Comhairle Contae Dhún na nGall
Donegal County Council

Derry City & Strabane District Council
Comhairle Chathair Dhoire & Cheantar an tSratha Báin
Derry Cittie & Stràbane Destrick Cooncil

Derry City & Strabane District Council and Donegal County Council

NORTH-WEST REGIONAL ENERGY STRATEGY

Executive Summary Report

INTRODUCTION

This document is an Executive Summary of the full North-West Regional Energy Strategy. The key messages set out within the full strategy document are summarised within this short report.

Executive Summary

Derry City & Strabane District Council (DCSDC) and Donegal County Council (DCC) both recognise the need to transition towards a smart, low carbon economy which can deliver sustainable prosperity for individuals, communities, businesses and the local environment within the North-West Region.

To fulfil this goal, both councils have collaborated, with the support of WSP, to define a clear and structured North-West Regional Energy Strategy for one combined region.

This strategy has been aligned with binding targets set by central governments and the EU and provides a roadmap to a sustainable future for the North-West. This can deliver real reductions in annual carbon emissions, whilst encouraging the growth of a low carbon economy and improving security of supply.

This strategy recommends a Whole Energy System approach and a holistic view on the consumption and management of energy throughout the region. A wide variety of local measures have been recommended as potential opportunities to encourage the adoption of renewable Low Carbon Technologies (LCTs) both for the consumption and generation of energy within the Region.

Moving forward, these local measures will be assessed individually and applied wherever technically and commercially feasible.

A Low Carbon Future Enabled Locally

The need to address climate change has given rise to a Low Carbon Economy which is already having a positive effect on the wider economy. In 2016, the industry turnover in Northern Ireland reached almost £1 billion, supporting 5000 jobs and 4000 businesses.

Decarbonising the energy system will not only address climate change but improve energy security and reduce fuel poverty. Implementing innovative solutions to the decarbonisation of the energy system is critical to ensure the cost to consumers remains affordable.

DCSDC and DCC have therefore joined forces to build a coordinated Regional Energy Strategy for the North-West Region which can deliver real improvements to the energy system within the region.

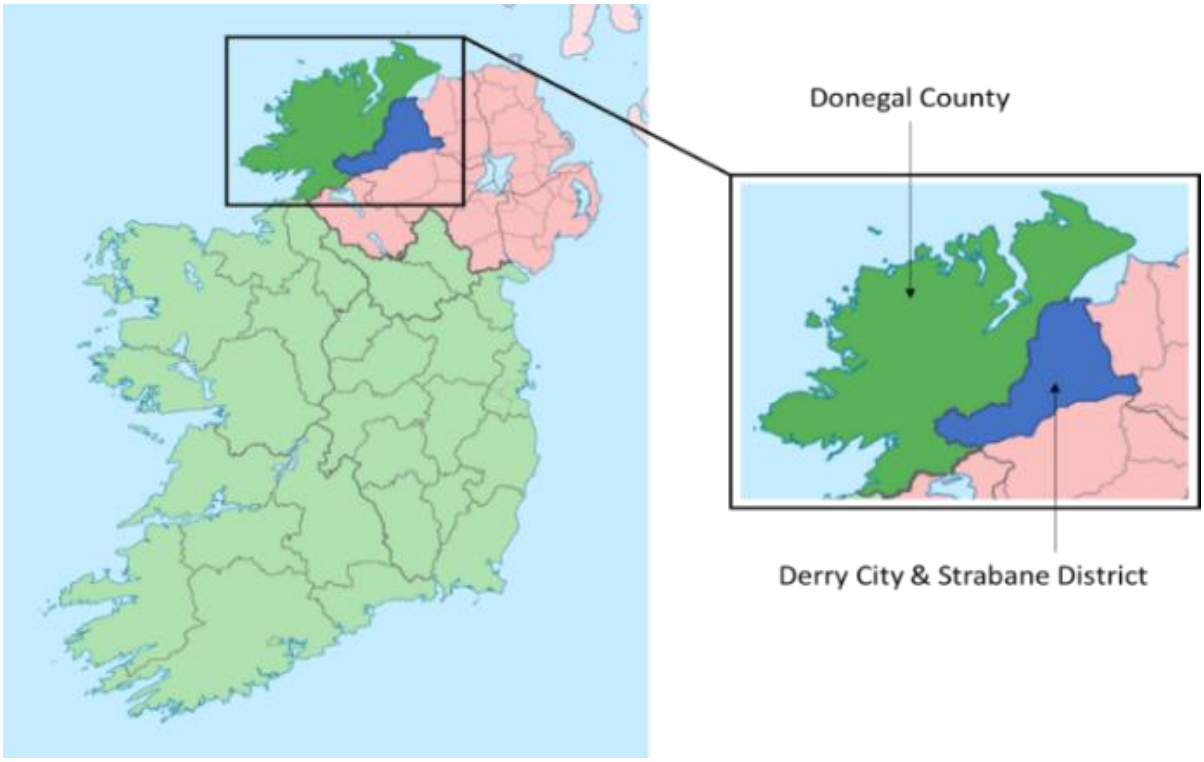
Both Councils have a history of driving energy conservation throughout their organisations, and through the ongoing delivery of this strategy, wish to remain a driving force for innovation in the region. They will bring together the strands necessary within their own organisations, working with the private sector stakeholders and academia to deliver the objectives as set out within the report.

Location of the North-West Region

The North-West Region consists of two areas; County Donegal located in the northern part of the Republic of Ireland, and Derry City & Strabane (DCS), located in the north-west of Northern Ireland.

Figure 1 shows a map highlighting both areas. Throughout this report, the term ‘North-West Region’ is used to refer to both County Donegal and DCS. Unless otherwise specified, the entire region is analysed with an overall strategy that applies to both operating councils.

Figure 1 - Location of County Donegal and Derry City & Strabane District



Vision for the North-West: Net Zero by 2045

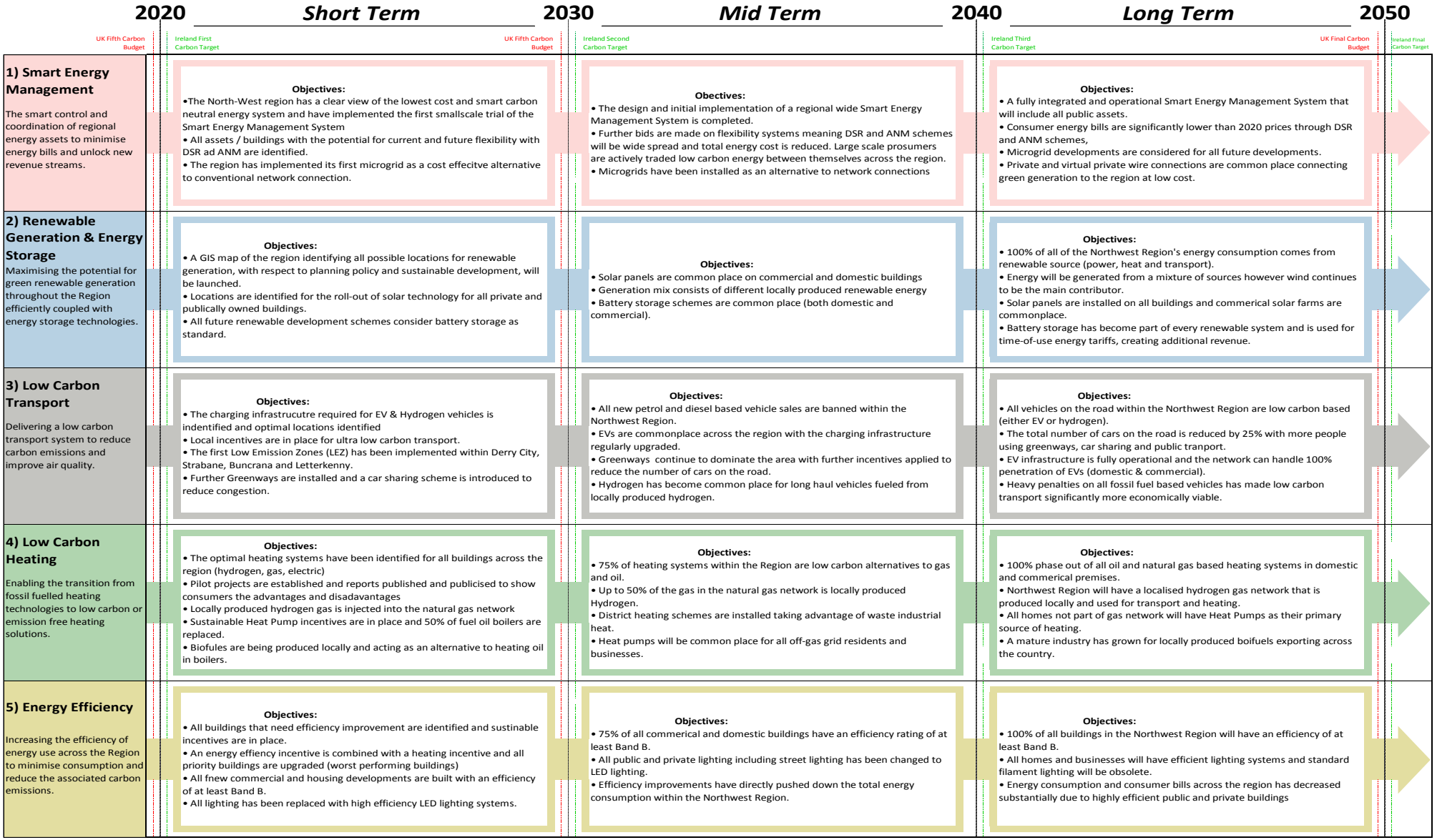
The North-West Region will become a leader in achieving national and international climate change targets and intends to **become carbon neutral by 2045.**

In doing so, it is important to ensure a sustainable, secure and affordable energy system for all citizens' whilst maximising opportunities for economic growth.

This report intends to encourage a holistic view of the energy system within the North-West Region by coordinating multiple energy vectors together, in order to optimise energy consumption across the area by both minimising greenhouse gas emissions and reducing customer bills.

The vision is intended to deliver sustainable economic growth for the region, whilst minimising the environmental impact of all our activities to realise the low carbon society which is so critical for our future.

REGIONAL ENERGY STRATEGY & ROADMAP



ENERGY UTILITY SECTORS

Electricity Networks

There are two Distribution Network Operators (DNO's) that are responsible for distributing electricity in the North-West Region: Northern Ireland Electricity (NIE) Networks in Northern Ireland and Electricity Supply Board (ESB) Networks in Republic of Ireland. The primary role of both is to reliably and safely deliver electricity to both domestic and commercial customers throughout the North-West Region. Both will have a crucial role in the transition to a low carbon energy system within the Region.

There are a variety of Low Carbon technologies (LCTs) that will have a significant impact on the electricity network, including Heat Pumps (HP's), Electric Vehicles (EV's), embedded renewable generation and microgrids. For example, HP's are an efficient and cost-effective electrical alternative to fossil fuelled heat sources and have an important role to play in reducing carbon emissions. However, connection of HP's to the grid will introduce an additional loading to the network, creating unwanted harmonic problems and increased stress on network infrastructure. This same issue is also prevalent in EV's. EV's are an essential alternative to fossil fuel transport, but the growth in their numbers, without smart solutions, would result in the need for expensive grid reinforcements. At this current time, the network within the region is heavily constrained meaning reinforcements would be required to add additional capacity for renewable generation. Furthermore, connections of renewable sources such as wind farms are constrained by thermal capacity, voltage limits and network harmonics. Innovative solutions alongside well planned network reinforcements are essential to ensure capacity is available for the connection of renewable technologies.

Heat Networks

Both within the region and throughout the rest of the UK and Ireland, domestic and commercial heating makes up a large percentage of the carbon emissions each year. Consequently, it is important that low carbon and efficient heating solutions are pursued and encouraged within the North-West Regional Energy Strategy. The primary fuel source for heating within the region is Heating Oil. The oil is transported to consumers via road and then sorted in oil tanks for use within oil boilers. Fuel oil produces large levels of carbon emissions when burned and its price is volatile. Furthermore, all the Heating Oil used within the region is imported from outside Ireland which puts a risk on energy security and leaves consumers vulnerable to global fluctuations in price.

Heating is also supplied by natural gas via the transmission and distribution gas network which is operated and maintained by Gas Networks Ireland (GNI). However, most of the region is not connected to the natural gas network with only some areas of DCS currently having access. While future projects are planned to increase the number of connections on the gas network, relying upon this fuel source brings similar concerns to that of fuel oil. This fuel source brings with it harmful carbon emissions and increases the regions reliance on imports from abroad as no natural gas is produced locally. It's important that the energy strategy for the North-West Region considers the adoptions of LCT's which reduce the long term environmental impact and cost of heating within homes and businesses. Hydrogen is a potential alternative as it provides clean and efficient energy. HP's are another potential alternative as well as renewable gas from natural waste. District heating schemes may also provide a suitable heating alternative for smaller communities disconnected from the natural gas network, and with limited network capacity for the connection of HP's.

Water Networks

Irish Water are the national water utility in the Republic of Ireland, whilst Northern Ireland Water provide the water and sewerage services for Northern Ireland. In Donegal, DCC act on Irish Waters behalf and are responsible for the maintenance and operation of the network throughout the Donegal region. As a large consumer of energy, the Water Networks across the North-West Region have an opportunity to reduce both their annual energy bill and carbon footprint. Some opportunities to reduce the environmental footprint from water networks could be the installation of renewable generation at pumping sites, improving aged and damaged waterpipes to reduce leaks, and reducing pump sizes where appropriate.

ROLL OF INNOVATION

Both technical, commercial and regulatory innovation is required to enable the strategy and vision described within this document. Both DCC and DCSDC are currently involved in a number of energy related innovation projects, whilst other national and international projects represent “fast follower” opportunities for the region to build upon learnings and accelerate the decarbonisation of the region.

Local Innovation Projects

Both the DCC & DCSDC are involved in several innovation projects that will accelerate the transition to a low carbon energy system. One such example is the DCSDC Funding Deal. This City Deal will provide £50 million in funding to support innovation and the growth of the area’s digital sector within DCSDC. The learnings that are acquired from the innovative projects funded should be applied across the entire region wherever possible. In addition, both LA’s are involved in the following energy related innovation projects:

- **SECURE** – Smarter Energy Communities
- **SmartRENEW** – Smarter Renewable Energy & Heating Management
- **SMARCTIC** – Smart Energy Management in Remote Areas
- **STARDUST** – Holistic and Integrated Urban Model for Smart Cities
- **CLIMATE** – Collaborative Learning Initiative Managing & Adapting to the Environment

(See main report section 7 for full details of these)

It is important that the region stays up to date with the latest “State of the Art” and innovations in Energy as the North-West Regional Energy Strategy is implemented.

There are many innovation projects and demonstrators around the world with the goal to reduce carbon emissions. This presents the North-West Region with fast follower opportunities to implement the learnings and developments that arise from global innovation projects as they become available.

As an example, the RUGGEDISED project has brought together six European cities to accelerate a path towards a sustainable future by creating model urban areas. The project is funded under the European Union’s Horizon 2020 research and innovation programme and intends to partner with industry and academia to demonstrate how to combine ICT, e-mobility and energy solutions to design smart future cities. In total, RUGGEDISED has funded 32 innovative projects in areas including Smart Thermal Grid, Smart Electricity and E-mobility and Energy Management and ICT.

It is recommended that the North West Regional Energy Hub project body is established, closely following the excellent examples from Codema in Dublin, and the Midland Energy Hub in England (see section 7 of main report)

REGIONAL ENERGY CARBON ASSESSMENT

An assessment of carbon emissions within the North-West Region has been conducted to establish a carbon baseline for the region. This exercise will allow progress against carbon emission targets to be tracked and allow future carbon reduction initiatives to be prioritised.

The assessment consisted of two parts; quantify the carbon emissions associated with the current energy system and secondly a quantification of the carbon impact associated with the local measures recommended within this strategy. This exercise allows the region to keep track of the carbon emissions arising from the area, set informed carbon targets, and prioritise investments in local measures which accelerate the decarbonisation of the region.

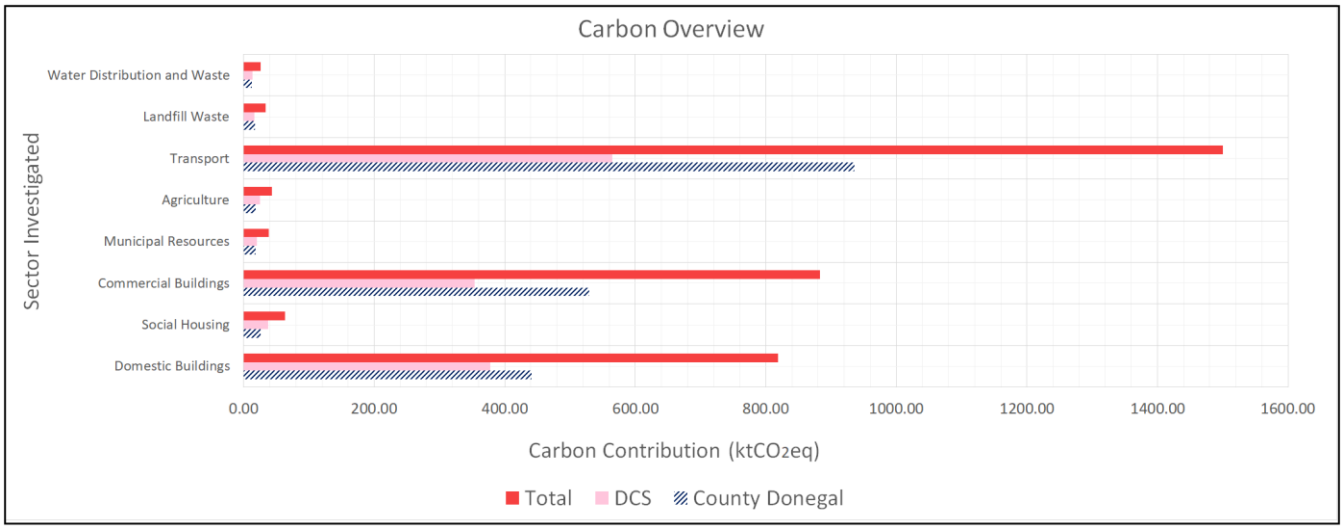
The Carbon Baseline exercise was delivered in collaboration with ERNACT and identifies the main sources of greenhouse gas emissions within the region with an Excel Tool. This includes the emissions associated with the energy consumed by Transport, Housing, Commercial properties, Industry, Waste and Water amongst others.

The second Excel tool allows the impact of the local measures to be quantified across the five key areas of interest; Renewable Generation, Low Carbon transport, Low Carbon Heating and Energy Efficiency. The target sectors have differing methodologies to quantify the total carbon savings, therefore requiring various data inputs specific to the individual carbon saving initiative. When complete, the results will provide evidence to support future investment in low carbon energy initiatives which will have the most significant impact and support the decarbonisation of the region.

Carbon Baseline Results

The total carbon baseline across all sectors for the North-West region was calculated to be **3,407 ktCO$_2$eq** (kilo tonnes of CO_2 equivalent), of which **1,998 ktCO$_2$eq** from County Donegal, and **1,409 ktCO$_2$eq** from the DCS. The carbon associated to each sector disseminated by Figure 2:

Figure 2 – North-West Region Carbon Baseline



Three main sectors; Transport, Commercial Buildings, and Private Domestic Buildings, have significant contribution to the carbon baseline making up 94 % of the total baseline (44%, 26%, and 24% for transport, commercial and domestic buildings respectively).

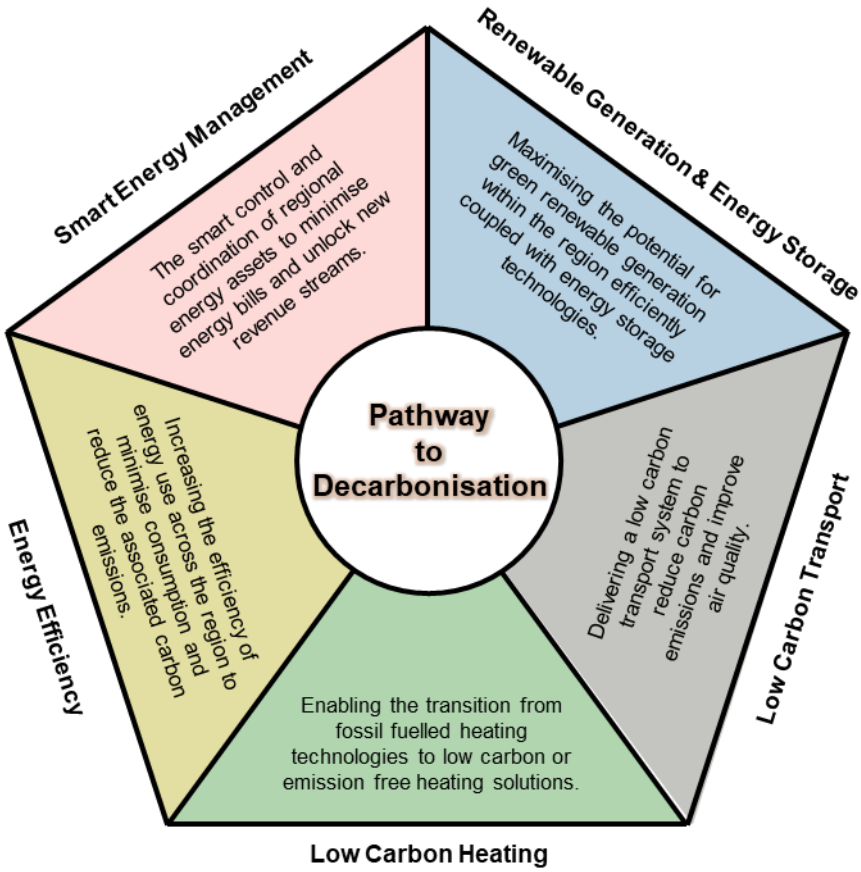
This analysis highlights the key focus areas for DCC and DCSDC to target with low carbon development strategies when attempting to reduce the carbon emissions associated with the region.

CONCLUSIONS

Both Derry City & Strabane District Council (DCSDC) and Donegal County Council (DCC) have joined forces to build a sustainable and low carbon region which can encourage further economic growth whilst reducing the carbon emissions arising from the use of energy within the Region. A Carbon Baseline of **3,407 ktCO2eq** has been established as the starting point towards "Net Zero".

This North-West Regional Energy Strategy has defined the current energy system within the Region and potential opportunities to that are available to help meet binding national and European carbon reduction targets. These opportunities have been mapped against five themed areas as described below:

Figure 3 – Themed decarbonisation areas: Pathway to Decarbonisation



It is recommended that a Whole Energy System approach is taken which assesses energy opportunities simultaneously across multiple energy vectors including gas, electricity, heat, and transport. This will allow the generation, consumption and storage of energy across the region to be optimised and the cost to achieve a future carbon neutral community minimised.

The next steps would require more in-depth feasibility studies and planning to be carried out against each of the potential local measures that are recommended within this report. This will allow the region to develop a clearer view and quantify the business case associated with each potential initiative, including all costs and benefits.

This document is an executive summary of the main Regional Energy Strategy report. Please refer to the full report for more detailed description of the content presented within this report and of the North West Regional Energy Strategy as a whole.

It is clear from above that there is a considerable amount of work over many years, which will need to be coordinated in order to develop, and deliver the projects set out within the North West Regional Energy Strategy. We are aware that as we are consulting on this strategy, the NI Energy Strategy is also being developed, and the intention is that both strategies are finalised towards the end of 2020. In keeping with similar organisational arrangements in both Ireland and England, we are confident that such a local delivery body would work well in the North West of Ireland.