

COMHAIRLE CHONTAE LIATROMA
LEITRIM COUNTY COUNCIL

Climate Change Adaptation Strategy



2019 - 2024

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Foreword

Climate change is now recognised as a global challenge with policy responses required in terms of both mitigating the causes of climate change and in adapting to the now inevitable consequences of our changing climate.

This Climate Change Adaptation Strategy highlights the impacts of recent severe weather events experienced in County Leitrim and includes a risk assessment for the county. The Strategy proposes a range of actions to be delivered at County Level to allow us to adapt better to such events in the future.

The Climate Change Adaptation Strategy represents a proactive step by Leitrim County Council in the process of adaptation planning, to build resilience and respond effectively to the threats posed by climate change.



Lar Power

Chief Executive

Early planning for adaptation will ensure we have sufficient time to plan in a considered and coherent way for how we adapt to the future impacts of climate change.

As the level of government closest to local communities and enterprise and as first responders in many emergencies, local authorities are uniquely placed to effect change on the ground and contribute towards climate resilience in the long term.

This Climate Change Adaptation Strategy for County Leitrim will improve our ability to plan for and respond to severe weather events in the shorter term. With essential local knowledge we have a critical role to play in managing climate risks and vulnerabilities and this strategy identifies the adaptation actions to be undertaken by Leitrim County Council in this regard.



Councillor Enda McGloin

Cathaoirleach

CHAPTER 1: INTRODUCTION & BACKGROUND

1.1 Introduction

The Earth's Climate is changing. While natural fluctuations in climate are considered normal, emerging research and observational records from across the world show rates of change that are far greater than those experienced in recent history. Global temperatures have risen and are projected to rise further, bringing changes in weather patterns, rising sea levels and increased frequency and intensity of extreme weather. Ireland's climate is changing in line with global patterns and these changes are bringing significant and wide ranging economic, environmental and social impacts.

Climate change is now recognised as a global challenge with policy responses required in terms of both mitigating the causes of climate change and in adapting to the now inevitable consequences of our changing climate. Action at local level is vitally important to help reduce the risks and impacts of climate change across communities.

This Climate Change Adaptation Strategy is the start of the process of adaptation planning in Leitrim County Council and is the first step in increasing knowledge and understanding of our changing climate, growing resilience, and enabling effective responses to the threats posed by climate change.

1.2 Purpose of this strategy

This Adaptation Strategy forms part of the National Adaptation Framework (NAF) which was published in response to the provisions of the Climate Action and Low Carbon Development Act 2015.

As the level of government closest to local communities and enterprise, and as first responders in many emergencies, Leitrim County Council are uniquely placed to effect real positive change with respect to delivery of the national transition objective, to a low carbon and a climate resilient future.

The local authority adaptation strategy takes on the role as the primary instrument at local level to:

- (i) ensure a proper comprehension of the key risks and vulnerabilities of climate change
- (ii) bring forward the implementation of climate resilient actions in a planned and proactive manner
- (iii) ensure that climate adaptation considerations are mainstreamed into all plans and policies and integrated into all operations and functions of the local authority

This adaptation strategy serves Leitrim County Council in its two capacities namely:

- As an organisation with an obligation towards customer service, a focus on effectiveness in business, improving efficiencies and maintaining staff welfare and
- In the delivery of services and functions across the administrative and geographical area of County Leitrim.

In accordance with the provisions of the Climate Action and Low Carbon Development Act 2015 this adaptation strategy is required to be adopted by members of Leitrim County Council before the 30th September 2019.

1.3 The challenge of climate change

Climate is described as the average weather prevailing in an area over a period of time. *Climate Change* is a significant change in weather patterns such as rainfall, temperature, and/or wind, which continue over an extended period of time (i.e. over decades or longer). The earth's climate is constantly changing. Climatic fluctuations are known to occur from natural causes including the Earth's orbit and tilt, volcanic eruptions, variations in solar energy and other phenomena such as the El Nino effect¹. However, in more recent times, there are growing concerns that natural fluctuations in climate are being overtaken by rapid human-related activities which are negatively influencing climate variability and giving rise to serious implications for the rate of global warming.

Scientific evidence for warming of the climate system is unequivocal. According to the Intergovernmental Panel on Climate Change (IPCC)² warming of the climate system is attributable to human activities as a consequence of greenhouse gas emissions³ from:

- Burning of fossil fuels such as oil, gas, peat, and coal resulting in carbon dioxide emissions,
- Agricultural activities that lead to methane and nitrous oxide emissions,
- Emissions from changes in land use such as urbanization, deforestation, reforestation and desertification.

Emissions from these activities are proven to impact the atmosphere by trapping the sun's radiation and reflecting this radiation back to the earth giving rise to global warming. The term greenhouse effect has been coined to describe this occurrence.

The effects of global warming are observed through reductions in snow and ice in polar regions, increase in global mean surface temperatures, rise in sea levels and changes in some climate extremes i.e. weather events. Scientists state these changes are occurring rapidly, are considerable, and will have consequences for this and future generations. Some impacts of global warming such as sea level rise and coastal flooding are already locked in and unavoidable. The full impacts of current warming have not yet been seen, since ice sheets and oceans take many decades to fully react to higher temperatures.

1.4 The challenge for Ireland

There is evidence that Ireland's climate is changing in line with global trends of climate change. Over the last few decades our climate has warmed, sea-levels have risen, rainfall patterns have changed and we have been impacted by frequent, intense and more extreme weather events. Temperatures

¹El Nino is a climate cycle in the Pacific Ocean with a global impact on weather patterns.

²The IPCC was created in 1988. One of its key objectives is to provide governments at all levels with scientific information that they can use to develop climate policies. IPCC reports are a key input into international climate change negotiations.

³Greenhouse Gases include: water vapour, carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and industrial gasses: Hydrofluorocarbons (HFCs), Perfluorocarbons (PFCs), Sulphur Hexafluoride (SF₆), and Nitrogen Trifluoride (NF₃). Carbon Dioxide emissions in the atmosphere are the main greenhouse gas caused by human activity

have increased by 0.8°C since 1900 and sea level rises of about 3.5cm per decade have been observed since 1990.

Climate change has diverse and wide ranging impacts on Ireland's economic and natural resources including:

- More intense storms and rainfall events giving rise to disruption to society
- Increased river and coastal flooding
- Water shortages in summer
- Increased risk of new pests and diseases
- Adverse impacts on water quality
- Changes in the distribution and phenology of plant and animal species on land and in the oceans⁴

Nationally, climate projections for the next century indicate that the climate trends observed over the last century will continue and intensify over the coming decades i.e.:

- Increase in average temperatures across all seasons. Heat waves are expected to occur more frequently.
- Significant reductions are expected in average levels of spring and summer rainfall with a substantial increase in the frequency of heavy precipitation events in Winter and Autumn
- Decrease in wind speed and an increase in extreme wind speeds. The number of very intense storms is projected to increase over the North Atlantic region.
- Sea levels will continue to rise for all coastal areas. The south of Ireland will likely feel the impacts of these rises first. Sea surface temperatures are projected to continue warming for the coming decade.

This local authority adaptation strategy is set against the background of increasing risks associated with climate change and seeks to reduce and manage these risks at local level through a combination of mitigation and adaptation responses.

All local authorities including Leitrim County Council, provide a wide range of services, many of which are already and will increasingly be affected by climate change. It is most likely that we will continue to play a critical role in responding to the impacts of extreme weather events and other impacts that are likely to emerge over the coming decades through various implementation tools available as a local authority⁵.

⁴ EPA Research, A summary of the state of knowledge on Climate Change Impacts for Ireland, Report No. 223, 2017.

⁵ Including: Spatial Planning, development consent, asset management and natural resource protection.

1.5 What is Climate Adaptation?

Climate Adaptation can be best described as planning proactively to take action and make adjustments to minimise or avoid the existing and anticipated impacts from climate change. The Intergovernmental Panel on Climate Change (IPCC), in 2014, defined climate adaptation as:

“The process of adjustment to actual or expected climate and its effects. In human systems, adaptation seeks to moderate or avoid harm or exploit beneficial opportunities. In some natural systems, human intervention may facilitate adjustment to expected climate and its effects.”

Climate adaptation aims to build climate resilient communities, to protect people, ecosystems, businesses, infrastructure and buildings from the negative impacts of climate change. As a Local Authority we play a pivotal role in planning for, and responding to, emergency situations. We are best placed to react faster and more effectively to local climate events given our close relationship with communities and extensive knowledge of the local natural and built environment. This is demonstrated by our prompt and unrelenting emergency responses to varying and more frequent extreme weather events.

Our climate is changing and we as a local authority need to ensure that we adapt to climate change. It is crucial that climate change adaptation is mainstreamed into our decision making processes and implemented proactively in the performance of our duties. In addition, the benefits and opportunities that may arise as a result of climate change must be capitalised upon in respect of cost savings and new ways to foster environmental sustainability.

1.6 Adaptation and Mitigation



***Adaptation** refers to efforts to manage the risks and impacts associated with existing or anticipated impacts of climate change.*

***Mitigation** refers to the efforts to reduce the emission of greenhouse gases and reduces the severity of future climate change impacts.*

This local authority climate change adaptation strategy forms part of Ireland's national strategy for climate adaptation as set out in the National Adaptation Framework (NAF) which was produced under the provisions of the Climate Action and Low Carbon Development Act 2015.

It is tasked with mainstreaming climate change adaptation over time into all functions, operations and services of the local authority. It seeks to inform or 'climate proof' existing plans and policies produced and implemented by the local authority. This ensures a considered, consistent and coherent approach, facing head on, the challenges of a changing climate. Crucially, it also helps in building resilience within the local authority organisation itself as well as across all communities.

While there is strong emphasis on local authorities through the NAF to develop and implement adaptation measures and actions, mitigation measures and actions that seek to combat, reduce or eliminate the emissions of greenhouse gases are also hugely important. Local authorities have a significant role to play in actively implementing mitigation actions through measures including the design and construction of flood defences, retrofitting of building stock, energy efficient projects, promoting sustainable energy communities and encouraging sustainable transport and land-use.

There are positive interactions between adaptation and mitigation measures. Employing both adaptation and mitigation measures represents a robust climate action response in addressing the challenges associated with climate change at local level. The actions set out in Chapter 6 of this strategy reflect both adaptation and mitigation measures as a considered, relevant and integrated approach to combating the effects of climate change in County Leitrim.

1.7 Adaptation Policy Context

This local authority adaptation strategy is set within a policy framework at International, European and National level.

1.7.1 International Context

The United Nations Framework Convention on Climate Change (UNFCCC) is an international environmental treaty adopted in May 1992. The framework's objective is "to stabilize greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system." The framework set non-binding limits on greenhouse gas emissions and contained no enforcement mechanisms. However the framework outlined how specific international treaties may negotiate further action towards its key objective. **The Paris Agreement 2015** is a protocol set within the context of the UNFCCC (ratified by Ireland on 4th November 2016) and it is aimed at:

- limiting global warming to less than 2^oC above pre-industrial level and pursue efforts to limit the temperature increase to 1.5^oC
- Increasing the ability to reduce impact of climate change and foster climate resilience

The agreement states the need for Parties to formulate and implement National Adaption Plans.

1.7.2 EU Context

The 2013 EU Strategy on Adaptation to Climate Change encouraged all Member states to adopt comprehensive adaptation strategies. It sought for better informed decision making through the identification and addressing of gaps in knowledge about adaptation. The European Climate Adaptation Platform, Climate-ADAPT, was developed as a resource mechanism to help users access and share information on adaptation.

The Global Covenant of Mayors for Climate and Energy is a voluntary, bottom up, approach for cities and local governments to combat Climate Change and move towards a low emission, resilient society. The Global Covenant of Mayors for Climate and Energy brought

the Compact of Mayors and the EU Covenant of Mayors under one international body in January 2017 incorporating over 9,000 cities and local governments.

1.7.3 National Context

The 2012 National Climate Change Adaptation Framework (NCCAF) was Ireland's first step in developing a national policy on adaptation actions to combat the impacts of climate change.

The National Policy Position on Climate Action and Low Carbon Development 2014 restated the policy position of the NCCAF, 2012. Greenhouse gas mitigation and adaptation to the impacts of climate change were to be addressed in parallel national plans under an evolving climate policy to 2050.

The Climate Action and Low Carbon Development Act 2015 was a landmark national milestone in the evolution of climate change policy in Ireland. It provides the statutory basis for the national transition objective laid out in the National Policy Position (as per above). Further to this, it made provision for and gave statutory authority to both the **National Mitigation Plan (NMP)**, published in 2017 and the **National Adaptation Framework (NAF)** published in 2018. This Local adaptation Strategy forms part of the National Adaptation Framework.

The Local Authority Adaptation Strategy Development Guidelines 2018 provides guidance to Local Authorities to develop their own Climate Action Adaptation Strategy. In developing this adaptation strategy Leitrim County Council has been consistent with these guidelines.

1.8 Methodology

Consultation with prescribed environmental authorities for the purposes of Strategic Environmental Assessment will be undertaken in accordance with the provisions of the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435 of 2004 as amended by S.I. 200 of 2011).

The Draft Strategy will be placed on public display for a 4 week period, where comments and observations will be invited from members of the public and interested parties.

1.9 Environmental Assessment

Screening Overview for SEA:

Under the European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 (S.I. 435 of 2004 as amended by S.I. 200 of 2011), all plans which are likely to have a significant effect on the environment must undergo screening to determine whether a Strategic Environmental Assessment (SEA) is required. "Screening" is the process for making a determination as to whether a particular plan, would be likely to have significant environmental effects, and would thus warrant SEA. This strategy has been screened for SEA and it is determined that full SEA is not required. The screening report accompanies this strategy.

Screening overview for AA:

Screening of this strategy will be undertaken in accordance with the requirements of Article 6(3) of the EU Habitats Directive (directive 92/43/EEC) to determine if the Climate Change Adaptation Strategy is likely to significantly affect Natura 2000 sites (*i.e.* Special Areas of Conservation (SAC) and Special Protection Areas (SPA)) within or surrounding the strategy area. It is determined that stage 2 Natura impact Report is not required. The Appropriate Assessment Screening Report accompanies this Strategy.

CHAPTER 2: OVERVIEW OF CARO REGION

2.1 Leitrim in Context

Leitrim County Council is located within the Eastern and Midlands Climate Action Region (CARO) and is one of 17 Local Authorities in the region. Leitrim County Council is located to the North West within the Eastern and Midlands Climate Action Region.

The Eastern and Midland CARO has assisted and supported Leitrim County Council in the development of this Climate Change Adaptation Strategy.

Demographics

The population of Co. Leitrim was recorded in 2016 as 32,044 people comprising of 16,064 men and 15,980 women. This displayed a modest growth of 246 in population from the 2011 recorded population of 31,798.

The population of the County Town of Carrick on Shannon was recorded at 4,062 of which 640 population were in the adjoining village of Cortober. The Census treats Carrick on Shannon and Cortober as a single census town.

The census recorded that there were 18,051 permanent dwellings in Co. Leitrim in 2016 of which 12,486 were occupied and 339 were temporarily absent, a total of 12,825 dwellings. The remainder consisted of unoccupied holiday homes (1,637) and other vacant dwellings (3,589). The percentage of other vacant dwellings at 20% is the highest in the country.

Of the 12,404 permanent private households, only 5,151 households were connected to a public sewerage scheme or 41.5% of households in Co. Leitrim. This is an indication of the extent of houses in the open countryside removed from built up towns and villages with foul sewerage facilities.

12,557 persons indicated that they were at work of which 695 walked to work, 62 cycled, 88 took the bus and 54 took the train. 421 persons indicated that they were passengers in cars. This represents 1,320 persons or 10.5% who availed of sustainable means of transport to get to work. Having regard to the rural dispersed nature of our population, allied to the manner in which we depend on adjoining large urban centres such as Sligo for work, presents a significant challenge in relation to reducing our carbon footprint from transport.

In stark comparison, 7,057 persons indicated that they were attending school or college of which 1,064 walked, 47 cycled, 1,944 took the bus and 55 took the train. 3,336 persons indicated that they were passengers in cars. This represents 6,391 persons or 90.5% who availed of sustainable means of transport to get to school or college.

The density of population per km² at 19.9 is the lowest in the country with Mayo the next lowest at 23.3 and followed by Roscommon at 25.

Topography

County Leitrim covers an area of 1,590 km² or 610 miles². This ranks County Leitrim as the 26th largest county or 7th smallest county. It is the smallest of Connacht's five counties in both size and population. Leitrim is bordered by the counties of Donegal to the north, Fermanagh to the north-east, Cavan to the east, Longford to the south, Roscommon to the south-west and Sligo to the west.

County Leitrim has a hilly, moor topped mountainous landscape in the north-west and has relatively flat drumlin covered lowlands in the south-east, each separated from the other by Lough Allen in the middle of the county. County Leitrim has the shortest length of coastline of any Irish county that touches the sea (4.6km). Geological features shaped by glacial action are a distinctive feature of much uplands and are most conspicuous where they enclose glens. In the south of the County, drumlins cloaked in lush green pastures, extend over many miles and are interspersed with hilly outcrops, loughs, rivers, wet pasture and raised peat bogs. Many areas are noted for their scenic beauty and nature conservation value.

It is considered that the percentage of forest cover in County Leitrim in 2018 was 18.9% and is substantially higher than the national level of 11.0%. This is a matter of concern within County Leitrim from a rural development and sustainability perspective.

Drainage

In general the drainage pattern of the County is determined by the principal rivers: the Shannon, Bonet, Duff, Diffreen and by tributaries to Lough Erne and Lough Melvin. The Shannon catchment is by far the largest, and drains the centre and south west of the County. The gradient is generally very small and flooding occurs frequently. Similar conditions prevail in the south-east of the County where the slow moving tributaries of the Erne drain the landscape.

The Bonet, which flows into Lough Gill, drains much of the north west of the County. The north east of the County is drained by tributaries to Lough Melvin which in turn is drained by the Drowes which forms the boundary between Leitrim and Donegal. The extreme north-west is drained by the Duff. Elsewhere along the coast small streams flow directly into the sea.

2.2 Background to the Eastern and Midland Climate Action Regional Office

The Eastern & Midland CARO is one of four regional climate action offices set up in 2018 in response to Action 8 of the 2018 National Adaptation Framework (NAF) – *Planning for a Climate Resilient Ireland*.

The four CAROs have been established to drive climate action at both regional and local levels. In recognition of the significant obligation to develop and implement climate action measures, the four regional offices are mandated to co-ordinate engagement across the varying levels of government and help build on experience and expertise that exists in the area of climate change and climate action.

The composition of the four Climate Action Regions has been determined by the geographical and topographical characteristics, vulnerabilities and shared climate risks experienced across local

authority areas. The climatic risks associated with the Eastern and Midlands Climate Action Region include Fluvial Flooding, Pluvial Flooding, Groundwater Flooding and Coastal Flooding.

The four CARO regions and constituent local authorities are illustrated in Figure 2.2(A) as follows:

Table 2.2(A)

	Climate Action Region	Local Authority function area	Lead Authority
	Midlands and Eastern	Carlow, Cavan, Kildare, Kilkenny, Laois, Leitrim, Longford, Louth, Meath, Monaghan, Offaly, Roscommon, Tipperary, Waterford, Westmeath, Wexford, Wicklow	Kildare County Council
	Atlantic Seaboard North	Donegal, Sligo, Mayo, Galway City & County	Mayo County Council
	Atlantic Seaboard South	Clare, Limerick, Kerry, Cork City & County.	Cork County Council
	Dublin Metropolitan	South Dublin, Fingal, Dun-Laoghaire-Rathdown, Dublin City	Dublin City Council

2.3 Profile of the Eastern and Midland Climate Action Region

With 17 local authority areas, the Eastern and Midland region is the largest of the four Climate Action Regions in Ireland. The region, exclusive of the Dublin Metropolitan Area, occupies the eastern and central aspects of the country. The Region borders Northern Ireland to the north with counties Louth, Cavan, Monaghan and Leitrim. The River Shannon flanks the western aspect bounding along its course, counties Leitrim, Roscommon, Longford, Westmeath, Offaly and Tipperary. The Irish Sea bounds the region to the east. Counties Louth, Wicklow, Wexford and Waterford are located to the east and south east of the region all with extensive coastlines along the Irish Sea.

The region with its extensive pattern of settlement areas and rural areas has a population of almost 1.8 million people accounting for 37.7% of the total population of the state⁶ and at 32,542 sq.km occupies 46.3% of the area of the state⁷. The region plays a significant role economically to the country hosting a range of sectors inclusive of multinationals, public service, private and small-medium enterprises. Agriculture remains the prevailing sectoral land-use in the region.

There is a rich variety of landscapes and topographies across the region. A mostly flat low-lying landscape sweeps through the midland counties. Significant areas of raised bogs occupy this central

⁶ Total population of E&M Region is 1,796, 923 persons. The state population is 4,761,865 persons (CSO, 2016).

⁷ Total area of state is 70,282 sq.km

location in the country as well as the Curragh Plains extending towards the Curragh Plains in County Kildare. The Drumlin Belt across the northern aspect of the region, the Wicklow Mountains, Galtee Mountains and Slieve Bloom Mountains offer variation and punctuation in the landscape of the region.

21 prominent rivers rise and flow (with tributaries) through the Region. The most prominent of these include the River Shannon, River Barrow, River Suir, River Nore, River Liffey and River Boyne. Counties Louth, Wicklow, Wexford and Waterford occupy coastal locations to the east and south east of this region while County Leitrim extends to occupy a distance of 4.6km along the western coast of the country.

The region offers an extensive and crucially important network of critical infrastructure. The road network in the region typically radiates from the metropolitan Dublin Region. The Rail Network is significant with the Dublin-Cork, Dublin-Limerick, Dublin-Waterford and Dublin-Galway/Mayo lines. Rosslare Europort in Wexford is a gateway to Wales and greater Europe through France. Electricity and communications infrastructure is widespread throughout the region.

CHAPTER 3: ADAPTATION BASELINE ASSESSMENT

3.1 Timeline of Extreme Weather Events

Figure 3.1(A) shows a timeline of extreme weather events specific to County Leitrim



3.2 Profile of Climate Hazards

Understanding how well adapted Leitrim is to current climate hazards is crucial to the development of an adaptation strategy. Figure 3.2(A) below summarises the climatic events that are linked to the Leitrim area over the last 32 years. These events were recorded due to their unique intensity and abnormal weather patterns.

Table 3.2(A) – Profile of recent extreme weather events and periods of climate variability – Leitrim

Extreme Weather Events – Non Exhaustive List									
Year	Date	Event Type / Name	Description	Climate Event					
				Strong Wind	Extreme rainfall	Heavy Snowfall	Sea Level	Low rainfall /	High Temp
2018	September	Storm Ali	Orange Wind Warning – gale force winds of up to 120km/h, stormy conditions						
2018	Summer	High Temperatures, Heat wave & Drought	High Temperatures, Heat wave and drought – distribution to water supply, issues with road maintenance etc.						
2018	February / March	Storm Emma & Beast from the East	Blizzard / Heavy Snowfall / widespread heavy snow drifting. Disruption to business, emergency services, power cuts etc.						
2017	16 th October	Storm Ophelia (Ex-Hurricane Ophelia)	Red warning – gale force winds, heavy rain and storm surges along some coasts (flooding). Disruption to business, power cuts etc.						
2016	January	Heavy Rain	Wettest January of record – 126% of monthly long term average						
2014	12 th February	Storm Darwin	Orange warning for strong winds – classified as a 1 in 20 year event						
2013/14	Winter	Winter Storms	Winter storms – serious coastal damage and widespread, persistent flooding						
2011	24 th October	Heavy rain and flooding	Persistent heavy rain in County Leitrim causing extreme flooding.						
2010	Nov / Dec	Winter Cold Spell	Lowest temperatures on record in County Leitrim including heavy snowfall						
2009/10	Winter	Winter Cold Spell	Coldest winter in almost 50 years (Met Éireann) -8 to -12 degrees overnight.						
2009	November	Severe flooding	Rainfall totals were highest on record, extensive flooding						
2008	August	Heavy Rain and Flooding	Heavy rain and extensive flooding						
2006	Summer	High Temperature / Heat Wave	Warmest summer since record breaking 1996 (may have been exceeded by 2018)						
2002	14 th November	Heavy Rain and Severe Flooding	Severe flooding in eastern areas. Wettest month on record						
2000	5 th November	Severe Flooding	Very heavy rain throughout the North West followed by flooding.						
1997	24 th December	Windstorm	Very strong gale force winds - prolonged storm.						
1995	Summer	High Temperatures, Heat wave & Drought	Warmest Summer on record. Mean temperatures over 2 ^o C above normal. Temp rises to 30 ^o C over a number of consecutive days						
1993	11 th November	Severe Flooding	Very heavy prolonged rainfall in County Leitrim.						
1987	12-13 th January	Heavy Snowfall	Across the North West including County Leitrim						
1986	August	Hurricane Charley	Strong winds and rain, worst flooding in 100 years						

3.3 Climatic Hazards - Local Impacts

Given the geographical nature of County Leitrim, flooding has the greatest impact on people in the county during most of these extreme weather events. For many decades, high flood levels in the River Shannon have caused major inconvenience and disruption along the river course, in particular the south of the county where the road and rail infrastructure is severely impacted. Flooding is also an issue in the north of the county in other river catchments during these events, due to poor drainage. Winter storms of snow and ice, have a particular impact in north county Leitrim with some remote areas becoming inaccessible for periods of time. However given the experience of these recent extreme weather events, we have built up a knowledge and understanding of vulnerable locations at risk throughout the county.

Fig. 3.3(A) Carrick on Shannon Flooding November 2009 – River Shannon bursts its banks. N4 partly flooded



Case Study – Flooding in Carrick on Shannon November 2009

Extreme rainfall in the Shannon River catchment in the Autumn of 2009 resulted in the River Shannon bursting its banks and flooding areas of the town. The flood water levels were the highest ever recorded and were equated to at least a 1 in 100 year event. Large areas of the town were flooded and roads cut off. Leitrim County Council Roads Department provided sand bags and submersible pumps to property owners and assisted in building barriers to protect property.

National Primary Road (N4), was flooded in two locations in the town. The section of N4 just south of the bridge was reduced to one lane and was kept passable with sandbagging and continuous large scale pumping. Another section of the N4 between the two roundabouts further south was closed and all traffic diverted onto an alternative route.

At Park Lane (see Fig. 3.3 (B) below) a temporary walkway was constructed on scaffolding to provide access to the town from St Patricks Park.

This flood event lasted for over 5 weeks and substantial resources were applied by Leitrim County Council towards maintaining barriers and pumps to protect property and traffic flow on the roads.

Fig 3.3 (B) Park Lane Carrick on Shannon Flooding November 2009



3.4 Impacts for the delivery of services/functions

The impact of extreme weather events and periods of climate variability will have consequences for the delivery of services and functions of Leitrim County Council. Table 3.4(A) describes in detail the impacts of the climate hazards and a description of the consequences.

Table 3.4(A) – Climate Hazards, Impacts & Consequences

Services/Functions	Climate Hazard Impacts	Consequences
<p>Business operations/continuity</p> <p>Business efficiency, effectiveness and emergency response</p>	<ul style="list-style-type: none"> • Building Closures – storm, snow, extreme rainfall • Building damage, impacts on servers – storm events • Electricity supply affected – storm events • Risks to staff welfare, public safety, local business and tourism assets - storm, snow and rainfall events • Roads closures – snow, flooding • Closure of Local Authority buildings – storm, snow, rainfall events • Onshore Atlantic storms impacting the north of the county - storm 	<ul style="list-style-type: none"> • Service disruption for customers: motor tax, housing applications, scheduled meetings, arts/cultural events etc. • Potential inaccessibility to rural areas within county for emergency services and engineering services and housing. • Inability to meet statutory deadlines e.g. planning applications – financial/reputational consequences. • Resources stretched to deal with various impacts from extreme weather events above and beyond the performance of daily duties. • Increased pressure on emergency response and recovery operations. • Consequence to local/regional economies • Financial implications to local authority in clean up operations, staff overtime, unable to perform normal duties.

Infrastructure & Built Environment		
Roads/footpaths, bridges, public lighting, project construction and maintenance	<ul style="list-style-type: none"> • Changes in rates of deterioration - faster rate of deterioration in areas subject to flooding, sustained high temperatures, combination events • Infrastructure collapse, significant damage – sustained duration and frequency of extreme events • Blocked roads – storm, snow, rainfall events • Impact on construction projects – all extreme weather events • Power interruption/outages - storm 	<ul style="list-style-type: none"> • Nuisance and risk to public safety • Financial implications for unscheduled maintenance, repair, upgrade, new construction, and staff overtime costs. • Reduced economic efficiency of road network for commuting traffic and emergency transport routes disrupted. • Time delays and cost implications in delivery of infrastructure.
Surface Water Drainage	<ul style="list-style-type: none"> • Exceedance of drainage capacity – localised and larger scale flooding - rainfall/flooding combination • Undersized drainage networks, reduced capacity – rainfall/flooding combination • Inflow/infiltration into wastewater networks – flooding 	<ul style="list-style-type: none"> • Blocked roads, flooding/damage to roads properties/business – impact on insurance costs. • Operating challenges of waste water infrastructure – knock-on effects for wider community. • Stretch on staff resources. • Financial implications for increased maintenance, repair etc. • Washout of wastewater treatment plant causing pollution and public health concerns.
Building Stock – LA Buildings and social housing stock	<ul style="list-style-type: none"> • Damage and deterioration of housing stock – Storm, rainfall, snow and heat wave events (combination events) • Upgrade of housing stock (insulation, heating) – extreme cold events • Need for mechanical ventilation systems and cooling systems – Heat wave events 	<ul style="list-style-type: none"> • Cost of maintenance, safety implications to public, possible re-housing of tenants etc. • Cost of major repairs to buildings • Increased insurance costs, third party claims, public liability • Cost of fuel (negative or positive) • Service disruption

	<ul style="list-style-type: none"> • Damage and deterioration of Corporate estate (LA buildings, depots etc.) - Storm 	<ul style="list-style-type: none"> • Pressure on housing staff to rectify reported issues.
Flood defences Infrastructure	<ul style="list-style-type: none"> • Storm overflow of existing quay walls and river banks –storm/rainfall/flooding events • Destruction, damage, disturbance to council managed and private owned marinas and boat ramps - storm/rainfall/flooding events • Onshore Atlantic storms impacting road traffic 	<ul style="list-style-type: none"> • Loss of capital infrastructure – cost of replacement. • Damage/loss of properties/lands – displacement or isolation of communities • Disruption to commuting traffic, and utilities – economic impact. • Increased cost to local authority – repair, replacement. • N16 national route along the coast in north of county impacted by coastal storms, high winds etc.
Community Infrastructure	<ul style="list-style-type: none"> • Deterioration of community infrastructure e.g., playgrounds, public parks, swimming pools, public realm spaces- sustained weather extreme events • Impacts on recreation amenities; sport and tourism activities, Blue-way activities, rowing activities, swim weeks in bathing areas – storm, rainfall, snow events • Reduced water for swimming pools, irrigation of open spaces, parks etc - drought conditions • Risk to public safety in times of high temperatures for unsecured lakes, water spots (quarries). 	<ul style="list-style-type: none"> • Cost of maintenance/upgrade. • Loss of revenue locally/regionally – tourism. • Closure of community infrastructure – short term. • Injury, illness or potential loss of life. • Cancellation of community and sporting events
Cultural/Heritage	<ul style="list-style-type: none"> • Damage to cultural and heritage assets and cultural landscapes – storm and rainfall events • Closure of Arts facilities, Dock, sculpture centre, theatres etc. - storm and rainfall events 	<ul style="list-style-type: none"> • Negative impact on tourism – economic consequence locally/regionally. • Loss of assets of intrinsic historical importance.

Water and Sewerage Services		
Water Quality / Rural Water	<ul style="list-style-type: none"> • Runoff from land, including contaminants into drinking water sources affecting water quality - Rainfall, storms • Low flows resulting in deterioration of water quality and supply – low rainfall/drought events 	<ul style="list-style-type: none"> • Increased discharges from drainage systems to ground-waters • Increased pollution of surface water systems • Changes to surface water habitats • Spread of pathogens and other contaminants
Natural Resources and Flood Management		
Biodiversity	<ul style="list-style-type: none"> • Shift in distribution of plant and animal species from heat and cold extremes, including possible extinction - heat waves and cold events. • Loss of bio-diversity - all sustained extreme weather events. • Damage to vulnerable ecosystems due to weather extremes – flooding, heat wave events. • Increased bog and forest fires – heat wave and drought events. 	<ul style="list-style-type: none"> • Inability to meet objectives to protect and conserve important natural habitats. • Negative consequence on health and wellbeing of communities. • Increased demand on emergency services (resources and financial) in dealing with bog fires, and forestry fires • Economic impact – reduced tourism.
Weed/Pest Management	<ul style="list-style-type: none"> • Changes in rate of coverage and spatial distribution of invasive species – change in average mean temperatures 	<ul style="list-style-type: none"> • Cost and staff resources in the Environment and Roads Departments required to manage and deal with invasive species.
Land-use and development policy		
Spatial Planning and Land-use	<ul style="list-style-type: none"> • Poor planning of urban expansion particularly in flood plains - flooding • Suitability of infrastructure designs to cope with impacts of weather events. Climate proof road, bridge and drainage design - flooding, storms, rainfall, drought/heat waves • Loss of private property and community assets – extreme rainfall events, flooding, storm • Early retirement and abandonment of capital infrastructure - all extreme weather events 	<ul style="list-style-type: none"> • Displacement of flood zones impacting on other zones • Increased insurance costs • Increased pressure on disaster management and response resources • Long term economic cost to area and to general public. • Impact on quality of life • Loss of biodiversity

Community Health and Wellbeing		
Community Development	<ul style="list-style-type: none"> • Increased isolation and disconnection of communities through inaccessibility – rainfall, snow, heat-waves (i.e. bog, gorse, commonage and forest fires) • Damage to properties, streetscapes and community assets, amenity & recreation areas – storm and rainfall events, heat-waves • Contaminants to waterways and drinking water supplies – rainfall (flooding) • Pressure on drinking water supplies – heat-wave and extreme cold events 	<ul style="list-style-type: none"> • Abandonment of vulnerable rural areas • Impact on local economies, reduced interest in settlement • Cost of repair, replacement of street surfaces, public realm • Cost of replacement/landscaping at facilities such as amenity areas, playgrounds etc. • Disadvantaged communities.
Economic Development		
Existing Business and retail outlets in towns and villages	<ul style="list-style-type: none"> • Inaccessibility and temporary retail business closure – all extreme weather events • Inaccessibility and temporary factory and office closure – all extreme weather events • Reduction in tourism related activities – all extreme weather events • Construction sector temporary site closures – all extreme weather events 	<ul style="list-style-type: none"> • Loss of income to individuals and self employed • Loss of productivity • Deliveries affected • Reduced economic activity • Increased construction costs • Increased local authority costs to maintain accessibility
Farming and Agriculture including Forestry	<ul style="list-style-type: none"> • Loss of animal stock, crop loss, tree/forestry damage – all extreme weather events 	<ul style="list-style-type: none"> • Loss of income • Loss of productivity
Recreational activities	<ul style="list-style-type: none"> • Cancellation of events, closure of facilities – storm events, flooding 	<ul style="list-style-type: none"> • Reduced social inclusion • Loss of income

CHAPTER 4: MITIGATION ACTIONS UNDERTAKEN TO DATE

4.1 Introduction

Mitigation can be defined as the efforts made to reduce the severity of future climate change impacts by reducing the emission of greenhouse gases.

In its latest performance report entitled 'Annual Report 2018 on Public Sector Efficiency Performance', the Sustainable Energy Authority of Ireland (SEAI) have credited Leitrim County Council with 31.5% energy savings against its 2009 energy usage baseline.

4.2 Leitrim County Council Mitigation Activities

Leitrim County Council has a key leadership role to play locally in terms of climate mitigation and the Council's commitment to this role is reflected by initiatives and activities undertaken by the Council, such as those listed on Fig 4.2A below.

Fig 4.2A

Mitigation Actions Undertaken by Leitrim County Council to date		
Year	Programme/Initiative	Outputs
2019	Building Management Programme	➤ Commissioned in February 2019 in the Aras an Chontae Building, which controls our heating and which will save €2-3k in oil consumption per year.
2018	Electric Vehicles	<ul style="list-style-type: none"> ➤ Electric Vehicles introduced into fleet ➤ Installation of an E-Car -charging point at Aras an Chontae, Carrick on Shannon
2016-2019	SECURE Programme 2016-2019 <i>(3 Year transnational project to help build the capacity of partners organisations to deploy successful energy efficiency and renewable energy technologies and solutions in housing and public infrastructure)</i>	<ul style="list-style-type: none"> ➤ New LED lighting at the Dock Arts Centre, Manorhamilton and Ballinamore Libraries ➤ New Air Curtains at entrances to maintain heat ➤ Installation of destratification fans at the Dock Arts Centre ➤ Installation of new wall heaters to replace storage heaters
2016	Energy Retrofitting Programme 2016	➤ Cavity wall and attic insulation, and installation of vents were completed in 158 dwellings in the Council's Housing Stock at a cost of €173,231
2016	(SEAI) Better Communities Area Based Scheme 2016	➤ Energy retrofitting works were completed at 43 No. Council Houses, 3 private houses consisting of fuel poor and non-fuel poor homes
2016	LEO Office / Credit Union Initiative Scheme	➤ Energy retrofitting works to 10 No. private homes

2016	Community Beneficiaries Projects	<ul style="list-style-type: none"> ➤ Energy retrofitting works at a Community Centre and 2 schools
2015	Energy Retrofitting Programme 2015	<ul style="list-style-type: none"> ➤ Cavity wall insulation, attic insulation & installation of vents completed in 251 No. Units of the Council's Housing stock at a cost of €308,382 which was fully recouped from the Department. ➤ Special case funding was also secured from the Department for windows/doors replacement works in 12 No. units of our stock at a total cost of €33,448.
2015	Sustainable Energy Authority of Ireland (SEAI) Better Energy Communities Area Based Scheme 2015	<ul style="list-style-type: none"> ➤ This SEAI Scheme which was approved for the Carrick on Shannon Area included Energy Retrofitting Upgrades to 41 No. Council Houses in the Cara Court, Autumn View, Oak Drive and Ath na Rí Housing Estates in Carrick on Shannon in addition to Energy Retrofitting Upgrades to a number of Community Buildings. ➤ The suite of works to the 41 No. Council Houses, included attic and cavity insulation, installation of new heating systems and heating upgrades. ➤ The project involved significant ongoing contact, correspondence and discussion with the tenants involved, including individual home visits to discuss the works to individual properties.
2014	Energy Retrofitting Programme 2014	<ul style="list-style-type: none"> ➤ Cavity wall insulation, attic insulation & installation of vents completed in 164 No. Units of the Council's Housing stock at a cost of €214,388 which was fully recouped from the Department. ➤ Special case funding was also secured from the Department for windows/doors replacement works in 11 No. units of our stock at a total cost of €39,871.
2014	Sustainable Energy Authority of Ireland (SEAI) Better Energy Communities Area Based Scheme YEAR	<ul style="list-style-type: none"> ➤ This SEAI Scheme which was approved for the Mohill Area included Energy Retrofitting Upgrades to 42 No. Council Houses in the Knocklongford and Cappagh Housing Estates in Mohill in addition to Energy Retrofitting Upgrades to a number of Community Buildings and public lighting in the Mohill Area ➤ The suite of works to the 42 No. Council Houses, included attic and cavity insulation, door replacement, heating upgrades and energy efficient light bulbs. ➤ The total cost of the housing upgrade element of the Project amounted to €248,639 with SEAI funding in the sum of €124,800 being provided towards these costs. ➤ The project involved significant ongoing contact, correspondence and discussion with the tenants involved, including individual home visits to discuss the works being undertaken at individual properties

CHAPTER 5: CLIMATE RISK IDENTIFICATION

5.1 Assessment of Risk for Local Authority

Climatic Hazard	Impact area	Risk Statement
	LA Resources	The capacity to fund identified mitigation measures arising from the risk assessment process and action plan.
	LA Assets	More frequent and intense extreme events i.e. rainfall, wind and snow events causing damage to local authority buildings, housing stock, equipment and facilities (machinery yards, storage facilities etc) giving rise to increased costs for maintenance and insurance. Increased demand on staff resources.
	Business Operations & Continuity	More frequent and intense extreme events will see more closures impacting the local authority in performing normal daily tasks, exercising statutory duties, cancellation of scheduled meetings and organised events. This will interrupt work programmes and efficiencies, disrupt scheduled events and increase staff costs in dealing with extreme events.
	Business Operations & Continuity	Projected increases in storm intensity will see a higher risk of service disruption due to closure of local authority buildings, closure of roads due to fallen trees, damage to LA communications infrastructure, impact on utility networks e.g. Electricity supply, directly impacting Local Authority's ability to operate. The North West of County Leitrim is particularly impacted by onshore Atlantic storms
	Critical Infrastructure Flood/ Water Management	Extreme rainfall events could affect critical infrastructure such as roads, water, sewerage, storm water, housing and communications through flooding and inundation. Damage to critical infrastructure will impact the economic function of transport routes, will give rise to flooding, impacts to properties and communities resulting in increased costs of clean up and maintenance, repair and insurance costs and a wider economic impact.
	Environment, Bio-diversity	Extreme rainfall events will give rise to flooding of habitats and wash nutrients and sediment into watercourses. This will result in changes to geomorphology and cause contamination of watercourses. Landscape may become more vulnerable, ecologically sensitive and may result in habitat loss.



Environment, Bio-diversity

Heat waves and/or sustained drought conditions will result in significant and serious **degradation of the natural environment and biodiversity** with loss to/of important species/habitats, impact on important landscapes and reduction in water quality.



Community

Higher temperatures and more hot days could result in heat exhaustion and **increased heat-related stress with vulnerable people within communities increasing the need for emergency response**. Remote communities are particularly vulnerable.



Community

Impacts on community in extreme cold and blizzard conditions, resulting in inaccessible homes, particularly older and more vulnerable people requiring medical assistance. This will increase the demands of the roads staff and emergency services, including the HSE.



Infrastructure
Structural, community, cultural

More **frequent and intense weather events** and combination events will undermine the integrity of **critical infrastructure, community infrastructure and cultural assets** giving rise to increased costs to repair, upgrade, or replace with potential for loss of these assets.



Emergency services

Higher temperatures and longer dry seasons will increase **risk of bog, gorse and forest fires**, and will impact on the integrity of road structure and water supply networks. This will impact on the capabilities of the fire services, result in road closures, threat to public safety and potential local economic impact through loss of tourism potential.



Environment
Infrastructure



Infrastructure
Structural, community, Heritage

More **frequent and intense weather events** and combination events will undermine the **integrity of Community, Heritage and Cultural Infrastructure**, giving rise to increased and significant costs of repair, reinforcement or replacement and possibly rendering assets unviable (note: some assets of heritage or cultural significance, by their nature and historical importance, cannot be replaced).



Bio-diversity
Environment



More climate extremes - **changes in rainfall variability and increased frequency of heat waves** will impact on native species, encourage diseases, weeds, pests and invasive species which will need to be managed appropriately.



Environment
Bio-diversity
Water Services



Extreme **rainfall events, storm surges in coastal areas and heat wave/drought events** will increase the risk of impacting **water quality** and the ability of the local authority to meet the requirements of the **WFD**.



All Services

Failure by the local authority **to plan for, respond effectively and appropriately adapt** to the impacts of Climate Change will encourage a **negative perception of ability and will impact the reputational status** of the area (damage/loss of critical assets, degradation of the natural and historical environment, local economic impact, community abrasion).

5.2 Overview of Projected Climate Change

Research has improved our understanding of projected climate change for Ireland and has provided critical insights into how climate change will impact us into the future. Models have been developed to project impacts of increased concentrations of greenhouse gases in the atmosphere. If the concentrations of greenhouse gases in the atmosphere is not reversed in the near-medium term, then it is clear that based on these models that temperatures will increase, sea levels will rise, and seasonal patterns of storms and precipitation will intensify. These changes will have a wide range of consequences for the social, environmental and economic sectors in Ireland generally and the continued delivery of services at all times by Leitrim County Council.

Rainfall and Drought

Projections indicate a significant increase in the frequency and intensity of winter and autumn rainfall, particularly in the North West of the country, which in County Leitrim will impact on the Shannon drainage system in particular and give rise to increased frequency of flooding in this river catchment. Similarly, flooding in the Bonet catchment and other spate rivers in North Leitrim will also be impacted.

Also the projections indicate a reduction in rainfall in the Spring and Summer, giving rise to extended dry spells which may result in a risk to water supply.

Storm Events

Climate Change projections are indicating the number and intensity of storms with high wind speeds, to increase over the North Atlantic region in the coming years. This may have serious impact for the alternative energy sector, i.e. wind farms located in County Leitrim. Road and rail infrastructure is also at increased risk during and following these increasingly intense storms. This may also impact on our built infrastructure i.e. offices, stores, yards, housing stock etc.

Temperature

Average temperatures are projected to continue to increase across all seasons with the number of warm days expected to increase, and heat-waves are expected to occur more frequently. Prolonged hot weather events will increase the risk of the health and safety of staff at work and the population generally. These heat-waves also impact on the roads infrastructure with softening of road pavements resulting in increased maintenance pressures.

CHAPTER 6: ADAPTATION GOALS, OBJECTIVES AND ACTIONS

6.1 Thematic Areas – High Level Goals

This Climate Change Adaptation Strategy is based around seven thematic areas that are developed further as *High Levels Goals*. These goals identify the desired outcomes anticipated through the effective implementation of the Climate Change Adaptation Strategy. They are supported by specific objectives and adaptation actions to achieve their desired outcomes.

Theme 1: Local Adaptation Governance and Business Operations:

Goal: Climate Change adaptation considerations are mainstreamed and integrated successfully into all functions and activities of the local authority, ensuring operational protocols, procedures and policies, implement an appropriate response in addressing the diversity of impacts associated with climate change.

Theme 2: Infrastructure and Built Environment:

Goal: Increased capacity for climate resilient structural infrastructure is centred around the effective management of climate risk, informed investment decisions and positive contribution towards a low carbon society.

Theme 3: Land-use and Development:

Goal: Sustainable policies and measures are devised influencing positive behavioural changes, supporting climate adaptation actions and endorsing approaches for successful transition to low carbon and climate resilient society.

Theme 4: Drainage and Flood Management:

Goal: Greater understanding of risks and consequences of flooding and successful management of a co-ordinated approach to drainage and flooding

Theme 5: Natural Resources and Cultural Infrastructure:

Goal: Fostering meaningful approaches to protecting natural and key cultural assets through an appreciation for the adaptive capacity of the natural environment to absorb the impacts of climate change.

Theme 6: Community Health and Wellbeing:

Goal: Empowered and cohesive communities with strong understanding of climate risks, increased resilience to impacts of climate change with capacity to champion climate action at local level.

Theme 7: Economic Development:

Goal: Promote projects and business opportunities that will contribute economically towards a climate resilient community in County Leitrim.

6.2 Climate Adaptation Plan – Goals, Objectives & Actions

G1 Local Adaptation Governance and Business Operations

Objective: To ensure that climate adaptation is mainstreamed into all activities and operations of the Local Authority

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
1.	Establish an Adaptation Steering Group with representatives from across key functions of the local authority to ensure the successful implementation of the actions of this Climate Change Adaptation Strategy and to report on progress.	Senior Management Team	✓	Short
2.	Mainstream Climate Action policy as an integral consideration in the Corporate Plan objectives, providing for all local authority activities and the delivery of functions and services across the administrative area.	Corporate Services	×	Short
3.	Undertake a Business Continuity Plan to identify and address specifically, the impacts associated with extreme weather events on all functions/services of the local authority including: <ul style="list-style-type: none"> • Prepare, adopt and update “Major Emergency Plan” • Prepare and adopt a Policy and Procedure for the Management of the Local Authority Response to Storms SMS PP S12 • Prepare a Winter Maintenance Plan • Provide necessary resources to implement these plans • Preparing for critical services disruptions • Mitigating/Minimising the impact of service disruption and, • Improving the capacity/ability to recover. 	Housing, Infrastructure, Environment, Water Services, Fire & Emergency Services	×	Short
4.	Updating Health and Safety Policies to reflect the learning from extreme weather events/changing climate.	Management Team, Health & Safety Officer	✓	Short

5.	Promoting Green Procurement.	Procurement Officer	x	Short
6.	Reflect the learning from climate change in budget preparation.	Management Team	✓	Short
7.	Climate Change training, awareness and capacity building for staff, elected members and local communities.	Climate Action Steering Group	x	Ongoing
8.	Liaise, collaborate and work in partnership with the sectors identified in the NAF, subject to funding, in the delivery of the Government approved sectoral adaptation actions, where they relate and are relevant to the functions and activities of the Council at local level/in local communities. Building on adaptation planning actions set out in this strategy, support and compliment the practical implementation of actions arising from the National Climate Action Plan – to Tackle Climate Breakdown (as revised and updated annually), across the broad range of functions of the local authority to achieve the national climate ambition i.e. decarbonisation targets to 2030 and objectives to 2050.	Management Team, Climate Action Steering Group	x	Ongoing
9.	Develop procedures and templates to ensure that the financial aspects of extreme weather are collated, recorded and reported to operational and senior management team.	Management Team, Climate Action Steering Group	x	Short-Medium

G2 Infrastructure and Built Environment

Objective: To ensure and increase the resilience of infrastructural assets and inform investment decisions

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
10.	Apply a robust risk assessment and management framework to Local Authority owned buildings and properties, to identify and protect against the key vulnerabilities to the impacts of climate change and mitigate against service disruption. This is subject to the availability of funding.	Management Team, Housing	x	Short

11.	Integrate climate considerations into the design, planning and construction of all roads, footpaths, bridges, public realm and other construction projects. Make provision to incorporate green infrastructure as a mechanism for carbon offset.	Road Design, Area Offices, NTA, Irish Water, Housing, TII	×	S/M/L
12.	Undertake a Risk Assessment of road infrastructure to identify the severity of climate change risks on their function and condition. The risk assessment should provide for an understanding and quantification of risks posed. The findings should be integrated into decision making processes, road infrastructure programmes and investment strategies.	Road section, TII	×	Medium
13.	For projects subject to funding and investment of public money, include climate change considerations as criteria for assessment ultimately ensuring that community projects are designed and developed to be climate resilient and/or are proactive in promoting and working positively towards climate action.	Road Section, TII, Capital Office	×	Medium

Objective: To work towards the objective for a low carbon society

14.	Incorporate landscaping and planting into the planning and design of all major infrastructure developments in the county.	Capital Office, Road Design Planning , Irish Water TII, Housing	×	Medium
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G3 Land-use and Development

Objective: To Integrate climate action considerations into land-use planning policy and influence positive behaviour

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
15.	Identify and integrate climate change as a critical consideration and guiding principle informing core strategy of the future County Development Plan.	Planning Dept, Elected Members, Management Team, Climate Action Steering Group	✓	Short
16.	Integrate and promote climate-smart building and urban design performance outcomes in development standards through the development management process.	Planning Section, Building Control, Housing section, Capital Office, Irish Water	×	Short

17.	Promote the integrated planning, design and delivery of green infrastructure (including urban greening) through appropriate provisions in planning policies, County Development Plan, Town Plans, development standards, infrastructural, public realm and community projects.	Planning, Community Development, Tourism, Economic Development, Capital Office, Area Offices, Heritage, Parks, Housing, Tidy Towns, Town Team	×	Short - Long
18.	<p>Research and incorporate, into the content of the County Development Plan, measures in accordance with section 10 (n) of the Planning and Development Acts 2000 (as amended) for:</p> <p><i>(n) the promotion of sustainable settlement and transportation strategies in urban and rural areas including the promotion of measures to—</i></p> <p><i>(i) reduce energy demand in response to the likelihood of increases in energy and other costs due to long-term decline in non-renewable resources,</i></p> <p><i>(ii) reduce anthropogenic greenhouse gas emissions, and</i></p> <p><i>(iii) address the necessity of adaptation to climate change;</i></p> <p><i>in particular, having regard to location, layout and design of new development;</i></p>	Planning Section in consultation with external agencies and key stakeholders including E&M CARO.	×	Short

G4 Drainage and Flood Management

Objective: To manage the risk of flooding through a variety of responses

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
19.	Support OPWs CFRAMS Plans for the management of flood risks with the aim of reducing the adverse consequences of flooding. To prioritise projects to reduce surface water flood risk and provide for detailed mapping of areas prone to surface water and groundwater flood risk.	Infrastructure, TII	✓	Short
	Identify and rectify where possible, recurring flooding issues on local roads.	Area Offices, Road Design	×	Short
20.	Stipulate the requirement for the design and specification of urban storm-water drainage systems. Sustainable Urban Drainage Systems (SuDS) for new development to take account of the potential future impact of climate change.	Planning section, Building Control, Environment	×	Short
21.	Incorporate the requirement for Sustainable Urban Drainage Systems (SuDS) where appropriate in local authority projects.	Capital Office, Planning Section, Road Design, TII	✓	Short

Objective: To support flood risk mitigation measures

22.	Ensure that potential future flood information is obtained/generated by way of a Flood Risk Assessment (FRA) and used to inform suitable adaptation requirements within the Development Management process in line with the Guidelines for Planning Authorities on Flood Risk Management (DoECLG & OPW, 2009).	Planning Section, OPW	×	Long
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G5 Natural Resources and Cultural Infrastructure

Objective: To provide for enhancement of the natural environment to work positively towards climate action

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
23.	Develop a strategy to undertake and implement an active native Tree Planting programme in the context of climate adaptation, in conjunction with an awareness campaign that informs of the benefits to communities in improving air quality, offsetting carbon emissions, promoting biodiversity, limiting flood risk, reducing urban heat, as well as aesthetic value.	Environment, Community Development, Capital Office, Planning, Tidy Towns, Town Teams	×	Short
24.	Integrate natural borders/buffers/native species, to be included as an integral component of the design of greenways/blue-ways, tracks and trails and amenity areas to promote natural enhancement.	Road Design, Roads Section, Heritage Officer, NPWS	×	Medium -Long

Objective: To promote effective bio-diversity management and enhance protection of natural habitats and landscapes

25.	Review Bio-diversity Plans / habitat conservation strategies, plans and projects to ensure that: <ul style="list-style-type: none"> • all risks from adverse climate change have been identified; • future changes are assessed and measures employed to address issues identified • carbon capture within habitats is considered. 	NPWS, Heritage Officer	×	Short-Long
26.	Develop an inventory of wetlands within the local authority area to identify sites which aid flood mitigation.	Heritage Officer	✓	Short-Medium

Objective: To protect Heritage and Cultural Infrastructure

27.	Support the work of other agencies in the risk assessment of the Heritage and Cultural Assets in the county to assess the vulnerability and the risk to the historical environment from the impacts of climate change.	NPWS, Heritage Officer, Heritage Council, DCCA	×	Medium
28.	Consider all risks from adverse climate change, when carrying out works on historic buildings and other heritage and cultural assets within the remit of the Local Authority.	Heritage Officer	×	Medium - Long

G6 Community Health and Wellbeing

Objective: To build capacity and resilience within communities

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
29.	Through the Public Participation Network, raise awareness of the impacts of climate change and ways for communities to increase their response and resilience to these impacts.	PPN, Community Development	×	Short
30.	Support communities across the county in addressing their vulnerability to the impacts of climate change.	Area Offices, Community Development	×	Short
31.	Integrate climate change into the strategy of future LECPs and ensure that actions contained within the LECP are integrated with climate action initiatives as part of their delivery, implementation and review.	Director of Services, Economic Development Department	×	Short-Medium
32.	Ensure that grants to communities incorporate climate resilient projects.	Area Offices, Community Development	×	Short

G7 Economic Development

Objective: To identify and support opportunities that may arise from pursuing adaptation efforts through the functions of Leitrim County Council

No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
33.	Identify, source and leverage funding streams for the active implementation of adaptation actions and measures across County Leitrim with an emphasis on capitalising on opportunities that will contribute both environmentally and economically to the area.	Climate Action Steering Group, Director of Services, All Section Heads,	×	Short-Long

34.	Through the work of the Leitrim Local Enterprise Office - support, encourage and nurture new ideas seeking to capture opportunities associated with environmental and technological advances that support local carbon transition.	External Agencies & Government Departments. LEO, Other external stakeholders.	×	Short-Long
35.	In line with the strategic objective of the Local Enterprise Development Plan Leitrim 2017-2020, actively contribute towards development of renewable energies and energy efficiency.	LEO	×	Medium
36.	Develop a Climate Change Awareness Plan/Campaign for business and start-up firms to inform of climate action measures that can be integrated into business activities.	LEO, Economic Development Department	×	Medium-Long
37.	Explore innovative ways of stimulating interest and creating awareness about climate change in the business community.	LEO, Economic Development Department.	×	Short-Medium
38.	Work with the County Leitrim LEADER Partnership to support and develop adaptation actions in communities to benefit local economies and promote innovation at local level through climate change.	Climate Action Steering Group, LEADER Partnership.	×	Short-Long
39.	In line with the strategic objectives of the Leitrim Local Economic & Community Plan, to promote and enhance the potential for economic development in the energy and green economy sector.	LCDC, Economic Development Department	×	Short-Long
40.	Encourage and promote projects that will contribute positively and grow the Circular and Bio-economy to promote sustainable rural and urban economic development as part of the overall aim of transiting to a low carbon economy.	LCDC, Economic Development Department	×	Short-Long

CHAPTER 7: IMPLEMENTATION, MONITORING AND EVALUATION

Leitrim County Council will establish a **Climate Action Steering Group** representative of all service delivery sections in the Local Authority, with emphasis on carrying out the following actions:

Objective : To support the successful and practical implementation of adaptation actions				
No.	Action	Lead & Partner(s)	Budget Approved	Timeframe S/M/L
1.	Establish a Climate Action Steering Group with representatives from the key functions of the local authority to: <ul style="list-style-type: none"> • Ensure the successful implementation of the actions of this Climate Change Adaptation Strategy • Set strategic direction and assist in policy formation • Report on progress • Meet on a regular basis • Encourage local innovation 	Management Team	✓	Short
2.	Ensure that Climate Action is listed as a standing item on the agenda of the Management Team meetings	Management Team	✓	Short
3.	Integrate Climate Actions of the Adaptation Plan into the Service Delivery Programme and provide for its translation to Team Development Plans and Personal Development Plans	Management Team, Line Managers, Human Resources	✓	Short
4.	Explore the potential of appointing a Climate Action Officer with responsibility for climate related activity within the county administrative area	Management Team	×	Short
5.	Liaise, collaborate and work in partnership with the Eastern & Midlands CARO and the Eastern and Midland Regional Assembly in the delivery of adaptation actions from this strategy	Climate Action Steering Group	✓	Short-Long
6	Identify and target funding streams to implement initiatives and actions as identified in the Plan	Climate Action Steering Group	×	Short-Long
7	Debrief and establish lessons learned from our responses on particular extreme weather events	Climate Action Steering Group	×	Short-Long