Laois Climate Action Plan 2024-2029

Appendix E

Evidence Base

APPENDIX E: EVIDENCE BASE

1.1 INTRODUCTION

Employing evidence-based approaches in climate action planning is vital for effectively tackling the pressing and complex challenges posed by climate change. It is crucial for making well-informed decisions, efficiently allocating resources, implementing effective mitigation and adaptation measures, engaging the public, fostering international collaboration, and continually assessing progress. Relying on scientific evidence and data allows policymakers to formulate robust and impactful strategies to address the urgent climate change challenges.

As part of this LACAP, three prescribed reports were undertaken by consultants.

1. **Baseline Emissions Inventory (BEI) of County Laois** that details the current source of GHGs in the County by Sector,
2. **Climate Change Risk Assessment (CCRA)** that evaluates the current and future climate related impacts and risks faced by County Laois and potential impacts on services of Laois County Council, and
3. **Baseline Emissions Inventory (BEI) of the Decarbonising Zone (DZ).** This is further detailed in Section 6.

1.2 RATIONALE FOR AN EVIDENCE BASED APPROACH

The key benefits of evidence-based climate action planning include:

- **Accurate Understanding of the Issue:** Climate change is a multifaceted problem with profound consequences. Evidence-based planning ensures that decision-makers have access to the latest scientific research and data, enabling them to comprehend the causes, impacts, and potential solutions related to climate change. This approach helps prevent misinformation, scepticism, and poorly-informed decision-making.
- **Efficient Resource Allocation:** Climate action planning often requires significant investments in infrastructure, technologies, and policies. Evidence-based methods enable the prioritisation and efficient use of limited resources. Policymakers can identify the most effective and cost-efficient actions by considering data and evidence, leading to optimal resource utilisation and maximum impact of climate initiatives.
- **Identifying Effective Mitigation Measures:** Evidence-based planning allows for the identification of the most effective and feasible measures to reduce greenhouse gas emissions. It involves evaluating the potential benefits and drawbacks of various strategies, technologies, and policy interventions. Decision-makers can select options that offer the greatest emission reductions while considering local contexts and constraints.
- **Informing Adaptation Strategies:** Climate change adaptation is crucial for minimising the impacts of climate-related hazards and protecting vulnerable communities, ecosystems, and economic sectors. Evidence-based planning helps identify specific risks and vulnerabilities associated with climate change, guiding the development of appropriate adaptation measures. It ensures that adaptation actions are tailored to local conditions and based on rigorous scientific assessments.

- **Building Public Trust and Engagement:** Evidence-based climate action planning enhances transparency, accountability, and public trust. Policymakers can demonstrate that their decisions are grounded in rigorous analysis rather than personal or political preferences, which fosters public support and engagement. This, in turn, facilitates the implementation of climate policies and initiatives.
- **Facilitating Cooperation at All Levels**: Climate change is a global challenge that requires collaborative efforts. Evidence-based planning provides a common foundation for cooperation at local, regional, national, and international levels. It allows countries to share data, research, and best practices, promoting collaboration and the development of coordinated approaches to address climate change.
- **Monitoring and Evaluation**: Evidence-based planning supports continuous monitoring and evaluation of climate actions. By setting measurable targets, collecting data, and regularly assessing progress, decision-makers can measure the effectiveness of their strategies and policies. This feedback loop enables adjustments and improvements to ensure that actions remain aligned with the evolving understanding of climate change.

1.3 BASELINE EMISSIONS INVENTORY ANALYSIS

The baseline emissions inventory (BEI) is a key instrument that enables the local authority to measure the impact of its actions related to emission reductions across its own operations as well as varying sectors of society. The BEI represents an evidence-based approach to inform emission reduction actions and measure progress over time. A baseline is needed in order identify and understand the main sources of GHG emissions in the County.

For the purposes of the local authority climate action plan, the assessment of climate mitigation takes three principal forms, namely:
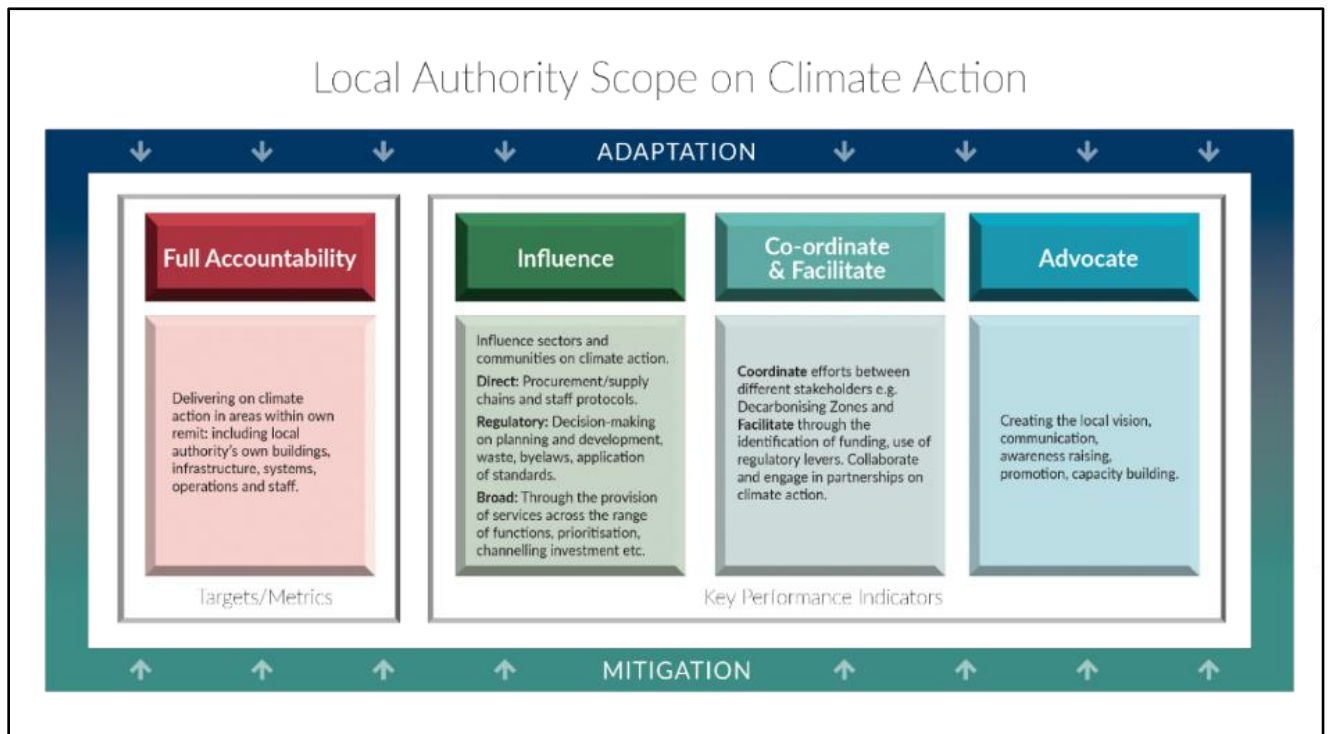
1. Baseline Emissions Inventory of a local authority's own emissions. This includes accounting for emissions related to all assets directly owned, operated or within full control of the local authority i.e. Buildings, Fleet and Public Lighting.

2. Baseline Emissions Inventory for County Laois across a range of pre-defined sectors including Agriculture, Residential, Transport, Commercial and industrial and Waste and Waste Water & LULUCF (Land Use Land Use Change & Forestry).

3. Baseline Emissions Inventory for emissions within Portlaoise Town as td decarbonizing zone by Sector.

Having this information will enable us to identify decarbonizing pathways and also acknowledge the barriers to Local Authority lead decarbonization due to our limited influence within certain sectors. Each local authority has three roles when it comes to the accountability of greenhouse gas emissions (GHG) in its administrative area:

1. Direct emissions from local authority operations and services (public lighting, fleet, local authority owned and operated buildings and facilities, social housing, etc.)

2. Direct influence on emissions through local authority functions (planning, procurement, infrastructure delivery, etc.)

3. Indirect influence on emissions (collaboration, facilitation, awareness building, promotion with private sector, etc.)

Figure 1.1: Extent of Local Authority's Role in Climate Action

Source: Local Authority Climate Action Plan Guidelines, 2023

1.4 BASELINE EMISSIONS INVENTORY FOR LAOIS COUNTY COUNCIL

Public sector entities, including Laois County Council, are mandated to annually report their energy consumption data to the Sustainable Energy Authority of Ireland (SEAI). This reporting is facilitated through the Monitoring and Reporting system (M&R), which serves the purpose of monitoring the progress of public sector organizations toward their 2030 energy consumption goals in comparison to the established 2018 Baseline.

In accordance with the National Climate Action Plan 2023, public sector entities, including local authorities, are instructed to calculate their 2018 baseline using an average of data from the years 2016, 2017, and 2018. This three-year average, referred to as the 2018 Baseline, is the reference point for energy consumption measurement and reduction efforts. The GHG emissions data for the local authority was sourced from the county council's SEAI monitoring and reporting database.

Figure 1.2 Laois County Council GHG Emissions for Baseline Year (2016-2018)

GHG Emissions Data for the Local Authority Category	GHG Emission tCO2-eq
Electricity	2,400
Thermal	552
Transport	711
Total	3,663

Source FT BEI for County Laois

Figure 1.3 Breakdown of Laois County Council GHG Emission by Energy Type for Baseline Year
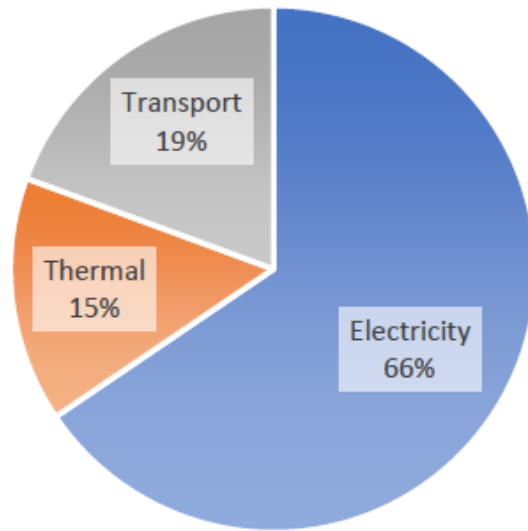
Source FT BEI for County Laois

The total GHG for Laois County Council is 3,663 tCO2-eq which equates to less than 0.3% of the total emissions from County Laois. The breakdown for Laois County Council is 66% Electricity, 15% Thermal which is Heating using fossil fuels and 19% for transport.

The target for all Public Sector is a reduction of 51% from the baseline year. This target is spilt into electricity and non-electricity (Fleet and Thermal) meaning that a 51% minimum target for each.

1.4.1 Gap to Target

The Gap-to-Target model (GTT model) is a spreadsheet model developed for use by public bodies to assist them evaluate their energy efficiency performance and energy-related GHG emissions over time, in accordance with SEAI's public sector energy monitoring and reporting framework for the period to 2030.

The gap-to-target analysis highlights the future emissions reductions required for Laois County Council to meet its 2030 targets.

The baseline year for Laois County Council is 4,161,391.8 kgCo2 the target for 1,288,769.1 kg Co2 which is 31% of GHG produced in the baseline year.

The non-electricity target of Thermal and Fleet is 647,917.3 kg CO2 which is 49% of total of baseline year. In the modelled BAU model where Laois County Council do not undertake any new energy efficiency improvements before 2030 we still gain a XX% improvement in electricity due to the predicted supply of 85% of renewable electricity to the grid by 2030. Even though we surpass our electricity target we must reach our non – electricity target.

To date we have focussed on Thermal i.e. heating to our buildings as the EV of fuel alternatives for our fleet have not been available. The Midland Energy Agency which is lead by Laois County Council have signed a MoU with SEAI for Pathfinder whereby 50% funding is available for Capital and Consultancy costs for energy retrofits of our building stock. To this end a report whereby the Significant Energy Users i.e. Two Leisure Centres and County Hall account for 70% of our energy use. Therefore these buildings have been prioritised for Pathfinder along with other buildings identified by our internal Energy Action Team.
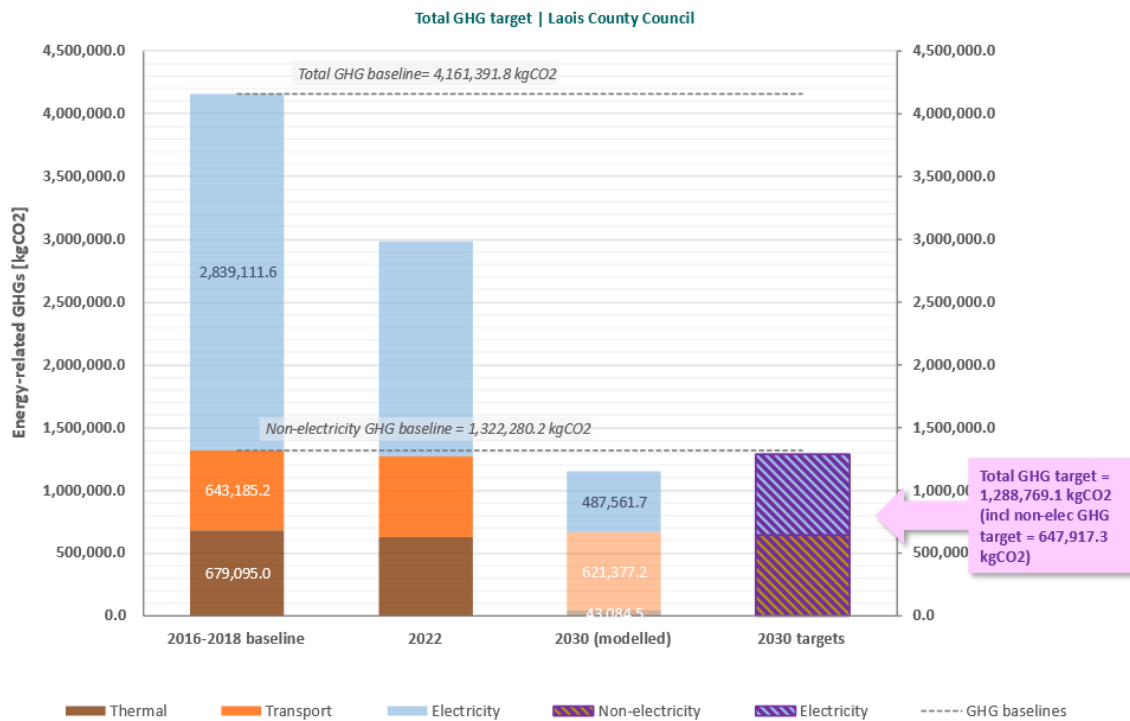
If Laois County Council complete all projects identified in the Pathfinder Plan (See Appendix 5) we will exceed our targets for non-Electricity by 1% .

Figure 1.4 Gap to Target BAU Model
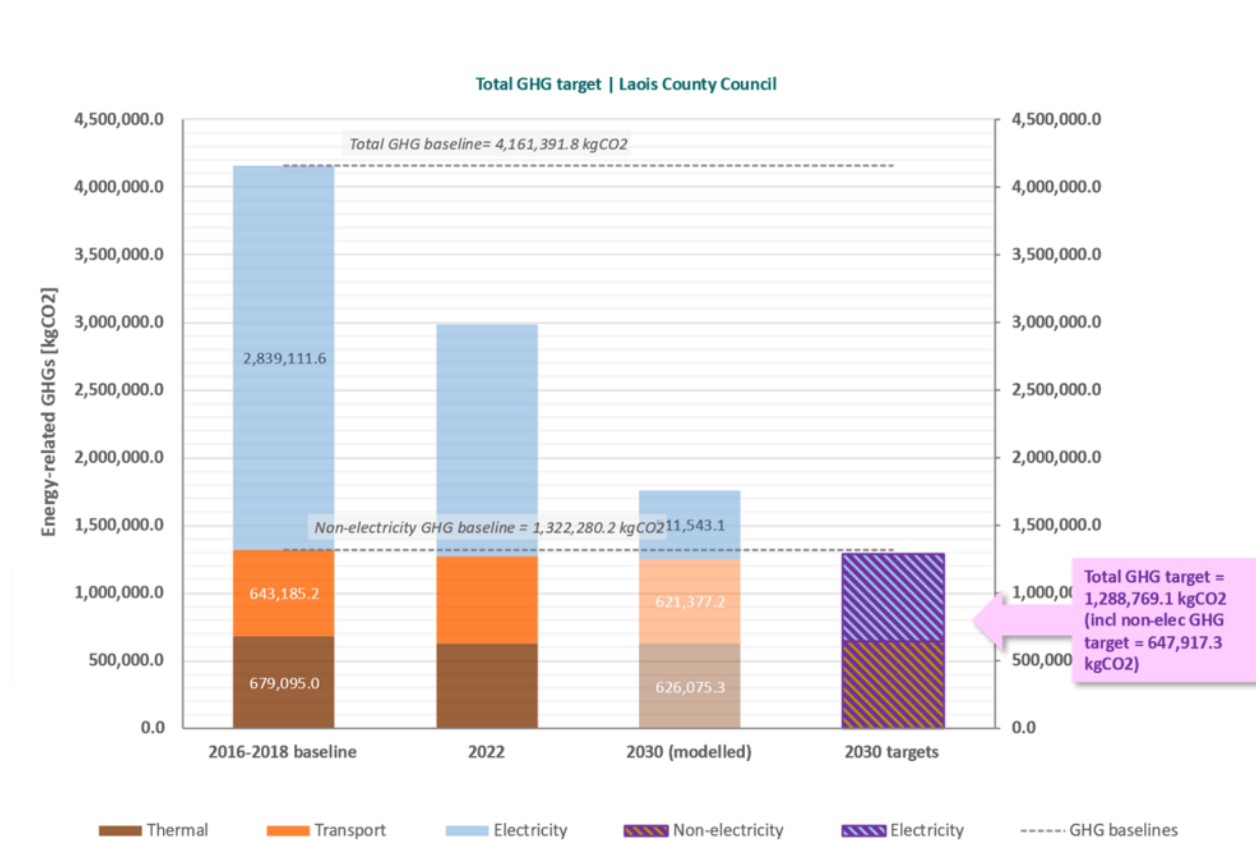
Source: SEAI Pathfinder Report

Figure 1.5. Gap to Target Implementation of Pathfinder projects

Source: SEAI Pathfinder Report

1.4.2 Transport & Fleet

Transport accounts for 19% of Laois County Council GHG emissions. In accordance with The *Local Authority Fleet – Strategy to Decarbonisation (Fleet Strategy) report* which was released in August 2023 Laois County Council will implement the Avoid-Shift-Improve framework for transport decarbonisation processes.

It is acknowledged that fleet electrification and the use of biofuels will provide the greatest share of emission reductions to 2030 and to plan for this a role of Fleet management will be assigned and priority task will involve the development of a Fleet Decarbonisation Roadmap. A tactic to achieving this is to procure only zero emission vehicles from 1st Jan 2023 in line with S.I. 381 of 2021 however it is also acknowledged that there is a lack of alternatives to heavy duty vehicles, which means there will be a continued reliance on diesel fuel so other alternative including HVO and CNG will have to be investigated as Laois County Council does not have its own fuelling stations in machinery yards so will be guided by the market in terms of the transition to alternative fuels.

1.4.3 Progress To Date

According to 2021 M&R figures the overall GHG emissions have reduced by 40% since the 2018 baseline, this is mainly due to reduction from electricity sources. Non-electricity related emissions have reduced by 52% since the baseline was established. These figures are the latest published by SEAI and some of the reductions are due to shutdowns due to Covid restrictions particularly the closure of both Leisure Centres.

Table 1.6 Laois County Council Energy Performance 2021

	ENERGY PERFORMANCE				GREENHOUSE GAS EMISSIONS							
	2021 energy consumption		Energy performance indicator		Non-electricity GHG emissions				Total GHG emissions			
Public Body	Final GWh	Primary GWh	2030 target	Change since EE baseline ● good ● bad	GHG baseline tCO₂	2021 tCO₂	2030 target tCO₂	Change since GHG baseline ● good ● bad	GHG baseline tCO₂	2021 tCO₂	2030 target tCO₂	Change since GHG baseline ● good ● bad
Laois County Council²·³ ●	7.9	13.0	-50%	-59%	1,322.3	635.7	647.9	-52%	4,088.8	2,440.7	1,272.9	-40%

Source: SEAI Public Sector Report 2021

1.4.4 Social Housing

The Climate Action Plan 2021 set a target for retrofitting 500,000 homes to a B2 and this has been committed to by the Programme for Government. It is expected that approximately 36,500 of those will be local authority owned homes.

GHG emissions from Laois County Council housing stock is not included as part of reported emissions or direct targets however an internal survey conducted in 2021 indicated that 2272 social houses in County Laois and only 9 of the these meet the minimum B2 BER standard.

Since this report 188 houses have been retrofitted and a further 534 are planned, 220 to be built directly by Laois County Council. Annually 490 homes will be retrofitted to minimum B2 standard. Please note a substantial proportion do not have a BER and 209 have been constructed since 2000 due to Buildings Regulations a minimum BER of B3 can be assumed. New builds must meet a A2 BER standard and retrofitted homes a Minimum B2 standard. From a starting point in 2021 of only less than 1% of Social Housing in Laois a BER of B2 of above to 27% BER by end of the term of the LACAP.

1.5 COUNTY WIDE BASELINE EMISSIONS INVENTORY ANALYSIS – TIER 1

The 'Tier 1' Baseline Emission Inventory (BEI) study was conducted by Fehily Timoney and Company for Laois County. The report assesses and establishes the baseline greenhouse gas (GHG) emissions for various societal sectors within the county, including the local authority organization, in the year 2018. It serves as a reference point for Laois County Council to gauge the emission reductions necessary to meet the target of reducing GHG emissions by 51% by the year 2030.

The sectors examined in the county-wide analysis encompass residential, commercial and industrial, industrial processes, agriculture, transport, waste and wastewater, as well as land use, land use change,

and forestry (LULUCF). GHG emissions stemming from the local authority's own operations are accounted for separately.

The methodology employed follows the Tier 1 'Top-down' Approach outlined in Annex C of the Draft Local Authority Climate Action Plan Guidelines.

In summary, the combined emissions from all sectors in the county amounted to 1,396,468 tCO2-eq in the baseline year. To meet the 51% GHG reduction target by 2030, an overall reduction of 712,199 tCO2-eq to 684,269 tCO2-eq is needed across all sectors within the county.

The top three sectors contributing to GHG emissions in the county were Agriculture, Transport, and Residential, accounting for 49%, 25%, and 16% of tCO2-eq emissions, respectively which amounts to 90% of overall GHG emissions. This analysis underscores the importance of focusing climate action initiatives primarily on these sectors. Pathways to influence, co-ordinate/facilitate and advocate for climate action across these sectors will be further explored and actioned in Section X

A detailed breakdown of sectoral GHG emissions in County Laois during the baseline year is depicted in the figure below.

**Figure 1.7 Emissions by Sector for County Laois**
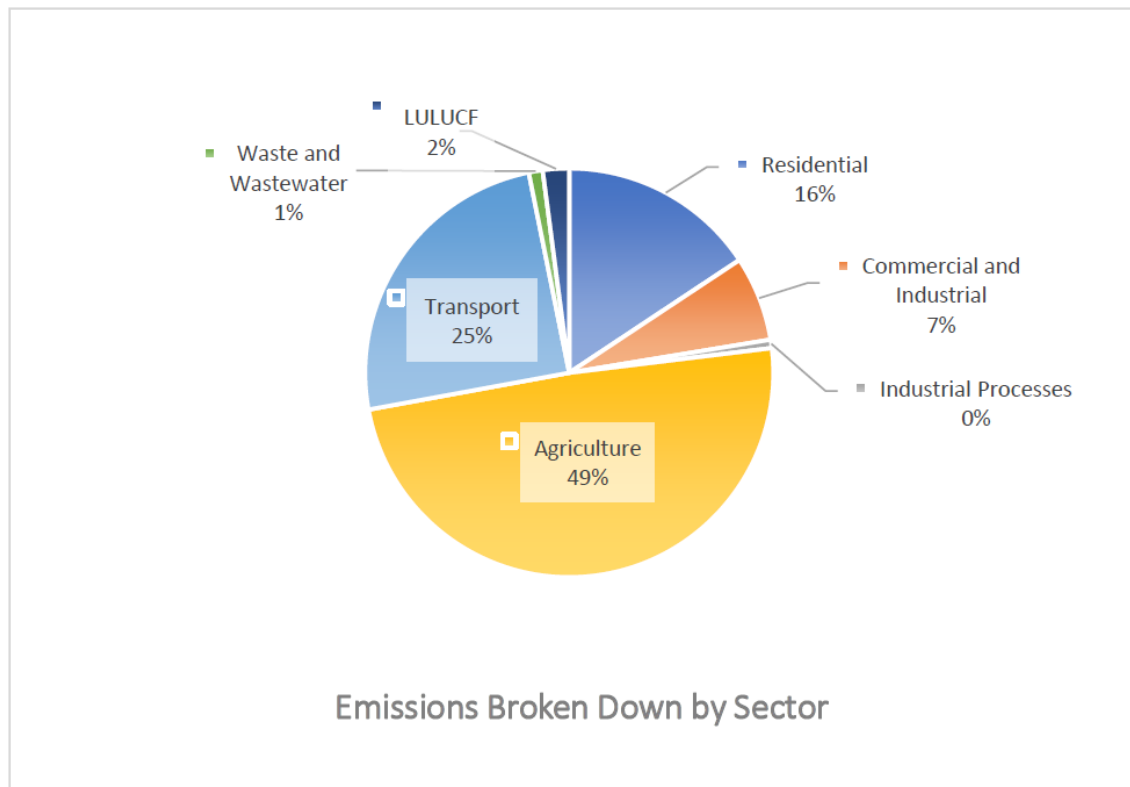
Source: FT Baseline Emissions Inventory Report for County Laois

Figure 1.8 A breakdown of these emissions and targeted emission levels for 2030 by sector

Sector	2018 Emissions tCO$_2$-eq	Percentage Breakdown	Sectoral Emission Ceiling Reduction Percentage 2030	Target Emissions 2030 tCO$_2$-eq
Residential	219,147	16%	40%	131,488
Commercial and Industrial	93,720	7%	45%	51,546
Industrial Processes	9,265	1%	35%	6,022
Agriculture	684,926	49%	25%	513,695
Transport	344,942	25%	50%	172,471
Waste and Wastewater	15,377	1%	50%	7,688
LULUCF	29,090	2%	-	-
Total	1,396,468	100%	-	-

Source: FT Baseline Emissions Inventory Report for County Laois

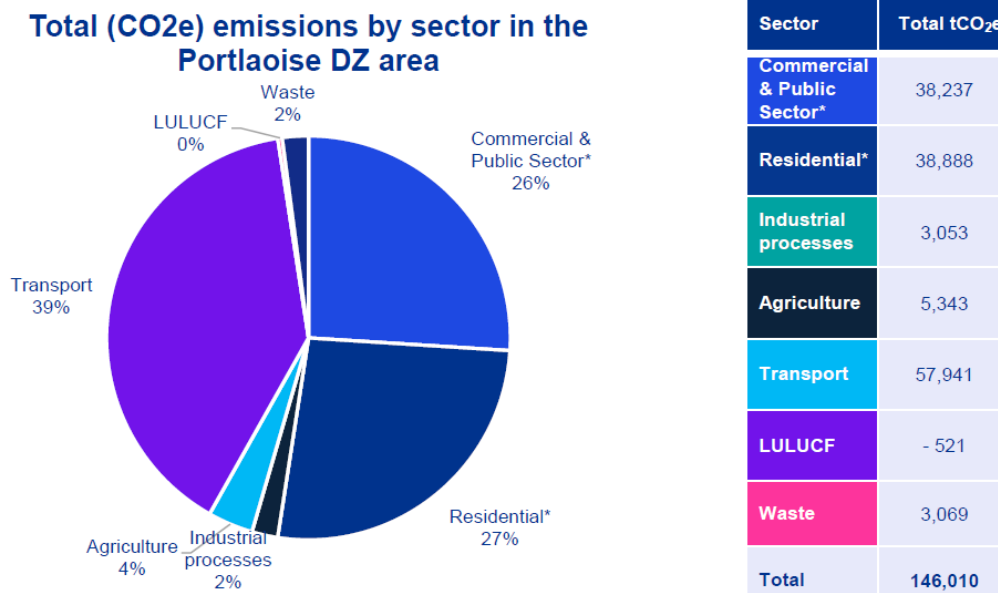**Figure 1.9 Emission reduction requirements by Sector**
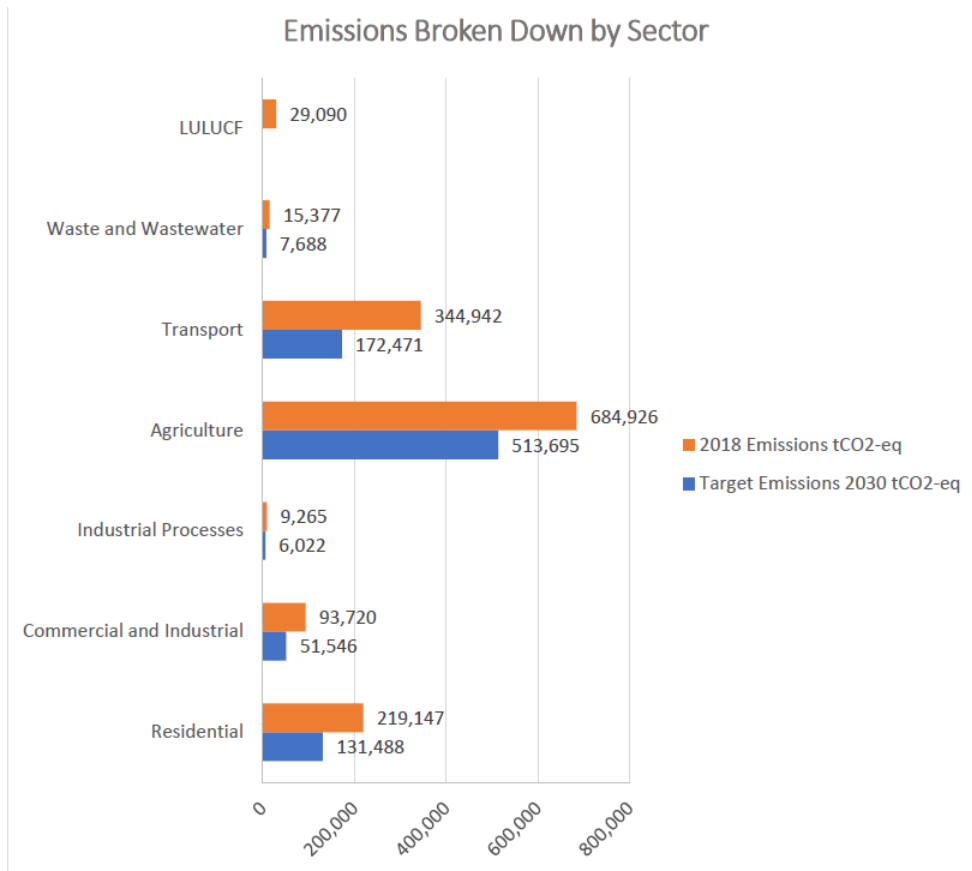
Source: FT Baseline Emissions Inventory Report for County Laois

1.6 BASELINE EMISSIONS INVENTORY ANALYSIS FOR THE DECARBONIZING ZONE

Portlaoise is the designated Decarbonizing Zone and there is a dedicated chapter within this report of the DZ. A total 148,010 tCo2e for Portlaoise so it is responsible for 10.5% of total tCo2e for County Laois. 18% residential emissions even though 23% of housing units are withing the DZ boundary.

Fig 1.10 Total (CO2e) emissions by Sector in the Portlaoise DZ Area

Sector	Total tCO₂e
Commercial & Public Sector*	38,237
Residential*	38,888
Industrial processes	3,053
Agriculture	5,343
Transport	57,941
LULUCF	- 521
Waste	3,069
Total	146,010

Source: KPMG DZ BEI Report

1.7 CLIMATE CHANGE RISK ASSESSMENT

In order to fully understand the current and future risks posed by climate change to local authority assets and activities. A climate change risk assessment (CCRA) enables the local authority to understand the likelihood of current and future climate hazards, the potential impacts of these hazards at local and community levels and support the development of adaptation actions to avoid or reduce the impacts of climate risks.

Assessing climate change risk underpins evidence-based adaptation planning and implementation. Adaptation is the approach for addressing the current and future risks posed by a changing climate. The aim of adaptation is to reduce the risks posed by climate change to our environment, society and economy and increase resilience. Adaptation also brings opportunity through green growth, innovation, jobs and ecosystem enhancement as well as improvements in areas such as water and air quality.

Internationally, national, and local governments are increasingly compelled to take ambitious action to increase resilience to climate change within their organizations through adaptation and mitigation measures.

The CCRA prepared by KPMG provides an assessment of climate change risks for County Laois and the potential implications for the delivery of services by Laois County Council. Based on a wide range of

publicly available information, this report first assesses current climate and weather-related risks for County Laois. Building on this baseline and employing the most up-to-date climate projections for Ireland, this report then provides an assessment of future climate risk for County Laois

Climate change poses a critical challenge for County Laois with the potential to result in a wide range of impacts across the County, from damaging infrastructure such as roads and bridges to detrimental effects on biodiversity and disruptions of water supply. These potential impacts and risks have substantial implications for Laois County Council.

Addressing the impacts of climate change requires taking proactive adaptation measures to mitigate the adverse risks posed by both current and projected climate change. While adopting their individual Climate Change Adaptation Strategy in 2019, each local authority would have done significant work in developing a CCRA at that time. Using national and international guidance and best practice, the LA CAP CCRA builds upon that body of work, bridging the information gap from 2019 to present day while taking two distinct approaches within the CCRA by determining "current climate risks and impacts" while also assessing "future climate risks and impacts".
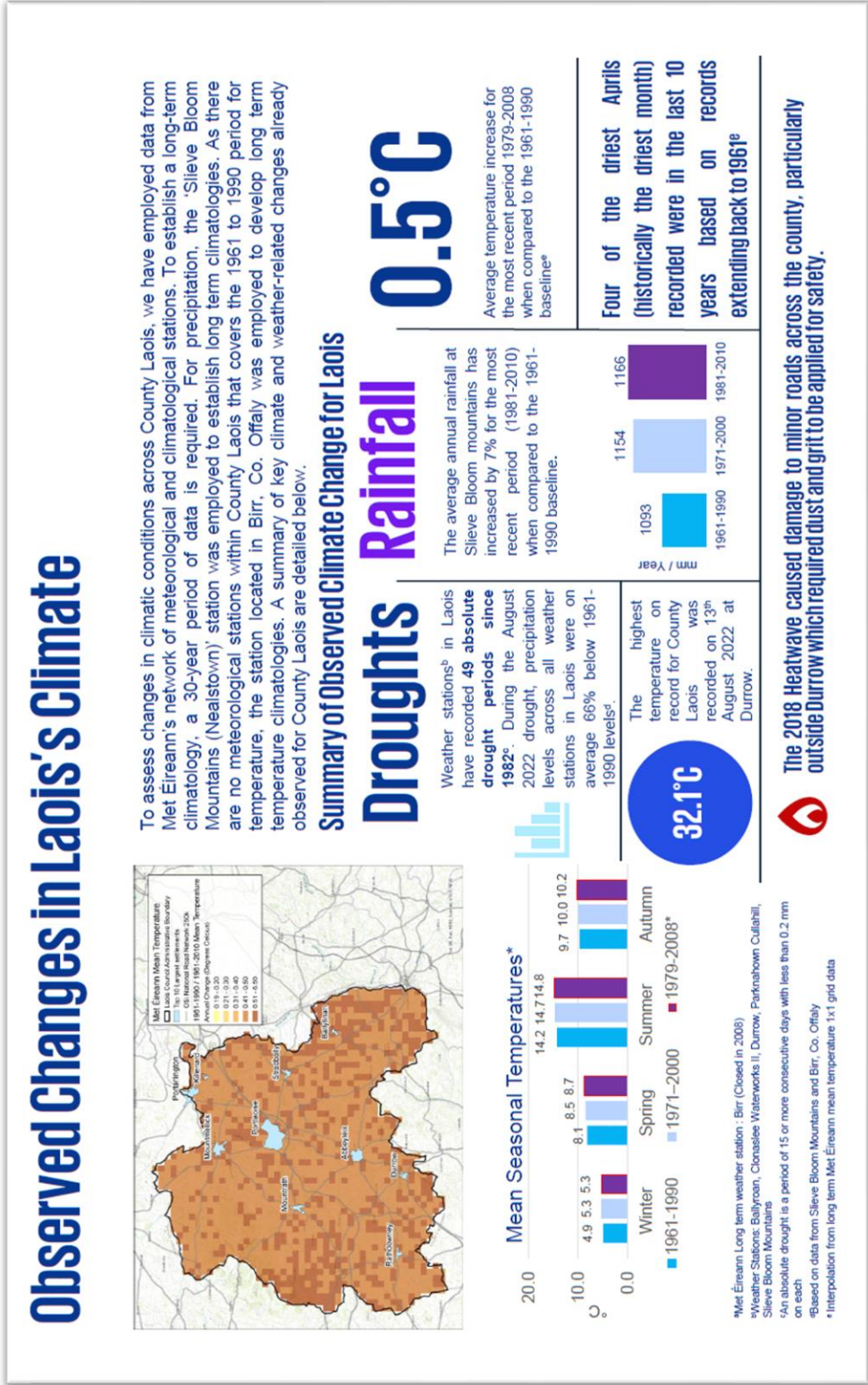
Climate change risk assessments serve as critical tools in identifying the likelihood of future climate-related hazards and their potential impacts. This fundamental process informs the prioritization of climate action initiatives and directs investments into climate action efforts. In essence, it enables decision-makers to allocate resources effectively and implement strategies that enhance resilience in the face of a changing climate.

1.7.1   Benefits of CCRA

The benefits of a Climate Change Risk Assessment include:

1. **Raising Awareness**: They promote awareness of climate change consequences.

2. **Identification and Prioritization of Risks**: These assessments reveal contributing factors and aid in prioritizing which risks to tackle.

3. **Identification of Adaptation Strategies**: Results and the assessment process can pinpoint potential adaptation strategies. They indicate where early action is crucial to prevent future impacts and emphasize the need for building adaptive capacity.

4. **Tracking Changes and Monitoring Adaptation**: Repeated assessments track changes over time and assess the effectiveness of adaptation measures. This generates valuable knowledge for ongoing climate resilience efforts.

**Figure 1.11 Summary of Climate Change Impacts In County Laois**

Observed Changes in Laois's Climate

To assess changes in climatic conditions across County Laois, we have employed data from Met Éireann's network of meteorological and climatological stations. To establish a long-term climatology, a 30-year period of data is required. For precipitation, the 'Slieve Bloom Mountains (Nealstown)' station was employed to establish long term climatologies. As there are no meteorological stations within County Laois that covers the 1961 to 1990 period for temperature, the station located in Birr, Co. Offaly was employed to develop long term temperature climatologies. A summary of key climate and weather-related changes already observed for County Laois are detailed below.

Summary of Observed Climate Change for Laois

Droughts

Weather stations[b] in Laois have recorded **49 absolute drought periods since 1982**[c]. During the August 2022 drought, precipitation levels across all weather stations in Laois were on average 66% below 1961-1990 levels[d].

32.1°C

The highest temperature on record for County Laois was recorded on 13th August 2022 at Durrow.

Rainfall

The average annual rainfall at Slieve Bloom mountains has increased by 7% for the most recent period (1981-2010) when compared to the 1961-1990 baseline.

mm / year

1093	1154	1166
1961-1990	1971-2000	1981-2010

0.5°C

Average temperature increase for the most recent period 1979-2008 when compared to the 1961-1990 baseline[e]

Four of the driest Aprils (historically the driest month) recorded were in the last 10 years based on records extending back to 1961[e]

The 2018 Heatwave caused damage to minor roads across the county, particularly outside Durrow which required dust and grit to be applied for safety.

Mean Seasonal Temperatures*

	Winter	Spring	Summer	Autumn
	4.9 5.3 5.3	8.1 8.5 8.7	14.2 14.7 14.8	9.7 10.0 10.2

■ 1961-1990   ■ 1971-2000   ■ 1979-2008*

Met Éireann Mean Temperature:
Laois County Administrative Boundary
OS: 101 Largest settlements
CIS: National Road Network 2006
1961-1990 / 1961-2010 Mean Temperature
Annual Change (Degrees Celsius)
0.19-0.20
0.21-0.30
0.31-0.40
0.41-0.50
0.51-0.59

*Met Éireann Long term weather station : Birr (Closed in 2008)

[b]Weather Stations: Ballyroan, Clonaslee Waterworks II, Durrow, Parknahown Cullahill, Slieve Bloom Mountains

[c]An absolute drought is a period of 15 or more consecutive days with less than 0.2 mm on each

[e]Based on data from Slieve Bloom Mountains and Birr, Co. Offaly

* Interpolation from long term Met Éireann mean temperature 1x1 grid data

Figure 1.12 Climate Risk Matrix for County Laois County
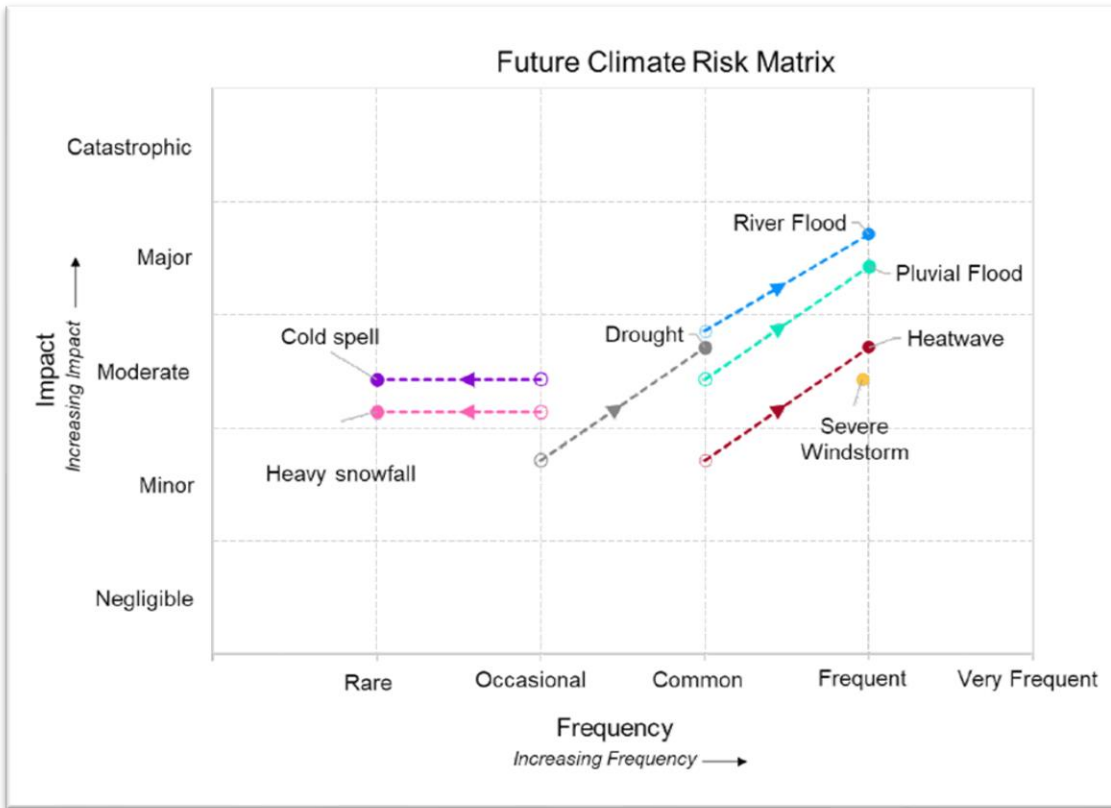
1.7.2 Key Results and Findings of the Climate Change Risk Assessment

The climate risk matrix in Figure 3.1 provides projections that demonstrate varying levels of risk associated with different hazards. Some hazards, such as river and pluvial flooding, heatwaves, and drought, are expected to increase in risk, while others, like severe windstorms, will likely maintain their current risk level. In contrast, cold spells and heavy snowfalls are projected to decrease in frequency.

- **Cold Spells and Heavy Snowfalls:**
  Recent experiences of cold spells and heavy snowfall events, such as Storm Emma in 2018, had a significant impact on County Laois, leading to road closures, public transport disruptions, power outages, and water supply interruptions. Projections indicate that as temperatures rise and snowfall decreases in frequency, the risk associated with these events will decrease. However, when they do occur, their impact is expected to be similar to current experiences.

- **River and Pluvial Flooding:**
  River and pluvial flooding events have occurred almost annually in recent years (2018, 2020, 2021, and 2022). These events resulted in property inundation, business closures, transportation disruptions, sewage overflows, farmland inundation, and bridge damage. Projected increases in extreme precipitation events suggest a heightened risk of surface water and riverine flooding in the future.

- **Heatwaves and Droughts:**
  Heatwaves and droughts, already experienced in County Laois, are anticipated to become more frequent and severe. These events have led to road damage, transportation disruptions, water supply restrictions, and increased demand on recreational areas. The increased risk of heat-related impacts will also affect vulnerable populations as the region's demographic profile changes.

- **Severe Windstorms:**
  Severe windstorms are currently frequent in County Laois, causing disruptions to energy supply and transportation networks. Projections do not indicate a significant change in their frequency, making them an ongoing risk.

To enhance resilience, Laois County Council must proactively plan for and adapt to the climate change risks identified in this report. The risk matrix above visualizes the current and future risk levels associated with climate hazards in Laois, with hollow markers representing current risk and solid markers depicting future risk. The dotted lines illustrate changes between current and future risk levels.

	Hazard	Projected Change	Future Frequency
🔴	**Heatwaves**	• Projections indicate **an overall increase in average temperature** (bottom left) of between 1.2 and 1.6°C for County Laois relative to the 1981-2000 period. • Under a high emission scenario, projections indicate that **heatwaves will become more frequent** (bottom middle) by mid-century.	Frequent ⬆
🚰	**Droughts**	• **Summer rainfall is expected to reduce** by between 6 and 11% in the future when compared with the baseline period of 1981 to 2000, in both the RCP4.5 and RCP8.5 scenario contributing to potential drought conditions.	Common ⬆
❄	**Cold Spell**	• As a consequence of the increasing temperatures, **a decrease in the number of frost days and ice days** is projected for mid-century when compared with the baseline period of 1981 to 2000, for both the RCP4.5 and RCP8.5 scenarios .	Rare ⬇
☁	**Heavy Snowfall**	• The annual **snowfall** in the region is projected to decrease substantially by the middle of the century for the RCP4.5 and RCP8.5 scenarios (bottom right).	Rare ⬇
🌀	**Severe Windstorms**	• **Projections of storms are subject to a high level of uncertainty**. By mid-century, projections indicate that average wind speed will remain similar to those currently experienced. There is limited evidence indicating an increase in the frequency of the most intense storms, which are currently rare events.	Frequent ▬
🌧	**Pluvial Flooding**	• Projections indicate an **increase in the frequency of heavy rainfall days** (days with precipitation >30mm) for County Laois with some areas projected to see an increase of up to 51% by mid-century (bottom). This will potentially contribute to an increase in the frequency of river and pluvial flooding.	Frequent ⬆
🌊	**River Flooding**		Frequent ⬆

Figure 1.13 Climate Projections for County Laois in 2050   Source: KPMG CCRA Report

1.7.3 Future Exposure and Vulnerability

Based on reported data and in collaboration with Laois County Council, KPMG conducted an evaluation of the effects of recognized climate change hazards on the provision of services by Laois County Council. This assessment adhered to the criteria outlined in Technical Annex B: Climate Change Risk Assessment. Each service delivery area was categorized as having negligible, minor, moderate, major, or catastrophic impacts.

In addition to changes in hazard frequency, future risk depends on shifts in exposure and vulnerability. KPMG made assumptions in seven exposure categories, informed by the Laois County Development Plan 2021-2027 and climate projections, in consultation with Laois County Council.

Figure 1.14 summary of the impacts on Laois County Council's service delivery resulting from climate hazards and impacts detailed in the climate hazard profile.

Hazard	Assets		Health and Wellbeing		Environment		Social		Cultural Heritage		Financial		Reputational	
	Current	Future (2050)	Current	Future (2050)	Current	Future (2050)	Current	Future (2050)	Current	Future (2050)	Current	Future (2050)	Current	Future (2050)
Heatwave	Minor	Moderate	Negligible	Minor	Moderate	Major	Minor	Moderate	Negligible	Minor	Minor	Moderate	Negligible	Minor
Drought	Negligible	Minor	Minor	Moderate	Moderate	Major	Minor	Moderate	Minor	Moderate	Negligible	Minor	Negligible	Minor
Cold Spell	Moderate	Moderate	Moderate	Moderate	Negligible	Negligible	Moderate	Moderate	Minor	Minor	Moderate	Moderate	Minor	Minor
Heavy Snowfall	Minor	Minor	Moderate	Moderate	Minor	Minor	Minor	Minor	Negligible	Negligible	Moderate	Moderate	Minor	Minor
Severe Windstorm	Moderate	Moderate	Moderate	Moderate	Negligible	Negligible	Moderate	Moderate	Minor	Minor	Moderate	Moderate	Minor	Minor
Pluvial Flood	Moderate	Major	Moderate	Major	Moderate	Major	Minor	Moderate	Negligible	Minor	Moderate	Major	Minor	Moderate
River Flood	Major	Major	Moderate	Major	Minor	Moderate	Moderate	Major	Minor	Moderate	Moderate	Major	Moderate	Major

- **Assets**
  County Laois' population is set to grow from 84,500 (2016) to 95,000-97,500 by 2031, requiring 3,998 new housing units. This growth will expand infrastructure, increasing assets exposed to hazards. More frequent heatwaves may damage road surfaces, and increased drought could harm peat-based roads. Heavy precipitation changes could expose new areas to flooding risks.

- **Health and Wellbeing**
  The population of those aged 65+ in County Laois increased by 18.6% (2011-2016). Nationally, this age group will double by 2051. More elderly residents will face hazards, leading to severe impacts during hazard events. Frequent heavy precipitation may expose more people to floods, impacting physical and mental wellbeing, especially for vulnerable groups.

- **Environment**
  Rising heatwaves and droughts may raise water temperatures and reduce water levels, affecting water quality and the environment negatively. Increased hazard events could stress the environment further and hinder recovery, potentially causing substantial degradation. Frequent heavy precipitation may expose environmental assets to floods, damaging habitats previously untouched by such events.

- **Social**
  Due to the expected increase in the total population of County Laois (Laois County Development Plan) and projected increases in population aged over 65, there will be an increase in both the number of people and the vulnerable population that may be affected by social isolation during extreme weather events. During heatwave events, there will likely be an increased use of blue (e.g. lakes, rivers) and green (e.g. parks, walking trails) spaces by the public. Due to this increased demand, there may be increased pressure on local amenities, e.g. littering, traffic problems, anti-social behaviour.

- **Cultural Heritage**
  As a result of climate change, there is an expected alteration to the physical, chemical, and biological mechanisms associated with degradation processes of cultural heritage assets. As a result, an acceleration in degradation rates is expected, resulting in both short- and long-term damage to cultural heritage assets. Projected changes in heavy precipitation events mean that pluvial and river flooding events that were once considered extreme will potentially become more frequent. Consequently, cultural heritage assets will be more frequently exposed to flooding hazards, and higher flood levels will mean 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**
  Due to the potential increase in frequency of hazard events and exposure across County Laois, there will be an increase in the responses taken by both public and private actors before, during, and after an event. As a consequence, there will be an increase in the costs associated with responding to events, e.g. air conditioning, emergency service response, temporary and permanent flood defenses, staff training, and equipment purchase/maintenance.

- **Reputational**
  Due to the potential increase in frequency of hazard events and exposure across County Laois, there will be an increasing demand/pressure on public and private actors to respond. Inadequate response has the potential to result in adverse reputational impacts for the county.

Climate Action

LAOIS
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