Climate
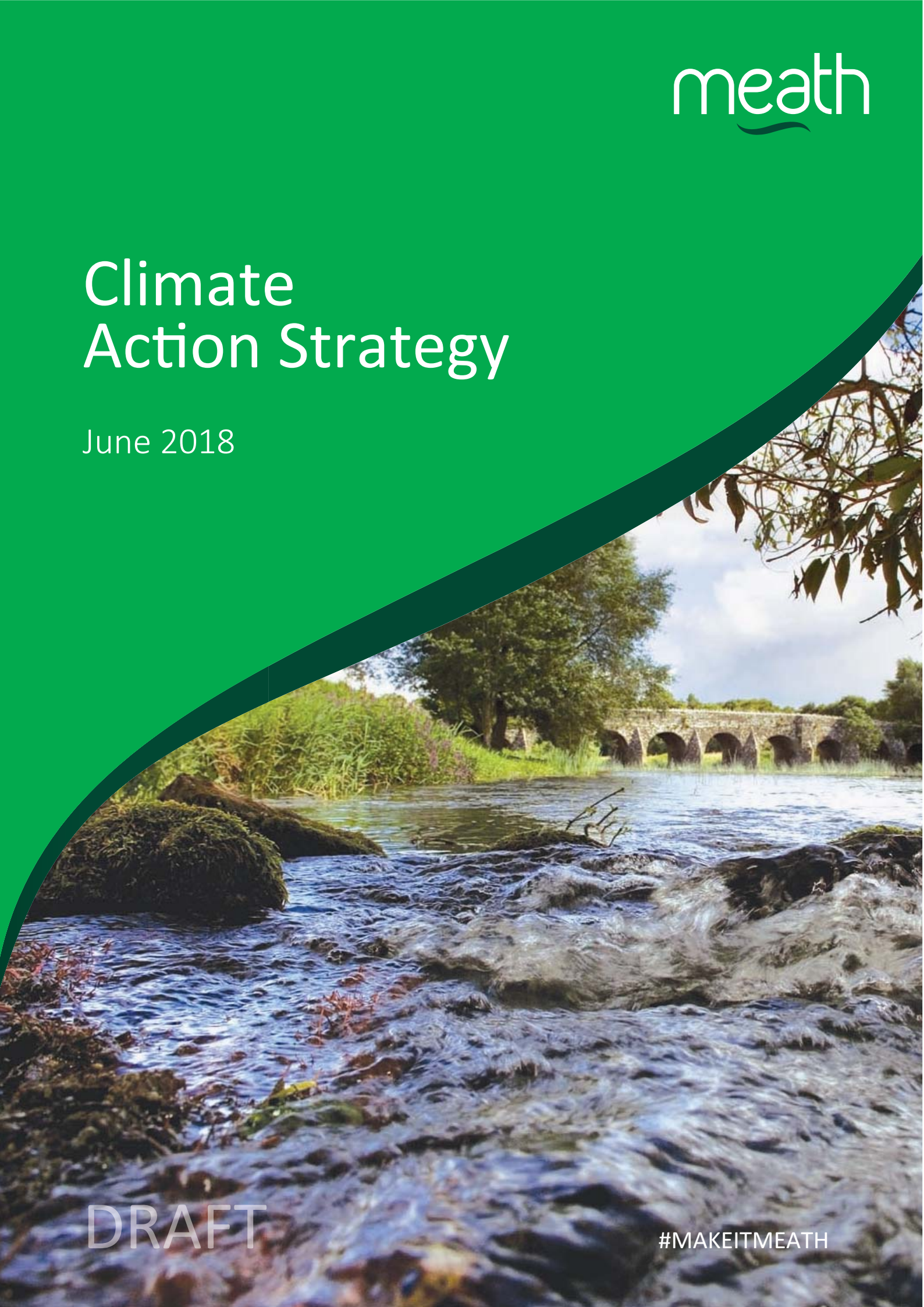# Action Strategy

June 2018

DRAFT

meath

MAKING MEATH CLIMATE READY

As Europe's Business Ready Region, we are committed to ensuring Meath is a great place to locate your business now, but also into the future. We're working hard to make sure we ensure that County Meath is future proof, and this includes how we consider the impact of climate change.

This means making sure that Meath remains physically connected and not disrupted by extreme weather events like flooding. It means generating low carbon energy to attract big business. It means making our homes more energy efficient to improve health and save our residents money. It means developing the county in a way that supports, active healthy lifestyles.

We believe our vision for climate change action presents a bold, exciting future for the county. If we do it well, we are confident that our residents and businesses will realise those benefits. This is why I am pleased to support this Climate Action Strategy, and to make it a priority for our team here at Meath County Council.

Jackie Maguire
Chief Executive Meath County Council

A Local Authorities will be at the coal face of advancing climate change adaptation in Ireland and we look forward to working with other Counties as part of the Regional approach and for which Kildare County Council have been nominated as Lead Local Authority for our region.

The regional approach will enable the sector to have a comphrensive approach to climate change and there is no doubt that a collaborative response is needed to ensure that Meath and Ireland are climate change ready as part of all the services we provide.

Meath County Council like all other Local Authorities are greatly positioned in interacting with the local community and will work through the Public Partnership Networks and the Strategic Policy Committees in bring the community on board in effecting a mature approach to the climate change agenda.

Gerry O'Connor
Chief Executive and Cathoirleach Cllr

MakeItMeath.com
#MakeItMeath

INTRODUCTION

Climate change refers to the long term, large scale change in global and regional climatic patterns. In recent years, average global temperatures have been rising. Between 1901 and 2012, the average global temperature has increased by 0.89 °C; a change which is significant and rapid when considered in the context of the rest of the Earth's history. This has been predominantly attributed to human activity, and its relationship to the 'greenhouse effect'. The increasing rate of carbon dioxide emissions, and other greenhouse gases such as methane and nitrous oxide, since the industrial revolution, has resulted in the 'greenhouse affect'. Many human activities generate these gases; the production of electricity, industrial activity, transportation and agriculture are just a few examples. These gases build up in the Earth's atmosphere and are responsible for trapping an increasing amount of the sun's energy, creating an overall shift in global atmospheric patterns.

As a result, Ireland and County Meath's climate is also changing and the scientific consensus suggests that this is only going to accelerate in the coming years. Incremental changes in the climate are already evident, including increases in average temperatures, wetter winters, more intense rainfall, more flooding, increases in summer droughts and rising sea levels. As these climatic changes intensify, there could be wider implications such as damage to existing ecosystems and biodiversity or the introduction of new pests which could impact agricultural production,. There may alsobe some positive impacts (such as fewer very cold days) but these positives are unlikely to outweigh the negatives. Although the type and magnitude of these potential impacts are uncertain, concerted action is required to prepare for and manage these changes in Ireland. For this reason, it is necessary to implement measures that will help the public to adapt to these changes, effectively combining an adaptation and mitigation approach to climate change in Ireland and County Meath.

The Climate Action and Low Carbon Development Act 2015 seeks to address this by establishing a national goal to move to a low carbon, climate resilient and environmentally sustainable economy. The Act provides the statutory platform for the institutional arrangements necessary to pursue and achieve the goals that are outlined for the period up to 2050. The primary focus is on the mitigation of greenhouse gas emissions that are responsible for climate change, and the adaption of Ireland to the current and future impacts of climate change.
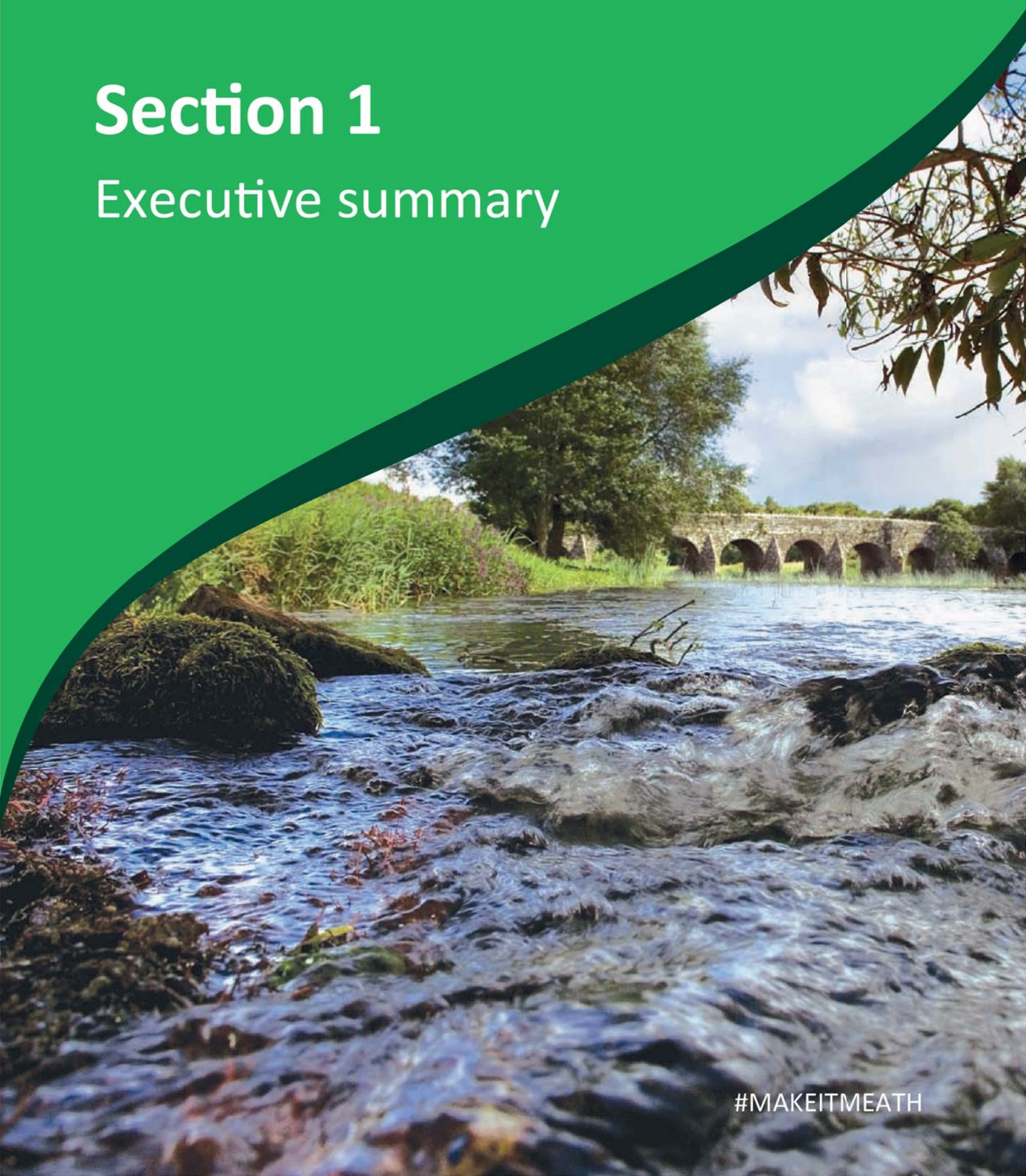
In 2017, members of the senior management from Meath County Council established a Climate Action Team. This team is made up of senior staff members who will be key in instilling a cultural change in relation to designing, building and developing sustainably and taking account of climate change within the County.

In response to this, and recognising the significant benefits of taking action, the Meath County Council Climate Action team commissioned this Climate Action Strategy. The purpose of the strategy is to outline practical actions that will help County Meath adapt to and mitigate against climate change. A strong adaptation and mitigation strategy are relevant to Meath for three main reasons:

1. Thinking ahead and moving faster than others has the potential to create a competitive advantage for Meath and its businesses.

2. Making the right decisions now will ensure that County Meath, its businesses and its residents will be ready for the future. Many decisions that are made on new developments and infrastructure will have long term implications, and the decisions made by the council, its officers, and the local community should anticipate this. A strong adaptation strategy will keep the county running in more extreme weather conditions, and avoid unforeseen shocks to services, residents and businesses.

3. County Meathwants to play its part in reducing greenhouse gases and supporting national programmes to deliver the commitments made by Ireland to reduce greenhouse gases to 20% below 2005 levels by 2020.

Section 1

Executive summary

#MAKEITMEATH

OUR VISION

'To make County Meath a climate ready region that supports jobs, growth and healthy lifestyles'

TARGETS

1. Reducing Meath County Councils emissions by 33% by 2020.

2. Reducing CO_2 emissions of the county by at least 40% by 2030.

3. Increasing our resilience by adapting to the impacts of climate change.

4. Sharing our vision, results, experience and know-how with fellow local and regional authorities within the EU and beyond through direct cooperation and peer-to-peer exchange, namely in the context of the Global Covenant of Mayors.

BENEFITS

- **Saving households and businesses money.** Using energy more efficiently and reducing emissions would help all families—especially low-income families—lower their energy bills. It is crucial that this strategy helps to deliver cost-savings to families in order to provide additional spending power, which could be spent on local businesses.

- **Competing internationally.** The clean energy economy is poised to be the growth industry of the future. With increasing numbers of big businesses signing up to commitments including 100% renewable energy and science based carbon reduction targets, Climate Action will become increasingly important if County Meath wants to continue to attract inward investment from big businesses.

- **Helping avoid the costs of climate change.** The impacts of climate change are already being felt across Ireland, with many counties experiencing the costly effects of climate change already. A strong adaptation strategy will help to ensure that the county can continue to run effectively during more extreme weather and avoid unforeseen shocks to our services, residents and businesses.

- **Creating jobs.** Irish corporate leaders on climate change have identified that tens of thousands of jobs could be created across Ireland by moving to a low carbon economy. For example, SEAI estimate that more than 10,000 Irish jobs will be created by the implementation of Smart Grid infrastructure and its associated technologies.

- **Health and wellbeing.** By moving to more active modes of transport, transport policy changes that reduce private car use and increase walking and cycling would reduce obesity, diabetes, and cardiovascular disease. In addition, by moving to cleaner modes of transport, we can improve air quality. Good quality, accessible green space and infrastructure can provide many potential health and well-being benefits including increased life expectancy and reduced health inequality

- **Less congestion.** By getting people out of cars and into shared modes of transport, we will future proof against congestion on our roads, which is one of our key USPs in the economic development plan.

- **Energy security.** Power generation in Ireland relies essentially on gas, imported mainly from the UK. Increasing our renewable energy will improve our resilience.

- **Improve profits.** A business can now be an energy generator as well as a consumer. Self-generation of renewable power to cover a firm's own needs and selling the surplus to the grid in effect makes energy a profit centre rather than a cost.

- **Stronger communities.** Community renewable energy schemes can deliver a range of social and economic benefits to local communities including increased autonomy, empowerment and resilience by providing a long term income and local control over finances, often in areas where there are few options for generating wealth.

- **Land regeneration.** Previously developed, derelict, underused or neglected (brownfield) land in and around urban centres can deliver social, environmental and economic benefits via conversion to green infrastructure.

OUR PLAN

Our plan is linked to the County Development Plan and covers the period from 2019-2025. We want our strategy to be ambitious but grounded in pragmatism. The success of this is dependent on recognising what is within Meath County Council's control, where we can enable others to take action, and inspiring others to lead. This means our actions will focus on the following key areas;

Lead:
We will take action ourselves

We have a unique leadership opportunity to influence and drive significant changes through our own operations.

However, much more needs to be done and Meath County Council must provide leadership through our own operations and continue to develop further initiatives to tackle climate change across the domestic, commercial, industrial and transport sectors.

Enable:
We'll support others to deliver

The responsibility for changing our energy system and adapting to climate change lies not only with Meath County Council, but with many of our businesses, social enterprises, public bodies and communities.

Furthermore, there may be opportunities where Meath County Council does not have appropriate jurisdiction to take a lead role and we will therefore strive to collaborate, empower and enable these organisations through initiatives that may help in securing funding, providing resources, sharing skills, knowledge and expertise and providing political support.
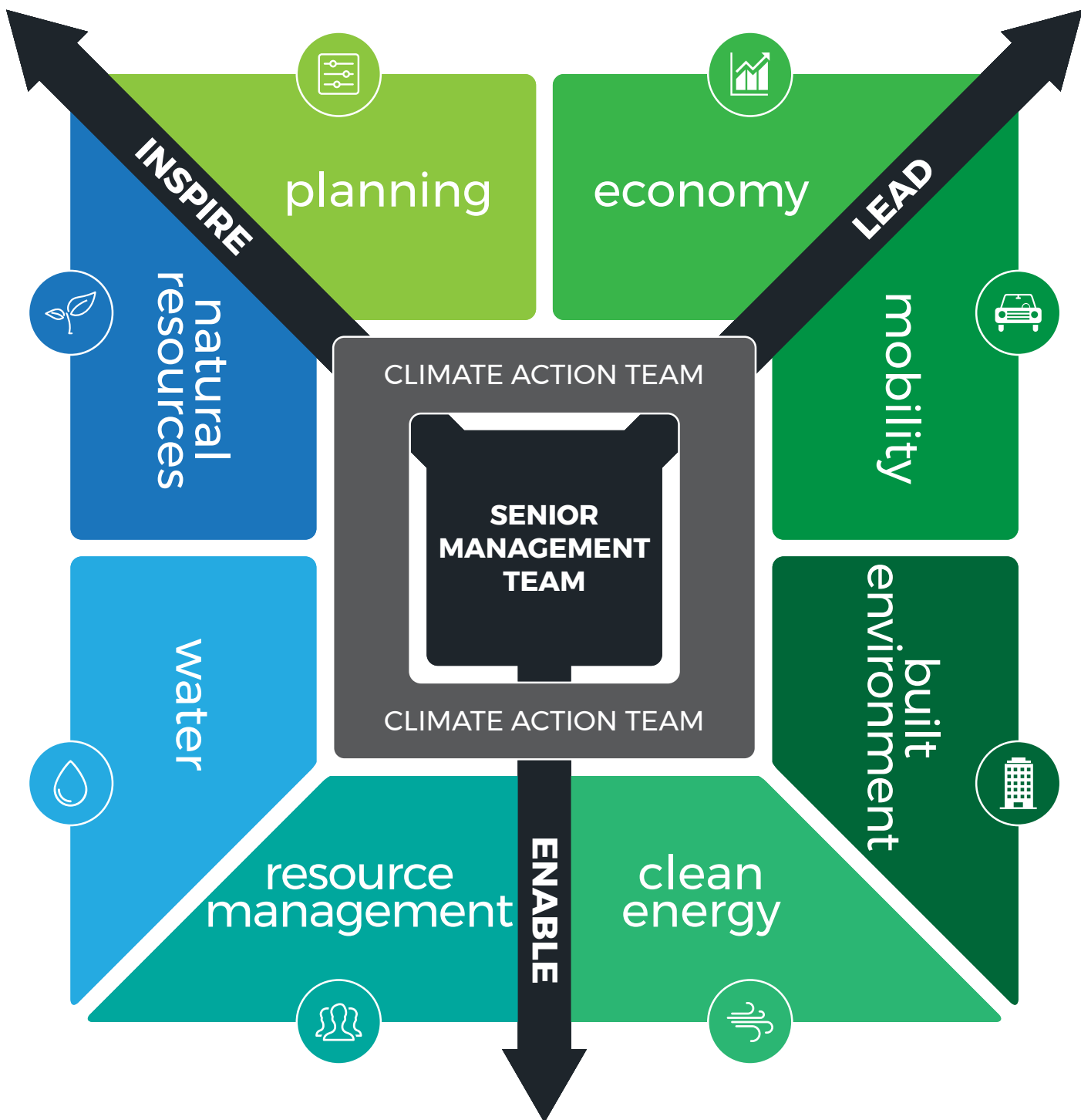
Inspire:
We'll inspire others to take action

Ensuring that County Meath is a thriving, climate resilient county, is an opportunity to inspire active public participation.

Through our engagement, we have identified a number of areas to inspire community action, from community energy projects, to planting trees. The key to working with citizens will be expanding and finding new ways to engage, from social media to a variety public events across the region.

OUR AREAS OF FOCUS

To deliver our plan, we have focused on 8 key themes. Action against these themes will be driven and championed by our Senior Management team and delivered through our Climate Action Team.

INSPIRE

planning

economy

LEAD

natural resources

mobility

CLIMATE ACTION TEAM

SENIOR MANAGEMENT TEAM

built environment

water

CLIMATE ACTION TEAM

resource management

ENABLE

clean energy

ECONOMY

Meath County Council now has primary responsibility for the economic development of the county. We will seek to enhance our economy through climate action by:

- Marketing County Meath as a Climate Ready region to support inward investment

- Provide additional resources to help our businesses transition to cleaner, cheaper energy.

- Promote local jobs and local workspaces to reduce commuting.

- Help businesses grow through spotting opportunities for innovation, increasing resilience and saving money.

MOBILITY

E Mobility is fundamental to how we live and work. A well-performing transportation system is essential to the functioning of society and the economy as a whole. The promotion of use and increased delivery of sustainable modes of transport is fundamental to achieving Ireland's carbon emission reduction requirements of 20% by 2020 and 30% by 2030. We will seek to make mobility climate ready by;

- Increasing the efficiency of the transport system by making the most of digital technologies, sharing platforms and further encouraging the shift to lower emission transport modes.

- Moving towards zero-emission vehicles, with a focus on how we can help roll out of electric vehicles.

- Promoting active transport.

- Providing opportunities for flexible working, reducing the need to commute on a daily basis.

- Ensuring critical transport infrastructure under our control is resilient to climate change, including roads.

🏢 BUILT ENVIRONMENT

The world's buildings account for a large share of the global final energy use and greenhouse gas emissions, with major potential for energy savings of up to 50–90% in existing and new buildings. We will seek to make the built environment Climate Ready by:

- Making sure that all council-owned buildings are retrofitted to improve energy efficiency or are built to best-practice standards.

- Ensuring that we manage our estate better, with a strong focus on energy efficiency & renewable energy.

- Ensuring that climate resilience is considered for all council-lead developments, including future temperature increases and increased risks of flooding.

💨 CLEAN ENERGY

Energy use is changing fast. The shift to renewable sources, however, needs to happen faster. This is not just in terms of how power is generated but also in terms of how it is used in heating, buildings and transport. We will support the transition to clean energy by:

- Develop Local Authority Energy Strategy

- Develop and energy master plan detailing planning and other areas the County can affect policy. Planning requirements being the major area.

- Strategy for roll out of solar (PV) on council buildings.

- Support Community Energy Groups and projects.

- Encourage a renewables positive policy and set targets for new build.

RESOURCE MANAGEMENT

WATER

Demand for raw materials has seen exponential growth due to a rapidly expanding global population coupled with rising standards of living. Yet the resources on which we all rely are depleting quickly which is exacerbated by our culture of single use of resources, which uses significant amounts of energy to extract and process.

We will seek to make our Resource Management Climate ready by:

- Implement waste management plans;

- Inspire our communities to help us recycle more; and

- Undertake research to explore opportunities for accelerating towards a more circular economy within County Meath.

Climate change will increase the frequency of heavy rainfall events, storm surges and their duration, thereby increasing the risk of flooding in vulnerable areas of the county. Equally, increased temperatures and prolonged dry spells will increase the likelihood of drought and water shortages. We will seek to make our Water Resources Climate Ready by:

- Investigate land management opportunities for water attenuation in council owned land.

- Review of infrastructure to identify assets at risk from flooding/extreme rainfall to inform low-cost 'minor works' flood relief schemes.

- Secure water resources for County Meath in conjunction with Irish Water

- Continue to support Irish Water's Water Conservation Programme to conserve valuable resources by reducing leakage.

NATURAL RESOURCES

PLANNING

Future trends mean that the benefits we get from biodiversity, green infrastructure and our wider natural resources have never been so valuable. Using our natural resources more effectively will not only play a key role in helping us to adapt to a changing climate but will also create multiple benefits for our residents, including improved health and wellbeing. We will seek to make our Natural Resources Climate Ready by:

- To engage with the agricultural community to understand how we can help make the sector more resilient.

- Use natural resources to help us mitigate and adapt to climate change.

- Explore how we can protect our coastlines using natural methods.

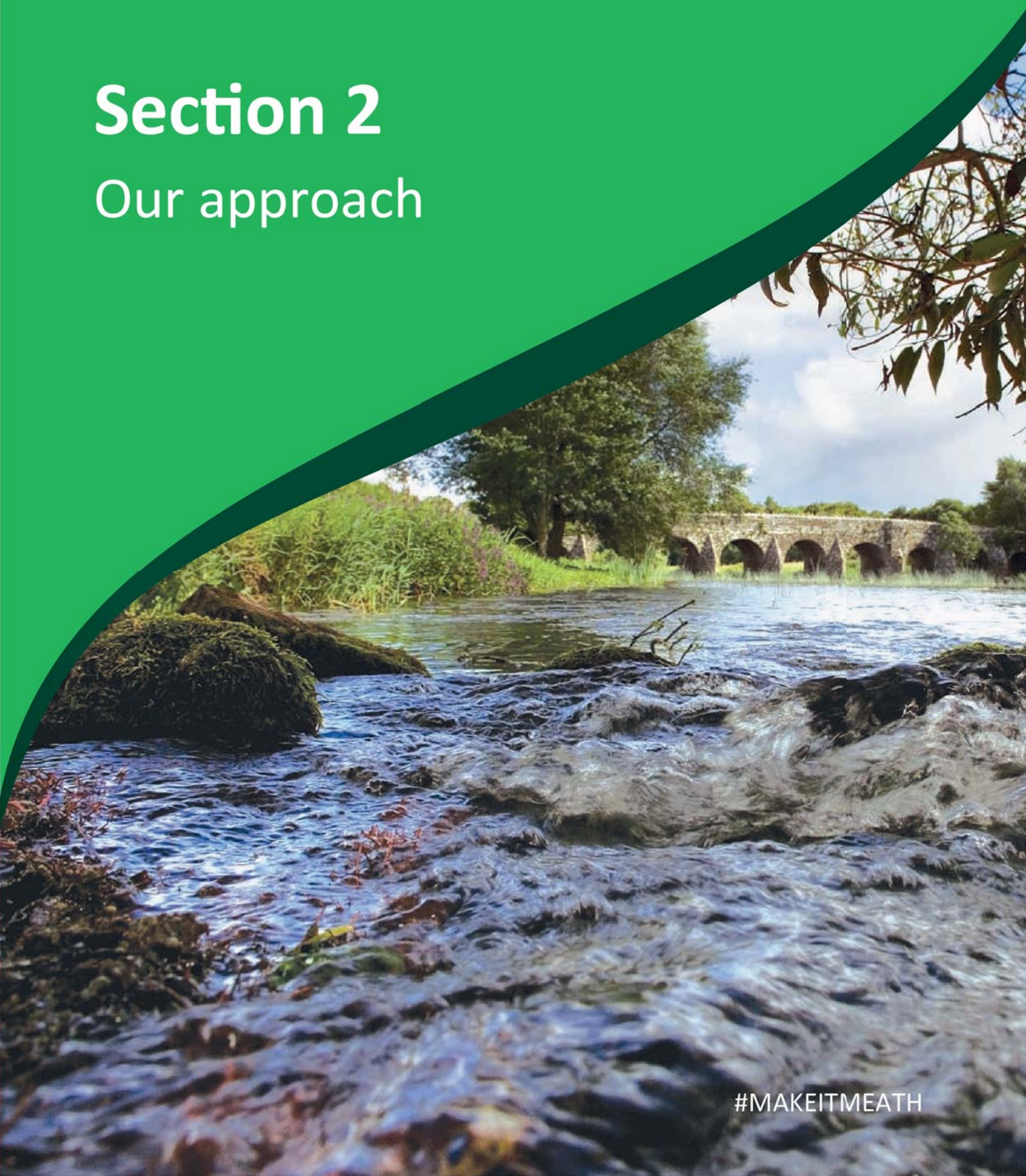- Use the natural world to inspire school children to take action.

One of our key roles is to ensure County Meath is properly planned. If we can do this with climate change in mind, it will help us to avoid 'locking in' high carbon and climate-vulnerable developments and land use patterns in the long-term.

By planning properly, we can increase the viability of new public and active transport routes renewable energy projects and business cases for investing in areas of currently underused and low quality greenspace. New developments served by such infrastructure will become a significant part of the appeal for existing and new domestic and commercial occupants. We will make sure our Planning is Climate Ready by:

- Using planning policy to:
  - promote near zero energy buildings for new development;
  - promote clean energy and energy efficiency;
  - promote Green infrastructure and protect and enhance our natural resources;
  - protect and enhance our flood defences;
  - support roll out of electric vehicles;
  - ensure new developments are located close to public transport and are well-served by walking and cycling facilities;
  - help conserve our water resources
  - improve waste management
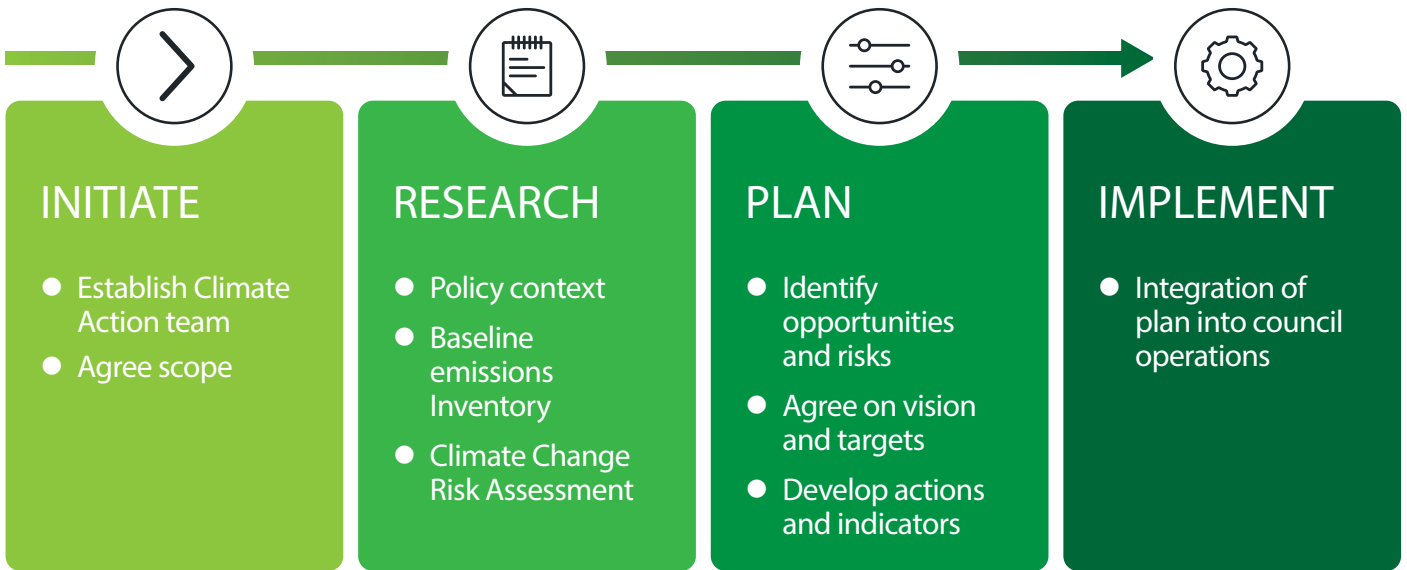 - keep our communities safe.

Section 2

Our approach

OUR APPROACH

To develop this Climate Action Plan, we followed a clear four stage approach:

INITIATE	RESEARCH	PLAN	IMPLEMENT
• Establish Climate Action team • Agree scope	• Policy context • Baseline emissions Inventory • Climate Change Risk Assessment	• Identify opportunities and risks • Agree on vision and targets • Develop actions and indicators	• Integration of plan into council operations

1. INITIATE

To kick the project off, we held an initial workshop with the climate action team. The purpose of this workshop was to present the key challenges, understand any action currently being taken, and to develop an initial list of potential future action areas.

2. RESEARCH

We then proceeded to undertake desk based research in order to determine what the action strategy should focus on. This included three key approaches:

- Desk based research. We started by researching publicly available information that provides guidance on mitigation and adaptation in a local context. This included reviewing relevant policies, renewable energy situation and international best practice. This was necessary in order to understand what is required of Meath County Council, but also what is within Meath County Council's control.

- Baseline Emissions Inventory. We then identified the main sources of CO_2 emissions in County Meath, in line with the principles set out by the Covenant of Mayors for Climate and Energy. This included both Meath County Council's emissions, as well as the the wider county's. The results of the study highlighted the carbon hotspots and where Meath County Council should be targeting emissions reduction strategies.

- Climate Change Risk Assessment. Finally, we undertook a high level climate change risk assessment. This assessment identified future climate hazards using ICIPs State of Ireland's Climate Tool, and the associated climate change risks in

County Meath. The results of this study allowed us to identify opportunities for adapting to climate change within the County.

3. PLAN

Following our baseline research, we had a series of engagements with the Climate Action team. This included a series of one-to-one interviews with members of the Climate Action team in order to identify current activities and potential opportunities for action within their respective areas of responsibility.
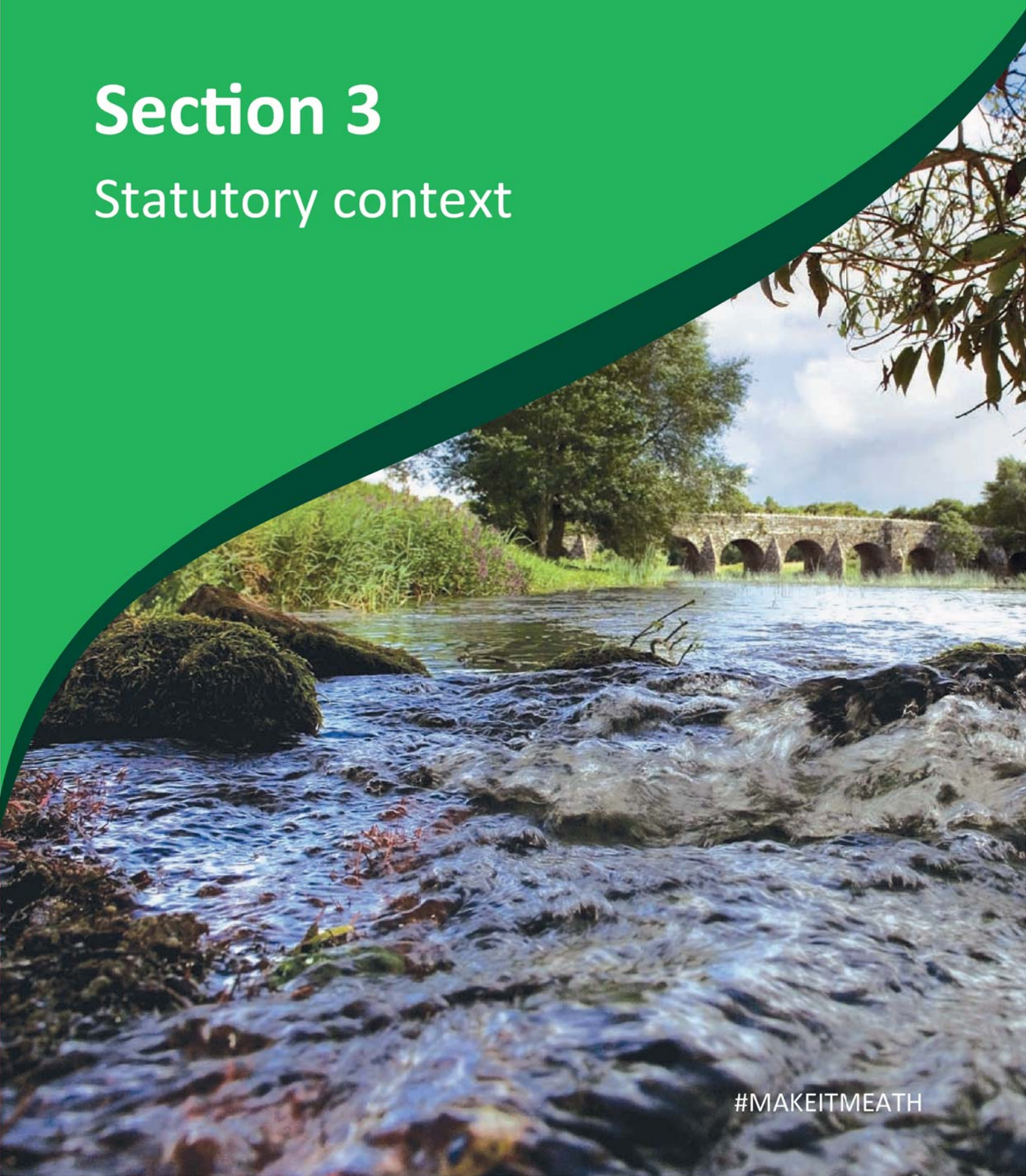
We also held a series of steering meetings with the Climate Action leadership team to agree on a vision for the strategy, which drew on the priorities of members of the Climate Action Team. We integrated these sessions with the outcomes of our research to develop the vision, objectives, goals, targets, actions and indicators that comprise this Climate Change Action Plan.

4. IMPLEMENT

To ensure that the proposed actions would be achievable, we held an additional round of one-to-one interviews in order to test the proposed actions, and provide more detail on how they could be delivered. This stage ensured that the proposed actions were assigned to specific departments and their team leaders, in order to provide clarity on what needs to be done and by whom. To ensure this strategy is fully implemented, the team leaders must now develop a detailed programme that demonstrates how these actions will be delivered over the life of this action plan (2019-2025).

Section 3
Statutory context

#MAKEITMEATH

3. STATUTORY CONTEXT

A key driver for the development of this Climate Action Plan is the need to respond to international, European, and national climate change action through a wide range of agreements, directives, legislation and regulations. This includes the Irish Government's Climate Action and Low Carbon Development Act 2015, National Mitigation Plan, National Adaptation Framework, and National Planning Framework. The relevant policies and initiatives are summarised below.

3.1 International Policy

3.1.1 United Nations Framework convention on climate change (UNFCCC)

A range of international climate change agreements and frameworks have been established that provide information on the impact of climate change on vulnerability and potential adaptation measures. The work of the UNFCCC provides countries with detailed technical information, including current and future climate change projections, which enables them to determine practical adaptation actions to improve their long term resilience to climate change.

Linked to the work of the UNFCCC – The Kyoto Protocol was adopted in Kyoto, Japan, on 11 December 1997 and entered into force on 16 February 2005. It sets binding targets for 37 industrialised countries and the European Community for reducing emissions.

In addition, 'The Paris Agreement', which was agreed on 12 December 2015, is an agreement made by all 196 members of the UNFCCC to ensure that global temperatures remain well below 2 degrees Celsius above pre-industrial levels and to keep the more   stringent target of below 1.5 degrees in sight. The European Union and its member states provide funding and support to climate change adaptation in countries within the UNFCCC.

3.1.2 European Union Adaptation Strategy

The European Union published its Adaptation Strategy in April 2013 with the overall aim of increasing climate resilience across Europe. Through increased coordination and providing a more consolidated approach, the Adaptation Strategy will enhance the preparedness and effectiveness of all governance levels to respond to the impacts of climate change. The strategy is focused on three key objectives:

- Promoting action by Member States
- 'Climate-proofing' action at EU level
- Ensuring better informed decision making

The primary adaptation initiatives promoted by the strategy are achieved through the provision of mitigation and adaptation requirements within EU sector policies and funding mechanisms. The initiatives run across a range of areas including:

- infrastructure and buildings;
- marine and inland water issues;
- forestry;
- agriculture; and
- social cohesion.

3.2 National Policy

3.2.1 Climate action and low carbon development act 2015

Ireland created the Climate Action and Low Carbon Development Act 2015 as the key policy instrument to address the issue of climate change. The Act sets out a roadmap for Ireland's transition towards a low carbon economy and details mechanisms for the implementation of the 'National Low Carbon Transition and Mitigation Plan' (National Mitigation Plan), published on the 19/07/2017 to lower Ireland's level of greenhouse gas emissions. This Act also details a 'National Climate Change Adaptation Framework' (National Adaptation Framework, published 18/01/18. They will be renewed every five years and are required to include tailored sectoral plans.

The Act requires public bodies to actively consider climate change mitigation and adaptation efforts, drawing on the objectives set out in the National Low-Carbon Roadmap, national adaptation framework and sectoral adaptation plans. The Planning and Development Act 2000 (as amended) also sets out provisions for climate change within Section 10 (2) (n). This include requirements to:

- reduce energy demand in response to the likelihood of increases in energy and other costs due to long-term decline in non-renewable resources;

- reduce anthropogenic greenhouse gas emissions; and

- address the necessity of adaptation to climate change; in particular withregard to location, layout and design of new developments.

3.2.2 National Climate change adaptation framework 2012 (NCCAF)

This framework provides the policy context for a strategic national adaptation response to climate change in Ireland. It highlights the role of planning and development in implementing adaptation measures and recognises the benefits of wider stakeholder engagement in achieving climate change objectives at a local level.

The NCCAF provides an overview of challenges for sectors that may be impacted by climate change, including:

- water;

- coasts;

- marine environments;

- agriculture;

- forestry;

- biodiversity;

- energy;

- transportation;

- communications;

- insurance;

- heritage; and

- human health.

3.2.3 National adaptation framework

Ireland's first statutory National Adaptation Framework (NAF) was published on 19 January 2018. The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. The NAF was developed under the Climate Action and Low Carbon Development Act 2015.

The NAF builds on the work carried out under the National Climate Change Adaptation Framework (NCCAF, 2012).

The NAF outlines an approach to climate change adaptation in Ireland considering both government and society.

Under the NAF, a number of government departments are required to prepare sectoral adaptation plans in relation to the priority areas that they are responsible for. Work on these plans will begin in 2018 and the NAF will be reviewed at least once every five years. Local authorities are required to prepare local adaptation strategies.. The NAF also aims to ensure ongoing engagement with civil society, the private sector and the research community.

3.2.4 National mitigation plan

The first National Mitigation Plan, published in 2017, represents an initial step to set Ireland on a pathway to decarbonising its economy. It is a whole-of-government plan, which covers the following core sectors:

- electricity generation;

- built environment;

- transport; and

- agriculture

The measures set out in the plan lay the foundations for transitioning Ireland to a low carbon, climate resilient and environmentally sustainable economy by 2050. In support of this, the plan also includes over 100 individual actions for various ministers and public bodies to take forward through its implementation. Action 20 is to finalise the wind energy guidelines and planning authorities listed as stakeholders in this process and their finalisation is anticipated in 2018.

3.3 Regional Policy

3.3.1 Regional planning guidelines for the Greater Dublin area 2010-2022.

The Regional Planning Guidelines (RPGs) aim to create an integrated policy approach in order to enable the creation of sustainable regions with the capability to be resilient to future climate change. The recommendations contained in the RPGs are designed to promote efficiencies in water and energy use and the move towards a low carbon economy. They aim to encourage a modal shift towards green transport options in addition to bolstering the robustness of local regional ecosystems through a regional green infrastructure strategy.

However, these RPGs are due to be replaced by Regional Spatial and Economic Strategies (RSES). These RSES's will have additional functions requiring an economic strategy to be combined with the spatial strategy. The RSES will support the implementation of national government policies such as the National Planning Framework (NPF) and will also set the framework for local economic development and spatial planning.

3.4 Local Policy

The NCCAF provides guidance on the role of Local Authorities in local climate change adaptation and on the preparation of Local Adaptation Plans. National guidance in relation to the preparation of Climate Change Adaptation Plans is still to be prepared. In May 2016 Minister Naughton launched the Local Authority Adaptation Strategy Guidelines.

3.5 International initiatives

3.5.1 Covenant of mayors for climate and energy

The EU Covenant of Mayors for Climate & Energy brings together thousands of local governments who have voluntarily committed to implementing EU climate and energy objectives.
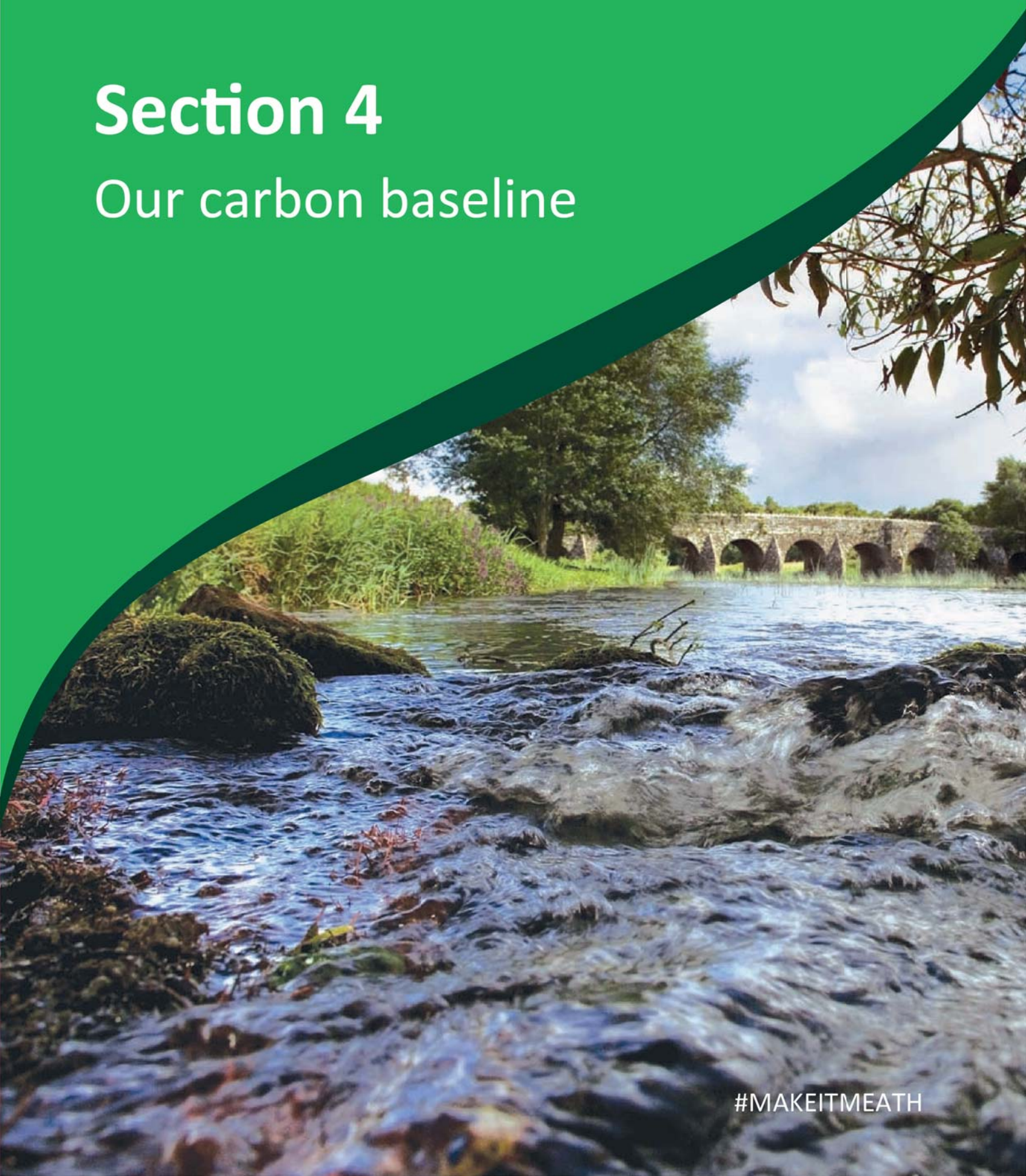
The initiative now gathers 7,000+ local and regional authorities across 57 countries in order to draw upon the strengths of a worldwide multi-stakeholder movement and the technical and methodological support offered by its dedicated offices.

Signatory cities pledge action to support implementation of the EU 40% greenhouse gas-reduction target by 2030 and the adoption of a joint approach to tackling mitigation and adaptation to climate change.

In order to translate their political commitment into practical measures and projects, Covenant signatories commit to submitting, within two years following the date of the local council decision, a Sustainable Energy and Climate Action Plan (SECAP) outlining the key actions they plan to undertake. The plan will feature a Baseline Emission Inventory to track mitigation actions and a Climate Risks and Vulnerability Assessment. The adaptation strategy can either be part of the SECAP or developed and mainstreamed in a separate planning document. This bold political commitment marks the beginning of a long-term process with cities committed to reporting every two year on the implementation progress of their plans.

Section 4

Our carbon baseline

4. OUR CARBON BASELINE

4.1 Overview

We have developed a Baseline Emissions Inventory to understand where the main sources of carbon emissions are within the county. The purpose of this was to determine where efforts should be focused. The Baseline Emissions Inventory has been calculated for County Meath using 2012 as the baseline year, and provides data related to Meath's County Council emissions (i.e. our direct emissions), and emissions at the County level.
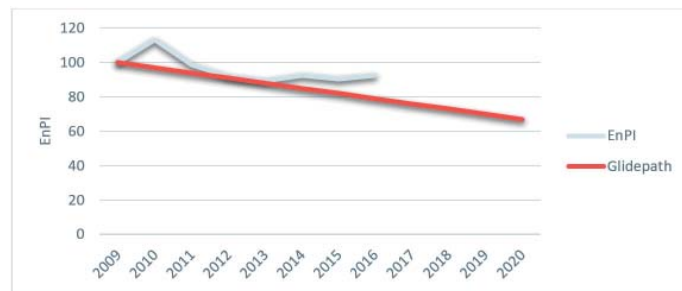
4.2 Meath County Council Carbon Baseline

In the baseline year(2012) Meath County Council emitted 17,399 tonnes of CO_2. The breakdown of the carbon emission sources showed that council buildings comprised the vast majority of emissions at 75% and public lighting and fleet making up 20% and 5% respectively.
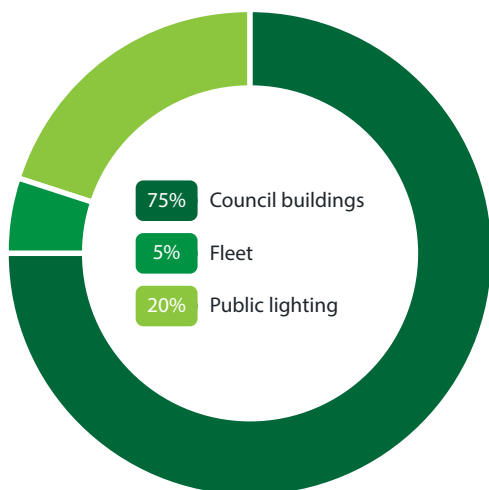

Figure 2. Meath County Council EnPI Glidepath

4.3 County Meath Carbon Baseline

In the baseline year, 2012, County Meath consumed 3,764 GWh of energy.

Figure 1. Total carbon emissions by Source

Figure 2 shows Meath County Council's Energy Performance Indicators (EnPI) from 2006 to 2016. Determining energy savings involves analysing changes in parameters that are directly related to energy use. EnPIs enable organisations to determine how efficiently they are using energy as it accounts for changes in the activity level related to energy use.

Following good progress in 2011 and 2012, additional effort will be required to get Meath County Council back on track with the required glidepath.

Figure 3. Final energy consumption by sector

Figure 3 depicts the breakdown of total final energy consumption by sector for County Meath. Transport (43.4 %), constitutes the greatest percentage of total energy use, followed by Residential (28.1%). This broadly follows the pattern depicted by national statistics, but with a slightly higher percentage for transport.

Based on the ratios used to apportion total energy consumption, car ownership in County Meath appears to be slightly higher than the national average, which is the likely reason for this slight shift. Industry also occupies a relatively large percentage of total energy use(16.7%), however it is possible that this may be an overestimation.

There is limited heavy industry occurring within the county, and although there is a reasonable proportion of the population employed within this sector, it is unlikely to be consuming the same amount of energy as more intensive national industrial processes, which have contributed to this skew in headline figures.
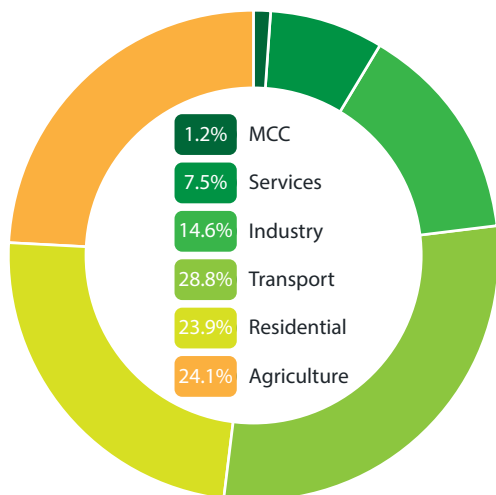

1.2%	MCC
7.5%	Services
14.6%	Industry
28.8%	Transport
23.9%	Residential
24.1%	Agriculture

Figure 4. Ftotal CO_2 emissions by sector

The breakdown of the total CO_2 equivalent emissions by sector, which totals 1,453 kilotons, is shown in Figure 4 above. There is a significant shift in the level of contribution from each of the six sectors, as the process emissions from the agricultural sector have now been included. Transport still remains as the highest emitter, at 28.8 %, but is only just ahead of agriculture and residential, which are both at approximately 24 %.

The transport statistics indicate a slightly higher proportion of total emissions than shown by the total national statistics, however this is again likely to have been caused by the above average level of car ownership in the county.

Aside from the introduction of the significant process emissions associated with arable and livestock farming, this shift is also likely to have been caused because petroleum emits less CO_2 per kilowatt hour than other fuels, such as peat or coal.

4.3.1 Implications

The BEI presented here provides a good representation of the total energy use and associated CO_2 equivalent emissions in County Meath in 2012 and will enable a clear vision of the priorities for action to be developed. It will also allow the impact of any potential measures to be evaluated and their progress to be tracked.

It is apparent that the transport, residential and agricultural sectors are consistently contributing to a significant percentage of total emissions. It would therefore be most beneficial to target emission reducing actions in these areas, in order to enable County Meath to contribute effectively to the national requirement to reduce CO_2 significantly.

Section 5

Climate change impacts

5. CLIMATE CHANGE IMPACTS

5.1 Irelands Changing Climate

Ireland's climate is changing, and incremental changes are already evident. The annual average surface air temperature in Ireland has increased by approximately 0.8 °C over the last 110 years and there has been an increase in average annual national rainfall of approximately 60mm (5%) in the period 1981-2010, compared to the period 1961-1990 . At the same time, extreme weather (including extreme temperatures and rainfall events) has become more frequent and severe.

Projections by Climate Ireland suggest that these changes will continue, dependent upon the volume of greenhouse gases (GHG) that are released into the atmosphere.

A changing climate will have specific impacts for County Meath; these have been summarised in the table below. Temperature and precipitation projections have been obtained from the probabilistic climate modelling tool, developed by Climate Ireland, using both a low-medium and a high emission scenario. Probabilistic projections are not available for extreme events such as heat waves, high winds, storms, fog and snow. This is because they occur relatively infrequently and therefore limited data regarding changes in their frequency or intensity is available. Where projections are not currently available for climate variables, climate impact projections have been taken from the EPA summary report.

Climate Variable (and baseline)	Projections	Summary	Confidence
Hotter Summers Mean summer temperature (1981-2000) 15.6 °C	Under all scenarios, projections suggest that, for all months of the year, Ireland will experience an increase in mean temperature. Climate Ireland suggests the following short and longer term projections for County Meath, for both a medium and high emissions scenario: 2020s: Annual average summer temperatures will increase by approximately 1.1 – 1.9°C 2050s: Annual average temperatures will increase by approximately 2.0 – 2.4 °C	Strong increase	High
Warmer Winters Mean winter temperature (1981-2010) 5.3 °C	Winter temperatures, are also anticipated to decrease. This is also expected to result in a decrease in the number of frost days. Temperature and frost day projections are as follows, for both a medium and high emissions scenario: 2030s: Annual average winter temperatures will increase by approximately 1.3 °C – 1.4 °C. Number of frost days are projected to decrease by as much as a 57 % 2050s: Annual average winter temperatures will increase by approximately 1.7 °C – 2.1 °C. Up to a 70% decrease in frost days	Moderate increase	High

Climate Variable (and baseline)	Projections	Summary	Confidence
Heatwaves Maximum summer temperature (1981-2010): 28.7	Although Climate Ireland does not provide specific projections for heatwaves, it does included projections for maximum daily temperature: 2030s: Maximum daily summer temperatures projected to increase by 1.5 – 2.1 °C. 2050s: Maximum daily summer temperatures projected to increase by 2.5 – 2.8 °C. These will likely intensify heatwaves, with maximum temperatures increasing and heatwave duration lengthening	Strong increase (summer)	High
Drought Average summer precipitation (1981-2010): 210 mm	An approximate 20% decrease in summer precipitation is indicated under a high emissions scenario in the North East of Ireland. This decrease is likely to result in progressively longer periods without significant rainfall, posing challenges to water-sensitive sectors and regions. However, it should be noted that uncertainties in precipitation projections are greatest in summer, both in terms of magnitude and direction (i.e. wetter or drier)	Strong increase (summer)	Low
Extreme Rainfall Average winter precipitation (1981-2010): 227 mm	Heavy precipitation days (in which more than 10mm of rain falls) are likely to increase in frequency in winter. By the 2050s an increase in the number of heavy precipitation days of around 20% above the level of 1981–2000 is projected under both medium and high emissions scenarios. Although winter precipitation is better understood than summer changes, a large range of uncertainty still exists around these projections	Strong increase (winter)	Medium
Flooding	Although specific projections for flooding are not available, the anticipated increases in high intensity winter precipitation events are likely to increase the risk of fluvial flowing. Projections of future flows are beset by uncertainties at the catchment scale, but a broad signal of wetter winters and drier summers is evident across a number of independent studies.	Moderate increase winter	Low
Sea Level Rise	According to the IPCC, on average, global sea level is expected to rise by 0.48 m (0.09-0.81 m) for the period up to 2100. For 2050 it is reasonable to assume a sea level rise in the region of 25cm above present levels Taking this in to account, along with isostatic rebound , it has been projected that areas along the Ireland's North East coast in Irelands could experience a rate of 2.2 – 3.7 mm per year	Strong increase	High

Climate Variable (and baseline)	Projections	Summary	Confidence
Coastal Erosion	County Meath's coastline is considered to be one of the most at risk areas to coastal erosion; all 21 km of the coastline is comprised of unconsolidated (soft) sediment, which is the more susceptible to erosion. Projected increase in coastal storms and storm surges is likely to exacerbate risk.	Moderate increase	Medium
Wind Speed/ Storminess	There is large uncertainty in projections for mean surface wind speed. However, it is anticipated that the distribution of wind will alter, with winters marginally more windy in Ireland, and summers marginally less so. Mid-Atlantic storms are a key driver of Ireland's climate. Although robust projections of climate-driven changes in these storm tracks are not yet available for Ireland, it is possible that mid-Atlantic storms may become more intense, particularly with long-term warming of sub-tropical Atlantic. However, there is a still a very wide range of inter-model variation.	Minor increase (winter)	Low
Storm Surge	As projections suggest that an increase in the frequency and intensity of cyclones and associated strong winds in the Atlantic may be expected, storm surge heights could also increase significantly. Expected surge levels for the 20- to 30- year return period surge events are likely to increase by up to 9cm, particularly in the North East of Ireland .	Strong increase	Medium

1. https://www.climateireland.ie/web_resource/resources/status-rep/Surface-Air-Temperature.pdf

2. CC, 2013. Summary for Policymakers. In: Climate Change 2013: The Physical Science Basis. Contribution of Working Group I to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change [Stocker, T.F., D. Qin, G.-K. Plattner, M. Tignor, S.K. Allen, J. Boschung, A. Nauels, Y. Xia, V. Bex and P.M. Midgley (eds.)]. Cambridge University Press. Cambridge, UK.

3. Isostatic rebound refers to the gradual adjustment of landmasses which were previously depressed by the heavy weight of glacial ice due to continental glaciation.

4. Murphy, C. & R. Fealy, 2009. Climate Change: Meeting the Challenge of Adaptation. Paper presented at the Irish Academy of Engineering. Dublin.

5. Wang, S., McGrath, R., Hanafin, J., Lynch, P., Semmler, T., & Nolan, P., 2008. The Impact of Climate Change on Storm Surge over Irish Waters. Ocean Modelling. 25. 83-94.

5.2 High Level Risks

To understand the likely impacts of these changing climate variables on County Meath, a climate risk and vulnerability assessment was undertaken. This enabled key areas of adaptation to be identified and targeted within the broader climate strategy. Risk was calculated for 11 of the key sectors within the county, over which Meath County Council exercise at least some level of operational control or influence, including; transport, planning and land use, waste, water resource management, agriculture, built environment, ecosystems and biodiversity, coastal and marine and the emergency services. The risk assessment analysed both the short-term (2020s) and medium-term (2050s) risks to the county, relative to the anticipated changes in climate noted above. Risk was quantified using the following equation:

> Consequence × Likelihood= Future Risk

wherein "consequence" is the level of harm or damage caused by an event and "probability" is the likelihood of the event occurring. Consequence and likelihood were both scored out of 5, resulting of possible maximum score of 25. The risk assessment highlighted a number of high-scoring climate-related risks, where the council should look to prioritise action, in both the short and medium-term. The top three scoring risks in each sector are highlighted in the table below.

RISK AND CONSEQUENCE:	RISK SCORE	
Transport	2020's	2050's
Increase in the number of flooding events causing road closures, affecting both private and public transport. This is anticipated to impact business and industry with knock-on effects to the local and wider economy.	🟨	🟨
Sea level rise and increased prevalence of storm surge events will lead to an increased risk of flooding to coastal road and rail infrastructure causing delays, disruption and overcrowding.	🟩	🟥
Warmer summers and more frequent heatwaves increases the risk of damage to asphalt roads and pavements, including buckling of the surface and issues with resurfacing. It may also cause reduced visibility and operational disruption (i.e. from fires).	🟨	🟥

RISK AND CONSEQUENCE:	RISK SCORE	
Built Environment	2020's	2050's
Increased risk of household water disruptions during periods of drought. This may lead to a decrease in quality which can cause health and wellbeing concerns.	🟨	🟥
Flooding will result in an increased risk of flood damage, damp and mould to residential, commercial and industrial buildings. Flooded communities may require rebuilding and temporary or permanent relocation. Additionally, sea level rise will create a compounded level of risk for buildings in the coastal zone.	🟨	🟨
Warmer summers and increased occurrences of heatwaves will increase overheating risk within both new and existing homes.	🟩	🟥

RISK AND CONSEQUENCE:	RISK SCORE	
Energy	2020's	2050's
During heatwaves, there may be surges in energy demand to meet cooling requirements.	🟨	🟨
As a result of sea level rise and associated increase in frequency and magnitude of storm surges, energy infrastructure will be a greater risk from flooding and some may need to be relocated	🟩	🟥

RISK AND CONSEQUENCE:	RISK SCORE	
Energy	2020's	2050's
Increases in wind speed and storminess disruption and/or damage to energy infrastructure and supply.	🟩	🟨

RISK AND CONSEQUENCE:	RISK SCORE	
Waste	2020's	2050's
Warmer summers may increase prevalence of vermin and odour from waste and may require more frequent collection.	🟨	🟨
Increased occurrences of flooding may result in a greater possibility of sewerage overflowing, which may also contaminate fresh water supplies.	🟨	🟨
Flooding and exposure of historic coastal landfill sites causing ground and surface water pollution	🟨	🟥

RISK AND CONSEQUENCE:	RISK SCORE	
Water Resource Management	2020's	2050's
Flooding may increase the risk of flood waters infiltrating and contaminating fresh drinking water supply.	🟨	🟥
Extreme rainfall events may exacerbate water quality risks, particularly if timing coincides with fertilisation of agricultural land.	🟨	🟨
During drought events there will be increased pressure on Meath's abstraction points, and the county may be unable to match demand sufficiently. As a result there is potential for hosepipe bans and agriculture/industry bans restrictions.	🟨	🟥

RISK AND CONSEQUENCE:	RISK SCORE	
Agriculture	2020's	2050's
Drought will lead to higher irrigation requirements, particularly for high value and specialist crops.	🟨	🟨
Warmer and wetter winters, and warmer summers may increase the prevalence of pests and diseases for both crops and livestock.	🟩	🟨
Flooding during harvest may restrict ability to harvest crop at the necessary time. This will increase the risk of crop loss, may result in delays in product availability and lead to higher food prices.	🟩	🟨

RISK AND CONSEQUENCE:	RISK SCORE	
Planning and Land Use	2020's	2050's
Warmer summers and more frequent heatwaves may increase the risk of buildings overheating, particularly for new homes meeting strict energy efficiency regulations.	🟩	🟥
Flood risk may further reduce availability of suitable development land and may require development in more flood prone areas	🟩	🟨
As a result of sea level rise, coastal developments are an increased risk of exacerbated flooding and damage from erosion/land sliding. This may limit availability of suitable land for development in the popular coastal area.	🟩	🟨

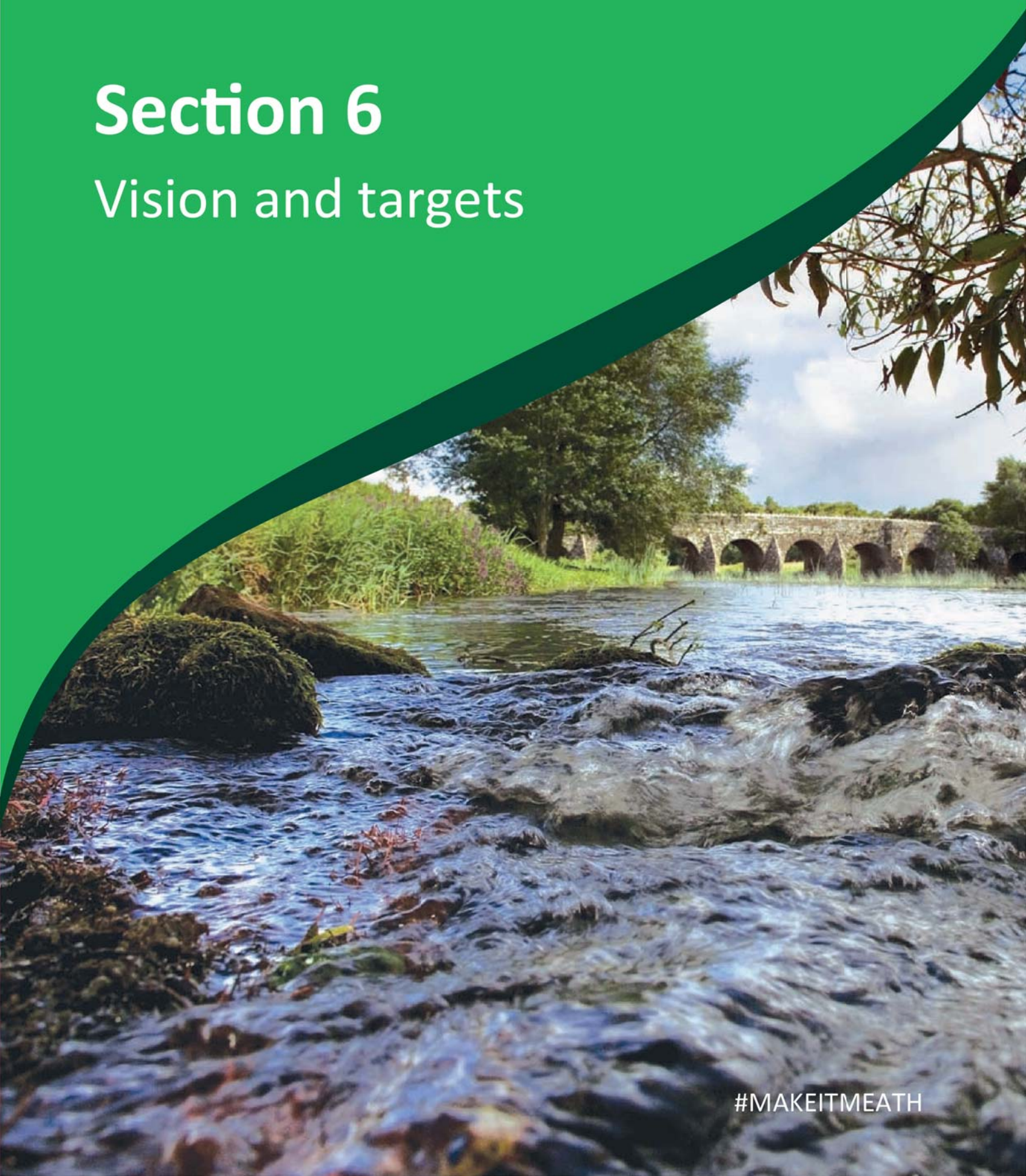| RISK AND CONSEQUENCE:	RISK SCORE	
Ecosystems and Biodiversity	**2020's**	**2050's**
Flooding will result in an increased risk of damage and loss of habitats during flood events.		
Warmer summers and warmer and wetter winters may increase the prevalence of invasive species, both existing and new.		
Drought may increase the risk of loss of some water sensitive species, including some trees and wetland species.		

RISK AND CONSEQUENCE:	RISK SCORE	
Coastal and Marine	**2020's**	**2050's**
Ecosystems in the coastal zone and the services and the functions they provide, are at a high risk of loss and damage during flood events and storm surges. Those located in sand dunes are particularly vulnerable.		
Increased frequency and intensity of storm surges, in combination with sea level rise will increase erosion rates in the already limited coastline. This will restrict both the housing and recreational activities in the area.		
During droughts, increased drainage of, and damage to, wetland habitats and water courses may occur. This can lead to a decline of and damage to the species they support.		

RISK AND CONSEQUENCE:	RISK SCORE	
Emergency Services	**2020's**	**2050's**
Increase risk of flooding will create a higher demand for rescue services, which may exceed capacity.		
During extreme rainfall and storm events, road damage and blockage could significantly reduce access for emergency vehicles.		
Increased occurrence of heatwaves will increase in heat related illnesses, including heatstroke and dehydration.		

RISK AND CONSEQUENCE:	RISK SCORE	
Tourism	**2020's**	**2050's**
Sea level rise, storm surges and associated flooding may result in loss and/or damage of coastal attractions. This is particularly so for more vulnerable small businesses which are clustered here.		
Flooding and storms may lead to damage and/or closure to road and rail infrastructure, both within the County and in the surrounding areas. This may limit the accessibility of the County to tourists.		

Section 6

Vision and targets

#MAKEITMEATH

6. VISION AND TARGETS

6.1 Our vision

Through engaging with senior management at Meath County Council, it was agreed that the strategy should have a positive vision, focusing on the significant benefits that can be achieved if Meath County Council adopts a strong climate action strategy. We propose the following vision for the climate action strategy; to make County Meath a climate ready region that supports jobs, growth and healthy lifestyles.

> *'To make County Meath a climate ready region that supports jobs, growth and healthy lifestyles'*

Based on our experience and engagement, we believe the following items will be key to the success of the strategy;

1. Support County Meath's 'Economic Development Strategy'.
2. Outline a bold, attractive vision for a cleaner, healthier future.
3. Be ambitious in setting and achieving targets.
4. Work with our regional partners to realise mutual benefits.

6.1.1 Supporting Meath's Economic Development Strategy

Thinking ahead and moving faster than others can deliver competitive advantage for Meath and its businesses. When developing this strategy, we have thought very carefully about how climate action supports the key elements of Meath County Councils Economic Development Strategy. The table below provides a few examples of how this strategy supports the economic development strategy.

Unique Selling Points for County Meath Identified in Economic Development Plan	How this Climate Action Strategy supports the Economic Development Plan
A Strategic Location	
INTERNATIONAL AIRPORT: 30 mins travel time Europe's 6th largest airport for transatlantic connectivity. 21.7 million passengers annually; 161 destinations globally.	By developing a strong adaptation strategy, we can make sure that roads stay open and uncongested, maintaining clear access to Dublin airport.
PORT: 1.7 million ferry passengers and 140,000 visitors on 86 cruise ships annually.	Sea levels are rising at around 3.4mm a year (±0.4mm), up an average of 1.4mm per year over the last century. They are also rising at a rate faster than predicted. By engaging in research to understand the impacts of coastal erosion, we can ensure that sufficient defences are developed for the port.
MOTORWAY: 4 of the 6 primary motorways to the national capital city including the Belfast- Dublin Economic Corridor.	By developing a strong adaptation strategy, we can make sure that roads stay open and maintenance free for longer.

Unique Selling Points for County Meath Identified in Economic Development Plan	How this Climate Action Strategy supports the Economic Development Plan
CONGESTION-FREE: No congestion & guaranteed journey times.	Increased frequency of extreme weather events (flooding, extreme heat) will impact the lifetime of roads. By developing maintenance plans that consider climate change roads will require less maintenance and closures due to essential works.
ACCOMMODATION: Over 1,000 serviced accommodation bedspaces, 65% of which are hotel spaces.	Peak temperatures will be higher – predicted to be 2.0-2.6oC higher on average by the 2050's. There will be additional demand for air conditioning which may be difficult if energy prices are much higher. By developing low carbon energy and increasing energy efficiency local businesses can be supported to reduce their operating costs.

A Location of Choice for Business and People	
Almost 80% of Meath businesses surveyed are 'happy' or 'very happy' with being located in Meath.	Consumer interest in health is growing year-on-year. This could result in health being considered as important as safety. By developing infrastructure that encourages active transport, this could support healthy lifestyles, as well as reducing carbon emissions from transport.
	Businesses are also increasingly setting ambitious carbon reduction renewable energy targets. Access to clean energy will become increasingly important for business satisfaction.

A Productive Location	
Meath forms part of the Greater Dublin Area (GDA) with 50% Gross Value Added (GVA) of Ireland in this region.	A report from the Irish Corporate Leaders on Climate Change says opportunities exist in wind energy, buildings, electrification, smart grid, green financing and agriculture. The group consists of Bord Gais, Bord na Mona, Siemens, Diageo Ireland, NTR, Sodexo and Vodafone.

Business Infrastructure	
Quality of life	This climate action strategy focuses on the significant health benefits that can be realised by moving to a low carbon economy. This includes active transport, more green infrastructure, cleaner air, fewer disruptions (e.g. from floods).
Ready to go business and technology parks	Meath is well positioned with ready to go business parks. By moving to clean energy parks that are resilient to climate change impacts, we can ensure that these business parks are future proof and continue to attract and retain the very best businesses to the region.
Business Supports	In this strategy, we have identified where we can support businesses transition to a low carbon economy and identify the opportunities that come with it. This includes increasing our expertise.

6.1.2 Outline a bold, attractive vision for a cleaner, healthier future

It is important that the benefits of moving to a low carbon and climate ready future are presented to residents. Research conducted over the past few years demonstrates that the co-benefits for health would substantially offset any costs associated with measures to reduce carbon emissions. As policy changes are introduced, reductions in greenhouse gas emissions are increasingly associated with a decline in air pollutants, leading to cleaner air and improvements in respiratory and cardiac health.

In addition to the health benefits of cleaner air, certain climate policies that are adopted in order to transition towards a low carbon economy could further contribute to better health by encouraging people to take more exercise and eat less meat. For example, transport policy changes that reduce private car use and increase walking and cycling could reduce obesity, diabetes, and cardiovascular disease.

6.1.3 Be ambitious in setting and achieving targets

We recognise the importance of setting targets that drive action. The table below list the key mitigation and adaptation targets that are relevant to Meath County Council.

Table 1: Key Relevant Mitigation Targets

Mitigation Commitments	Legally Binding	Target
Global	Yes	The Paris Agreement aims to tackle 95% of global emissions through 188 Nationally Determined Contributions (NDCs) which will increase in ambition over time. Ireland's contribution to the Paris Agreement will be via the NDC tabled by the EU on behalf of its Member States. This is a binding EU target of an overall EU reduction of at least 40% of greenhouse gas emissions by 2030 compared to 1990 levels. The target will be delivered collectively by the EU with reductions in the Emissions Trading Scheme (ETS) and non-ETS sectors amounting to 43% and 30% by 2030 compared to 2005 respectively.
EU	Yes	In February 2011, the European Council reconfirmed the EU objective of reducing GHG emissions by 80-95% by 2050 compared to 1990 levels. This is in the context of the necessary reductions set out by the Intergovernmental Panel on Climate Change (IPCC) for developed countries as a group. While maintaining a focus on the long-term objective of 2050, the more immediate focus is on the period 2017-2020 and planning ahead for the period 2021-2030. In this context, the EU provides the legislative foundation for the 2013-2020 EU climate and energy agenda with the adoption of the EU 2020 Climate and Energy Package by the European Council in December 2008.
National	Yes	Under the 2009 Renewable Energy Directive, Ireland is obliged to deliver 16% of energy from renewable sources by 2020. This will be met by achieving 40% from renewable electricity, 12% from renewable heat and 10% from the renewable transport sector. Ireland is also committed to a national target of improving energy efficiency by 20% by 2020. Within this national target, the public sector is required to achieve energy savings of 33%. While Ireland's national target of improving energy efficiency by 20% by 2020 is not legally binding, it is critical to progress towards statutory EU 2020 targets to reduce GHG emissions by 20% and meet 16% of the energy demand from renewable sources.
Covenant of Mayors for Climate and Energy	No	Signatory cities have pledged action to support the implementation of the EU 40% greenhouse gas reduction target by 2030 and the adoption of a joint approach to tackling mitigation and adaptation to climate change. There are currently 12 Irelish cities and regions that are signatories, including Dublin City Council, South Dublin County Council and Kilkenny County Council. The new National Adaptation Framework for Ireland, launched on the 19th of January 2018, highlights the EU Covenant of Mayors as a key movement to further climate adaptation efforts by Irish local authorities.

Table 2: Key Relevant Adaptation Targets

Adaptation Commitments	Legally Binding	Target
Global	Yes	The Conference of the Parties (COP) to the UNFCCC has made several decisions with regard to climate change adaptation. The Paris Agreement (COP 21) committed 195 countries to the goal of limiting the increase in global temperature to well below 2°C above pre-industrial levels. The agreement also places significant importance on actions that need to be taken, both nationally and globally, to help society adapt to climate change. Article 2.1(b) of the Agreement establishes the long-term adaptation goal as follows: "This Agreement … aims to strengthen the global response to the threat of climate change by: Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low greenhouse gas emissions development, in a manner that does not threaten food production".
United Nations Sustainable Development Goals	Yes	The SDGs aim to directly combat climate change adaptation through SDG 13: Climate Action. SDG 13 has the following targets that are relevant to the National Adaptation Framework: • Strengthen resilience and adaptive capacity to climate-related hazards and natural disasters in all countries. • Integrate climate change measures into national policies, strategies and planning. • Improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning.
EU	Yes	At European Union (EU) level, the European Commission published a whitepaper on adapting to climate change in 2009, which was followed by the publication of a strategy on adaptation in April 2013. The EU Adaptation Strategy has the overall aim of contributing to a more climate-resilient Europe and focuses on three key objectives: • Promoting action by member states – the Commission will encourage all member states to adopt comprehensive adaptation strategies and will provide funding to help them build their adaptation capacities and take action. It will also support adaptation in cities through Mayors Adapt and the Covenant of Mayors for Climate and Energy. • 'Climate proofing' action at EU level – by further promoting adaptation in key vulnerable sectors such as agriculture, fisheries and cohesion policy, ensuring that Europe's infrastructure is made more resilient, and promoting the use of insurance against natural and man-made disasters. • Better informed decision making – by addressing gaps in knowledge about adaptation and further developing the European climate adaptation platform (Climate-ADAPT) as the 'one-stop shop' for adaptation information in Europe.

Adaptation Commitments	Legally Binding	Target
National	Yes	In accordance with the Low Carbon Development Act 2015, the government developed the National Adaptation Framework, which specifies the national strategy for the application of adaptation measures in different sectors and by local authorities in their administrative areas, in order to reduce the vulnerability of the state to the negative effects of climate change and to avail any positive effects that may occur. The National Adaptation Framework does not identify specific locations or propose adaptation measures or projects in relation to sectors. Respecting the principle of subsidiarity, detailed adaptation measures will be developed across sectors and local government, in accordance with the NAF. The NAF also suggests that local authorities adopt a joint or regional approach.
Covenant of Mayors for Climate and Energy	No	Signatory cities pledge action to support the implementation of the EU 40% greenhouse gas-reduction target by 2030 and the adoption of a joint approach to tackling mitigation and adaptation to climate change. There are currently 12 Irish cities/regions that are signed up, including Dublin City Council, South Dublin County Council and Kilkenny County Council. The new National Adaptation Framework for Ireland, launched on the 19th of January 2018, highlights the EU Covenant of Mayors as a key movement to further climate adaptation efforts by Irish local authorities.

Based on a review of the current statutory targets and discussions with the Climate Action Leadership team, we propose to align with the following targets;

- Reducing Meath County Councils emissions by 33% by 2020. This aligns with national targets. Whilst not legally binding, these are seen as key if Ireland is to meet statutory EU 2020 targets.

- Reducing CO_2 emissions of the county by at least 40% by 2030. This aligns with Covenant of Mayors and Paris Agreement. This goes beyond what is currently required at the national and EU level for County Meath. However, it is a level that will be recognised internationally and has been adopted by many regions through the Covenant of Mayors.

- Increasing our resilience by adapting to the impacts of climate change. There is very little in the way of specific targets for adapting to climate change. This should be seen as a high level ambition, with more detailed targets being developed as the maturity of Meath County Council develops in this area.

- Sharing our vision, results, experience and know-how with fellow local and regional authorities within the EU and beyond through direct cooperation and peer-to-peer exchange, namely in the context of the Global Covenant of Mayors.

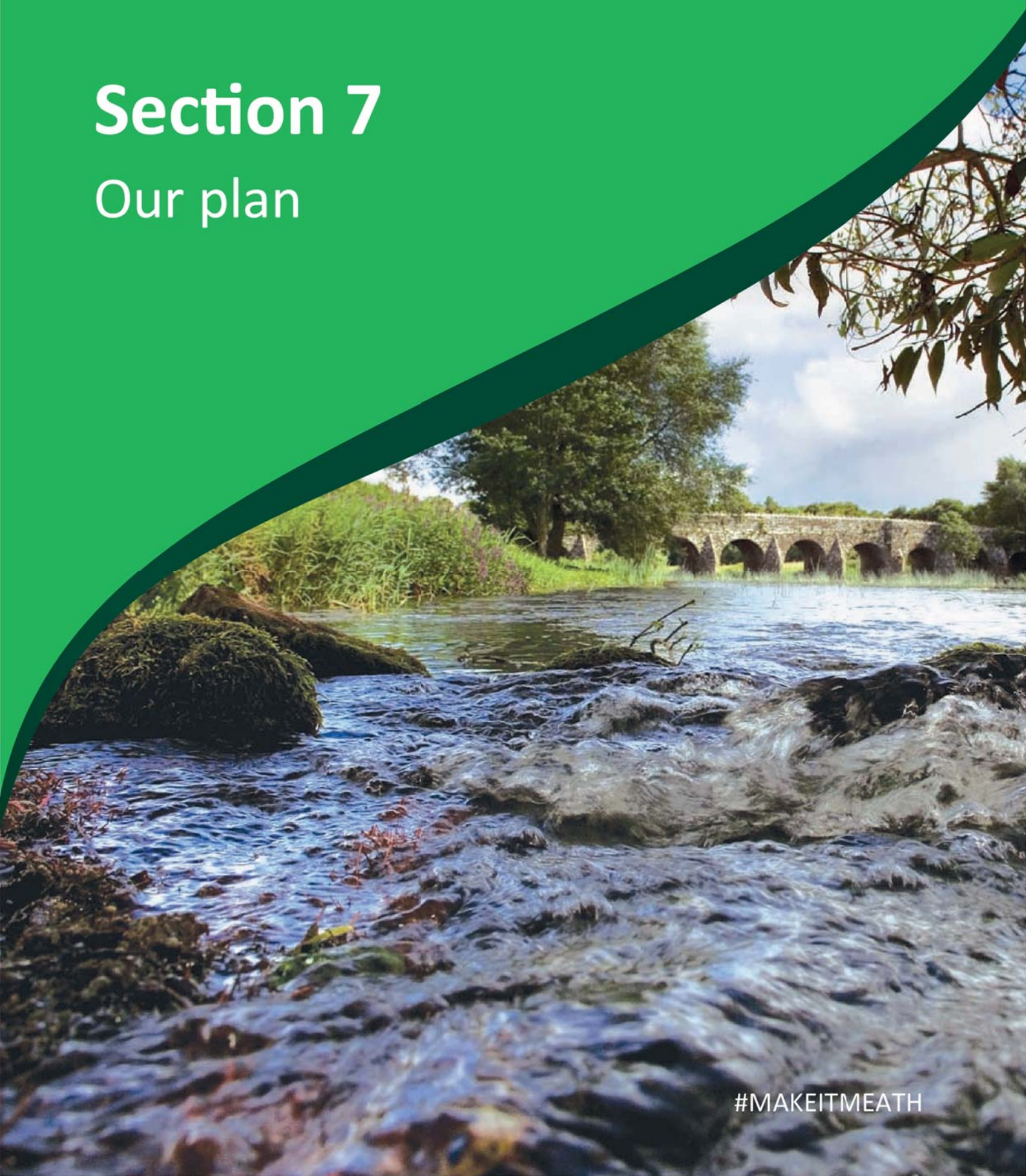## 6.1.4 Work with our regional partners to realise mutual benefits

While the structure of local government facilitates independent adaptation planning and action on the part of individual local authorities, it is clear that many authorities face challenges similar to their neighbouring areas. The National Adaptation Framework suggests that local authorities are now proposing to adopt a joint or regional governance approach to adaptation planning, where there are opportunities to share knowledge, experience and resources or to avail of economies of scale.

While a regional structure does not remove the requirement for each local authority to advance the adaptation strategy process, it does provide the opportunity to establish centres of expertise that will be available to local authorities in the region, ensure consistency within the various local authority plans and deal with cross-boundary issues within and across the regions. They will equally provide input/advice into sectoral adaptation plans and in particular, they will be in a position to advise on the local implications of sectoral actions.

Kildare County Council have been nominated as Lead Local Authority for the preparation of plans and the regional implementation of climate change initiatives. It will be important to share this plan with Kildare to identify synergies and share resources to support effective delivery.

Section 7

Our plan

7. OUR STRATEGY

7.1 Scope

Our strategy is linked to the County Development Plan and covers the period from 2019-2025. We recognise that our targets go beyond this period and it is important to note that this climate change action plan will require updating in line with the next County Development Plan. Equally, to ensure targets are met, more detailed analysis will be required to ensure that the cumulative actions will result in the emissions reductions required.

7.2 Remit

We want our strategy to be ambitious but grounded in pragmatism. The success of this is dependent on recognising what is within Meath County Council's control. The primary responsibilities of Meath County Council are:

- Housing and Building
- Road Transport and Safety
- Water Services
- Development Management
- Environmental Services

- Recreation and Amenity
- Agriculture, Education, Health and Welfare
- Miscellaneous Services
- Central Management Charges

Although these are the areas that Meath County Council have direct control over, there is also a significant role that Meath County Council can take in enabling others to take action, and inspiring others to lead. This means our actions will focus on the following key areas;

Lead:
We will take action ourselves

We have a unique leadership opportunity to influence and drive significant changes through our own operations.

However, much more needs to be done and Meath County Council must provide leadership through our own operations and continue to develop further initiatives to tackle climate change across the domestic, commercial, industrial and transport sectors.

Enable:
We'll support others to deliver

The responsibility for changing our energy system and adapting to climate change lies not only with Meath County Council, but with many of our businesses, social enterprises, public bodies and communities.

Furthermore, there may be opportunities where Meath County Council does not have appropriate jurisdiction to take a lead role and we will therefore strive to collaborate, empower and enable these organisations through initiatives that may help in securing funding, providing resources, sharing skills, knowledge and expertise and providing political support.

Inspire:
We'll inspire others to take action

Ensuring that County Meath is a thriving, climate resilient county, is an opportunity to inspire active public participation.

Through our engagement, we have identified a number of areas to inspire community action, from community energy projects, to planting trees. The key to working with citizens will be expanding and finding new ways to engage, from social media to a variety public events across the region.
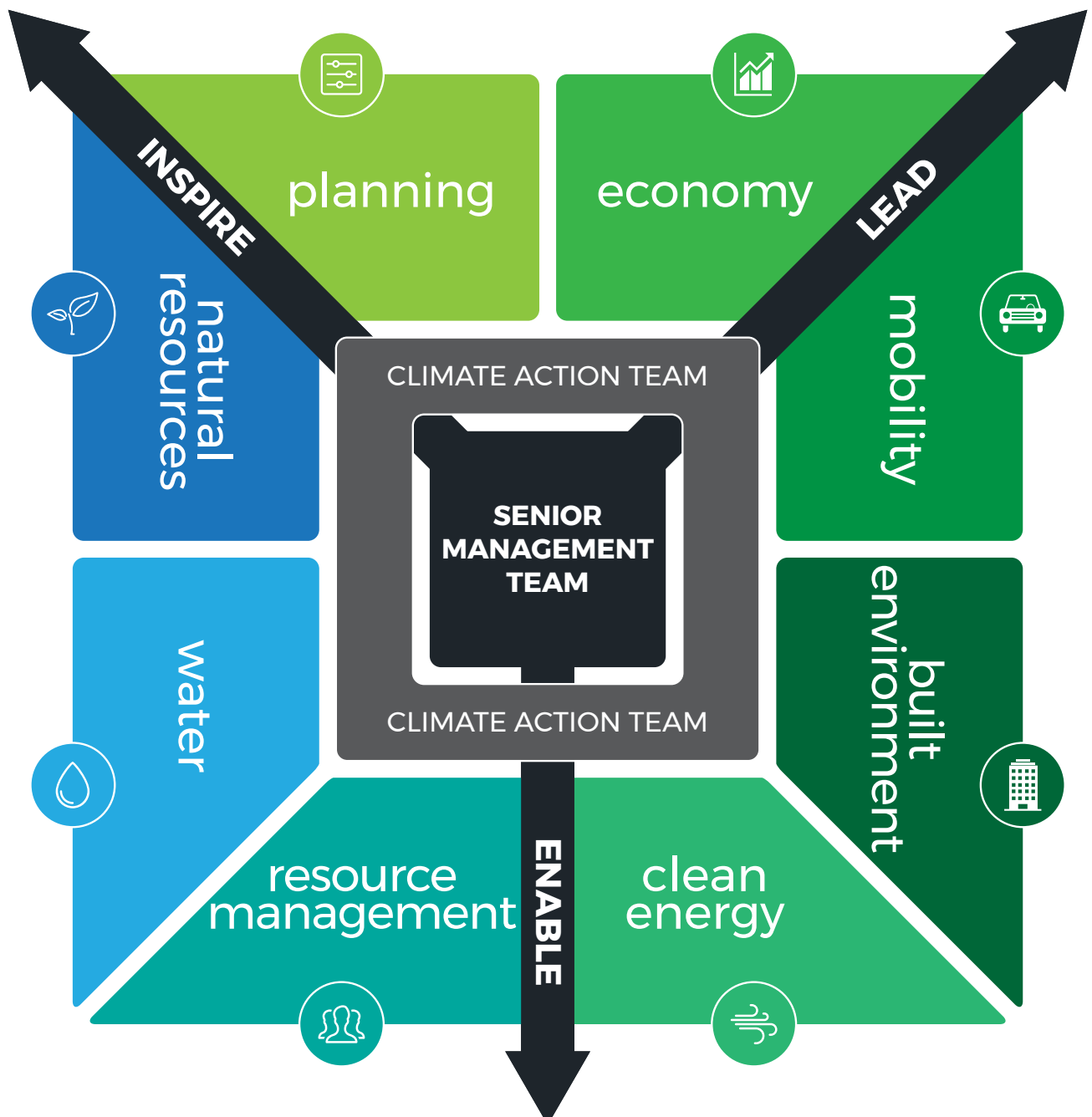
7.3 Thematic Areas

This section sets out the eight thematic areas where action will be taken. The thematic areas have been drawn from the areas within Meath County Council's control.

- Economy
- Mobility
- Built Environment
- Clean energy
- Resource Management
- Water
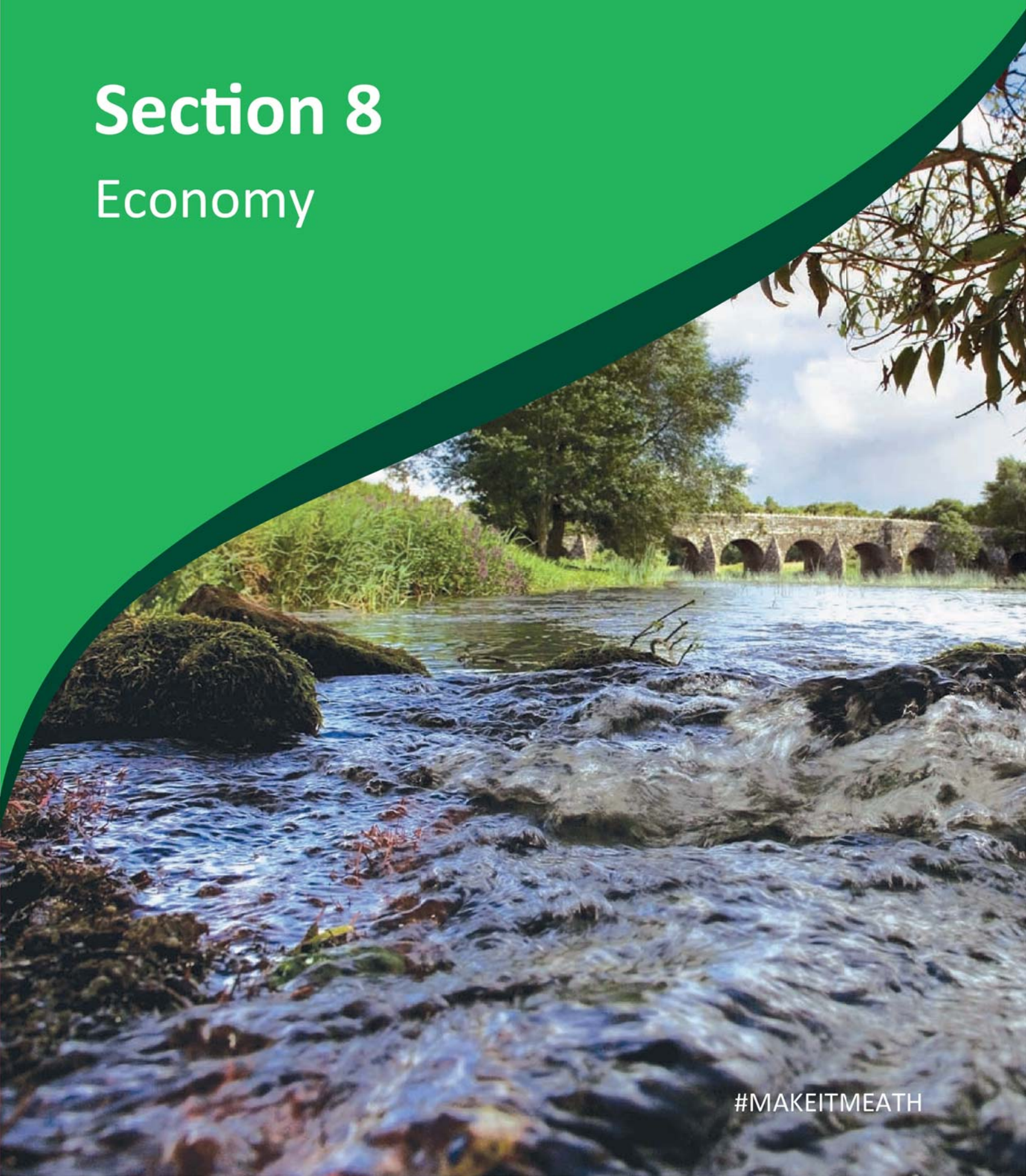- Natural Resource
- Planning

7.4 Delivery

The key to the delivery of this strategy is leadership from our senior management team and Chief Executive. From this, our Climate Action Team has a clear mandate to lead, enable and inspire action to combat climate change across our eight thematic areas. This is summarised in the diagram below.

Section 8

Economy

8. ECONOMY

8.1 Overview

What

Meath County Council now has primary responsibility for the economic development of the county. In 2017, we released our Economic Development Strategy to provide clear, concise, innovative and evidence-based measures aimed at accelerating the economic transformation, revitalisation and sustainable development of Meath.

We recognise the significant potential economic benefits from taking action on Climate Change. These include creating new jobs, driving competitiveness and exports, efficiency and productivity gains, innovation, supply chain development, energy security, health benefits, fuel poverty alleviation, boosting tax revenues, and regional development. By taking action, this strategy will support County Meath's economy by:

- Saving households and businesses money. Using energy more efficiently and reducing emissions would help all families—especially low-income families—lower their energy bills. It is crucial that this strategy helps to deliver cost-savings to families in order to provide additional spending power, which could be spent on local businesses.

- Competing internationally. The clean energy economy is poised to be the growth industry of the future. With increasing numbers of big businesses signing up to commitments including 100% renewable energy and science based carbon reduction targets, Climate Action will become increasingly important if County Meath wants to continue to attract inward investment from big businesses. For example Facebook has a target of 100% clean and renewable energy, achieving 50% of this by 2018.

  To continue being Europe's business ready region, access to low carbon and cheap energy will become increasingly important.

- Helping avoid the costs of climate change. The impacts of climate change are already being felt across Ireland, with many counties experiencing the costly effects of climate change already. This includes coastal areas that are threatened by rising sea levels and more intense rainfall causing floods.

  Many of the decisions we make on new developments and infrastructure will have long-term implications. We want to make sure that the decisions made in County Meath by the council, by our officers and by business and residents, anticipate this future. A strong adaptation strategy will help to ensure that the county can continue to run effectively during more extreme weather and avoid unforeseen shocks to our services, residents and businesses.

- Creating jobs. Irish corporate leaders on climate change have identified that tens of thousands of jobs could be created across Ireland by moving to a low carbon economy. For example, SEAI estimate that more than 10,000 Irish jobs will be created by the implementation of Smart Grid infrastructure and its associated technologies.

How

By delivering on the actions listed in this strategy, we hope to work towards each of the significant benefits listed above. This next part of the strategy focuses on how we can actively support businesses to transition to a low carbon economy and how we will communicate to the business communities how we are taking action.
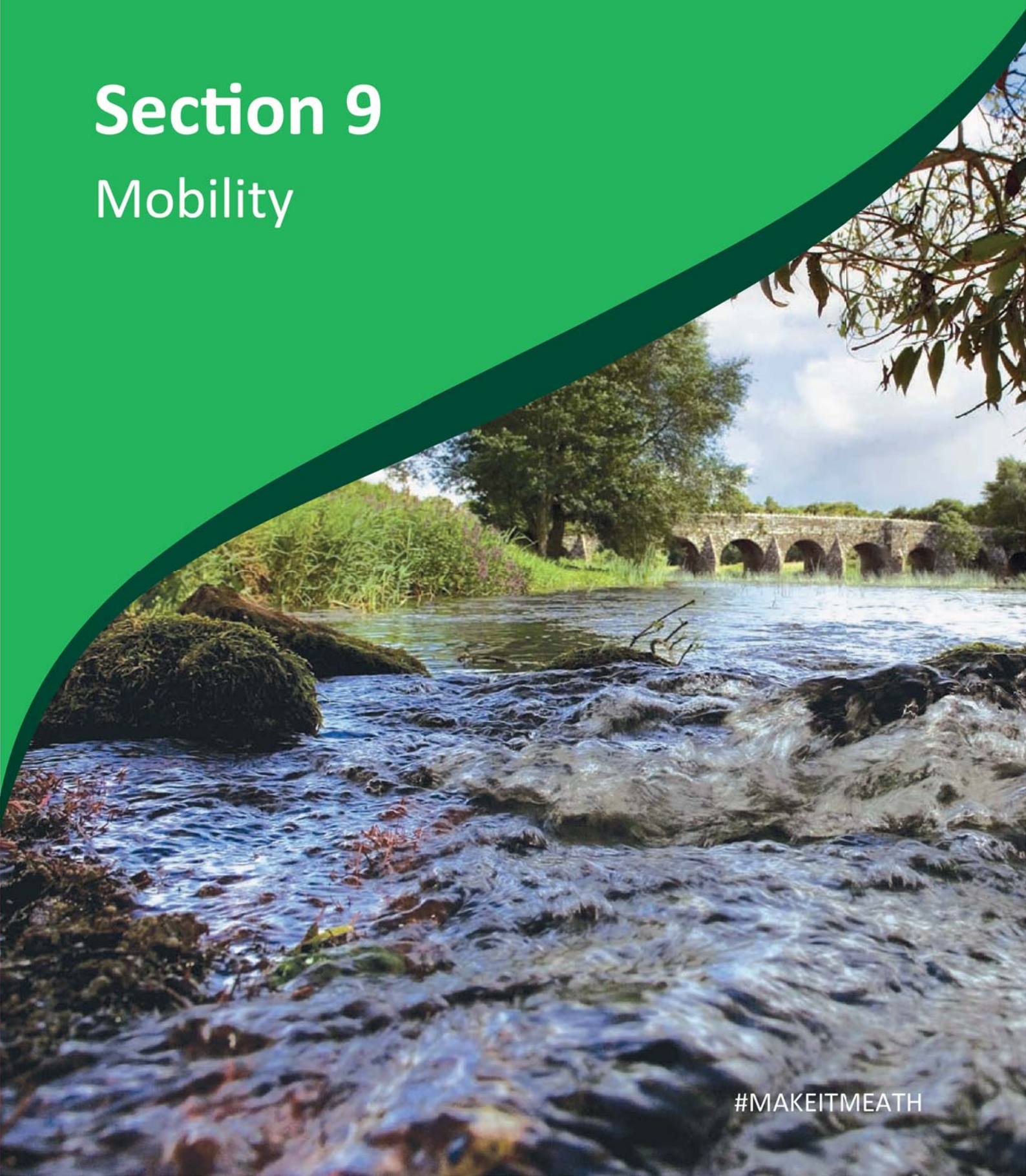
8.2 Specific Actions

The table below summarises the actions we are planning to undertake in the period 2019-2025. It includes a high level ambition, with specific actions, indicators and owners.

Action	Indicator	Owner
E1. Use Climate Action as a driver for growth in County Meath.		
E1.1 Promote Climate Action Strategy to IDA.	Meath County Council to have shared Climate Action Strategy in 2018.	Economic & Enterprise Team
E1.2 Develop high level marketing plan for climate strategy for business.	High level marketing plan to be completed in 2018.	Economic & Enterprise Team
E1.3 Showcase businesses in County Meath that are making money from the Green Economy.	List of Meath Businesses benefiting from transition to low carbon economy.	Economic & Enterprise Team
E1.4 Help businesses grow through spotting opportunities for innovation, increasing resilience and saving money.	Energy and climate candidates to be included on Local Enterprise Office mentoring panel. SEAI approved business low carbon transition paper. Updated lean manufacturing programme.	Economic & Enterprise Team
E1.5 Review potential EU funding streams to understand whether climate strategy might place Meath County Council in a stronger position to apply for certain funding.	List of EU funding streams.	Economic & Enterprise Team
E1.6 Promotion of local jobs and local workspaces to reduce the amount of commuting outside of the county.	Outline plan assessing the potential for ex-council buildings to be used as office hubs.	Economic & Enterprise Team

Section 9
Mobility

#MAKEITMEATH

9. MOBILITY

9.1 Overview

Why

Mobility is fundamental to how we live and work. A well-performing transportation system is essential to the functioning of society and the economy as a whole. The promotion of use and increased delivery of sustainable modes of transport is fundamental to achieving Ireland's carbon emission reduction requirements of 20% by 2020 and 30% by 2030. In addition to the reduction of emissions, failure to deliver public transport investment will result in a highly congested network that cannot meet the economy's transport needs.

> *Modal shift from cars to public transport, cycling or walking will contribute to improved local air quality and reduced congestion.*

Meath recognises the need to support this modal shift and with 43.4% of County Meath's emissions coming from transport, it is a priority area of action as part of this strategy. Providing more sustainable travel choices to our residents is a strategic priority that should reduce transport carbon emissions while realising the following key benefits:

- Health benefits. By moving to more active modes of transport, transport policy changes that reduce private car use and increase walking and cycling would reduce obesity, diabetes, and cardiovascular disease. In addition, by moving to cleaner modes of transport, we can improve air quality.

- Economic savings. By providing alternative modes of transport and working, we can offer our residents savings from reduced fuel bills and costs of owning private vehicles.

- Less congestion. By getting people out of cars and into shared modes of transport, we will future proof against congestion on our roads, which is one of our key USPs in the economic development plan.

- Reduce loneliness. Even as we become more digitally connected, the future could also be an increasingly lonely one (and one with increased health issues caused by lack of activity). Improved mobility can help avoid this growing trend.

How

We will seek to make mobility climate ready by:

- Increasing the efficiency of the transport system by making the most of digital technologies, sharing platforms and further encouraging the shift to lower emission transport modes.

- Moving towards zero-emission vehicles, with a focus on how we can help roll out of electric vehicles.

- Promoting active transport.

- Providing opportunities for flexible working, reducing the need to commute on a daily basis.

- Ensuring critical transport infrastructure under our control is resilient to climate change, including roads.
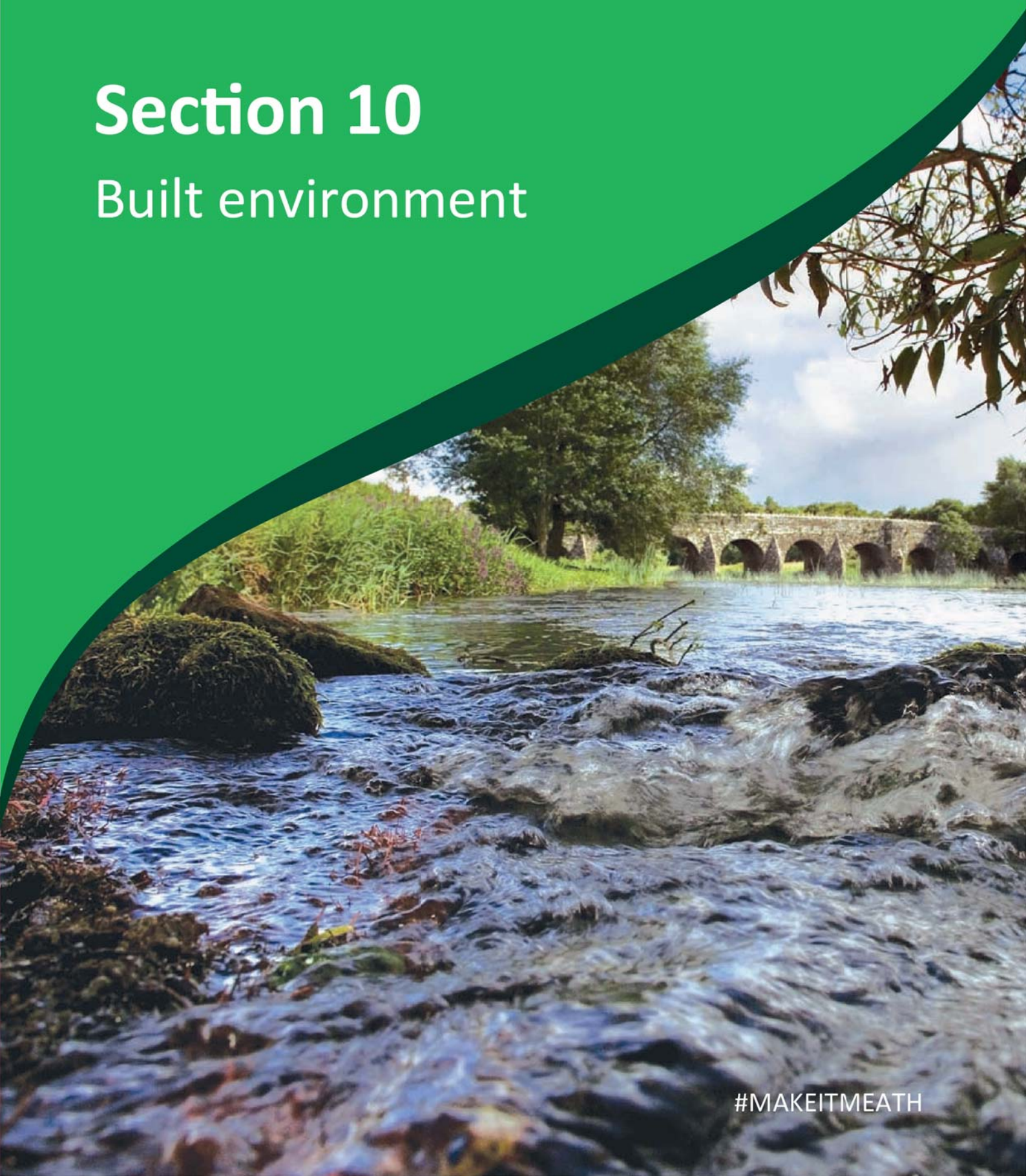
9.2 Specific Actions

Action	Indicator	Owner
M1 Operations		
M1.1 Pilot low carbon alternatives vehicles through lease agreements.	Pilot EV in fleet in 2018.	Transport
M1.2 Explore electric vehicles or pooled travel for MCC business travel.	Pilot electric pool car in 2018 if there is a need.	Corporate
M2 Active Transport		
M2.1 To identify and seek to implement a strategic, coherent and high quality cycle and walking network across the county that is integrated with public transport and interconnected with cultural, recreational, retail, educational and employment destinations and attractions.	Outline strategic cycle and walking network for County Meath.	Transport
M2.2 To support the provision of a long distance walking/cycling route which links Northern Ireland and Ireland.	Outline strategic cycle and walking network for County Meath.	Transport
M2.3 To support the NTA in the development of a strategic pedestrian network plan for in the main urban centres of the county.	Outline plan of candidate pedestrianisation schemes for County Meath.	Transport
M2.4 Revise road junction layouts to improve pedestrian access.	Schedule of road layout alterations and how they will benefit active transport.	Transport
M2.5 Support Minimum Passing Distance Law (MPDL), whereby motorists will be obliged to give at least a 1.5m gap when overtaking cyclists on rural roads and a 1m gap on urban roads.	Evidence Meath County Council has supported Minimum Passing Distance Law through appropriate channel.	Management Team
M2.6 Introduce pedestrianisation schemes where appropriate.	Outline plan of candidate pedestrianisation schemes.	Transport
M3 New Mobility		
M3.1 Retrofit of charging points in towns in and around Meath.	Outline plan for location of charging points; % being used with increasing trend.	Transport
M3.2 Promote EVs to residents.	Indicators to be agreed with SEAI.	Transport
M3.3 Promote car clubs and car sharing schemes.	Promotional material on car sharing.	Transport
M3.4 Parking permits and reduced charges based on vehicle emissions.	Pilot scheme launch.	Transport
M3.5 Increase Parking space privileges for car club/EV vehicles.	# parking spaces for car club/EV vehicles.	Transport
M3.6 To support the growth of electric vehicles and EBikes and supporting facilities, through a roll-out of additional electric charging points in collaboration with relevant agencies at appropriate locations.	# of charging points; % being used with increasing trend.	Transport
M3.7 To implement suitable charging structures for park and ride facilities.	# of charging points at park and ride; % being used with increasing trend.	Transport

Action	Indicator	Owner
M4 Public Transport		
M4.1 To explore the potential of demand responsive transit in rural areas and small towns.	# demand responsive travel options.	Transport
M4.2 To identify deficits in bus infrastructure and develop a priority list as a basis for seeking funding for improvement works, including the provision of bus shelters, bus stops and travel information at stops.	Priority list for provision of bus shelters, stops and travel information.	Transport
M4.3 To deliver in conjunction with the NTA and the Department of Transport, Tourism and Sport a public transportation hub in Navan to accommodate national, commuter, regional and local bus services.	Project implemented.	Transport
M4.4 To co-operate with the NTA and other relevant agencies to continually review the network of bus services in Meath, and work with public transport operators to provide improved bus services in, and through, the county.	Priority list for provision of bus shelters, stops and travel information.	Transport
M5 Rail		
M5.1 To provide in conjunction with the NTA and Irish Rail improvements to facilities at existing stations.	Project implemented.	Transport
M5.2 To support the NTA in the delivery of a strategic multi-modal park-and-ride facility at M3 Parkway train station.	Project implemented.	Transport
M5.3 To promote, facilitate and advance the development of Phase II of the Navan railway line project and rail services in co-operation with other relevant agencies.	Project implemented.	Transport
M5.4 To support the improvement of existing rail transport infrastructure including the Dublin/Sligo route with increased suburban services to Enfield and Kilcock, the existing Dublin – Drogheda rail service which serves East Meath and to support the proposed electrification of this rail line to Drogheda.	Project implemented.	Transport
M6 A resilient network		
M6.1 Climate resilience review of existing network.	Climate change risk assessment of County Meath infrastructure.	Transport
M6.2 Future ready review of new Meath climate change infrastructure.	% Part 8 protocols considering climate change.	Transport
M6.3 Greenway cycle network to be resilient to climate change.	Ensure that climate is considered as part of design.	Transport
M6.4 Engaging with TII (Transport Infrastructure Ireland) to develop maintenance and improvement regimes.	Maintenance and improvement regime reflect future climate.	Transport

Action	Indicator	Owner
M7 Flexible Working		
M7.1 To facilitate the delivery of a high capacity Information and Communications Technology (ICT) infrastructure and broadband network and digital broadcasting throughout the county.	% increase in broadband performance indicators.	Economic & Enterprise Team
M7.2 To encourage the further co-ordinated and focused development and extension of telecommunications infrastructure including broadband connectivity in the county as a means of improving economic competitiveness and enabling more flexible work practices e.g. teleworking.	% increase in broadband performance indicators.	Economic & Enterprise Team
M7.3 To encourage coverage and capacity of mobile technology network infrastructure and the remediation of blackspots, while endeavouring to reduce the number of telecommunications structures, by ensuring that ComReg's Code of Practice on Site Sharing (or any such replacement guidance) is implemented and reciprocal national roaming is entered into.	% increase in broadband performance indicators.	Economic & Enterprise Team
M7.4 To seek to have appropriate modern ICT, including open access fibre connections in all new developments and a multiplicity of carrier neutral ducting installed during significant public infrastructure works such as roads, water and sewerage, where feasible.	% increase in broadband performance indicators.	Economic & Enterprise Team

Section 10

Built environment

10. BUILT ENVIRONMENT

10.1 Overview

Why

The world's buildings account for a large share of the global final energy use and greenhouse gas emissions, with major potential for energy savings of up to 50–90% in existing and new buildings. In County Meath, buildings account for 28% of emissions, making it the second largest source of emissions for the region.

> *Over €2.7 million has been spent on improving the energy efficiency of our housing stock.*

Standards for housing will increase the energy efficiency of new developments but the rate of development of new technologies, such as solar powered tiles, is outstripping how fast standards can be updated. This presents an opportunity for council-led development to lead on what is possible.

Whilst newly constructed buildings will be more energy efficient, 80% of buildings in 2050 have already been built. This means decarbonising our existing stock will need to be a priority. The council is committed to improving energy efficiency in homes, while recognising that this will be a long term task. €2.7m has already been spent to date on our Phase 1 Energy Upgrade Works Programme, with works carried out on 2,175 units. There is approximately a further 300 units to be completed under Phase 1.

We also recognise the significant improvements that can be made to improve the performance of our municipal buildings and wider infrastructure.

Council buildings constitute the vast majority of energy consumption (73.86% of our energy use), however public lighting (16.65%) represents the single biggest individual source of emissions. By taking action to reduce emissions from the built environment, we will also realise the following key benefits:

- Improve quality of life. Reducing the energy bills of homeowners and tenants will increase disposable incomes and reduce the number of people affected by fuel poverty. This will, in turn, improve quality of life.. In addition, reducing our energy bills at the council will allow us to spend more money on other areas. This will directly benefit our residents.

- Improved health. Improving health outcomes for those who are vulnerable by improving insulation standards

- Improved educational outcomes. Improving educational outcomes by providing warmer and more comfortable learning places for children at school and in their homes.

How

To make the built environment climate ready, our actions will focus on the following:

- Making sure that all council-owned buildings are retrofitted to improve energy efficiency or are built to best-practice standards.

- Ensuring that we manage our estate better, with a strong focus on energy efficiency and renewable energy.

- Ensuring that climate resilience is considered for all council-lead developments, including future temperature increases and increased risks of flooding.
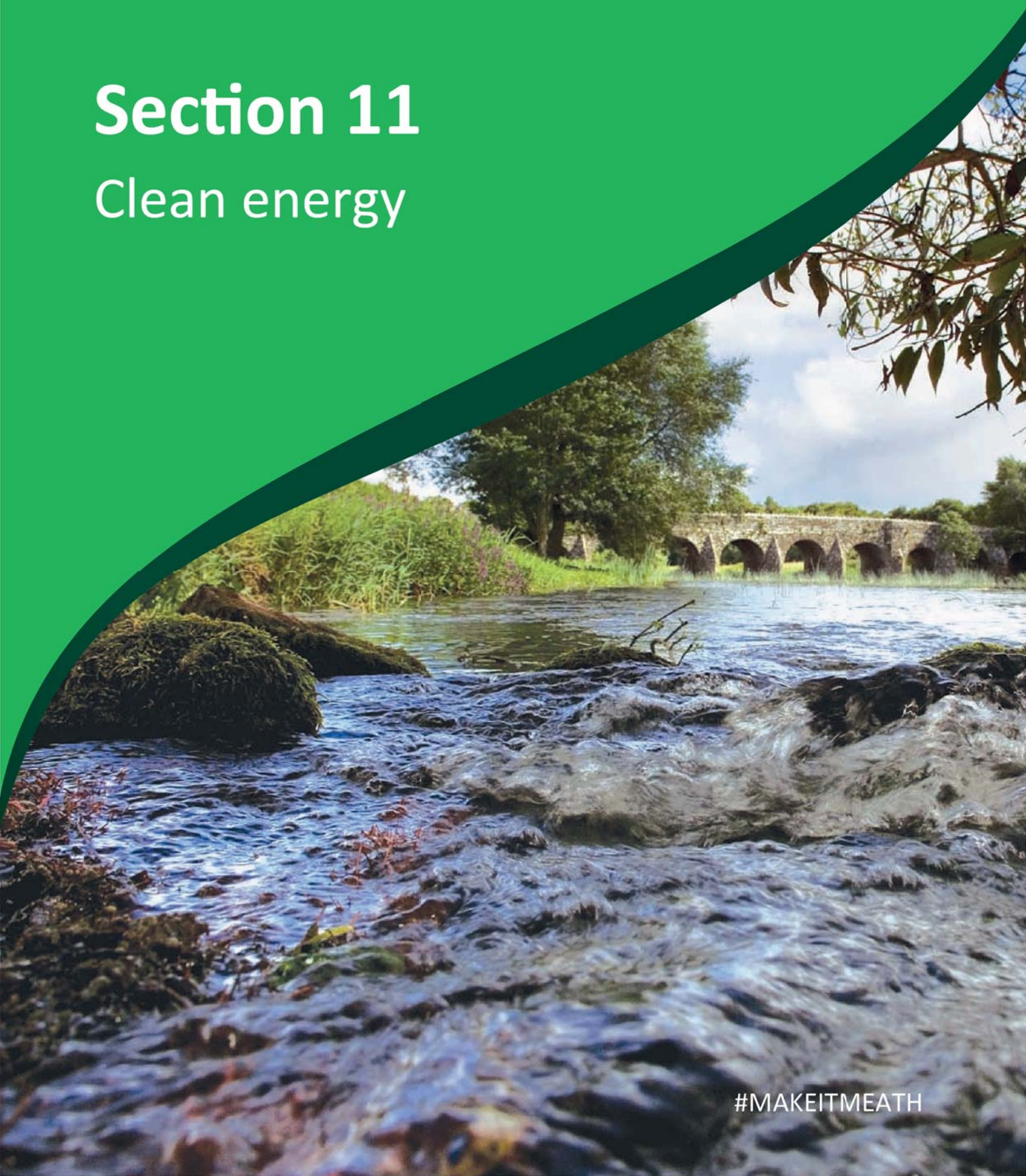
10.2 Specific Actions

Action	Indicator	Owner
B1 Energy efficient, climate proof council homes		
B1.1 Move towards near-zero-energy in council new-build buildings, in line with EU policy.	Improved EPCs.	Housing Department
B1.2 Future proof all future council led developments for projected temperatures, heavy rain and local flooding.	List of practical adaptation measures for council homes.	Housing Department
B1.3 Continue to roll out retrofit council housing stock.	# homes receiving deep energy upgrades.	Housing Department
B2 Municipal building management		
B2.1 Introduce maintenance contract.	# Maintenance contracts in place.	Facilities Management
B2.2 Introduce effective BMS systems on larger corporate buildings.	BMS system.	Facilities Management
B2.3 Explore potential for district heating in council owned buildings.	Feasibility study on council owned swimming pool.	Facilities Management
B2.4 Explore ESCo packages for council owned sites/services.	Outline plan for using ESCo for public lighting.	Facilities Management
B2.5 Introduce ISO 15001 as part of new energy policy.	Energy Policy. ISO15001	Management team
B2.6 Build in climate related requirements into energy/facilities management contractors.	Energy efficiency to be built into contract requirements.	Facilities Management
B2.7 Identify funding opportunities provided by SEAI and OPW for retrofit/renovation of public buildings.	Clear list of all potential funding sources for improving energy efficiency of council buildings.	Facilities Management

Section 11

Clean energy

11. CLEAN ENERGY

11.1 Overview

Why

Energy use is changing fast. The shift to renewable sources, however, needs to happen faster. This is not just in terms of how power is generated but also in terms of how it is used in heating, buildings and transport.

Global competition is helping to spread best project development practices, reducing technology and project risk, and making renewables more cost-competitive than ever before. A recent study suggests that renewable energy is set to be cheaper than fossil fuels by 2020.

> *'We are committed to powering our operations with 100% clean and renewable energy'*
>
> *Facebook*

County Meath, like the rest of Ireland, is reliant upon fossil fuels for the generation of power, heat (hot water and steam) and transport fuels. Under the EU Renewable Energy Directive, Ireland is committed to producing at least 16% of all energy consumed from renewable sources by 2020. Ireland is currently facing a fine of up to €75 million each year, as official predictions show that it will fall short of its EU renewable-energy targets.

For us to become a more sustainable region we need to dramatically increase our deployment in low carbon energy generation technologies, which will cut across all of our targets relating to commercial and industrial, domestic and transport emissions, and improved energy security.

By increasing clean and renewable energy, County Meath could also realise the following benefits:

- Energy security. Power generation in Ireland relies essentially on gas, imported mainly from the UK. Increasing our renewable energy will improve our resilience.

- Improve profits. A business can now be an energy generator as well as a consumer. Self-generation of renewable power to cover a firm's own needs and selling the surplus to the grid in effect makes energy a profit centre rather than a cost.

- Stronger communities. Community renewable energy schemes can deliver a range of social and economic benefits to local communities including increased autonomy, empowerment and resilience by providing a long term income and local control over finances, often in areas where there are few options for generating wealth.

- Inward investment and jobs. Following the Paris conference in 2015, more and more corporates are setting ambitious carbon reduction targets. Much of their strategies align with access to clean energy.

How

Whilst this shift has to be led at government level, we recognise our role in promoting a cultural and technological shift in the way we design and build new developments to source and use energy for power, heating and cooling.

This will require a co-ordinated cross-department/sector response to encourage, remove barriers and regulate effectively. It will also come from leadership through decisions we make on our own estate and enabling communities to take action.
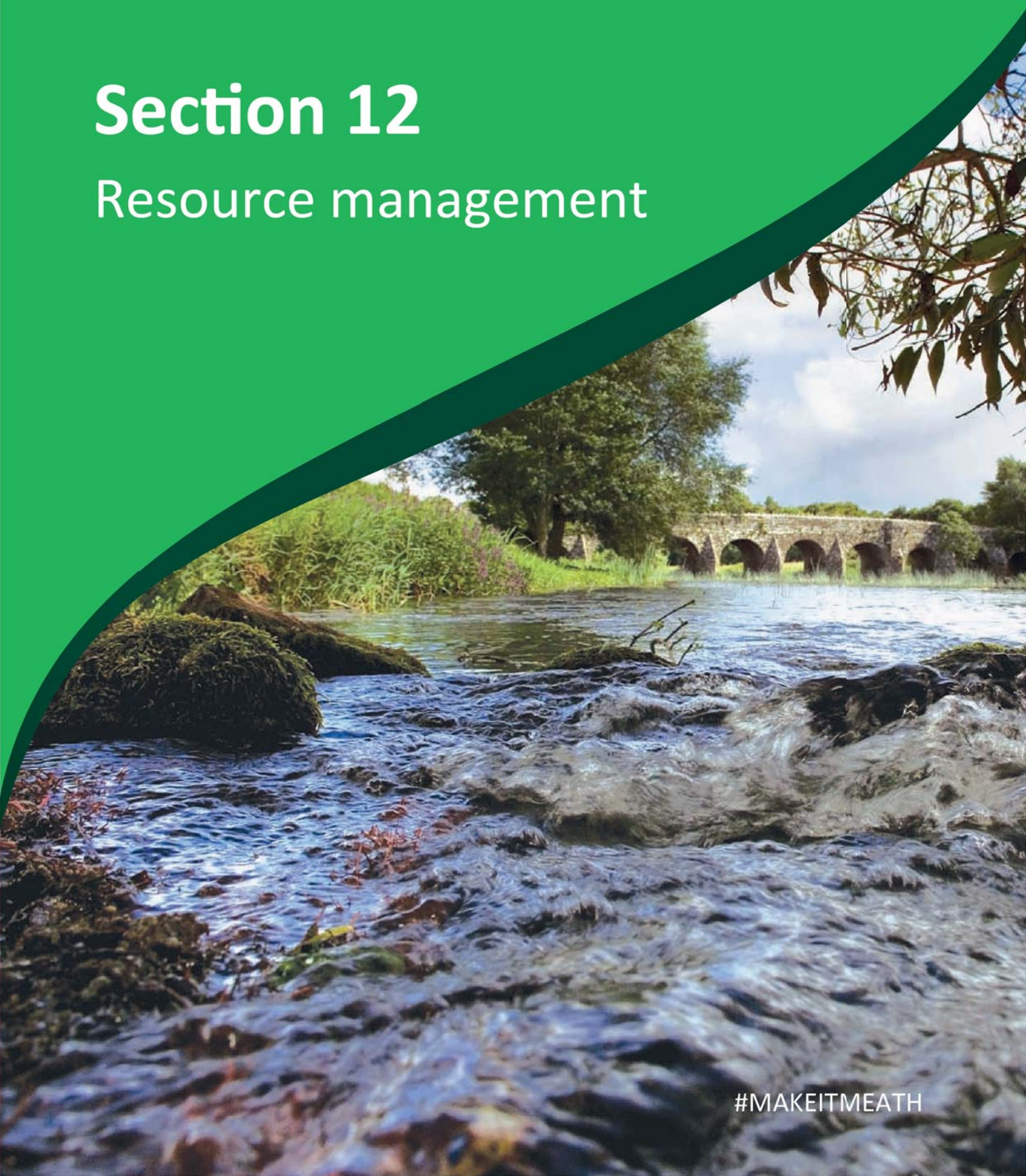
11.2 Specific Actions

The table below summarises the actions we are planning to undertake in the period 2019-2025. It includes a high level ambition with specific actions, indicators and owners.

Action	Indicator	Owner
C1 Build on and support national renewable energy targets and strategy.		
C1.1 Develop Local Authority Renewable Energy Strategy (LARES) for County Meath, in line with SEAI guidance.	County Meath LARES.	Environment
C1.2 Develop an Energy Master Plan for County Meath.	Energy Masterplan.	Environment
C1.2 To support the recording and monitoring of renewable energy potential in the county in partnership with other stakeholders including SEAI.	% of energy generated from renewables in county.	Environment
C1.3 Support the development and delivery of community energy projects.	# community energy projects.	Community
C1.4 Raise awareness of SEAI community energy project within Meath County Council.	# project referrals.	Community/ Planning
C1.5 Explore how Meath can benefit from Energy Agency Support.	Outline of potential collaboration.	Management Team
C1.6 Explore potential for demand side response and energy storage.	Feasibility study for demand side response.	Environment
C1.7 Explore potential for renewable energy/ microgeneration at council facilities.	Strategy for rolling out solar on council owned buildings.	Environment
C1.8 Develop information packs to be distributed with all new developments (Domestic & Non Domestic).	Renewable energy Information pack.	Environment

Section 12

Resource management

12. RESOURCE MANAGEMENT

12.1 Overview

Why

Demand for raw materials has seen exponential growth due to a rapidly expanding global population coupled with rising standards of living. Yet the resources on which we all rely are depleting quickly which is exacerbated by our culture of single use of resources, which uses significant amounts of energy to extract and process.

Maintaining economic progress in County Meath is dependent on a strong natural environment and the availability of necessary waste management facilities. Waste management policy is predicated on the EU Waste Hierarchy of prevention, preparing for reuse, recycling, energy recovery and sustainable disposal.

By following circular principles, managing our resources will play a key role in avoiding emissions through reuse, recycling and generating energy. For example, recycling an aluminium can eliminate the need to mine raw materials and avoid the significant carbon impacts associated in the mining and smelting process.

Whilst most of the avoided emissions may not be directly measurable as part of the data captured in the Baseline Emissions Inventory (BEI), we are targeting it as it is critical that this is not overlooked as part of the wider emissions reduction in County Meath.

By improving the way we manage our resources, and moving to a more circular model, we can realise the following benefits;

- Landfill tax savings. The tax previously paid on resources lost to landfill can now be circulated back in the economy, boosting GDP.

- Jobs. One of the characteristics of the circular economy is changing business models by shifting from selling products towards offering a service instead. This presents an opportunity for new jobs and services for County Meath.

- Saves energy. Recycling saves significant amounts of energy. For example, recycled aluminium uses 95% less energy to produce. Recycled paper uses 40% less.

How

We will look to realise the benefits of increased recycling by;

- Implement the Eastern Midlands Regional Waste Management Plan 2015-2021;

- Inspire our communities to help us recycle more; and

- Undertake research to explore opportunities for accelerating towards a more circular economy within County Meath.
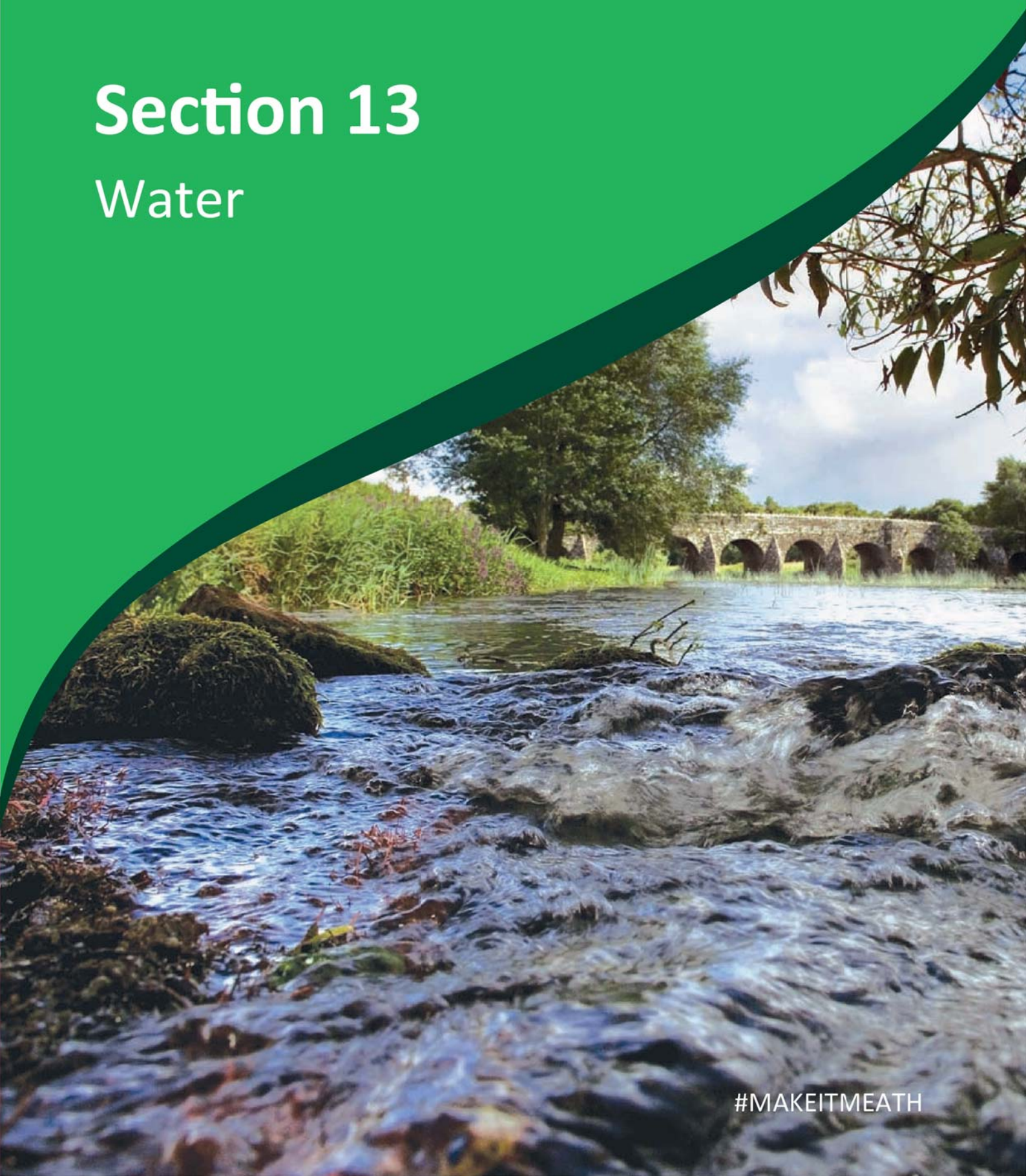
12.2 Specific Actions

The table below summarises the actions we are planning to undertake in the period 2019-2025. It includes a high level ambition, with specific actions, indicators and owners.

Action	Indicator	Owner
R1 Implement Waste Management Plans		
R1.1 To encourage and support the provision of a separate collection of source segregated waste throughout the county.	# waste categories collected.	Environment
R1.2 To encourage the development of waste infrastructure and associated developments in appropriate locations.	% increase in waste processing infrastructure.	Environment
R1.3 To encourage the recycling of construction and demolition waste and the reuse of aggregate and other materials in future construction projects.	% increase in recycling of C&D waste.	Environment
R1.4 To co-operate with relevant stakeholders to implement proposals which discourage illegal or improper disposal of waste and promote the diversion of recyclable items from the waste streams including 'bottle return and refund' schemes.	# recycling schemes.	Environment
R1.5 To promote and facilitate high quality sustainable waste recovery and disposal infrastructure/technology including composting (anaerobic digester) plants for managing organic solid waste at appropriate locations.	% increase in waste processing infrastructure.	Environment
R1.6 To promote and facilitate high quality sustainable waste recovery and disposal infrastructure/technology including composting (anaerobic digester) plants for managing organic solid waste at appropriate locations.	% increase in waste processing infrastructure.	Environment
R1.7 To identify suitable sites for additional recycling centres and bring bank facilities.	Potential sites mapped.	Environment
R1.8 To support the continued expansion of Bring Bank networks to a target density of 1 bank per 500 households.	Number of bring banks per household.	Environment
R1.9 To support the acceptance of WEEE at all Recycling Centres for household waste.	% increase in wastes accepted for recycling.	Environment
R1.10 To support the development of facilities to cater for commercial waste not provided for in the kerbside collection system such as WEEE, C&D type waste.	% increase in wastes collected.	Environment
R2 Communuity Engagement		
R2.1 To promote and facilitate communities to become involved in environmental awareness activities and community-based recycling initiatives or environmental management initiatives that will lead to local sustainable waste management practices.	Community engagement plan developed Q4 2018.	Environment

Action	Indicator	Owner
R2.2 To seek the effective engagement of local communities in County Meath to promote their role in recycling waste and tackling the problems of illegal dumping within the county through liaising with the Environmental Awareness Officer.	Community engagement plan developed Q4 2018.	Environment
R2.3 To encourage community/voluntary groups to establish additional waste services or facilities (e.g. small scale facilities for recycling, reuse/repair) in their area and assist them to develop a strategy to provide such facilities for and with members of their community.	Community engagement plan developed Q4 2018.	Environment
R2.4 To continue to promote and encourage the education and awareness on all issues associated with waste management at school, household, enterprise and community level. This will include the promotion of waste reduction by encouraging the minimisation, re-use, recycling and recovery of waste within the county.	Community engagement plan developed Q4 2018.	Environment
R3 Circular Economy		
R3.1 Explore opportunities to move towards a circular economy.	Study to outline opportunities.	Environment

Section 13

Water

#MAKEITMEATH

13. WATER

13.1 Overview

Why

Climate change will increase the frequency of heavy rainfall events, storm surges and their duration, thereby increasing the risk of flooding in vulnerable areas of the county. Equally, increased temperatures and prolonged dry spells will increase the likelihood of drought and water shortages. These impacts will have specific impacts on County Meath's residents and businesses, and must be addressed.

Meath County Council's role in the management of water has changed in recent years, with significant changes in responsibility for water supply and waste water treatment. Irish Water was formed in July 2013 as a semi-state company under the Water Services Act 2013. As of January 2014, Irish Water replaced local authorities as a single provider of water and wastewater services.

It is responsible for the operation of public water and waste water services, including the management of national water assets, maintenance of the system, investment and planning, and managing capital projects. Meath County Council will work closely with Irish Water to inform and influence the timely provision of infrastructure within the County, in line with Meath's Settlement & Core Strategy.

Meath County Council is actively working with the Office of Public Works (OPW) to tackle the challenge of water quality and flooding. The OPW has responsibility for leading and co-ordinating the implementation of the National Flood Risk Policy approved in 2004, which involves the development of a planned programme of prioritised feasible works, with a greater emphasis for non-structural measures.

National Flood risk management plans were recently announced by the Government and providing for 118 new schemes two of which are fully or partially in County Meath namely Mornington & Drogheda. By improving the way we manage our water, we can realise the following benefits:

- Economic. By ensuring we keep the county flood resilient, we will reduce the amount of money we have to spend on repairing our infrastructure. Equally, we will ensure that County Meath remains well connected to Dublin and key transport hubs, as identified in the Economic Development Plan.
- Quality of life. It is important to recognise the human impact of floods. Protecting people's homes from flooding will not only save them money but will also help them to avoid the significant emotional impact that comes with the stress and anxiety associated with flooding.
- Health. Flooding can have a significant impact on the spread of diseases, availability of clean water and food. By ensuring we have a flood resilient county, these negative impacts can be avoided.

How

Although the OPW and Irish Water have a significant role to play in maintaining a high quality water supply and resilience to flooding, we have identified some additional actions that can be taken in order to help County Meath adapt to wetter winters and drier summers. These activities are additional to the strong role that we have to play in the way that our natural resources are planned and managed. This is discussed later in this strategy.
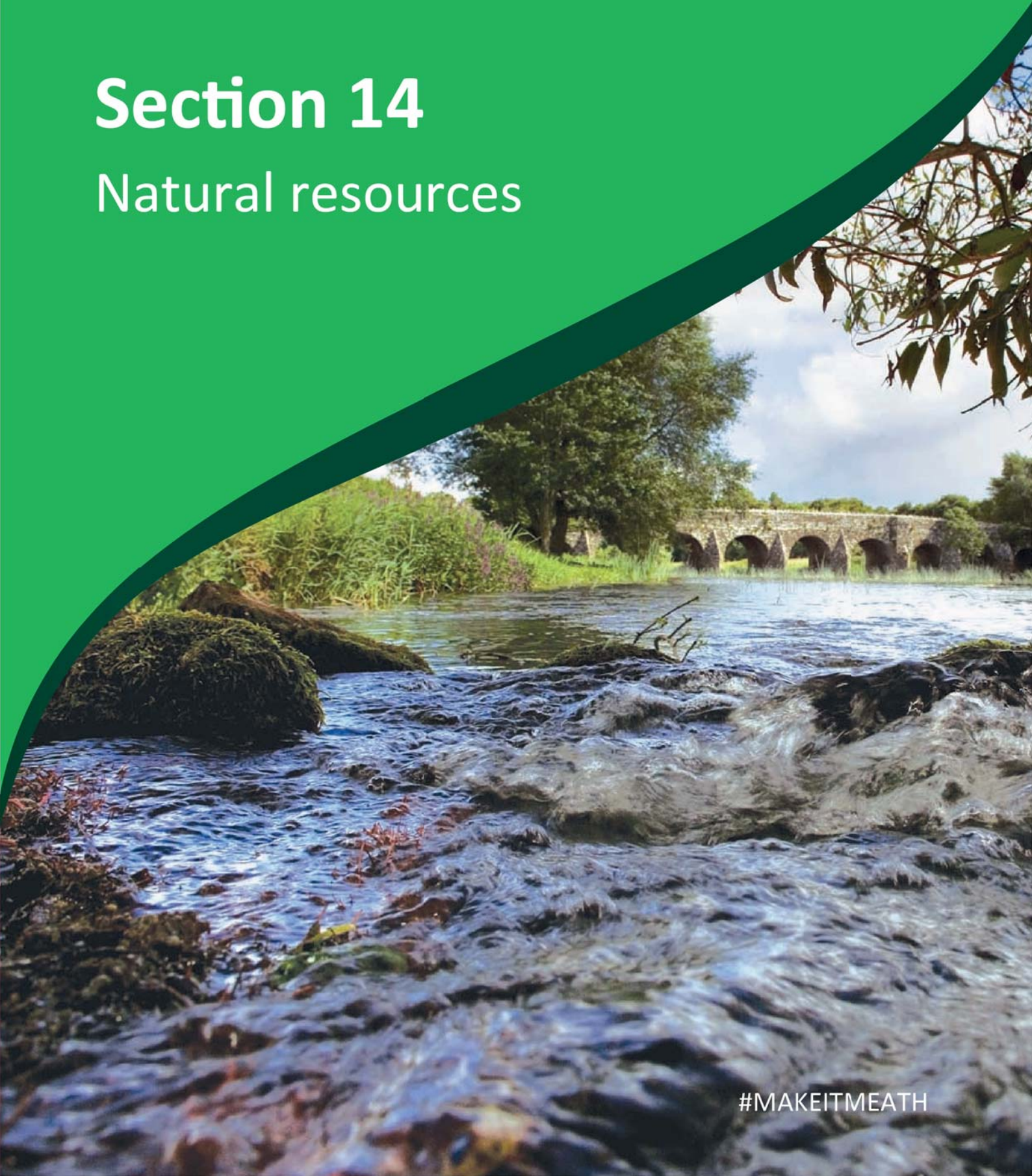
13.2 Specific Actions

The table below summarises the actions we are planning to undertake in the period 2019-2025. It includes a high level ambition, with specific actions, indicators and owners.

Action	Indicator	Owner
W1 Flood resilience		
W1.1 Investigate land management opportunities for water attenuation in council owned land.	Project implemented.	Environment
W1.2 Review of infrastructure to identify assets at risk from flooding/extreme rainfall to inform low-cost 'minor works' flood relief schemes.	Risk review.	Environment
W1.3 Review data from closed landfill to ensure rainfall events don't impact contaminants leaving the site.	Acceptable leachate levels.	Environment
W1.4 Increased collaboration between water team and engineering team.	Process change.	Transport/ Environment
W1.5 All OPW minor work scheme applications to go past water team to ensure a joined up approach.	Process change.	Transport/ Environment
W1.6 Engage with ESB to understand level of risk.	Details of ESB risk assessment.	Environment
W2 Water Conservation		
W2.1 To seek to secure water resources for County Meath in conjunction with Irish Water from any project supplying water to the Greater Dublin Area from the River Shannon or any other water source.	Water performance indicators.	Water Resources
W2.2 To liaise, support and work with Irish Water in the development and upgrade of the water supply systems so as to ensure that County Meath has an adequate, sustainable and economic supply of suitable quality piped water for all users.	Water performance indicators.	Water Resources
W2.3 To continue to support Irish Water's Water Conservation Programme to conserve valuable resources by reducing leakage.	# pipes repaired.	Water Resources

Section 14

Natural resources

14. NATURAL RESOURCES

14.1 Overview

Why

Future trends mean that the benefits we get from biodiversity, green infrastructure and our wider natural resources have never been so valuable. Using our natural resources more effectively will not only play a key role in helping us to adapt to a changing climate but will also create multiple benefits for our residents, including improved health and wellbeing.

Strategically planned and managed green infrastructure should comprise areas with high quality biodiversity (uplands, wetlands, peatlands, rivers and coasts), farmed and wooded lands, and other green spaces that conserve ecosystem values which provide essential services to society. Linked together, these strategically planned networks of green elements are able to provide multiple benefits in the form of supporting a green economy, improving quality of life, protecting biodiversity and enhancing the ability of ecosystems to deliver services such as disaster risk reduction, water purification, air quality, space for recreation and climate change mitigation and adaption.

Emissions from agriculture comprise 24% of County Meath's estimated emissions. It is also one of the sectors that is most at risk from a changing climate due to theincreased costs for farmers as they seek to cope with climate change. Adaptation will require earlier planting and harvesting dates, lower fertiliser application rates and significant capital investment in irrigation equipment. Farmers will also need to be aware of opportunities which arise as a result of adverse changes in agriculture elsewhere in the EU as this may create new market opportunities.

By improving the way we manage our natural resources, we can realise the following benefits:

- Health and well-being. Good quality, accessible green space and infrastructure can provide many potential health and well-being benefits including increased life expectancy and reduced health inequality; improvements in levels of physical activity and health, and promotion of psychological health and mental well-being.

- Economic growth and investment. Placing accurate, economic values on green infrastructure or its green space components is vital to support the case for sustained investment. There is good evidence that green space can have a positive impact on local economic regeneration, especially for job creation, entrepreneurship, increasing land value and inward investment.

- Land regeneration. Previously developed, derelict, underused or neglected (brownfield) land in and around urban centres can deliver social, environmental and economic benefits via conversion to green infrastructure.

- Economic. The agriculture sector is sensitive to climate change. By supporting our agricultural community to adapt to a changing climate, we can help to protect it. Equally, by using natural resources to safeguard our urban environment, we can save significant sums of money that would be required for maintenance and building of new defences (e.g. flood defences).

How

To realise these opportunities, our actions will be focused on the following:

- To engage with the agricultural community to understand how we can help make the sector more resilient.

- Use natural resources to help us mitigate and adapt to climate change.

- Explore how we can protect our coastlines using natural methods.

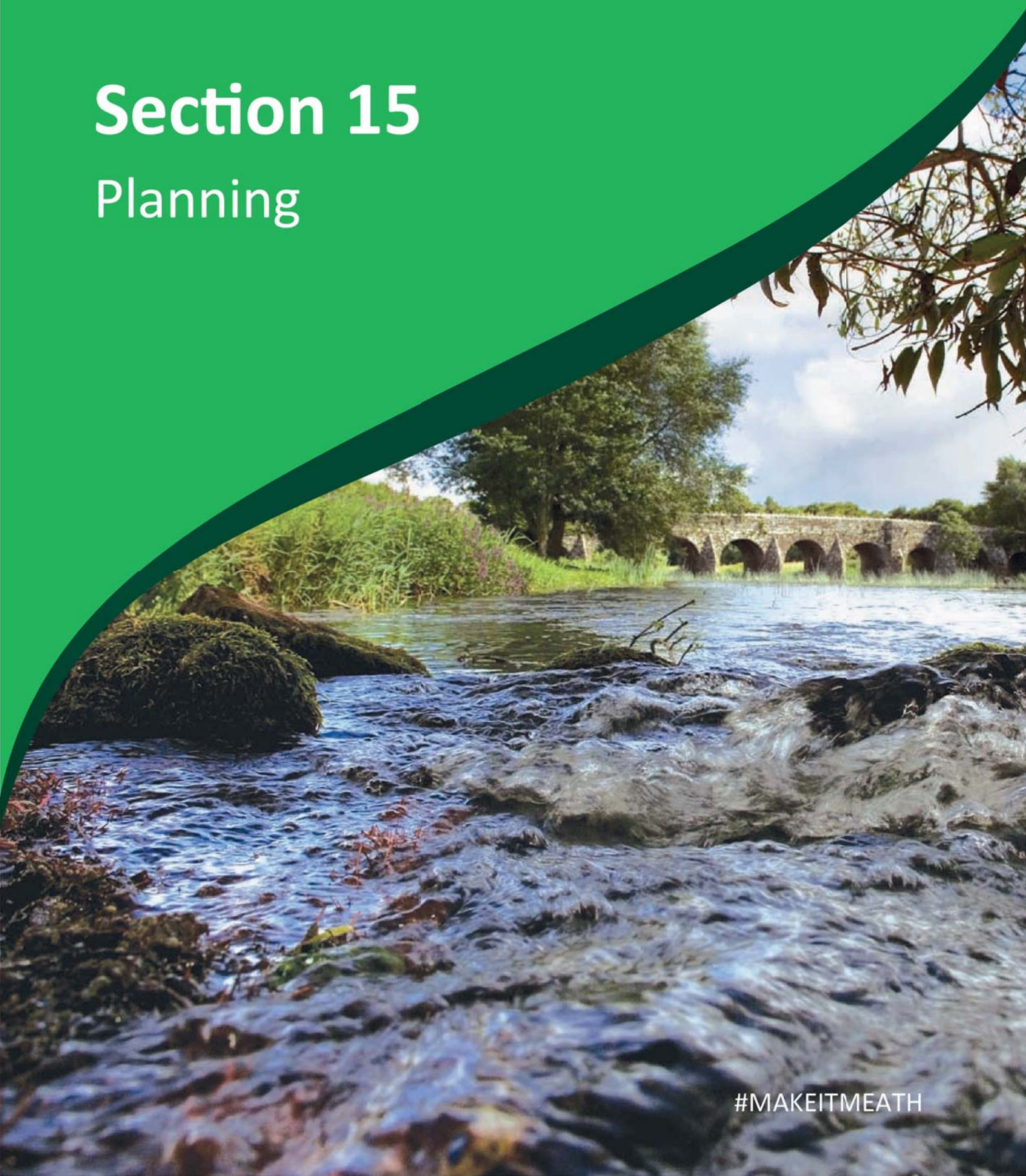- Use the natural world to inspire school children to take action.

14.2 Specific Actions

The table below summarises the actions we are planning to undertake in the period 2019-2025. It includes a high level ambition, with specific actions, indicators and owners.

Action	Indicator	Owner
NR1 Agriculture		
NR1.1 Engage with the agricultural community to understand how the local council can support resilience efforts.	# engagement sessions.	SPC / Environment
NR2 Use natural resources to mitigate and adapt to climate change.		
NR2.1 Explore the potential for a policy of biodiversity net gain.	Project implemented with clear recommendation for policy development.	Environment
NR2.2 Explore the potential for ecosystem service valuation.	Project implemented with case study.	Corporate Services/ Environment
NR2.3 Support partners to improve the condition of peatland to reduce emissions.	# articles shared # events promoted.	Environment
NR2.4 Introduce a spreading buffer zone to the flood zones.	Introduction of increased buffer zone.	Environment
NR2.5 Develop a green infrastructure strategy that incorporates climate change mitigation and adaptation benefits specifically sustainable urban drainage systems that use plants and trees.	Green infrastructure strategy.	Environment
NR3 Protect our coastlines.		
NR3.1 Introduce policy on the location of new developments considering erosion/storm surges.	Policy on location of development in relation to coastline.	Environment/ Planning
NR3.2 Partner with an academic institution/study to increase the understanding of risk of erosion.	Project implemented.	Environment/ Planning
NR4 Schools engagement		
NR1.1 Plant a tree in every school in tree week.	# trees planted.	Environment/ Planning

Section 15

Planning

#MAKEITMEATH

15. PLANNING

15.1 Overview

Why

One of our key roles is to ensure County Meath is properly planned. If we can do this with climate change in mind, it will help us to avoid 'locking in' high carbon and climate-vulnerable developments and land use patterns in the long-term.
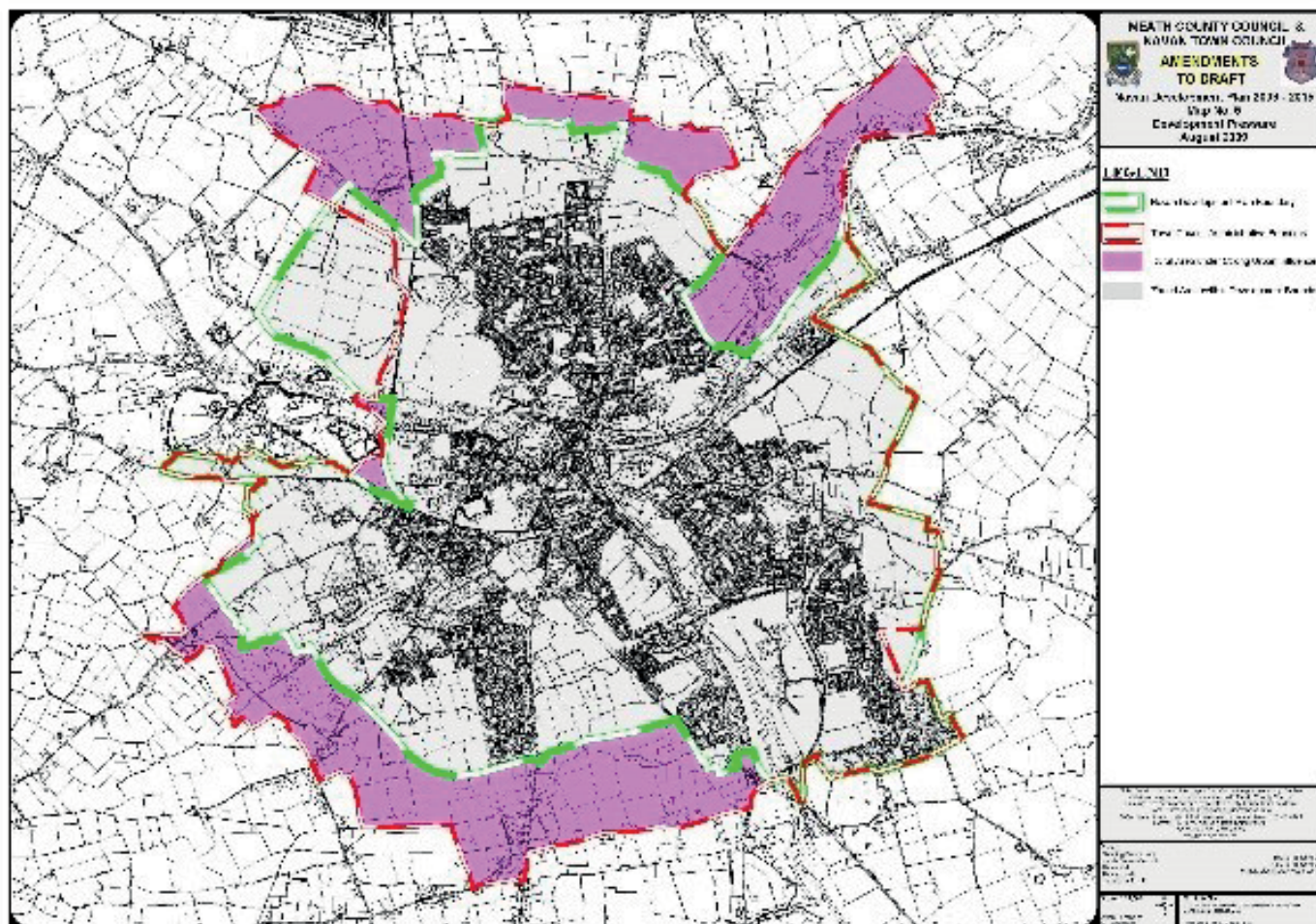
By planning properly, we can increase the viability of new public and active transport routes renewable energy projects and business cases for investing in areas of currently underused and low quality greenspace. New developments served by such infrastructure will become a significant part of the appeal for existing and new domestic and commercial occupants.

To enable this, we will need to be bold in our use of local planning powers, in order to ensure that we make use of it as a tool for delivering on the objectives that can benefit our businesses and residents.

A critically important and immediate first step is to ensure that this strategy is aligned with the County Development Plan.

How

By delivering on the actions listed in this strategy, we hope to work towards each of the significant benefits listed above. This next part of the strategy focuses on how we can actively support businesses to transition to a low carbon economy and how we will communicate to the business communities how we are taking action.

15.2 Specific Actions

The table below summarises the actions we are planning to undertake in the period 2019-2025. It includes a high level ambition, with specific actions, indicators and owners.

Action	Indicator	Owner
P1 Use planning policy to promote near zero energy buildings for new development.		
P1.1 To seek to improve the energy efficiency in developments in accordance with the Building Regulations Part L (Conservation of Fuel and Energy) and exceeding these standards where possible.	% compliant planning permissions.	Planning
P1.2 To support the use of heat pumps instead of gas boilers where suitable.	% compliant planning permissions.	Planning
P1.3 To encourage development proposals to maximise energy efficiency through siting, layout, design or which incorporate best practice in energy technologies, conservation and implementation of smart technology.	% compliant planning permissions.	Planning
P1.4 To require, where feasible and practical, the provision of photovoltaic solar panels in new residential developments, commercial developments and public buildings for electricity generation/storage and/or water heating purposes.	% compliant planning permissions.	Planning
P2 Promote and integrate Green Infrastructure Strategies into all regional and local planning policies		
P2.1 To continue the development of a network of greenways in the county in accordance with the Department of Transport, Tourism and Sport Strategy for Future Development of Greenways when adopted.	Distance of new installed greenways (km).	Planning
P2.2 To require, where feasible and practical, the provision of green roof technology for all new public buildings (council buildings, school buildings, hospitals, community centres, sports facilities, libraries, garda stations etc.), to assist in flood alleviation, insulation and improved biodiversity, and to actively promote these measures where appropriate in new commercial and industrial buildings.	# green roofs installed.	Planning
P2.3 To encourage the use of green roof technology particularly on apartment, commercial, leisure and educational buildings. (See also Section 11.3 re; Residential Development).	# green roofs installed.	Planning
P2.4 To engage in the Compulsory Purchase Order process when required in order to facilitate the timely delivery of the greenway programme within the county.	Distance of new installed greenways (km).	Planning
P3 Ensure new developments are located close to public transport and are well-served by walking and cycling facilities		
P3.1 To promote higher residential development densities in settlement centres along public transport corridors, that are not located in areas sensitive to flooding or will increase temperatures of urban areas.	% of planning permissions within 500m (10 minute walk) of bus/rail stop; % reduction of parking; % increase in bike parking facilities.	Planning

Action	Indicator	Owner
P3.2 To promote sustainable land use planning measures which facilitate transportation efficiency, economic returns on transport investment, minimisation of environmental impacts and a general shift towards the use of public transportation throughout the county.	% of planning permissions within 500m (10 minute walk) of bus/rail stop; % reduction of parking; increase in bike parking facilities.	Planning
P3.3 Promoting higher residential development along higher capacity public transport corridors.	% of planning permissions within 500m (10 minute walk) of bus/rail stop; % reduction of parking; increase in bike parking facilities.	Planning
P3.4 To ensure that new developments in Large Growth Towns I and II and Sustainable Moderate Grown Towns are laid out so as to facilitate the provision of local bus services.	% of planning permissions within 500m (10 minute walk) of bus/rail stop; % reduction of parking; increase in bike parking facilities.	Planning
P3.5 To support and facilitate the integration of land use with transportation infrastructure through the development of sustainable compact settlements which are well served by public transport infrastructure.	% of planning permissions within 500m (10 minute walk) of bus/rail stop; % reduction of parking; increase in bike parking facilities.	Planning
M3.6 Land use and transportation. Looking at optimal zoning for next CDP based on mobility.	Included in next County Development Plan.	Planning
P4 Safeguard future rail development		
P4.1 To facilitate and encourage the upgrade of existing railway stations and to protect lands required for the upgrading of existing railway lines or stations, or the provision of new railway stations throughout the county	Safeguarded route.	Planning
P5.1 To identify suitable lands to provide for park and ride facilities at appropriate locations in the county.	GIS layer of suitable park and ride locations.	Planning
P5.2 To promote and support the provision of park and ride facilities which improve public transport accessibility without worsening road congestion or which cause increased car travel distances at appropriate locations within the county.	% increase in park and ride facilities.	Planning
P5.3 To support and facilitate the provision of an accessible taxi and hackney carriage service in the county, particularly in the main urban centres.	% increase in taxi and hackney carriage services in urban centres.	Planning
P5.4 To facilitate the development of properly designated taxi ranks to facilitate additional public transport infrastructure.	% increase in taxi and hackney carriage services in urban centres.	Planning
P5.5 To provide public transport interchange facilities, including facilities for taxis, at appropriate points on the public transport network.	% increase in interchange facilities.	Planning
P6 Use planning policy to promote active transport		
P6.1 To encourage, where appropriate, the incorporation of safe and efficient cycleways, accessible footpaths and pedestrian routes into the designs for town centres/neighbourhood centres, residential, educational, employment, recreational developments and other uses.	% increase in pavements and cycleways.	Planning

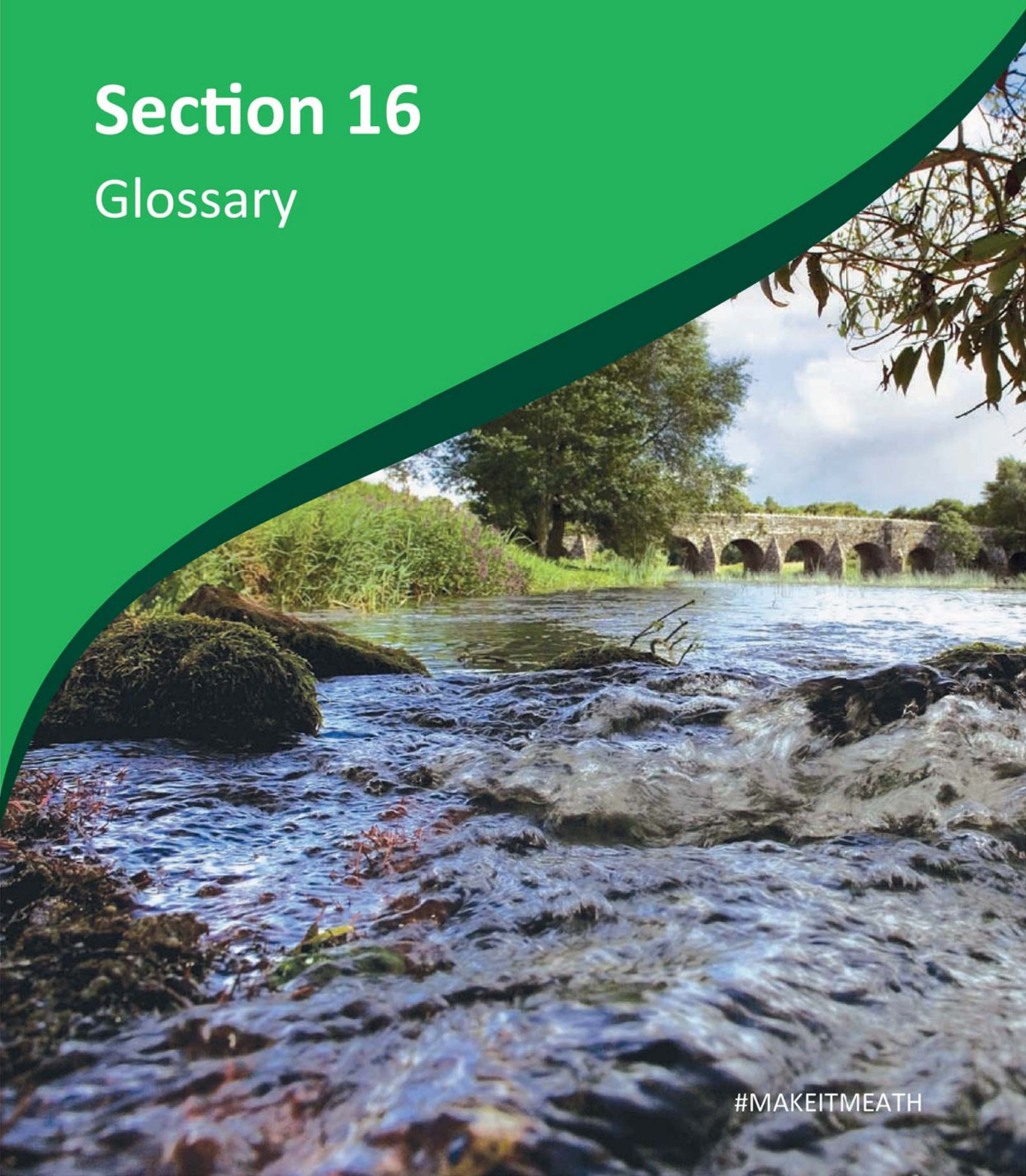| Action	Indicator	Owner
P6.2 To require that adequate facilities for the secure parking of bicycles be provided at convenient locations close to public transport nodes and public transport interchanges.	Increase in bike parking.	Planning
P6.3 To prioritise the movement of pedestrians and cyclists in proximity to public transport nodes.	# road layout changes.	Planning
P6.4 To request pedestrian permeability plans as part of all new developments.	% compliant planning permissions	Planning
P7 Ensure Development Plan policies support supports roll out of electric vehicles		
P7.1 To facilitate the provision of electricity charging infrastructure for electric vehicles both on street and in new developments in accordance with car parking standards.	% increase in EV charging points.	Planning
P7.2 Explore sharing mobility models and develop suitable policies that could benefit both public and private sector operators.	Sharing mobility policy.	Planning
P8 Using policy to promote and support clean energy and energy efficiency		
P8.1 To support Ireland's renewable energy commitments by promoting the use of renewable technologies, as per policies and objectives listed in the County Development Plan. This includes wind, solar, district heating systems in urban residential and enterprise developments where such developments will not negatively impact upon the surrounding landscape, environment, biodiversity or local amenities and will use renewable energy.	% increase in renewable energy generation.	Planning
P8.2 To encourage the development of wind energy, in accordance with government policy and with regard to the Landscape Characterisation Assessment of the county and the Wind Energy Development Guidelines (2006), or any revisions thereof.	% increase in renewable energy generation.	Planning
P8.3 To support and encourage pilot schemes which promote innovative ways to incorporate energy efficiency.	# schemes promoting innovative energy efficiency.	Planning
P9 Use planning policy to protect and enhance our flood defences		
P9.1 To undertake a review of the Strategic Flood Risk Assessment for County Meath following the completion of the flood mapping which is being developed as part of the Eastern Catchment Flood Risk Assessment and Management (CFRAM) Study and Fingal East Meath Flood Risk Assessment and Management Study (FEMFRAMS). This will also need to demonstrate how climate change has been taken into account.	Review undertaken	Planning
P9.2 To restrict new development within floodplains other than development which satisfies the justification test, as outlined in the Planning System and Flood Risk Management Guidelines 2009 for Planning Authorities (or any updated guidelines).	% planning permissions grated outside of floodplain.	Planning

Action	Indicator	Owner
P9.3 To ensure flood relief measures are suitably designed to protect the conservation objectives of Natura 2000 sites and to avoid direct or indirect impacts upon qualifying interests or Natura 2000 sites.	% flood defences compliant with guidance.	Planning
P9.4 To protect and enhance the county's floodplains, wetlands and coastal areas subject to flooding as green infrastructure, which provide space for storage and conveyance of floodwater and ensure that development does not impact on important wetland sites within river/stream catchments.	# of improved floodplains.	Planning
P9.5 To require the use of sustainable drainage systems (SuDS) to minimise and limit the extent of hard surfacing and paving, and require the use of sustainable drainage techniques where appropriate for new development or for extensions to existing developments, in order to reduce the potential impact of existing and predicted flooding risks.	% compliant planning permissions.	Planning
P9.6 To facilitate the provision of new or the reinforcement of existing flood defences and protection measures where necessary and in particular to support the implementation of flood schemes being progressed through the Part Viii planning process during the lifetime of the plan.	# improved flood defences.	Planning
P9.7 To require all development proposals to address the presence or absence of invasive alien species on proposed development sites and (if necessary) require applicants to prepare and submit an Invasive Species Management Plan where such a species exists to comply with the provisions of the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. 477/2011).	% compliant planning permissions.	Planning
P9.8 To ensure that all new developments comply with Section 3.12 of the Greater Dublin Regional Code of Practice for Drainage Works V6 which sets out the requirements for new developments to allow for Climate Change.	% compliant planning permissions.	Planning
P9.9 To implement the findings and recommendations of the Strategic Flood Risk Assessment prepared as part of the County Development Plan review, ensuring climate change is taken into account.	Updated CDP.	Planning
P9.10 To require that a flood risk assessment is carried out for any development proposal where flood risk may be an issue in accordance with the Planning System and Flood Risk Management – Guidelines for Planning Authorities (DoECLG/OPW, 2009). This assessment shall be appropriate to the scale and nature of risk to and from the potential development and consider the impact of climate change.	% compliant planning permissions.	Planning
P9.11 To ensure that flood risk management is incorporated into the preparation of Local Area Plans in accordance with The Planning System and Flood Risk Management - Guidelines for Planning Authorities (2009).	# Local Area Plans.	Planning

Action	Indicator	Owner
P10 Using planning policy to help conserve our water resources		
P10.1 To utilise the existing water supply in an efficient and fair manner and in the best interests of the proper planning and sustainable development of the county.	Litres of water used.	Planning
P10.2 To protect and develop, in a sustainable manner, the existing groundwater sources and aquifers in the county and to manage development in a manner consistent with the protection of these resources.	% compliant planning permissions for new water supplies.	Planning
P10.3 To consider future climate scenarios and water availability as part of decision making around water supplies.	% compliant planning permissions for new water supplies.	Planning
P11 Using planning policy to protect and enhance our natural resources		
P11.1 To maintain and enhance our natural coastal defences to increase resilience to climate change.	# projects.	Planning
P11.2 To ensure the county's natural coastal defences, such as beaches, sand dunes, salt marshes and estuary lands, are protected and are not compromised by inappropriate works or forms of development.	# planning permissions within 1km of coastline.	Planning
P11.3 To employ soft engineering techniques as an alternative to hard coastal defence works, wherever possible.	Record of compliant coastal defence works.	Planning
P11.4 To Identify, prioritise and implement necessary coastal protection works subject to the availability of resources, whilst ensuring a high level of protection for natural habitats and features, and ensure due regard is paid to visual and other environmental considerations in the design of any such coastal protection works. This will include the identification of coastal areas sensitive to climate change, particularly coastal erosion.	Coastal protection works plan.	Planning
P11.5 To prohibit development along the coast outside existing urban areas where such development could not be adequately safeguarded over the lifetime of the development without the need to construct additional coastal defences. This will include areas that may become unsuitable as climate change increases.	# planning permissions within 1km of coastline.	Planning
P12 Using planning policy to improve waste management		
P12.1 To require the provision of bring-banks, bottle banks or other appropriate recycling facilities as part of the overall development in the case of new or extended commercial, employment, educational, recreational facilities and managed residential developments. (See Section 11.8 Development Management Standards re; Commercial Development).	% compliant planning permissions.	Planning

Action	Indicator	Owner
P12.2 To ensure that household waste recycling is adequately addressed in all proposed new residential developmentsby taking this into account during the development management process.	% compliant planning permissions.	Planning
P12.3 To require developers to prepare construction and demolition waste management plans for new construction projects over certain thresholds, which shall meet the relevant recycling/recovery targets for such waste in accordance with the national legislation and national and regional waste management policy.	% compliant planning permissions.	Planning
P13 Keeping our communities safe.		
P13.1 Update emergency plans for future climate risks. Future emergency plans should refer to climate change, specifically considering; • Flooding • Extreme heat	Updated emergency plans.	Chief Fire Officer / Michael Fitzsimmons

Section 16

Glossary

16. GLOSSARY

Active transport:	Relates to physical activity undertaken as a means of transport. It includes travel by foot, bicycle and other non-motorised vehicles.
Adaptation:	This involves actions taken to counteract new or changing environmental challenges and reduce the vulnerability of people and places to the e ects of climate change. It can take place in anticipation of an event or as a response to it, and can include both physical and behavioural changes.
Air pollutants:	Any substance in air that could, in high enough concentration, harm animals, humans, vegetation, and/or materials. Most of this air pollution we cause results from the burning of fossil fuels, such as coal, oil, natural gas, and gasoline to produce electricity and power our vehicles.
Baseline Emissions Inventory:	Quantifies the amount of CO2 emitted due to energy consumption in the territory of the local authority, for the chosen baseline year.
Biodiversity:	The variety of plant and animal life in a particular areas, a high level of which is usually considered to be important and desirable.
Carbon dioxide (CO_2):	This is one of the main greenhouse gases (see below) which is mainly released when carbon rich fossil fuels including coal, oil and gas are burned for fuel.
Circular Economy:	An alternative to a traditional linear economy (make, use, dispose) in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each life.
Climate Change:	A pattern of change affecting global or regional climate, as measured by yardsticks such as average temperature and rainfall, or an alteration in frequency of extreme weather conditions. This variation may be caused by both natural processes and human activity. Global warming is one aspect of climate change.
Climate Projections:	Potential future climate conditions calculated by computer-based models of the Earth system. Projections are based on sets of assumptions about the future (scenarios) that may or may not be realised.
Covenant of Mayors:	The Global Covenant of Mayors for Climate & Energy is an international alliance of cities and local governments with a shared long-term vision of promoting and supporting voluntary action to combat climate change and move to a low emission, resilient society.
Decarbonisation:	The reduction or removal of carbon dioxide from energy sources, such as through using more renewable energy to produce electricity.
Ecosystems:	An ecosystem includes all of the living things (plants, animals and organisms) in a given area, interacting with each other, and also with their non-living environments (weather, earth, sun, soil, climate, and atmosphere).
Extreme weather:	When a weather event is significantly different from the average or usual weather pattern. This may take place over one day or a period of time. A flash flood or heat wave are two examples of extreme weather in the Ireland.

Fossil fuels:	Natural resources, such as coal, oil and natural gas, containing hydrocarbons. These fuels are formed in the Earth over millions of years and produce carbon dioxide when burnt. As they are non-renewable, this means that their supply is limited and they will eventually run out with continued use.
Global Warming:	The steady rise in global average temperature in recent decades, which experts believe is largely caused by man-made greenhouse gas emissions. The long-term trend continues upwards, they suggest, even though the warmest year on record, according to the UK's Met Office, is 1998.
Green infrastructure:	This refers to the use of 'green' concepts in urban building, to improve storm-water management, climate adaptation, biodiversity, air quality, and many other environmental factors. This could include more tree planting to increase shading, and the installation green roofs and walls, amongst others.
Greenhouse Gas Emissions:	Greenhouse gases such as water vapour, methane and carbon dioxide stop heat escaping from the Earth into space. An increased greenhouse effect can lead to global warming and climate change.
IPCC:	The Intergovernmental Panel on Climate Change is a scientific body established by the United Nations Environment Programme and the World Meteorological Organization. It reviews and assesses the most recent scientific, technical, and socio-economic work relevant to climate change.
Low-carbon economy:	An economy based on low carbon power sources that has a minimal output of greenhouse gas (GHG) emissions, but specifically refers to minimal emissions of carbon dioxide.
Mitigation:	Mitigation is action taken to reduce activities that are the man-made causes of climate change. These activities include burning fossil fuels, deforestation and livestock farming – all of which increase concentrations of greenhouse gases (GHG) in the atmosphere, producing a blanketing effect and warming the Earth.
Probabilistic climate modelling:	Modelled projections of future climate conditions, which assign a probability level to each climate outcome. This allows you to see how likely each estimated climate outcome is.
Renewable Energy:	Energy that is created from sources that can be replenished in a short period of time. The five renewable sources used most often are: biomass (such as wood and biogas), the movement of water, geothermal (heat from within the earth), wind, and solar.
Resilience:	The capacity of a community, business, or natural environment to prevent, withstand, respond to, and recover from a (climate –related) disruption.
Smart Grid:	An electrical grid (which delivers electricity from the power plant to homes and businesses), which includes a variety of digital measures to improve energy efficiency and to improve response to changes in demand. This will include smart meters, smart appliances, renewable energy resources, and energy efficient resources.
Sustainable Development:	Development that meets the needs of the present without compromising the ability of future generations to meet their own needs.