



LIMERICK CITY AND COUNTY COUNCIL
SUMMARY REPORT FOR THE PREPARATION
OF THE LOCALCTAUTHORITY CLIMATE
ACTION PLAN

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INTRODUCTION

Climate change has become one of the most pressing global public policy challenges facing governments today. International organisations, national and local governments are increasingly compelled to take ambitious action through mitigation (decreasing emissions that cause climate change) and adaptation (enhancing resilience to climate change impacts and risks).

Ireland’s Local Authorities are developing Local Authority Climate Action Plans (LACAPs) to play their part in meeting national emissions objectives and to transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy.

This report provides a summary of the evidence base developed in preparation of the LACAP for Limerick City and County Council as well as the current and future climate- related risks faced by the local authority. This evidence base also includes an assessment of the key sources of emissions for the proposed Decarbonisation Zone located in the city centre. This report is the first step in preparing the LACAP. Its aim is to open dialogue and discussion on the development of the LACAP.

Guidance for the preparation of the LACAP has been developed by the Climate Action Regional Offices (CAROs) to outline the approach in conducting these assessments. These guidelines structure the development and implementation of LACAP around a 4-step cycle, which is supported by 4 technical annexes.

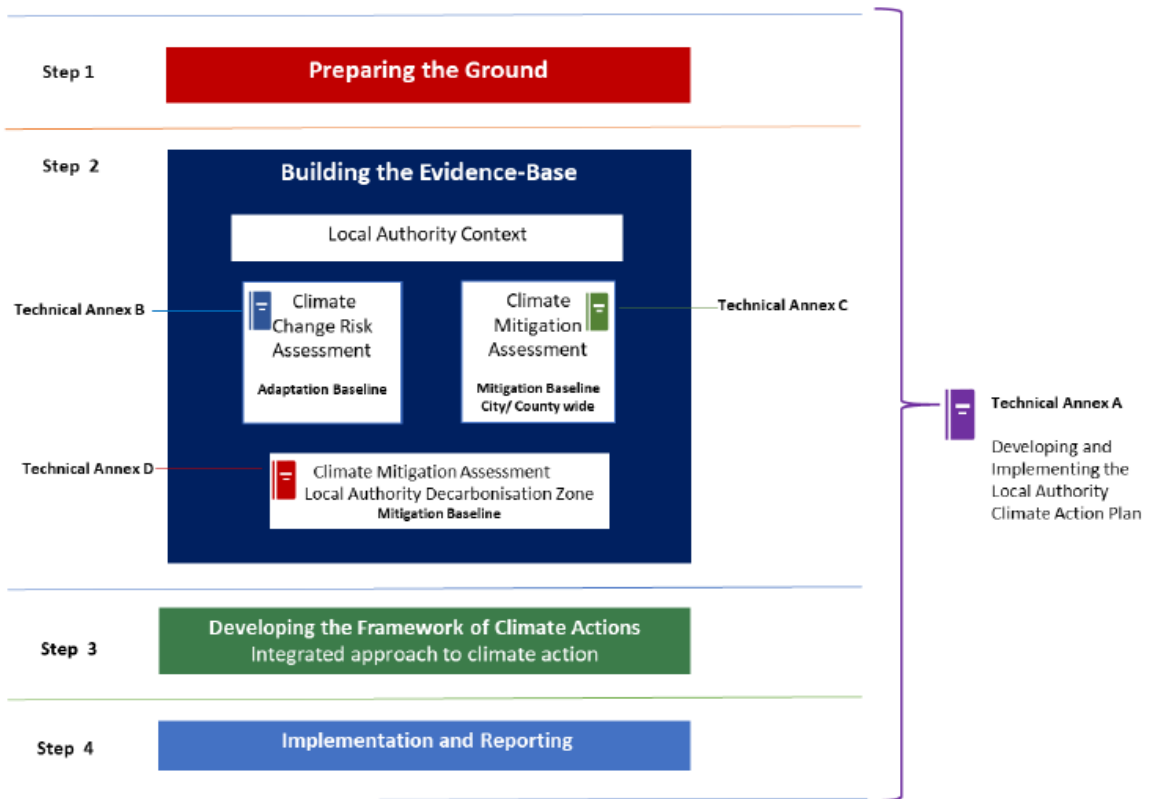


Fig 1: 4-Step-Cycle for Development of Local Authority Climate Action Plan (Source: Local Authority Climate Action Plan Guidelines, page 5).

CLIMATE CHANGE: IMPACT AND ACTION

The Earth's climate is changing, and the impact of these changes are becoming more evident. Such visible climate changes include variations in air and ocean temperatures, accelerated melting snow and ice caps, widespread retreat of glaciers, rising sea levels and extensive changes in weather patterns on a global basis. These changes are already having significant economic, environmental and social impacts.

Ireland's climate is changing in line with global trends. Recent assessments indicate an increase in average annual temperatures of 0.9°C since 1900 with an increase in the number of warm spells; patterns of precipitation are changing with evidence of an increasing trend in winter rainfall; and sea levels are rising with recent estimates indicating the sea levels are rising at double the global rate in Ireland. These changes are already being reflected in changes in the frequency and intensity of extreme weather events. In 2021, the World Meteorological Organization identified five extreme weather events in 2021 for Ireland that were considered unusual and made more likely by climate change. Climate change projections for Ireland indicate that these changes will continue and intensify into the future. For Ireland, projections indicate that:

- Sea levels will continue to rise and by up to 0.9m in the seas around Ireland by 2050;
- Average temperature will continue to increase with heatwaves such as those experienced in 2018 and 2022 becoming more frequent;
- Extreme precipitation events and associated flooding will become more frequent and intense; and
- The seas around Ireland will continue to warm while the chemistry and salinity of our seas will change, affecting marine ecosystems and commercial fish stocks. The impacts of these changes will be felt across Ireland's communities and environment, incurring huge costs to our economy and society.

POLICY CONTEXT - GLOBAL, NATIONAL AND LOCAL LEVELS

Global responses to climate change is accelerating as exemplified by the signing of the COP21 Paris Agreement by 195 countries in 2015. Ireland's climate policies are evolving in line with national and international requirements and aims to "pursue and achieve, by no later than the end of 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy."

Responding to climate change is now a pressing priority for governments on a global basis and this was reflected by the signing of the COP21 Paris Agreement by 195 countries which aims to limit global warming to less than 2°C above pre-industrial levels, pursue efforts to limit increases to 1.5°C, build resilience and reduce vulnerability to climate change by significantly strengthening adaptation efforts.

Reflecting the aims to the Paris Agreement, The European Climate Law (2021) set the goal of achieving climate neutrality across the EU by 2050, with an intermediate reduction of net GHG emissions by at least 55% by 2030. Climate policy in Ireland is aligned with the EU's ambitions to combat Climate Change.

The Climate Action and Low Carbon Development (Amendment) Act 2021 enshrines the National Climate Objective to "pursue and achieve, by no later than the end of 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy". The Act commits Ireland to

a 51% reduction in overall greenhouse gas emission by 2031 (when compared to 2018) and carbon neutrality by 2050 at the latest. Annual Climate Action Plans are published underlying the progress and key action areas.

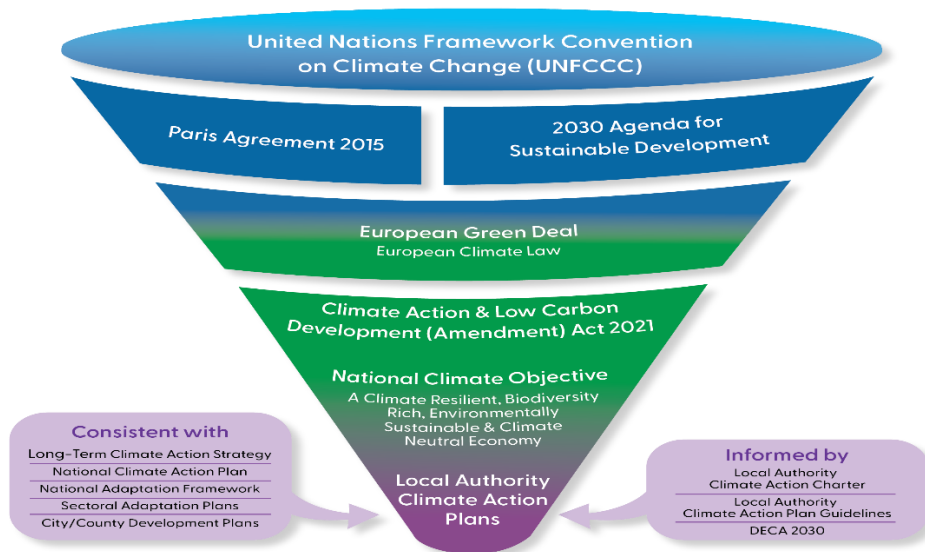


Figure 2: Legislation and Policy Context for the Climate Action Plan. (Source Climate Action Regional Offices)

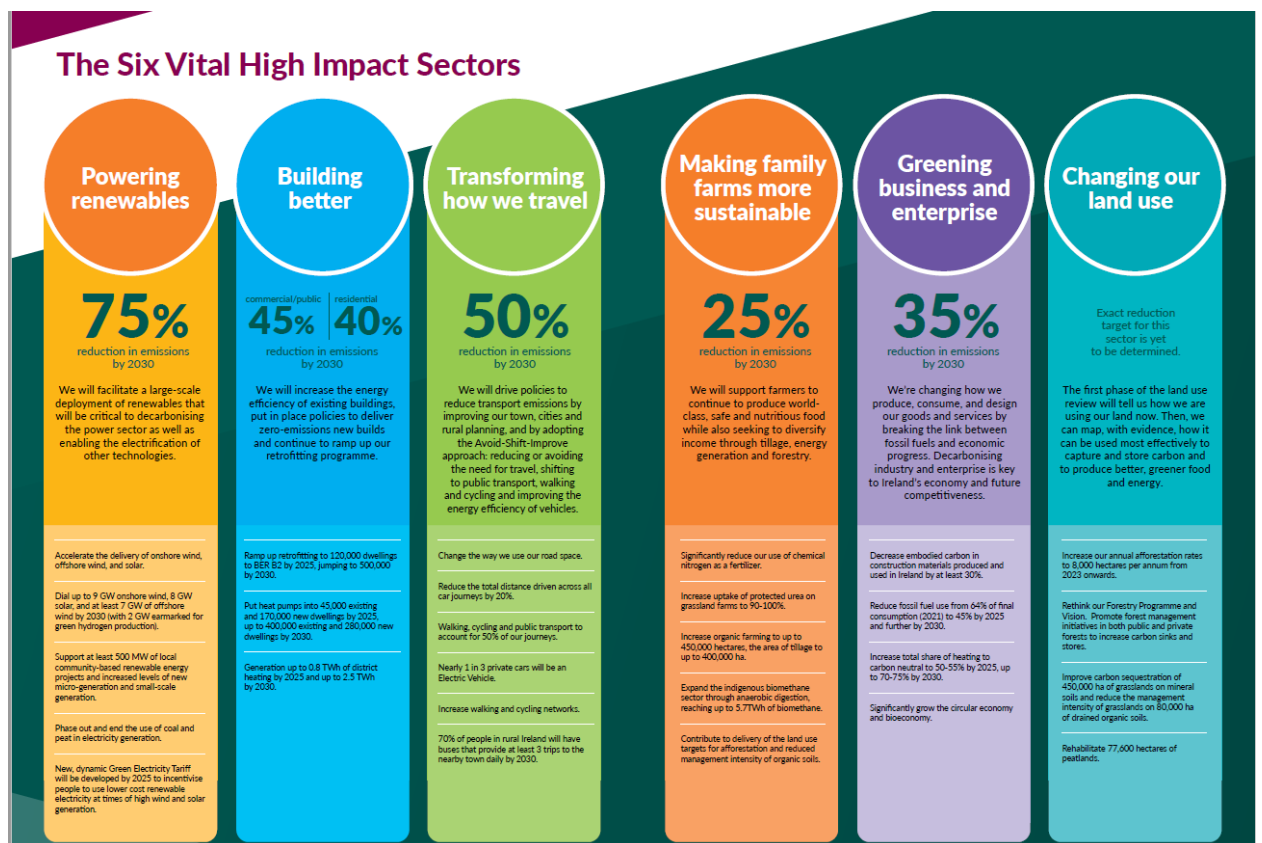


Fig 3: Climate Action Plan 2023 Infographic (Source: Climate Action Plan 2023 Govt. of Ireland)

The importance of place-based approaches and the role of the local authority is highlighted in the Act, which stipulates that all local authorities need to prepare a LACAP that specifies the mitigation and

adaptation measures to be adopted by the local authority for a period of 5 years. These plans will drive mitigation and adaptation measures at the local level, translating the national policy to the specific local situation in meeting the National Climate Objective.

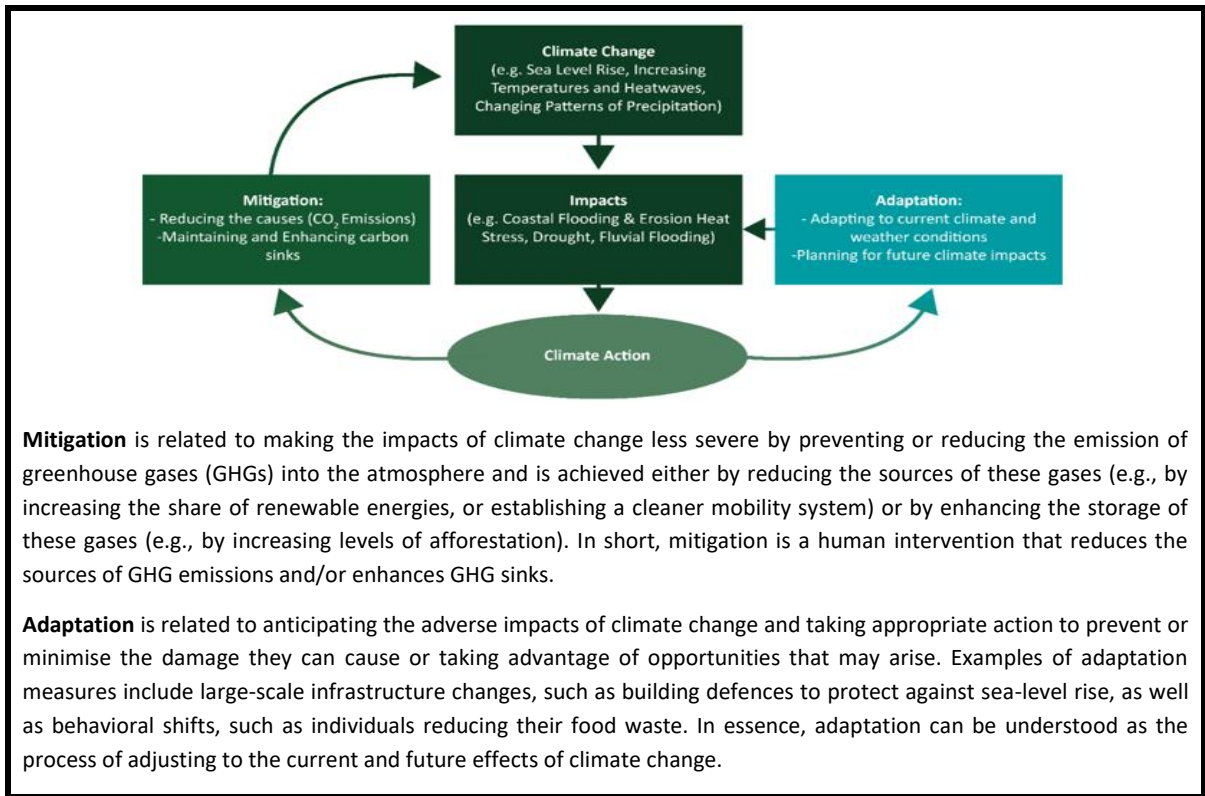


Figure 4: An overview of the role of mitigation and adaptation actions in reducing the impacts of climate change. (Based on European Environment Agency)

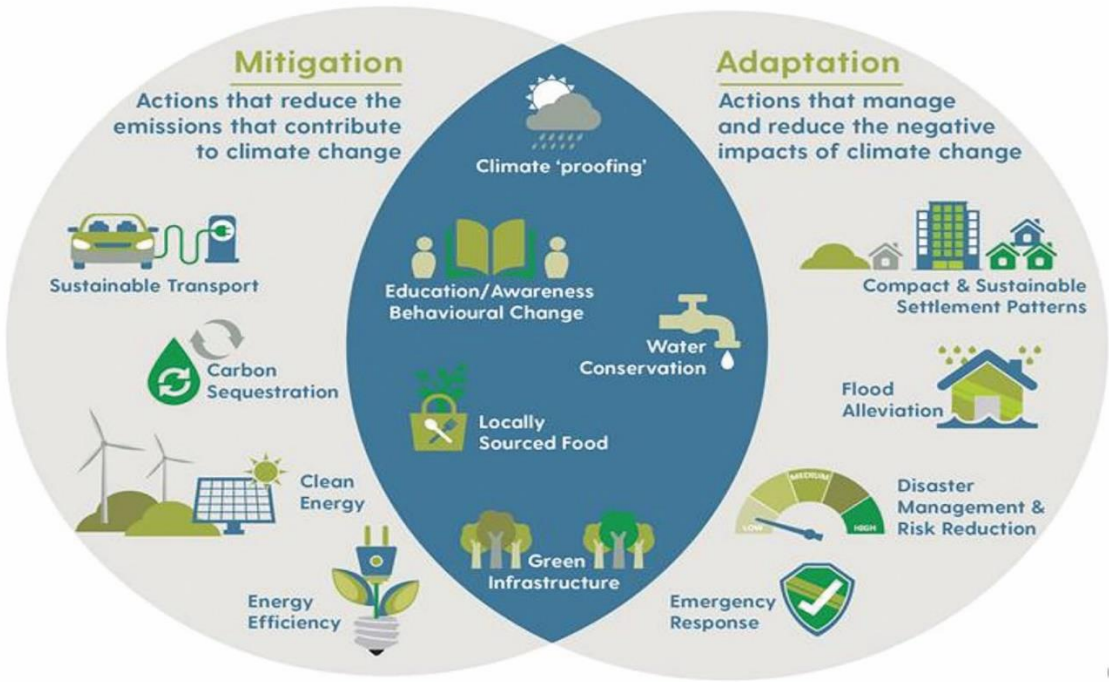


Fig 5: Examples of mitigation and adaptation measures (Source Dublin City Council)

LIMERICK CITY AND COUNTY COUNCIL CLIMATE ACTION PLAN

Limerick City and County Council (LCCC) stands ready to lead on climate action and have huge ambition for what it can achieve with government support. Through the LACAP, LCCC will seek to deliver climate action across three key areas:

1. **Delivering climate action across local authority functions and services:** Local authorities are responsible for approximately 11% of all public sector emissions. Local authorities are accountable for and have authority over the management and reduction of these emissions. In addition, protecting and enhancing the resilience of the human and infrastructural assets against the negative impacts of climate change while ensuring essential functions and services are delivered, is also the responsibility of the local authority.
2. **Influencing and leading climate action across its communities:** The local authority plays a leadership role to drive climate action at the local and community levels. Through this leadership role, the local authority takes on the responsibility to address the unprecedented challenges of climate change in the many distinct and diverse ways available to them.
3. **Co-ordinating, facilitating and advocating for climate action:** Local authorities also have significant scope to maximise their regulatory and strategic functions such as spatial planning, infrastructural provision and local economic and community development to prompt and promote local responses and influence and support the reduction of emissions across all sectors of society at local level, while supporting communities to adapt and build resilience to the impacts of a changing climate. In addition, local authorities can secure elevated protection and enhancement of the natural environment and biodiversity, continue their proactive engagement on flood risk management, source funding and investment, as well as coordinate and work in partnership with other stakeholders to facilitate and enable the delivery of appropriate climate initiatives and infrastructure.

To deliver across these areas, Limerick City and County Council will have to apply an organisational and community focus on building resilience to the negative impacts of climate change (adaptation) and in tackling the causes of climate change (mitigation) across all of its activities.

The primary focus of this plan will be on reducing greenhouse gas emissions from across the Council's own assets and infrastructure by 51% by 2030. This will require transformative action that can support and facilitate communities and business to meet their own targets. This will ensure the environmental, social and economic benefits that will come with climate action can be equitable and fully realised.

ORGANISATIONAL	COMMUNITY
<ul style="list-style-type: none">• Managing and reducing greenhouse gas emissions across the local authority organisation while ensuring essential functions and services are delivered• Protecting and enhancing the resilience of the local authority's human and infrastructural assets against the negative impacts of climate change	<ul style="list-style-type: none">• Influencing sectors, business, communities, and individuals in the delivery of local climate action• Coordinating and working in partnership with other stakeholders to facilitate and enable the delivery of climate action• Advocating for climate action by raising awareness, communicating and engaging on climate related issues and responses• Ensure that the transition to a low carbon society is just and equitable.

Fig 6: The two actions areas of the LCCC Climate Action Plan

LCCC has significant scope across its functions to support these ambitions:

We can utilise key strategic and regulatory powers and instruments to mainstream climate action into their broad range of functions such as spatial planning, infrastructural provision and local economic and community development to prompt and promote local responses.

We can secure elevated protection and enhancement of the natural environment and biodiversity, continue their proactive engagement on flood risk management, source funding and investment, as well as coordinate and work in partnership with other stakeholders to facilitate and enable the delivery of initiatives and infrastructure.

Local Authority Scope on Climate Action

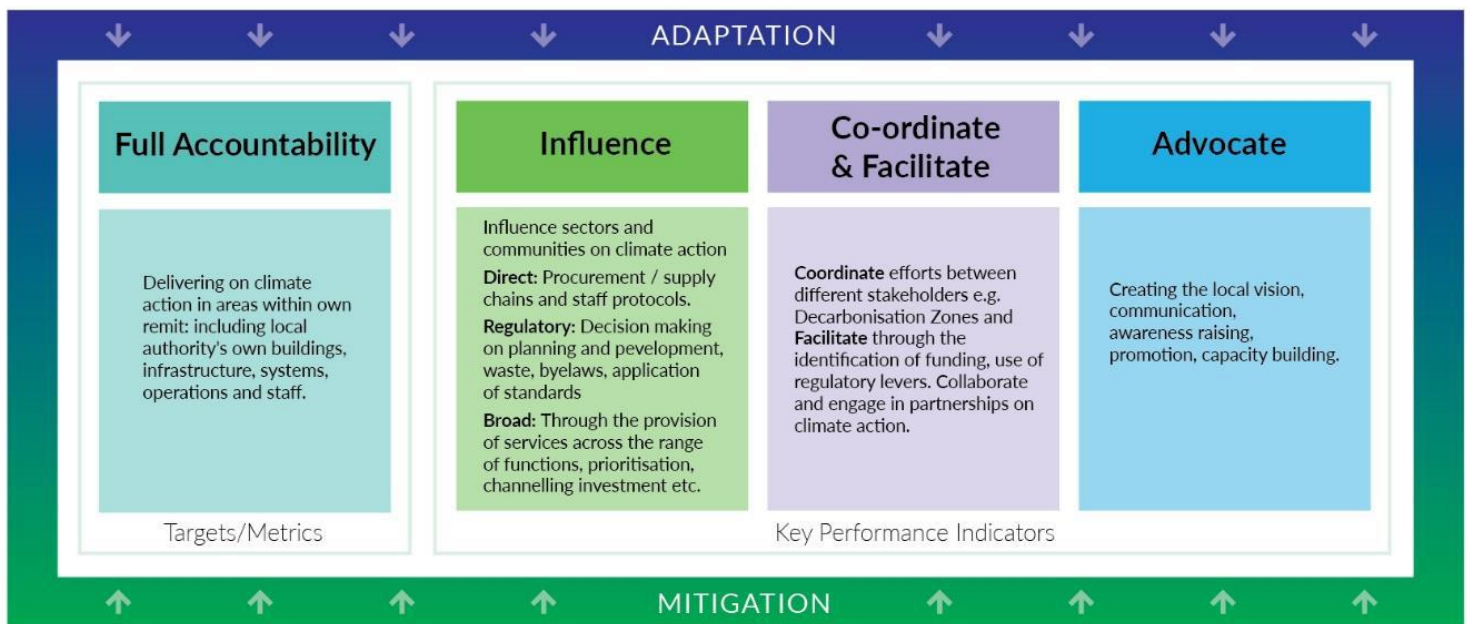


Fig 7: Local authority scope on climate action (source CCMA/CARO).

A VISION AND A MISSION FOR LIMERICK CITY AND COUNTY COUNCIL'S CLIMATE ACTION PLAN

The Limerick Development Plan is underpinned by a strategic vision that guides the sustainable future growth of Limerick. At the core of the vision are cohesive and sustainable communities, where our cultural, natural and built environment is protected. The vision embraces inclusiveness and a high quality of life for all, through healthy place-making and social justice, including the ongoing development of the Regeneration Areas and disadvantaged communities. An integrated approach will align housing and public transport provision. Human and environment wellbeing including climate adaptation are at the core of the vision.

The Strategic Vision reads as follows:

Limerick – A Green City Region on the Waterfront By 2030, Limerick will become a green City region on the Shannon Estuary connected through people and places. This will be achieved through engagement, innovation, resilient urban development and self-sustaining rural communities.

At the heart of this vision is Climate Action and this is reflected in the Key Ambitions that embeds the vision into all aspects of the Council's activities. These ambitions underpin this plan and provide a focus for the actions that will be set out in it.



Fig. 8: Key Ambition in Limerick Development Plan 2022-2028

Building on this the proposed **Vision** for the Climate Action Plan is as follows:

Limerick City and County Council will lead the transition to a low carbon and climate resilient society. This will be achieved through engagement, innovation and a just transition.

This vision statement is aligned with the vision statement proposed for the Decarbonisation Zone, which was set out in its submission to Government in 2021:

Limerick City and County Council's Decarbonisation Zone will form a clear path for the development of a sustainable City and County, which is aligned to the UN Sustainable Development Goals. The decarbonisation zone will be a demonstrator for the just transition to a low carbon, climate resilient society and economy, by achieving at least a 51% reduction in carbon emissions by 2030 and carbon neutrality by 2050, enabling national climate change policy.

While the vision statement defines where LCCC would like to lead the County, a mission statement speaks to its grounded purpose in delivering and mainstreaming effective climate action. This action-oriented mission statement helps guide representatives and stakeholders in coordinating their work towards the defined Vision.

The indicative **Mission** for Limerick City and County Council is:

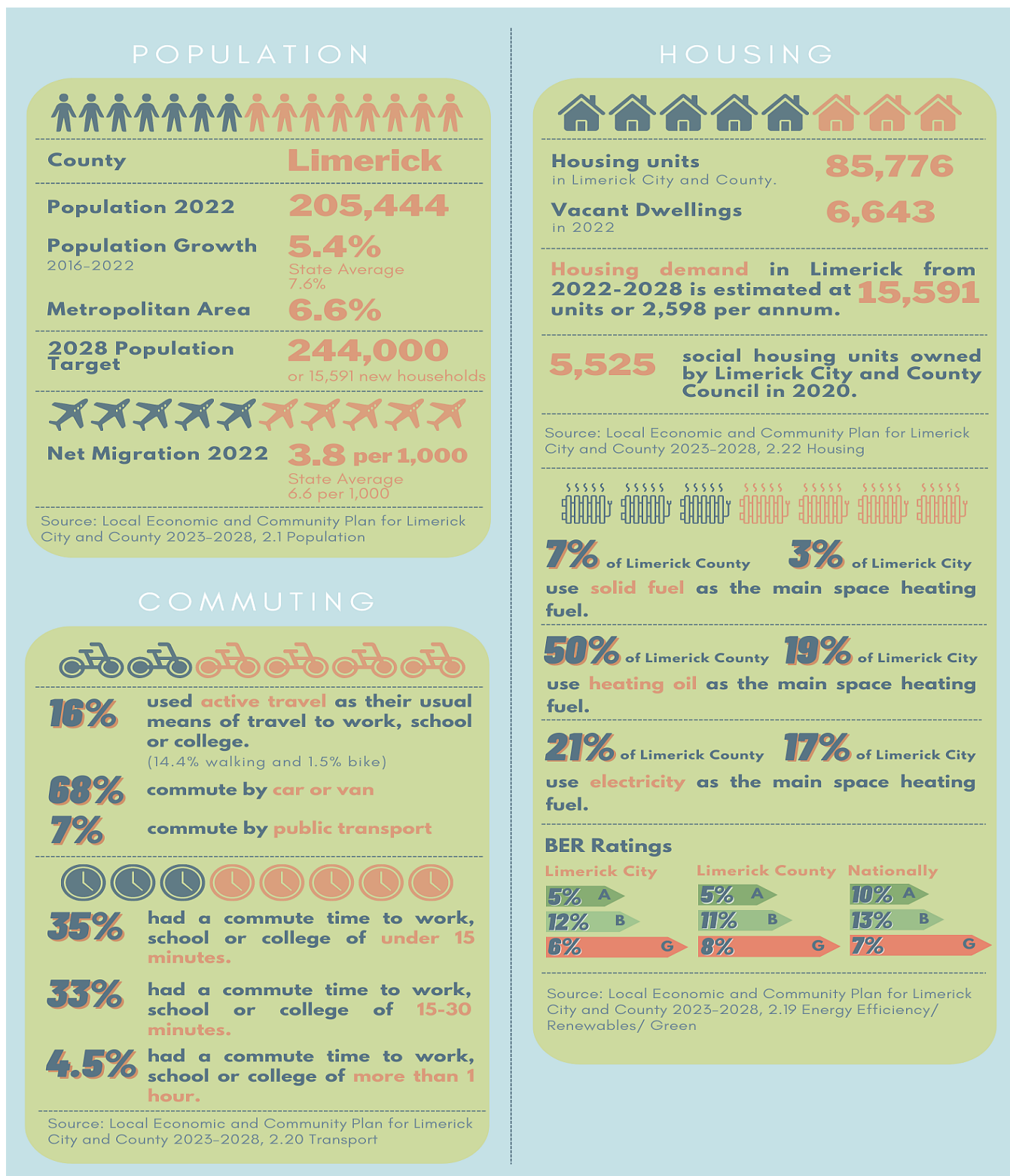
We will strive to achieve this by focusing on the key sustainability pillars of energy, transport, waste, behavioural change, land use, ecosystems and the built and natural environments. We will achieve this by supporting innovation and co-creation with all stakeholder in a collaborative environment across the county



DOES THE VISION AND MISSION CAPTURE THE FUTURE DIRECTION WE WANT FOR LIMERICK?

PROFILE OF COUNTY LIMERICK

The Climate Action Plan will set out a co-ordinate planned approach that addresses the specific challenges in Limerick. The Local Economic and Community Plan sets out a detailed profile of the County. The Figure below sets out some of the key elements of that profile that will inform the preparation of the Climate Action Plan



EMPLOYMENT & ECONOMY



44,624 Daytime workers in Limerick City and Suburbs.

This is the 3rd largest in the state.

11,378 Workers from Limerick County, the main source of workers to Limerick City and Suburbs.

22,716 Workers commute into Limerick City and Suburbs for work.

2,413 Workers in Newcastle West. This is the largest daytime working population in the county (2016).

836 Abbeyfeale has the largest net gain in working population, followed by Rathkeale (465) and Newcastle West (336)

24,500 Jobs have been announced for Limerick between 2013 and April 2022.

Source: Local Economic and Community Plan for Limerick City and County 2023-2028, 2.10 Daytime Working Population



19.7% of jobs in enterprises are manufacturing jobs

10.7% are construction jobs

50%+ are service sector jobs

Source: Local Economic and Community Plan for Limerick City and County 2023-2028, 2.12 Enterprise

9,000 People are employed in manufacturing in the rural economy.

Source: Local Economic and Community Plan for Limerick City and County 2023-2028, 2.18 Manufacturing



Limerick received **602,000** overseas visitors in 2019.

The Mid-West received **1,432,000**

These visitor's spent **€254m** in Limerick and **€472m** in the Mid-West.

Source: Local Economic and Community Plan for Limerick City and County 2023-2028, 2.14 Tourism



16.6% Commercial vacancy rate in Limerick.

47% Commercial vacancies in service sector businesses.

Towns/ Areas with the highest rates of commercial vacancy:

Abbeyfeale 22.1%

Newcastle West 21.6%

Limerick City 19.1%

Commercial vacancy rate in the state in Q2 2022 was at its highest level since 2013.

Source: Local Economic and Community Plan for Limerick City and County 2023-2028, 2.11 Dereliction and Vacancy

Fig 9: Socio Economic Analysis (Based on Limerick Local Economic and Community Plan Socio Economic Statement 2023)

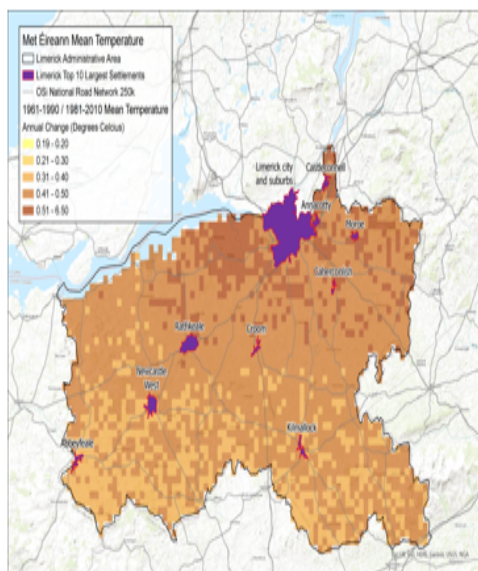
CLIMATE CHANGE RISK ASSESSMENT

Limerick City and County Council have engaged KPMG to help build the adaptation baseline and develop a climate change risk assessment (CCRA) following **Technical Annex B of the LACAP Guidelines** in order to understand current and future risks posed by climate change for County Limerick and the implications of these for Limerick City and County Council.

The Technical Annex B provides a stepped approach to carrying out a climate change risk assessment:

1. Assess the climate impact baseline, identifying, assessing and characterising the climate and weather-related impacts already being experienced by the authority, and
2. Identify and assess potential future climate impacts and risks.

OBSERVED CHANGES IN LIMERICK'S CLIMATE



In line with global trends, the climate of Ireland and Limerick is changing, temperatures are increasing and patterns of precipitation are changing. A summary of key climate and weather-related changes already observed for County Limerick are detailed below.

Summary of Observed Climate Change for Limerick City and County

Drought



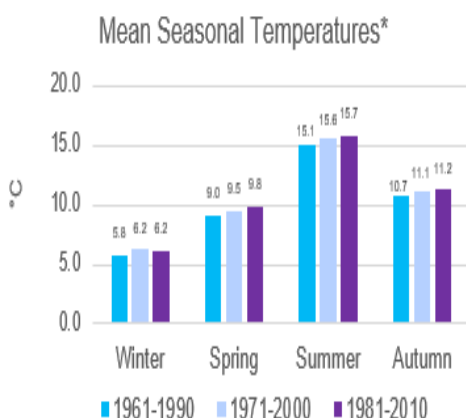
The longest running continuous Drought was recorded in June 2018 at Abbeyfeale Caherlane lasting a total of 25 days

Rainfall

Average annual rainfall at Shannon Airport has increased by 5.5% for the most recent period (1981-2010) when compared to the 1961-1990 baseline.*

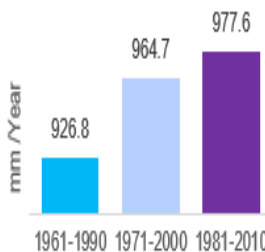
0.6°C

Average temperature increase for the period 1981-2010 when compared to the 1961-1990 baseline.*



Highest temperature on record recorded on Jul 18th 2022 at Mount Russell

29.5°C



6 of the top 10 wettest years on record since 1941 have occurred since the year 1981*

*Source: Met Éireann Long term weather station : Shannon Airport



The longest running heatwave in Limerick was recorded at the Mount Russell Weather station during the summer of 2021, lasting a total of 8 days with temperatures over 25°C

Fig 10: Observed Climate Change in Limerick. (Source Climate Change Risk Assessment KPMG 2023)

Based on the climate hazard baseline, severe windstorm events have impacted upon Limerick City and County most frequently over the period 1945-2022, with coastal flooding, river flooding, pluvial flooding and heat waves affecting the County on a number of occasions. Coastal erosion, cold spells, droughts, heavy snow fall, and ground water flooding have also impacted Limerick City and County, but less frequently. The hazard frequency for each hazard is shown in the table below.

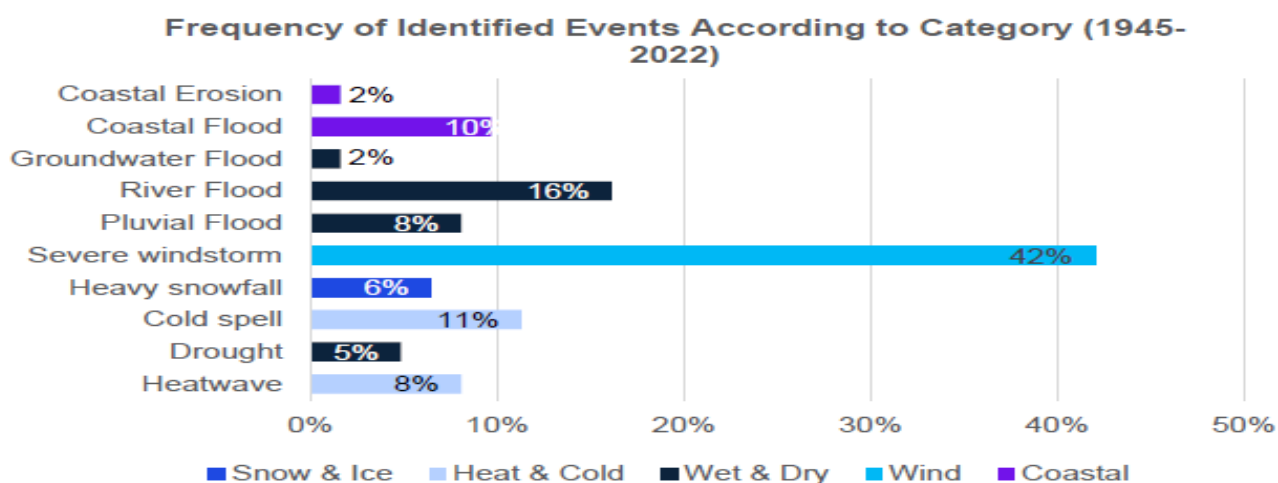


Fig 11: Frequency of weather events in Limerick. (Source Climate Change Risk Assessment KPMG 2023)

Exposure, Vulnerability and Impacts for Limerick City and County

On the basis of identified exposures, vulnerabilities and impacts for Limerick City and County, the impact of climate and weather-related hazards on key categories of exposure for Limerick City and Council was assessed. A summary of impacts across the key categories of exposure for the seven climate hazards identified is provided below.

Hazard	Current Frequency	Assets	Health and Wellbeing	Environment	Social	Cultural Heritage	Financial	Reputational	Overall Impact Score
Heatwave	Common	Moderate	Negligible	Moderate	Negligible	Minor	Negligible	Minor	1.9
Drought	Occasional	Negligible	Minor	Moderate	Minor	Negligible	Negligible	Minor	1.7
Cold Spell	Frequent	Moderate	Minor	Minor	Minor	Minor	Moderate	Minor	2.3
Heavy Snowfall	Rare	Moderate	Minor	Minor	Moderate	Minor	Minor	Moderate	2.4
Severe Windstorm	Very Frequent	Moderate	Minor	Minor	Minor	Minor	Moderate	Minor	2.3
Coastal Flood	Common	Minor	Minor	Minor	Minor	Minor	Moderate	Minor	2.1
Coastal Erosion	Occasional	Minor	Negligible	Minor	Negligible	Negligible	Negligible	Negligible	1.3
Pluvial Flood	Frequent	Moderate	Minor	Negligible	Minor	Minor	Minor	Minor	2.0
River Flood	Frequent	Major	Moderate	Moderate	Moderate	Minor	Moderate	Moderate	3.0
Groundwater Flood	Occasional	Minor	Negligible	Minor	Minor	None	Minor	Negligible	1.4

Fig 12: Impact of severe weather events in Limerick. (Source Climate Change Risk Assessment KPMG 2023)

Current Climate Risk Matrix

Based on frequency of hazard occurrence and level of impact, a current climate impact matrix for Limerick City and County has been developed that identifies that river flooding, severe windstorms and pluvial flooding pose the highest levels of risk while cold spells, coastal flooding and heatwaves can also be considered as posing significant risks.

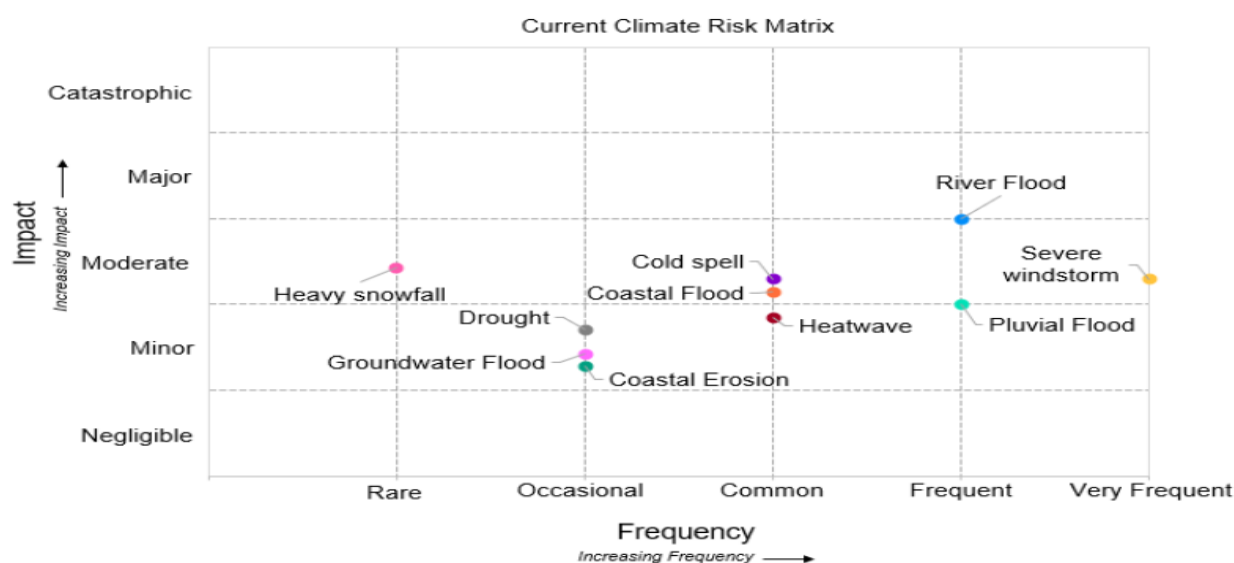


Fig 13: Current Climate Risk Matrix for Limerick. (Source Climate Change Risk Assessment KPMG 2023)

Climate Projections for County Limerick in 2050

- ↓ • Recent experiences of **cold spells and heavy snowfall** events in 2018 (e.g. Storm Emma) demonstrated the wide range of impacts for Limerick City and County. These included, amongst others, increase in the frequency of trips and falls, disruption to road networks, closure of community infrastructure, and impacts on water resources (e.g. boil water notices). Projected increases in average temperature and decreases in the frequency of snowfall indicate a decrease in the frequency of cold spells, heavy snowfall, and their associated impacts.
- ↑ • Recent experiences of **river and pluvial flooding** events in 2019, 2020, and 2021, resulted in inundation of homes (e.g. Coonagh), disruption of transport networks (e.g. N69), inundation of farmland (around Mellon, Kildimo, Ballydoole, and Pallaskenry), and damage to recreational amenities (e.g. Closure of the Red Path cycleway in Corbally). Historic events include the August 2008 flooding in Newcastle West. Projected increases in the frequency of extreme precipitation events will result in increased river and pluvial flood risk for Limerick City and County.
- • **Groundwater Flooding** is currently experienced on an infrequent basis in Limerick City and County, and results in impacts including inundation of homes. Projections indicate no significant change to this frequency.
- ↑ • Recent experiences of **coastal erosion and coastal flooding** events resulted in damage to coastal infrastructure (e.g. sea defence wall along the N69), and temporary submergence of transport infrastructure (e.g. low-lying quays in Limerick City), and loss of coastal habitat. Projected increases in sea level projections will increase the frequency and associated impacts of coastal inundation and erosion for Limerick.
- ↑ • Limerick City and County experienced both a **heatwave and drought** in 2018 and 2022. These events resulted in damage to road surfaces (e.g. Ballintubber Road), increased demand placed on water resources, increased pressure on agriculture due to reduced grass growth, and loss of biodiversity (e.g. wild fires in 2018). Projected increases in the frequency of heatwaves and drought conditions will mean that events currently experienced on an infrequent basis will become more frequent. As the population ages, there will also be an increase in the number of vulnerable people exposed to heat-related risks.
- • **Severe windstorms** are currently experienced on a very frequent basis in Limerick City and County, and result in wide-ranging impacts, including disruption to energy supply and transport networks. Projections indicate no significant change to this frequency.

Future Exposure and Vulnerability

In addition to the changes in the frequency of hazard events, future risk is also driven by the changes in exposure and vulnerability of assets. In order to estimate the potential change in risk, a number of assumptions have been made in relation to the seven impact areas, which are outlined below.

Assets	<ul style="list-style-type: none"> Due to the expected increase in County Limerick's population, there will be an increase in the associated households and infrastructure resulting in an increase in the number of assets exposed to hazard events. Due to the expected increase in the frequency of heatwaves, road assets will be more regularly exposed to extreme temperatures and drought conditions with the potential for increased damage to roads. Due to the expected increase in the frequency of coastal erosion and coastal flooding, assets on the coastline will be more regularly exposed to erosion and flooding which will result in the washing away of the coastline and increased damage to assets along the coastline. Pluvial and river flooding events that were once considered extreme, will become more frequent. This will increase damage in the areas already exposed to these hazards and also expose new areas and therefore assets that were previously unaffected.
Health and Wellbeing	<ul style="list-style-type: none"> Due to the expected increase in the elderly population in County Limerick, there will be a greater number of vulnerable people who are more sensitive to hazards, particularly heatwaves. Pluvial and river events that were once considered extreme, will become more frequent. Consequently, people will be more frequently exposed to flooding hazards, and higher flood levels which will mean people previously unaffected by flooding may become exposed. This could impact on both physical and mental health and wellbeing.
Environment	<ul style="list-style-type: none"> The potential increasing occurrence of heatwaves and drought conditions within County Limerick will mean increased temperatures in water bodies and lower water levels which can decrease water quality resulting in short and long term impacts on the environment. Due to the potential increase in the frequency of exposure to hazards in County Limerick, there could be an increase in the impact on environmental assets as the time/ability for the habitat/environment to recover is reduced. Coastal Erosion and Coastal Flooding events will become more frequent. Consequently, environmental assets will be more frequently exposed to flooding and erosion hazards, and higher flood levels and more frequent erosion events will mean environmental assets previously unaffected by flooding and erosion may become exposed, resulting in short and long term damage to habitats/environment by these hazards.
Social	<ul style="list-style-type: none"> Due to the expected increase in the total and elderly population in County Limerick, there will be an increase in the number of people affected by social isolation during some hazard events. In response to heatwaves, there will be an increased use of blue/green spaces by the public putting increased pressure on local amenities e.g. littering, traffic problems, anti social behaviour.
Cultural Heritage	<ul style="list-style-type: none"> Due to the potential increase in frequency of heatwave and drought events, degradation rates will potentially increase resulting in an increase in the impact of cultural heritage assets. Coastal Erosion and Coastal Flooding events will become more frequent. Consequently, cultural heritage assets will be more frequently exposed to flooding and erosion hazards, and more frequent flood events will mean that cultural heritage assets previously unaffected by flooding may become exposed resulting in short and long term damage to cultural heritage assets by these hazards.
Financial	<ul style="list-style-type: none"> Due to the potential increase in frequency of hazard events and exposure across County Limerick, there will be an associated increase in the actions the local authority takes before, during, and after an event. As a consequence, there will be an increase in the costs associated with dealing with the events, e.g. air conditioning, emergency service response, temporary and permanent flood defences, staff, training, and equipment purchase/maintenance.
Reputational	<ul style="list-style-type: none"> Due to the potential increase in the frequency of hazard events and exposure across County Limerick, during an event there will be an increase in demand/pressure on services/resources potentially reducing the level of service delivery and harming the reputation of the local authority. For hazards which are existing long-term issues in County Limerick, e.g. coastal erosion, if the response to the increased frequency and severity events is deemed insufficient by the public, this may negatively impact on the reputation of the local authority.

Future Climate Risk Matrix

The risk matrix below shows the future change in risk. The dotted line shows the change between the current and future risk. The risk of existing hazards such as river, pluvial, and coastal flooding and coastal erosion is projected to increase in the future because of projected increases in the frequency of heavy precipitation events, rising sea levels and associated increases in inundation extent and depth.

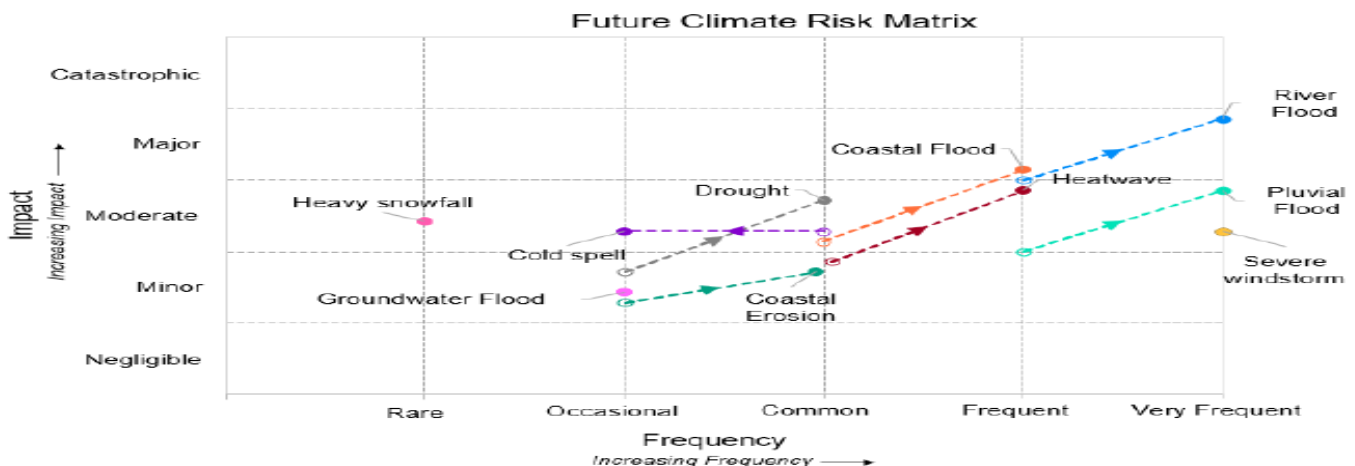


Fig 14: Future Climate Risk Matrix for Limerick. (Source Climate Change Risk Assessment KPMG 2023)

SUMMARY

- Recent experiences of **cold spells and heavy snowfall** events in 2018 (e.g. Storm Emma) demonstrated the wide range of impacts for Limerick City and County. These included, amongst others, increase in the frequency of trips and falls, disruption to road networks, closure of community infrastructure, and impacts on water resources (e.g. boil water notices). Projected increases in average temperature and decreases in the frequency of snowfall indicate a decrease in the frequency of cold spells, heavy snowfall, and their associated impacts.
- Recent experiences of **river and pluvial flooding** events in 2019, 2020, and 2021, resulted in inundation of homes (e.g. Coonagh), disruption of transport networks (e.g. N69), inundation of farmland (around Mellon, Kildimo, Ballydoole, and Pallaskenny), and damage to recreational amenities (e.g. Closure of the Red Path cycleway in Corbally). Historic events include the August 2008 flooding in Newcastle West. Projected increases in the frequency of extreme precipitation events will result in increased river and pluvial flood risk for Limerick City and County.
- **Groundwater Flooding** is currently experienced on an infrequent basis in Limerick City and County, and results in impacts including inundation of homes. Projections indicate no significant change to this frequency.
- Recent experiences of **coastal erosion and coastal flooding** events resulted in damage to coastal infrastructure (e.g. sea defence wall along the N69), and temporary submergence of transport infrastructure (e.g. low-lying quays in Limerick City), and loss of coastal habitat. Projected increases in sea level projections will increase the frequency and associated impacts of coastal inundation and erosion for Limerick.
- Limerick City and County experienced both a **heatwave and drought** in 2018 and 2022. These events resulted in damage to road surfaces (e.g. Ballintubber Road), increased demand placed on water resources, increased pressure on agriculture due to reduced grass growth, and loss of biodiversity (e.g. wild fires in 2018). Projected increases in the frequency of heatwaves and drought conditions will mean that events currently experienced on an infrequent basis will become more frequent. As the population ages, there will also be an increase in the number of vulnerable people exposed to heat-related risks.
- **Severe windstorms** are currently experienced on a very frequent basis in Limerick City and County, and result in wide-ranging impacts, including disruption to energy supply and transport networks. Projections indicate no significant change to this frequency.

GREENHOUSE GAS EMISSIONS IN COUNTY LIMERICK - BASELINE AND EMISSIONS INVENTORY (BEI)

The baseline emissions inventory (BEI) is a key instrument that enables local authorities to measure the impact of planned actions related to emission reductions across its own operations as well as relevant sectors of society. The BEI represents an evidence-based approach to not only inform appropriate emission reduction actions but also measure progress overtime.

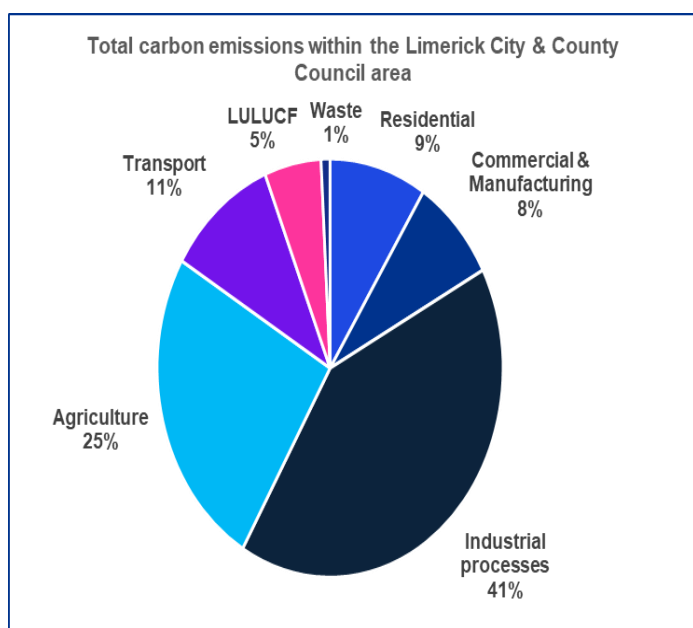
Limerick City and County Council’s BEI is informed by the guidance document ‘Technical Annex C: Climate Mitigation Assessment’, ensuring a robust and consistent approach across all local authorities to the development of their BEIs. A Tier 1 approach to the development of the BEI has been used.

Tier 1 ‘Top-down’ Assessment is the simplest and quickest approach to estimate carbon emissions at a County Council level. The approach is informed by publicly available data, predominantly the Environmental Protection Agency’s (EPA) MapEire database, CSO and SEAI.

2018 is used as the baseline year for the BEI assessment. This year has been purposefully chosen to align with Ireland’s national targets, which are set against a 2018 baseline year. This BEI assessment provides a snapshot in time of the carbon emissions across all identified sectors of the economy within the boundaries of LCCC. The baseline covers both direct and indirect emission sources within the administrative area, as well as the level of control and influence a local authority has over these emissions.

As illustrated, the main sources of emissions within the Limerick City and County Council boundary area are Industrial Processes, Agriculture and Transport, accounting for 41%, 25% and 11% of total carbon emissions, respectively. The Residential and Commercial & Manufacturing sector account for 9% and 8%, respectively with the Waste and LULUCF sectors accounting for the remaining 6% of total carbon emissions.

? HOW CAN THE LACAP SUPPORT SUSTAINABLE AGRICULTURE AND ENTERPRISE?



Sector	Total carbon emissions (tCO ₂ e)
Residential	434,519
Commercial & Manufacturing	391,858
Industrial processes	1,974,124
Agriculture	1,204,097
Transport	493,548
LULUCF	253,854
Waste	40,155
Total	4,357,636

Fig 15: Source of Carbon Emissions in Limerick. (Source: Limerick County Baseline and Emissions Inventory KPMG 2023)



WHAT ARE THE CHALLENGES OR OPPORTUNITIES FOR LIMERICK CITY and COUNTY COUNCIL OF IMPLEMENTING CLIMATE ACTION TOWARDS 2030?

Challenges for Emission Reduction

The assessment of the emission sources provides valuable information on which to create relevant and targeted actions for Limerick City and County Council to reduce emissions within the region. Possible actions could include:

1. At an organisational level:
 - a. Ensuring green energy sources are used within council buildings
 - b. Ensuring energy efficiency measures are implemented in all buildings
 - c. Expansion of the green fleet for local authority vehicles
2. At a Community level:
 - a. Integrating climate action further into the planning system to support mitigation objectives.
 - b. Promote the use of active travel (e.g., walking and cycling) by providing suitable infrastructure
 - c. Support, grow and connect local Sustainable Energy Communities
 - d. Support the sustainable management of Clare's natural heritage, habitats, and landscapes
 - e. Support the development of agriculture that is compatible with the sustainable development of the county and farming community
 - f. Leveraging leadership role within the community to influence residents to switch to lower greenhouse gas emitting energy sources
 - g. Raising awareness amongst the community of actions they can take, such as use greener energy sources and transport choices



HOW CAN WE BEST PROMOTE AND SUPPORT A MODAL SHIFT TOWARDS MORE SUSTAINABLE MODES OF TRANSPORT ACROSS THE COUNTY?

DECARBONISATION ZONE

A Decarbonisation Zone (DZ) is a spatial area, identified by each local authority in Ireland, in which a range of climate change mitigation, adaptation and biodiversity measures are identified to address local low carbon energy, greenhouse gas emissions and climate needs to contribute to national climate action targets. DZs are a demonstration and testbed of what is possible for decarbonisation and climate action at a local and community level. Through a feedback loop of experimentation and evaluation, the DZ enables a flexible, incremental and community-driven approach to ensure that its objectives are delivered.

Limerick's proposed decarbonisation zone (DZ) is located in the heart of the city and includes much of Newtown Perry, the historic Georgian area of the city. The core of the decarbonisation zone is based on the Innovation Playground developed as part of the H2020 +CityxChange (Positive City xChange) smart city project.

+CityxChange uses the concept of a Positive Energy Block (PEB) as a driver for change in relation to energy use, energy generation, regulation, mobility, and retrofit. A PEB is a compact area, which over a year produces more energy than it consumes. The Innovation Playground is an area of Limerick city centre where different virtual and physical places and activities related to innovation are brought together into a coherent whole to facilitate collaboration, empower citizens, and find new ways of addressing challenges related to climate change and the energy transition.

Limerick's proposed DZ covers an area of 133ha and has an estimated population of 7,127 (CSO 2016). Figures xx below show the geographical extent of the proposed DZ.

In addition to the historic core, the zone includes significant areas for redevelopment and will, therefore, facilitate the implementation of a broad range of measures ranging from deep retrofit of historical and protected buildings, to new builds on brownfield sites with the attendant opportunities to explore nature based solutions and other emerging technologies.

One such redevelopment area will be the Colbert Station Quarter, which is set to become a sustainable and flourishing new urban quarter for Limerick. It is expected to offer vibrant, compact neighbourhoods in a well-connected and walkable environment. This will include community and recreational amenities, quality public realm and parkland setting to enhance liveability and well-being, whilst promoting sustainability and flexibility for the area to evolve over time. A network of new and improved links will promote sustainable and active travel, better connecting new and existing communities with supporting neighbourhood amenities. Early development opportunities will act as a catalyst to demonstrate the vision, set the tempo for development and support the unlocking of the transformative potential of this new urban quarter and gateway for Limerick.



Fig 16: Location of the Decarbonisation Zone. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)

SUMMARY RESULTS

The results of the 'bottom-up' Tier 3 assessment are presented on the table and chart below. Total carbon emissions equate to approximately **99,480 tCO₂e**. This translates to **13.96 tCO₂e per capita** based on 2016-census population data. In 2018, Ireland's national carbon emissions equated to approximately 12.6 tCO₂e per capita. While the DZ's carbon emissions per capita is lower than the national equivalent, Ireland is significantly higher than the EU average of 8.2 tCO₂e per capita.

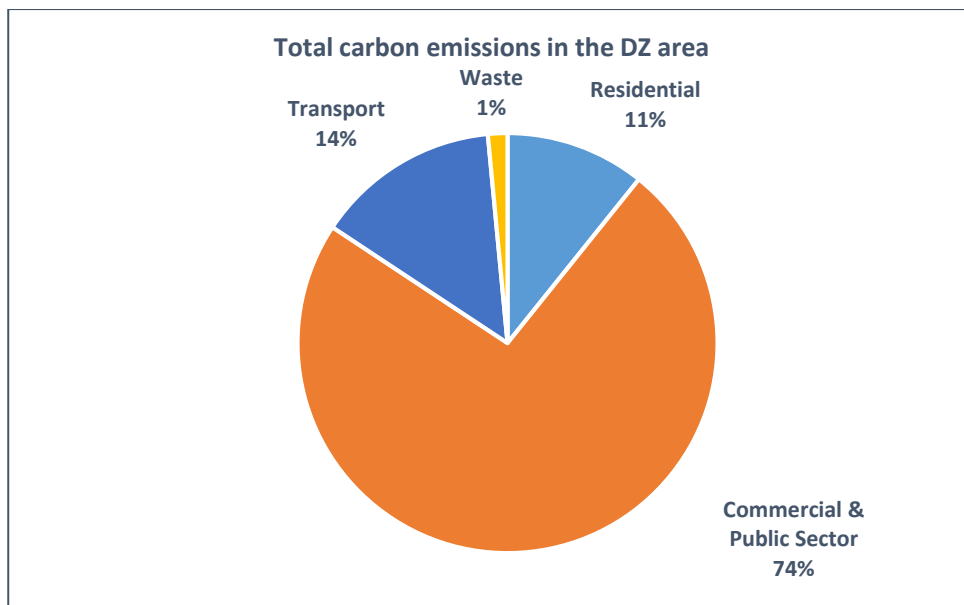


Fig 17: Total Carbon Emissions in the DZ. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)

	Carbon emissions (tCO ₂ e)
Residential	10,706
Commercial & Public Sector	73,161
Transport	14,119
Waste	1,494
Total carbon emissions	99,480
Total carbon emissions per capita (tCO₂e/capita)	13.96

Fig 18: Total Carbon Emissions in the DZ. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)

COMMERCIAL AND PUBLIC SECTOR

The commercial and public sector are the largest contributor to carbon emissions within the DZ. Total sector energy consumption equates to **262,333 MWh**. The associated carbon emissions of the sector equates to approximately **72,963 tCO₂e**. Commercial buildings within the DZ area account for the majority of carbon emissions. Electricity is the primary fuel source used in the DZ area and is estimated to power approximately 51% of commercial buildings in the DZ area.

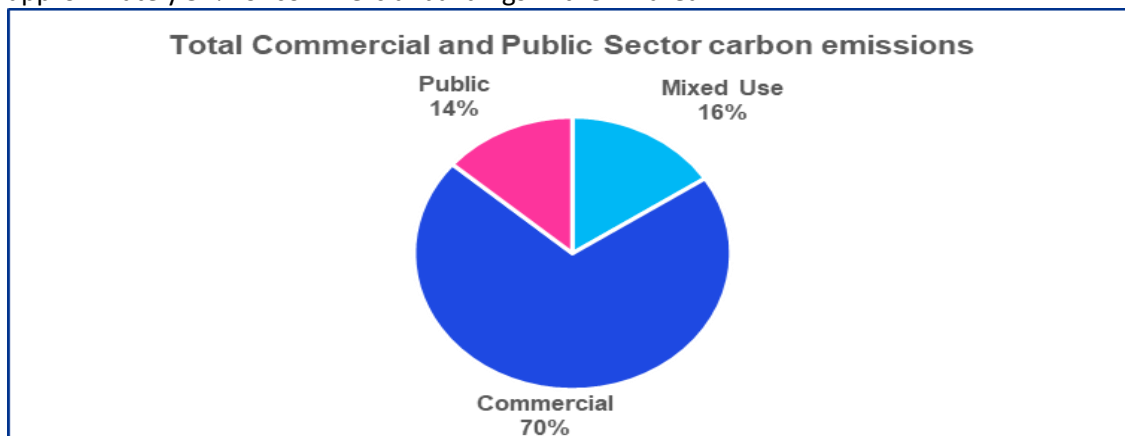


Fig 19: Total Commercial and Public Sector Carbon Emissions in the DZ. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)

TRANSPORT SECTOR:

The associated carbon emissions of the sector equate to approximately 14,119 tCO₂e. Private cars account for the highest energy consumption and associated carbon emissions.

	Energy Consumption (MWh)	Carbon emissions (tCO ₂ e)
Road Freight	11,119	2,814
Road Light Goods Vehicle	6,199	1,569
Road Private Car	37,097	9,274
Public Passenger Services	1,830	462
Total	56,246	14,119

Fig 20: Transport Energy and Carbon Emissions in the DZ. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)

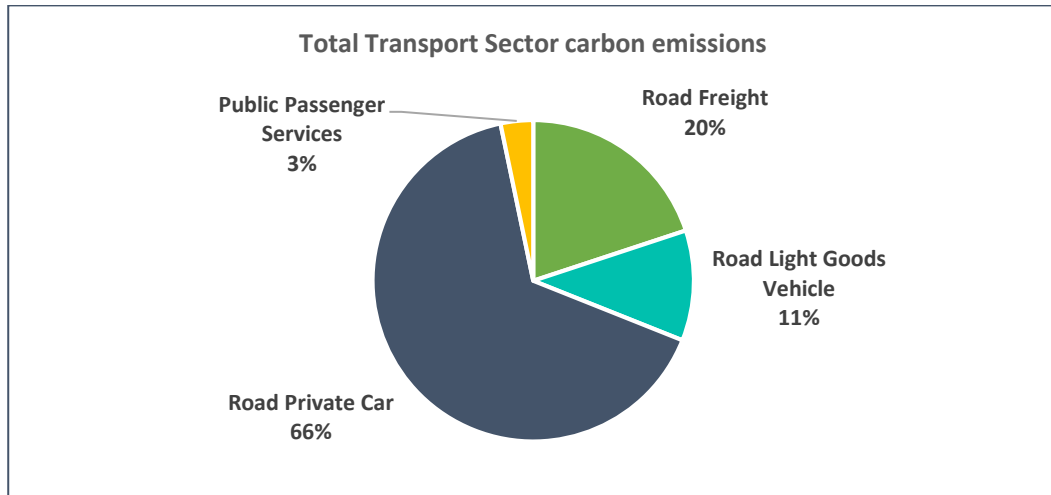


Fig 21: Total Transport Carbon Emissions in the DZ. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)

Commuting patterns in the DZ area show a 30% reliance on private car with almost two thirds of commuting journeys using public transport, cycling or walking. It is estimated that these daily commuter trips leaving the DZ area, and assumed to then return, contribute approximately **585 tCO₂e on an annual basis**. **The estimated carbon contribution of trips into the DZ is approximately 6,872 tCO₂e.**

RESIDENTIAL SECTOR

The residential sector contribute 11% of all carbon emissions within the DZ. This equates to 10,706 tCO₂e. The breakdown of energy consumption and carbon emissions are presented below. ‘Occupied’ homes, as defined by the 2016 CSO database, account for the majority of residential homes in the DZ area, at 80%

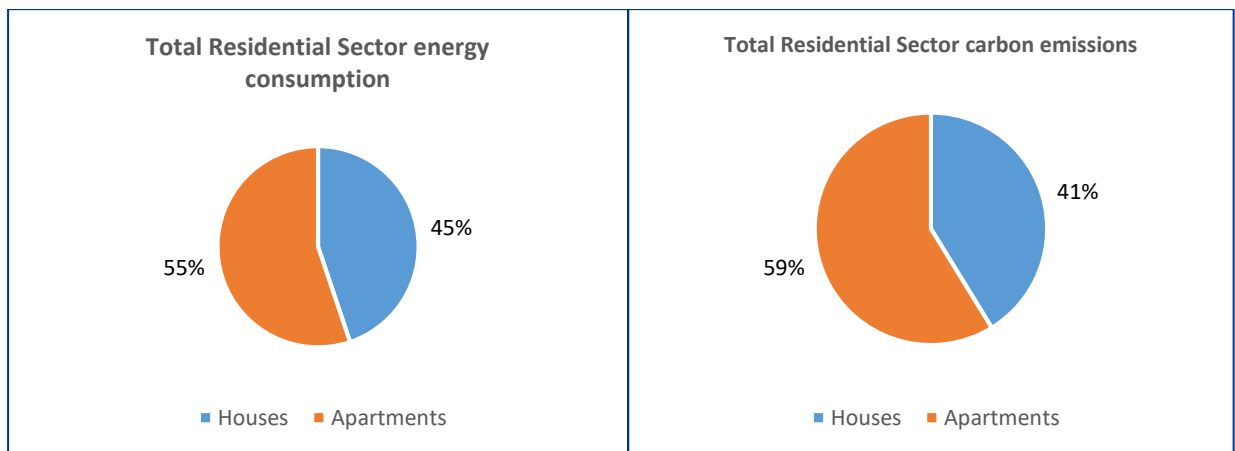


Fig 22: Total Residential Energy Consumption and Carbon Emissions in the DZ. (Source: Decarbonisation Zone Baseline and Emissions Inventory KPMG 2023)



HOW CAN THE LACAP BEST PROMOTE THE CONSERVATION OF ENERGY AND MINIMISE ITS USAGE?

CONCLUSION

The analysis highlights the carbon hotspots within the DZ area; Residential Sector (including Social Housing), Commercial and Public Sector and Transport Sector. The waste sector, although a smaller impact in

comparison to the others, should also be focussed on given its transboundary nature and the level of influence the local authority can have on its impact on carbon emissions.

A range of sectoral specific measures to reduce carbon emissions will be explored during the next stages of the DZ development, including stakeholder engagement and register of opportunities for action planning. Examples of key measures specific to these sectors to consider are set out on the following pages.

In addition to sectoral specific measures, LCCC can also engage with relevant government departments to develop and resource programmes which will directly and indirectly provide the necessary tools to enable an effective transition to a low carbon economy. These include but are not limited to:

- Citizen engagement and awareness raising to promote behavioural change across the DZ area;
- Internal capacity building to equip employees with the knowledge and skills to promote decarbonisation;
- Support for external initiatives such as innovation and knowledge sharing hubs.

Many of these initiatives can be applied towns and villages in the country



HOW CAN THE LACAP PROMOTE THE SCALABILITY OF POTENTIAL CLIMATE RELATED PROJECTS IN THE DZ ACROSS LIMERICK?

HAVE YOUR SAY ON THE DEVELOPMENT OF THE LIMERICK CLIMATE ACTION PLAN

In order to ensure that local based information is included, Limerick City and County Council are inviting observations and recommendations for consideration in the in the draft Climate Action Plan.

Submissions will be accepted from July 7th to August 4th and can be submitted online, by email or in writing with details provided below:

- Online: You can submit your feedback on the Limerick City and County Council's engagement platform:
- Email: You can submit your feedback via email to urbaninnovation@limerick.ie
- Writing: You can submit your feedback in writing to

The Climate Action Co-ordinator
Environment and Climate Action Department
Planning Environment and Place-Making Directorate
City Hall
Merchants Quay
Limerick