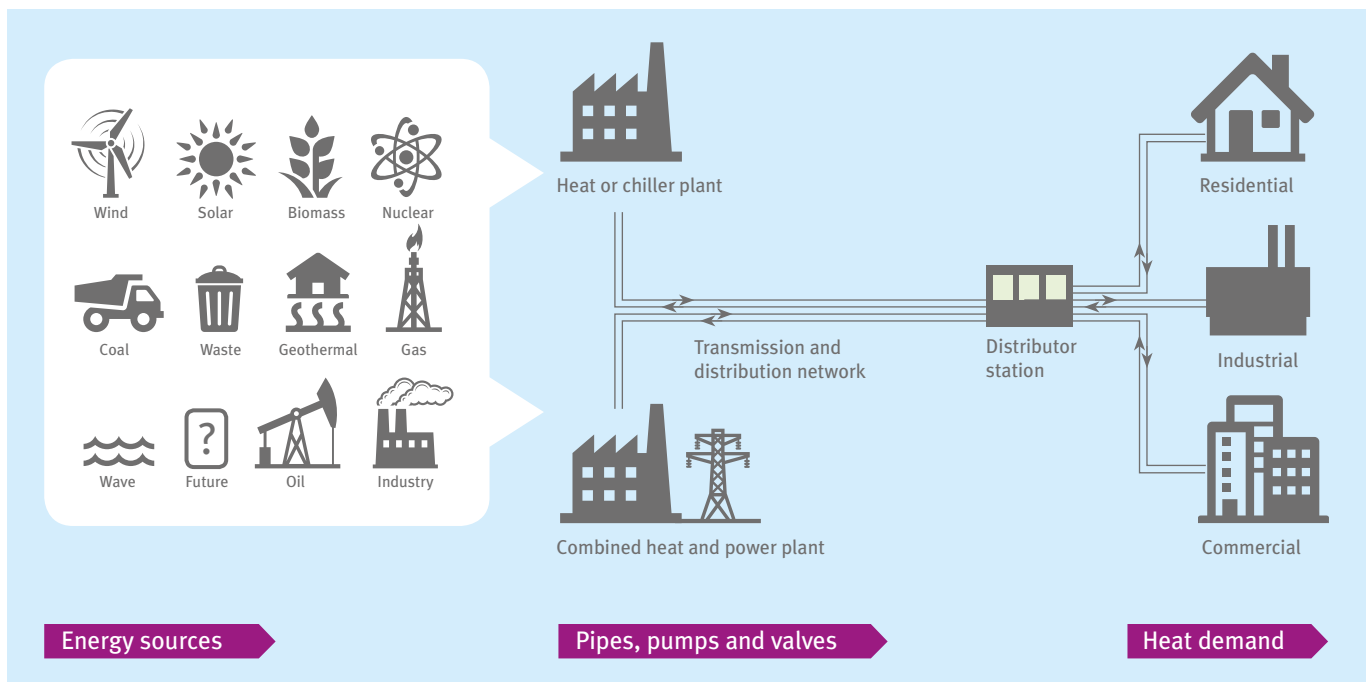


Figure 15: Schematic of a District Heating Network

The Role of the Public Sector

The Scottish Government has indicated that the public sector has a key role in developing DH. It emphasises the importance of the public sector estate in transforming the district heating market by providing ‘anchor’ loads (buildings with major heat requirements).

There are three specific roles identified for local government: (1) encourage developers to focus on alternatives to fossil fuel heating through the planning process; (2) use heat maps to plan decarbonisation initiatives in their local areas; and (3) establish frameworks to encourage businesses, industry and homeowners to minimise heat demand.

While Edinburgh has some smaller scale DH schemes there are a few larger schemes most notably those developed by the University of Edinburgh. The Council has also

A study by PB Power (2006) estimated that around 35% of heat demand for the whole of Edinburgh could be met from a decentralised energy strategy including a major push on district heating.

implemented its own schemes connecting over 380 homes to district heating schemes at Cables Wynd, Greendykes and Wauchope Houses and Combined Heat and Power in new build homes at West Pilton and Greendykes.

There are also opportunities to engage with larger organisations. In doing so, enabling measures will need to be put in place, including a comprehensive heat map to provide data on loads across the city and the use of any Council regulatory powers to encourage DH.

The Vision for Heating: Delivering a City Wide Network

It is important that rather than a series of individual schemes, there is a strategic and co-ordinated approach to DH in the city. In understanding what is possible, a schematic has been developed showing existing and potential schemes seen in Figure 16 below. This demonstrates the potential for connecting systems strategically across the city.

The Council will support this vision by considering what additional policy mechanisms need to be put in place.

While encouraging smaller schemes, the SEAP will aim to have a number of major developments up and running across the city by 2020.

The SEAP will begin the development of a city-wide network. This would need to identify the different elements of a heat network and the sequencing. Discussion is already underway with a range of partners in the city. The development of these schemes will boost economic growth and create new skills in sustainable technologies. Supplying heat efficiently via heat networks it will help to reduce costs to consumers and deliver affordable warmth.

Focus for DH in the SEAP must be two-fold – connecting as many existing buildings as possible to DH as well as creating new networks for future developments.

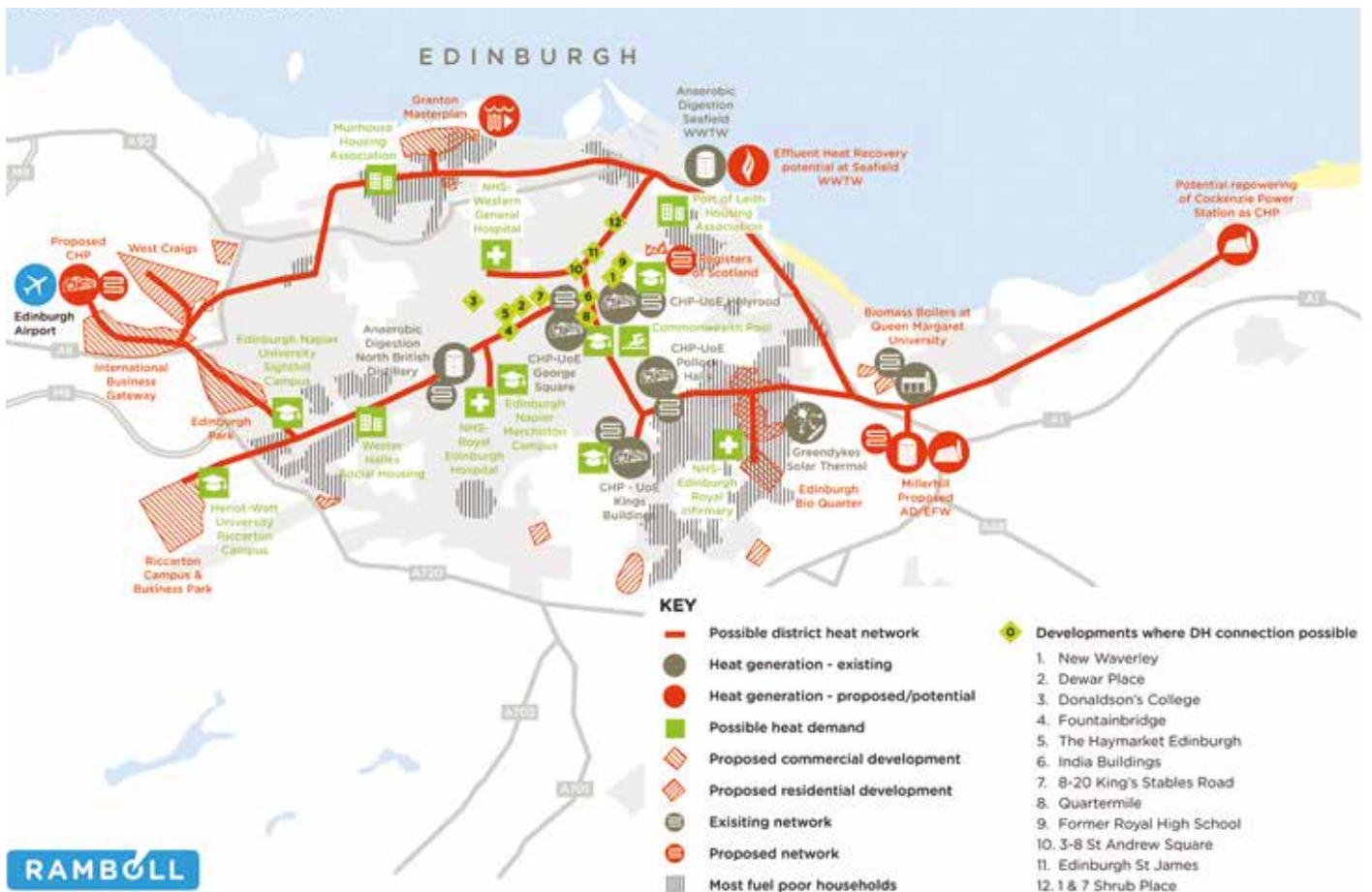


Figure 16: Proposed City Wide Heat Network in Edinburgh. Ramboll.

Current Feasibility Studies

A number of feasibility studies have already been carried out identifying potential DH schemes. The more significant studies include the BioQuarter, Fountainbridge and West Edinburgh. These are new-build developments. All are technically feasible, provide very reasonable rates of return and importantly offer significant carbon savings in terms of meeting the SEAP targets. A key aim of the SEAP will be to drive these schemes forward. Figure 17 below shows the carbon savings from the three schemes totalling between 15,400 and 22,480 tonnes CO₂ per annum once operational.

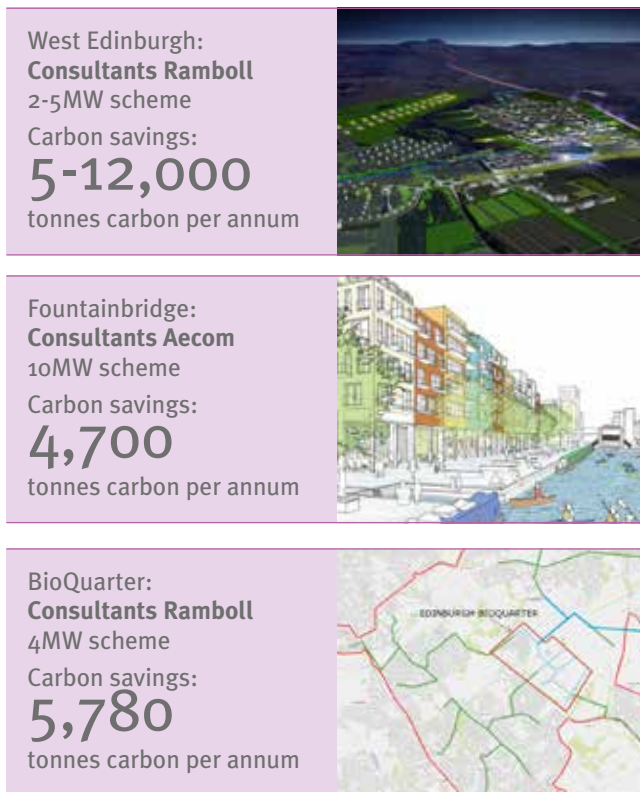


Figure 17: District Heating Feasibility Studies in Edinburgh

Council's Own Estate

The Council will review opportunities for establishing district heating networks with its own estate, including linkages with council housing. The more variable a heat load the better such as mixing housing with offices or linking schools with leisure centres etc. There are opportunities for the Council to develop new infrastructure for example in the refurbishment of major Council buildings. The Council will also partner with Edinburgh Leisure on exploring potential schemes.

Case Study

The BioQuarter

Located in the south east of the city, the BioQuarter has been identified by Scottish Government as an Enterprise Zone. Four partners Lothian Health, Scottish Enterprise, University of Edinburgh and the City of Edinburgh Council commissioned a feasibility study into creating a district heating network for the site and explore the potential for expanding the network in the surrounding area.

The study identifies the opportunity for a DH network, using a gas fired DH system and suggests the carbon savings over the lifetime of the preferred scheme are 144,515 tonnes CO₂ – an annual average of 5,780 tonnes per annum.



Other Development Opportunities

Engagement with the public and private sectors in retrofitting opportunities and with developers for new schemes is crucial to expanding DH across the city. While discussion with both has indicated interest in creating future heat networks, there is still a perception that DH is technically difficult. Countries such as Denmark and Germany have had DH for over 40 years and have seen a number of benefits including more affordable energy and lower carbon emissions.

As part of the SEAP, there will be engagement with the Edinburgh Developers Forum and the Edinburgh Business Forum to promote the benefits of district heating and encourage take up. Specific guidance on DH will be produced for developers to assist with energy schemes which will become part of the Edinburgh Premium service for new developers and investors.

The new St James Quarter will be a major new retail development in the heart of the City. This will include an Energy Centre with combined heat and power.



Heat Mapping

Heat mapping is an important tool to help identify locations where heat distribution is most likely to be beneficial and economical. It can be used to identify individual buildings and groups of buildings which could benefit from heat distribution networks. Heat maps can utilise information on both demand (domestic, industrial and commercial) and supply for renewable heat. The Scottish Government has developed a heat mapping tool for local authorities based on using standard GIS methodologies. A new heat map for Edinburgh will be produced.

Actions

District Heating

- Publish an Edinburgh District Heating Strategy that provides the framework for establishing a city wide heat network for public and private sectors and the policy drivers to achieve this.
- Publish a heat map for Edinburgh that will identify the major heat loads across the city. This will be developed in partnership with key public and private sector partners.
- The Council will carry out an evaluation of its own estate and assess the opportunities for connections to existing buildings.
- Produce guidance for developers on district heating and engage with the Edinburgh Developers Forum.
- Working with partners, take forward the district heating scheme at the BioQuarter working with partners with the aim of a scheme up and running before 2020.
- The Council will work with EDI (the developer) to deliver the district heating scheme at Fountainbridge.
- Engage with a wide range of partners in the public and private sectors as to existing schemes and the potential for expansion and connections.



Programme 3: Renewables



The aim of this programme will be to expand the use of renewable technologies for both electricity and heat across the city and integrate these into buildings, assets and infrastructure.

The range of options includes heat pumps, biomass, solar energy, biofuels, tidal and geothermal. Exploring these can help to support the market demand for particular types of technologies, stimulate new supply chains, provide investors with confidence about returns, increase wider benefits for consumers and generate cleaner energy. If projects are scaled up, they can contribute significantly to meeting carbon targets.

A key objective of the SEAP will be to develop a supportive regime for installing renewables. Currently there is a lack of awareness of the potential opportunities across Edinburgh and no strategic policy framework to assist with installations. This awareness needs to be developed further. The main aim of any review would be the identification of investable renewable projects to power Edinburgh's homes, public and commercial buildings.



1,000 households in Edinburgh installing a typical PV system could save around 1,500 tonnes of carbon. However 50,000 households could save in the region of 75,000 tonnes of carbon per annum.

Micro Renewables

The amount of energy produced from microgeneration in Edinburgh is very small. In 2012 this was less than 0.2MWe or 0.12% of total microgeneration in the UK and mostly from photovoltaic panels (PV). However in 2014, this figure had increased by over 10% to 1.6MWe leading to the Council coming first in the Scottish National Renewables League.

An advantage of renewables is their potential to generate income through Government schemes such as the Feed in Tariff (FiT) for electricity and the Renewable Heat Incentive (RHI) for heat. These schemes encourage the installation of renewables into existing buildings and apply to both domestic and non-domestic consumers.

For electricity, the Energy Savings Trust Scotland has indicated that a 4kWp PV system in Scotland can generate about 3,100 kilowatt hours of electricity a year – more than three quarters of a typical household's electricity needs.

The Use of Renewable Technologies

In a dense city like Edinburgh, the use of some renewable technologies such as wind is limited. However there is a wide range of other renewable technologies available. Some of these technologies are now well established while others are not yet in widespread use. The SEAP aims to encourage the use of renewables across the city and so will trial new approaches and develop pilot scheme. Projects will also be assessed in terms of their potential for scaling up across the city and maximising carbon savings.

A number of specific project opportunities will be evaluated as part of the SEAP seen in Figure 18 below:



Figure 18: Opportunities for Renewables in Edinburgh

Biomass

Due to concerns about air pollution and particulates, the Council currently has a planning policy on biomass where any application will be decided case by case. Specific issues such as the size of the scheme, location and supplies of fuel will be taken into account along with the potential of the system to minimise particulates.

Community Renewables

An objective of the SEAP is to support community-led energy projects. Community renewable schemes can deliver a range of social and economic benefits to local communities. These include developing skills, knowledge and locally generated revenue that can fund further energy projects for the community. Local businesses can benefit as the planning, surveying and engineering works can provide local employment, and the income from the schemes strengthens the local economy. Being involved in community renewables schemes can help to build confidence, leading to engagement in further schemes.

The Scottish Government target is to generate 500 MW of community and locally owned energy by 2020. A toolkit has been developed to encourage and help communities developing projects. The Council will look to support this by providing an Edinburgh guide on developing schemes. This will cover liaison with the Council, information on issues to be addressed (such as planning and any other regulatory requirements) and key contacts.

Actions

- The Council will publish a new policy on renewables and study into their application in Edinburgh including the potential for new jobs and skills.
- In partnership with Greenspace Scotland the Council will pilot heat pumps in three parks and monitor their performance.
- The Council will assess its own estate for renewables potential.
- Community Renewables schemes will be supported and a new guide drafted to provide advice and information.
- The Council will lead a review into the potential for solar farms on unused Council land or former landfill sites.
- In partnership with Home Energy Scotland, develop a Make Energy Make Money campaign for domestic users to install renewables where appropriate.
- Explore the potential for large-scale application of solar PV canopies for car parking.
- Trial a pilot using biofuel in the Council fleet and extend to other partners with large-scale fleet e.g. Lothian Buses.
- As part of the redevelopment of Saughton Park, the Council will evaluate a potential micro hydro site at the Water of Leith.

Programme 4: Resource Efficiency



Natural capital is nature's ability to renew and provide resources. These resources include water, land, minerals and timber and are not finite. Human activities are consuming these inefficiently, producing more waste leading to increasing carbon emissions.

This means that there is a need to find new sustainable methods of production, address wasteful consumption and develop new uses for products previously considered 'waste'. This programme aims to address these issues and the potential for reducing carbon emissions as a consequence.

Energy from Waste

For the purposes of the SEAP, energy from waste refers to the potential use or capture of energy from any solid or liquid waste source to generate heat or electricity. Solid waste streams such as contaminated wood, chicken litter, brewery waste, etc. can be used as a fuel source to generate energy however air quality needs to be maintained. The capture and use of methane gas from landfills or from sewage works can be burned to run gas engines and produce electricity. Used cooking oil can be refined into different types of biofuels which typically have a lower carbon content.

New technologies are now well proven to capture heat from the millions of litres of hot water from showers, washing machines etc. which maintain a fairly constant temperature travelling through sewers to waste treatment works.

The Council is partnering with Scottish Water to investigate the potential of capturing waste heat from sewage pipes in the city. Technology exists using filters and heat pumps to capture the waste heat from wastewater and transfer it to clean water streams entering buildings. This provides a cleaner and renewable source of heat for buildings.

Reuse and Repair

Thousands of tonnes of waste are thrown out by households each year ending up in costly landfill sites and adding considerably to carbon emissions.

Finding alternative uses by reusing and repairing can divert this waste from landfill and save carbon. There are a range of organisations in the city actively involved in re use and repair of a range of items including, textiles, furniture, bikes, electronic and white goods. Some cities are now setting up larger reuse and repair services or centres. The Council will look to support these organisations and work in partnership to develop further projects.



Edible Edinburgh

There are considerable carbon emissions from the production and consumption of food. Representatives from the public and private sectors in the city have developed a Sustainable Food City Plan. This initiative is engaging with residents to transform Edinburgh into a city where good food is available for all. It has key actions aimed at local food sourcing and reducing food waste all of which will have an impact in helping to reduce emissions in the city.



Circular Economy

For businesses in particular there can be benefits to being more resource efficient including carbon reduction and cost savings. Addressing the inefficient use not just of energy but also of water and waste can provide a range of benefits.

A new concept is the 'circular economy' moving away from a linear economy to a more closed loop in which materials are retained within productive use for as long as possible. This can offer businesses new commercial opportunities, greatly reduce resource (waste) costs, and protect against resource shortages as well as helping to reduce carbon emissions. The Scottish Government has signed up to this concept and is looking to introduce a new Circular Economy 100 Initiative in 2015.

Case Study

Zero Waste Project

This will be a key project for the SEAP. The Zero Waste Project is a partnership initiative with Midlothian Council to procure facilities for the treatment of up to 135,000 tonnes of residual waste and 30,000 tonnes of food waste per annum collected by the two Councils that is currently disposed of in landfill sites.

Alauna Renewable Energy (ARE) has been appointed to construct and run an Anaerobic Digestion plant which will recycle over 95% of the food waste it receives, producing an agricultural fertiliser/soil improver for use on local arable farmland plus electricity for the National Grid. Construction is underway with the plant due to be operational from the start of 2016.

FCC has now been appointed as preferred bidder to construct and manage the Millerhill Recycling and Energy Recovery Centre, planned to be operational from the start of 2018. This facility will be capable of treating all the residual, non-hazardous waste collected from households and business within the Edinburgh and Midlothian areas. Metals will be extracted for recycling before the remaining non-recyclable waste is burned as a fuel to generate electricity for the National Grid. The thermal treatment process will produce approximately 46,500 tonnes per annum of bottom ash which will be recycled off-site by a third party for use in the construction industry.

By using proven energy from waste technology, the Energy Recovery Centre will generate up to 11 MW of electricity – enough to power approximately 26,000 homes, and up to 20MW of surplus heat will be produced, enough to meet the average heating needs of approximately 10,000 homes if connected to a district heating scheme.



Festivals Edinburgh

With the support of Creative Carbon Scotland, Edinburgh's 12 major Festivals work together to implement a rigorous environmental strategy which covers carbon measurement, reporting and reduction; embedding good environmental practice in the core business of the Festivals; and a range of initiatives helping partners to reduce carbon emissions.

These include the Re-Use and Recycle Days at the end of the Edinburgh Festival Fringe, enabling companies to avoid sending materials to landfill. The Green Venue Initiative helps venues publicise their environmental action to audiences; and the Edinburgh Mela supports sustainable audience transport. Building on this, four of the Festivals are working with Creative Carbon Scotland towards certification in ISO20121, an internationally recognised sustainable events management system.



Actions

Resource Efficiency

- The Council in partnership with Midlothian Council will progress the Zero Waste Project processing up to 130,000 tonnes of mixed waste annually through the Recycling and Energy Recovery Centre and anaerobic digestion plant.
- Taking forward the 2014 Sustainable Food City Action Plan, a three year plan with key actions for more sustainable food in the city.
- The Council will look to join the Scottish Circular Economy 100 programme which will be launched by Zero Waste Scotland in 2015.
- Promote the Resource Efficient Scotland advisory and support service to Edinburgh's business community, using the Business Gateway service as a point of contact for interested businesses.
- The Council will engage with organisations involved in reuse and repair activities in the city and seek to develop initiatives and projects which benefit carbon reduction.
- The Council will work in partnership with Scottish Water to evaluate a scheme piloting waste heat from sewage pipes.

Programme 5: Sustainable Transport



While Edinburgh has a high rate of public transport usage, transport emissions in the city still accounted for 21% of all emissions in 2012.

Figure 19 below shows how Edinburgh's residents travelled to work over the period 2012-13. It can be seen that over half of all journeys are carried out using sustainable modes of transport with a large percentage using the bus or walking to work reflecting Edinburgh's compact density as a city.

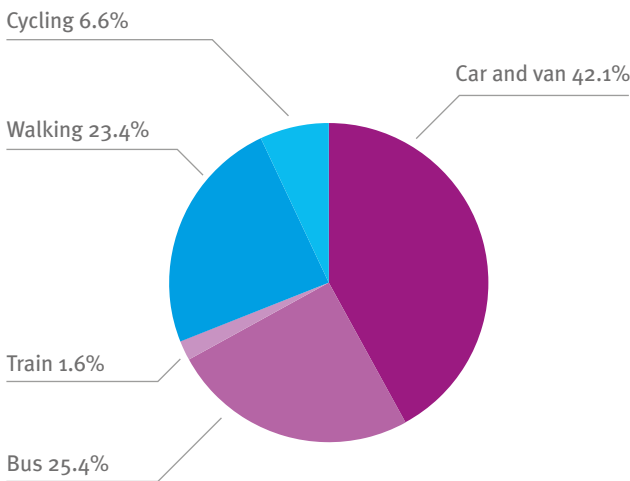


Figure 19: Modes of Travel to Work in Edinburgh, 2012-13

Source: Scottish Household Survey Data

This SEAP programme aims to support the work of the Council's Local Transport Strategy 2014-19 by developing initiatives specifically aimed at reducing carbon emissions from transport. This will also support the Active Travel Action Plan which sits at the heart of the Local Transport Strategy, in helping to meet targets through sustainable and active travel programmes.

The SEAP will also work with partners on a major programme to substantially increase the number of electric and hybrid vehicles in the city including cars, buses and vans and ensure that there is infrastructure in place to support this. An important element of this work will be to ensure that the electricity generation for the vehicles is decarbonised.

Travel Planning

Informing people about the travel choices available to them and allowing them to change their travel habits by using viable alternatives to car use is a simple but effective way of reducing carbon emissions. The target audience for journey planning is quite varied; residents are a key focus particularly within Edinburgh as 70% of residents work within the city boundary.¹³

Schools offer great opportunities to engage with a younger generation on the merits of active and sustainable transport. Businesses are another important sector accounting for almost a quarter of all travel. As the second largest employer in the city the Council needs to set an example of best practice in travel planning and encourage other larger employers to do the same.

Active Travel

Increasing the number of Edinburgh's residents that walk, cycle or use public transport has huge potential in terms of reducing emissions.

The City of Edinburgh Council became the first UK signatory of the Velo-City Charter of Brussels, and is now working to achieve 15% of journeys to work by bike by 2020 setting an unprecedented 7% of its transport budget for cycling initiatives. In order to increase the number of residents choosing to walk or cycle, these modes of transport need an infrastructure that is attractive, safe and secure.

Street design guidance needs to take account of cyclists' needs to ensure that the road network is cycle friendly and joined up. Another issue that inhibits the use of cycling as a transport option is wider infrastructure, such as bike storage. Pilot schemes to address this issue are now being tested in the city.

¹³Business Register and Employment Survey, 2014

Public Transport

Edinburgh is well served with a high quality bus service across the city. With a concentration of jobs and services in the city centre, this service is well used by the city's residents. Public transport remains an attractive choice for journeys in and around the city. The introduction of the tram has added a valuable new high-capacity, high-quality service that has built on the public transport infrastructure.



Case Study

Lothian Buses

Edinburgh's Lothian Buses is making significant progress on its green agenda contributing significantly to reducing carbon emissions.

With a fleet of over 650 buses running predominantly on urban routes, cutting air pollution and fuel use for its diesel engines is critical. The company has heavily invested in new technology and by the end of 2014 had 65 hybrid buses in service. It has also retrofitted 45 buses with low emission selective catalytic reduction technology exhausts (SCR).

Through the introduction of innovative technology, including; alternative fuel use, retrofit technology and engine reprogramming throughout its bus fleet, the municipal company has achieved impressive emission improvements. The company has achieved cuts to its carbon footprint of over 2,000 tonnes per year. To add to this, a successful marketing campaign was run which has encouraged new passengers, moving away from cars and on to buses.

Looking to 2020, Lothian Buses' decarbonisation agenda is only growing in ambition. Its targets include for 15% of its fleet to be hybrid buses by the end of 2015, 50% of its fleet to be EURO V or better by 2017, and to introduce electric plug-in hybrid (EURO 6) into the fleet by 2016. Lothian Buses is also targeting energy use across its estate with plans to source 100% of its office energy from renewables by 2015.

Electric Vehicles

While any car can still contribute to congestion, electric vehicles offer the benefits of zero emissions at the point of use and lower fuel costs than similar internal combustion vehicles. Hybrid and fuel-cell powered vehicles also contribute to reducing emissions.

There are now over 30 charging points across the city installed at a range of sites. The Scottish Government is supportive of electric/hybrid vehicles and through Transport Scotland's Plugged in Places initiative has provided funding to public sector organisations for vehicles and infrastructure.

A similar scheme for householders who have bought a hybrid or electric vehicle provides funding of £5000 to install charging points in their homes. This however has had a lower take-up. The Council is developing an Electric Vehicle Strategy aiming to create 1000 charging points right across the city for residents, commuters and visitors by 2020.



Green Fleet

Many organisations have fleet vehicles or staff using cars on business all of which contribute to carbon emissions. One way of addressing this is through 'green fleet reviews'. Organisations such as the Energy Savings Trust provide reviews and 'health checks' which can include transport needs assessments and travel planning reviews. These programmes are designed to reduce unnecessary travel, address fuel efficiency, promote eco driving and assess technologies such as alternative fuels and electric vehicles. The SEAP will encourage the adoption of this approach.



Case Study

Edinburgh City Car Club

The Edinburgh City Car Club is the second largest outside London and has built a network of more than 130 vehicles ranging from small city cars to vans and electric vehicles.

Independent research by Carplus shows that an average of 25 private cars is taken off the road for every car club vehicle. This is because new members often sell their own car or defer buying one. Furthermore, City Car Club members think more carefully about each trip they make in a car and make greater use of alternative travel options such as cycling, public transport and walking.

Over the period 2015-2020, City Car Club will be increasing its sustainability agenda with more ambitious targets. These include adding ten more electric vehicles to its fleet, increasing its electric Fleet to 10% by 2020 and increasing the number of electric vehicle charging points at City Car Club bays throughout Edinburgh.



Edinburgh Trams

With 27 modern electric vehicles the new Edinburgh trams are making a positive contribution to the city's carbon footprint and encourage a shift from car to tram use.

The trams will also help the city cope with the increased demand for public transport in the next decade. They are electrically powered and will have zero on-street carbon emissions. This will also result in improved air quality across the city as a whole and as the grid is decarbonised, less of a carbon footprint. The trams also have regenerative braking which means energy that would otherwise have been wasted, can be used. A feasibility study will be commissioned to investigate expanding the tram route.



Actions

Sustainable Transport

- Delivery of the Local Transport Strategy. This includes a wide range of measures such as the Active Travel Action Plan to address active travel, walking and cycling, meeting the Charter of Brussels commitment to get 15% of commutes taken by bike by 2020 and a range of initiatives to encourage sustainable transport.
- The Council will implement an electric vehicle strategy aiming to substantially increase the number of charging points across the city by 2020.
- In the first year of the plan the Council will target the 10 largest employers in the city to implement sustainable travel plans, with the aim of developing a rolling five year programme.
- A new Council Staff Travel Plan to be published in 2015.
- Promotion of the Green Fleet Health check carried out in 2015 and to roll this out to other organisations.
- Investigating options for reducing the emissions from freight transport.
- The City Car Club will increase its electric vehicle fleet by 10 in 2014/15 (carbon saving – 19,000 kg pa) and aim for EV's to be 10% of the fleet by 2020 (carbon saving 36,100 kg pa).

Lothian Buses

- 15% of Lothian Buses fleet will be hybrid buses by end of 2015.
- 60% of the fleet to be Euro V or better by 2017
- Introduce Electric Plug In Hybrid (Euro 6) into the fleet by 2016.
- Electric charging facilities available to the public from infrastructure put in place for the plug in Hybrids.
- Use of electric vehicles by Lothian Buses service vehicles.

Supporting Measures

Infrastructure and Controls

The infrastructure that provides and supplies our energy includes the network of grid, powerlines, cables and pipework supplying gas and electricity. Renewable energies particularly solar and wind are intermittent and inflexible.

Because the SEAP aims to increase the percentage of these across the city, the grid needs to be able to balance this variable supply with fluctuating demand. The Council is partnering with Scottish Power (the city's Distribution Network Operator) to assess future capacity and demand in the city.

Innovation

Innovation in energy and carbon has real potential to drive the transformation of energy supply and use and create a 'smart city'. New technologies for renewables, energy storage, next-generation biofuels, hydrogen fuel cells, new building materials and intelligent sensors are advancing the agenda at an increasing rate. Edinburgh is fortunate in having world-class universities with a range of specialists, expertise and research initiatives in energy and carbon who collaborate with the Edinburgh Centre for Carbon Innovation.

A key requirement of the SEAP is the need to work closer with universities and innovators, continually reviewing potential opportunities. The SEAP will aim to foster closer links with academia and innovators and encourage demonstration projects tested in the city that lead to a reduction in carbon.

The Role of Planning

The role of planning has an important contribution to the SEAP and in particular in encouraging infrastructure such as district heating.

The Scottish Planning Policy (SPP) states that local development plans (LDPs) should identify where heat network, heat storage and energy centres exist and include policies to support their implementation. LDPs should also support the development of heat networks in as many locations as possible, even where they are initially reliant on carbon-based fuels if there is potential to convert them to run on renewable or low-carbon sources of heat in the future. The new Edinburgh LDP promotes delivering low or zero-carbon technologies within major new developments. The SEAP will assess whether any additional policies are required to support the SEAP programmes such as district heating.

Community Organisations

There are a number of community groups and organisations in Edinburgh engaged in projects to reduce carbon emissions, including the Transition Edinburgh groups, PEDAL (Portobello) and Greener Leith as examples.

These groups actively promote sustainable living in communities and develop projects about food, energy efficiency, waste and recycling and transport. There are examples of community renewables schemes, farmers markets, awareness and training projects and work with schools.



The SEAP will engage with groups across the city and develop further projects to raise awareness of the benefits of low-carbon agendas. The Council will host an annual “energy fair” in partnership with Transition Edinburgh and other organisations that will encourage participation from community groups, the public and other stakeholders. The event will enable an exchange of information about carbon and energy projects across the city and also review progress on the SEAP. Each year there will be an opportunity to develop new ideas and initiatives that meet the SEAP’s ongoing aims and objectives. A network of interested groups will be set up as part of the Energy Fair and a website created to allow groups to keep in contact with each other.

Procurement

Large private and public organisations have considerable buying power. This gives them a great opportunity to develop sustainable procurement policies which help them reduce the carbon impacts of their goods and services. The Council has already developed such a policy framework that addresses carbon emissions as part of the supply chain and that might result in cost saving opportunities. The Council will promote this approach to other organisations in the city.

Economic Development

One of the key outcomes of the SEAP is to maximise the economic benefits for the city. This includes job creation, skills development and the potential for new supply chains. In Edinburgh, the Low Carbon Environmental Goods and Services¹⁴ sector (LCGES) is estimated to be worth £1.64 billion (assuming Edinburgh assumes a share proportional to the share of the Scottish economy). The largest of these is the low-carbon sector estimated as worth around £724m. Renewable energy is estimated at £534m and environmental services £381m.

Actions

Low Carbon Economic Development

- Attracting green inward investment and working to minimise environmental effects from development and regeneration. Actions include: developing Edinburgh’s reputation for being a green city; building on traditional strengths in sectors such as finance and, research and development; supporting development that delivers on other areas of the SEAP, such as district heating and transport.
- Supporting businesses, including: helping them become more resource efficient and well placed to take advantage of opportunities arising from the SEAP; support for accessing funding and developing a network of businesses that operate in the sector that will enable sharing of best practice and help develop local supply chains.
- Seeking to ensure there is a skilled workforce to take advantage of jobs in the low-carbon sector. This will include detailed research into the economic opportunities in the low-carbon sector, (including from the SEAP) and communicating these to education providers.



¹⁴Department of Business Innovation and Skills 2013

Working in Partnership

Smart City Solutions

ECCI is a hub for the knowledge, innovation and skills required to create a low-carbon economy. Located in Edinburgh and building upon the best ideas from around the world, the ECCI provides the place and space for 'low-carbon leaders' and networks from business, finance and the public sector to work together to deliver a low-carbon future.



Actions

The Council will partner with the ECCI specifically. Actions include:

- The Council will become involved with the ECCI Sustainable Product Trials Network, in trialling innovative low-carbon products and services with other organisations. This will help to enhance carbon management particularly across the Council estate.
- The ECCI Smart Accelerator project works on identifying projects related to energy, infrastructure and mobility. The ECCI will look at applying a similar process for prioritising smart projects in and around Edinburgh that link with current and future SEAP objectives.
- The ECCI Ideas Lab provides support, mentoring and world-class accommodation for inspirational low-carbon ideas, particularly for business, public and third sector organisations. Working with the Council, the ECCI will identify candidates for support that align with SEAP objectives.
- The ECCI will continue to bring together groups to work around relevant issues such as buildings, pollution, transport, financial models, using its policy connections (through ClimateXChange) and business innovation networks to meet the SEAP objectives.

7. Implementing the SEAP

Effective delivery and monitoring of the SEAP is crucial to its implementation. This section describes the measures that need to be developed to assist delivery and the mechanisms for reporting on its progress. An important requirement will be resourcing the SEAP in terms of both appropriate staffing and funding for actions.

Leadership

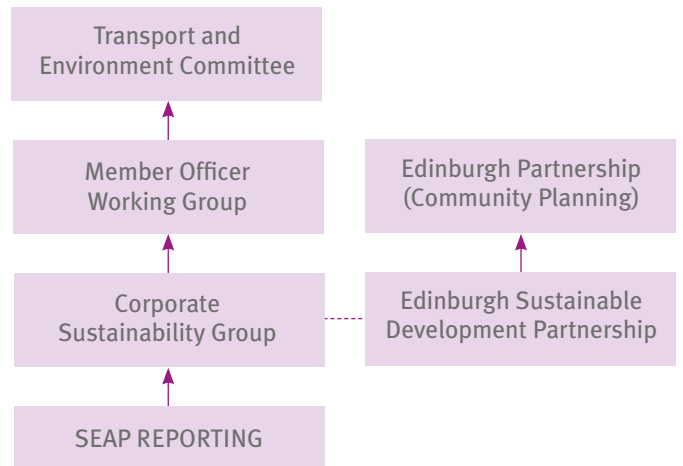
The Council will appoint a SEAP champion and lead by example, prioritising actions for energy and low carbon within its own buildings and services. It will take the leadership role for the city encouraging other public-sector organisations, communities and businesses to become involved in sustainable energy. The Council will look to harness the expertise within businesses and universities to maximise benefits for the SEAP. The Council will provide strong governance and monitoring to ensure the action plan is delivered. In terms of communication regular updates to a range of stakeholders are vital.

A Communication Plan for the SEAP will be developed setting out the actions for ongoing engagement and consultation with all sectors in the city. This will also address how information and updates will be disseminated.

Governance

To ensure effective implementation of the SEAP, robust governance mechanisms will be required at both the strategic SEAP level and the individual project level. The Council will lead on both, setting up clear governance processes that provide clarity on the roles, responsibilities and accountabilities for projects ensuring there are sufficient resources and skills to deliver projects. In terms of accountability, the plan will be reported to the Council's Transport and Environment Committee. Internal consultation within the Council will include reports to the Member Officer Working Group on Carbon Climate and Sustainability. SEAP reports will be submitted to the Corporate Sustainability Working Group. External liaison will be through groups such as the Edinburgh Sustainable Development Partnership and the Edinburgh Business Forum.

All projects will be expected to have appropriate project plans and business cases with clear lines of responsibility. In the case of larger infrastructure or strategic projects these may have to have their own project governance with project plans, resources and reporting structures.



A key component of governance will be to carry out gateway reviews to account for any substantial changes in circumstances, technological advances or fundamental changes in government policies and practices that might affect progress. These reviews are also invaluable in highlighting risks and issues facing the internal project teams. A particular focus for any SEAP review will be the progress towards the carbon targets and the performance of projects in reducing emissions. Two Gateway Reviews will be carried out at the end of Year 1 and Year 3 and reported to Committee.

Resources

The successful delivery of the SEAP will depend on appropriate levels of resources in place. There will be a need for a new SEAP team within the Council to oversee the plan and monitor and co-ordinate the range of projects and initiatives. Some of the larger infrastructure projects with complex delivery arrangements will need technical and specialist expertise. In the first six months of the SEAP, delivery plans for some of the more complex projects will be developed where significant collaboration is required. These will provide more details on funding, partners, milestones and outcomes.

Across the city and nationally there is expertise and knowledge that could be used in delivering the SEAP. There may also be a number of organisations that can assist the Council specifically with additional resources to oversee the SEAP. Some of the most important resources will be the input from communities across the city to achieve a low-carbon future for Edinburgh.

Funding

There is a wide range of funding schemes available for energy projects including government grants, EU finance schemes, private-sector investment and other equity schemes. Public-sector pension funds are also now assessing investment in larger scale projects. The city is home to the Green Investment Bank which can offer funding for larger infrastructure schemes such as street lighting and district heating. Some of these funding schemes are open only to local authorities while others are available to community organisations. A number of schemes also require partnership approaches.

It is important to consider both capital expenditure and operational expenditure through a whole lifecycle energy cost model, so that the best approach can be taken when investing in new buildings and refurbishments. Often, capital expenditure and operational expenditure are separated so that the long-term cost-effectiveness of actions is not fully understood.

There is funding in place for some of the projects already while others will need to acquire this. The total costs will be known once detailed business cases have been developed. This is particularly the case for some of the larger projects. What is clear is that significant additional investment will be needed for a number of projects if the targets are to be met. All the sources of funding highlighted above will be explored further as will any innovative approaches to funding projects.

The Council has set up a new funding team. This resource will be used for the SEAP.

Horizon 2020 Smart Communities

The Council is partnering with the Edinburgh World Heritage Trust and others to submit an application to the EU Horizon 2020 – a major research and innovation fund.

This initiative will focus on integrating energy, waste and transport projects through the innovative use of ICT including addressing issues such as the energy retrofitting of listed buildings.

These initiatives will have a positive impact on carbon emissions in the city.

Delivery Models

Delivering the range of energy projects proposed in this SEAP will require robust delivery mechanisms. A number of local authorities and other public sector agencies have developed different models to deliver projects. One model is where a structure is set up that seeks to deliver a range of energy services and takes on the project manager role, in some cases assuming the technical and performance risk associated with an energy project. Generically these models have become known as energy services companies (ESCOs).

Energy for Edinburgh

The Council has agreed to set up a new energy services company. This will be a strategic structure wholly owned by the Council which will oversee energy initiatives across the city. The ESCO is being seen as the main delivery vehicle for a number of major projects in the SEAP. It will be key to driving forward energy projects and in particular focusing on developing the scale of projects necessary to achieve considerable carbon reduction.

The ESCO will have four objectives:

- To deliver affordable energy with a focus on fuel poverty.
- To reduce carbon emissions.
- To encourage wider community benefits.
- To generate potential income.

The Company will be governed by a Board of Directors with a detailed business case setting out the initial activities and focus of the ESCO. In the longer term the ESCO will be able to initiate its own projects and deliver a wide range of benefits for Edinburgh.

Monitoring and Reporting

An annual report will be provided to Committee every year outlining progress on projects and where possible an assessment of carbon reduction. For the Covenant of Mayors requirements a more in-depth report will be prepared every two years. This will monitor every action for progress to date and evaluate the quantifiable results if possible. Where necessary initiatives may be reviewed and modified to ensure progress and new initiatives added to the action plan as needs emerge.

8. Contacts and Further Information

Becoming Involved

The SEAP is a city wide plan, not just a Council document. It is essential that everyone becomes involved and that all who live and work in the city can play their part in reducing carbon emissions. The SEAP will therefore be constantly evolving and changing to reflect this involvement with as many stakeholders as possible.

Actions to engage organisations, neighbourhood partnerships, community groups, businesses etc will be developed.

Endorsement for the SEAP will be sought from larger organisations both public and private across the city. Without their engagement and active participation it will be difficult to meet the targets.

Contacts

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Action No.	KEY ACTION	Direct/Enabling, Delivery	OTHER KEY STAKEHOLDERS/PARTNERS	RESPONSIBLE (Lead Partner)	Expected CO2 savings in kilotonnes of carbon	Project Start	Project End	Funding (RAG)
	Buildings							
1	CEC Carbon Management Plan	Direct	-	CEC Corporate Policy and Strategy	17.29	Q1 2015 ongoing	2020 ongoing	
2	Integrate SEAP to major Plans, Policies and Strategies	Enabling		CEC Service Areas	Unknown	Q1 2015	Phase 1, Q1 2016	
3	Large scale energy retrofit programme for nondomestic buildings (phase 1)	Direct	Public and Private sector partners	CEC (ESCO)	7	Q1 2015	Rolling programme.	
4	Development of carbon management plans for largest organisations. Year 1 = 10 Organisations. 5 year rolling programme	Enabling	Largest employers in the city public and private sector	CEC Economic Development and Community Planning	50			
5	Expand the schools small steps programme and roll out to 20 schools in the city in year one. Expand after year one.	Enabling	Schools/Parent Teacher Councils	CEC Children and Families	Unknown	Q1 2015	Q1 2016 - Rolling programme	
6	Profile and raise awareness of the implications of the EPC and Section 63 legislative requirements with Commercial Property owners in the city.	Enabling	Property owners/managers	CEC - Economic Development and Estates				
7	Trial a system of green Leases	Direct	Property owners/managers	CEC - Economic Development	tbc	Q2 2015	Q2 2016	
8	Partnership work with Resource Efficient Scotland to provide advice and support on energy efficiency to small businesses through the Business Gateway. Target 100% of businesses per year.	Enabling	CEC/RES	Resource Efficient Scotland	Unknown.	Rolling programme	Rolling Programme	
9	Pilot a smart energy business district to test out the application of a number of energy efficiency measures such as smart meters.	Enabling	Local Businesses	CEC Business Partnerships team	0.04	Q3 2015	Q3 2016	
10	Implement the Smart Sensors project led by the University of Edinburgh.	Direct	CEC	University of Edinburgh	Unknown until project evaluated	Q2 2015	Q2 2018	
11	Assess the potential for large scale building management systems in reducing energy consumption	Direct	-	CEC Housing	0.075	Q3 2015	2020, Rolling Programme	
12	Build new energy efficient homes through 21st Century Homes, the Affordable Housing Investment Programme and the National Housing Trust scheme.	Direct		CEC Housing	Unknown			
13	Improve existing privately owned homes through the HEEPS/ABS programmes – promote free insulation to homes in Council Tax bands A-C and assist owners to fund their contributions to communal improvements in Council or housing association-led schemes.	Direct		CEC Housing	Unknown			
14	Improve Council homes through the capital programme to meet the Energy Efficiency Standard for Social Housing by 2020, following on from SHQS achievements.	Direct		CEC Housing	Unknown			
15	Raise awareness of grants, loans and incentives available to private landlords to improve their properties.	Enabling	Private landlords	CEC Housing	Unknown			
16	Raise awareness of Home Energy Scotland and other advice resources through the 'warm your home' campaign. Evaluate the effectiveness of this campaign and involve tenants in future communications planning.	Enabling		CEC Housing	Unknown			
17	Consult the Tenants' Panel, Registered Tenants Organisations and Edinburgh Tenants Federation to gather tenants' views on investing in energy efficiency and tackling fuel poverty.	Enabling	Tenants Organisations	CEC Housing	Unknown			
18	Develop collaborative projects through the Housing & Energy Forum which brings together housing associations, the Energy Saving Trust, Changeworks, Council staff, tenant organisations and industry representatives.	Direct	Changeworks, EST, Tenant organisations, RSL's and Housing Associations	CEC Housing	Unknown			
19	Explore options for renewable energy and low carbon distribution for homes in Edinburgh.	Enabling	Home Energy Scotland	CEC Housing	Unknown			
20	Smart Meter Street – a plan for trialling smart meters in streets across the city to demonstrate where and how to save energy.	Enabling	Transition Edinburgh, Neighbourhood Partnerships	CEC Housing	Unknown			
21	Support the Edinburgh World Heritage Trust project into retrofitting listed and historic buildings.	Direct	Edinburgh World Heritage	Edinburgh World Heritage	TBC	0	0	
22	Lothian Buses office energy use to be used from 100% renewable energy			Lothian Buses	0			
23	Install smart meters for gas and electricity in every home to encourage better domestic energy management.	Enabling	Utilities Companies	UK Government	5	2014	2019	
24	The Council will replace all street lights with energy efficient lighting systems by 2020.	Direct		CEC - Roads	5.9	Phase 1 Q1 2015	Rolling programme	
25	The Council will replace all stair lights in communal tenement properties with energy efficient lighting by 2020.	Direct		CEC - Housing	2.4	Q2 2015	Rolling programme	

26	Phase 3 Retrofit of 6500 small to medium sized commercial buildings (e.g. shops, restaurants, offices, hotels) with energy efficiency measures such as better insulation and heating systems that will reduce heat and electricity demand.			UK Government	84.5	tbc	tbc	tbc
27	Phase 1 Retrofit of 1000 public and community buildings with energy efficiency measures such as better insulation and heating systems that will reduce heat and electricity demand.			UK Government	95	tbc	tbc	tbc
28	Transport							
29	15% of the fleet will be hybrid buses by end of 2015			Lothian Buses	0.5	Dec-14	Dec-15	Ongoing
30	50% of the fleet to be Euro V or better			Lothian Buses	1	Nov-16	July-17	Ongoing
31	Introduce Electric Plug in Hybrid (Euro 6) into the fleet			Lothian Buses	TBC (75% CO2 reduction)	Dec-14	Jun-17	Ongoing
32	Selected depots to have electric vehicle charging facilities for members of the public			Lothian Buses	Unknown	Jan-15	Jan-16	Ongoing
33	Electric charging facilities available to the public from infrastructure put in place for the plug in Hybrids			Lothian Buses	Unknown	Dec-15	Jul-17	Ongoing
34	Increase City Car Club Electric Vehicles by 10 in 2014/15			City Car Club	0.019	Apr-15	Dec-20	
35	Increase City Car Club Pure Electric Vehicles to be 10% of the fleet by 2020		CEC	City Car Club	0.036	Apr-15	Dec-20	
36	City Car Club Charging points to allow other vehicles to charge at adjacent bay.		CEC	City Car Club/ CEC	TBC	Apr-15	Dec-20	
37	City Car Club to increase membership per annum to allow increase in City wide fleet.			City Car Club	tbc	Apr-15	Dec-20	
38	Encourage City Car Club bays to be included in key new developments.			City Car Club/ CEC	Unknown	Apr-15	Dec-20	
39	Delivery of the Local Transport Strategy; encouraging active travel and working to decarbonise transport		Transport partners, Lothian Buses	CEC - Transport	7.7	2014	2019	
40	Electric Vehicle Strategy			CEC - Transport / Environmental Health	0.05	2015	2016	
41	Target largest employers and encourage staff travel planning			CEC - Economic Development	1.6	Q3 2015	Q1 2016	
42	Roll out travel planning help to all organisations to minimise staff travel.		Public and Private Organisations	CEC - Economic Development	TBC	Q2 2016	Rolling programme	
43	District Heating							
44	The Council will lead the development of an Edinburgh District Heating Strategy that provides the framework for establishing a city wide heat network for public and private sectors and the policy drivers to achieve this.	Enabling	RES/SFT/SE/EST	CEC - Economic Development	50	Q4 2014	Q2 2015	
45	Publish a heat map for Edinburgh that will identify the major heat loads across the city. This will be developed in partnership with key public and private sector partners.	Enabling	Public/Private sector partners	CEC - Economic Development/Housing/ Planning	Unknown	Q1 2015	Q3 2015	
46	The Council will carry out an evaluation of its own estate and assess the opportunities for connections to existing buildings.	Enabling		CEC - Corporate Property/Economic Development	Unknown	Q2 2015	Q3 2015	
47	Produce guidance for developers on district heating and engage with the Edinburgh Developers Forum.	Enabling	Edinburgh developers forum	CEC - Economic Development/Planning	Unknown	Q1 2015	Q3 2015	
48	Take forward the potential district heating scheme at the Bioquarter working with partners with the aim of a scheme up and running by 2020	Direct	NHS/UoE/S.E.	CEC - Economic Development/Scottish Enterprise.	5.78	Q1 2015	Q4 2020	
49	The Council will work with EDI to deliver the district heating scheme at Fountainbridge.	Direct	Developers, Community groups and others	EDI/CEC Economic Development	4.7	Q4 2014	Rolling programme	
50	Engage with a wide range of partners in the public and private sectors to develop new schemes.	Enabling	Various	CEC - All services	tbc	Q1 2015	Q4 2020	
51	Renewables							
51	Support the Edinburgh Community Solar Co-operative Solar PV project using 25 Council buildings.	Enabling	CEC Corporate Policy and other community groups	Edinburgh Community solar co-operative	tbc	Q2 2015	Rolling programme to 2020	
52	Council to assess it's own estate for renewables	Enabling	Private sector partners	CEC - Corporate Property	tbc	Q2 2015	Q4 2015	
53	The Council will lead a review into the potential for solar farms on unused Council land or former landfill sites.	Direct		CEC - Estates	2	Q2 2015	2016	
54	Explore the potential for large scale application of PV for car parking.	Enabling	Lothian Buses	CEC - Transport / Economic Development	Unknown	Q3 2015	2016	

55	The Council will publish a new policy on renewables and instigate a study into their application in Edinburgh including the potential for new jobs and skills.	Enabling	Greenspace Scotland	CEC - Economic Development/Corporate Property	Unknown	Q2 2015	Q4 2015	
56	In partnership with Greenspace Scotland the Council will pilot using 3 parks to install ground source heat pumps and monitor their performance.	Direct	Friends of Saughton Park	CEC - Parks/Economic Development	tbc	tbc	tbc	
57	Ongoing development micro hydroelectric schemes (eg at Saughton)	Direct	Friends of Saughton Park	CEC - Parks	0.234	TBC	TBC	
58	Hydrogen CHP system installed in 6 location.	Direct	igen	CEC - Estates	0.024	Q1 2015	Q4 2020	
Resource Efficiency								
59	Zero Waste project. Energy to waste plant and anaerobic digestion from food waste treatment Millerhill, Midlothian	Direct	Midlothian Council/FCC/Alauna	CEC - Waste and Midlothian Council	36.039	2012	2017 and ongoing	
60	Council will engage with organisations that seek to promote reuse and repair.	Enabling	Various organisations, especially third sector	CEC	Unknown	Q1 2015	Rolling programme	
61	Quantify the CO2 savings from the Lothian Buses recycling operation			Lothian Buses	0.35	Dec-14	Dec-15	
62	Trial a pilot using biofuel in the Council fleet and extend to other partners with large scale fleet e.g Lothian Buses.		CEC - Fleet	Argent Energy/Lothian Buses	4.5	2015	2016	
63	Sustainable food is a key area of action for the Council and the Sustainable Food City Action Plan published in 2014 has key actions aimed at local food sourcing and reducing food waste. All of which will have some impact in helping to reduce emissions in the city.	Enabling	Community groups	CEC - Corporate Governance	Unknown	2014	2017	
64	The Council will work in partnership with Scottish Water to evaluate a scheme piloting waste heat from sewage pipes for Council buildings	Direct		Scottish Water/Share Energy/CEC Economic Development and Corporate Property	0.556	Q2 2015	Q2 2016	
65	Improve energy efficiency of local Council suppliers and their supply chain through implementation of the Council's Sustainable Procurement Policy and Sustainable Procurement Action Plan.			CEC - Procurement	0.23	tbc	tbc	
66	Citizen engagement – Empowering community groups in the city such as Transition Edinburgh to host community initiatives within their respective neighbourhoods such as; sustainable energy events, community renewable energy initiatives, and resource awareness through re-use and repair programmes.			Community Groups/CEC	Unknown	Q1 2015	Ongoing	
67	The Council will look to join the Scottish Circular Economy 100 programme which will be launched by Zero Waste Scotland in 2015			CEC - Economic Development	Unknown	tbc	tbc	
Policy								
68	Local impact of the Carbon Reduction Commitment Energy Efficiency Scheme – a UK-wide scheme to increase energy efficiency in large organisations across the public and private sectors.			UK Government	11	tbc	tbc	
69	Local impact on businesses of the implementation of energy-intensive business packages including Climate Change Agreements, Energy Performance of Building Directive, industrial smart metering and advice and loans from the Carbon Trust.			UK Government	11	tbc	tbc	
70	Local use of electricity from the UK Grid, 30% of which comes from renewable energy			National Grid	289	tbc	tbc	
71	Local impact of new mandatory car emissions targets – by 2012, maximum average emissions from new cars will be 130g of CO2 per kilometre. By 2015, maximum average emissions from new cars will be 95g of CO2 per kilometre.			EU	53	tbc	tbc	
72	Local impact of new EU bio fuels target – the Renewable Energy and Fuel Quality Directives will increase the amount of bio-fuel used in the transport sector.			EU	45	tbc	tbc	
73	Expansion of low-carbon vehicles and infrastructure via Central Scotland Plugged in Places Programme and other Scottish Government funding streams			Scottish Government	5	tbc	tbc	
74	Local application of new national domestic buildings energy standards for 2013 – standards will be reviewed for 2013 with the aim of achieving a 60 per cent reduction in emissions compared with 2007.			UK Government	9	tbc	tbc	
75	Encourage other public sector organisations to adopt and implement their own sustainable procurement policies.			ESDP	Unknown	tbc	tbc	
76	Application of Intelligent Transport Systems technology to make most efficient use of Edinburgh's roads.			CEC Transport	0.7	tbc	tbc	
77	Encourage local installation of renewable heat equipment in homes such as solar thermal technologies and heat pumps through promotion of the Renewable Heat Incentive Scheme	Direct	Home owners, tenants,	CEC/Government agencies	22	Rolling programme	Rolling programme	
78	Encourage local installation of renewable heat equipment in commercial buildings such as solar thermal technologies and heat pumps through the Renewable Heat Incentive Scheme	Direct	Property owners	CEC/Government agencies	70	Rolling programme	Rolling programme	
					898.22			
					% of total requirements (excluding tbc and unknown)	65.1%		

Key: Green = existing resources; Amber = first phase funded; Red = requires funding; Blue = externally funded

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