The Highland Council

Highland Council – 4th September 2014

Agenda Item	10
Report No	HC/18/14

Carbon CLEVER Programme Plan and Update

Report by Head of Policy and Reform

Summary
This paper provides Members with an update on the Carbon CLEVER Programme Plan and in particular the chapter on Energy. The paper also provides Members with an update on a number of Carbon CLEVER projects.

1. Background

1.1 At a meeting of the Highland Council in June 2013, Members agreed to an initiative to achieve a carbon neutral Inverness in a low carbon Highlands by 2025, Carbon CLEVER.

1.2 The Council has a commitment in its Programme, Working together for the Highlands, 2012-17, that it will maintain its commitment to Scotland's Climate Change Declaration and work with everyone to achieve a Carbon CLEVER Highlands by 2025 (a carbon neutral Inverness in a low carbon Highlands).

1.3 There are a number of projects and actions currently being developed and delivered as part of the Carbon CLEVER initiative. Along with this action, there is also a need to develop a programme plan for the initiative that sets out a strategy for achieving its ambitious targets.

2. Carbon CLEVER Programme Plan

2.1 At a meeting of the Highland Council in March 2014, Members agreed that Carbon CLEVER should address five key strategic themes: Economy; Energy; Land Use and Resources; Transport; and Engagement Strategy. Members further agreed that a programme plan should be drafted comprising a strategy document based on these key strategic themes.

2.2 As the strategy document develops, a three year action plan will also be drafted which will be updated and reviewed regularly. The final programme plan will also outline how the performance of the initiative is measured both quantitatively and qualitatively. The final strategy and action plan will be launched at the second Carbon CLEVER conference which has a provisional date of 21st November 2014.

2.3 Two chapters were presented at a meeting of the Highland Council on 26th June: Economy and Transport. This report presents the Energy chapter for Members to consider. This has been written with input from Highland Council officers, Scottish and Highland stakeholders, and feedback from the Carbon CLEVER conference 2013 and the series of workshops that were conducted with Council Members and staff in 2013. This chapter is in a draft format and aims to highlight both the current direction of travel under the strategic themes, and areas where additional action is required. Following Member feedback we will consult again with regional stakeholders before the chapter is finalised.

3. Energy

3.1 The transition to low carbon energy and becoming more energy efficient in the Highlands is already underway and the aim of Carbon CLEVER is to help to accelerate this process. The chapter is structured around the ambition for Carbon CLEVER Energy that was agreed at a meeting of the Highland Council on the 13th March 2014.

3.2 The Energy chapter is attached at Appendix 1. The chapter highlights Council commitments and Single Outcome Agreement outcomes that relate to transition to Carbon CLEVER Energy. Other key items in this chapter include:

Energy renovated, comfortable, and attractive buildings

- Progress with Highland Council Property
- Scottish Housing Quality Standards
- Energy Efficiency support programmes
- Carbon CLEVER Declaration

Increased renewable energy generation, including micro-generation

- Private renewable energy schemes
- Community owned and micro-renewables
- Highland Council owned renewables
- Community benefit policy

Self-sufficient energy generation with minimal energy import and reliance on fossil fuels

- Isle of Eigg
- Applecross Energy Efficiency
- Local Energy Economies Programme

Renewable heating and infrastructure where appropriate

- Scotland's Heat Map
- Highland Council estate
- Highland District Heating schemes

Energy storage to reduce reliance on fossil fuels during periods of peak energy demand

- Pumped storage
- Coire Glas pumped storage

Affordable Energy

- Healthy Homes for Highland
- Highland's Housing Strategy 2010-15

Energy and fuel security

This outcome will be achieved through the actions outlined under many of the other sections in this chapter, most notably: Increased renewable energy generation, including micro-generation; Self-sufficient energy generation with minimal import and reliance on fossil fuels; Renewable heating and infrastructure where appropriate; and Energy storage to reduce reliance on fossil fuels during periods of peak energy demand.

Engagement Strategy

- Carbon CLEVER Conference and workshops
- E.ON Energy Efficiency workshops

- Citizens' Panel and Communities' Panel
- Energy Efficiency "Expo"

4. Carbon CLEVER project updates

4.1 Carbon CLEVER Community Grant Fund

At a meeting of the Highland Council, Members approved the development of a Carbon CLEVER Community Grant Fund with an allowance of up to £200,000 from the Carbon CLEVER capital budget allowance of £1 million p.a. Further details on the Grant Fund were presented at a meeting of the Resources committee on the 27th August.

4.2 STEP-UP

Strategies Towards Energy Performance and Urban Planning (STEP-UP) is a European project which aims to bring together excellence on energy planning from four European cities, Glasgow, Ghent, Gothenburg and Riga, running from Autumn 2012 to Spring 2015.

4.3 Following agreement by Members at the meeting of the Highland Council, 26th June, Inverness is a now a companion city of the STEP-UP project. Support from the STEP-UP project is being combined with that from the Sustainable Scotland Network to develop a Sustainable Energy Action Plan which will provide a carbon emissions baseline for the region. This is an important step in developing the evidence base of Carbon CLEVER.

4.4 Climate Change Leadership Programme

Through the Scottish Leaders Forum, the Government have developed a proposal to support and encourage Climate Change Leadership across Scotland. The Highlands have been selected as a pioneer region for this programme. This will require be a multi-agency approach, and will require buy-in from prominent leaders in the public, private and third sector. An initial meeting of Highland stakeholders is expected to occur in late October/ early November.

4.5 Mini-Stern Report

Through the Scottish Cities Alliance (SCA), a mini-Stern report has been commissioned for Inverness. This report will outline the economic challenges and opportunities for the city as a result of climate change. This report should be viewed as a key strategy document and where possible the recommendations implemented to ensure economic benefits to the region. Highland Council officers have fed a great deal of information and data into the development of the mini-Stern report which will be published later in 2014.

4.6 Local Energy Economy Programme (LEEP)

The LEEP programme is being co-ordinated by Community Energy Scotland (CES) and will initially cover the Highlands and Islands area. The Climate Change Team, Chief Executive's Office is actively involved in the scheme and the Highland Council is a key stakeholder. £10,000 has been committed to the programme development from the Climate Change Team's revenue budget.

4.7 The proposed LEEP project has the ambition to turn Scottish communities and regions into local energy economies, based on the key principles of: local generation; local demand; local supply; and local finance. Through this approach energy would be generated and used locally, bringing economic benefits to the local community and reducing energy costs.

4.8 The LEEP programme will encourage communities to become self-sufficient in terms

of energy generation with minimal energy import and reliance on fossil fuels. The programme will further develop ideas and feasibility studies progressing projects to the stage where they are investible, enabling access to finance through European and national funds such as the Local Energy Challenge Fund.

4.9 Inverness Car Club

A car club can reduce the perceived demands on households to own cars. Reducing car ownership, understandably, is the most successful way to reduce mileage. Car club vehicles are typically small with a modern engine specification and have very low associated carbon emissions. Such schemes are operated in many Scottish cities e.g. Edinburgh, Glasgow, and Aberdeen.

4.10 Working with CarPlus, and with funding from Transport Scotland as part of the Developing Car Clubs in Scotland programme, a feasibility study has been commissioned for a car club in Inverness. The results and recommendations of this study will be presented at a future meeting of the City of Inverness Area committee.

4.11 Carbon CLEVER Cycle hire scheme

The Carbon CLEVER Cycle hire scheme was launched on the 18th August. The scheme allows residents, businesses and visitors to hire an electric bike (e-bike) from two easily accessible locations in the city (Council Headquarters on Glenurquhart Road, and Falcon Square), thus promoting active travel and reducing congestion. The scheme consists of 12 e-bikes in total, six at each location, and can be hired from as little as £1.75 per hour.

4.12 Four of the six e-bikes at Glenurquhart Road have been block-booked from the scheme operator, Co-wheels, to allow Highland Council staff to use an e-bike for inner city business journeys during office hours. This availability will help to promote active travel within the Council, thus improving the health and well-being of staff, whilst reducing grey-fleet journeys, carbon emissions, and costs. The scheme will be actively promoted to staff by the Climate Change team and Council champions, including the Chief Executive and the Director of Development and Infrastructure, to maximise carbon and cost savings.

4.13 Carbon Management Plan (CMP) Annual Review

The Highland Council's CMP includes a target to reduce emissions by 3% per year. Currently, data indicates that in 2013/14 carbon emissions decreased by 9%, although this data has yet to be verified. This would mean that total emissions have reduced by 6% over the first two years of the CMP. The annual CMP report will be presented to the Resources committee on the 26th November when all the data will have been verified. The Climate Change team, Chief Executive's Office, have started work on aligning the CMP with the Carbon CLEVER initiative which will be completed in Spring 2015.

4.14 Scotland's Climate Change Declaration

The Highland Council signed Scotland's Climate Change Declaration in 2007. As part of this signatories are required to produce and annual report. Sustainable Scotland Network (SSN) oversee the reporting process and have been revising the reporting template. Due to this, the reporting timescales have been delayed over the past 12 months. The Highland Council's Year 6 report for 2012/13 is available on the Members Bulletin and this will be submitted to SSN in September. The Highland Council's Year 7 report for 2013/14, will be against a revised reporting template and is required to be submitted to SSN by 14th November 2014. It will be presented at a meeting of the Resources committee on the 26th November to be homologated by committee.

5. Implications

5.1 Resource Implications: The Carbon CLEVER initiative has been allocated a capital budget of £1million p.a. from 2014/15. For 2014/15, £575,000 has been allocated as outlined at paragraph 4.1, with £425,000 available to commit. Proposals for further projects will be submitted to the Resources Committee. There are no resource implications arising from this report.

5.2 Legal Implications: The Council has a duty to assist Scotland achieve its national carbon emission reduction targets as set out by the Climate Change (Scotland) Act 2009.

5.3 Equalities Implications: Projects and actions developed as part of the Carbon CLEVER will be screened on an individual basis for equalities implications.

5.4 Climate Change/ Carbon CLEVER Implications: Projects and actions developed as part of the Carbon CLEVER initiative will lead to reductions in carbon emissions, helping the region to mitigate its impact on climate change.

5.5 Gaelic Implications: Carbon CLEVER is a Highland-wide initiative. As such promotional material and messages will be translated into Gaelic in accordance with the Council's policy.

5.6 Risk Implications: There is a reputational risk to the Council in not achieving such ambitious goals. However, this is far outweighed by the potential success of the initiative. Carbon CLEVER requires project management to be used for development and delivery, this will include risk assessments and performance will be carefully monitored through a transparent process which will reduce the risks associated with the initiative.

5.7 Rural Implications: Climate change will provide challenges and opportunities for rural communities in Highland. It is important that the impact of these challenges is minimised, and the potential opportunities maximised.

Recommendations

Members are asked to:

1. Agree any changes to the draft Energy chapter and to note that the final draft will be subject to wider consultation with relevant groups;
2. Note that at the next Council meeting on the 30th October a draft chapter on Land Use and Resources will be presented; and
3. Note that the final Carbon CLEVER Programme Plan will be launched at the second Carbon CLEVER conference, 21st November 2014.

Designation: Head of Policy and Reform
Date: 21st August 2014
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Appendix 1

Strategic Theme 3: Energy

1.1 Carbon emissions associated with energy generation and consumption account for over two thirds of those from Highland[1]. In order to become a low carbon region, the Highlands needs to reduce its energy consumption and reduce the carbon intensity of the fuels used to produce electricity and heat. Decarbonising energy in the Highlands is already underway and the aim of Carbon CLEVER is to accelerate this process to ensure that the Highlands have sources of energy supply suitable for the 21st century.

1.2 Scotland has a long history in renewable energy and it was one of the first countries in the world to harness electricity from its waters. Scotland's ambitious hydro building scheme throughout the 1950s and 1960s resulted in infrastructure which produces energy to this day. Scotland has an estimated 25% of Europe's potential for both tidal and offshore wind energy, and 10% of Europe's wave potential. Scotland has a highly skilled engineering and research and development workforce as a result of the oil and gas industry with expertise in working offshore. This means that it is well placed to continue to make the most of its renewable resources, as well as the potential for carbon capture and storage.

1.3 The Scottish Government have set a number of targets which will ensure that Scotland uses energy efficiently and that Scotland has an energy mix that is predominately based on renewables sources of energy by 2020[2]. These include:

- 12 % reduction in Scotland's final energy consumption by 2020;
- 100 % electricity demand equivalent from renewables by 2020, with an interim target of 50 % by 2015;
- 11 % heat demand from renewables by 2020;
- At least 30 % overall energy demand from renewables by 2020; and
- 500 MW community and locally owned renewable energy by 2020

1.4 Scotland is progressing well towards achieving these targets. In 2013, 46.6% of gross electricity consumption was produced from renewable sources compared to 16.9 % in 2006[3]. In 2012, Scotland produced enough heat from renewables to meet 4.1 % of the forecast non-electrical heat demand in 2020[4].

1.5 Feedback gathered from the Carbon CLEVER Conference 2013, a series of internal workshops (paragraph 9.3), and a review of other European cities approaching similar low

[1] Department of Energy and Climate Change (2013) Emissions within the scope of influence of Local Authorities for 2005-2011. Available at: http://ow.ly/xC49H
[2] More information available at: http://ow.ly/zKVK0
[3] More information available at: http://ow.ly/zKScp
[4] More information available at: http://ow.ly/zKSXV

carbon targets, have been used for the Council to determine the potential key Energy outcomes of achieving a carbon neutral Inverness in a low carbon Highlands. These are:

1. Energy renovated, comfortable, and attractive buildings;
2. Increased renewable energy generation, including micro-generation;
3. Self-sufficient energy generation with minimal energy import and reliance on fossil fuels;
4. Renewable heating and infrastructure where appropriate;
5. Energy storage to reduce reliance on fossil fuels during periods of peak energy demand;
6. Affordable energy; and
7. Energy and fuel security.

1.6 This chapter is structured around these key outcomes and the activity that is being undertaken, or is programmed to occur across the Highlands to achieve them.

2. Energy renovated, comfortable, and attractive buildings

2.1 Action to reduce the carbon emissions of the energy sector should occur as a hierarchy, as suggested by the Government[5] for decarbonising heat, Figure 1. This hierarchy prioritises action which reduces energy demand by improving efficiency, such as by designing and retrofitting buildings to be energy efficient. Secondly, once the demand for energy is efficient, it should be supplied efficiently and at least cost to consumers. Some efficiency measures can be made in buildings such as low temperature radiators, whilst other opportunities may rely on the relationship between buildings such as district heating or smart energy grids. Finally, the energy provided should be from renewable sources with low associated carbon emissions.

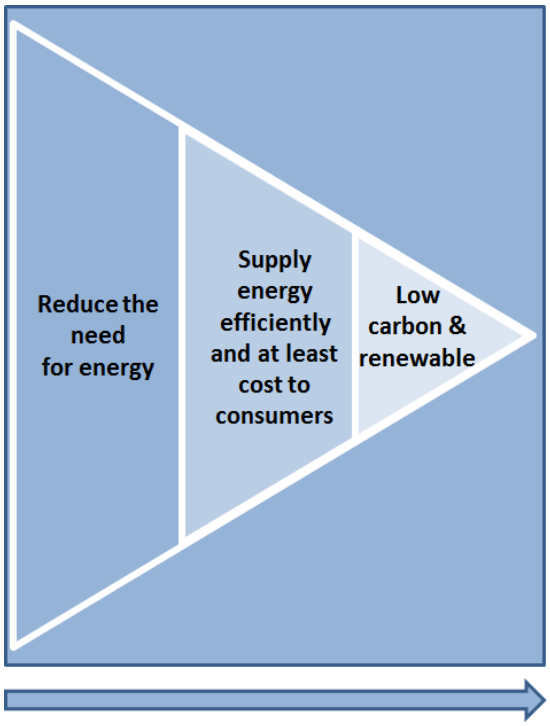

Figure 1: A hierarchy approach to decarbonising energy.

2.2 The housing stock in Highland is generally less efficient than the rest of Scotland due to building types, age, and tenure, and there are also restricted fuel choices. This alongside low income levels result in high levels of fuel poverty.

2.3 Where we are now?

Commitments in the Highland Council Programme with a link to energy renovated, comfortable, and attractive buildings include:

- The Council will promote energy efficiency in Highland schools, and build on the success of our 'eco-schools';

[5] Scottish Government (2014) Towards Decarbonising Heat: Maximising the opportunities for Scotland. Draft heat generation policy statement for consultation. Available at: http://ow.ly/zNnKs

- The Council will continue to reduce carbon emissions from its operations and work to meet the new target in the Carbon Management Plan (CMP) of a 21% reduction between 2011/12 and 2020. We will realign the CMP to the Carbon CLEVER initiative;
- The Council will deliver an ambitious Housing Capital Programme, utilising innovative, environmentally sustainable methods to build new council houses and achieve the Scottish Housing Quality Standard for existing housing stock.

2.4 Single Outcome Agreement

The purpose of the SOA[6] is to identify areas for improvement and to deliver better outcomes for the people of the Highlands and Scotland through specific commitments made by the Council, its community planning partners, and the Scottish Government. Outcomes within the SOA with a link to energy efficiency and energy renovated, comfortable, and attractive buildings include:

- To promote energy efficiency advice as a measure to reduce fuel poverty;
- Increase the proportion of the Council's housing stock meeting energy efficiency standards as part of achieving the Scottish Housing Quality Standard by 2015; and
- Identify and reach individuals and communities most in need of advice and support to maximise income and improve energy efficiency.

2.5 Highland Council Property and the Built Environment

The Council owns, operates and develops a wide ranging portfolio of buildings, including schools, offices, care homes and industrial premises. There has been an ongoing drive for energy efficiency across the estate which has brought the Council to prominence in the fields of renewable technology. The efficiency improvements are extensive, but include changing the heating systems and types, renewable installations (wind, solar, heat pumps and biomass) provision of total building management control along with lighting and power efficiency programmes. Energy efficiency has been a main stay of the Council's environmental drive and will continue to be one of the main carbon reduction themes. The Council are aiming to meet and exceed the requirements of the Energy Efficiency Buildings Directive and move towards zero carbon buildings for all new buildings.

2.6 Scottish Housing Quality Standard (SHQS)

The SHQS was introduced in February 2004 and is the Government's principal measure of housing quality in Scotland. The SHQS is a set of five broad housing criteria which must all be met for the property to pass the standard set. The criteria set a minimum standard below which a property should not fall. In the case of social housing, the Government have set a policy for landlords to bring every element of their stock up to the standard by April 2015.

[6] The Single Outcome Agreement is available at: http://ow.ly/xYvXa

2.7 The energy efficiency of Highland Council houses continues to improve, and good progress is being made to achieve the Scottish Housing Quality Standard by April 2015. Council Housing energy efficiency is assessed as part of the SOLACE (Society of Local Authority Chief Executives) benchmarking framework. The energy efficiency of Highland Council Houses was 47.9% in 2011/12, but this metric increased to 80.0% in 2012/13. The target is to reach 100% energy efficiency in 2015.

2.8 Energy Efficiency Support Programmes

There are a wide range of energy efficiency support programmes being operated by the Scottish and UK Governments and energy companies. These offer a wide range of services from impartial advice, to home energy checks, grant funding, and access to loan finance.

2.9 It is important that the support that is available through such programmes is promoted to homeowners in an efficient and streamlined fashion, so that people in the Highlands are supported to improve the energy efficiency of the homes they live in. A one-stop shop for this in the Highlands is available through Home Energy Scotland[7], which offers free and impartial advice to householders, community groups and businesses.

2.10 Home Energy Efficiency Programmes for Scotland (HEEPS)[8]

The Government HEEPS provide assistance for people wanting to make their homes more energy efficient. Support provided through the programmes includes:

- Free home energy check – short survey to check how energy efficient your home is and to suggest a range of practical changes and improvements;
- More money in your pocket – a benefit and tax credit check, and access to the lowest-cost energy rates from your supplier;
- Energy efficiency measures – measures funded by energy companies or the Government to make your home more efficient. Energy suppliers fund measures under the Affordable Warmth Scheme, and the Government through the Energy Assistance Scheme.
- Gas infill – Loan funding of up to £5,000 for the connection of properties that are currently within the existing gas grid, but that are not currently connected.

2.11 HEEPS-Area Based Scheme

In the Highlands, the HEEPS – Area Based Scheme is being administered and managed for the Government by Highland Council and is contracted to E.ON. Home owners in the Upper Achintore area are in one of four Highland Council Wards which are the first to be offered free energy saving measures in a £6.4 million project funded by the Scottish Government. The scheme is mainly aimed at insulating hard-to-treat properties with primary measures

[7] For more information, please visit the Energy Saving Trust's website at: http://ow.ly/zVi7g
[8] For more information on HEEPS, please visit the Energy Saving Trust's website at: http://ow.ly/zV1D6

being cavity wall insulation or external wall insulation. The three-year programme will help to reduce the carbon footprint and improve the energy efficiency of Highland homes, with E.ON contributing £4.6 million to the scheme as part of the Energy Company Obligation (see paragraph 2.14).

2.12 The Green Deal[9]

The Green Deal is a UK-wide scheme which can help to finance home energy efficiency improvements without the householder having to finance all the costs upfront. It allows homeowners to pay off the costs of improvements through savings in their energy bills.

2.13 Green Homes Cashback[10]

The Green Homes Cashback scheme is funded by the Government and offers money back on home improvements which increase energy efficiency, as long as the measures have been recommended through a Green Deal assessment.

2.14 Energy Company Obligation (ECO)

ECO is an energy efficiency programme that was introduced to Great Britain in 2013. ECO places legal obligations on large energy suppliers to deliver energy efficiency measures to domestic energy users. It has been designed to work alongside the Green Deal to provide additional support in the domestic sector, with a particular focus on vulnerable consumer groups and hard-to-treat homes. The work ECO delivers is structured around three core targets:

- Carbon Emissions Reduction Obligation – Energy companies must concentrate efforts on hard-to-treat homes that cannot be fully funded through the Green Deal. Solid wall insulation and cavity wall insulation are the primary focus of this target. Under certain circumstances, other insulation measures and connections to district heating schemes can be eligible.
- Company Obligation – Energy companies must focus support to areas of low income.
- Home Heating Cost Reduction Obligation – Energy companies are required to provide measures which improve the ability of low income and vulnerable households to heat their homes, e.g. replacement or repair of a boiler.

2.15 Resource Efficient Scotland (RES)

RES is a Government programme which has been designed to help the public and private sector reduce costs by implementing resource efficiencies in energy, water, raw materials, and waste management. RES have estimated organisations in Scotland could achieve £2.9billion savings per year by using resources, such as energy, more efficiently. RES offer

[9] For more information on the Green Deal, please visit the Energy Saving Trust's website at: http://ow.ly/zV9s3
[10] For more information please visit the Energy Saving Trust's website at http://ow.ly/zV90Q

free advice and technical support to help businesses and organisations to become more efficient.

2.16 Carbon CLEVER is supporting businesses and organisations to access support from Resource Efficient Scotland through the Carbon CLEVER Declaration (Economy, 7.5). The Highland Council is a RES Pledge Ambassador (Economy, 7.7) and through this has committed to promote resource efficiency to local businesses and organisations.

2.17 Highland and Islands Enterprise (HIE) Developments

HIE[11] recognise the importance of providing energy efficient, comfortable and attractive buildings. All HIE developments aim to meet the highest possible standards, both in terms of environmentally and resource efficiency, achieving BREEAM[12] 'excellent' ratings where possible. This approach is being adopted at the Inverness Beechwood campus site which is aiming to have an outstanding purpose built environment with world class facilities and sustainable buildings (see Economy Chapter, 4.4 for further details). The site will include traditional dry stone walling, native woodland planting, wildlife corridors between sites, and two lochans which will accommodate aquatic life and act as sustainable drainage.

2.18 What have we planned already?

Highland Council Property and the Built Environment

All new Highland Council building projects will comply with the Scottish Sustainable Standards with a minimum of an Energy Performance Certificate B+ rating on performance. The Council's Council Housing estate is on track to meet the Scottish Housing Quality Standards in 2015 and the Energy Efficiency standard in Social Housing and will have affordable, controllable heating systems.

2.19 Buildings are to encompass a holistic approach to sustainable design, incorporating good daylighting, natural ventilation, low energy consumption with high insulation values and sustainable choices of materials. The Council are developing on a more inclusive way assessing joint occupation opportunities and the Sustainable Schools Estate Review seeks to improve the sustainability of the school estate.

2.20 The Council will seek to take advantage of dynamic energy management and load management within the wider estate, incorporating district heating and community energy programmes where practical and possible.

2.21 Carbon CLEVER Declaration

[11] Highlands and Islands Enterprise (2014) Building our Future. Operating Plan 2014-2017. Available at: http://ow.ly/zNAOD

[12] For more information on BREEAM, please visit: http://www.breeam.org/

Through the Declaration (Economy 7.5) and in partnership with the RES Pledge (Economy 7.7) the Highland Council will support businesses to become more energy efficient, through signposting to relevant information and funding, and by levering in support from national organisations. This will ensure that businesses make their buildings more energy efficient and as a result increase their competitiveness.

2.22 Mini Stern

As detailed in the Economy Chapter (3.8-3.9) a mini-Stern report has been commissioned that will identify the economic challenges and opportunities of climate change in the Highland region. This report will be published in 2015. In a similar study conducted by Leeds City Region, research indicated that the region could reduce its energy bill by £1.2bn (1.6% GDP) and reduce carbon emissions by 36% by investing 1% of the city's GDP in cost-effective low carbon measures. The investments would have a payback period of four years and generate wider benefits including 4,500 new jobs and substantial reductions in fuel poverty across the city. It is anticipated that the Highland mini-Stern will generate similar findings and where possible the report recommendations should be implemented to bring economic benefits to the region.

2.23 What more do we need to do?

The Highland Council will continue its work to ensure its Council Housing meets the standards set out by the SHQS, that its estate continues to become increasingly energy efficient, and that new builds are built to high standards with the vision of moving to zero carbon buildings.

2.24 The support that is outlined at paragraph 2.8 to make buildings more energy efficient needs to be appropriately promoted and clearly signposted to communities and businesses across the Highlands. For businesses, this will be conducted through the Carbon CLEVER Declaration and through the Resource Efficient Scotland Programme which has advisors located within the Highlands. Support for domestic users is streamlined through Home Energy Scotland.

3. Increased renewable energy generation, including micro-generation

3.1 Growth in the renewable energy generation sector is a high priority for the Government, with targets set out to generate 100% of Scotland's gross annual electricity demand and 11% of the heat demand from renewables by 2020. The renewable energy sector in the Highlands is undergoing rapid development due to natural resources, excellent facilities, and a highly trained workforce and it is a key growth sector. Renewable energy supports over 11,000 jobs across Scotland[13]. At the end of 2013, the total installed capacity of renewable

[13] Scottish Renewables (2012) Scotland's renewable energy sector in numbers. Available at: http://ow.ly/wSWNB

electricity in Scotland was 6,592 megawatts (MW), with 4,508 MW of this capacity from on-shore wind[13]. Installations of 14,139 MW are currently either in the planning process or under construction. In 2013, over £1.1 billion was invested in Scotland in renewables[13].

3.2 The siting of renewables is a key planning concern. This is recognised as part of the National Planning Framework (NPF3). Scotland has an exceptional and internationally recognised environment. It also now has an unprecedented opportunity to secure growth from renewable energy generation. In Scotland's more remote areas this will bring new employment, reverse population decline and stimulate demand for development and other services. THE NPF3 spatial strategy recognises the importance of Scotland's coast and islands as an economic opportunity and a resource to be protected and enjoyed. This is covered in more detail as part of the Land Use and Resources Chapter.

3.3 Where we are now?

Commitments in the Highland Council Programme with a link to increased renewable energy generation, including micro-generation include:

- The Council will support and invest in appropriate opportunities presented by renewable energy, particularly wave and tidal power. We will continue to develop the Highlands as a centre for research & development, fabrication and engineering;
- The Council will continue to reduce carbon emissions from its operations and work to meet the new target in the Carbon Management Plan (CMP) of a 21% reduction between 2011/12 and 2020. We will realign the CMP to the Carbon CLEVER initiative;
- The Council will support community, business and infrastructure developments through a successor to the EU 'LEADER' programme and other EU funds; and
- The Council will continue to support Highland-wide, large scale employment growth opportunities in the Cromarty Firth (Invergordon, Highland Deephaven and Nigg Energy Park), Scrabster Enterprise Area, Ardersier and Kishorn and in the UHI Campus Development.

3.4 Single Outcome Agreement (SOA)

The energy sector is recognised in the SOA as a crucial part of the Highland's economy. Energy, and in particular renewable energy generation, is mentioned in several chapters for it's potential to stimulate economic growth in the region, provide well-paid employment opportunities, and to reduce the region's impact on the environment. The SOA contains commitments to:

- Ensure that the electricity grid is fit-for-purpose to support ambitions for renewable power;
- Ensure that the region's ports can play an appropriate role in the energy sector;
- Increase installed capacity of renewable energy to 2908 MW by 2017;
- Three demonstrated wave and tidal projects to be implemented by March 2017; and

- No. of clients in the renewables and life sciences sectors supported through Business Gateway.

3.5 To make the most of the region's renewable energy resources and potential, development should to be conducted in a sustainable manner. This is recognised in the SOA through the environmental outcomes:

- To sustainably manage the outstanding natural heritage of the Highlands to optimise the economic, health and learning benefits in the long term;
- To increase and develop the use of renewable energy (linked to economic recovery and employability outcomes); and
- A carbon neutral Inverness in a low carbon Highland by 2025 (Carbon CLEVER).

3.6 An outcome of the SOA is that communities can participate in and benefit from the development of renewable energy across the Highlands. This is to be delivered through implementing Highland Council policy on community benefit.

3.7 Community benefit is a voluntary contribution by a developer. It is for the benefit of communities affected by development where this will have a long term impact on local resources and the local environment. It is Highland Council policy to seek funding or in-kind contribution from developers from large scale renewable energy schemes of not less than £5,000 per installed MW. The Highland Council Community Benefit Policy[14] is under revision and details guidance for developers on voluntary community benefits and how funds should be distributed amongst communities.

3.8 SSE Community Benefit

Since 2012, SSE's community benefit policy commits £5,000 per MW per year for the lifetime of a scheme, up to 25 years, split between a local and a regional fund. The Highlands and Islands region hosts seven SSE developments that provide community benefit comprising a total capacity of 265 MW. Approximately £23 million will be generated through these funds in their lifetime, and a large proportion of this will finance community projects in the Highlands. SSE delivered over £4.5 million in support for community projects in 2013/14 through community benefit[15].

3.9 Private Renewable Energy Schemes

The Highland Council is the planning authority for offshore wind, wave and tidal schemes up to 1 MW, as well as onshore wind energy schemes and hydroelectric generating schemes of

[14] The Highland Council (2014) Community Benefit Policy. Available at http://ow.ly/A0PT1, see Appendix 1. This policy was approved at a meeting of the Community Safety, Public Engagement and Equalities Committee on the 12th June 2014.

[15] SSE (2014) Responsible Neighbour. Sustainable Partner. SSE Community Investment Review 2013/14. Available at: http://ow.ly/A10Bj

up to 50 MW. Above these capacities, consent is sought from Scottish Ministers under the Electricity Act 1989.

3.10 The total capacity of renewable energy schemes in the Highlands is 5,070 MW. This includes all schemes that have been permitted, irrespective of whether they are operational yet. This is well above the Highland Renewable Energy Strategy (HRES)[16] target of 2000 MW for 2014. The renewable energy generation composition in the Highlands is:

- 2,500 MW from two off shore wind schemes in the Moray Firth that were permitted in 2013/14;
- 1,632 MW on-shore wind;
- 852 MW from hydro-electric schemes. This includes the Coire Glas pump-storage hydro scheme which was permitted in 2013/14 (600 MW), but does not include 'old' schemes as defined by the HRES; and
- 86 MW energy generation is from Tidal schemes. The first phase of the tidal scheme for the Inner Sound has consent, whilst pre-application consultation has been held for the wave scheme off Farr Point, and the tidal scheme at Ness of Duncansby has had initial scoping. The application for a tidal scheme at Kyle Rhea is under consideration.

3.11 Two large offshore wind installations have been granted planning consent in the Outer Moray Firth: Moray Offshore Renewables Limited; and Beatrice Offshore Windfarm Limited. The two neighbouring projects will involve up to a total of 326 turbines and the combined development would be the third largest offshore wind farm in the world. The project will generate electricity for more than a million homes and work for up to 4,600 people could be created at the peak of the turbine construction.

3.12 The Highlands is leading the way on generating renewable energy from tidal systems with the phased deployment of the Maygen Limited scheme in the Pentland Firth. Whilst the project is still at an early stage of development, the aim of the project is to have 398 MW of offshore tidal turbines installed by 2020. The first phase will involve installing a maximum of 86 turbines (86 MW). This "deploy and monitor" system will provide information on the interactions between the array and the environment. The second phase of the scheme is subject to a separate consent application and the phased approach is to ensure that installation of large commercial tidal arrays can be proven on a smaller scale.

3.13 Further growth of this sector will require the attraction of inward investors and considerable investment in the skills base of the local economy. This sector has the potential to create jobs both directly, and through a supportive supply chain, in some of the more challenging parts of the region. Proposals have been permitted at Nigg, Kishorn, Ardersier

[16] For more information on the Highland Renewable Energy Strategy, please visit: http://ow.ly/zXFrE

and Scrabster to enable shore bases to support the renewables sector. These developments will provide employment opportunities associated with engineering, manufacturing and the deployment of offshore wind and other marine energy devices. SSE is also investing in developing the engineering skills base in the Highlands and across Scotland, and has various trainee and apprenticeships schemes to support growth in the renewables industry. SSE is increasing staff in the Inverness office from 10 to 120, have an extra six staff in the Caithness office, and five staff in a new Brora office.

3.14 The UHI will contribute to the expertise in renewables and in the region through its research programmes on environmental sciences, mountain studies and sustainable development, marine sciences, and renewable energy and sustainability.

3.15 Community Owned and Micro- Renewables

Across the Highlands, renewable energy schemes are being installed by communities and individuals to generate clean energy and to provide cost savings, and to provide a sustainable income. The Government have set a target for 500 MW of renewable energy to be generated from community and locally owned renewables by 2020[17]. Achieving this target could be worth up to £2.4 billion to Scottish communities and rural businesses over the lifetime of those projects.

3.16 Communities in remote, fragile, and island areas often have the most to gain from community energy projects. Investing the income generated from renewables into other community enterprises can multiply benefits over time and help to strengthen communities.

3.17 At the end of June 2013, an estimated 285 MW of community or locally owned renewable energy capacity was operational in Scotland[18]. The Highland region has been nationally and internationally recognised for the amount of community and locally owned installed renewables. In 2013, the region was won the Scottish National Renewables League for Solar, Heat Pumps, Biomass, and Hydro-electric schemes (regions with a population over 100,000). Following this, the region finished third in the RES European Champions League (regions with a population over 100,000). This award is based on the installed capacity of renewable energy in the region as well as a number of other criteria including political commitment and strategy.

[17] For more information please visit: http://ow.ly/A0Era

[18] Energy Saving Trust (2014) Community and locally owned renewable energy in Scotland at June 2013. A report by the Energy Saving Trust for the Scottish Government. Available at: http://ow.ly/A0Hcr

3.18 Various Government incentives are available for individuals, communities, and organisations that produce renewable energy including Feed-in-Tariffs[19] and the Renewable Heat Incentive[20].

3.19 Highland Council owned renewables

The Highland Council has been investing in renewable energy on its own estate for over a decade. The major focus of this has been the replacement of carbon intensive oil and electric based heating systems with biomass boilers. These are considered to be a near carbon neutral as the trees that are cut down for fuel use are re-planted, maintaining a continuous carbon cycle. In 2013/14, just under 10% of the energy used in the Highland Council's buildings came from biomass heating. This investment in biomass has helped to support the region's emerging biomass economy and supply chain. As of July 2014, the Highland Council had over 15 MW installed capacity of renewables technologies on its estate, Table 1.

Table 1: Highland Council Installed Renewables, 31st July, 2014.

Renewable Energy Technology	Installed Capacity (kW)
Biomass	13,991
Ground Source Heat Pump	706
Solar Photo Voltaics	582
Wind	141
Air Source Heat Pump	84
Solar Thermal	25.3
Total	**15,539.3**

3.20 What have we planned already?

Good progress is being made in the Highlands to capitalise on the benefits of renewable energy, from large scale private developments, to community owned schemes, to on the Council's own estate. These developments need to continue in a considered manner to ensure the region continues to move to a low carbon future, attracts inward investment, economic growth, and employment opportunities.

3.21 Private Large Scale Renewables

As detailed from paragraph 3.9, there are a number of large scale renewable energy projects planned within the Highland region. These include onshore wind farms, hydro, and offshore wind, tidal and wave schemes. To support this emerging offshore renewable

[19] For more information please visit: http://ow.ly/A0KQ7
[20] For more information please visit: http://ow.ly/A0Kpp

industry proposals have also been permitted at Nigg, Kishorn, Ardersier and Scrabster to develop shore bases to support this sector.

3.22 Community Owned and Micro- Renewables

The Council will continue to support communities and individuals to install appropriately sited renewable energy. It will do this by promoting and signposting information to community groups and individuals, through supporting applications for funding, and through the Local Energy Economies Programme, as detailed at paragraph 4.11.

3.23 Highland Council Renewables

Through the Highland Council's Energy and Sustainability Team, the Council will continue to take opportunities to install renewables as part of its estate to reduce energy costs and carbon emissions.

3.24 What more do we need to do?

Developing renewable energy generation at a wide range of scales, from large scale private renewables to community and privately owned renewables, is important to achieve a low carbon Highlands. These renewables need to be sited correctly taking into account factors such as grid connection, the landscape, and visual impact, to ensure that economic, environmental and social impacts are maximised whilst any negative impacts are kept to a minimum.

3.25 The Highland Council will publish its updated Community Benefit Policy for Onshore wind to encourage developers to make voluntary contributions to the communities and region in which renewables are installed and will respond to the Scottish Government consultation on Community benefits from offshore renewables.

3.26 The Highland Council should continue to install renewables on its sites to reduce its energy bills, but should also consider opportunities to install renewables on sites for income generation and to provide local communities and settlements with renewable energy. Potential sites could include those with limited commercial use such as closed landfill sites.

3.27 As detailed at 2.22, the commissioned mini-Stern report is expected to outline the economic challenges and opportunities of climate change. Investment opportunities around the installation of renewable energy will be an outcome of this study and opportunities should be investigated through feasibility studies.

4. Self-sufficient energy generation with minimal energy import and reliance on fossil fuels

4.1 By generating its own energy through renewable technologies and by developing energy storage such as pumped storage, the Highlands can become self-sufficient and greatly

reduce energy import and the current reliance on fossil fuels. This decoupling can take a further step and communities can become self-sufficient. Energy storage and smart energy grids would mean energy generation and distribution would no longer need to occur at a national level, and communities could control their energy network. National grids have evolved to take advantage of economies of scale and to avoid the need to over engineer energy generating capacity. However, the continued development of small-scale renewables and energy storage technologies, combined with falling generation costs, mean that in some scenarios, such as many remote and rural communities, it can make more sense for energy to be generated, stored, and used at a local level.

4.2 Energy planning at a regional and at a local level is an important step towards a self-sufficient region and communities. Calculating the energy and carbon emissions baseline of a region or community and then from this developing an action plan can demonstrate the need for, and motivate action.

4.3 Renewable energy can also benefit a community in a variety of other ways. Community owned renewables can provide income for a community and investing this into other community projects and enterprises can bring a range of additional benefits and strengthen communities. Communities can also benefit financially from private schemes that are operational in their region such as through the SSE's Community Onshore Wind Fund.

4.4 Where we are now?

Commitments in the Highland Council Programme with a link to self-sufficient energy generation with minimal import and reliance on fossil fuels include:

- The Council will seek to identify means whereby communities can participate in and benefit from the development of renewable energy across the Highlands; and
- The Council will support community, business and infrastructure developments through a successor to the EU 'LEADER' programme and other EU funds.

4.5 Sustainable Energy Action Planning

Strategies Towards Energy Performance and Urban Planning (STEP-UP) is a European project which aims to bring together excellence on energy planning from four European cities, Glasgow, Ghent, Gothenburg and Riga, running from Autumn 2012 to Spring 2015.

4.6 Inverness is a now a companion city of the STEP-UP project. Support from this project is being combined with that from the Sustainable Scotland Network to develop a Sustainable Energy Action Plan which will provide a carbon emissions baseline for the region. This is an important next step in developing the supporting evidence base for Carbon CLEVER, for monitoring progress, and for co-ordinating action.

4.7 Isle of Eigg

The community on Eigg have taken significant steps to reducing their carbon emissions and to become self-sufficient with minimal energy import and reliance on fossil fuels. The Isle of Eigg Trust was wet up in 1996 to buy Eigg for the community, the purchase of which was completed in 1997. The trust has the aims to:

- Make the most of natural and cultural resources without damaging them;
- Retain a viable and empowered community;
- Reduce problems of remoteness by delivering local needs locally, and reducing dependence on external inputs; and
- Avoid harmful effects of other people, places, and future generations.

4.8 Following the purchase of the island, the community's next major project was to enable the provision of a mains electricity grid, powered from renewable sources. The now established system incorporates a 9.9 kW photovoltaic system, three hydro-electric generating systems (totalling 112 kW) and wind turbines (24 kW). This system is supported by batteries and a diesel back-up generator to ensure continuous availability of power. A load management system has been installed to ensure the optimal use of the renewables. The network is self-sufficient and powered 98 % by renewable energy.

4.9 The network generates a finite amount of electricity, and Eigg residents agreed to cap electricity use at 5 kW at any one time for households and 10 kW for businesses. If renewable resources are low, a system is in place which asks residents to keep their usage to a minimum.

4.10 Building upon the renewable energy that powers their lifestyles, the community are also working hard and making significant strides to reducing carbon emissions from transport, waste, and food production to ensure the long term sustainability of the island.

4.11 What have we planned already?

Local Energy Economies Programme (LEEP)

The potential LEEP programme is being co-ordinated by Community Energy Scotland (CES) and will initially cover the Highlands and Islands area. Highland Council is actively involved in the scheme as a key stakeholder. CES have supported over 600 community energy installations across Scotland, totalling 37 MW capacity, and providing income and affordable energy worth over £5 million per year to local communities. The proposed LEEP project has the ambition to turn Scottish communities and regions into local energy economies, based on key principles: local generation; local demand; local supply; and local finance. Through this approach energy would be generated and used locally, bringing economic benefits to the local community and reducing energy costs.

4.12 The LEEP programme will focus on:

- New community owned infrastructure, e.g. community microgrids;
- New energy management and storage technologies, e.g. storage heaters, hydrogen production, electric vehicles;
- New supply companies; and
- New business models utilising local finance.

4.13 The activity proposed through the LEEP programme could encourage communities to become self-sufficient in terms of energy generation with minimal energy import and reliance on fossil fuels. As such, Highland Council and Carbon CLEVER will look to support the programme. The programme will further develop ideas and feasibility studies progressing projects to the stage where they are investible, enabling access to finance through European and national funds such as the Local Energy Challenge Fund.

4.14 Applecross Energy Efficiency

Applecross is a Highland community targeting a low carbon and self-sufficient future. Applecross Energy Efficiency is a community led peninsula-wide initiative for the area's households, community-owned buildings, and small businesses. It aims to support the community to make informed decisions about energy efficiency measures and renewable energy with the aim of reducing the community's energy consumption and to derive the remaining demand from renewable and local sources where possible.

4.15 What more do we need to do?

To become self-sufficient and to reduce reliance on energy import and fossil fuels, it will be important to understand the current situation across the region as a whole, but also on a community by community basis. This will enable targeted actions and progress to be monitored. A key focus of this will be to develop a sustainable energy action plan for the Highlands which will provide an evidence base for the Carbon CLEVER initiative and also a programme of actions. In the future, this work will be supported through the University of the Highlands and Islands through the Low Carbon Institute.

4.16 Following regional baselining, it will be important to work with communities to develop local energy action plans. This will further increase awareness within the community of energy consumption and generation, and stimulate discussion and energy action planning. To achieve self-sufficient communities may require the development of energy storage and micro grids, and smart grids may have an important part to play in the Highlands and Inverness becoming self-sufficient. Smart grids use communication and information technology to balance the grid in real time, and could be used to reduce peak energy demand. This is a key issue in being able to move away from fossil fuelled derived energy

completely. Similarly, energy storage will be required on a small and large scale to ensure that energy is available during occasions where demand exceeds supply (see Section 6).

4.17 Communities targeting an energy self-sufficient future need to be supported, and experience and expertise from self-sufficient communities needs to be harnessed and shared with other communities across Scotland. To become self-sufficient, communities will need to balance local supply, demand, and storage. This may require the installation of new technologies and transmission networks. The Highland Council will continue to work closely with Community Energy Scotland to support the development of community-led energy schemes.

5. Renewable heating and infrastructure where appropriate

5.1 Approximately half the energy we use in Scotland is used for heating[21]. To achieve a low carbon economy, it is therefore vital that the carbon emissions associated with heating are reduced. The Scottish Government have set a target for 11 % heat demand from renewables by 2020. A strategy for achieving this target is set out in the "Towards Decarbonising Heat: Maximising the Opportunities for Scotland[22]" document which was published for public consultation in 2014 and will be finalised in 2015. This policy documents how Scotland can reduce the amount of energy used for heat, diversify sources of heating, provide increased security of heat supply, along with greater local control and reduce the pressure on household energy bills.

5.2 The policy sets out a step-phased approach. Firstly the need the heat needs to be reduced through better insulated buildings. Secondly, an efficient heat supply needs to be ensured, such as through the development of district heating networks and the use of unused heat through heat recovery. Finally, heat needs to be provided through renewable and low carbon heat sources.

5.3 Sources of renewable heat include biomass, wood stove, solar heating, geothermal, and air source and ground source heat pumps.

5.4 Where we are now?

Commitments in the Highland Council Programme with a link to renewable heating and infrastructure where appropriate include:

- The Council will continue to reduce carbon emissions from its operations and work to meet the new target in the Carbon Management Plan (CMP) of a 21% reduction

[21] Scottish Government (2013) District Heating Action Plan. Response to the Expert Commission on District Heating. Available at: http://ow.ly/A3Phb

[22] Scottish Government (2014) Towards Decarbonising Heat: Maximising the Opportunities for Scotland. Draft heat generation policy statement for consultation. Available at: http://ow.ly/A3x6T

between 2011/12 and 2020. We will realign the CMP to the Carbon CLEVER initiative; and

- The Council will support community, business and infrastructure developments through a successor to the EU 'LEADER' programme and other EU funds.

5.5 Scotland's Heat Map

Mapping heat demand is an effective way to visualise opportunities by assessing where heat demand is, where potential sources of heat may come from, and how these can be connected in an efficient manner to reduce the costs and carbon intensity of heat generation. Scotland's heat map was published in 2014[23], following heat map trials in the Highlands, Perth & Kinross, and Fife.

5.6 The Highland Council has entered into a framework agreement with Scottish Government to use a high resolution version of the heat map. It will be used by the Council to identify opportunities for decentralised energy projects including heat networks, and as a key tool for the Council's planning service when considering developments.

5.7 Highland Council estate

The Highland Council has actively replaced oil and electric boilers in locations that are off the gas grid network with biomass boilers to reduce costs and carbon emissions. In 2013/14 just under 10% of the Council's total energy demand for buildings was supplied from biomass heating (see paragraph 3.17). In addition to this, the Council have also installed air source and ground source heating systems (Table 1).

5.8 The Highland Council's investment in biomass heating has assisted in the development of a biomass supply chain in the region, and a number of growth businesses are now operating in the region with their core business focus on biomass and renewable heat.

5.9 NHS Highland has also installed biomass boilers at many of their sites across the Highlands to reduce costs and carbon emissions. At Raigmore hospital wood pellet boilers were installed in 2013 to provide up to 80 % of the hospital's heating and hot water, and save the hospital up to £1 million per year on energy costs.

5.10 Highland District Heating schemes

There are a number of district heating schemes operating in the Highlands, the largest is operated in Wick by Ignis Wick Ltd. It provides heat and hot water generated from a 3.5 MW biomass plant to nearly 200 homes, a public meeting room/ concert hall, and Old Pulteney Distillery at thirty percent less cost than the nearest alternative. Most households connected to the scheme have also chosen to upgrade to smart metering which will assist

[23] To view Scotland's Heat Map, please visit: http://heatmap.scotland.gov.uk/

them to more easily control their energy use and therefore achieve further savings on their energy costs.

5.11 Other district heating schemes operating in Highland include a scheme in Fort William where a wood fuel district heating system supplies heat and hot water for 10 buildings, and in Evanton where a medium sized district heating scheme supplies heat and hot water for 11 buildings (including 10 households and a grain dryer). Excess heat from the system will be used to dry up to 600 tonnes of malting barley.

5.12 What have we planned already?

Replacement of Highland Council Heating Systems

In assessing the replacement of a heating system the preferred installation is based on cost, running cost, and carbon emissions. The preferred installation is gas system where the network exists. Off the gas grid, the hierarchy is biomass > wood burning stove > Air source heat pump > Electrical system.

5.13 The Council will continue to replace carbon intensive heating systems such as oil and old electric systems with low carbon and renewable heat alternatives. This will be delivered in the Councils corporate estate and housing estate.

5.14 Highland District Heating Strategy Group

This partnership group, including membership the Government, Highlands and Islands Enterprise, and Highland Council is establishing a strategic approach to district heating in the Highlands, using support available through the Heat Network Partnership.

5.15 What more do we need to do?

Focus on decarbonising heat should follow the hierarchy as outlined at paragraph 5.2, with a concentration on reducing the demand for heat prior to supplying heat through renewable sources. Installation of sources of renewable heat in the Highlands has focused on replacement of oil heating systems in off the gas grid areas with renewable heating systems such as biomass. The Highland Council have shown leadership on the installation of renewable heating, and through this have supported the development of a supply chain and the growth of a number of local businesses.

5.16 Through Carbon CLEVER, and working with partners, the Highland Council needs to continue to promote the benefits of renewable heat to businesses, communities and organisations across the Highland. It should also work closely with the Government to signpost available incentives and support.

5.17 The District Heating Action plan[24] recommends that the Government and other public bodies such as local authorities, NHS Scotland and the higher education sector adopt a policy of connecting their estates to district heating schemes. Through this, heat demand can be established for a district heating scheme. The Highland District Heating Strategy Group is vital for ensuring a strategic approach to district heating in the Highlands is adopted, both in terms of new developments and retrofitting. Maximising the use of the Heat Map to identify suitable opportunities will be crucial for this.

5.18The Highlands is experiencing growth in population and there is demand for new housing and settlements. Ensuring that these have sustainable and low carbon heat sources is important for ensuring low carbon communities.

5.19 The mini-Stern report (paragraph 2.22) is expected to outline the economic challenges and opportunities of climate change. Investment opportunities around the installation of renewable heat will be an outcome of this study and opportunities should be investigated through feasibility studies.

6. Energy storage to reduce reliance on fossil fuels during periods of peak energy demand

6.1 To fully maximise the fraction of our energy that comes from renewable sources, energy storage needs to be developed so that energy can be stored from renewables when generation exceeds demand, and can be released into the grid when demand exceeds supply. There are a wide range of energy storage technologies from established and proven technologies to those currently under development, these include:

- Compressed Air: Air is stored and compressed then expanded to produce electricity;
- Pumped Storage Hydro-electricity: Water is pumped to an uphill reservoir and released when needed to produce electricity;
- Batteries: A range of types including lithium ion, sodium sulphur, and liquid metal;
- Liquid air: Cools and liquefies air, before expanding with heat to produce electricity; and
- Other technologies being explored include flywheels, pumped heat, and various electromechanical systems

6.2 Any storage of electricity ultimately means a loss of energy from the system due to inefficiencies. It is therefore important that we use as much energy at the time it is generated as possible. But as the fraction of energy we look to generate from renewables

[24] Scottish Government (2013) District Heating Action Plan: Response to the Expert Commission on District Heating. Available at: http://ow.ly/AG47S

increases, it makes increasing sense to build storage into the system, rather than over engineering the energy production system.

6.3 Where we are now?

Pumped Storage

There are two large scale pumped storage hydro-electric schemes in Scotland: Cruachan Dam, Argyll and Bute, commissioned in 1965, capacity of 440 MW; and Foyers, Highland, commissioned in 1974, capacity of 300 MW.

6.4 What have we planned already?

Coire Glas

Coire Glas is a proposed pumped storage scheme approximately ten miles north-east of Fort William which was granted consent in December 2013. If the site is developed, it will be the first large scale pumped storage scheme to be developed in the UK for over 30 years. SSE's final decision as to making an investment in the scheme will depend upon overcoming a number of commercial and regulatory challenges and any decision is unlikely before 2015.

6.5 The scheme is currently designed to be able to generate 600 MW, with a height of 500 m between the upper and lower reservoir sites. The project would cost in the region of £800 million and would be used to store energy and balance the grid during periods of high demand and low supply.

6.6 What more do we need to do?

At present, energy storage in the Highlands is largely limited to pumped storage schemes. Whilst new and appropriate opportunities for pumped storage schemes should continue to be investigated and implemented, future energy storage will require a variety of solutions. Across Scotland and Europe a number of technologies are under investigation for their potential to store energy such as hydrogen, compressed air, chemical batteries and heat storage. The viability of these technologies should be considered at a regional and at a local level.

6.7 The development of smart energy grids would also have a number of important impacts on energy storage. Smart grids can be used to control demand, allowing devices to draw energy from the grid when supply is high, and control demand when supply is low or during times of peak energy demand. In addition, as part of a smart energy grid, electric vehicles could become a potential energy source for the grid, rather than just a store for the individual.

7. Affordable energy

7.1 A person is living in fuel poverty if, in order to heat their home satisfactory, they would be required to spend 10 per cent of their household income (including housing benefit or

income support for mortgage interest) on all household fuel use. The Government has pledged that by November 2016, so far that is practically reasonable, people are not living in fuel poverty in Scotland.

7.2 Fuel poverty is closely linked to the price of fuel. Peaks in consumer prices correspond to high levels of fuel poverty. Fuel poverty rates also vary based on a number of factors, such as building type and fuel type. Mains gas is typically the cheapest commonly available heating fuel. Where households do not have access to the mains gas network, fuel poverty is higher (52% households off the gas grid fuel poor in 2012, compared with 24% on the grid[25]). The Scottish House Condition Survey 2010-2012[26] reported that in the Highland Council area over one in three (39%) of households were in fuel poverty, and that 61% of pensioners in the region are living in fuel poverty.

7.3 A key approach to make energy more affordable is to reduce the need for heat. Therefore, affordable heat has links with a number of other sections in this chapter, most notably energy renovated, comfortable, and attractive buildings.

7.4 Where we are now?

Commitments in the Highland Council Programme with a link to affordable energy include:

- We will devise a comprehensive strategy to bring about a reduction in energy costs in the Highlands, including particular support for fuel poor households and co-operative fuel buying; and
- The Council will work to tackle fuel poverty in the Highlands.

7.5 The Affordable Warmth Partnership Group is continuing to develop and implement action aimed at addressing fuel poverty. The Housing Revenue Account (HRA) capital programme for 2014-15 places a heavy emphasis on new heating systems using renewable technology in council houses. The proportion of our council housing stock meeting the energy efficiency standard (SHQS), in 2013/14 was 81.6% compared to 74.5% the year before. A new scheme is now in place for home insulation measures, the Home Energy Efficiency Programme for Scotland – Area Based Scheme, during 2013/14 there were 300 measures approved.

7.6 Single Outcome Agreement

The SOA contains commitments and actions to take to reduce fuel poverty across the Highlands. Reducing fuel poverty is a cross-cutting theme in the SOA, noted under both the

[25] For more information, please visit:
[26] Scottish Government (2013) Scottish House Condition Survey 2010-2012 Local Authority Analyses. Available at: http://ow.ly/zPFhF

environment theme and as a means to reduce health inequalities. Actions to reduce fuel poverty in the SOA include:

- Increase the number of low income households taking up income maximisation and energy efficiency advice; and
- Identify and reach individuals and communities most in need of advice and support to maximise income and improve energy efficiency.

7.7 Healthy Homes for Highland

Healthy Homes for Highland is a cross-referral fuel poverty initiative that encourages and supports frontline staff and volunteers to identify vulnerable households and refer them to sources of advice on energy efficiency, income maximisation and home safety. Anyone referred to the service can get free advice and assistance with:

- Making their home warmer and ways to reduce their fuel bills;
- Making their home safer through a Home Fire Safety Check;
- Getting more income from tax credits and benefits and access to other entitlements; and
- Debt counselling.

7.8 Highland's Housing Strategy 2010-2015

Highland's Housing Strategy 2010-2015 sets out a strategic vision that: "Everyone in Highland has a warm, affordable, secure home in good condition which meets their needs in a pleasant and thriving community. Housing helps communities across Highland to have sustainable economic growth."

7.9 This vision is supported by six priorities:

1. People are able to live in suitable, and affordable, housing through increased supply in the best places and improved access routes to a wide range of housing choices;
2. Owners and renters are able to live in suitable, energy efficient houses which are in good condition and, for renters, are well managed;
3. Fewer households living in fuel poverty;
4. More people with community care needs successfully living at home independently;
5. Fewer households experience homelessness through increased prevention and the delivery of responsive, effective services which bring about better outcomes; and
6. We have strong and supportive communities which have a long term future; where people feel safe and are able to play a greater role in shaping their future; where the impact of disadvantage is reduced and where public services are delivered well and provide value for money.

7.10 The implementation of this Highland Council strategy is ensuring fewer residents live in fuel poverty.

7.11 Warm Homes Discount Scheme

The Warm Home Discount Scheme is run by energy companies and aims to support those most vulnerable in our communities through providing a rebate on their energy bills. The scheme offers support to those classified as vulnerable customers in the form of an energy bill rebate, and for the winter of 2014-15, this will be £140. This scheme helps to make energy more affordable to those who most affected by the cost of energy.

7.12 What have we planned already?

Highland Housing Strategy

The Highland Council's Housing Strategy is currently under review and a revised strategy will be presented at a future meeting of the Highland Council's Community Service's committee. This strategy will continue to outline a strategic approach to ensuring that fewer households live in fuel poverty.

7.13 Energy Efficiency Programmes

As detailed earlier in this chapter, there is a number of energy efficiency programmes occurring in the Highlands to improve the fabric of Highland property. These activities will reduce the energy demand of properties in the Highlands and as such remove people from fuel poverty. This includes Highland Council progress to meet the Scottish Housing Quality Standards by 2015 (paragraph 2.6) and the work being conducted by E.ON through HEEPS-ABS (paragraph 2.11). These programmes of support are typically aimed at those households most at need and most vulnerable to fuel poverty.

7.14 What more do we need to do?

The fabric of homes across the Highlands needs to continue to be improved to ensure that energy demand continues to decrease. Support for householders should continue to be targeted at those most at risk of fuel poverty.

7.15 Fuel poverty is an issue that will take time to overcome. In the interim, programmes of financial support need to be appropriately communicated to those most at need and suffering fuel poverty, such as the Warm Homes Discount scheme and the Healthy Homes for Highland scheme. Carbon CLEVER can support this progress through working with partners to communicate the support that is available.

7.16 It is also important that areas off the gas grid have access to affordable sources of heat. This could include developing district heating networks with heat provided from renewable sources which could provide a lower cost source of heat than current systems.

7.17 The mini-Stern report (paragraph 2.22) is expected to outline the economic challenges and opportunities of climate change. In a similar study conducted by Leeds City region, investments were identified that would lead to substantial reductions in fuel poverty. It is anticipated that the Highland mini-Stern will generate similar findings and where possible the report recommendations should be implemented to make energy more affordable.

8. Energy and fuel security

8.1 The energy and fuel markets can be extremely volatile in terms of price fluctuations, and also guarantee of supply. Energy and fuel security is an important outcome for the Highlands, Scotland, and the UK by generating an increasing proportion of its energy from local and renewable sources.

8.2 The potential development of district heating networks may also have positive outcomes for energy and fuel security. Within a heating network, heat can be added into the system at multiple points through a variety of heat sources. This means that the system can be flexible, using the lowest cost sources of heat that are available.

8.3 The upgrade of the energy grid to a smart grid would also improve efficiency, reliability, and the sustainability of supply and demand. Smart grids utilise digital information and communication technology to act on information from both suppliers and consumers in an automated fashion in real time to balance the system. Smart grids enable demand-side management, enabling demand to be spread out to avoid peaks that put the grid under demand and allow optimal utilisation of renewable energy.

8.4 The outcome of energy and fuel security will be achieved through the actions outlined under many of the other sections in this chapter, most notably: increased renewable energy generation, including micro-generation; self-sufficient energy generation with minimal import and reliance on fossil fuels; Renewable heating and infrastructure where appropriate; and Energy storage to reduce reliance on fossil fuels during periods of peak energy demand.

8.5 As detailed at paragraph 4.7, the Isle of Eigg have developed an energy grid based primarily on a mix of renewable energy technologies, reducing reliance on external energy and fuel markets. The now established system incorporates a 9.9 kW photovoltaic system, three hydro-electric generating systems (totalling 112 kW) and wind turbines (24 kW). This system is supported by batteries and a diesel back-up generator to ensure continuous availability of power. The community are also investigating approaches to reduce dependence on fossil fuels used for vehicles.

9. Engagement Strategy

9.1 To achieve the goals of Carbon CLEVER it will require engaging with, and working in partnership with a wide range of stakeholders across the public, private and third sector, as well as communities and residents. Engaging with stakeholders will facilitate the exchange of ideas and good practice. The following relates specifically to engagement around the theme of energy.

9.2 Where we are now?

Carbon CLEVER Conference

At the Carbon CLEVER Conference in November 2013, delegates told us that the most exciting things about Carbon CLEVER Energy in the Highlands are:

- Homes retrofitted and energy efficient;
- Fuel poverty ended; and
- Grid issues all solved

Delegates also highlighted that biomass or hydrogen would replace town gas, there will be renewable energy in every street in Inverness, and suitable energy storage solutions will be in place.

9.3 Carbon CLEVER Workshops

In developing the Carbon CLEVER initiative, workshops have been conducted internally with Highland Council Services, senior management, Green Ambassadors, and Elected Members, and with Highland Youth Voice in 2013. These workshops were used to determine the main drivers, opportunities, barriers, and threats to decarbonising energy in the Highlands in order to achieve a carbon neutral Inverness in a low carbon Highlands. This feedback is an extremely valuable resource which has been used to inform and direct the early action taken as part of Carbon CLEVER – ensuring that drivers are understood and fully exploited, opportunities are investigated, barriers overcome, and threats acted upon and reduced.

9.4 Eco-Schools

The Eco-Schools programme is a sustainable development award scheme running across primary and secondary schools. It engages young people in raising awareness of environmental issues linking to all areas of the curriculum and supporting sustainable education. Eco-Schools have a wide range of aims, and can help to:

- Reduce energy and water use;
- Improve the school's environment;
- Reduce litter and waste;
- Devise sustainable ways of travelling to and from school;
- Promote healthy lifestyles;
- Encourage active citizenship;
- Build strong partnerships with a variety of community groups; and

- Develop national and international links and networks.

9.5 All schools in the Highlands are actively engaged with the Eco-Schools programme, and as a result all schools have achieved awards. In the Highlands 152 Bronze awards, 148 Silver awards, and 100 Green Flags have been achieved. All schools have a designated countryside ranger who works to support the aims and aspirations of the school in the Eco-School programme.

9.6 E.ON Energy Efficiency workshops

In 2014, as part of HEEPS-ABS work occurring in the Fort William area (paragraph 2.11), pupils at six Fort William primary schools were visited by a touring Energy Saving Play production which aims to get the message across to young people to save energy.

9.7 The touring workshops were delivered by Pals Productions on behalf of E.ON. The Fort William schools are engaging with actors and take part in drama activities, songs and games aimed at encouraging them to think about their carbon footprint. Each performance is ended with a scripted mini play called “The E-onators” which includes a Carbon CLEVER rap which is performed by the children to their school and parents.

9.8 Green Ambassadors

The Highland Council has a network of over 140 Green Ambassadors across Council services and buildings ensuring that climate change, sustainability, and energy efficiency messages are not only cascaded from Senior Management but are distributed and discussed at individual site level.

9.9 Energy Efficiency and Renewable Energy advice

Throughout the Energy chapter, the dissemination and targeted communication of energy advice and information has been stressed. It is important that where support is available it is communicated to the right people in the Highlands to ensure that finance and support to the region is maximised. The Highland Council will continue to work closely with Home Energy Scotland who provide free, impartial energy advice to householders, community groups, and businesses.

9.10 What have we planned already?

Engagement will continue to occur with partners and stakeholders through a number of avenues. This will be supported through a number of ad hoc events. Carbon CLEVER will work in close partnership with energy companies and associated organisations such as Community Energy Scotland, Resource Efficient Scotland, and Home Energy Scotland. As detailed in the Economy chapter, a survey of both the Citizens’ Panel and Communities’ Panel will be conducted in 2014 or 2015 as a qualitative measure of the performance of the

initiative (Economy, paragraph 9.9). These surveys will cover a range of topics related to the strategic themes and outcomes of Carbon CLEVER. They will aim to ascertain the effectiveness and public awareness of the initiative, and to identify additional support, guidance, and action that is required.

9.11 Carbon CLEVER Conference 2014

A conference will be held in November 2014. At this conference, the Carbon CLEVER Programme will be published, progress made by Carbon CLEVER in the first year of the initiative will be detailed and future projects and actions outlined. The conference will also be utilised with to engage with Highland stakeholders on the Economy, Energy, Transport, and Land Use and Resources, and to challenge each other to accelerate our collective progress to decarbonising transport.

9.12 Highland Council Staff Engagement Campaign

The Highland Council has a Green Ambassador scheme (see paragraph 9.7), but it has been recognised that more work is needed to ensure that Highland Council staff are engaged and feel empowered to take action to reduce energy consumption across the Highland Council estate. Using the ISM model, the Highland Council's Climate Change Team will work closely with the Energy and Sustainability Team, the Waste Awareness Team, and Resource Efficient Scotland to develop a staff engagement campaign. Initially, this will target energy efficiency and waste awareness.

9.13 Energy Efficiency Exhibition

Working with the Energy Saving Trust and the Scottish Provincial Press, plans for a Energy Saving Exhibition are being developed by the Carbon CLEVER initiative. This event would occur over two days, with a day targeted at businesses and a day focused on householders. It would bring together a range of expertise on energy efficiency, renewable energy generation, electric vehicles and much more to engage businesses and Highland residents to take action to be more energy efficient, and to switch to lower carbon forms of energy.

9.14 What more do we need to do?

Sustainable Energy Action Plans

Support from the STEP-UP project (paragraph 4.5) is being combined with that from the Sustainable Scotland Network to develop a Sustainable Energy Action Plan which will provide a carbon emissions baseline for the region. This is an important step in developing the evidence base of Carbon CLEVER.

9.15 Following this it is proposed that energy actions plans are developed with communities. This will further increase awareness within the community of energy consumption and generation, and stimulate discussion and energy action planning. From this it is hoped that

specific action plans are developed, and the community can take the leading role in the delivery of these.

9.16 Community Engagement Campaign

Developing sustainable energy actions plans for communities will require engagement with communities This should utilise the ISM model to initiate discussions and from this a programme of bespoke measures will be identified. The ISM model focuses on personal preferences, social norms and infrastructure requirements as a way of understanding how to support behaviour change effectively.

9.17 School Engagement Campaign

In a similar manner to the proposed Community Engagement Campaign, the ISM model should be utilised to stimulate discussions in schools, both with staff, and with pupils. This should look to compliment the current actions be taken at the schools, such as the Eco-schools programme. Within the Highlands there are 215 schools, and therefore it will be necessary to prioritise such a campaign.