Rialtas na hÉireann
Government of Ireland

CLIMATE ACTION PLAN 2023
CAP23

Changing Ireland for the Better

Contents

Foreword

Climate Action is the most pressing long-term global challenge of our time and is a significant priority for this Government.

Through our strengthened climate legislation, Our Shared Future, and our annually updated Climate Action Plan, we have set ourselves the ambition of halving Ireland's greenhouse gas emissions by the end of the decade, and of putting Ireland on course to becoming carbon neutral by 2050.

We are determined that Ireland will play its full part in EU and global efforts to stop climate change and, in so doing, harness the opportunities and rewards that will come from moving quickly to a low-carbon society.

We must harness our massive untapped, renewable natural resources – providing greater energy security, stable prices, more jobs, and regional development.

Achieving these ambitions will require a coordinated effort across Ireland and every economic sector will be involved. It requires no less than a national transformation over the coming years in how we work, travel, heat our homes, source our energy and use our land.

This is a national endeavour that will require a positive, sustained engagement from people across all communities, all walks of life and all sectors.

Government will continue to lead on climate action, to provide support and direction, and to introduce the system changes that will make the transformation as smooth and successful as possible. Ministers have now assumed individual legal responsibility to ensure that the sectors they oversee are equipped and enabled to achieve the necessary emissions reductions.

This plan, which outlines the actions required to 2035 and beyond, will guide our joint efforts over the coming years. It will be updated annually and will be improved and strengthened when required, allowing us to learn from our experiences in what is a very significant and complex undertaking.

While we have yet to see the large emissions reductions that will be required to achieve our goals, we will continue to put in place the policies and measures that will allow these reductions to be achieved over the remainder of the decade and beyond. We will also continue to deal with the climate change that is already upon us and strengthen our resilience to the adverse impacts of extreme weather events that are becoming increasingly frequent.

We have a distance to travel, but together we can and will pursue the best interests of Ireland and its people through responsible, transformative climate action. We must take better care of our planet. This generation must be the generation to pass on our planet in a better condition than we inherited it.

Leo Varadkar TD
Taoiseach

Micheál Martin TD
Tánaiste and Minister for Foreign Affairs and Defence

Eamon Ryan TD
Minister for the Environment, Climate and Communications and Transport

Glossary of Acronyms

°C	Degrees Celsius
3-NOP	3-Nitrooxypropanol
ACE	Action for Climate Empowerment
AD	Anaerobic Digestion
AECM	Agri-Environment Climate Measure
AFIR	Alternative Fuels Infrastructure Regulation
AR5	IPCC Fifth Assessment Report
AR6	IPCC Sixth Assessment Report
BCP	Broadband Connection Point
BER	Building Energy Rating
BIK	Benefit in Kind
BMW	Biodegradable Municipal Waste
BOGA	Beyond Oil and Gas Alliance
CADB	Climate Action Delivery Board
CAMG	Climate Action Modelling Group
CAP	Climate Action Plan
CAP	Common Agricultural Policy
CARO	Climate Action Regional Office
CAU	Climate Action Unit
CC22	Climate Conversations 2022
CC23	Climate Conversations 2023
CCCC	Climate Communications Coordination Committee
CCAC	Climate Change Advisory Council
CCIM	Climate Change in the Irish Mind
CCS	Carbon Capture and Storage
CECLT	Citizen Engagement and Climate Literacy Taskforce
CEP	Clean Export Premium
CH_4	Methane
KIC	Knowledge and Innovation Community (KIC)
CO_2	Carbon Dioxide
CO_2eq.	Carbon Dioxide Equivalent
COALESCE	Collaborative Alliances for Societal Challenges
COP26	26th Conference of the Parties
COP27	27th Conference of the Parties
COST	European Cooperation in Science and Technology
COVID-19	SARS-CoV-2 / Coronavirus Disease 2019
CPR	Construction Products Regulation
CRU	Commission for the Regulation of Utilities

CSO	Central Statistics Office
CSP	Common Agricultural Policy Strategic Plan
DART	Dublin Area Rapid Transit
DAFM	Department of Agriculture, Food and Marine
DCEDIY	Department of Children, Equality, Disability, Integration and Youth
DECC	Deparment of the Environment, Climate and Communications
DETE	Department of Enterprise, Trade, and Employment
DG REFORM	Directorate General for Structural Reform Support
DHLGH	Department of Housing, Local Government, and Heritage
DoT	Department of Transport
DMAP	Designated Marine Area Plan
DMS	Demand Management Strategy
DPER	Department of Public Expenditure and Reform
DMURS	Design Manual for Urban Roads and Streets
EDRRS	Enhanced Decommissioning, Rehabilitation, and Restoration Scheme
EED	Energy Efficiency Directive
EGFSN	Expert Group on Future Skills Needs
EI	Enterprise Ireland
EIC	European Innovation Council
EIP	European Innovation Project
EIT	European Institute of Innovation and Technology
EMAS	Eco Management and Audit Scheme
EPA	Environmental Protection Agency
EPBD	Energy Performance of Buildings Directive
ERDF	European Regional Development Fund
ESB	Electricity Supply Board
ESBN	Electricity Supply Board Networks
ESD	Education for Sustainable Development
ESG	Environment, Social and Governance
ESRI	Economic, Social Research Insititute
ESRS	European Union Sustainability Reporting Standards
ETB	Education and Training Board
ETS	Emissions Trading System
EU	European Union
EU JTF	European Union Just Transition Fund
EU TEN-E	European Union Trans-European Energy Networks
EV	Electric Vehicle
EXEED	Excellence in Energy Efficient Design
F-Gases	Fluorinated Greenhouse Gases

FarmPEAT	Farm Payments for Ecological and Agricultural Transitions
FET	Further Education and Training
GCOS	Global Climate Observing System
GFC	Gross Final Consumption
GHG	Greenhouse Gas
GPP	Green Public Procurement
GSI	Geological Survey Ireland
GTF	Green Transition Fund
GW	Gigawatt
GWh	Gigawatt-Hour
GWP	Global Warming Potential
Ha -	Hectare
HAC	High Ambition Coalition
HDV	Heavy-Duty Vehicle
HEI	Higher Education Institutions
HfA	Housing for All
HGV	Heavy Goods Vehicle
HSE	Health Service Executive
ICE	Internal Combustion Engine
IDA	Industrial Development Agency
IEA	International Energy Agency
IFI	International Financial Institutions
IFS	International Financial Services
IRC	Irish Research Council
IT	Information Technology
IPCC	Intergovernmental Panel on Climate Change
ISO	International Organisation for Standardisation
ISGB	Irish Sovereign Green Bonds
KPI	Key Performance Indicator
Kt	Kiloton
kW	Kilowatt
kWe	Kilowatt Electric
kWh	Kilowatt-Hour
LA CAP	Local Authority Climate Action Plan
LDCs	Least Developed Countries
LED	Light Emitting Diode
LEU	Large Energy User
LIFE	L'Instrument Financier pour l'Environnement Programme
LOETB	Laois Offaly Education and Training Board

LTER	Long-Term Ecosystem Research
LULUCF	Land Use, Land Use Change and Forestry
M&R	Monitoring and Reporting
MAC	Maritime Area Consent
MAP-	Maritime Area Planning [Act 2021]
MARA	Marine Area Regulatory Authority
MaREI	Research Centre for Energy, Climate, and Marine Research and Innovation
MATS	Metropolitan Area Transport Strategies
Mbit	Megabit
Mbps	Megabits per Second
MD	Municipal District
MHDV	Medium- and Heavy-Duty Vehicles
Mm	Millimetre
MMC	Modern Methods of Construction
MPA	Marine Protected Area
MREP	Midlands Regional Enterprise Plan
MRTT	Midlands Regional Transition Team
MtCO2eq.	Million Tonnes of Carbon Dioxide Equivalent
MW	Megawatt
N2O	Nitrous Oxide
NAF	National Adaptation Framework
NASCO	National Agricultural Soil Carbon Observatory
NBP	National Broadband Plan
NCCLA	National Climate Conversation on Local Actions
NDCA	National Dialogue on Climate Action
NDP	National Development Plan
NECP	National Energy and Climate Plan
NESC	National Economic and Social Council
NewERA	New Economy and Recovery Authority
NFCS	National Framework for Climate Services
NGO	Non-Governmental Organisation
NIFTI	National Investment Framework for Transport in Ireland
NIR	National Inventory Report
NMPF	National Marine Planning Framework
NPF	National Planning Framework
NPWS	National Parks and Wildlife Service
NRRP	National Recovery and Resilience Plan
NSBAG	National Social and Behavioural Advisory Board
NTA	National Transport Authority

NTMA	National Treasury Management Agency
NYAC	National Youth Assembly on Climate
NZEB	Nearly Zero Energy Building
OECD	Organisation for Economic Cooperation and Development
OPW	Office of Public Works
OREDP II	Offshore Renewable Energy Development Plan II
OSPAR	Oslo and Paris Convention for the Protection of the Marine Environment of the North-East Atlantic
OSS	One Stop Shop
PMO	Project Management Office
PO	Principal Officer
PV	Photovoltaic
PSO	Public Service Obligation
R&D	Research and Development
R&I	Research and Innovation
RD&D	Research, Development, and Demonstration
RDI	Research, Development and Innovation
RED	Renewable Energy Directive
RES-H	Target for Renewable Heat
RESS	Renewable Electricity Support Scheme
SDGs	Sustainable Development Goals
SEAI	Sustainable Energy Authority of Ireland
SI	Statutory Instrument
SIDS	Small Island Developing States
SFI	Science Foundation Ireland
SME	Small and Medium-Sized Enterprise
SMP	Sustainable Mobility Policy
SOLAS	An tSeirbhís Oideachais Leanúnaigh agus Scileanna
SRTS	Safe Routes to School
SSG	Small-Scale Generation Support Scheme
SSRH	Support Scheme for Renewable Heat
STEM	Science, Technology, Engineering, and Mathematics
TCF	Town Centres First
tCO_2	Total Carbon Dioxide
TJ	Terajoule
TW	Terawatt
TWh	Terawatt-Hour
UCC	University College Cork
UCD	University College Dublin
UN	United Nations

UNFCCC	United Nations Framework Convention on Climate Change
URDF	Urban Regeneration Development Fund
US	United States
VAT	Value Added Tax
VRT	Vehicle Registration Tax
WAP	Waste Action Plan
WMO	World Meteorological Organisation
ZEB	Zero Energy Building
ZEVI	Zero Emission Vehicles Ireland

Executive Summary

Climate Action Plan 2023 is the second annual update to Ireland's Climate Action Plan 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings. The plan implements the carbon budgets and sectoral emissions ceilings and sets a roadmap for taking decisive action to halve our emissions by 2030 and reach net zero no later than 2050, as we committed to in the Programme for Government.

Our climate is changing rapidly and is transforming our world. Since 1850 there has been an increase of 1.1°C in average global temperature, and the increase since 1970 has been faster than in any other 50-year period over the last 2,000 years. Warming is being propelled by increases in greenhouse gases (GHGs) in the atmosphere mainly produced when we burn fossil fuels and power industrial processes, together with emissions associated with land-use. These increased GHG emissions are being driven by unsustainable patterns of production and consumption. Today, atmospheric carbon dioxide (CO^2) concentrations are higher than at any time in at least 2 million years, and concentrations of methane (CH^4) and nitrous oxide (N^2O) are higher than at any time in at least 800,000 years.

Human influence has warmed the atmosphere, ocean and land leading to widespread and rapid change. Projections of future global and regional climate change indicate that continued emissions of GHGs will cause further warming and further changes to our climate. The science is indisputable, and the effects of climate change are already clear. As global temperatures increase, the extremes of weather and climate we experience will also increase, and this will lead to increased risks to people and to nature. Scientists warn that without rapid, deep, and sustained reductions in GHGs, global warming will be greater than 2°C above pre-industrial levels and, at current emission rates, could rise to 5°C by the end of the century. Limiting warming to 1.5°C will substantially reduce losses and damage to people and to ecosystems, although it will not eliminate them altogether.

It is, therefore, essential that we act now to increase the rate of key decarbonisation activities across all sectors of the economy. For the citizen and business, it will involve a significant change in life-styles and business models respectively over the period to 2030. Government policy will have a vital role in supporting and empowering the myriad of individual decisions that will be needed to drive the transition to a low carbon society and economy.

Implementation of the Climate Action Plan will create jobs, new economic opportunities and protect people and the planet. By delivering on this plan, we will secure the future for our children and grandchildren. It's our chance to make the right choice.

CITIZEN ENGAGEMENT

Delivering on our climate ambition requires that the Government and the people of Ireland come together in a strengthened social contract for climate action and the co-creation of real solutions to these challenges. A comprehensive programme of engagement activities and research was delivered under the National Dialogue on Climate Action in 2022, this Dialogue will inform and support a strengthened social contract between the Government and the Irish people around climate action.

We will continue to engage with people, ensuring that they are empowered to take the actions needed to build an Ireland where:

- Our communities are healthy and secure, enjoy cleaner air and water, and where homes are warmer and cheaper to heat;
- Thousands of new jobs are created by investing in areas like offshore wind, retrofit and cutting-edge agriculture;
- We cut our dependence on imported fossil fuels, and power comes from our own indigenous renewable resources including wind and solar;
- Walking and cycling are safe and accessible, public transport is cleaner and more frequent, and the rollout of electric vehicles is supported nationwide;
- Farmers have certainty that their industry has a viable future where farmers can continue producing world-class food with an even lower carbon footprint.

JUST TRANSITION

The plan acknowledges that some sectors and communities will be more impacted than others, and we will need to help people with the costs of the transition to ensure that it happens. Just Transition principles are embedded in the plan, including the principle that people need to be equipped with the skills to benefit from changes and that costs need to be shared.

A Just Transition Commission will be established to provide advice to Government. Specific indicators to measure progress in relation to ensuring a just transition will be adopted, and activation and training responses for at risk employment through social protection policies will be strengthened.

The Midlands region is the first in Ireland to directly experience the negative impacts of the transition away from fossil fuels, with the ending of peat extraction for power generation, and this plan sets out a just transition implementation plan for this region. Under the National Just Transition Fund, 56 projects in the Midland's region are being supported, with up to €22 million in committed grant funding until 2024, bringing €15 million in additional funding to the region and supporting an estimated 178 direct and 999 indirect jobs. The EU Just Transition Fund Programme will deliver an additional €169 million in investment to the region in the period to 2030.

INVESTMENT

Every sector must adapt rapidly. This will allow our society and economy to realise the economic potential of the transition, remain competitive and resilient, and explore new opportunities for innovation and growth. Detailed analysis has informed the identification in this plan of abatement technologies that will need to be implemented across key sectors. Considerable investment will be required to reduce our greenhouse gas emissions by 51% by 2030, and this must influence both public and private capital investment choices.

There will be unprecedented levels of investment in climate action over the next decade.

The NDP sets out a total public investment of €165 billion over the period 2021 to 2030. This will bring public investment to 5% of GNI*, well above the EU average of 3% of GDP.

In order to meet the targets and objectives of this Climate Action Plan, it is necessary to direct the private sector towards financing the necessary investments and away from financing investments that are inconsistent with the Government's sectoral emissions ceilings. Public bodies such as planning authorities, funding authorities and the enterprise agencies will work to support this objective.

Enhanced analytical capacity is being developed by the Department of Public Expenditure and

Reform and the Department of Finance in collaboration with the ESRI over the next 18 months to better assess and model the required investments and macroeconomic implications of Ireland's enhanced climate governance framework, particularly the sectoral emission ceilings.

ELECTRICITY

The electricity sector faces an immense challenge to meet its requirements under the sectoral emissions ceilings. Electricity will play an important role in the decarbonisation of other sectors through electrification, including transport, heating, and industry.

Transformational policies, measures and actions, and societal change are required to increase the deployment of renewable energy generation, strengthen the grid, and meet the demand **for** flexibility **in response to** the challenge.

Among the most important measures in the plan is to increase the proportion of renewable electricity to 80% by 2030 and a target of 9 GW from onshore wind, 8 GW from solar, and at least 5 GW of offshore wind energy by 2030.

This will not just reduce our emissions from electricity, it will allow us to electrify other sectors such as transport and heat and reduce our emissions in these sectors too. Achieving further emissions reductions between now and 2030 requires a major step up in how we accelerate and increase the deployment of renewable energy to replace fossil fuels, deliver a flexible system to support renewables, and manage electricity demand.

INDUSTRY

The green economy, including retrofitting, renewable energy, clean mobility, and sustainable agriculture will create high quality employment, and IDA Ireland will also seek to attract businesses to invest in decarbonisation technologies. IDA Ireland, Enterprise Ireland and the Sustainable Energy Authority of Ireland will work to help decarbonise industry and align grants and other supports with emissions reductions.

Compliance with the sectoral emissions ceiling requires changes in the way we produce, consume, and design our goods and services. This can bring with it great opportunities for employment, innovation and growth. Decarbonising industry and enterprise is vital for Ireland's economy and future competitiveness. The linkages between fossil fuel use and economic progress must be decoupled. This will require carbon-neutral heating in industry, decarbonising construction materials, fossil fuel demand reduction through energy efficiency measures, and increasing the use of zero emission gas.

BUILDINGS

Government has already committed to retrofit 500,000 homes by 2030 (including increased funding through the National Development Plan particularly for free upgrades for low-income households) and will install 680,000 renewable energy heat sources in both new and existing residential buildings. All new dwellings will be designed and constructed to Nearly Zero Energy Building standard by 2025, and Zero Emission Building standard by 2030. We recognise that we will need work out ways to assist broader society with the costs of retrofitting.

The ambitious National Retrofit Plan will drive demand, make retrofitting more affordable, and expand the capacity of the industry including training of workers. Other measures include increased

targets for district heating, renewable gas, and the public sector, as well as strengthening building standards for all buildings.

TRANSPORT

The plan calls for a significant cut in transport emissions by 2030 in order to meet the sectoral emission ceiling. Meeting our 2030 transport abatement targets will require transformational change and accelerated action across all key decarbonisation channels. Climate Action Plan 2021 targets have been revised to meet this higher level of ambition, including a 20% reduction in total vehicle kilometres, a reduction in fuel usage, and significant increases to sustainable transport trips and modal share.

Fleet electrification and use of biofuels will continue to provide the greatest share of emissions abatement in the medium term, and vehicle targets, while unchanged, have been reframed as a percentage share of total fleet and new registrations, to better embed our vehicle strategy within our wider Sustainable Mobility Policy.

AGRICULTURE

Farmers know the land better than anyone. We will empower farmers with a science-based approach, backed by robust research. The agriculture sector is undergoing a significant transformation to deliver the reduction in GHG emissions required which will impact across Ireland's agriculture and food production systems. Guided by the Food Vision 2030 Strategy, Irish farmers and food producers will further prioritise delivery of environmental, social, and economic sustainability. Significant additional investment will be required to underpin the proposed diversification measures.

Farm practices that enable farmers to produce world-class food with a lower carbon footprint are key. The plan commits to using less chemical nitrogen and more targeted use of fertiliser, while maintaining the same level of grass growth through multi-species swards. Other measures include improving the genetics of our herds to reduce emissions and improve productivity. We will also incentivise increased organic farming and diversification into forestry, biomethane and energy production.

LAND USE

Ireland's land use, land use change and forestry sector is currently a carbon source rather than a carbon sink. To reduce emissions and move to being an overall store of carbon, will involve further bog rehabilitation, increased afforestation, improved management of grasslands on mineral soils, increasing the use of cover crops in tillage, and the rewetting of organic soils. The ongoing Land Use Review will inform the sector's sectoral emission ceiling.

CIRCULAR ECONOMY

The Circular Economy and the Bioeconomy offer alternatives to today's linear 'take-make-waste' model of production. This has been supported by the enactment of the Circular Economy and Miscellaneous Provisions Act 2022, which underpins Ireland's shift to a circular economy, as well as the ongoing implementation of the Waste Action Plan for a Circular Economy and the Whole-of-Government Circular Economy Strategy. New measures and initiatives include the introduction of a deposit and return scheme for plastic and aluminium beverage containers. We will reduce food

waste by 50% and will ensure that all plastic packaging is reusable or recyclable by 2030. We will also increase our capacity to recycle packaging waste by 70%, and plastic package waste by 55%.

PUBLIC SECTOR

The public sector will play a leadership role in driving far-reaching climate action across its buildings, transport, waste, and energy usage, as well as wider society. This will include reducing emissions by 51% by 2030 and increasing the improvement in energy efficiency in the public sector from the 33% target in 2020 to 50% by 2030, as well as increasing climate literacy in the public sector, implementing green public procurement and retrofitting public sector buildings.

GOVERNANCE

The actions to deliver on our ambition and decarbonise our economy will be supported by a robust governance structure that now includes Ireland's first carbon budget programme and sectoral emission ceilings. The Climate Action Delivery Board will have an enhanced role in relation to delivery, including providing recommendations for overcoming barriers, while taskforces will be established to focus on key specific areas or initiatives of climate delivery that require cross-Government collaboration. In addition to this, an annual climate action planning and reporting cycle will be introduced.

The Environmental Protection Agency and the Climate Change Advisory Council reports will continue to inform the monitoring of Ireland's climate action performance on a sectoral level.

The Government will annually update the new Climate Action Plan and the roadmap of actions to reflect developments in the previous year, developments in technology and research in relation to climate action, and to ensure the required emissions reductions are achieved.

SUSTAINABLE DEVELOPMENT AND INTERNATIONAL CLIMATE ACTION

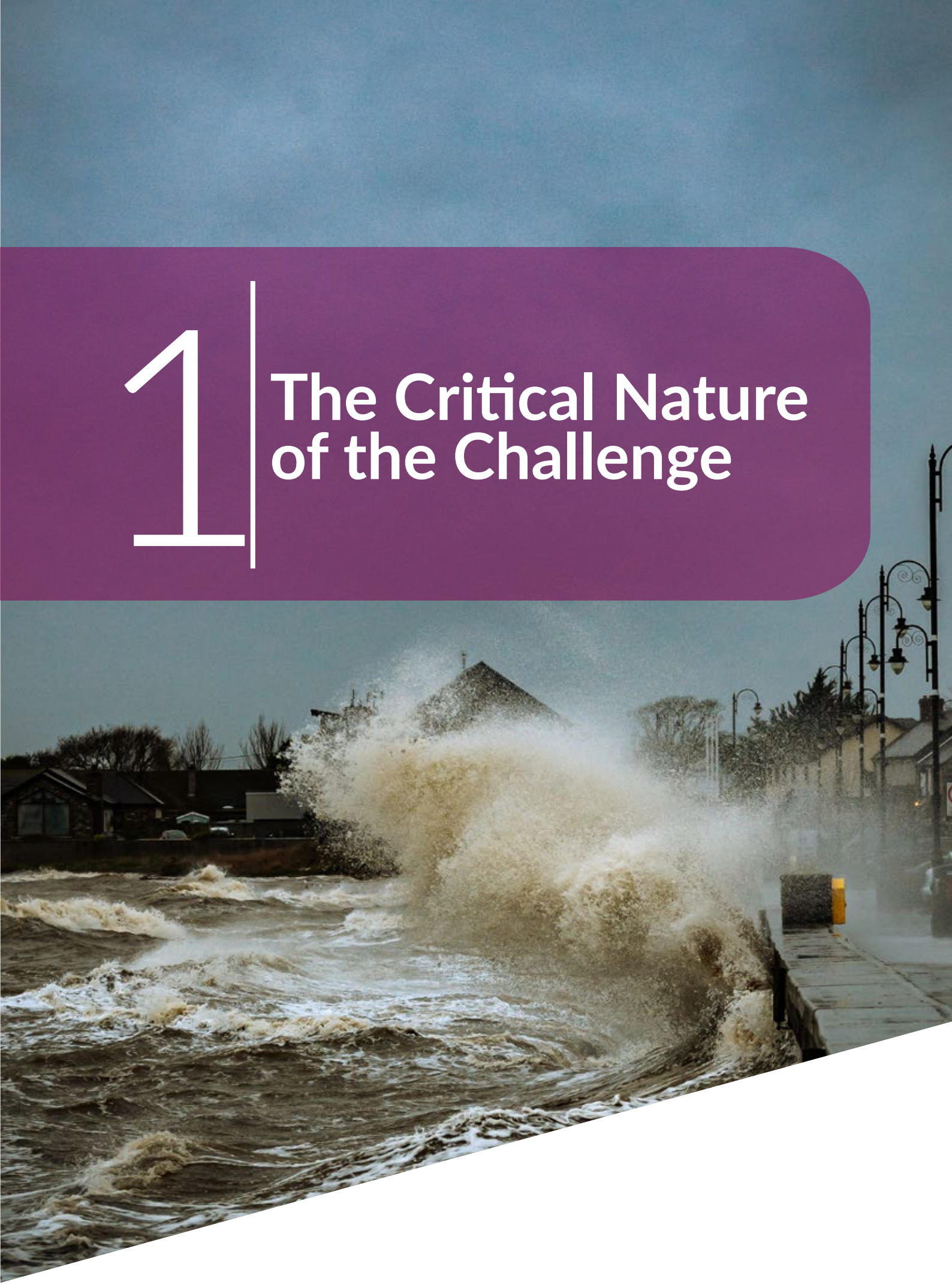
This year's catastrophic drought in the Horn of Africa and devastating flooding in Pakistan remind us of the urgency of addressing climate impacts. The most vulnerable people continue to be disproportionately affected. Climate Action Plan 2023 reflects Ireland's commitment to achieving the 2030 Agenda for Sustainable Development. Ireland will work with its international partners to ensure that climate action remains a major policy priority, in recognition of the grave threat climate change poses to the achievement of the Sustainable Development Goals globally. This is reflected in our commitment to provide €225 million climate finance to developing countries by 2025. Support will continue to focus on leaving no one behind and on gender-sensitive and locally-led climate action. Ireland will continue to engage proactively in international negotiations relating to climate action by working with like-minded international partners to promote climate action. This will be supported by our expanding diplomatic network under the Government's Global Ireland initiative.

ADAPTATION

As well as taking measures to reduce greenhouse gas emissions, we will continue to adapt to certain climate change impacts that are already locked-in and will continue to evolve for the foreseeable future. Observations show that Ireland's climate is changing in terms of sea level rise, increases in average temperature, changes in precipitation patterns, and weather extremes. Ireland's primary adaptation policy response to these challenges is set out in our first statutory five-year National Adaptation Framework (NAF). The development of an updated NAF will be a priority action in

2023 reflecting the increasingly important role of adaptation in addressing the locked-in impacts of climate change.

1 The Critical Nature of the Challenge



1. The Critical Nature of the Challenge

Key Messages

State of Play

- The world's climate is changing rapidly with temperatures increasing faster in the last 50 years, than in any other 50-year period in the last 2,000 years
- Human influence has warmed the atmosphere, ocean and land, leading to widespread and rapid change, including changes to our weather system
- Ireland has experienced first-hand the consequences of climate change as set out in the *Climate Status Report for Ireland 2020*
- Continued emissions of GHGs will cause further warming and further changes to our climate and will lead to increased risks to people and to nature

Current and Future Action

- It is essential that the international community steps up its efforts towards meeting the 2015 Paris Agreement and the UN's Sustainable Development Goals
- The European Green Deal commits to delivering net-zero GHG emissions at EU level by 2050
- Ireland is committed to achieving a 51% reduction in GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050; with legally binding requirements to achieve these objectives set out in legislation

Expected Outcomes

- Following on from Climate Action Plans 2019 and 2021, Climate Action Plan 2023 sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022

1.1 Introduction

Climate change has disrupted human and natural systems, and widespread loss and damage to people and nature has occurred

Our climate is changing rapidly and is transforming our world. Since 1850 there has been an increase of 1.1°C in average global temperature, and the increase since 1970 has been faster than in any other 50-year period over the last 2,000 years. Warming is being propelled by increases in greenhouse gases (GHGs) in the atmosphere mainly produced when we burn fossil fuels and power industrial processes, together with emissions associated with land-use. These increased GHG emissions are being driven by unsustainable patterns of production and consumption. Today, atmospheric carbon dioxide (CO_2) concentrations are higher than at any time in at least 2 million years, and concentrations of methane (CH_4) and nitrous oxide (N_2O) are higher than at any time in at least 800,000 years.

1.2 Human Influence

Human influence has warmed the atmosphere, ocean and land, leading to widespread and rapid change. This is affecting our weather and leading to changes in the frequency, duration and intensity of heatwaves, rain, droughts, and cyclones in every region of the world. Climate change has disrupted human and natural systems, and widespread loss and damage to people and nature has occurred. Ecosystem functions and services that human well-being depends on are being undermined, and climate change impacts and risks are becoming more complex and difficult to manage. The future will see multiple climate hazards occurring simultaneously, further compounding the risks that people across the globe will face due to climate change. It is also clear that some impacts of climate change, such as loss of ice sheets and rising sea levels, will be irreversible for centuries or millennia to come.

> *Scientists warn that without rapid, deep, and sustained reductions in carbon dioxide (CO_2) and other GHG emissions such as methane (CH_4), global warming will be greater than 2°C above pre-industrial levels and, at current emission rates, could rise to 5°C by the end of the century*

Projections of future global and regional climate change indicate that continued emissions of GHGs will cause further warming and further changes to our climate. The evidence is clear that as global temperatures increase, the extremes of weather and climate we experience will also increase, and this will lead to increased risks to people and to nature. Scientists warn that without rapid, deep, and sustained reductions in carbon dioxide (CO_2) and other GHG emissions such as methane (CH_4), global warming will be greater than 2°C above pre-industrial levels and, at current emission rates, could rise to 5°C by the end of the century. Limiting warming to 1.5°C will substantially reduce losses and damage to people and to ecosystems, although it will not eliminate them altogether.

The recently published Sixth Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) sets out the most up-to-date scientific information in relation to climate change globally. It highlights the need for urgent, effective, and equitable action globally, and confirms that climate change is threatening the health and livelihoods of people around the globe, as well as ecosystem health and biodiversity. It also makes clear that predicted changes in response to changes in the climate system, some of which are set out below, will also become larger as warming increases:

- Rising sea-levels threatening land and particularly coastal infrastructure;
- Extreme weather, including more intense storms and rainfall affecting our land, coastline, and seas;
- Further pressure on our water resources and food production systems with associated impacts on river and coastal ecosystems;
- Greater political and security instability;
- Displacement of populations with increased numbers of climate refugees;
- Heightened risk of the arrival of new pests and diseases;
- Poorer water quality;
- Changes in the timing of lifecycle events for plants and animals on land and in the oceans.

It highlights the link between climate change and biodiversity loss and underscores the need to safeguard biodiversity and ecosystems as a fundamental part of climate resilient development.

1.3 Paris Agreement

It is, therefore, essential that the international community steps up its efforts towards meeting the Paris Agreement objectives of:

- Holding the increase in the global average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the temperature increase to 1.5°C above pre-industrial levels, recognising that this would significantly reduce the risks and impacts of climate change;
- Increasing the ability to adapt to the adverse impacts of climate change and foster climate resilience and low GHG emissions development, in a manner that does not threaten food production;
- Making finance flows consistent with a pathway towards low GHG emissions and climate-resilient development.

The Paris Agreement and the Sustainable Development Goals (SDGs) recognise that the impacts of climate change will be felt by all, but that these impacts will be uneven. Vulnerable communities and people around the world – in particular women and girls – face devastating impacts to their livelihoods and greater challenges in adapting to the long-term effects of climate breakdown.

At COP26 countries reaffirmed the Paris Agreement goal of limiting the increase in the global average temperature to well below 2°C above pre-industrial levels and pursuing efforts to limit it to 1.5°C. Countries also stressed the urgency of action 'in this critical decade' when carbon dioxide emissions must be reduced by 45% to reach net zero around mid-century. During the COP26 process Ireland signed up to a number of international agreements and commitments. These included:

- Becoming a signatory to the High Ambition Coalition (HAC), to support global efforts to limit the temperature rise to 1.5°C;
- Joining the Beyond Oil and Gas Alliance (BOGA), to lead the transition away from global oil and gas production;
- Participating in the Climate and Clean Air Coalition Ministerial, to accelerate action to reduce short-lived climate pollutants.

At COP27 agreement was reached on financing Loss and Damage which means that millions of people whose land, water sources, and livelihoods are being eroded every day because of the impacts of climate change, can begin to look forward to targeted and strengthened support and protection from the global community. The Mitigation Work Programme to reduce emissions across sectors, with a strong, annual political review mechanism, represented a signal of trust between the 198 parties to the UNFCCC that we are serious about climate change and protecting especially vulnerable countries and communities. The first midterm action plan of the Glasgow work programme on Action for Climate Empowerment, commenced at COP26, was agreed at COP27, and will provide an enhanced framework for inclusive climate action in the areas of education, training, public awareness, public participation, access to information and international cooperation. The COP27 Presidency also announced the Sharm el-Sheikh Adaptation Agenda, enhancing resilience for people living in the most climate-vulnerable communities by 2030. The UN Climate Change's Standing Committee on Finance was requested to prepare a report on doubling adaptation finance for consideration at COP28 next year.

1.4 Ireland Impacted Also

The impact of climate change will be felt by every individual, household, and community in Ireland

Ireland has experienced first-hand the consequences of climate change as set out in the *Climate Status Report for Ireland 2020*, including:

- All seasons have seen a rise in temperature and the annual average surface air temperature has increased by over 0.9°C in the last 120 years;
- There has been a reduction in the number of frost days and shortening length of the frost season;
- Sea levels around Ireland have risen by approximately 2 to 3mm per year since the early 1990s;
- Projections predict a significant reduction in average annual levels of spring and summer rainfall with a substantial increase in the frequency of heavy precipitation events in winter and autumn.

These changes will cause extensive direct and indirect harm to Ireland and its people, with predicted impacts including increased likelihood of river and coastal flooding; increased pressure on water supply and water quality; and changes in wind speeds and storm tracks. The impact of climate change will be felt by every individual, household, and community in Ireland. The outcomes of the EPA's *Climate in the Irish Mind* study illustrate that there is a high level of awareness of climate change and its impacts, and there is a broad consensus on the need for strong and early action to reduce Ireland's GHG emissions and to make Ireland climate resilient.

Therefore, there is an onus on us to mitigate the magnitude of long-term climate change by acting now to reduce GHG emissions, and to increase the capacity of carbon sinks such as forests and wetlands. In addition, short-lived pollutants with high global warming potential (such as methane, nitrous oxide and others), which together with carbon dioxide are responsible for climate change, are also damaging to human health and have, for example, been shown to be linked to respiratory diseases. Reductions in these emissions will not only address the climate challenge but will also improve our quality of life.

1.5 European Green Deal

The European Green Deal frames Europe's response to climate change. It recognises the challenges of transition and aims to be just and inclusive, paying attention to regions, industries and citizens who will face the biggest challenges as Europe transforms to a climate-neutral, fair and prosperous society, with a modern, resource-efficient and competitive economy.

The Green Deal commits to delivering net-zero GHG emissions at EU level by 2050. It also increases the EU-wide GHG emissions reduction target to at least 55% for 2030 to limit warming to 1.5°C and align with the goal of the Paris Agreement. The EU is working on the revision of its climate, energy and transport-related legislation under the 'Fit for 55 Package' in order to align current laws with the 2030 and 2050 ambitions. This means that additional effort will be asked of all Member States, including Ireland. Ireland fully supports this enhanced ambition at EU level.

The war in Ukraine has had a significant impact on the cost and security of our energy supply. In

response to this, the EU has launched the REPowerEU Plan which aims to phase out the use of Russian fossil fuels and to address climate change through energy savings, diversification of energy supplies and accelerated roll out of renewable energy in homes, industry and power generation by 2027.

1.6 Taking Action in Ireland

The 2019 and 2021 Climate Action Plans Plan saw a big step-up in our engagement with citizens and communities through more coherent mobilisation of existing structures and initiatives to inform, engage, motivate, and empower people to take climate action.

In line with EU ambition, the Programme for Government, Our Shared Future commits to achieving a 51% reduction in Ireland's overall GHG emissions from 2021 to 2030, and to achieving net-zero emissions no later than 2050. These legally binding objectives are set out in the Climate Action and Low Carbon Development (Amendment) Act 2021. The Climate Act supports Ireland's transition to net-zero and the achievement of a climate neutral economy no later than 2050. It also establishes a legally binding framework with clear targets and commitments, to ensure the necessary structures and processes are in place to deliver our national, EU and international climate goals and obligations in the near and long term. Against this background, strategies must be devised to reduce and manage climate change risks through a combination of mitigation and adaptation responses.

The National Development Plan 2021 - 2030 (NDP) sets out the investment priorities that will underpin the implementation of the National Planning Framework, through a total investment of approximately €165 billion. The NDP has been designed to ensure that it supports the Government's climate ambitions. For the first time in Ireland, climate and environmental assessment of the NDP measures has been undertaken, along with an assessment of the alignment of the NDP as a whole with the principle of a green recovery. Post COVID-19, Ireland's National Recovery and Resilience Plan (NRRP) prioritises a sustainable, equitable, green and digital recovery, in a manner that compliments and supports the Government's climate ambition.

The Climate Action Plan 2021 set out an ambitious all-of Government response to the challenges posed by climate change. Implementation to the end of Q3 2022 stands at 77%, with 542 measures completed out of a total of 708. The oversight of the delivery of the Climate Action Plan by the Department of the Taoiseach will continue to ensure that critical coordination across all Departments and Agencies is in place. This will mean that stakeholders remain focussed on timely implementation in their areas and anticipate any corrective measures needed.

The 2019 and 2021 Climate Action Plans Plan saw a big step-up in our engagement with citizens and communities through more coherent mobilisation of existing structures and initiatives to inform, engage, motivate, and empower people to take climate action. We recognise that individuals and communities will be at the heart of the low-carbon transition and that not everybody is equally placed to readily respond to the policies and initiatives that will be implemented by this Plan. Therefore, through our work to empower individuals and communities to act, we will seek to recognise different capacities and starting points so that positive choices can be made for the future that will bring long-term benefits to all communities across Ireland.

It is impossible to predict how the next decade will unfold. The pace of individual, technological,

scientific, societal and economic change will not be precisely in line with our assumptions today. In line with legislation, this Plan will be revised and renewed every year, following consultation with key stakeholders. These updates will be informed by the latest analyses and by our performance against targets; and will include any new or corrective actions that we may need to stay on track towards our overall 2030 targets and our ultimate objective of achieving a transition to a competitive, low-carbon, climate-resilient, and environmentally sustainable society and economy by 2050.

While much of this Plan focusses on climate mitigation – the imperative to reduce our emissions of greenhouse gases and thereby reduce warming – we also need to focus on climate adaptation. This is addressed primarily in Chapter 22 of this Plan but is also mainstreamed across the Plan as a whole. People throughout Ireland have already experienced first-hand the impacts of climate change, particularly through floods and storms, and the subsequent damage caused. Events like these, and the expected increase in their frequency and intensity, highlight the need for adaptation measures to help the country cope with the effects of climate change. The National Adaptation Framework, published in January 2018, sets out the actions we are taking to reduce our vulnerability and increase our resilience in response to climate change. The Framework is due to be updated in 2023.

This Climate Action Plan sets out the roadmap to deliver on Ireland's climate ambition. It aligns with the legally binding economy-wide carbon budgets and sectoral ceilings that were agreed by Government in July 2022. This will enable Ireland to meet 2030 targets and be well placed to meet mid-century decarbonisation objectives which will also help deliver cleaner air, warmer homes and a better quality of life for Irish citizens.

1.7 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
CN/23/1	Finalise Ireland's Long-term Climate Strategy in line with the requirements in the Climate Act 2021

2 Where We Stand

2. Where We Stand

Key Messages

State of Play

- In the context of COVID-19, greenhouse gas (GHG) emissions in Ireland decreased by 3.6% in 2020. However, 2021 saw emissions rise again by 4.7% as some sectors began to emerge from Covid-related restrictions
- The key sources of our GHG emissions include Agriculture (33.3%), Transport (15.7%) and Energy (14.4%)

Current and Future Action

- Ireland's statutory climate objective is a 51% reduction in emissions by 2030 (relative to 2018 levels) and net-zero emissions no later than 2050
- The Environmental Protection Agency's projections demonstrate the need for full implementation of measures from Climate Action Plans 2023, and further future Climate Action Plans

Expected Outcomes

- Climate Action Plan 2023 and our Long-term Climate Strategy will set the strategic direction for meeting our climate targets

2.1 Trends in Ireland's Emissions to Date

Ireland's greenhouse gas (GHG) emissions have undergone a considerable shift in the three decades since 1990[1]. According to the Environmental Protection Agency's (EPA) inventory data, the rate of emissions reduction was modest up to 2008, with efforts to decarbonise constrained by strong economic activity. While an economic downturn in 2008 saw GHG emissions drop, they began to trend upwards again from 2011 as the economy picked up, with an overall peak in 2018. Agriculture is our largest source of emissions, representing 33.3% of total national GHG emissions in 2021, based on provisional estimates[2]. The transport and energy (primarily power generation) sectors represented 15.7% and 14.4% of emissions respectively in 2021. The transport sector has been the fastest growing source of GHG emissions over the past three decades, showing a 112% increase between 1990 and 2021. These three key sectors – agriculture, transport and energy – consistently produce the largest share of Ireland's emissions.

In the context of COVID-19, GHG emissions in Ireland decreased by 3.6% in 2020. However, 2021 saw GHG emissions rise again by 4.7% as some sectors recovered. As set out in Figure 2.1, this increase in total emissions relative to 2020 was driven by increased use of coal and oil for electricity generation, as well as increases in both the Agriculture and Transport sectors.

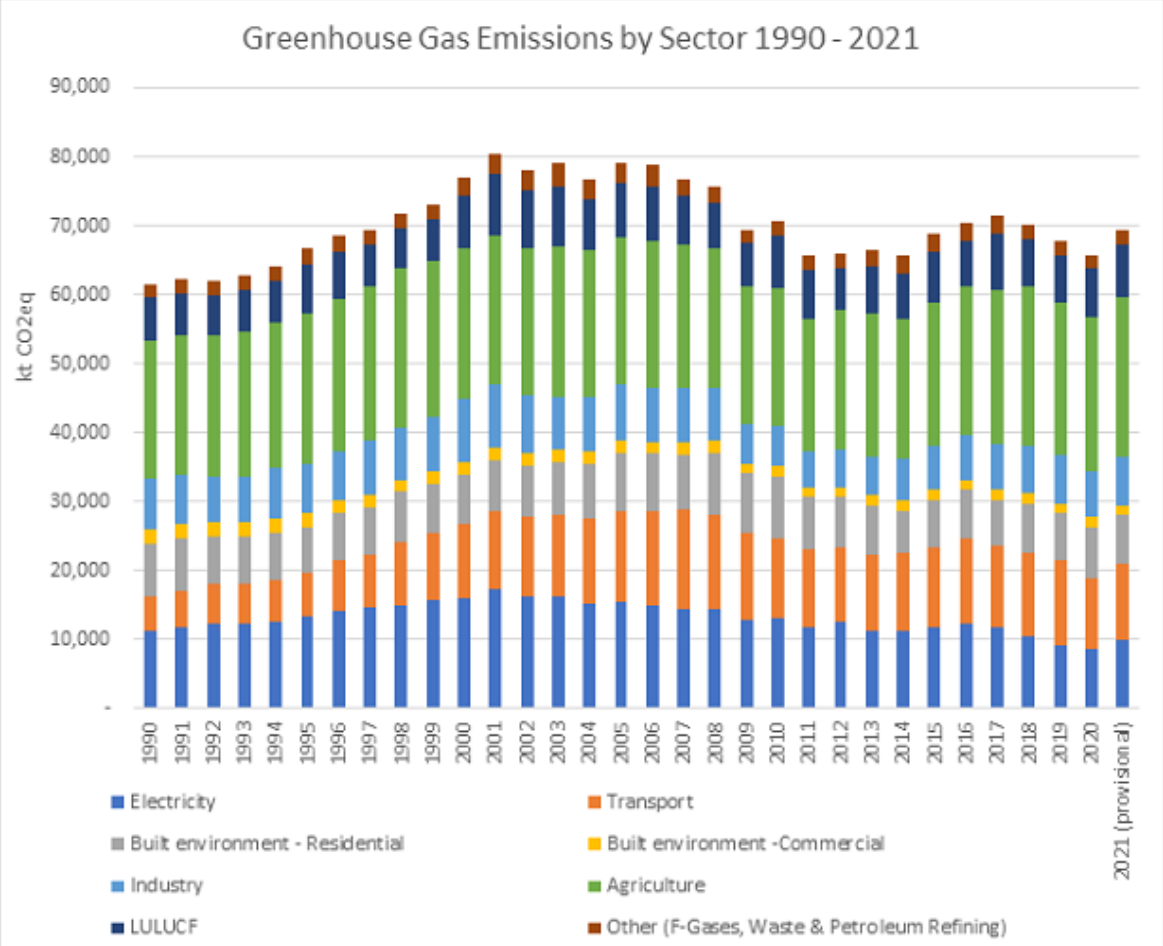
Decreases in emissions in 2021 in the residential sector resulted from a combination of reduced time in the home due the partial lifting of COVID restrictions, a milder winter and increased fuel prices. Higher emissions in the Agriculture sector were driven by an increase in synthetic nitrogen

1 Greenhouse gas emissions trends and inventories published by the EPA. See https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/

2 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2021.php (see 'National Total with LULUCF')

fertiliser use and in liming of soils.

Figure 2.1 – Ireland's CO_2eq. Emissions Inventories 1990-2022[3]



2.2 Ireland's National Climate Targets

Under the Climate Action and Low Carbon Development (Amendment) Act 2021, Ireland's national climate objective requires the State to pursue and achieve, by no later than the end of the year 2050, the transition to a climate-resilient, biodiversity-rich, environmentally sustainable and climate-neutral economy. The Act also provides for provides for a reduction of 51% in GHG emissions by 2030, compared to 2018 levels.

Our statutory national climate objective and 2030 targets are aligned with Ireland's obligations under the Paris Agreement and with the European Union's objective to reduce GHG emissions by at least 55% by 2030, compared to 1990 levels and to achieve climate neutrality in the European Union by 2050.

3 Chart data available from https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/GHG_Final-emissions-data_1990-2021_AR5_Web.xlsx

Box 2.1

Ireland's EU Climate Targets

In its approach to decarbonising, the EU has split GHG emissions into two categories, the Emissions Trading System (ETS) and the non-ETS.

Emissions from electricity generation and large industry in the ETS are subject to EU-wide targets which require that emissions from these sectors be reduced by 43% by 2030, relative to 2005 levels. Within the ETS, participants are required to purchase allowances for every tonne of emissions, with the amount of these allowances declining over time to ensure the required reduction of 43% in GHG emissions is achieved at EU-level.

Emissions from all other sectors, including agriculture, transport, buildings, and light industry are covered by the EU Effort Sharing Regulation. This established binding annual GHG emission targets for Member States for the period 2021–2030. Ireland is required to reduce its emissions from these sectors by 30% by 2030, relative to 2005 levels.

Under the EU Green Deal, the targets for the ETS and non-ETS sectors will be revised upwards in order to achieve the commitment, at EU level, to reach an economy-wide 2030 reduction in emissions of at least 55%, compared to 1990 levels. Legislative proposals to implement these targets were published in July 2021. Tripartite negotiations between representatives of the European Parliament, Council and Commission commenced in the second half of 2022. Provisional agreement has been reached on a number of proposals with a view to reaching agreement as soon as maybe on all proposals to underpin the EU's enhanced ambition.

2.3 Impact of Existing Policies

Ireland's latest projections of GHG emissions to 2030, published by the EPA, show total emissions decreasing from 2018 levels by 17% with the impact of implemented and committed-to policies, before the additional impact of the measures outlined in Climate Action Plan 2021 and this Climate Action Plan. Factoring in the additional measures from Climate Action Plan 2021 results in a projected decrease in GHG emissions of 33.2% relative to 2018 levels. These projections assume significant reductions in key sectors such as power generation, residential buildings, transport, commercial and public services, and agriculture; with full and early implementation of existing policy commitments including by 2030:

- achieving at least 70% of electricity demand from renewable sources;
- retrofitting 500,000 homes to a BER B2 or cost optimal equivalent standard;
- increasing the number of electric vehicles on our roads to almost 1 million.

This Climate Action Plan sets out further policies, measures and actions to ensure compliance with the carbon budgets and sectoral emissions ceilings adopted by the Government in 2022. Early and full implementation of these policy commitments will also enable Ireland to meet its EU Effort Sharing Regulation targets for the period 2021 to 2030.

3 Policy to Date and Expected Impact of Planned Policies

3. Policy to Date and Expected Impact of Planned Policies

Key Messages

State of Play

- The Climate Action and Low Carbon Development (Amendment) Act 2021 requires Ireland to achieve a 51% reduction in emissions by 2030 (relative to 2018 levels) and net-zero emissions no later than 2050; deliver annual climate action plans; implement a carbon budget programme; and define sectoral emissions ceilings

Current and Future Action

- Ireland's first carbon budget programme came into effect in April 2022
- Sectoral emissions ceilings, which operate within the carbon budgets, were approved in July 2022
- The Land Use, Land Use Change and Forestry sectoral ceiling will be finalised no later than end 2023 and in parallel with the completion of the Land-use Review

The Government is committed to reducing Ireland's greenhouse gas (GHG) emissions by 51% by 2030 relative to 2018 levels as legislated for in the Climate Action and Low Carbon Development (Amendment) Act 2021. The Act also places our 'national climate objective' on a statutory footing, committing Ireland to pursue and achieve no later than 2050, the transition to a climate resilient, biodiversity-rich, environmentally sustainable, and climate-neutral economy.

The new climate governance framework set out in the 2021 Act requires an annual update of the Climate Action Plan supported by a system of carbon budgeting and sectoral emissions ceilings. In 2022, a carbon budget programme, comprising three 5-year budget periods, and sector-specific emissions ceilings, operating within the parameters of the carbon budgets, were approved and came into effect. The carbon budgets and sectoral emission ceilings (see Tables 3.1 and 3.2 below), provide a pathway towards our 2030 and 2050 climate targets.

3.1 Carbon Budgets

A carbon budget represents the total amount of emissions, measured in tonnes of CO^2 equivalent, that may be emitted by a country or region during a specific time-period. The 2021 Act mandated the Climate Change Advisory Council (CCAC) to propose carbon budgets for each of the periods 2021-2025; 2026-2030; 2031-2035 (provisional). Under the legislation, the proposed carbon budgets must provide for a reduction of 51% in the total amount of GHG emissions by 2030, relative to 2018, and set Ireland on a pathway consistent with our 2050 target of delivering a sustainable economy and society where emissions are balanced or exceeded by the removal of GHGs.

Following an extensive review and consultation process, the carbon budgets proposed by the CCAC were approved by the Government on 22 February 2022. The carbon budgets then came into effect on 6 April 2022 after they were approved by both Houses of the Oireachtas.

Table 3.1 – Ireland's Carbon Budgets

Budget Period	2021 – 2025	2026 – 2030	2031 – 2035 (provisional)
$MtCO_2eq.$	295	200	151
Average annual reduction	4.8%	8.3%	3.5%

3.2 Sectoral Emissions Ceilings

The 2021 Act requires that 'as soon as may be' after the carbon budgets are approved, the Minister for the Environment, Climate and Communications submits sectoral emissions ceilings to Government for approval. These ceilings represent the maximum amount of GHG emissions permitted within different sectors of the economy during a carbon budget period.

Following the approval of the carbon budgets, the Minister for the Environment, Climate and Communications engaged with relevant Ministers, and their Departments and Agencies, to prepare sectoral emissions ceilings for Government review and approval. This engagement was informed and supported by the procurement of external technical support services, as well as modelling support from members of the Climate Action Modelling Group. The analysis undertaken to inform the preparation the sectoral ceilings was based on the analysis used to develop Climate Action Plan 2021 (CAP21).

Through an iterative process that comprised extensive and frequent engagement with all relevant Departments and Agencies, policies, measures and actions (including those identified in CAP21) were assessed and refined to determine their emission abatement potential, while also considering various other factors and constraints such as cost, feasibility, and socioeconomic impact. The potential policies, measures, actions and ceilings were also assessed in terms of alignment with other sustainability goals, and their effectiveness in achieving net zero emissions no later than 2050.

Following this process, the Minister submitted sectoral emissions ceilings to the Government and the ceilings were approved on 28 July 2022. The sectoral emissions ceilings assume 5.25 $MtCO_2eq.$ in annual unallocated savings for the second carbon budget period (2026 to 2030). These unallocated savings will require that additional abatement measures be identified ahead of the commencement of the second carbon budgetary period, and work has commenced to identify these abatement measures. This approach was anticipated in the Programme for Government which recognised that we would not be in a position to identify all the emerging technologies, changing scientific consensus or policies to meet our full ambition, and this would require a further allocation within the overall carbon budgets as the decade progresses and would be subject to intense evaluation. This approach, which mirrors the Danish model, is reflected in Section 6C(10) of the 2021 Climate Act. Finalising the sectoral emissions ceiling for the LULUCF sector has been deferred for up to18 months from July 2022 to allow for the completion of the Land-use Review.

Table 3.2 sets out the approved sectoral emission ceilings.

Table 3.2 – Sectoral Emission Ceilings as approved by Government on 28 July 2022

(Figures for $MtCO^2eq$ for 2018 and 2030 have been rounded. This may lead to some discrepancies)

Sector	2018 Baseline ($MtCO_2eq.$)[1]	Sectoral Emission Ceilings for each 5-year carbon budget period ($MtCO_2eq.$)		Emissions in final year of 2021-2025 carbon budget period ($MtCO_2eq$)	Reduction in Emissions in final year of 2021-2025 carbon budget period compared to 2018 Baseline	Emissions in final year of 2026-20230 carbon budget period ($MtCO_2eq$)	Reduction in Emissions final year of 2026-2030 carbon budget period compared to 2018 Baseline
	2018	2021-2025*	2026-2030*	2025*	2025	2030	2030
Electricity	10	40	20	6	~40%	3	~75%
Transport	12	54	37	10	~20%	6	~50%
Built Environment - Residential	7	29	23	5	~20%	4	~40%
Built Environment - Commercial	2	7	5	1	~20%	1	~45%
Industry	7	30	24	6	~20%	4	~35%
Agriculture	23	106	96	20	~10%	17.25	~25%
LULUCF[2]	5	XXX	XXX	XXX	XXX	XXX	XXX
Other (F-Gases, Waste & Petroleum refining)	2	9	8	2	~25%	1	~50%
TOTAL[3]	68	XXX	XXX	XXX	XXX	XXX	XXX
Legally binding Carbon Budgets and 2030 Emission Reduction Targets[4]	-	295	200	-	-	34	51%
Annual unallocated Emission Savings in 2030	-	-	5.25[5]	-	-	-	-
Unallocated Savings 2026-2030[6]			26				

[1] Million tonnes of carbon dioxide equivalent

[2] Finalising the sectoral emissions ceiling for the LULUCF sector has been deferred for up to 18 months from July 2022 to allow for the completion of the Land-use Review

[3] Following finalisation of the sectoral emissions ceilings for the LULUCF sector, 5-year economy-wide total figures will be available

[4] As provided by section 6A(5) of the Climate Action and Low Carbon Development (Amendment) Act 2021

[5] Unallocated savings on an economy-wide basis in 2030 (final year of second carbon budget period), before factoring in net LULUCF sector emissions

[6] Unallocated savings on an economy-wide basis in the second 5-year carbon budget period from 2026-2030, before factoring in net LULUCF sector emissions

3.3 Progress under Climate Action Plan 2021

CAP21 reflected the legally binding target for 2030 by providing indicative ranges for the emissions reductions required from each sector of the economy to ensure that on an economy-wide basis we meet our 51% reduction target. CAP21 also set out the policies, measures and actions needed to meet this target.

This Climate Action Plan builds upon CAP21 by setting out the policies, measures and actions required to keep within our carbon budgets and sectoral emissions ceilings.

As noted in CAP21, we have already started the transition with significant progress made over the last three years. As well as the massive capital investment programmes committed to under the National Development Plan out to 2025, some key achievements by sector include:

Electricity

- A record year for the connection of renewable electricity to the grid in 2022;
- Enactment of the Maritime Area Planning Act 2021 and the creation of a new Maritime Area Consent regime;
- 1,836 MW of renewable generation successful in the Renewable Electricity Support Scheme (RESS) 2 auction, representing a nearly 20% increase on Ireland's current renewable electricity generation capacity;
- First grid-scale, solar project, having come through the RESS 1 process, connected to the grid;
- Development of a grid connection policy for the first Offshore Renewable Energy Auction;
- Publication of a Roadmap on Corporate Power Purchase Agreements;
- Celtic Interconnector project entered operational phase, with agreements reached for the construction and financing of the interconnector.

Transport

- Completion of a public consultation on the National Cycle Network Strategy;
- Planning guidelines for EV charging infrastructure reviewed and guidance issued to Local Authorities;
- Launch of the Phase 2 of the BusConnects Dublin Network Redesign;
- Publication of new Sustainable Mobility Policy;
- Publication of a new investment framework for land transport in Ireland;
- Publication of updated Policy Statement on Renewable Fuels.

Buildings

- Review of the Support Scheme for Renewable Heat to enhance uptake;
- Publication of the Sustainable Energy Authority of Ireland National Heat Study;
- Expansion of the Public Sector Pathfinder Programme;
- Launch of the National Home Energy Upgrade Scheme;
- Standard Recommendation for the design, installation and commissioning of solar PV panels in new and existing dwellings published.

Industry

- Launch of a €55 million Green Transition Fund;
- Delivery of training supports to 140 companies through the Climate Planning Fund for Business;
- Establishment of focus group to develop actions to decrease embodied carbon in construction materials;
- Launch of the Climate Toolkit 4 Business;
- Review of the Support Scheme for Renewable Heat to enhance uptake.

Agriculture

- Launch of an eLearning Platform with sustainable farming resources for farmers;
- Announcement of a €5 million Pilot Farm Environmental Study;
- Launch of consultation process on Ireland's new National Biodiversity Action Plan;
- Agreement of the Common Agricultural Policy Strategic Plan 2023-2027;
- Launch of €1.5 billion Agri-Climate Rural Environment Scheme as part of the Common Agricultural Policy Strategic Plan 2023-2027;
- Evaluation of the effects of 3-NOP;
- Establishment of the Fifth Nitrates Action Programme;
- Use of National Agricultural Soil Carbon Observatory carbon towers to better understand carbon storage in Irish soils.

Land Use, Land Use Change and Forestry

- Completion of a public consultation on Forestry Strategy 2023-2027;
- Commencement of rehabilitation works on over 10,000 hectares of peatlands damaged by extraction for energy production;
- Launch of new not-for-profit focused on attracting corporate funds to plant new native woodlands;
- Incorporation of measures aimed at tackling deforestation into other Department of Agriculture, Food and the Marine schemes.

Marine

- Enactment of the Maritime Area Planning Act 2021 which underpins an entirely new marine planning system;
- Continued investment in the Marine Research Programme to address climate change issues.

Carbon Pricing and Cross-cutting Policies

- Provision of targeted supports from revenue raised by the carbon tax, and communication of the use of carbon tax funds;
- Implementation of National Planning Framework to support compact growth.

Public Sector

- Introduction of the Public Sector Climate Action Mandate;
- Publication of the first report on Green Public Procurement;
- Awarded contract to replace 78,000 lights in the southwest region with LEDs;
- Development and implementation of a Blended Working Policy Framework for Civil Service Organisations;
- The School Energy Retrofit Pathfinder Programme retrofitted 42 schools across Ireland;
- The Energy Efficiency and Decarbonisation Pathfinder Programme 2020 for the Higher Education Sector has 16 retrofit projects underway across the higher education sector.

Circular Economy

- Signing into law of the Circular Economy and Miscellaneous Provisions Act 2022;
- Publication of Ireland's first Whole-of-Government Circular Economy Strategy 2022-2023;
- Publication of research reports in support of a Mineral Policy Statement for Ireland.

Citizen Engagement

- Launch of the Climate Conversation 2022 public consultation;
- Meeting of the National Youth Assembly on Climate;
- Publication of the second National Strategy for Education for Sustainable Development 2030;
- Launch of an Implementation Plan for the National Dialogue on Climate Action.

Adaptation

- Launch of a public consultation on the existing National Adaptation Framework;
- Completion of a review of the Flood Risk Management Plans.

Just Transition

- Submission of Ireland's Territorial Just Transition Plan to the European Commission for the upcoming EU Just Transition Fund 2021 – 2027;
- Supporting 56 innovative projects in the Midlands Region with a grant value of €22.1 million through the National Just Transition Fund 2020;
- Establishment of the Just Transition Principles Framework and the Just Transition Implementation Plan for the Midlands Region.

3.4 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
PD/23/1	Conduct a review of greenhouse gas emissions on a consumption basis, with the goal of ensuring that Irish and EU action to reduce emissions supports emission reductions globally, as well as within our own territories
PD/23/2	Undertake a review of the Ministerial accountability framework for the sectoral emission ceilings

4 | Research and Innovation

4. Research and Innovation

Key Messages

State of Play

- Research and innovation (R&I) provide the knowledge, expertise, data, evidence, technologies and solutions to enable the transition to a competitive, low-carbon, climate-resilient, and environmentally sustainable society and economy
- Ireland continues to develop its climate research and innovation ecosystem and to build strong relationships with the European and global research and innovation community

Current and Future Action

- The Government provides significant funding to research-performing organisations to carry out climate-relevant research in the sciences and humanities including policy-relevant research
- Several areas of strategic importance for climate-related research and innovation have been identified, together with key actions

Expected Outcomes

- Climate policy, action and implementation will be strengthened
- An increased focus on knowledge transfer and the provision of timely evidence to inform policy will strengthen policy and implementation
- New knowledge, expertise, data, evidence, technologies and solutions will continue to support climate action

4.1 Introduction

The transition to net zero is as much an economic and societal challenge as a scientific or technical one.

Climate change is a fundamental, complex and multi-faceted issue for society. Research has been central in developing an understanding of climate change, and its consequences, and will be crucial in providing the best data and evidence to enable us to decouple our greenhouse gas (GHG) emissions from economic activity. New, and as yet unknown, technologies and solutions will be required as we transition to a low carbon economy by transforming our energy, transport and food systems; by ensuring the sustainable use of land; and by creating a circular and a bio-based economy. In addition, climate action must complement efforts to deal with a range of other pressing environmental concerns, including ensuring that we have clean air, water and soils, and restoring our biodiversity. Climate action should be seen as complementary to a range of other important policy objectives such as the United Nations' (UN) Sustainable Development Goals. The transition to net zero is as much an economic and societal challenge as a scientific or technical one. The research and innovation required to address these challenges span a range of areas from fundamental and applied sciences, to the social sciences, to technology and innovation, to the production of knowledge and evidence to inform public policy.

4.2 Current State of Play

4.2.1 European Context

At European Union (EU) level, there are several programmes providing funding opportunities for research and innovation, including Horizon Europe with its EU Missions and Partnerships, the L'Instrument Financier pour l'Environnement (LIFE) Programme, and the EU Innovation Fund.

Horizon Europe (the Framework Programme for Research and Innovation) is the EU's key funding programme for research and innovation. It tackles climate change, helps to achieve the United Nations' Sustainable Development Goals and boosts the EU's competitiveness and growth. It supports research and innovation (R&I) projects primarily through competitive grant calls, and also includes activities pursued by the Joint Research Centre which supports policymakers with independent scientific evidence and technical support. Horizon Europe has earmarked 35% of its total budget towards climate objectives. Irish researchers and innovators expect to collectively draw down €1.5 billion in total Horizon Europe funding across the programme's lifetime.

Funding for climate-related research and action is also provided by the European Regional Development Fund (ERDF) as part of European Structural and Investment Funds, and COST (European Cooperation in Science and Technology), that funds bottom-up, open research and innovation networks. Ireland also benefits from extensive international R&I relationships beyond the EU, for example, with the United States through the US-Ireland Research and Development (R&D) Partnership. In particular, the United Kingdom remains a strong and valued collaborator.

4.2.2 EU Missions and Partnerships

EU Missions aim to develop tangible solutions to some of our greatest challenges with a portfolio of actions that combine R&I with implementation actions, policy development and citizen engagement. They operate under the aegis of Horizon Europe. There are four EU Missions which have direct implications for the climate challenge: Adaptation to Climate Change; Climate-neutral and Smart Cities; A Soil Deal for Europe; and Restoring our Oceans and Waters. Each EU Mission will be overseen by a lead Department and working groups are currently being established for this purpose.

EU Partnerships bring the European Commission and partners together to address some of Europe's most pressing challenges through concerted research and innovation initiatives. For example, Partnerships under Cluster 6 in food, bioeconomy, natural resources, agriculture and environment support a range of EU strategies in relation to climate, the circular economy, sustainable and healthy food systems, biodiversity and pollution.

4.2.3 LIFE Programme and Innovation Fund

The EU also provides funding opportunities for environment and climate projects through the LIFE Programme and the Innovation Fund. LIFE provides funding opportunities to a wide range of applicants across its four sub-programmes: nature and biodiversity; circular economy and quality of life; climate change mitigation and adaptation; and clean energy transition. The Innovation Fund is one of the world's largest funding programmes for the commercial demonstration of innovative low-carbon technologies, aiming to bring industrial solutions to the market to decarbonise Europe and support its transition to climate neutrality.

4.2.4 Ireland's Climate Research Ecosystem

Ireland has strategically built a strong R&I infrastructure in recent years. *Impact 2030* seeks to advance the R&I system's strategic development and to maximise the impact of R&I on our economy, society and environment. It also focusses on key societal challenges including climate, environment and sustainability. Many of the Higher Education Institutions (HEIs) are involved in climate-related research and innovation, including hosting Enterprise Ireland (EI) Technology Centres, Technology Gateways, and Science Foundation Ireland (SFI) Research Centres. These centres and funded research programmes allow Irish HEIs (including the new Technological Universities) to collaborate and work with small and medium-sized enterprises (SMEs) and multinationals, to develop the talent and skills needed for the jobs of the future, and to provide innovative technologies, new processes and insights to address key challenges. The arts, humanities and social sciences also have a significant role to play in developing holistic, human-centred, and sustainable solutions to the challenges we face now and in the future.

The Government provides significant funding to Ireland's research-performing organisations to carry out climate-related research in the sciences and humanities and to carry out policy-relevant research. Key elements across Government Departments and Agencies are set out below.

Department of the Environment, Climate and Communications, the Environmental Protection Agency, the Sustainable Energy Authority of Ireland and Geological Survey Ireland

The Department of the Environment, Climate and Communications funds a range of climate relevant research programmes with spending in 2022 totalling over €40 million. Technical support for the development and management of key operational elements in the national climate and energy policy process is provided by the Climate Action Modelling Group (CAMG) chaired by the Department.

The Environmental Protection Agency (EPA) plays an important statutory role in relation to environmental research and manages its research activities under the EPA Research Framework 2030 which delivers essential scientific support for policy development, implementation and broader decision-making.

The Sustainable Energy Authority of Ireland (SEAI) funds a range of research, development and demonstration (RD&D) activities relating to the production, supply and use of energy and also has a Behavioural Economics Unit which focuses on encouraging measurable changes to homeowners' and businesses' energy behaviour.

Geological Survey Ireland (GSI) is Ireland's public earth science knowledge centre and is involved in climate research in a number of key areas collaborating with partners in Ireland and internationally. GSI provides data on past climates, the ongoing impact of climate change on the natural world and how this will affect the future and also funds social science and behavioural research in relation to protecting and managing natural systems.

Department of Further and Higher Education, Research, Innovation and Science, Science Foundation Ireland and the Irish Research Council

The Department of Further and Higher Education, Research, Innovation and Science is responsible for national research and innovation policy and provides funding to SFI and the Irish Research Council (IRC) for competitive research calls, and to the Higher Education Authority for core research funding as part of the block grant to the HEIs.

SFI funds research in the areas of science, technology, engineering, and mathematics (STEM), including research infrastructure and talent in the areas of climate, environment, and sustainability. Several SFI Research Centres work in the broad climate area and SFI also funds climate-relevant large-scale research initiatives[4]. A new Co-Centres Programme, launched in 2022, will bring together leading academic and industrial researchers, as well as policy makers across Ireland, Northern Ireland and Great Britain focusing on climate, and sustainable and resilient food systems. SFI also manages the National Challenge Fund, which will see mission-oriented challenges to address Ireland's green transition being used to incentivise researchers to deliver tangible impacts for society.

The IRC supports excellent research across all disciplines and career stages, including early-career researchers. Its Collaborative Alliances for Societal Challenges (COALESCE) Research Fund Programme provides opportunities for researchers across all disciplines to propose excellent research projects that enhance our collective ability to meet national challenges and contribute to a global sustainable future.

Department of Transport

The Department of Transport administers a transport climate research fund which supports research objectives in relation to climate action and sustainability. This research allows the Department to develop the evidence base to support policy development and national emissions reduction targets, including the development and assessment of Climate Action Plan targets and trajectories. The Department also funds research to support the deployment of alternative fuels in the context of the EU Green Deal and the associated 'Fit for 55' legislative package, which is currently being negotiated.

Department of Agriculture, Food and the Marine, Teagasc and the Marine Institute

The Department of Agriculture, Food and the Marine manages a wide range of research activities and funds climate-related research directly and through the research programmes of Teagasc and the Marine Institute. The Government's new agri-food strategy, *Food Vision 2030*, sets out to embed the role of research and innovation in the development of a competitive and resilient agri-food sector over the coming decade. The Department's research programmes support the development and application of cutting-edge and emerging scientific and technological innovation to provide the basis for climate action and policy implementation.

Teagasc is significantly increasing its resources devoted to climate-related research and knowledge transfer with a new strategy built around three pillars: a new advisory programme available to all farmers; a sustainability digital platform, to be developed in cooperation with Irish Cattle Breeding Federation and Bord Bia; and a new "virtual centre", the National Centre for Agri-food Climate Research and Innovation, which will co-ordinate climate research and innovation programmes and accelerate efforts to bring to fruition "almost ready" and "early stage" technologies required for adoption at farm level.

The Marine Institute focusses on the impacts of climate change on our coastline and our oceans and on how data is collected and used in climate modelling and monitoring, in relation to this. The Oceans, Climate and Information Services Group provides support for national and international marine monitoring, marine mapping, research and development as well as information technology

4 Research Centres include MaREI, BiOrbic, iCRAG and VistaMilk and large-scale research initiatives include Terrain-AI (sustainable land use), CONSUS (crop optimisation), and NexSys (energy system decarbonisation)

infrastructure and digital service development.

Department of Enterprise, Trade and Employment, Enterprise Ireland and IDA Ireland

The Department of Enterprise, Trade and Employment funds and promotes enterprise-led innovation through a range of programmes and supports delivered mainly through EI and IDA Ireland, and engagement with other Departments, including the Disruptive Technologies Innovation Programme, Knowledge Transfer Ireland, Health Innovation Hub Ireland, the Eureka Programme for SME cooperation at international level, European Digital Innovation Hubs, and other initiatives. The Department also supports the implementation of Ireland's Smart Specialisation Strategy for the period 2022 to 2027. Additionally, under Ireland's National Recovery and Resilience Plan, €55 million has been committed to driving decarbonisation of enterprises through the Green Transition Fund.

EI provides direct supports for R&D activity within Irish firms and runs programmes to increase the level of collaborative R&D activity between industry and the higher education institutions. This includes support for: industry-academic projects known as Innovation Partnerships; Technology Gateways (in Institutes of Technology and Technological Universities); industry-led Technology Centres; and networking initiatives. It has programmes to accelerate the commercialisation of third level research programmes, including the Commercialisation Fund and also runs the Technology Transfer Strengthening Initiative to ensure that best use is made of research outputs with commercial potential, and the Campus Incubator Scheme which provides space for spin-out companies.

IDA Ireland's work in the research and innovation space includes progress towards the delivery of the National Advanced Manufacturing Centre in the IDA Ireland National Technology Park in Limerick. In addition, the National Institute for Bioprocessing, Research and Training was established at UCD primarily through IDA Ireland funding in 2011, and is a global centre of excellence for training and research in bioprocessing.

Department of Housing, Local Government and Heritage, Met Éireann and the National Parks and Wildlife Service

The Department of Housing, Local Government and Heritage, which includes Met Éireann and the National Parks and Wildlife Service (NPWS), funds research and undertakes research directly. Met Éireann's Weather and Climate Research Programme supports national predictive capability and capacity building in the areas of weather, climate, and hydrology through flexible and effective research funding mechanisms. In addition, core research activities include Numerical Weather Prediction; modelling research; climate modelling; climate services development; flood forecasting capability development; and weather and climate monitoring network development. Met Éireann is also responsible for leading and developing Ireland's National Framework for Climate Services which will provide important climate decision tools.

NPWS undertakes and commissions research in relation to biodiversity and nature conservation, including research on remote sensing, ecohydrology and the carbon exchange of ecosystems, and has a long history of research on peatland ecosystems and their restoration. The NPWS is currently working on developing a national ecosystem monitoring network to be included in the Long-Term Ecosystem Research (LTER) observation pan-European network.

The Department's National Monuments Service and Built Heritage Policy Unit drive delivery of the new national heritage plan, *Heritage Ireland 2030*, in which climate change research is embedded,

and are also commencing implementation of the National Policy on Architecture, which includes an action category to enhance the evidence base through research, education and knowledge exchange.

4.3 Themes of Strategic Importance

Several areas of strategic importance for research and innovation have been identified and are set out below. There is also an ongoing need for further and more inclusive research and innovation in relation to climate communications (see Chapter 9 on Citizen Engagement).

> *There is also an emerging consensus that the unique and urgent challenge of climate change and sustainability requires the exploration of more responsive modes of knowledge production.*

4.3.1 Expertise, Knowledge and Evidence

The research and innovation systems represent an important source of expertise which can be made available to provide data-driven and evidence-based approaches to guide the development and implementation of public policy in relation to climate. Various mechanisms have been used to achieve this including leveraging the expertise in Government Departments, Agencies, SFI research centres, HEIs, research contracts, consultancy, and calls for expert evidence. SFI has also piloted the use of Public Service Fellowships which provide opportunities to embed academic researchers in Government Departments and the Oireachtas for a period to work on specific collaborative research projects.

The development of robust knowledge transfer systems is also important. Connecting the outputs of research and innovation to policy, industry and societal actors in a systematic fashion requires further attention, including some key initiatives set out in *Impact 2030*. There is also an emerging consensus that the unique and urgent challenge of climate change and sustainability requires the exploration of more responsive modes of knowledge production. There needs to be greater direct linkages with policy makers in relation to the development of research strategies and research calls, and policy makers need to be aware of novel developments in research and innovation to inform policy making.

4.3.2 Climate Science and Research Infrastructures

Climate science is important in understanding how global, regional and local climates are maintained and how they change over time, using observations and theory from a variety of disciplines. These inputs then inform the development of computer models of the climate system, which enable us to make predictions about the future and to examine mitigation and adaptation options. Climate attribution science allows scientists to assess by how much an event was made more likely to occur, as well as the severity of the event, due to climate change. Ireland can make an important contribution to attribution studies, given our location at the western periphery of Europe, by using our weather infrastructure to collect and record data on changing weather and climate patterns. Ireland also carries out an extensive range of systematic climate observations and hosts a range of advanced observation sites which are part of regional and global networks. Observations are being continually developed by building on existing observation systems and through investment in new systems. These research infrastructures are important in ensuring that Ireland can collect, store and

manage the data required to understand the impacts of climate change and the measures we take to address it.

4.3.3 Systems Research and Modelling

A "system" is a set of things working together as parts of a greater whole. Systems research can provide insights to tackle complex problems by explicitly considering the influence of different aspects of a system on outcomes. Effective systems research can bring different specialisms and stakeholders together in a search for solutions to real-world problems such as climate change. These approaches have already been widely applied in Ireland, for example in SFI's Research Centres and in its challenge-based research initiatives. Further development in this area will be needed into the future.

Sectoral activity and emissions modelling has played a key role in developing climate mitigation actions to date, allowing us to assess the feasibility of proposed actions, to assess their impacts, and to determine necessary investment costs. Modelling activity has resulted in the development of highly successful sectoral models, but as we transition to a net-zero future we will need much more integrated modelling capable of assessing the implications of large-scale simultaneous change across sectors. Coordination, structures and funding that encourage collaboration across disciplines, and across research groups, are important and will be pursued.

Currently a whole-of-Government approach is being taken to develop a modelling framework which can analyse the macroeconomic, fiscal, and distributional impacts of climate transition policies in a robust manner over the medium term. Modelling capability to investigate the combined macroeconomic impacts of different policies across households and production sectors is required. The Departments of Public Expenditure and Reform and Finance are now actively providing funding and support for climate macroeconomic modelling work in the ESRI in concert with the wider climate research programme that is being led by the Department of the Environment, Climate and Communications and progressed through the Climate Research and Modelling Group chaired by the Department of the Taoiseach.

Foresight (i.e., alternate future scenario) modelling will be essential to identify potential opportunities associated with transformative changes, necessary to provide a balanced economic perspective for strategic policy making. Foresight modelling can also underpin effective "re-imagining" of sectors, which will be critical to guide the kind of discontinuous changes needed to achieve rapid decarbonisation and ultimately climate neutrality. Such an approach applied across sectors can help to identify complementarities, competing interests and trade-offs across the diversity of prospective technological, organisational and behavioural "solutions". It will also be important to understand the wider socio-economic impacts and distributional effects of climate actions taken across sectors, and to understand their cumulative effect on an economy-wide basis. This type of modelling is important from a just transition perspective as well as when determining the appropriate balance of policy incentives and disincentives.

4.3.4 Technology and Innovation

Addressing the climate challenge will require the development of new technologies and innovative solutions to current and emerging issues. Technological innovation will be required across a wide range of areas, including in the ongoing development of heat pump technology, in the development of carbon capture and storage, in sustainable farming systems and in the bioeconomy. There is a critical role for Technology Centres and Technology Gateways, supported by the enterprise

agencies, in transforming businesses by leveraging the private sector knowledge base and bringing important innovations to the market. The transition to a climate-neutral and circular economy also represents a clear market opportunity for our enterprises, driven by the fundamental policy, regulatory and market changes occurring across Europe and in our export markets.

Horizon Europe has established the European Innovation Council (EIC), the European Institute of Innovation and Technology (EIT) and European innovation eco-systems to enhance Europe's innovation performance. The EIC is a new body to support high-potential start-ups and SMEs through equity financing. The EIT has established several Knowledge and Innovation Communities (KIC), which are partnerships that bring together businesses, research centres and universities. Three KICs contribute directly to climate objectives namely, EIT Climate-KIC, EIT InnoEnergy and EIT Urban Mobility.

While climate action is often expressed in terms of national targets, delivery in many cases must happen at regional or local level.

4.3.5 Supporting Delivery at Local Level and Ensuring a Just Transition

While climate action is often expressed in terms of national targets, delivery in many cases must happen at regional or local level. The capacity of national, regional, and local structures to effectively downscale these targets and deliver them poses a range of organisational and regulatory challenges. Further research is needed to understand the challenges to delivery across sectors, and at different scales.

To date, the Climate Action Regional Offices have supported Local Authorities in leading climate action at local level. Participation in Horizon Europe's Climate-neutral and Smart Cities Mission and the Climate Adaptation Mission will provide further support in this area. The Department of the Environment, Climate and Communications will coordinate engagement across Departments to bring together an interdepartmental group to oversee the Cities Mission and to ensure that the necessary support is provided to the participating cities – Dublin and Cork. Ongoing research and innovation are important to achieving just transition objectives, and in understanding the distributional impacts of polices across multiple sectors and on communities throughout the country.

4.3.6 Policy Monitoring and Evaluation

Monitoring and evaluation of policies in the post-implementation stage is critical to measuring progress. Methodologies derived from both physical and social perspectives should be developed to assess and monitor the effectiveness of policy implementation. This work should be aligned with the key performance indicators being developed in this Climate Action Plan for maximum impact. Long-term, consistent, and accurate monitoring and assessment of a suite of environmental indicators (including water, air, biodiversity, etc.) is essential to support evidence-based decision making in all matters related to climate action.

4.3.7 Research Networks and Co-ordination

Ireland participates in a range of EU networks, in EU Partnerships and in collaborative projects facilitated by Horizon Europe. Ireland is also active in international organisations including the Intergovernmental Panel on Climate Change and the World Meteorological Organisation, and

actively engages with the United Nations Framework Convention on Climate Change Subsidiary Body on Scientific and Technical Advice. Continued active participation in these networks and fora is important. At national level, there are a number of inter-agency and cross-departmental co-ordination groups on climate and environmental research[5]. These groups provide fora for research funders and others to come together to enhance research co-ordination.

4.3.8 Climate Finance

It is critical to ensure that Ireland's finance industry has the skills needed to meet our climate objectives. The recently announced International Sustainable Finance Centre of Excellence will focus on research, talent development and leadership activities to support the design and implementation of innovative financial mechanisms to facilitate the transition to a net-zero economy in Ireland and internationally. The centre will focus on practical acceleration of the sustainable finance agenda at a policy, regulatory and market level, and support the research and development of innovative financial mechanisms to facilitate the transition to a sustainable economy. The Government is committed to doubling the proportion of Ireland's Overseas Development Aid that counts as climate finance by 2030. In July 2022, the Government published Ireland's International Climate Finance Roadmap which illustrates Ireland's plans for scaling up its international climate financing to meet a target to provide at least €225 million by 2025.

5 This includes the Climate Research Coordination Group and the National Environmental Research Coordination Group chaired by the EPA; the National Energy Research Funders' Forum chaired by the SEAI; the Climate Research and Modelling Group chaired by the Department of the Taoiseach; and the Marine Research Funders' Forum chaired by the Marine Institute

4.4 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
RE/23/1	National Agricultural Soil Carbon Observatory to be fully operational
RE/23/2	Effectively coordinate and prioritise national environmental research priorities, including climate, and inform research gaps
RE/23/3	Increase knowledge transfer and provide expertise in the development of policy
RE/23/4	Publish Ireland's Five-year Assessment Report on Climate Change
RE/23/5	Support national LULUCF commitments
RE/23/6	Develop governance and monitoring of selected NPWS ecosystem observation sites for integration into LTER, and establish long-term ecosystem monitoring, including GHG measurement
RE/23/7	Support Irish engagement and participation in International Energy Agency (IEA) activities
RE/23/8	Provide a national level assessment of the size and location of potential candidate areas for district heating including pilot feasibility study
RE/23/9	Produce a practical guide for manufacturing companies looking to integrate renewables onto their site
RE/23/10	Launch annual National Energy Research, Development and Demonstration (RD&D) Funding Programme Call
RE/23/11	Stimulate research, development and demonstration projects across industry and enterprise sectors with a focus on accelerating energy decarbonisation e.g., innovative approaches to decarbonising heat and electricity, energy storage solutions, renewable energy and energy efficiency solutions
RE/23/12	Enhance the National Energy Modelling Framework
RE/23/13	Conduct research on household sustainable heating
RE/23/14	Supplement national-level statistics with county and local authority level breakdowns
RE/23/15	Improve citizen engagement pathways and uptake on sustainability initiatives
RE/23/16	Support the Climate-neutral and Smart Cities Mission and the Climate Adaptation Mission
RE/23/17	Implement the National Challenge Fund, a €65 million all-of-Government endeavour, funded under the EU Recovery and Resilience facility and administered by SFI
RE/23/18	Implement EPA Research Strategy
RE/23/19	Ensure that research and research activities are funded in an environmentally sustainable way
RE/23/20	Support the coordination of Ireland's interests in EU's Destination Earth initiative
RE/23/21	Establish governance and data structure to support Ireland's membership of Integrated Carbon Observation System European Research Infrastructure Consortium

5 Choosing the Pathways

5. Choosing the Pathways

Key Messages

State of Play

- Measures to implement and deliver Ireland's emission targets, as set out in the sectional emissions ceilings, were assessed and refined based on their emissions abatement potential and other factors including cost, feasibility, and socioeconomic impact

Current and Future Action

- Decarbonisation in line with the sectoral emissions ceilings will require major changes to our society and economy. The most important changes will relate to electricity generation, buildings, transport, agriculture and land use
- These changes require significant capital investment

Expected Outcomes

- Meeting the target of 51% emissions reduction by 2030, relative to 2018 levels, while staying within our legally binding carbon budgets, will require implementation of all measures outlined in the Climate Action Plan's plus:
  - additional, not yet specified measures to deliver the unallocated emissions savings of up to 5.25 $MtCO_2eq$ per annum, which were assigned to the second carbon budget period (2026-2030);
  - agreeing a sectoral emissions ceiling for the Land Use, Land Use Change and Forestry.

5.1 Introduction

The Climate Action Plan 2023 will build on the measures and technologies set out in previous Climate Action Plans, as well as the analysis conducted to support preparation of the Sectoral Emissions Ceilings. In addition, it will set out specific actions required to achieve the emissions targets over the coming years.

Following the approval of the Carbon Budget Programme, the Minister for the Environment, Climate and Communications engaged with relevant Ministers, and their Departments and Agencies, to determine the level of effort required by each sector of the economy to deliver these budgets. The resultant Sectoral Emissions Ceilings were approved by Government on 28 July 2022 based on analytical input from the Climate Action Modelling Group and other externally procured expertise.

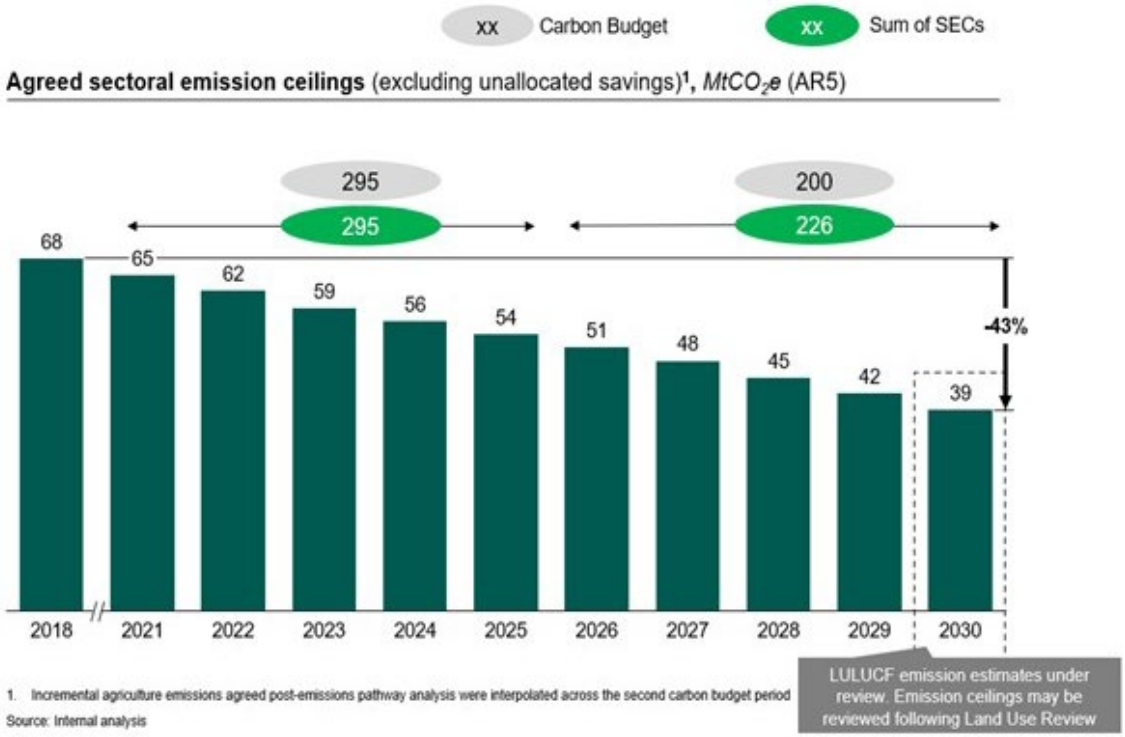
Measures to implement and deliver the sectional emissions ceilings were assessed and refined based on their emission abatement potential and other factors including cost, feasibility, and socioeconomic impact. Analysis undertaken to inform and support Climate Action Plan 2021 (published November 2021[6] served as a starting point for establishing the sectoral emissions

6 https://www.gov.ie/en/publication/76864-sectoral-emissions-ceilings/

ceilings). This analysis was further developed through an iterative process that comprised extensive and frequent engagement with the relevant Departments and Agencies.

Meeting the target of 51% emissions reduction by 2030 and the emissions limit for the second carbon budget will require implementation of all measures outlined in the sectoral emissions ceiling analysis (which result in emissions reductions of approximately ~43%) and additional, not yet specific measures to deliver the unallocated per annum savings of up to 5.25 MtCO2eq. The emissions reductions required are illustrated in Figure 5.1

Figure 5.1: Agreed Sectoral Emissions Ceilings



5.2 Key Measures and Shifts Required

Achieving the ambition set out in the sectoral emissions ceilings requires a step change in climate action. It will necessitate rapid moves to the technologies and fuels of the future, as well as a mindset shift for consumers. This section highlights the five key measures that will move the needle on decarbonisation. However, while having the largest emissions reduction potential, they alone will be insufficient to achieve the targets – a more complete and detailed view of sectoral abatement pathways and corresponding measures is provided in section 5.3.

The five most important decarbonisation measures for Ireland over the coming decade are:

- **Renewable Generation:** Large scale deployment of renewables, both onshore and offshore, will be critical to decarbonising the power sector as well as enabling the electrification of other technologies. Shifting to an emissions pathway consistent with the sectoral emissions ceilings will require in the region of 22 GW in renewable generation capacity overall by 2030.
- Retrofitting of Residential and Commercial Buildings: Increasing the energy efficiency of existing buildings and putting in place policies to deliver zero-emission new builds is critical

to meeting the sectoral emissions ceilings pathway. This implies an almost 50-fold increase in annual deep retrofits to B2 level from 1,500 households retrofitted in 2019 to 75,000 households that will need to be retrofitted in 2030.

- Modal Shift in Transport and Fleet Electrification: Policies providing the infrastructure and incentives to use public transport, coupled with changes in behaviour are required to reduce passenger car use. This will require a 20% reduction in vehicle kilometers travelled, and significant increases to the level of additional public transport and active travel journeys per day, as set out in Chapter 15. The uptake of electric vehicles will also require a step change with 30% of the private car fleet to be electrified by 2030, and all new car registrations to be electric for subsequent years.
- Changes to Land Use: Afforestation rates would need to more than triple, going from approximately 2,400 hectares reforested in 2021 to 8,000 hectares reforested annually between 2021 and 2025.
- Efficiency Improvements in Agriculture: The adoption of greenhouse gas (GHG) efficient farming practices will need to be increased in 1.5-fold compared to measures outlined in Climate Action Plan 2019. This includes more climate-efficient use of fertiliser, improved animal feeding, improved animal breeding, bringing forward the finishing age of cattle, and increasing organic farming.

Achieving these and all other required measures requires a sea change in the functioning of society and the economy including mobilisation of capital, physical construction, reconfiguration and scaling-up of supply chains, and individual behaviour change, to name a few. A transformation at this scale and speed has rarely, if ever, seen before outside of war time. It will require mindset shifts, new ways of working, and innovative collaborations between citizens, business and the public sector.

While significant, this change is not impossible. The UN estimates that technological solutions which can tackle more than 70% of the world's emissions already exist and are ready to be deployed[7]. Governments and companies across the world have also begun taking unprecedented action to address climate change.

To better reflect the reality of the scale of transformation needed, the governance and delivery approach for the Climate Action Plan has also been updated to enhance whole-of-Government ownership and delivery focus. This is detailed in Chapter 6.

5.3 Sector Abatement Ambition

Achieving the sectoral emissions ceilings agreed requires deep climate action across all aspects of the economy. Table 3.2 in chapter 3 illustrates the emissions reductions for each sector, compared to 2018 levels, as required by the sectoral emission ceilings.

Electricity: The proposed pathway includes a massive and rapid build-out of renewable generation capacity (wind and solar power generation technologies) and will also rely on the continued build-out and strengthening of grid infrastructure, the deployment of zero-emissions gas, and improved electricity demand management. The decarbonisation of the electricity sector will be an immense challenge as we face a growing demand for electricity and a need to ensure security of supply, while providing support for the decarbonisation of other sectors through the electrification of transport and heat.

Transport: The proposed pathway in transport focuses on reducing the use of private passenger

7 United Nations (2022), The Climate Crisis – A Race We Can Win. https://www.un.org/en/un75/climate-crisis-race-we-can-win

cars, a modal shift to transport modes with lower energy consumption (e.g., public transport, walking and cycling) while accelerating the electrification of road transport (e.g., increased use of electric and low-emission vehicles) and increasing biofuel blend rates.

Buildings: The proposed pathway includes delivering the retrofit ambition in Climate Action Plan 2021, rollout of district heating in cities, and acceleration of zero-emissions heating in both residential and commercial buildings.

Industry: The proposed pathway involves a ramp-up of zero emissions heat and district heating in commercial buildings, accelerating uptake of alternative fuels, blending in zero-emission gas and decreasing embodied carbon in construction materials. In addition, there may be a need for Carbon Capture and Storage (CCS) in difficult-to-abate industry sectors.

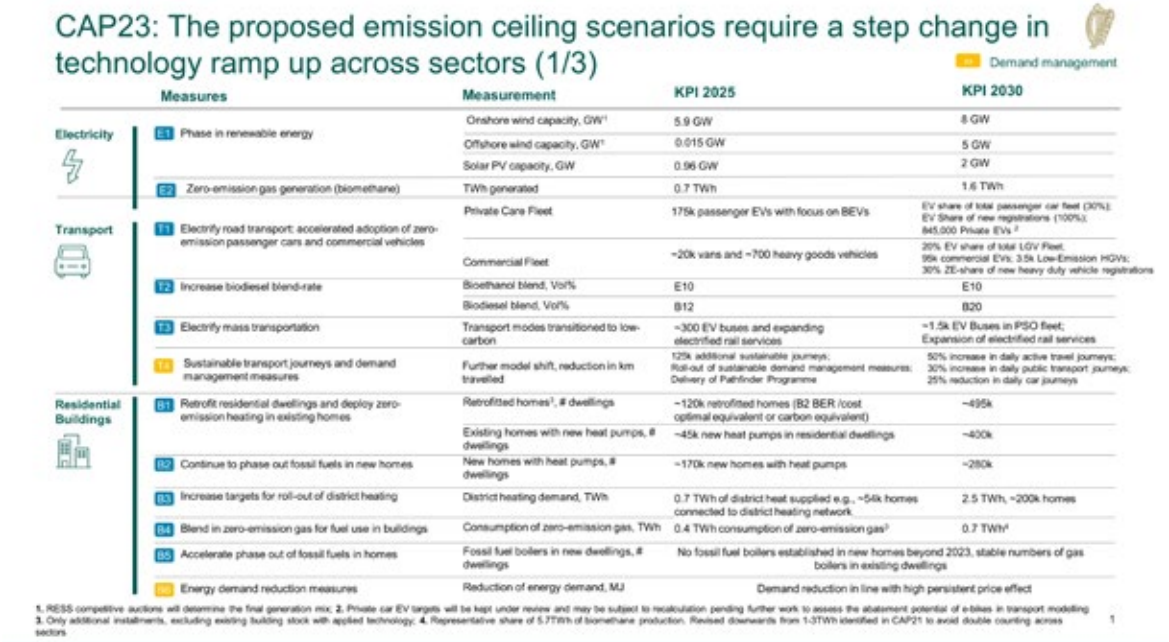
Agriculture: Key measures in agriculture include increasing adoption of GHG-efficient farming practices, diversifying farm activities (e.g., through afforestation, forest management and bioenergy), and creating new biomethane business opportunities.

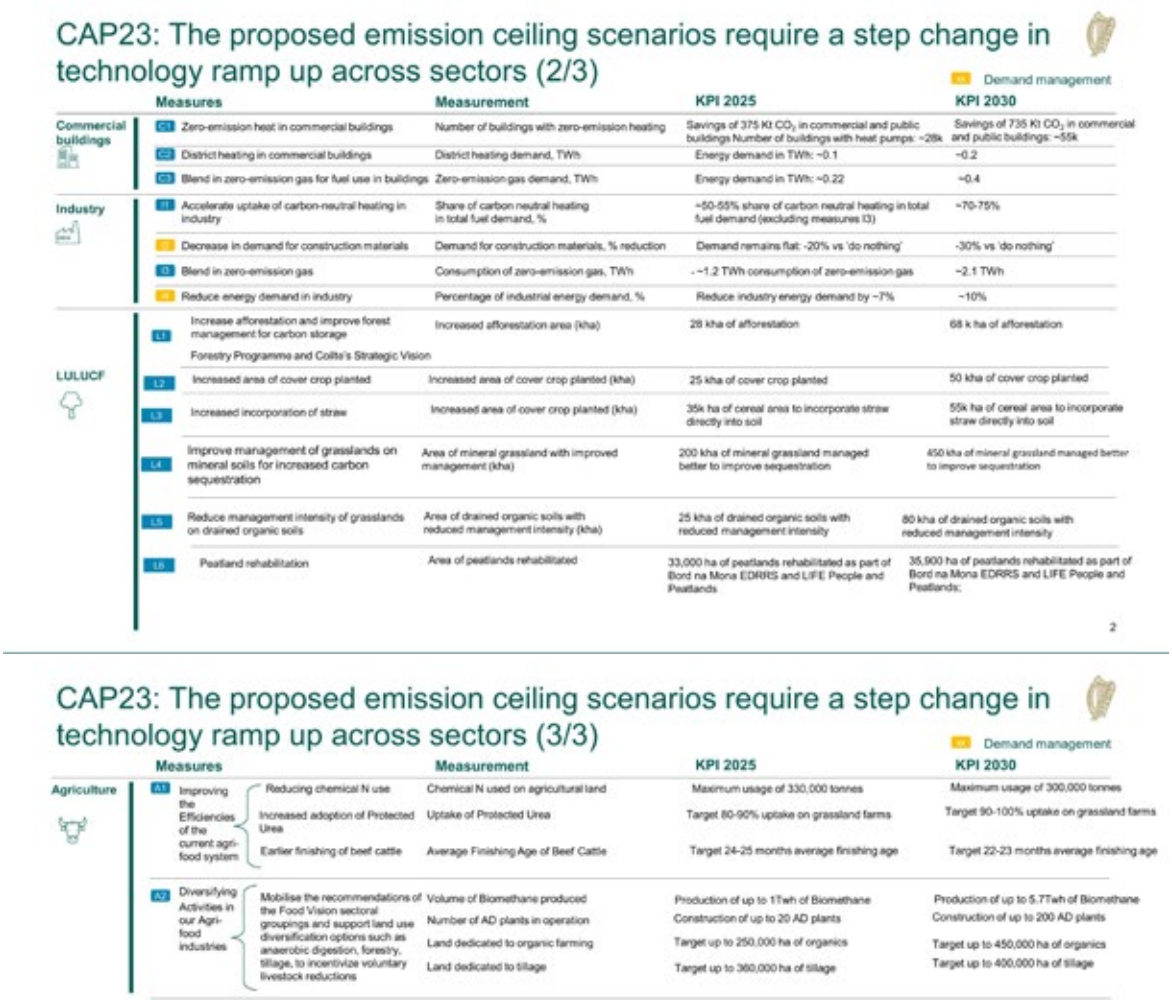
LULUCF: The proposed pathway includes acceleration of afforestation planting rates, significant reduced management intensity of peatlands, and more efficient management of grasslands and croplands to reduce emissions. This will be further elaborated as part of agreeing a sectoral emissions ceiling in the coming year.

Other: The proposed pathway includes reducing emission from F-gases, waste and petroleum refining.

Figure 5.2 shows the measures for each sector, setting specific ambitions (indicated by KPIs) to be achieved by 2030. Articulating the KPIs will enable each sector to monitor progress, and to gauge whether the most appropriate policy tools have been identified and are being deployed, or whether there is a need to reconsider the policy and/or the ambition.

Figure 5.2: Measures and Associated KPIs for each Sector under the Agreed Pathway to Deliver the Sectoral Emissions Ceilings





5.4 Investments Required

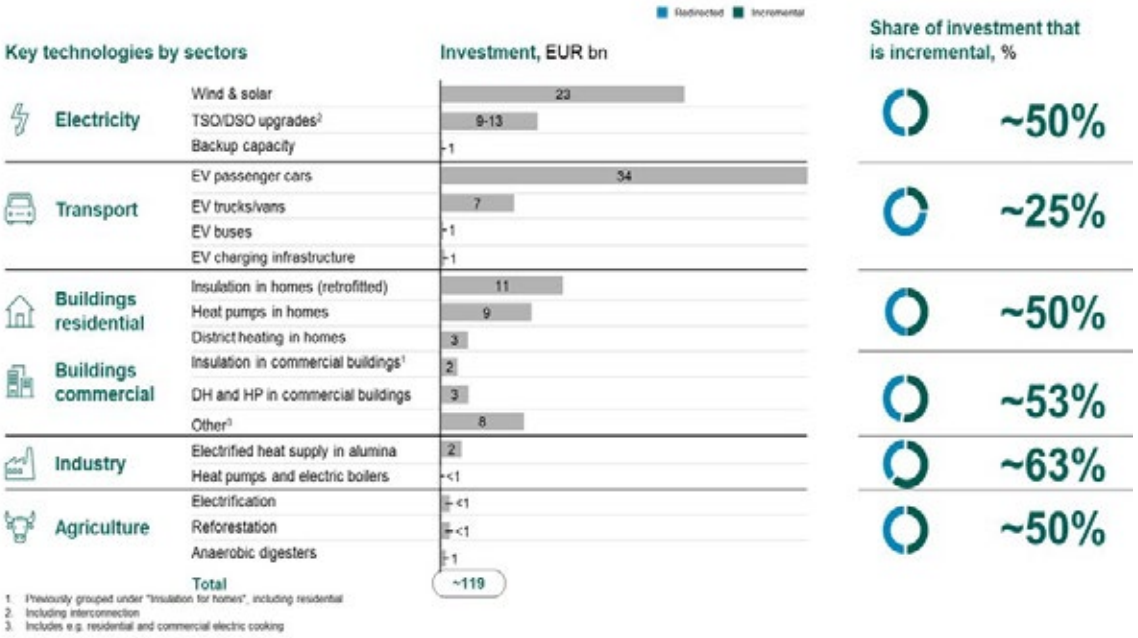
In order to meet the targets and objectives of this Climate Action Plan, it is necessary to direct the private sector towards financing the necessary investments and away from financing investments that are inconsistent with the Government's sectoral emissions ceilings. Public bodies such as planning authorities, funding authorities and the enterprise agencies will work to support this objective.

It is not possible to give a complete assessment of the investments required or the macroeconomic implications of the proposed sectoral emissions ceilings. Enhanced analytical capacity is being developed by the Department of Public Expenditure and Reform and the Department of Financed in collaboration with the ESRI over the next 18 months. To partially address this analytical gap, the Department of the Environment, Climate and Communications sought preliminary analysis from externally procured expertise in relation to the investment implications of the proposed sectoral ceilings.

This preliminary analysis suggested a total of ~€119 billion incremental and redirected capital investment in low-carbon technologies and infrastructure will be required in the period 2022 to 2030 (as illustrated in Figure 5.3). Investment required this decade is expected to be driven by

transport (~€42 billion), electricity (~36 billion) and buildings (~€31 billion)[8]. The analysis suggests that the most significant share of capital could flow into electric vehicle passenger cars, renewables, and transmission and distribution related upgrades.

Figure 5.3: Investment likely needed to Mobilise Key Technologies[9]



5.5 Benefits for Ireland

In addition to the critical contribution to limiting global warming, decarbonisation can deliver broad benefits for Ireland. Climate action measures can have significant social and economic co-benefits, health benefits and present opportunities for job creation (summarised in Figure 5.4).

8 Note that the estimated electricity investment is to reach 80% renewables by 2030. A significantly higher level of investment is needed to deliver on the carbon budget programme set out in the electricity chapter

9 'Agriculture' includes estimated investment requirements for LULUCF sector. 'Reforestation' also includes afforestation activities and initiatives

Figure 5.4: Benefits of Climate Action

Co-benefits

Additional social and economic benefits that arise from measures to decarbonise

- Habitat creation
- Improved air quality
- Flood risk mitigation
- Reduced water pollution
- Increased water and energy efficiency

Health benefits

Health improvements and reduced health risk linked to the Net Zero transition

- Shift to active travel
- Physical health improvement
- Mental health improvements
- Healthier diets
- Reduced mortality risks

Job creation

Sustainable economic growth and job creation opportunities arising from the low-carbon transition

- Increased demand for higher-skill roles
- New high-growth green export and export opportunities
- Additional job opportunities in key low-carbon transition sectors

- Co-benefits. Climate co-benefits refer to additional social and economic benefits that arise from climate action. For example, the restoration of peatlands and increase in woodland enables habitat creation and improves air quality. Increased forest cover can retain excess water and mitigate the impacts of floods, increasing resilience to climate change. Changes to farming practices bring air quality improvements from reduction in ammonia use, and reduced eutrophication/water pollution because of more efficient nitrous oxide application. Regenerative agricultural practices improve soil health and the soil's capacity to infiltrate, reducing the need for irrigation and improving water and energy efficiency.
- **Health Benefits.** There is a wealth of evidence that many climate actions can lead to health improvements and reduced health risks. For example, embracing active travel (walking and cycling) can have improved physical and mental health benefits which, considered in economic terms are even greater than the positive environmental impact, while the shift to renewable fuel sources improves air quality. Diets that shift away from meat consumption not only reduce our carbon footprint, but also reduce the risk of some health conditions like heart disease. Improved air quality from cleaner transport reduces exposure to pollutants and the associated mortality risks.
- **Job Creation**. Climate action can lead to market opportunities that enable sustainable economic growth and green job creation. For example, increased demand for jobs in higher-skilled roles such as offshore wind installation engineers. Ireland is well positioned to seize new high-growth green export and import substitution opportunities such as horticulture and harvested wood products. Further opportunities for job creation exist in low-carbon transition sectors such as buildings, transport and manufacturing. In the buildings sector, this could include jobs to support the energy efficiency and low-carbon heat programmes.

The actions set out in this plan aim to ensure that Ireland's response to climate change maximises the potential benefits and ensures that the impacts are distributed fairly.

5.6 Potential Measures to address Unallocated Savings

This plan recognises that it is not yet possible to identify all the emerging technologies or policies required to meet our full ambition. The unallocated emissions abatement of 26 $MtCO_2eq.$, which must be addressed ahead of the second carbon period (2026-2030) and equates to 5.25 $MtCO_2eq$ per annum, will require further allocation across the sectoral emissions ceilings in the coming

decade. Further detailed evaluation of possible technologies and measures will be completed well in advance of the second budgetary period commencing, in order to identify additional abatement potential.

Some potential options to close the unallocated emissions savings gap include:

- **Increasing the ambition of existing measures:** The targets for specific measures set as part of this plan could be revisited to understand if a further increase in ambition for these is possible given evolution of technologies or behavioural shifts (e.g., increase number of homes retrofitted etc.).
- **Implement targeted demand management measures:** These measures would encourage people to do less of certain emissions-intensive activities and/or switch to alternative options. For example, further encouraging a hybrid or work-from-home model could result in reduced ICE vehicle travel.
- **Rely more on emerging technologies**: These measures would require implementation of new technologies (e.g., Hydrogen, Carbon Capture and Storage) in Ireland. Further research on the operational and implementation feasibility of these technologies, as well as their emissions abatement potential needs to be conducted.

6 Governance of the Challenge

6. Governance of the Challenge

Key Messages

State of Play

- The carbon budget programme was adopted in April 2022 and the sectoral emissions ceilings approved in July 2022, setting out framework and pathway for achieving our emissions reduction targets
- The EU governance and reporting framework also informs and provides structure for Ireland's climate action

Current and Future Action

- The Climate Action Delivery Board will have an enhanced role in relation to delivery, including providing recommendations for overcoming barriers
- Taskforces will be established to focus on key specific areas or initiatives of climate delivery that require cross-Government collaboration
- An annual climate action planning and reporting cycle will be introduced
- The Environmental Protection Agency and the Climate Change Advisory Council reports will continue to inform the monitoring of Ireland's climate action performance on a sectoral level

Expected Outcomes

- Improved delivery and reporting architecture will support delivery on climate action and transparent reporting

6.1 Introduction

The carbon budgets adopted by the Oireachtas in April 2022 and sectoral emissions ceilings approved by the Government in July 2022 underpin the policies, measures and actions outlined in this Climate Action Plan (CAP23). This chapter summarises Ireland's climate targets as set out under the carbon budgets and sectoral emission ceilings, and then sets out the implementation, governance, and delivery architecture for the Climate Action Plan, including responsible bodies and the annual planning process.

6.2 Carbon Budgets and Sectoral Emissions Ceilings

The approval and adoption of the carbon budgets and sectoral emissions ceilings provides a strong statutory footing for CAP23. This plan, and all subsequent plans, are required under the Climate and Action and Low Carbon Development (Amendment) Act 2021 to provide a roadmap of actions that ensure compliance with the budgets and ceilings.

6.2.1 Carbon Budgets

A carbon budget represents the total amount of emissions, measured in tonnes of CO2 equivalent that may be emitted by a country or region during a specific time period. Ireland's carbon

budget programme, proposed by the Climate Change Advisory Council (CCAC), was approved by Government in February 2022, and subsequently adopted by the Oireachtas in April 2022[10].

The carbon budget programme comprises three successive 5-year carbon budgets as follows:

- **2021-2025: 295 $MtCO_2eq$**. representing an average reduction in emissions of 4.8% per annum for the first budget period;
- **2026-2030: 200 $MtCO_2eq$**. representing an average reduction in emissions of 8.3% per annum for the second budget period;
- **2031-2035: 151 $MtCO_2eq$**. representing an average reduction in emissions of 3.5% per annum for the third provisional[11] budget.

6.2.2 Sectoral Emissions Ceilings

Sectoral emissions ceilings set out the maximum amount of greenhouse gas (GHG) emissions that are permitted in different sectors of the economy during a carbon budget period. Under the provisions of the Climate Action and Low Carbon Development (Amendment) Act 2021, sectoral emissions ceilings were prepared for Government approval, following the adoption of the carbon budgets. These ceilings, which must sit within the parameters of the carbon budgets, were approved by Government in July 2022[12].

Figure 3.2 in chapter 3 below sets out the sectoral emissions ceilings for 2021-2025 and 2026-2030, and the associated percentage change in emissions required to meet the ceilings (relative to 2018 levels).

The sectoral emissions ceilings for electricity, transport, the built environment (residential and commercial), industry, agriculture and 'other'[13] emissions were agreed by Government in July 2022. As preparation of the sectoral emissions ceilings was being finalised, important additional information in relation to land use, land use change and forestry emerged. As a result, the finalisation of this ceiling has been temporarily deferred. In addition, further work is required to assign the 5.25 $MtCO_2eq$. in annual unallocated savings for the period 2026 to 2030. These unallocated savings must be assigned to sectors as soon as may be, and prior to the commencement of the second carbon budget period (2026-2030). Work has commenced to determine this assignment.

6.3 Oversight of Government

The Environmental Protection Agency's (EPA) annual GHG inventory and projection reports and the CCAC annual report will serve to inform the public how well the Government is doing in achieving and planning for the emissions reductions that are required to comply with each carbon budget and sectoral emissions ceiling.

Each year, the CCAC must report by 30 October, following which relevant Ministers will be required to give account to an Oireachtas Committee on performance both in implementing Climate Action Plan actions and in adhering to their sector's emissions ceiling under the carbon budget period. Where Ministers are not in compliance with the targets, they will need to outline what corrective

10 https://www.gov.ie/en/publication/9af1b-carbon-budgets/#:~:text=A%20carbon%20budget%20represents%20the,effect%20on%206%20April%202022

11 It is necessary to consider how emissions might develop in the period post-2030 in order to establish a basis for proposals for the provisional third carbon budget for the period 2031-2035

12 https://www.gov.ie/en/publication/76864-sectoral-emissions-ceilings/

13 The 'Other' ceiling includes waste, F-gases and petroleum refining

measures are envisaged. Ministers will have to respond to any recommendations made by the Committee within 3 months. This 'comply or explain' approach will ensure greater scrutiny and accountability is provided.

The annual revision to the Climate Action Plan acts as a further review mechanism and an opportunity to re-adjust or refocus actions to ensure targets are achieved.

6.4 Delivery of Climate Action Plan

Achieving the carbon budgets and sectoral emission ceilings set out in section 6.2 requires significant mobilisation of capital; shifts in technologies; upgrading of infrastructure; reconfiguration and scaling-up of supply chains; and individual behaviour change. A transformation at this scale and speed has rarely, if ever, been seen before. It will require mindset shifts, new ways of working, and innovative collaborations between citizens, businesses and the public sector.

While significant, this change is not impossible. The United Nations estimates that technological solutions which can tackle more than 70% of the world's emissions already exist and are ready to be deployed[14]. Governments and companies across the world have also begun taking unprecedented action to address climate change.

The delivery and governance architecture of CAP23 has also been strengthened to better reflect the scale and nature of the challenge ahead. This includes building on the existing foundation of policy development, governance and reporting, and upgrading processes, structures and public sector capacity required to deliver the plan. Two key areas of change include:

- Strengthening the role of the Climate Action Delivery Board (CADB) to ensure better alignment with the Cabinet Committee on the Environment and Climate Change and enable cross-Governmental ownership of the plan;
- Aligning the Climate Action Plan's delivery cycle to an annual rhythm to match other cross-Government processes.

6.4.1 Delivery Structures and Rhythm

The statutory footing of the carbon budgets and sectoral emissions ceilings means that the Government, as a whole, has committed to delivering the emissions reductions set out by these targets, and that all relevant Departments are accountable for climate action and emission reductions in their sector. The Climate Action Plan's importance is emphasised across Government, resulting in active participation from all relevant Departments as well as cross-cutting Agencies such as the EPA; the Sustainable Energy Authority of Ireland; Teagasc; the National Transport Authority; Enterprise Ireland; IDA Ireland; and the Central Statistics Office. The current delivery and governance infrastructure of the Climate Action Plan provides a strong foundation on which to build.

The key elements of the updated delivery system are:

- Enhanced engagement with the political system, in particular better alignment with the Cabinet Committee on the Environment and Climate Change;
- Upgraded delivery capabilities;
- Effective cross-Governmental collaboration and ownership.

The Cabinet Committee on the Environment and Climate Change plays an important role across the broad climate and environment agenda, by prioritising content and decisions to be brought to

14 United Nations (2022). The Climate Crisis – A Race We Can Win (https://www.un.org/sites/un2.un.org/files/2020/01/un75_climate_crisis.pdf)

Cabinet for consideration, and by focusing on delivery of the Climate Action Plan. The Climate Action Delivery Board (CADB) is composed of Secretaries General of Government Departments with key responsibilities in driving climate action. The Cabinet Committee will receive regular reports from the CADB as well as early signalling of emerging delivery challenges. The Cabinet Committee may request the CADB to provide recommendations for overcoming barriers to delivery as required.

The CADB will oversee delivery of the Climate Action Plan and act as a forum for identifying solutions to any challenges or obstacles impeding delivery. To enhance coordination between the administrative and political perspectives, the CADB will be attended by the Chiefs of Staff of the Taoiseach, the Tánaiste, and the Minister for the Environment, Climate and Communications. It will meet as required and no less than once a quarter to jointly problem-solve in relation to key obstacles to the implementation of the plan identified by the Cabinet Committee and accountable Departments.

The Climate Action Unit (CAU), which was established in the Department of the Taoiseach to monitor implementation of the Climate Action Plan and to enhance the delivery capability of the Government's climate action system, will work closely with all accountable Departments, facilitating knowledge sharing across Departments and supporting transparent performance reporting. It will provide regular updates to the CADB.

The Department of An Taoiseach will continue to compile quarterly reports on implementation of agreed actions contained within this plan and will publish these reports following consideration by Government.

Each accountable Department will put in place taskforces or other appropriate structures to ensure that the policies and programmes necessary to comply with sectoral emissions ceilings are expedited. These structures will enable accountable Departments to maintain focus on important climate initiatives (e.g., residential retrofitting, offshore renewables, etc.) and facilitate the necessary collaboration across Government Departments, Agencies and offices.

6.4.2 Annual Cycle for CAP delivery

Climate delivery needs to be embedded as a core part of Government business. It is important, therefore, that the Climate Action Plan delivery and reporting cycle aligns with broader Government cycles and allows responsible Departments room for collaboration and early review of sectoral proposals. It will also be important for the Climate Action Plan delivery and reporting cycle to align with key publications regarding Ireland's climate action and emissions, as set out in the 2021 Climate Act, namely the CCAC Annual Report and the EPA's emissions inventory and emissions projections reports. In recognition of this, an annual planning process will be implemented, as a form of annual 'climate action calendar'. The plan will be updated as required both to ensure Government remains on course to deliver its climate targets and to reflect evolving responsibilities of accountable Departments.

First Phase (Q1): Department of the Environment, Climate and Communications Planning and Preparation

DECC provides a starting baseline of performance to date against plan, prepares a Memorandum for Government setting out current progress status and defining key shifts necessary in upcoming plan.

Second Phase (Q2): Sectoral Engagement

In this second phase of the planning cycle, DECC coordinates Departments proposing updated action plans that will meet their sectoral emissions ceilings, including ensuring overall coherence. Support will be available from the Climate Action Modelling Group.

Third Phase (Q3): Circulation of Draft Plan and Wider Evaluation

DECC circulates a draft national plan integrating sectoral plans and identifying cross-cutting initiatives for review and input. DECC will also ensure that sectoral plans deliver the carbon budgets and sectoral emissions ceilings, including determining new policy recommendations for consideration by Government. DECC will engage with the Department of Public Expenditure and Reform and the Department of Finance in relation to the wider socio-economic implications of the plan, recognising that capacity to undertake this type of analysis is currently being developed and may not be in place for at least 18 months. Any requirements that may arise in relation to Strategic Environmental Assessment and Appropriate Assessment will also be addressed during this phase.

Final Phase (Q4): Approvals and Publication

The final stage involves engagement with Government Ministers, leading to Government review and approval for an updated Climate Action Plan. Following Government approval, the annual Climate Action Plan is published. Following CCAC reporting, Ministers with responsibilities for sectoral emissions are invited to the Joint Oireachtas Committee on the Environment and Climate Action, pursuant to section 14A of the Climate Action and Low Carbon Development (Amendment) Act 2021, to discuss progress on climate action, emissions reductions and actions to meet relevant emission ceilings.

6.5 What happens if Sectoral Targets and Carbon Budgets are not achieved?

If required, corrective or additional measures shall be introduced to ensure targets are achieved. However, at the end of a five-year carbon budget period, any excess emissions will be carried forward to the next budget period, which will be reduced accordingly.

6.6 EU compliance costs

In addition to the provisions of the Act, we will consult on how individual sectors could bear any EU compliance costs for the State arising from failure to reach sectoral targets.

6.7 Climate Proofing of Government Memoranda

Ireland has exacting economy-wide climate mitigation obligations that are set out in EU and national law. In previous Climate Action Plans, the Government has acknowledged a necessity to improve its system's capacity to measure, model and accurately calculate the climate implications of policy options that it is asked to consider so that it can be confident that its decisions are consistent with meeting climate objectives. We will continue the process, incorporated into Cabinet procedures, of ensuring that all Government policy decisions are subject to a climate mitigation and adaptation evaluation and seek to develop a standardised, evidence-based approach that will allow for consistency and comparability of proposals across Departments.

6.8 Alignment with Ireland's Long-term Climate Strategy

In line with Article 4 of the Paris Agreement and with Article 15 of the EU Regulation on the Governance of the Energy Union and Climate Action, Ireland had prepared a draft Long-Term Strategy in 2019 that set out Ireland's 2050 climate action targets and described the sector specific pathways to reaching these targets. However, the submission of this Strategy to the European Commission was paused to ensure alignment with the new domestic climate ambition following the change of Government in 2020 and the enactment of the Climate Action and Low Carbon Development (Amendment) Act in 2021.

As noted previously, the 2021 Climate Act places on a statutory basis 'the National Climate Objective', that 'the State shall, so as to reduce the extent of further global warming, pursue and achieve, by no later than the end of the year 2050, the transition to a climate resilient, biodiversity rich, environmentally sustainable and climate neutral economy'. As part of the strengthened governance framework provided for under the Climate Act, a national long-term climate action strategy is required to be prepared 'not less frequently than once every 5 years' and shall specify the manner in which it is proposed to achieve the national climate objective. The Strategy must include:

- projected reductions in greenhouse gas emissions and the enhancement of sinks, for a minimum period of 30 years;
- projected reductions in greenhouse gas emissions in each of the relevant sectors determined by the Government for the Sectoral Emission Ceilings and the enhancement of removals in such sectors, for a minimum period of 30 years;
- an assessment of potential opportunities for achieving reductions in greenhouse gas emissions in the Sectoral Emission Ceilings' sectors.

An updated draft of the Long-term Strategy incorporating the above is being prepared. The draft strategy will be aligned with Climate Action Plan 2023, and both strategy and plan will support Ireland in continuing to pursue its climate ambition, as set out in the 2021 Climate Act.

6.9 Alignment with EU Governance and Reporting Framework

Ireland's climate governance and reporting framework is informed and guided by the requirements and obligations set out under the relevant EU legislation, agreements and regulations.

The European Green Deal frames the EU's response to climate challenges. It is the new growth strategy that will lead the transformation in Europe to a climate-neutral, fair and prosperous society, with a modern, resource-efficient and competitive economy. The Green Deal commits to delivering net-zero GHG emissions at EU level by 2050. It also increases the EU-wide GHG emissions reduction target to at least 55% for 2030 in order to limit warming to 1.5 degrees Celsius and align with the goal of the Paris Agreement. Ireland fully supports the enhanced ambition at EU level.

The EU is currently working on the revision of its climate, energy and transport-related legislation under the 'Fit for 55 Package' in order to align current laws with the increased 2030 and 2050 ambitions. This means that additional effort will be asked of all Member States, including Ireland.

The regulation on the governance of the energy union and climate action (EU) 2018/1999 sets out rules for integrated reporting and monitoring by EU countries. This ensures consistent reporting by the EU and its Member States under the UN Framework Convention on Climate Change and the Paris Agreement. The reporting evolves according to the requirements and deadlines set out in the regulation.

The governance mechanism is based on integrated national energy and climate plans (NECPs) covering ten-year periods starting from 2021 to 2030, EU and national long-term strategies, as well as integrated reporting, monitoring and data publication. The transparency of the governance mechanism is ensured by consulting with the public.

From 2023, and every 2 years thereafter, each EU country will report to the Commission on the status of the implementation of its national energy and climate plan by means of an integrated national energy and climate progress report.

The various legislative files of the Green Deal include updated and improved governance structures in which Ireland will need to demonstrate progress towards our EU climate and energy targets.

6.10 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
GV/23/1	Develop a monitoring and reporting system to track the KPIs set out in this Climate Action Plan
GV/23/2	Establish taskforces or similar appropriate structures which focus on specific areas or initiatives of climate delivery that require cross-Government collaboration
GV/23/3	Finalise an annual climate action planning and reporting cycle
GV/23/4	Develop proposals on how individual sectors could bear any EU compliance costs for the State arising from failure to reach sectoral targets
GV/23/5	Develop a standardised, evidence-based approach for assessing the climate impact of policy proposals.
GV/23/6	Ensure Ireland's Long-term Climate Strategy is fully aligned with the Climate Action Plan, and national and EU legislative requirements

7 Ensuring a Just Transition to a Climate Neutral Ireland

7. Ensuring a Just Transition to a Climate Neutral Ireland

Key Messages

State of Play

- A Just Transition Framework was established in the 2021 Climate Action Plan
- Its principles have been taken into account in developing this Climate Action Plan
- Further education and skills for climate action is being delivered through Green Skills for Further Education and Training 2021-2030
- The annual Budget social welfare package redistributes carbon tax revenues to lower income households

Current and Future Action

- The Just Transition Framework is being progressively integrated into the annual Climate Action Plan cycle and sectoral policy-making
- A Just Transition Commission will be established to provide advice to Government
- Government will adopt specific indicators to measure progress in relation to ensuring a just transition
- We will continue to strengthen activation and training responses for at-risk employment through social protection policies

Expected Outcomes

- The Just Transition Framework will be fully mainstreamed across climate action policy-making and delivery
- Higher and further education and training provision will fully meet the demand for the range of low carbon skills required across the economy
- The cost of climate action will be shared equitably across society

7.1 Introduction

The Climate Action and Low Carbon Development (Amendment) Act 2021 sets Ireland on the path to a 51% reduction in emissions by the end of this decade and to net-zero emissions no later than 2050.

Delivering a just transition is based on recognising the transformational level of change required to meet these targets and having a shared understanding that the transition is fair, and just, and that the costs are shared equitably. Our climate policies should, therefore, seek to protect the most vulnerable.

A just transition requires a framework to structure how Ireland's economy and society will transition to a low carbon future. Important elements of this are already in place in Ireland. Strong climate governance and progressive policies contained in this Climate Action Plan are enabling Ireland to respond to the challenges and opportunities ahead. The National Dialogue on Climate Action (NDCA) has just transition at its core. The National Economic and Social Council (NESC)

will continue to provide strategic advice, research and analytical support for a just transition. We are developing an enterprise, education, and training system that is responsive, targeted and effective, and we are committed to ensuring that our carbon taxation policies are progressive by complementing future increases with targeted increases in social welfare and other initiatives to address fuel poverty.

We have made just transition a central consideration in our climate policy by explicitly recognising and aligning it with our policy framework through the Climate Action and Low Carbon Development (Amendment) Act 2021; the adoption of the just transition framework; the integration of just transition into the NDCA; and the planned establishment of a Just Transition Commission.

7.2 Defining a Just Climate Transition

There is no single internationally agreed definition of a 'just transition' and there are many different ways to understand the term. In Ireland, the Climate Action and Low Carbon Development (Amendment) Act 2021 situates a just transition to a climate neutral economy as a process, within the wider statutory framework of climate action, which endeavours, as far as is practicable, to maximise employment opportunities, and support persons and communities that may be negatively affected by the transition.

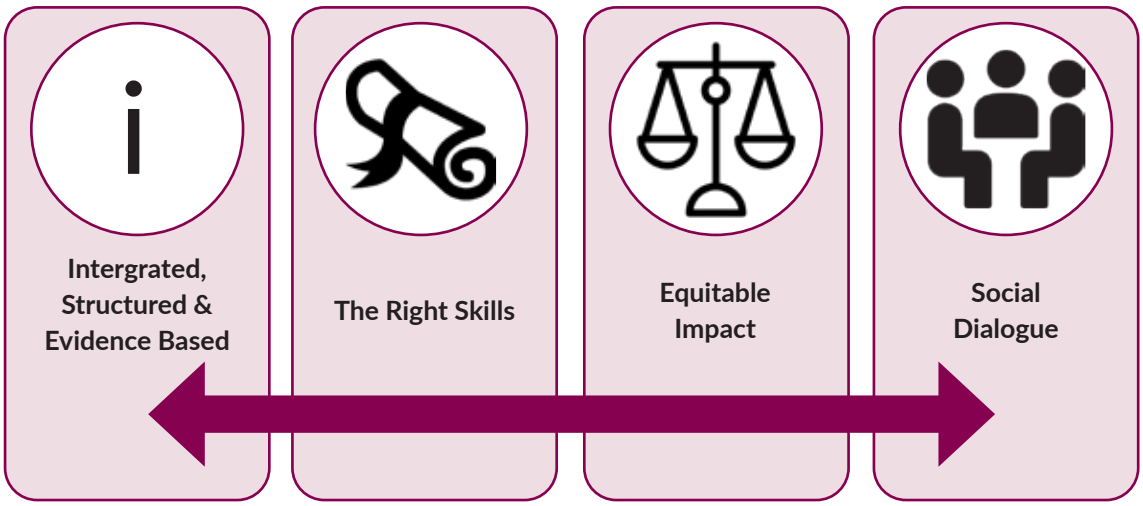
The NESC has also defined a just transition as 'one which seeks to ensure transition is fair, equitable, and inclusive in terms of processes and outcomes'.[15] A just transition can, therefore, refer both to the broader policy framework of climate action to support individuals and communities in the transition, as well as the process of ensuring that individuals and communities have a voice and a role in informing and shaping these supports.

> *A just transition can mean new jobs, new skills, new investment opportunities, and the chance to create a more productive and resilient economy*

The transition to a climate neutral economy has significant potential to create employment and enterprise opportunities. A just transition can mean new jobs, new skills, new investment opportunities, and the chance to create a more productive and resilient economy. While the transition will require targeted supports to help particularly impacted groups, regions and communities adapt, we are also working to support our citizens, communities and regions to realise the benefit of these opportunities.

15 NESC (2020) Addressing Employment Vulnerability as Part of a Just Transition in Ireland http://files.nesc.ie/nesc_reports/ en/149_Transition.pdf

Figure 7.1 – Our Principles for a Just Transition



7.2.1 Just Transition Framework

The just transition framework is made up of four principles:

1. An **integrated, structured, and evidence-based approach** to identify and plan our response to just transition requirements.
2. People are **equipped with the right skills to be able to participate in and benefit from** the future net zero economy.
3. The **costs are shared so that the impact is equitable** and existing inequalities are not exacerbated.
4. **Social dialogue to ensure impacted citizens and communities are empowered and are core** to the transition process.

The instruments, policies and regulations deployed in the delivery of our climate policy will need to align with these four principles, and ensure they are addressed in their design and implementation.

7.3 Principle 1: An integrated, structured, and evidence-based approach to identify and respond to just transition needs as they emerge

In the Midlands region the impact from the end of peat extraction for power generation has been regionally concentrated. Based on our current understanding, it is likely that the future impacts of our transition to a climate neutral economy will be both incremental and broadly-based, affecting occupations most closely linked to consumption of fossil fuels, arising from increases in heating, energy, and transport costs, or resulting from changes in agricultural practices.

This does not exclude the possibility of concentrated impacts in different parts of the country or income groups (e.g., with higher reliance on private cars for mobility, on solid fuels for domestic heating, or on particular types of agricultural production).

For the transition to be just, it must be structured in such a way as to allow the State to identify and respond to just transition needs as they are likely to emerge. Affected regions and sectors may also require specific structures to assist them in effectively managing the transition, supported by a lead

Department where required.

At a national level, the long-term agenda for a just transition to a climate-neutral economy and society will be supported through the establishment of a new Just Transition Commission. We will also embed just transition in our existing governance and engagement structures, which will allow us to deliver a more integrated approach that fully embeds our just transition principles into the delivery of climate policy.

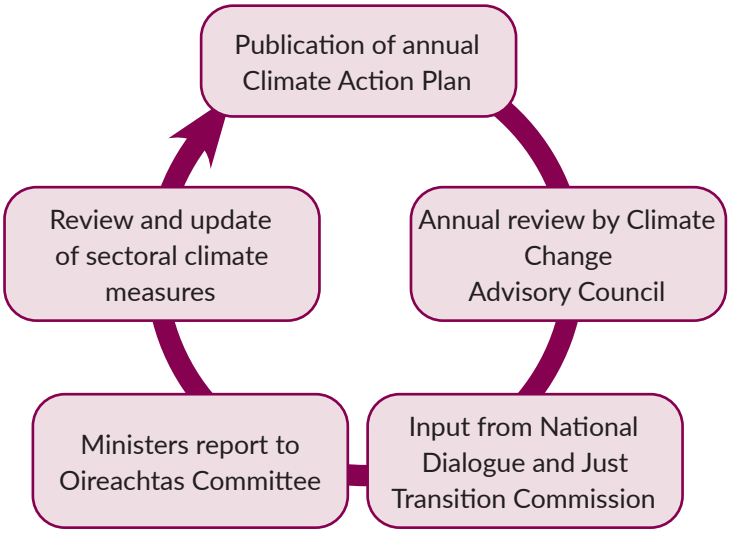
7.3.1 An Integrated and Structured Approach

We will fully integrate our approach to the management of a just transition into the annual policy development and reporting cycle provided for under the Climate Action and Low Carbon Development (Amendment) Act 2021. This will include:

- We will establish a Just Transition Commission to provide evidence-based, independent advice to the Government on the just transition implications of policy development for the Climate Action Plan. The Just Transition Commission will make recommendations to Government, building on research and engagement through the NDCA, and the annual review from the Climate Change Advisory Council (CCAC), on how Government policy can further the just transition. It is proposed that the Commission will be tasked with the following, considering the key elements of the Just Transition framework:
  - Monitoring the implementation of the just transition principles set out in Climate Action Plan 2021 and producing reports and recommendations to the Government and to the Oireachtas on progress;
  - Commissioning research to examine which sectors of the economy are most likely to experience disruption as a result of the transition, as well as exploring solutions to mitigate against these challenges;
  - Advising and supporting the Minister and Government in relation to social dialogue, including the NDCA, in a manner which effectively integrates just transition considerations;
  - Examining specific just transition challenges as requested by the Minister and providing recommendations to Government on potential solutions to mitigate against these challenges.
- The CCAC will address just transition issues in its annual review as part of its general mandate (under section 12 of the 2015 Climate Action and Low Carbon Development Act), to review and report and to make recommendations as it considers necessary or appropriate in order to enable the achievement of the national transition objective.
- The Minister and the Government will have regard to the requirement for a just transition to a climate neutral economy which endeavours, as far as is practicable, to maximise employment opportunities, and support persons and communities that may be negatively affected by the transition in the preparation of the Climate Action Plan and National Long-term Climate Action Strategy.
- Each Minister will need to consider their climate policy development and implementation against the four principles for a just transition set out above and the recommendations of the CCAC and Just Transition Commission.
- Each relevant Minister will report to the Oireachtas on how our principles for a just transition are being addressed under the most recently approved Climate Action Plan, including the policies, mitigation measures and adaptation measures for each sector.

- The NDCA will gather input, on a rolling basis, about the key challenges facing individuals and communities in the transition, and this will be complemented by the development of a set of indicators for a just transition.
- NESC will provide support for analysis and dialogue in relation to sectoral issues including, initially, a major report on agriculture, climate and a just transition in agriculture, due in 2023.

Figure 7.2 – Incorporation of Just Transition into Annual Climate Policy Cycle



Examples of where we are already integrating just transition considerations into our policy development through CAP23 include:

- Integration of community participation mechanisms in the Renewable Electricity Support Scheme, a package of enabling support (including technical, financial, and legal services) that has been rolled out to assist communities in navigating renewable electricity challenges;
- Provision of 100% grant funding for retrofitting to lower income households under the Warmer Homes Scheme;
- The Connecting Ireland Rural Mobility Plan, which aims to enhance existing services and introduce new public transport services to improve the alternatives to private car use.

7.3.2 Developing our Evidence Base

Our capacity to anticipate and plan for a just transition requires the development of a robust evidence base to support policy development and effective ongoing monitoring.

As our climate action progresses, there are incremental risks and opportunities in the context of a just transition. These will occur throughout the country, in particular regions, sectors or occupations. Identifying these shifts requires a structured approach informed by the most up-to-date evidence base which provides the information required to make informed decisions.

Data will play a critical role in assisting the Local Authorities in forecasting where changes will occur (or are already underway), and who will be most impacted.

A number of methodologies are already available, or are under development, to provide a quantitative evidence baseline, as well as to inform qualitative considerations for policy design and implementation.

These include:

- The NESC report, Addressing Employment Vulnerability as Part of a Just Transition in Ireland (2020), Exploring Place-based Opportunities for Policy and Practice in Transition (2022), and related research publications from the Council; and the forthcoming report on agriculture, climate and just transition in agriculture
- A 2020 CCAC working paper, Designing and Implementing Policy for a Just Transition and relevant recommendations in the CCAC's annual review;
- Research by the Economic and Social Research Institute (ESRI) and others into the distributional impacts of increases in carbon tax;
- Teagasc analysis, based on the annual National Farm Survey, to examine the micro-economic, environmental and other socio-economic and socio-demographic indicators relating to the principal Irish economic farm types;
- Ireland's Territorial Just Transition Plan for the EU Just Transition Fund;
- The report of the Expert Group on Future Skills Needs (EGFSN) on Skills for Zero Carbon, published in November 2021;
- The forthcoming Environmental Protection Agency Five Year Climate Research Assessment, which will include a volume on realising the benefits of transition and transformation.

Developing a strong evidence base will be critical to defining a baseline of risk, to guide the design and targeting of actions, and for the objective measurement of impacts that particular actions will have in order to manage a fair and equitable just transition over time. This will provide Ministers and the Government with a strong base from which to progressively embed just transition principles into the delivery of climate action through each annual Climate Action Plan.

In continuing to develop our evidence base for policy design and implementation, we will:

- Commission anticipatory research and dialogue work, through the NDCA, NESC or otherwise, on current and future anticipated transitions to ensure actions to provide for a just transition are implemented;
- Review input from the CCAC annual review and the Just Transition Commission to consider the impacts of, and make recommendations to improve, existing and planned climate policy measures;
- Develop a suite of suitable indicators for adoption by Government, guided by measurement tools that currently exist, and by the processes that have been put in place to develop and report on our progress towards the Sustainable Development Goals, as well as the development of a national well-being framework. Such indicators will also be important to inform our public engagement processes under the NDCA, and to complement both the quantitative and qualitative data that will be gathered directly from these public engagement processes.

7.4 Principle 2: People are equipped with the right skills to be able to participate in and benefit from the future net zero economy

7.4.1 Ireland's Decarbonisation Opportunity

A climate neutral Ireland will bring new, green employment opportunities. The Climate Action Plan sets out a number of key measures which will drive the creation of new jobs with new skills requirements in a number of sectors, in particular building retrofits; renewable energy generation; the move to sustainable mobility; and new farming practices.

Meeting Ireland's renewable energy targets will increase demand for a range of engineering and technician roles including: civil; electrical/electronic; mechanical; marine; production and process; quality control and planning; telecommunications; IT; and energy.

There will also be demand for a range of built environment jobs, including construction and building trades; supervisors; construction occupations; health and safety officers; chartered surveyors; as well as other roles such as: environment professionals; finance and investment analysts; advisers; physical scientists; solicitors; accountants; and tax experts.

According to the EGFSN estimates, this could raise demand for roles in these activities from a 2020 estimate of 5,000 to potentially 22,000 to 27,000 by 2030. There is also scope for additional job creation as we seek to decarbonise and embed sustainability practices across all sectors of the economy.

Climate action presents opportunities for existing supply chains and new business formation. Finding the right balance between regulation and incentives to progress decarbonisation will be crucial to maintaining our national competitiveness and ability to create jobs. As progress is made in the transition to a carbon neutral economy, changes in regulatory requirements (nationally and internationally), a higher carbon price, supply chain patterns, and evolving consumer preferences will drive growth and innovation in our enterprise base. As businesses take steps towards decarbonisation and reducing their climate impact, there is a need to ensure that the new employment opportunities are seized.

7.4.2 Ireland's System of Skills Development

Developing a greener economy will not be socially inclusive by default, and coherent policies are needed to maximise opportunities and cushion the social cost of the transition. People need to be equipped with the skills to be able to participate in and benefit from our future climate neutral economy. To maximise these opportunities, continuous pre-emptive workforce development is required. For individuals, this means reskilling and lifelong learning to have the capacity to be able to access and create future opportunities.

The Irish higher and further education systems have been providing in-demand training to respond to the decarbonisation of the economy by adapting the provision of, and putting in place additional, training spaces where needed. Ireland's further education model is centred on apprenticeships, transferrable skills, and lifelong learning, to keep pace with future changes. Ireland's skills architecture will minimise skills mismatches and ensure our approach to skills development is routed towards the green transition and broader areas of opportunity and growth. Lifelong pathways between, and within, further and higher education and training will advance lifelong learning rates. The new Action Plan for Apprenticeship 2021 – 2025 will grow new apprentice registration to 10,000 per annum by 2025. SOLAS's Green Skills for Further Education and Training 2021-2030

sets out the response of the further education and training sector to the future skills requirements of the green economy.

7.4.3 Forecasting Future Skills Needs

The EGFSN report, Skills for Zero Carbon – The Demand for Renewable Energy, Residential Retrofit and Electric Vehicle Deployment Skills to 2030, sets out the demand for, and nature of, the skills required to deliver on key elements of Ireland's Climate Action Plan over the period to 2030. It identifies the nature and quantifies the scale of the skills needs of enterprises supporting the transition to a low carbon economy. It develops a suite of recommendations that can be drawn upon to ensure that these future skills needs are fully addressed.

The Regional Skills Fora continue to play an important role in identifying future skills needs emerging from a greener economy. These feed directly into the regional skills development pipelines through the Education and Training Boards. Each forum provides for ongoing regional engagement between the employment, enterprise, education, and skills sectors, such as Local Enterprise Offices, Enterprise Ireland, the Department of Further and Higher Education, Skillnet, and the Education and Training Boards.

7.4.4 Support for Employees at Risk and Labour Market Activation

An upcoming challenge for training providers will be to identify which jobs are at risk and which are in demand. This will require monitoring the types of new jobs emerging. Linked to this is the need to continually review the skills needs of these new employment opportunities. It will be important to assess the types of opportunities emerging and their skills levels, and to work with employers in developing opportunities across a range of skill levels and job types. Ongoing horizon scanning is required to identify employment opportunities from the green transition, and mapping these to current training provision, setting out where new training and education courses are needed.

Existing research on the impact on employees in declining sectors shows that it is critically important to enhance the skills, training advice, and supports, for workers before they become unemployed, by delivering one-to-one coaching, counselling and mentoring

Existing research on the impact on employees in declining sectors shows that it is critically important to enhance the skills, training advice, and supports for workers before they become unemployed, by delivering one-to-one coaching, counselling, and mentoring. This can be supported by making greater use of skills audits with at-risk workers to better identify transferable skills and competencies, including informal occupational skills, which may link workers to new opportunities they had not considered or did not think they had the qualification for. This will also be informed by closer alignment between the work of the Regional Enterprise Plans and Regional Skills Fora.

Finally, employment activation for those on the Live Register, as well as creating supported job placements, will play a key role in providing opportunities for people at the margins to be part of Ireland's transition to a greener economy. This could include the long-term unemployed, people keen to return to the workplace after taking time out for caring duties, those recovering from illness, and people with disabilities or severe needs. Developing additional community-based projects

and supported employment places in green sectors will provide opportunities for individuals to contribute and develop new skills and experience.

7.5 Principle 3: The costs are shared so that the impact is equitable and existing inequalities are not exacerbated

To ensure a just transition to a climate neutral Ireland, the costs must be shared so that the impact is equitable and existing inequalities are not exacerbated.

If compensatory measures are not taken, increases in the carbon tax can have a regressive effect on low-income households as they spend a greater share of their income on carbon intensive goods, such as heating fuel. The Government has ensured that increases in the carbon tax are progressive through targeted social welfare and other initiatives to prevent fuel poverty, thus ensuring a just transition.

The Government has sought to ensure that revenue from increases in the carbon tax will be ring-fenced to protect those who are most exposed to higher fuel and energy costs, to provide support for displaced workers, and to invest in new climate actions

The Government has sought to ensure that revenue from increases in the carbon tax will be ring-fenced to protect those who are most exposed to higher fuel and energy costs, to provide support for displaced workers, and to invest in new climate actions. This includes expenditure on a socially progressive national retrofitting programme, and an agri-environment programme to encourage and incentivise farmers to farm in a greener and more sustainable way. We have also committed to using approximately one-third of all additional carbon tax revenues over the next decade on targeted measures to ensure that the carbon tax increases are progressive.

Government has also invested additional funding in supporting lower income households to participate in retrofitting schemes based on their ability to pay

Analysis undertaken by the ESRI on the distributional impacts of increasing carbon tax has informed our decisions in Budgets 2021 and 2022 to provide a targeted package of social protection supports that offset impacts on lower-income households. As a result of Budget 2022, for example, analysis has demonstrated that households in the bottom four income deciles will see all of the cost of the carbon tax increase offset, with the bottom three deciles being better off as a result of the compensatory measures.

Considerations around costs and equity are not limited to the carbon tax and will also apply to other fiscal measures, as well as to the provision of grants or other supports to assist the implementation of climate policy.

Government has also invested additional funding in supporting lower income households to participate in retrofitting schemes based on their ability to pay. The Warmer Homes Scheme will continue to deliver a range of energy efficiency measures free of charge to low-income households vulnerable to energy poverty.

7.6 Principle 4: Social dialogue to ensure impacted citizens and communities are empowered and are core to the transition process.

Social dialogue is core to developing a vision for how to implement the just transition framework. Impacted citizens, businesses (including the self-employed) must be a part of the conversations on climate policies and climate impacts, and the processes to manage these.

NESC's research on just transition has found that co-designing an inclusive, focused and participatory process with those most impacted at an early stage, is key to ensuring that a transition is just. There are many ways to ensure engagement with those impacted, including meaningful dialogue; engagement from local, regional and national agencies; bringing in community leaders; and clustering support networks.

The NDCA will be the key mechanism for facilitating the social dialogue process as part of the just transition. The NDCA will prioritise awareness-raising, communications and activation, and ensure community engagement and participation, using a model that has been co-designed with stakeholder participation and informed by broad public participation and social and behavioural research. Citizen engagement sessions will be held throughout the year and will be supported by ongoing research. In particular, the regular National Climate Stakeholder Forum provides an opportunity to engage all relevant stakeholders in addressing the need for a just transition.

The strong participative approach of the NDCA will assist all stakeholders in identifying and prioritising what the challenges of transitioning are, and how to respond to them.

The NDCA is complementing engagement activities undertaken by Departments and Agencies at sectoral, local, regional and national levels, including through Local Authorities, Public Participation Networks, SEAI Sustainable Energy Communities, Local Community Development Committees, Climate Action Regional Offices, the Labour Employer Economic Forum, NESC, and other key national and sectoral dialogues.

This is building on the model of the Midlands Regional Transition Team, established by the Midlands Local Authorities, to coordinate all local actors in their response to the ending of peat-fired power generation. Affected regions and sectors may also require specific structures to assist them in effectively managing the transition, including to design and implement local-led, bottom-up responses.

7.7 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
JT/23/1	Establish a Just Transition Commission
JT/23/2	Ensure that targeted social welfare measures are put in place to prevent fuel poverty and support a just transition
JT/23/3	Promote timely and tailored activation and training responses for workers whose jobs are at risk by the decarbonisation process
JT/23/4	Build on existing education and training measures in place to address identified skills needs

8 Delivering a Just Transition in the Midlands Region

8. Delivering a Just Transition in the Midlands Region

Key Messages

State of Play

- The Just Transition Implementation Plan for the Midlands Region continues to support the transition to a decarbonised economy
- Significant exchequer investment has been mobilised to date, supporting communities and enterprises in the region

Current and Future Action

- 56 National Just Transition Fund Projects will continue delivery until 2024
- The EU Just Transition Fund Programme will deliver an additional €169 million in investment to the region to 2030
- The EU Just Transition Fund will support implementation of Regional Enterprise Plans and Local Economic and Community Plans
- Low-carbon investments will be made in intra-regional public and private transport networks
- Rehabilitation of peatlands and development of amenity and tourism opportunities will continue
- There will be support for bioeconomy value chain opportunities

Expected Outcomes

- Strengthened resilience of the regional economy of the Midlands in line with national climate objectives

8.1 Responding to the Transition

A key focus has been to support the transition of the existing workforces and the creation of new enterprise and employment opportunities so that the region remains vibrant, innovative, and prepared to maximise the opportunities that decarbonisation will bring

Significant resources, supported by carbon tax revenues, have been committed by Government to support the Midlands region in addressing socio-economic impacts following the closure of peat-fired power stations and the cessation of commercial peat extraction as a feedstock for power generation.[16] The Government's appointment of a Just Transition Commissioner in 2019 facilitated discussions and work with stakeholders to develop, mobilise and deliver opportunities for the Midlands for both the workers directly affected and the wider community. Through his

16 In this chapter, the wider Midlands region refers to the counties of Galway, Kildare, Laois, Longford, Offaly, Roscommon, Tipperary, and Westmeath. The specific territory covered by the EU Just Transition Fund programme is set out in Figure 8.1

extensive engagements within the region, documented in recommendations contained in four reports, the Commissioner made a series of recommendations for Government to further achieve a just transition in the Midlands region. These recommendations have informed the Government's Implementation Plan for the Midlands, initially published with Climate Action Plan 2021.

Our continuing work to support a just transition in the region is set out in this chapter. A key focus has been to support the transition of the existing workforces and the creation of new enterprise and employment opportunities so that the region remains vibrant, innovative, and prepared to maximise the opportunities that decarbonisation will bring. This programme of Government investment in the region will continue over the coming years, complemented by additional support from the EU Just Transition Fund (EU JTF) from 2023. A Territorial Just Transition Plan and Programme will reflect funding priorities within the region under the EU JTF.

8.2 Measures to Deliver a Just Transition in the Midlands

8.2.1 A Bottom-up Approach through the Midlands Regional Transition Team

In line with the ethos of just transition, the Midlands Regional Transition Team (MRTT) was established by the four Midlands' Local Authorities under the auspices of the Midlands Regional Enterprise Plan (MREP), to mitigate job losses, develop alternative employment opportunities and to promote the region for investment. The MRTT plays a key role in coordinating regional and local strategic partnerships, working closely with key Government Departments and with local communities to advance these objectives. The MRTT will continue to support the development of projects with transformative potential in the region, with the support of relevant exchequer and EU funding streams.

8.2.2 Tailored Funding Measures

National Just Transition Fund

The National Just Transition Fund continues to support a diverse range of innovative projects that contribute to the economic, social and environmental sustainability of the wider Midlands region

The National Just Transition Fund continues to support a diverse range of innovative projects that contribute to the economic, social and environmental sustainability of the wider Midlands region. They include new enterprise hubs, supporting local business and community development, research and exploratory studies, tourism and heritage projects, development of greenways, and opportunities for education, training and reskilling. In total 56 projects in the region are now being supported, with up to €22 million in committed grant funding until 2024, bringing €15 million in additional funding to the region and supporting an estimated 178 direct and 999 indirect jobs, as reported by the grantees.[17]

17 Details of all projects in receipt of funding under the National Just Transition Fund are available at https://www.gov.ie/en/publication/ed10d-just-transition-fund

Box 8.1 Selected National Just Transition Fund Projects

1. Energy Communities Tipperary Cooperative is mobilising community-led energy efficiency in communities affected by the closure of the peat-fuelled plants in the Midlands region. Phase 1 of the project involved informing the public; technical assessments; and enlisting households for the retrofitting services. Phase 2 will carry out the necessary retrofitting works along with conducting a behavioural assessment.

2. Bord na Móna is providing a training and up-skilling project to ensure that their workers can begin to immediately retrain and up-skill. This is assisting workers to prepare for other career paths and opportunities.

3. Kilcormac Development Association is carrying out a series of projects to reinvigorate the community and local economy by maximising their potential as the gateway to Boora. This includes a Tourist Recreation Hub on the grounds of Saint Joseph's Community Centre which will include facilities for bike hire, purchase of train tickets and the provision of tourist information; as well as a Remote Working Hub in the community centre offering co-working facilities for local commuters and businesses.

4. Lirpro Limited is developing 'The Lir Project,' which will create a new hybrid visitor attraction in the Midlands region with a significant investment in technology to provide an immersive and fun experience for all visitors around bog-scape themes. It will create a low-carbon world class visitor experience to help preserve and advocate for the peatlands.

EU Just Transition Fund

The EU JTF has been established as part of the EU Green Deal, to support the most affected regions in EU Member States to meet the challenges associated with achieving the EU's climate targets for 2030 and climate neutrality no later than 2050. It will invest in areas that will contribute to alleviating the impact of the transition, by financing the diversification and modernisation of the local economy, and by mitigating the negative repercussions on employment in the territories most impacted by the transition away from fossil fuel use.

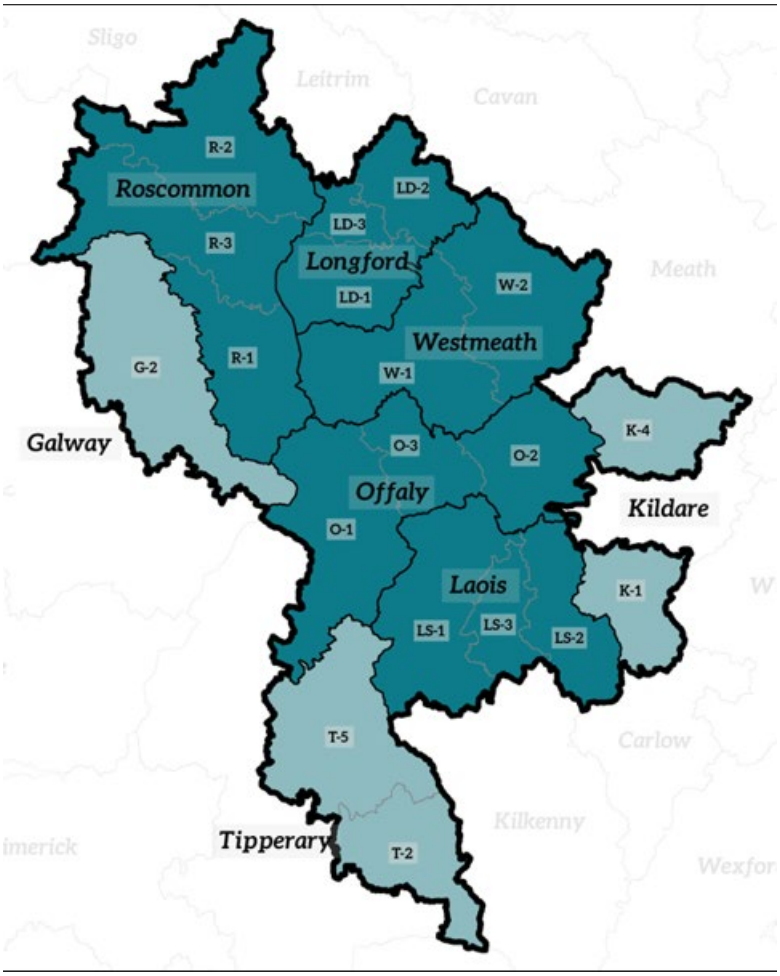
Ireland has secured €84.5 million under the EU JTF for investments over the period 2021 to 2027 and this will be matched by exchequer resources to comprise an overall programme envelope of up to €169 million. The Eastern and Midland Regional Assembly has been appointed as Managing Authority for the fund.

Ireland's EU JTF Programme will contribute to economic diversification in the Midlands and, through three complementary priorities, will enhance the regional economy, addressing existing deprivation and rural depopulation, and placing it on a path to a more diverse and resilient economy based on climate neutrality by:

- Generating employment for former peat communities by investing in the diversification of the local economy;
- Supporting the rehabilitation and restoration of degraded peatlands and regeneration and repurposing of industrial heritage assets;
- Providing former peat communities with smart and sustainable mobility options to enable them to benefit directly from the green transition.

The territory to be supported under the EU JTF should include Counties Offaly, Laois, Longford, Westmeath, and Roscommon, as well as five additional Municipal Districts: (MDs Ballinasloe (County Galway); Athy and Clane-Maynooth (County Kildare); and Carrick-on-Suir and Thurles (County Tipperary).

Figure 8.1 – Proposed EU JTF Territory



8.2.3 Peatlands Restoration Measures

Returning peatlands to more natural conditions will reduce carbon emissions and deliver a range of climate benefits, including: long-term carbon storage; increased carbon sequestration; and enhanced resilience to the locked-in impacts of climate change. The improvements to peatlands will enrich Ireland's natural capital; increase ecosystem services; strengthen biodiversity; and improve

water quality and storage attenuation; as well as developing amenity potential. Several restoration schemes have reskilled workers and sustained employment while protecting the storage of millions of tonnes of CO_2.

Enhanced Decommissioning, Rehabilitation and Restoration Scheme

The EU's Recovery and Resilience Facility, through the National Recovery and Resilience Programme, is investing up to €108 million in the Enhanced Decommissioning, Rehabilitation and Restoration Scheme (EDRRS) to rehabilitate 33,000 hectares of peatlands over 82 Bord na Móna bogs, previously used for peat extraction for electricity generation. The EDRRS is the largest programme of bog rehabilitation in the State's history, involving a wide array of engineering and ecology works designed to encourage and accelerate natural processes. From 2021, approximately 350 Bord na Móna employees transitioned from working in peat harvesting and haulage to operating the EDRRS.

Once rehabilitated, the peatlands will include peat forming bogs and a mosaic of wetlands, grasslands, and native woodlands, protecting the storage of 100 million tonnes of carbon, enhancing biodiversity and contributing to Ireland's target of carbon neutrality no later than 2050, while developing the capacity of peatland communities to respond to challenges faced by transitioning to a net-zero economy.

National Parks and Wildlife Service Peatlands Restoration Programme

For protected raised bogs, the National Parks and Wildlife Service has significantly accelerated its programme of restoration in recent years. Since 2018, with increased funding and resources, restoration measures have been completed on approximately 4,000 hectares of designated raised bogs. Further works on raised bog Special Areas of Conservation and Natural Heritage Areas are underway and planned for 2022. These rehabilitation and restoration efforts will assist Ireland in reaching our national conservation target to restore raised bogs within the network to a favourable conservation status.

EU LIFE Peatlands and People Project

> *Ireland has secured €84.5 million under the EU JTF for investments over the period 2021 to 2027 and this will be matched by exchequer resources to comprise an overall programme envelope of up to €169 million*

The European Commission approved funding in 2020 for Ireland of almost €10 million for a 7-year peatlands and climate action project under its EU LIFE Programme. The EU LIFE Peatlands and People Project will connect Ireland's peatlands, policies, and people to support the realisation of a carbon-neutral, low-emission, climate-resilient and environmentally sustainable society. It aims to make a significant contribution towards achieving the objectives of this Climate Action Plan.

A consortium, led by Bord na Móna, is working with local communities in the Midlands to deliver capacity, and generate and share solutions and knowledge in support of the carbon neutral vision. The project focuses on three pillars: a Peatlands Centre of Excellence; a Just Transition Accelerator Programme; and a People's Discovery Attraction.

The Peatlands Centre of Excellence will be established to explore best practices in peatland restoration and rehabilitation

- The Peatlands Centre of Excellence will be established to explore best practices in peatland restoration and rehabilitation, and design robust methodologies to monitor and analyse carbon fluxes. This project intends to further estimate emissions factors for a fuller suite of cutover habitats
- A Just Transition Accelerator Programme for innovation will focus on low-carbon and circular economies to support the region economically. It will provide a range of services to selected small and medium-sized enterprises (SMEs) to support the development of new sustainable products, services, enterprises, and value chains. Eight companies were supported by Accelerate Green in 2022, through the provision of tools, advice and mentoring in transitioning to a green economy. New applications are being sought for the chance to collaborate and gain further knowledge of green innovation in 2023
- An immersive and inspiring People's Discovery Attraction will be designed to promote the importance of climate action, focusing on the role of peatlands and behaviour change. Its long-term aim is to establish an educational space that cultivates curiosity and climate literacy, providing a forum for dialogue and discovery. A number of areas in the Midlands are being considered at present for the location of this attraction

8.2.4 Agricultural and Geological Research and Development Projects

European Innovation Partnership Projects

The Department of Agriculture, Food and the Marine (DAFM) is funding European Innovation Partnership projects in the Midlands, including the FarmPEAT Project, Green Restoration Ireland, and the Danú Farming Group.

- The FarmPEAT Project set out to design and develop a pilot, results-based agri-environmental programme over a 2-year period, to improve the environmental quality of agricultural lands surrounding a selection of raised bogs in Counties Roscommon, Offaly, and Westmeath. DAFM are working with 51 farmers to rollout the results-based agri-environmental scheme. FarmPEAT is also developing a practical streamlined model for approaching rewetting actions on farms and the scoring of farm habitats. A successful schools education programme and art competition has taken place, and further work with schools and community engagement projects is underway.
- The Green Restoration Ireland co-operative project aims to develop clear, workable guidelines for a transition programme to carbon farming. The project has engaged a cohort of pilot 'lighthouse farms' in Counties Laois, Offaly and Westmeath as 'living laboratories' using a citizen/farmer-science strategy, supported by the relevant expertise.
- The Danú Farming Group project set up control and trial plots in the Midlands with the aim of developing clear, workable guidelines for a transition programme to biological farming based on a sound understanding of soil structure, chemistry, biology, and plant nutrition. All 12 Danú farmers now apply biological farming principles to all their farmed lands. Livestock farms have seen a reduction of artificial nitrogen usage by an average of 35 to 40% without any reduced output. Arable farms have reduced artificial nitrogen usage by 10 to15% with

no reduction in output. Insecticides have been reduced by at least 50%; fungicides by 30 to 50%; and herbicides by 30 to 40%.

Investigation and Evaluation of Potential Geological Resources in the Midlands

Geological Survey Ireland will carry out a range of investigations and evaluate the geological potential of the Midlands, including producing a map and report outlining available resources and potential associated management considerations. It will also evaluate the possibility for communities and local economies to use resources, such as groundwater or geothermal energy, as part of the just transition, assessing the feasibility of their use.

8.2.5 Training, Education and Enterprise Supports

Regional Enterprise Plans 2021 – 2024

Led by the eight regional enterprise steering committees, Regional Enterprise Plans to 2024 have been prepared using a bottom-up, collaborative approach involving Enterprise Ireland; the Industrial Development Agency Ireland; Local Enterprise Offices; Local Authorities; Higher and Further Education Bodies; and businesses. The MREP has a key focus on supporting a just transition in the Midlands region.

Reskilling and Training Opportunities

There has been significant investment in the region to ensure that affected workers and those living in the region can access training courses that open future employment opportunities, particularly in green sectors.

There has been significant investment in the region to ensure that affected workers and those living in the region can access training courses that open future employment opportunities, particularly in green sectors. The Education and Training Boards (ETBs), the Department of Social Protection, SOLAS and the MRTT have collaborated effectively to provide employment support for workers directly impacted by the phasing out of fossil fuel production in the Midlands. The ETBs have provided one-to-one career support to impacted Bord na Móna employees. Over €800,000, funded through the European Social Fund and the National Training Fund, has supported retraining in a range of areas.

Well over 1,000 people have benefitted from the Laois and Offaly ETB (LOETB) green skills training programmes in 2022, including Retrofit/NZEB; Peatland Rehabilitation Traineeship; Sustainable Agriculture Traineeship; Bicycle Engineering Traineeship; Remote Working/Leading Remote Teams; Lean Management; Heat Pump Installation; Digital Built Environment/Modern Methods of Construction; and Micro-Generator Electrical Installations. LOETB is planning the development of two Centres of Sustainable Development Excellence – one in the peatland communities at the heart of the just transition, and the other in Ireland's first low carbon town – Portlaoise. The Bord na Móna Employee Supports: Training and Upskilling Project has also been established under the National Just Transition Fund to continue this work, preparing and upskilling workers for other career paths, with funding of €590,000 available.

The newly established Technological University of the Shannon: Midlands Midwest will increase higher education access; drive enhanced regional development; and increase opportunities for

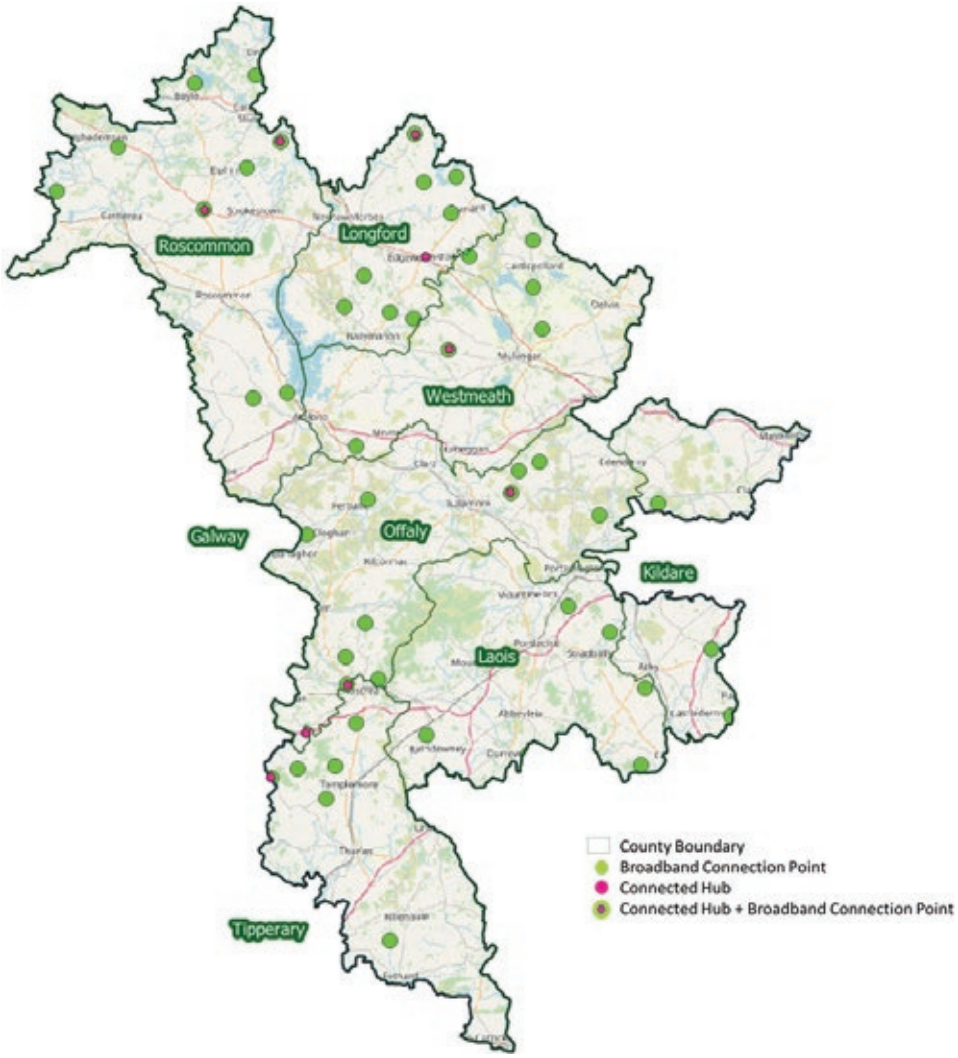
students, staff, businesses and enterprises, and local communities. This unified, multi-campus, higher education institution serves several counties in the Midlands and adjoining regions, acting as an important catalyst for balanced regional development.

Enterprise and Co-Working Spaces

The move to greater levels of remote work is accelerating. This will afford opportunities for the Midlands region, which had experienced high levels of outward commuting to the Greater Dublin Area prior to COVID-19. Our Rural Future: Rural Development Policy 2021 – 2025 and Making Remote Work: National Remote Working Strategy, have facilitated this trend, supported by development of the National Hub Network (which includes some broadband connection points (BCPs) under the National Broadband Plan) and the Connected Hubs Network – connectedhubs.ie.

A single network of 276 remote working facilities affords new options for workers to avail of a shared booking system, work within their own communities – regardless of where their employer is headquartered – and retain vibrancy and economic activity within the region, driving both urban and rural regeneration and contributing to reduced carbon emissions. Figure 8.2 shows connected hubs and BCPs in EU Just Transition Territory.

Figure 8.2 – Connected Hubs and Broadband Connection Points in EU Just Transition Territory



8.2.6 Tourism and Recreation

Ireland's new Smart Specialisation Strategy identifies tourism as one of the most employment intensive sectors in the country, particularly in rural areas, such as the Midlands. The MREP provides a strong focus on amenity and recreation use, and the potential for sustainable "slow" tourism and strategic trails development, unlocking the regenerative and commercial potential within the region. Local Authorities, Fáilte Ireland, Waterways Ireland, Coillte, the Electricity Supply Board (ESB), and Bord na Móna are working together to progress the development of a number of important tourism infrastructure opportunities including: the Galway-Dublin Cycleway; the Midlands Cycling Destination; the Slieve Bloom Mountain Bike Trail; and the Shannon Master Plan. Work is also being undertaken to explore the eco-tourism potential for the peatlands, including a network of peatland trails and aligned industrial heritage story. The EU JTF will provide further support to tourism SMEs, aligning and complementing regional spatial and economic strategies, regional enterprise plans, and tourism strategies.

8.2.7 Renewable Energy Infrastructure and Community Participation

Both Bord na Móna and the ESB have announced major investment plans for the region, which will support continued employment growth over the coming years. Several private energy companies are also planning investments.

Both Bord na Móna and the ESB have announced major investment plans for the region, which will support continued employment growth over the coming years. Several private energy companies are also planning investments.

There will also be support for the development of community-based energy master planning, led by the Sustainable Energy Authority of Ireland (SEAI). This will provide a strong platform for community participation in future calls under the Renewable Electricity Support Scheme. The SEAI Sustainable Energy Communities Programme will provide support to Midlands' communities, through local mentors and co-ordinators, to assist on their decarbonisation journey. The mentors provide free guidance on how to form a sustainable energy community and develop an energy master plan, including establishing a baseline for energy used in the community and a register of opportunities for projects. By the end of 2024, it is estimated that investment of €450,000 will have supported the development of 30 energy master plans in the Midlands region.

8. 3 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
JM/23/1	Coordinate regional and local strategic partnerships in the Midlands region to support the transition to a low-carbon economy
JM/23/2	Support delivery of projects under the National Just Transition Fund 2020
JM/23/3	Deliver European Innovation Partnership projects in the Midlands Region
JM/23/4	Develop opportunities to unlock the full potential of the bioeconomy in Midlands Region
JM/23/5	Evaluate potential geological resources to provide supporting information for the transition to low carbon economy
JM/23/6	Support regeneration, repurposing and sustainable development of walking and cycling tracks and trails, and waterways
JM/23/7	Support the enhanced rehabilitation and restoration of peatland sites in the Midlands, including raised and blanket bog, fens and other wetland types
JM/23/8	Deliver the Enhanced Decommissioning, Rehabilitation and Restoration Scheme for Bord Na Móna peatlands
JM/23/9	Support the decarbonisation of public and private local rural bus routes
JM/23/10	Support the installation of publicly available fast and high-powered charge point infrastructure

9 Citizen Engagement

9. Citizen Engagement

Key Messages

State of Play

- Delivering on our climate ambition requires that the Government and the people of Ireland come together in a strengthened social contract for climate action and the co-creation of real solutions to these challenges

Current and Future Action

- Increasing awareness of climate change based on evidence
- Delivering an inclusive programme of engagement to inform climate policy
- Promoting climate literacy and improving people's capacity to act
- Empowering people to make positive behavioural changes that improve their quality of life

Expected Outcomes

- A strengthened social contract between the Government and the Irish people around climate action

9.1 State of Play

9.1.1 Engagement in Climate Action in 2022

A comprehensive programme of engagement activities and research was delivered under the National Dialogue on Climate Action (NDCA) in 2022 which included:

- Climate Conversations 2022 (CC22) involving a ten-week long online public consultation engaging 4,300 people, 10 focus groups involving over 80 people most vulnerable to the transition to carbon neutrality, 15 workshops with Public Participation Networks, and 10 in-depth expert interviews with subject matter experts in areas including social and behavioural research and citizen and stakeholder engagement. The programme was designed based on best practice research method and the findings analysed employing robust methodologies;
- Two National Climate Stakeholder Forum (NCSF) events, which took the form of deliberative workshops and reached over 300 stakeholders from a wide range of organisations to discuss climate action challenges and solutions;
- The first National Youth Assembly on Climate (NYAC) engaging over 40 young people, between the ages of 12 and 24, to capture their suggestions on how young people in Ireland can deliver climate action. A report was published in November;
- The Environmental Protection Agency (EPA) Climate Change in the Irish Mind (CCIM) study provided nationally representative data on the attitudes and behaviours of 4,000 members of the Irish public in response to climate change;
- The EPA Climate Conference 2022, Creating Ireland's Climate Future, examined the vision for a climate-neutral and resilient Ireland by 2050, and how that vision will be achieved in terms of strategic planning for our built and natural environments;
- The EPA Climate Change Lecture Series 2022 presenting on the role of the public,

consumers and politicians as enablers of climate action, and on the risks posed by climate change and those associated with investing in climate adaptation;
- The National Social and Behavioural Advisory Board (NSBAG) met three times to provide ongoing expert insight into research to help inform policy.

9.1.2 Key Findings from NDCA 2022

The following represent some of the main issues that emerged through the NDCA 2022 programme:

Demonstrating Leadership

The public recognise that everyone should play their part in taking climate action, with 8 in 10 people saying that the Irish Government are 'extremely important' in delivering climate action. Participants clearly articulated that people want Government to lead by example but are eager and willing to take significant action themselves. They want to know that everyone is doing their part and have the opportunity to learn by doing and from the example of others. The Government is viewed as the actor most responsible for providing leadership in delivering climate action through clear strategies and ambitious policies.

Coherent Communications

"A national campaign is needed around climate to change the mindset, and to reach the 'hard to reach' communities - it must be simple to increase awareness and it must be solution-focused."
- Stakeholder Interview

The CCIM study tells us that nearly all Irish people believe that climate change is happening, over 9 in 10 of us are worried about it, and more than 8 in 10 say it is important to them. Clear, coherent, and consistent communications from Government are viewed as essential to provide a trusted source of information about climate-related issues to all sectors of society. Communications must provide direction and guidance to all stakeholders on what responsibilities they have in delivering climate action.

Transparency in Decision-making

People's support for climate-related policies depends on the extent to which they understand the rationale behind them. It is vital that the Government communicates the scientific data in an accessible way that underpins policy decisions as well as the short-term and long-term objectives and expected outcomes.

Investing in Infrastructure

Better infrastructure in areas such as energy and transport is seen as a key priority. The adoption of more climate-friendly habits in the everyday lives of individuals that reduce their climate impact is viewed as a fundamental requirement for people.

Promoting Climate Literacy

"Climate literacy means that everyone knows enough to take action."
- National Climate Stakeholder Forum

Findings from the CC22 and the CCIM study suggest that while Irish people feel informed about climate change, they are not as clear on what actions they should prioritise. The findings show

that climate literacy, defined as 'people knowing enough to allow them take meaningful action on climate', plays a crucial role in enabling people to understand the connection between individual action and systemic change. Climate literacy should be promoted through multiple channels including education, communications, and sectoral policy. Levels of climate literacy and the impact of an increasingly climate literate population should also be measured through robust research.

Embedding Climate in Everyday Practices

While the findings suggest that awareness of climate change is high among the Irish public, this does not necessarily translate into climate action. People require more concrete, tangible guidance from the Government to be able to apply climate action in the context of their own circumstances, the choices that are available to them, and the impact they can make.

Consulting with Under Represented Communities

Participants in the CC22 felt that representation must be at the heart of all discussions about climate action, and that the perspectives of marginalised and minority groups need to be considered at all stages of policy-making to ensure all communities can adapt to the transition.

Prioritising Fairness

> *"We can't end this crisis of inequalities with more inequality, a just transition means the Government supports people to make changes in their life that suit them and the environment."*
> *- National Youth Assembly on Climate*

The findings also suggest that people are willing to support the Government's objectives if they feel that they consider that the action they are being asked to take is fair, and if the Government clearly communicated how fairness is being included in climate-related initiatives.

9.1.3 Insights from 2022

Cumulatively, evidence from the 2022 NDCA programme suggests that there is a high level of awareness of climate change among the Irish people, and they want to get involved in climate action. The insights gained provide us with a better understanding of how people in Ireland view the Government's climate action and what support they need to better take climate action themselves.

Delivering on this ambition requires that the Government and the people of Ireland come together in a strengthened social contract where Government, Agencies, stakeholders and the public recognise their shared responsibility for climate change and their accountability for taking climate actions in a manner that is transparent, appropriate, fair, and accessible to all. This will make it possible to realise the opportunities the transition to a carbon-neutral society and economy presents, such as new sustainable careers; warmer more energy-efficient homes; better travel options; more sustainable consumer choice; integrated spatial planning; cleaner air and water; and a better environment for future generations.

To support this, the Government will continue to engage, enable and empower everyone in Irish society in a two-way dialogue leading to the co-creation of climate actions. The Climate Communications Coordination Committee (CCCC), led by the Department of the Taoiseach, and the NDCA led by the Department of the Environment, Climate, and Communications (DECC), are the two main Government initiatives through which this programme is being delivered in Ireland.

9.2 Measures to Deliver Targets in 2023

9.2.1 Climate Communications Coordination Committee

The CCCC – chaired by the Department of the Taoiseach and reporting to the Climate Action Delivery Board – has been established to support clear and consistent climate communications across all of Government.

The CCCC has agreed a communications strategy that provides cohesive direction to all Government Departments and Agencies. The strategy sets out a vision to build an understanding of and support for climate action through informed communications, empowering individuals, communities, businesses, and policymakers to work together to tackle climate change, fostering a sense of fairness and shared purpose.

The CCCC is working closely with the NDCA to ensure that effective communications are underpinned by research, insights and engagement. A Climate Communications Working Group will provide whole-of-Government coordination to deliver on the communications strategy, setting out a workplan for climate communications.

9.2.2 The National Dialogue on Climate Action

Governance of the NDCA

The NDCA delivers a two-way dialogue and informs the annual Climate Action Plan and wider sectoral policy by: promoting awareness based on trusted sources of information; delivering a national engagement programme throughout the year; supporting climate literacy through formal, non-formal and informal education; and funding social and behavioural research.

DECC works closely with Government Departments and Agencies, including the EPA, the Sustainable Energy Authority of Ireland (SEAI), the Local Authority sector, and a wide range of experts, as well stakeholders and the wider public to co-design and deliver this programme.

The NDCA Governance and Implementation Structure includes the following:

- The Citizen Engagement and Climate Literacy Taskforce (CECLT) is chaired at Assistant Secretary level, and attended by the Minister, Assistant Secretaries from all key policy areas, the EPA, the SEAI and external experts. It was established in 2022 to provide an opportunity for policy leads to consider the strategic implications of the insights gained from the outputs of the NDCA programme for climate action, support the coordination of engagement, and agree policy priorities;
- The Interdepartmental Working Group on Citizen Engagement and Dialogue is more operationally focused, and includes key policy leads across Government Departments, the EPA, the SEAI and the Local Authority sector, who are actively involved in delivering on climate action goals in key sectors. The group supports the work of the CECLT;
- The NSBAG Group, which is chaired by DECC, is comprised of leading social and behavioural scientists from Government Agencies, the university sector, and research institutes, who provide expert insights from research to inform climate policy and communications.

Structure of the NDCA

The social contract between the Government and the Irish people is being strengthened through

increasing awareness of the risks of climate change; the delivery of an inclusive programme of engagement on climate action; promoting climate literacy; and supporting behavioural change.

Figure 9.1 – Programme of Engagement and Public Participation in Climate Action Plan and Sectoral Policy

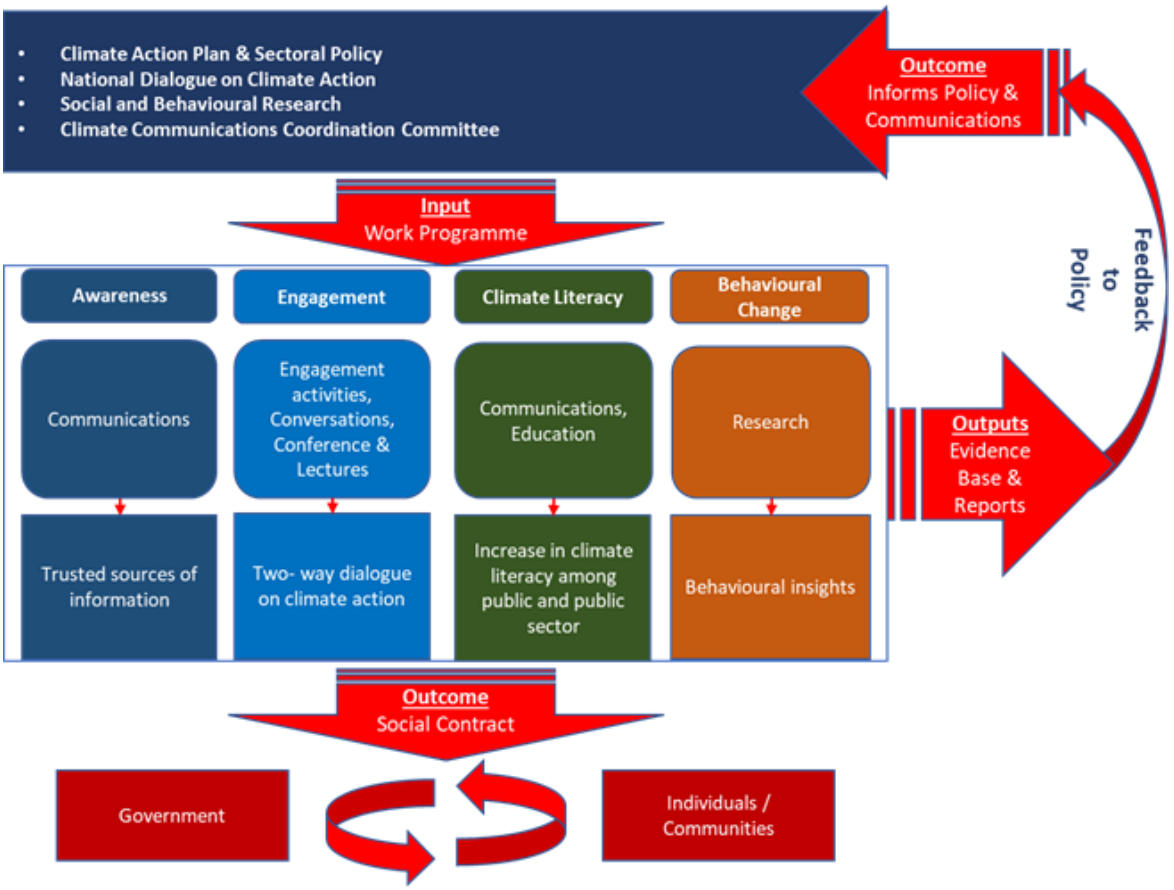


Figure 9.1 illustrates the programme of engagement and public participation and supporting structures, which inform evidence-based policies and communications, guiding delivery across four areas: awareness; engagement; climate literacy; and behavioural change. It provides a vehicle for Government and policy makers to engage with stakeholders and the public in the co-design of climate and sectoral policies, and simultaneously for communities and individuals to benefit from policies that are better tailored to their specific needs.

Insights gained from the NDCA 2022 programme have informed priorities for Climate Action Plan 2023 and the NDCA programme for 2023 suggesting the following priority objectives.

Pillars of the NDCA

1. Awareness

Insights from the EPA CCIM study and CC22 indicate that the overall levels of awareness of climate change are high. However, the risk of climate change is more likely to be perceived as a long-term rather than immediate risk, with the evidence suggesting that we are now experiencing the effects of climate change in the form of extreme weather events. There is also some uncertainty as to

what the most significant impacts of climate change are likely to be for individuals, society, and the environment. There is a call from the public and stakeholders to:

- Communicate that there is a clear plan, and when it will be delivered;
- Clarify why policy decisions are being made and how they will affect people's lives;
- Clarify that everyone is required to make changes;
- Provide information through clear, consistent communications across all of Government from trusted sources;
- Be clear about the risk, but focus on the benefits of the decisions that people are being asked to make, and the opportunities they will deliver;
- Tailor messages to specific groups and communities to reach everyone.

Effective public engagement is supported by clear and cohesive communications across Government. To achieve this, Climate Action Plan 2021 identified the need to establish a centralised approach to climate communications.

The NDCA will work closely with the CCCC to help provide an evidence base to inform strategic communications across all of Government. The aim of this work is to strengthen trust in climate communications from Government, improve climate literacy, and help people take climate action based on reliable information.

2. Engagement

The findings of the 2022 engagement programme have shown that there is a willingness to engage in climate action, but people may not know which actions are most effective or where to start acting. In 2023, we will continue to build on the successful delivery of the 2022 engagement programme, reaching a broader range of people across Ireland. We will support the coordination of climate action across local, national, and European levels, and improve processes for meaningful two-way dialogue between the Government and the public.

The 2023 work programme will focus on three central strands:

- The design and delivery of Climate Conversations 2023 (CC23), which acts as the public consultation to inform the next Climate Action Plan;
- The design and delivery of a range of national engagement events to support a two-way dialogue with the public, stakeholders, policy makers and Government to explore the acceleration of key climate actions. This includes organising and hosting events, promoting networking and capacity building, and empowering people to make changes in their day-to-day behaviours;
- Working with Government and Departments to support the design and delivery of sector-specific climate engagement activities through the NDCA.

Figure 9.2 – Annual Roadmap of NDCA Activity

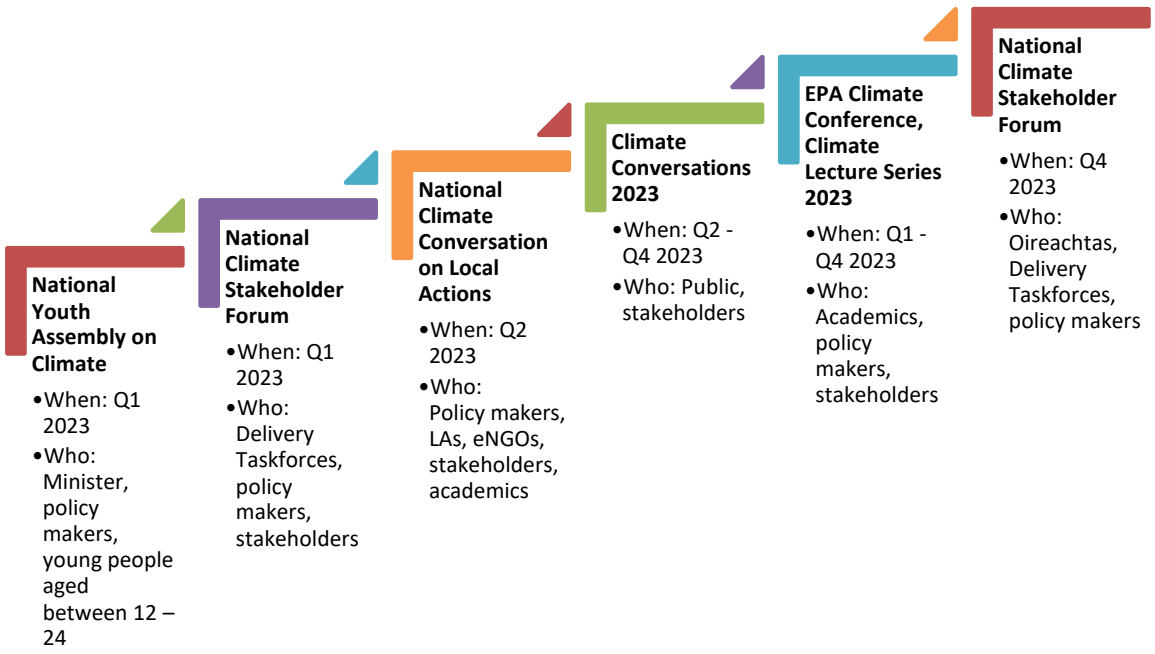


Figure 9.2 illustrates the annual roadmap of NDCA activity. Short reports will be produced within a month of each event, in response to the request for timely feedback from participants at NDCA events in 2022. Two annual reports will also be published by the end of 2023: one on CC23, as well as an NDCA Annual Report. Details for the planned engagement events to be delivered in 2023 are presented below.

National Youth Assembly on Climate

The NYAC was established in 2022 in a collaboration between DECC and the Department of Children, Equality, Disability, Integration and Youth (DCEDIY) to act as a consultative forum on climate issues capturing the voices of young people, facilitating their input into policy development. In 2023, the NDCA will continue to work with DCEDIY in the evolution of this forum to better engage with young people on climate action and examine the coordination of youth engagement on climate actions across society.

National Climate Stakeholder Forum

The NCSF takes the form of a deliberative workshop similar to the National Economic Dialogue, and functions as a consultative forum on climate issues. It will meet twice in 2023.

The first NCSF of 2023 will be held in Q1 and engage a broad range of stakeholders from across society including Government Departments; Local Authorities; State Agencies; national organisations; academics; representative bodies; voluntary organisations; community and local groups; and representatives from populations most at risk of climate change or impacted by the

transition to a carbon neutral society. Insights from this session will form the basis of a short report and inform the discussion at the second session later in the year.

The second NCSF of 2023 will be held in Q4 2023, with Oireachtas members invited to engage with the Delivery Taskforces on Climate Action and sectoral policy leads to discuss the outputs of the first NCSF session with the view to:

- Providing stakeholder feedback to the Oireachtas on the outputs of the first NCSF event, and the broader NDCA and CCCC programmes;
- Engaging in a discussion on the delivery of CAP23 across sectors, and allowing an opportunity to examine the public and stakeholder suggestions;
- Engaging the Oireachtas members in a dialogue to explore how to lead on the delivery of our climate ambition;
- Promoting a coherent view on the delivery of climate action across the wider political system.

National Climate Conversation on Local Actions

In Q2 2023, the NDCA will engage with Government Departments, State Agencies, Local Authorities, environmental non-governmental organisations, and community and voluntary groups to develop a National Climate Conversation on Local Actions (NCCLA). The NCCLA will allow communities, organisations, and individuals to showcase projects, engage in practical discussions, share best practice, and explore the scalability of local activity or individual innovations. The aim is to identify projects and best practice emerging from communities across Ireland, supporting the delivery of these innovative approaches in different locations throughout the country.

Climate Conversations

CC23 will build on the approach developed in previous years and deliver an increasingly proactive engagement programme to bring stakeholders and the public from more diverse backgrounds and perspectives into the dialogue. This will include:

- A public consultation on the next Climate Action Plan;
- A series of deliberative workshops delivered online and in regional locations involving a broad range of stakeholders, including those not yet engaged with climate action, and populations most at risk of climate change or impacted by the transition to a carbon neutral society;
- In-depth interviews with stakeholders and subject matter experts across a range of areas relating to communications, engagement, and behavioural change.

EPA Climate Conference, Climate Lecture Series and Support Workshops

The EPA hosts a series of annual engagement events, including its annual climate conference, climate lecture series, and workshops on engagement and participation. These provide an opportunity for the research and academic community to share findings from innovations, studies, and research; debate the approaches taken; and examine the scalability of these ideas. In 2023, the EPA's climate conference and lecture series will continue to be shaped by priority areas emerging in scientific research, taking account of priority areas for national and local Climate Action Plans, and issues emerging from the wider NDCA programme of engagement.

3. Climate Literacy

Knowing what climate actions improve their quality of life, how to take them, and which ones will have the greatest impact on mitigating climate change emerged from CC22 as one of the most significant issues for people. Climate literacy can be understood as individuals' understanding of their influence on climate and climate's influence on individuals, communities and society. A climate-literate person understands the basic principles of the Earth's climate system, knows how to assess credible information, can communicate about climate in a meaningful way, and is able to make informed and responsible choices regarding their own actions that affect the climate.

Figure 9.3 – Climate Literacy Model

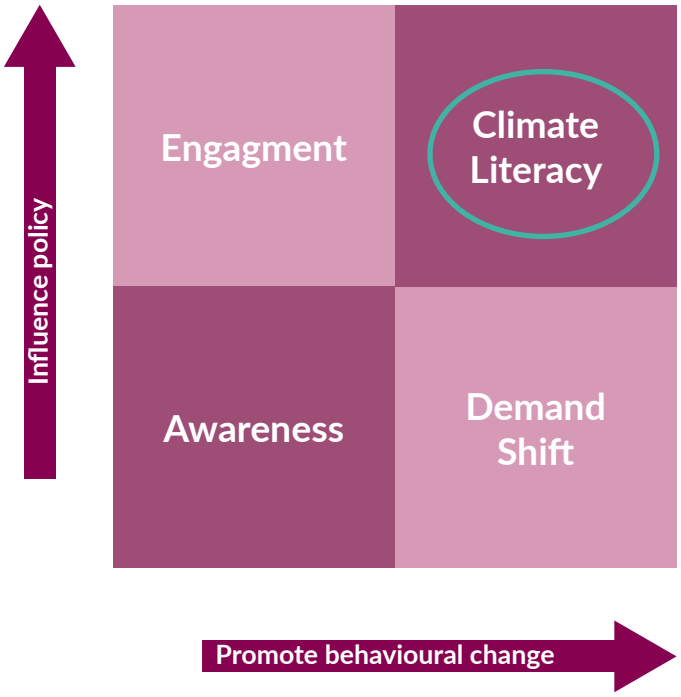


Figure 9.3 illustrates key objectives of the NDCA: to provide mechanisms to allow people influence the direction of policy; and to support people to make meaningful changes in their behaviours. Insights gained from CC22 suggest that:

- We may have high levels of awareness, but this does not necessarily influence policy nor promote behavioural change;
- We are engaging people in a two-way dialogue on climate action, but this is not necessarily translating into behavioural change;
- We can influence behaviours by changing choices, but this may not be the ideal manner in which to promote agency or self-efficacy.

We will deliver a programme of formal, non-formal, and informal education to *'make sure everyone knows enough to take action'* – NCSF participant.

Improving climate literacy enhances individuals' capacity to make small changes in their daily lives, and engage with climate action at individual, local and national levels. Improving climate literacy at all levels of Government and policy making is also important. Improvements in climate literacy can be best achieved through the provision of evidence-based communications. Initiatives include:

- A core module in the EPA CCIM study establishing a benchmark measure for climate literacy in a representative sample of the Irish population;
- Progressing the implementation of actions in the Second National Strategy on Education for Sustainable Development (ESD) to 2030 to ensure that ESD is further embedded in relevant programmes and curricula at all levels, from early learning and care to third level education;
- Informal education embedding climate action in everyday life and decision-making;
- Initiatives such as the Green Schools, Young Environmentalist Awards, and others.

4. Social and Behavioural Research and Behavioural Change

The delivery of the objectives of the NDCA will be measured through robust quantitative and qualitative research. Since 2021, we have had the first EPA CCIM study and established the first NSBAG. The outputs of CCIM study serve as a benchmark for longitudinal comparison and the survey will be run every two years (again in 2023) to allow measurement of changes in attitudes and behaviours over time. The NSBAG met three times in 2022 providing expert insights and recommendations based on the latest research.

9.3 Multi-annual Programme

In 2022, the NDCA facilitated DECC and other key Government Departments working closely with the EPA, social and behavioural scientists, communications professionals, and research experts to interpret the findings of the engagement activities and latest research. Outputs from the 2022 programme have informed policy and communications across Government and supported the establishment of an inclusive NDCA structure as illustrated in Figure 9.1 above.

In adopting this approach, the NDCA has a strong action focus leveraging public, sectoral and regional involvement in delivering changes at system level within relevant spheres of influence, while also promoting and enabling long-term behavioural change. This approach engages those already involved in climate action, enables those not yet engaged to get involved, and empowers those who are likely to be most affected by climate change to act.

Going into 2023, we have established baselines for awareness and engagement through the EPA CCIM study, and clearly defined workstreams through which it will be possible to provide an evidence base for a multiyear approach to policy development, engagement and communications.

9.4 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
CZ/23/1	Advance coordinated climate action communications from the centre of Government
CZ/23/2	Provide insights from NDCA programme to support climate communications
CZ/23/3	Deliver the NDCA programme
CZ/23/4	Deliver the CC23
CZ/23/5	Deliver inclusive whole-of-Government governance structures guiding the NDCA Programme
CZ/23/6	Support, through the education system, the required initiatives to support the development of a climate neutral economy
CZ/23/7	Support climate literacy through formal education (primary and secondary curriculum)
CZ/23/8	Promote climate literacy through non-formal education
CZ/23/9	Promote climate literacy through informal education
CZ/23/10	Employ the latest research to provide an evidence base to support work of the NDCA, CCCC, IDWG, and CECLT; and the Climate Action Plan and sectoral policy

10 Public Sector Leading by Example

10. Public Sector Leading by Example

Key Messages

State of Play

- The public sector will play a leadership role in driving far-reaching climate action across its buildings, transport, waste, and energy usage, as well as wider society

Current and Future Action

- To achieve this, the public sector will:
  - Implement the Public Sector Climate Action Mandate
  - Strengthen climate governance frameworks in public sector bodies
  - Increase climate literacy in the public sector
  - Implement policies to decarbonise the public sector vehicle fleet
  - Procure only Zero Emission Vehicles from the end of 2022 onwards where available and practicable
  - Retrofit public sector buildings
  - Fully implement green public procurement in the public sector

Expected Outcomes

- By 2030, we will:
  - Reduce greenhouse gas emissions from the public sector by 51%
  - Increase the improvement in energy efficiency in the public sector from the 33% target in 2020 to 50% by 2030
- By 2025, we will achieve the buildings and retrofitting targets laid out in the Public Sector Climate Action Mandate and in Chapter 14: Built Environment
- Implement and review the Public Sector Climate Action Mandate annually

10.1 State of Play

10.1.1 Role of the Public Sector

> *We will lead by example, embedding climate action as a central value across all public sector organisations, relentlessly focusing on continuous improvements that deliver real progress.*

The public sector will play a leadership role in driving far-reaching climate action across its buildings, transport, waste, and energy usage. A clear message from the National Dialogue on Climate Action is that people want Government to lead by example and know that everyone is doing their part. Government is committed to working closely with all citizens, communities, and businesses to

empower them to take the necessary action to address climate change. We will lead by example, embedding climate action as a central value across all public sector organisations, relentlessly focusing on continuous improvements that deliver real progress.

10.1.2 Sectoral Emissions Ceilings

The public sector target is to reduce its emissions by 51% in 2030. Emissions from public sector buildings are included under the Commercial Built Environment sectoral ceiling, with the Minister for the Environment, Climate and Communications currently accountable for the public sector component of emissions under this ceiling. The Minister for Public Expenditure and Reform takes a joint coordinating role in implementing climate action in the public sector, with all Ministers having a leadership role in their areas of responsibility.

Table: 10.1 – Public Sector GHG Emissions, 2021 [18]

Public Sector Emissions CO_2eq.	Share of Total GHG Emissions	Public Sector Emissions CO_2eq. per person
0.66 Mt	1.0%	0.13 t

10.2 2025 and 2030 Key Performance Indicators

2025 and 2030 targets **To meet the required level of emissions reduction we will:**
By 2025 • Achieve our buildings and retrofitting targets[19] • Procure only zero emission vehicles from 1st Jan 2023 onwards, unless the vehicle is exempt under the European Communities (Clean and Energy-Efficient Road Transport Vehicles) (Amendment) Regulations (S.I. 381 of 2021) • Implement and review the Public Sector Climate Action Mandate annually • Develop a new Green Public Procurement Strategy and implementation action plan, based on a review of Green Tenders • Public Bodies leading by example, shall specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects from 2023
By 2030 • Reduce GHG emissions from the sector by 51% • Increase the improvement in energy efficiency in the public sector from the 33% target in 2020 to 50% by 2030

18 Figures in Table 10.1 are the "Public Services" figures from the EPA Inventory category 1.A.4.a. The source for Public Services emissions is the SEAI Energy Balance, specifically: Water Supply, Sewerage, and Waste Management (NACE 36-39); Public Administration (NACE 84); Education (NACE 85); and Health, Residential Care, and Social Work activities (NACE 86-88). Most of the emissions in 1.A.4.a are related to the heating of buildings. The following are not included: transport emissions related to public sector fleet (captured in the transport sector 1.A.3); and emissions associated with the generation of the electricity being used (captured in 1.A.1)

19 See chapter 14, Built Environment

Box 10.1 – Setting Public Sector Decarbonisation Targets

Approach to Target Setting for Public Sector Bodies

Nature of Target

Emission reduction targets will be based on an absolute tonnage of GHG emissions. The total tonnage target will be a 51% reduction of direct energy-related emissions (thermal and transport consumption), plus projected supply side reductions in indirect energy-related emissions from electricity. The baseline for the methodology is the period 2016 to 2018, with a scaling factor applied to ensure the individual targets equal the total ambition.

Application

The definition of public sector body for the purpose of tracking emissions is based on that used in S.I. No. 426/2014 – European Union (Energy Efficiency) Regulations 2014. This means that all public bodies that report under the Energy Efficiency Monitoring and Reporting (M&R) System will be assigned an emissions reduction target.

An overall sectoral target of 51% will apply to the public sector. Each public sector body has a responsibility to endeavour to reach this target. Progress towards the target is measured at sectoral level. Public sector bodies' progress toward the target will be tracked and monitored through the Sustainable Energy Authority of Ireland (SEAI) M&R system. Each Government Department is responsible for the bodies under its aegis. To ensure accountability, public sector bodies are assigned to sectoral groups.

Public sector bodies are part of the same sectoral group as their parent Department. This is in line with existing governance structures. The sectoral group structure enables the prioritisation of budgets and facilitates effective budgetary planning within each group. These targets will evolve over time and change in line with Ireland's climate vision. The public sector should expect more ambitious targets in the coming years.

Public Sector Mandate

To support public sector bodies leading by example, the Climate Action Mandate applies to bodies covered by public sector decarbonisation targets, except for Local Authorities, Commercial Semi-State Bodies and the School Sector (where sector-specific mandates will apply). The responsible Departments will annually review both the Climate Action Mandate and the School Sector Climate Action Mandate.[20]

Large Public Bodies

Requirements relating to large public bodies are applicable to:

- Organisations that consume over 50 GWh of energy per annum
- Homogenous sectors such as Schools, Health, Local Authorities, and the Civil Service

20 The Department of the Environment, Climate, and Communications has responsibility for the annual review of the Public Sector Climate Action Mandate. The Department of Education has responsibility for the annual review of the School Sector Climate Action Mandate.

In relation to the Civil Service, the Office of Public Works (OPW) and Government Departments' building stock are defined as a large public body.

In relation to the Further and Higher Education Sector, the further and higher education's building stock are defined as a large public body. These large public bodies, together with the thirty-one Local Authorities, generate approximately 90% of public sector emissions.

Allowed Savings

The emissions reduction target will be achieved through energy efficiency measures, electrification, demand reduction, and the use of on-site renewables (e.g., rooftop solar panels, and geothermal heat sources). Emissions reductions from purchasing energy from a "green" energy supplier, or using offsets, cannot be used to meet a public sector body's target.

Growth

If an increase in a public sector body's emissions can be demonstrated to lead to an overall net economy-wide emissions reduction, and is 'additional', an 'emissions credit' can apply. To count this credit towards emissions reductions, approval for the associated emissions impact should be sought and granted (for example, an additional bus for a public sector transport operator that reduces transport emissions in the broader economy).

Governance

The SEAI will support the capture of data using its M&R system and provide guidance and support to public sector bodies in reducing their emissions from energy use. Each public sector body will be required to:

- Individually report on their progress towards targets;
- Be part of a sectoral group, which includes a given Government Department and all public bodies under their aegis. Each public sector body will be assigned to the same sectoral group as they are in for energy efficiency target measurement. The key progress indicator for the public sector to meet its target will be the sectoral groups.

Reporting

The current Annual Report on Public Sector Energy Performance will be widened to include the public sector decarbonisation target. The SEAI and the Environmental Protection Agency will collaborate on the elements of this report related to the public sector decarbonisation target, which will be combined with energy efficiency performance in a single 'Annual Public Sector Energy Performance and Greenhouse Gas Emissions Report.'

10.3 Measures to Deliver Target Impact

10.3.1 Public Sector Climate Action Mandate

The Public Sector Climate Action Mandate applies to all bodies covered by decarbonisation targets, except for Local Authorities, Commercial Semi-State Bodies and the School Sector. The mandate highlights the main climate action objectives for public bodies and will be reviewed annually.

Progress on the implementation of the mandate will be tracked through the SEAI M&R system using a 'comply or explain' approach. Each public sector body's Climate and Sustainability Champion (see Box 10.2 below) has responsibility for reporting annually on the mandate. Reporting on the mandate can be an opportunity or mechanism for public sector bodies to demonstrate the exemplar nature of their climate action measures.

Public sector bodies are encouraged to avail of the SEAI's Partnership Programme, for support in implementing the mandate. Funding for the implementation of the mandate is as per the capital envelope set out in the National Development Plan.

Box 10.2 – Public Sector Climate Action Mandate

1.	**Our Targets**
1.1	Reduce GHG emissions by 51% in 2030.
1.2	Increase the improvement in energy efficiency in the public sector from the 33% target in 2020 to 50% by 2030.
1.3	Update Climate Action Roadmaps annually in line with updated Public Sector Climate Action Mandate.
2.	**Our People**
2.1	Establish and resource Green Teams, reporting to senior management, to become integrated drivers of sustainability in every public sector body.
2.2	Nominate a member of the Management Board as the Climate and Sustainability Champion with responsibility for implementing and reporting on the mandate.
2.3	Incorporate appropriate climate action and sustainability training (technical and behavioural, including green procurement training) into learning and development strategies for staff.
2.4	Organise staff workshops (at least annually) to engage on climate issues, including a focus on decreasing the organisation's carbon footprint.
2.5	Ensure all senior management (P.O level or equivalent and above) complete a climate action leadership training course in 2023, similar to the Local Authority training course as delivered by the CAROs[21].

21 https://www.caro.ie/training-events/training/training-course-1

3.	Our Way of Working
3.1	Report on the following in the Annual Report: - GHG emissions; - Implementation of the mandate; - Sustainability activities report; - Compliance with Circular 1/2020: Procedures for offsetting the emissions associated with official air travel. Using SEAI's Public Sector Monitoring and Reporting System, public bodies are to report annually on implementation of the individual mandate requirements using a 'comply or explain' approach.
3.2	Review any paper-based processes and evaluate the possibilities for digitisation so it becomes the default approach. Eliminate paper-based processes as far as is practicable. Where paper must be procured, ensure that recycled paper is the default.
3.3	Achieve formal environmental accreditation for large public sector bodies, such as ISO 50001 (Energy Management Standard) or ISO 14001 (Environmental Management System), with a view to going beyond ISO 14001 to adopting EMAS (Eco Management and Audit Scheme). Specifically: - All public sector bodies with an energy spend greater than €2m per annum to achieve ISO 50001 certification by end-2024; - All remaining public bodies to implement energy management programmes as per SEAI's energy management guidance (S.I. 426 of 2014) and report to SEAI annually on M&R.
3.4	Implement Green Public Procurement (GPP), in line with the EPA Green Public Procurement Guidance and using GPP Criteria Search where appropriate. All public bodies shall: - Cease using disposable cups, plates and cutlery from any public sector canteen or closed facility, excluding clinical (i.e., non-canteen healthcare) environments; - Specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects from 2023.
4.	**Our Buildings and Vehicles**
4.1	Promote the use of bicycles (including push bikes, electric bikes, and cargo bikes) and shared mobility options as an alternative to car use among employees and visitors by creating and maintaining facilities (both inside and outside of buildings) that support such options, including secure and accessible bicycle parking, shared mobility parking, and charging stations, as appropriate, with a view to achieving the Smarter Travel Mark, which is currently being developed as part of the Sustainable Mobility Pathfinder Programme.

4.2 Phase out the use of parking in buildings that have access to a range of public transport services and active/shared mobility options for the majority of staff/visitors while providing that sufficient accessible parking is maintained for those with physical mobility issues.

4.3 Display an up-to-date Display Energy Certificate in every public building that is open to the public to clearly show energy use.

4.4 The public sector will not install heating systems that use fossil fuels after 2023, in (1) new buildings, and (2) "major renovation" retrofit projects (as defined in the Energy Performance of Buildings Directive (EPBD)) unless at least one of the following exceptions applies:

- The fossil-fuel use is only using electricity from the grid;
- There is no technically viable non-fossil alternative (generally only related to applications for a purpose other than space heating);
- The installation of a renewable space heating system would increase final CO_2 emissions;
- The fossil-fuel use is provided for backup, peaking, or operational purposes (and makes up less than 10% of annual heating energy);
- Where the direct replacement of existing fossil fuel heating is required for an emergency maintenance purpose.

4.5 In relation to existing buildings:

- Large public sector bodies and sectoral groups with a large estate should commence a deep retrofit of at least one building in 2023 in pursuit of the 2030 51% target;
- All public sector bodies should develop a building stock plan, as defined in the EPBD, by end-2023 for retrofitting their building stock to meet CAP targets;
- As part of the building stock plan, public sector bodies should undertake data gathering and consider the long-term (to 2050) retrofit key performance indicators to upgrade all their building stock to Nearly Zero Energy Buildings (NZEB) or Zero Energy Buildings (ZEB) as outlined in the recast EPBD and Energy Efficiency Directive;
- In 2023, SEAI will work with sectoral groups with a large estate to develop a renovation target.

4.6 Procure (purchase or lease) only zero-emission vehicles from the end of 2022, enabling Ireland to go beyond the requirements of the EU Directive, amending Directive 2009/33/EC on the promotion of clean and energy-efficient road transport vehicles (EU Directive 2019/1161, the Clean Vehicle Directive) and act as an international leader in this area. An exception applies where the vehicle is exempt under European Communities (Clean and Energy-Efficient Road Transport Vehicles) (Amendment) Regulations (S.I. 381 of 2021)[22]. Public sector procurement contracts for delivery and haulage should specify zero emissions vehicles where possible.

22 Major manufacturers have indicated their commitment to increasing the availability of e-trucks to the market by mid-decade. However, it is acknowledged that it may not be possible to procure the desired number or variety of zero emission heavy-duty vehicles until the second carbon budgetary period (2026-2030). Depending on market developments, public sector bodies should, at the least, procure (purchase or lease) 'Clean Vehicles', in accordance with the EU Clean Vehicles Directive, to meet their heavy-duty vehicle targets.

10.3.2 Reduce Your Use Campaign

In line with the National Energy Security Framework, the SEAI and the OPW are delivering an energy efficiency campaign to public bodies. This campaign is focussing on driving behavioural change and implementing a range of measures to lower energy consumption and costs in the public sector. All public sector bodies will lead by example in lowering energy consumption and costs by signing up to the campaign. They will be supported with energy awareness resources, including online seminars, live webinars, and one-to-one online energy clinics.

The Reduce Your Use energy efficiency campaign is designed to target reductions in energy use. This includes targeted reductions by public sector bodies, through simple and easy to implement measures, such as:

- Reducing the temperature and duration of heating systems;
- Reducing energy use from lighting;
- Reducing electricity use at peaks times whenever possible;
- Making more efficient use of buildings where occupancy is low, at certain times, due to remote working.

Box 10.3 – Public Sector Climate Strategy, Mandate and Roadmaps

Climate Action Strategy	**Climate Action Mandate**	**Climate Action Roadmaps**
The public sector strategy will set out the leadership and governance structures that are essential for the achievement of meaningful climate action in the public sector. It runs from 2023 to 2025 and will support the public sector to lead the way on climate action towards our 2030 targets. This will be brought to Government for approval in 2023.	To support public sector bodies leading by example, a Climate Action Mandate now applies to all bodies covered by decarbonisation targets, except for Local Authorities, Commercial Semi-State Bodies, and the School Sector. The mandate highlights what public sector bodies must do and how they must prioritise their climate action.	The mandate requires that public sector bodies put in place a Climate Action Roadmap. This roadmap is the path by which the public sector body will implement the mandate.

10.3.3 Climate Action Roadmaps

Each public sector body to which the mandate applies, will develop a Climate Action Roadmap, setting out how it will deliver on its energy efficiency and emissions reduction targets. The roadmap is the pathway by which the body will implement the Climate Action Mandate. The purpose of the roadmap is to encourage a collective vision, strategy, and planning within each organisation. Climate action should be embedded into how each body plans, organises, and mobilises to deliver its functions and services. Public sector bodies will update their roadmaps each year, in line with the mandate which is reviewed annually.

The SEAI and the EPA have published guidance for preparing roadmaps. The first iteration of the guidance focuses on energy management. The next iteration of the guidance will be updated to include wider climate action. This guidance will be revised as necessary in line with any changes required due to updates to the mandate.

10.3.4 Role of the Health Sector

The Health Service Executive (HSE) has developed an ambitious Climate Action and Sustainability Strategy 2022-2050. The strategy will be delivered through a series of detailed Implementation Plans which establish governance structures for each focus area, assign responsibilities, develop measurement and reporting mechanisms, prioritise the deployment of resources, and promote engagement and awareness.

Key Activities to 2025

The implementation of the HSE Climate Action and Sustainability Strategy will be enabled by the development in 2023 of a suite of frameworks and supporting Implementation Plans targeting priority areas of focus, with additional work to develop enabling environments. This will allow for full integration with the Climate Action Plan process going forward.

During the period to 2025, the Department of Health and the HSE will develop a successor to the 2019 Health Sectoral Adaptation Plan, informed by the review of the National Adaptation Framework, as well as domestic and international developments.

10.3.5 Bodies not included in the Public Sector Climate Action Mandate

Local Authorities

Local Authorities have a key role in the delivery of both climate mitigation and adaptation

Local Authorities have a key role in the delivery of both climate mitigation and adaptation. This is reflected in the provisions of the Climate Action and Low Carbon Development (Amendment) Act 2021, which requires each Local Authority to prepare a Local Authority Climate Action Plan (LA CAP), specifying the adaptation and mitigation measures to be adopted by the Local Authority. All LA CAPs are due to be submitted to the Department of the Environment, Climate and Communications (DECC) no later than March 2024. LA CAPs will be updated once every 5 years from this date.

The LA CAPs will be designed and delivered across three main phases:

- Phase 1: Delivery of the national Climate Action Plan 2021 and establishment of the evidence base, resource needs and other requirements for each LA CAP (2022 – February 2023);
- Phase 2: Development of LA CAP (March 2023 – February 2024);
- Phase 3: Implementation (March 2024 – February 2029).

Within each Local Authority, new specialist resources will form the nucleus of climate action teams. Each LA CAP will be produced following Local Authority Climate Action Plan Guidelines. The Local Authority Climate Action Training Programme is being delivered to develop the capacities and skillsets of Local Authority staff in relation to climate action. In addition, Smart and Sustainable Mobility Training Workshops will be provided under the recently launched Sustainable Mobility Policy Pathfinder Programme. The four Climate Action Regional Offices will ensure a coordinated approach on climate action across the Local Government sector.

Commercial Semi-State Bodies

The Climate Action Framework for the Commercial Semi State Sector[23] was approved by Government in July 2022. The Framework consists of five commitments that each Commercial Semi-State Body should adopt:

1. Governance of climate action objectives;
2. Emission measurement and reduction target;
3. Emission valuation in investment appraisal;
4. Circular economy and green procurement;
5. Climate-related disclosures.

Commercial Semi-State Bodies are already playing a significant role in the decarbonisation of Irish society

Commercial Semi-State Bodies are already playing a significant role in the decarbonisation of Irish society. The framework will assist them in determining how they can conduct their functions in a manner that is consistent with our climate ambitions: achieving a 51% overall reduction in greenhouse gas emissions by 2030 and reaching net-zero no later than 2050. The framework assists each company to publicly demonstrate its commitment and the steps it will take to deliver on this commitment. The New Economy and Recovery Authority (NewERA) will monitor the implementation of the commitments set out in the framework and report biannually on progress to DECC.

Schools

The School Energy Retrofit Pathfinder Programme, with a target investment budget of €105 million, has already retrofitted 48 schools across Ireland, with work on an additional 15 schools currently underway. This programme is paving the way for a much larger national programme for the decarbonisation of schools built prior to 2008.

Budget 2023 includes funding from the Climate Action Fund to provide photovoltaic panels (up to 6kW output) on all schools, which will reduce energy costs and support the decarbonisation of our school buildings.

A new Climate Multi-annual Summer Works Scheme will be developed and open for applications in 2023. Budget 2023 includes funding from the Climate Action Fund to provide photovoltaic panels (up to 6kW output) on all schools, which will reduce energy costs and support the decarbonisation of our school buildings.

10.3.6 Capacity of the Public Sector to Deliver Climate Action

It is essential that the public sector has the capacity to lead on the delivery of climate action. A review is currently underway to identify the resources, knowledge, skills, training, and abilities needed within the Civil Service for this role. The review will also consider wider issues such as barriers to delivery, leadership cultures and governance, and will be completed in early 2023.

23 See the Climate Action Framework for the Commercial Semi State Sector at the following link: https://www.ntma.ie/uploads/publication-articles/Climate-Action-Framework-for-CSS-Sector.pdf

10.3.7 Green Public Procurement

The Government is committed to sustainable public procurement, to ensure that what we are buying and building is consistent with our climate ambition.

- We will review and update Green Tenders (Action Plan on Public Procurement) for greener public sector purchasing, including promoting the use of the recently launched Green Public Procurement (GPP) Criteria Search tool in the public sector.
- GPP training will be provided for public sector bodies, including Local Authorities.
- Annual monitoring and reporting on GPP by Government Departments will continue, and we will identify reporting structures and develop reporting guidelines for public bodies in 2023/2024.
- The Cement Task Force shall prepare and submit to Government a public procurement policy by no later than Q2 2023 to facilitate public bodies to incorporate the principle of low carbon construction methods and materials and whole life-cycle analysis approaches in all publicly procured or supported projects. Public bodies' consistency with the policy will be examined under the SEAI reporting framework.

10.3.8 Ambitious Cross-cutting Decarbonisation

Retrofitting and Improving the Energy Efficiency of Buildings

There are between 12,500 and 13,700 buildings in the public sector, including about 4,600 school buildings and 1,000 buildings in the Commercial Semi-State sector. They consumed 2,191GWh of thermal energy (heating) in 2019, 99% of which was from fossil fuels. Altogether they account for about half of public sector energy consumption and associated GHG emissions.

SEAI is supporting retrofitting and improving the energy efficiency of these buildings through:

- Helping public bodies plan for 2030, including using SEAI's 'Gap to Target' tool and accessing advisory supports in developing their Climate Action Roadmaps;
- The Building Pathfinder Programme, which supports building retrofit projects.

The Department of Further and Higher Education, Research, Innovation and Science, in partnership with the SEAI and the Higher Education Authority, launched the Energy Efficiency and Decarbonisation Pathfinder Programme for the Higher Education Sector. Work has commenced on a similar pathfinder programme in the Further Education and Training Sector.

Decarbonisation of Public Sector Transport

Emissions from transport account for about 30% of the public sector's overall GHG emissions, the second largest portion after buildings. While more sustainable commuting and business-related travel by public sector employees should be strongly encouraged and facilitated (e.g., active travel, shared mobility options, and public transport), increased use of electric vehicles by the public sector will also help to demonstrate their value to wider society, improve urban air quality, and reduce noise pollution.

Electrifying the vehicle fleets of public sector organisations – those that are used for the performance of the functions of that organisation – and encouraging more sustainable commuting and business-related travel by public sector employees are key elements of public sector transport decarbonisation. Public transport decarbonisation (e.g., bus, taxi, and rail), is dealt with in Chapter 15: Transport.

Public sector bodies, which are currently partners of the National Transport Authority's Smarter Travel Workplaces Programme, are committed to the promotion of sustainable travel to and from work. This is undertaken through behavioural change interventions which enable staff members to explore alternatives to private car use for their commute (e.g., public transport, cycling, or walking). We will expand the Smarter Travel Workplaces Programme, providing scope for more public sector bodies to join and make the commitment to promote a more sustainable transport environment for their employees.

Smarter Travel Mark

The Sustainable Mobility Pathfinder Programme, launched in October 2022, includes a project to develop a Smarter Travel Mark. The mark will recognise a workplace as being committed to active and sustainable travel for their workforce, or visitors. As part of the process to attain the Smarter Travel Mark, public sector bodies should lead on the development of workplace sustainable mobility hubs and consider the mechanisms to reduce car-based office commuting.

10.3.9 Public Sector Decarbonisation Incentives

The Taskforce for the Built Environment will undertake a detailed assessment of the options available to support the delivery of the sector's decarbonisation objectives, with a particular focus on incentivising early action by public sector bodies and achieving an enhanced level of activity. This taskforce will report to Government with conclusions and recommendations by Q3 2023 at the latest. The work programme will consider, among other options, the introduction of measures which will support public bodies that demonstrate leadership in decarbonising their operations and will hold those that fail to meet their targets to account.

10.4 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
PS/23/1	Public Sector Climate Action Mandate to be implemented by all relevant Public Sector bodies
PS/23/2	Deliver a strategy to achieve at least a 51% reduction in GHG emissions and a 50% improvement in public sector energy efficiency by 2030
PS/23/3	Strengthen climate action reporting in public sector bodies
PS/23/4	Development and delivery of HSE Climate Action and Sustainability Strategy 2022-2050
PS/23/5	Implementation of Commercial Semi-State Climate Action Framework
PS/23/6	Development and delivery of Local Authority Climate Action Plans
PS/23/7	Implement the Second National Strategy on Education for Sustainable Development to 2030
PS/23/8	Development and delivery of a report on capacity of public sector to deliver climate action
PS/23/9	Provision of climate-related training and upskilling

PS/23/10	Support development of Public Procurement Framework for charging infrastructure for public sector fleets
PS/23/11	Review and update Green Tenders: an Action Plan on Green Public Procurement to provide an updated and fit for purpose plan for greener public sector purchasing (new strategy and action plan)
PS/23/12	Support implementation of GPP in the public sector

11 Carbon Pricing and Cross-cutting Policies

11. Carbon Pricing and Cross-cutting Policies

Key Messages

State of Play

- Policies on taxation, expenditure, sustainable finance, spatial planning, digital transformation, and the bioeconomy have a key role to play in supporting delivery of emissions reductions in sectors with sectoral emissions ceilings

Current and Future Action

- Implement successive carbon tax increases as legislated for in the 2020 Finance Act until the carbon tax rate reaches €100/tonne and redistribute the carbon tax income in a socially fair manner
- Continue to examine environmental taxation measures across the taxation system
- Mobilise public and private investment for climate action
- Promote the development of a sustainable and climate resilient financial system
- Ensure the National Planning Framework guides the implementation all relevant policies at national, regional, and local levels
- Promote the digital transformation, sustainable remote working practices and the roll-out of the National Broadband Plan
- Develop and implement a National Bioeconomy Action Plan

Expected Outcomes

- Pricing signals through carbon and other environmental taxation will continue to drive changes in household and business behaviour and investments towards low carbon alternatives
- Public investment will be complemented by and work to mobilise private investment across the economy towards meeting our sectoral emissions ceilings
- Reform and evolution of the financial system will promote sustainable outcomes
- National Planning Framework objectives will support climate policy implementation
- The digital transformation will continue to support low carbon choices in households and businesses
- Ireland's bioeconomy will continue to grow through harnessing Ireland's natural resources and competitive advantage and fully developing opportunities

11.1 State of Play

Government policies on taxation, expenditure, sustainable finance, spatial planning, digital transformation, and the bioeconomy provide an important enabling framework for individual, household, community, and company-level climate action.

For the actions and targets set out in this Climate Action plan to achieve the Government's sectoral emissions ceilings, the implementation of key cross-cutting policies is required at a national level. These policies are designed to remove barriers and to provide a broad, supportive, national policy framework to promote the transition to a climate neutral society. Government policies on taxation, expenditure, sustainable finance, spatial planning, digital transformation, and the bioeconomy provide an important enabling framework for individual, household, community, and company-level climate action. These policies also act as enablers for a wide range of other Government policies and activities within individual sectors.

11.2 Measures to Deliver Cross-cutting Policy Objectives

11.2.1 Environmental Taxation and Carbon Pricing

Taxation policy can play a central role in encouraging the changes necessary to reduce our greenhouse gas (GHG) emissions and to support additional environmental benefits. We are committed to having in place a taxation framework that plays its part in incentivising, along with other available policy levers, the necessary actions to reduce our emissions. There are already a number of environmentally progressive elements to Ireland's taxation regime:

- A carbon tax, in place since 2010, that is one of the most broadly-based carbon taxation systems in the world, applying to approximately 50% of all CO_2eq. emissions. Legislation in place to increase the annual rate of carbon tax until at least 2030. Government policy is to ringfence carbon tax receipts for a socially progressive retrofit programme, social welfare measures and supports to support farming in a more sustainable way;
- A suite of taxation incentives to promote the uptake of electric vehicles, including substantial Vehicle Registration Tax (VRT) relief and Benefit-in-Kind (BIK) exemptions;
- A CO_2 emission based VRT and motor tax regime for private motor cars that imposes a higher tax liability on vehicles with higher emissions.

We are committed to regularly reviewing and reforming key environmental tax measures including:

- Examining the introduction of an emissions-based tax regime for light goods vehicles;
- Examining gradually phasing out VAT rebates on commercial fuel use where electric alternatives exist;
- Examining the gradual equalisation of the diesel and petrol excise rates;
- Introducing environmental criteria into the vehicle BIK regime, with commencement sensitive to typical fleet renewal timescales;
- Supporting the use of accelerated capital allowances to promote investment in energy efficient equipment and zero emissions commercial vehicles;
- Assessing the role for taxation measures, in meeting our building retrofit targets set out in this plan.

All EU Member States implement carbon pricing through the EU Emissions Trading System (ETS) and Ireland is also one of fifteen Member States to have economy-wide pricing through a combination of the ETS and a separate domestic carbon tax applied to sectors not included in the ETS. As part of the EU's Fit for 55 legislative package, the European Commission has proposed further strengthening of the EU ETS by introducing:

- Changes to the Energy Taxation Directive to align the taxation of energy products with EU energy and climate policies and to promote clean technologies;
- A new carbon border adjustment mechanism that would place a carbon price on the importation of certain goods from outside the EU, to encourage EU partners to raise their climate ambition and reduce the risk of carbon leakage.

Our Commitment on Carbon Taxation

We have legislated for increasing, on a phased basis, the rate of carbon tax that applies in Ireland to €100 per tonne by 2030 and to ring-fencing all additional revenues from that increase to support measures that advance the achievement of our climate action objectives. The Government is committed to additional spending of €9.5 billion using the revenues raised by the planned increases in the carbon tax over the period to 2030. This revenue will be allocated to programmes such as a socially progressive national retrofit programme (€5 billion); addressing fuel poverty and providing for a just transition through targeted social welfare and other initiatives (€3 billion); and the promotion of sustainable agriculture practices (€1.5 billion) as set out elsewhere in this document.

Shadow Price of Carbon

The Public Spending Code is the tool that the Government uses to evaluate the consequences of the capital investment decisions it faces. Every public investment project with a value above €20 million must conduct a full analysis on all the potential costs and benefits associated with that project, using rules set by the Department of Public Expenditure and Reform (DPER).

As the Government's climate ambitions have been considerably strengthened, the Public Spending Code must be updated to reflect this enhanced ambition. DPER is currently working with UCC MaREI to revise the shadow price of carbon, informed by updated research on the marginal abatement cost of reaching our climate targets.

DPER is also working with the Organisation for Economic Co-operation and Development (OECD), supported by the EU Commission funding through DG REFORM's Technical Support Instrument, on progressing a new model for assessing the emissions impact of infrastructure investment. This is to ensure that the full range of potential consequences for this type of investment are captured and valued appropriately. This work will also examine how we should consider and appraise investments that may be vulnerable to the impacts of climate change.

Over the longer term DPER will also examine the role that the Public Spending Code can play in the achievement of broader environmental objectives e.g., valuing biodiversity or ecosystem services.

11.2.2 Mobilisation of Investment for Climate Action

Project Ireland 2040 Funds

The four Project Ireland 2040 funds, comprising the Climate Action Fund; Disruptive Technologies Innovation Fund; the Urban Regeneration and Development Fund; and the Rural Regeneration and Development Fund, will have a collective budget of an estimated €4 billion to 2027. Each of the four funds will continue to promote investments for climate action within the scope of its mandate.

The Climate Action Fund will continue to fund projects and initiatives that contribute to the achievement of Ireland's climate and energy targets in a cost-effective manner. It offers the potential for innovative interventions in these sectors which, in the absence of support from the fund, would not otherwise be developed. Projects spanning the electricity, heat, transport, and agriculture sectors, with both an urban and rural focus, have already been approved for funding of up to €77 million under the first call from this fund, which leverage a total investment of over €300 million. In November 2021, the Minister for the Environment, Climate and Communications launched the Community Climate Action Programme. This will see €60 million from the Climate Action Fund invested in community climate action projects over the next three years. In September 2022 it was also announced that €50 million would be made available from the Climate Action Fund for solar PV for schools across the country, and a further €50 million would be made available for climate action business supports through the Sustainable Energy Authority of Ireland. Funding will also be provided to the Department of Transport for sustainable travel projects.

Green Budgeting

Ireland is committed to the implementation of a series of progressive green budgeting reforms. The purpose of these reforms is to better embed climate and environmental goals within the budgetary process, with a view to improving outcomes. To support these reforms, Ireland joined the OECD Paris Collaborative on Green Budgeting and participates in the Coalition of Finance Ministers for Climate Action.

As part of the 2022 budgetary framework, the Department of Finance published a review of green budgeting from a tax perspective. This publication represents a first-stage analysis of tax-related green budgeting, a process which can be expected to develop over time and help inform other areas of the Department's climate analysis. As part of the 2023 budgetary framework, the Department intends to undertake an updated green budgeting analysis, accounting for the latest available data.

Green budgeting initiatives will make Government action on climate change more transparent to citizens and will raise awareness and understanding of the specific impacts of individual climate and environmental policies.

Green budgeting initiatives will make Government action on climate change more transparent to citizens and will raise awareness and understanding of the specific impacts of individual climate and environmental policies. Ultimately, it has the potential to contribute to policy-making that will result in improved outcomes.

Reporting on green expenditures has been progressed through the inclusion of material in budgetary documentation. In particular, the Revised Estimates Volume provides detailed programme by programme allocations on expenditure that the Government as deemed to be "green". The

definition for green expenditure is:

"Any expenditure which promotes, in whole or in part and whether directly or indirectly, Ireland's transition to a low carbon, climate-resilient and environmentally sustainable economy."

A conservative interpretation of this definition is applied and items of Government expenditure are only included in the table *"where it is evident that all, or at least the majority of investment in the programme in question, will support improved climate and environmental outcomes."*

Integrating Green Budgeting in Expenditure Management

The next phase of reform will focus on broadening the coverage of green budgeting to all areas of public spending. Ireland is benefiting from the experience and expertise of the OECD who are leading a project to improve the systems used to tag and trace expenditure and measure performance against a range of metrics.

The new approach will allow all policy areas to:

- Identify and quality-assure performance metrics;
- Ensure alignment of performance reporting with financial management reforms;
- Associate programmes of expenditure with standardised performance metrics and KPIs;
- Identify or "tag" particular line-items and programmes of expenditure as linked to achievement of particular cross-cutting policy priorities;
- Present performance information online in a way that is accessible to all citizens and tell a comprehensive story about the performance of Government.

Identification of Climate-Harmful Spending

To inform the public and policy makers about measures that are helping or hindering progress towards our climate targets, DPER are currently developing definitions to identify and track and ultimately reduce government spending that may be having a negative impact on climate and environmental outcomes.

Assessing spending that may be having a negative impact on climate and environmental outcomes will be informed by the ex-post assessment of fossil fuel and similar subsides conducted by the Central Statistics Office and international best practice. We will also publish supporting information on methodologies used to arrive at our assessments.

Irish Sovereign Green Bonds

In 2018, the National Treasury Management Agency (NTMA) issued €3 billion of Ireland's first sovereign green bond to further diversify Ireland's debt investor base. The proceeds from the Irish Sovereign Green Bonds (ISGB) programme are allocated to projects aimed at addressing climate action. ISGBs provide investors with the security of regular Irish Government bonds but are governed by a Green Bond Framework which commits Ireland to allocate the proceeds raised in accordance with the International Capital Market Association standard. Since the launch in 2018, a total of €7.3 billion of proceeds has been allocated to green projects. Examples of the types of projects which receive allocations include retrofit programmes, investment in public transport and flood relief schemes. The NTMA intends to continue to develop the market for ISGBs.

Mobilising Private Sector Investment

The low-carbon transition will require significant private investment alongside Exchequer

expenditure on a sustained basis over a number of decades. This investment will cover a range of activities:

- Developing disruptive innovations;
- Expanding new types of infrastructure, including clean sources of energy;
- Adapting existing infrastructures, such as retrofitting homes and offices to make them more energy efficient.

In order to meet the targets and objectives of this Climate Action Plan, it is necessary to direct the private sector towards financing the necessary investments. We are taking the lead in developing innovative approaches to financing our decarbonisation objectives and are committed, for example, to rolling out a low-cost residential retrofit loan scheme. To meet the scale of this challenge, the financial sector will also need to bring innovative solutions to the market.

Through the commercial State sector and other public bodies, we will seek to leverage the significant volumes of private sector capital that is available for well-structured projects, including wind (both onshore and offshore) and solar electricity generation, interconnection, and major transport infrastructure.

NewERA will continue to work with the commercial state companies, the Ireland Strategic Investment Fund, the Strategic Banking Corporation of Ireland, and other public bodies, to identify priority opportunities in key sectors to mobilise private investment towards assisting in meeting our climate objectives.

Promoting a Sustainable Financial System

Under forthcoming and existing EU rules, financial institutions, when they are funding the acquisition of assets, will be required to understand the climate resilience of assets and the sustainability of the technology they are investing in, as well as other climate vulnerabilities their assets might face.

The EU is aiming to create a set of rules that will, over time, bring sustainability reporting on a par with financial reporting. Under the Corporate Sustainability Reporting Directive, drafts of EU Sustainability Reporting Standards (ESRS) have been prepared. These draft ESRSs cover environmental, social and governance topics, with additional sector-specific standards planned for release in due course. They also introduce the concept of double materiality (multi-stakeholder approach); expand a company's reporting boundary to its entire value chain; and require that companies report on how their activities and value chains affect the environment and people; as well as how sustainability matters affect cash flows, financial position, and financial performance.

To support the financial system in directing essential investments into climate action, the EU has developed a science-led taxonomy as the gold standard for sustainable activities. This aims to scale up sustainable investment, both to underpin the ambitions of the European Green Deal and to support the achievement of Member States' own climate action objectives. It provides a consistent, science-based, classification framework to companies, investors, and policymakers, through which economic activities can be considered environmentally sustainable, and sets out the requirements that must be met by each activity for it to be sustainable. Requirements for climate adaption and mitigation are already in force, and negotiations and development of standards for the remaining environmental goals are ongoing, with entry into force expected in the near future.

The EU taxonomy aims to provide greater certainty for investors, protect private investors from greenwashing, help companies to plan for the decarbonisation transition, reduce market

fragmentation, and shift investments to where they are most needed and to where they are more sustainable.

Given the increase in regulatory focus, and increasing appetite for sustainable and green products, it is therefore crucial to develop the necessary skills and leadership capacity, and to advance Environment, Social and Governance (ESG) best practices across Ireland's financial services sector in order to promote a sustainable financial system. The Sustainable Finance Skillnet has invested over €1 million in upskilling and in the development of new courses for the sector, including Europe's first accredited programme in 'Sustainable Finance for Compliance Professionals'.

We will maintain and grow our existing International Financial Services (IFS) sector by exploiting opportunities and meeting any emerging challenges in this sector. To this end, the update to the Ireland for Finance strategy was launched in October 2022 and it reaffirms the strategic vision of developing Ireland as the premier location of choice for green and digital financial services. The sustainable and digital transitions are the defining societal changes that the world is confronting, and they are creating long-term opportunities for Ireland in international financial services.

The Central Bank of Ireland works closely with European Supervisory Authorities to develop supervision of climate risks and to mobilise capital for green and low-carbon investments. The Central Bank is also a member of the Network for Greening the Financial System and, by directly engaging with financial service providers, is focussed on climate and environmental risks being assessed for banks and insurers, as well as investment firms and intermediaries.

At EU-level, the European Commission is working with Member States and the European Parliament on the development of a European Green Bond standard to assist with allocating funds to environmentally friendly investments, as well as working on improving and developing ESG transparency and reporting across different financial services actors.

11.2.3 Spatial and Planning Policy

Our National Planning Framework (NPF) stipulates that Ireland's planning system provides an established means through which to implement and integrate climate change objectives, including adaptation, at regional and local level and the transition to a low carbon and climate resilient society.

The NPF specifically includes the following objectives:

- National Policy Objective 53 – Support the circular and bioeconomy including through greater efficiency in land management, greater use of renewable resources and by reducing the rate of land use change from urban sprawl and new development;
- National Planning Objective 54 – Reduce our carbon footprint by integrating climate action into the planning system in support of national targets for climate policy mitigation and adaptation objectives, as well as targets for GHG emissions reductions;
- National Policy Objective 55 – Promote renewable energy use and generation at appropriate locations within the built and natural environment to meet national objectives towards achieving a low carbon economy by 2050;
- National Policy Objective 56 – Sustainably manage waste generation, investing in different types of waste treatment and support circular economy principles, prioritising prevention, reuse, recycling and recovery, to support a healthy environment, economy and society.

These national policy objectives also directly inform regional and local decision-making. Underneath the NPF, the three Regional Spatial and Economic Strategies in each Regional Assembly contain

a number of policy objectives in order to ensure emissions can be reduced and targets met. At a local level, national renewable energy objectives, and those set out in the regional strategies are also reflected in County Development Plans. Section 10(2)(n) of our Planning and Development Act specifically identifies Climate Action (adaptation and mitigation) as a mandatory objective to be included in all Development Plans. Adopted by the elected members of the Local Authority, these plans are subject to review and evaluation by the Office of the Planning Regulator to ensure consistency with national planning policy and guidance.

11.2.4 Digital Transformation

The pandemic has accelerated the pace of digital transformation of our economy and society, including the move to online and digital services, remote working, and automation. As these trends continue, new opportunities will open-up to accelerate our climate action.

The Government published a new National Digital Strategy, Harnessing Digital – The Digital Ireland Framework, in February 2022. The Strategy is a high-level framework to position Ireland as a digital leader, at the heart of Europe and globally, by setting out a pathway to drive and enable the digital transition across the economy and society.

It places a strong emphasis on balance, inclusiveness, security and safety, and it complements work towards achieving Ireland's climate targets, with our green and digital ambitions re-enforcing each other. It includes targets, high-level workstreams and deliverables across four dimensions, in line with the EU's Digital Decade 2030 – Digital Transformation of Business; Skills; Digital Infrastructure; and Digitalisation of Public Services.

National Broadband Plan

The National Broadband Plan (NBP) will deliver high-speed broadband services to over 1.1 million people in areas where there is no existing or planned commercial network. The intervention area includes almost 560,000 premises, approximately 100,000 farms and businesses, and 679 schools. The NBP network will offer those premises a high-speed broadband service with a minimum download speed of 500Mbps from the outset. The NBP will ensure that households and businesses in rural parts of Ireland will have a similar level of connectivity as households and businesses in urban areas.

For each new remote worker, an estimated average net saving of up to 10kWh per day will be achieved, reducing commuter transport energy use and carbon emissions.

Over the lifetime of the NBP, every home, school and business in Ireland, regardless of how remote or rural, will be provided with high-speed broadband. This will be achieved through a combination of exchequer investment of €2.7 billion under the NBP, complemented by multi-billion-euro investment programmes by commercial operators in cities, towns and villages. During deployment of the network, reuse of existing infrastructure and materials (i.e., existing poles and underground ducts) will be maximised. This will increase resource efficiency and reduce emissions associated with fabrication, transport and the installation of new physical network materials. The high-speed broadband network will deliver a range of environmental benefits. For each new remote worker, an estimated average net saving of up to 10kWh per day will be achieved, reducing commuter transport energy use and carbon emissions.

Availability of better online conferencing and collaboration tools will reduce the need for business travel and the associated carbon emissions. Deployment of the NBP has the potential to deliver a range of environmental benefits linked to Government policy and cloud services as well as reduced emissions from teleworking and business travel.

Quality high speed broadband will provide citizens in rural communities with the option of working from home thereby reducing business travel and commuter transport. Furthermore, it will also increase the creation of local employment opportunities, allowing more people to work closer to their homes and reducing the emissions associated with longer commute times.

A recent report on the current and future benefits of the NBP to the Irish economy and society, commissioned by the Department of the Environment, Climate and Communications (DECC),[24] highlighted the environmental benefits that are unlocked as fibre networks are more energy-efficient than legacy copper telecoms networks, reducing GHG emissions. Analysis has found there is an 88% reduction in GHG emissions per Mbit in Europe by fibre compared to a combination of copper and coaxial cable.

Remote Working

Our experience of the Covid-19 pandemic has led to a major transformation in how and where we work and has highlighted the possibility for significant parts of Ireland's economy and workforce to effectively function on a remote working basis. The Government's remote working strategy, Making Remote Work: National Remote Working Strategy, will facilitate remote working in a way that maximises the economic, social and environmental benefits, including increasing participation in the labour market; enabling balanced regional development; improving work/life balance; reducing commuting times; and reducing transport-related carbon emissions. Together with the legislation on the right of workers to request remote working, the strategy aims to support the adoption of remote working as a long-term policy.

11.2.5 The Bioeconomy

Our bioeconomy is a powerful enabling tool which can address the key challenges that the climate transition poses while providing sustainable sources of proteins, bioactivities, energy, biobased fertiliser, locally sourced feed for our animals, nature-based building materials, and many other innovative sustainable products; while ensuring both the continued success of our agri-food and forestry sector and contributing to our emissions targets and the development of a circular economy.

Supporting our bioeconomy offers us the potential to modernise industries and sectors through innovation without impacting on our climate or environment, as often these new bio-based solutions can course-correct previously harmful practices. The bioeconomy seeks to do more with less, it seeks to cascade the use of our biological resources, and harness waste and natural capital sustainably, displacing the use of fossil-based, fossil-reliant, or non-renewable products.

The bioeconomy is not solely an agricultural, forestry or land-use activity. It cuts across enterprise, the built environment, the marine, and our energy system. It will have a fundamental role in ensuring we have a sustainable and resilient food system which works harmoniously with

24 https://www.ey.com/en_ie/strategy-transactions/connecting-irish-rural-communities-with-the-national-broadband-plan

biodiversity and the environment. Bioeconomy encompasses all sectors and associated services and investments that produce, use, process, distribute or consume biological resources, including ecosystem services. It is a natural enabler and result of the transition to climate neutrality.

The Government's vision for the bioeconomy, outlined in the National Policy Statement on the Bioeconomy 2018, is to grow Ireland's ambition to be a global leader for the bioeconomy through a coordinated approach that harnesses Ireland's natural resources and competitive advantage and that fully develops the opportunities available, while monitoring and avoiding unintended consequences.

The bioeconomy has been fully embraced at EU level through the EU Bioeconomy Strategy. This strategy aims to accelerate the development of a sustainable European bioeconomy market, which will aid in the delivery of the Sustainable Development Goals while also assisting in the delivery of goals outlined in the Paris Climate Accords and the European Green Deal transformation.

A High-level Bioeconomy Implementation Group consisting of relevant Government Departments and Agencies and chaired by DECC and the Department of Agriculture, Forestry and the Marine oversees the development of our bioeconomy. The group has also established a National Bioeconomy Forum, consisting of industry representatives and experts.

Bioeconomy processes often require actors working across sectors to: unlock the full potential and cascading use of biomass; develop new types of bioeconomy business models; and produce higher-value biobased products in alignment with addressing the climate and biodiversity challenges, and renewable energy opportunities. For Ireland's vision to be accomplished, it is essential that we have a coherent, horizontal, joined-up approach to policymaking across sectors. A Bioeconomy Action Plan is currently under development and will be published in the coming months, representing a key step in achieving the vision outlined in the National Policy Statement on the Bioeconomy.

11.3 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
CP/23/1	Monitor and review the carbon tax increases as legislated in the 2020 Finance Act
CP/23/2	Consider a number of reforms to the taxation system under relevant tax heads from an environmental perspective
CP/23/3	Undertake analysis and research on green budgeting
CP/23/4	Continue with the Public Spending Code review to enhance its alignment with international best practice, including tools to evaluate climate and environmental investment impacts, the methodology for assessing climate risk and uncertainty, and compatibility with Ireland's climate neutrality objective
CP/23/5	Develop definitions to identify and track Government spending that may be having a negative impact on climate and environmental outcomes
CP/23/6	Promote the further development of the sustainable finance sector to facilitate increased investment in zero-emissions sectors in Ireland
CP/23/7	Consider further opportunities for issuing new Irish Sovereign Green Bonds, and monitor the allocation and impact of funds raised through existing Irish Sovereign Green Bond
CP/23/8	Promote opportunities for European Investment Bank investment in relevant climate projects in Ireland
CP/23/9	Establish a working group to examine implementation of climate actions in the National Planning Framework
CP/23/10	Plan for and progress the regeneration and development of underutilised and centrally located sites to provide compact sustainable development, jobs, amenities, and services
CP/23/11	Support and promote a modal shift towards healthy active and sustainable mobility in the design and delivery of our developments. Plan to reduce travel by private car and design to optimise connectivity and access to sustainable and active travel. Promote mobility management planning and e-mobility as well as options for car sharing/clubs
CP/23/12	Relevant bodies shall, where practicable, ensure private sector investment is consistent with the Government's Sectoral Emission Ceilings

11 Carbon Pricing and Cross-cutting Policies

12. Electricity

Key Messages

Sectoral Emission Ceilings

- Carbon Budget 1: 40 $MtCO_2eq.$
- Carbon Budget 2: 20 $MtCO_2eq.$
- Emissions Abatement (on 2018): -75% (3 $MtCO_2eq.$ per annum by 2030)
- Emissions up to 2021: 9.98 $MtCO_2eq.$

Trends in the Sector

In 2020 42% of all electricity generated in Ireland came from renewable sources, while in 2021 electricity accounted for just 14.4% of Ireland's greenhouse gas emissions. Ireland is in the top five globally for installed wind power capacity per capita and it is clear that onshore wind will continue to play a vital role in increasing the decarbonisation of the electricity sector particularly over the next five years, along with solar energy

Key Targets

Target	2025	2030
Renewable Electricity Share	50%	80%
Onshore Wind	6 GW	9 GW
Solar	Up to 5 GW	8 GW
Offshore Wind	-	At least 5 GW
New Flexible Gas Plant	-	At least 2 GW
Demand Side Flexibility	15-20%	20-30%

Measures and Actions

The electricity sector faces an immense challenge to meet its requirements under the sectoral emissions ceilings. Electricity will play an important role in the decarbonisation of other sectors through electrification, including transport, heating, and industry

Transformational policies, measures and actions, and societal change are required to increase the deployment of renewable energy generation, strengthen the grid, and meet the demand and flexibility requirements required to meet the challenge

12.1 State of Play

12.1.1 Emissions Profile to Date

Considerable progress has been made in decarbonising the electricity sector over the last decade, resulting in electricity emissions falling by 45%[25] between 2005 and 2020. This was possible through the deployment of renewables and their successful integration into the power grid, and the increased use of higher-efficiency gas turbines. Ireland is now in the top five globally for both installed wind power capacity per capita and the contribution of wind energy to electricity demand. We have seen a significant reduction in the use of high-intensity carbon fuels for electricity generation.

The deployment of renewable energy has enabled emissions reductions during a period of increased demand, with electricity accounting for just 14.4%[26] of Ireland's greenhouse gas (GHG) emissions in 2021. Since 2018 our electricity emissions per capita have reduced to around the EU average, further reflecting our use of renewable electricity.

Table 12.1 – Electricity GHG Emissions 2021

Electricity Emissions $MtCO_2eq.$	Share of Total GHG Emissions	Electricity Emissions tCO_2 per capita
9.98	14.4%	1.95 t

Table 12.2 – Trends in Electricity GHG Emissions

Timeframe	Percentage Change	Absolute Change $MtCO_2eq.$
2005-12	-19%	-2.9
2012-20	-33%	-4.1

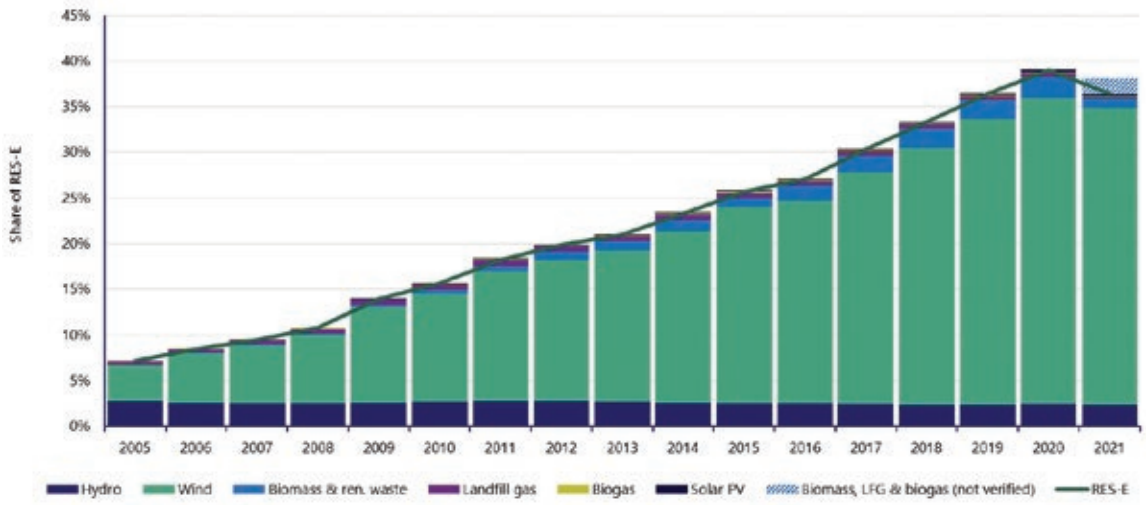
There was more than a six-fold increase in the share of renewable electricity generation between 2005 and 2020 – from 7% to 39.1% and falling to 36.4% in 2021[27] . In absolute terms the electricity generated from renewable electricity increased from 1.8 TWh in 2005 to 13.5 TWh in 2020 and 12.6 TWh in 2021. The estimated amount of CO2 avoided through the use of renewable energy reached a peak in 2020 before decreasing slightly to 6.2 Mt CO2 in 2021.

25 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2021.php

26 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2021.php

27 2021_Final.pdfhttps://www.seai.ie/publications/Energy-in-Ireland-2022.pdf

Figure 12.1 – Renewable Energy Share in Electricity Gross Final Consumption (GFC)



Source: SEAI (This graph uses normalised figures for renewable electricity generation data to account for year-to-year variation in wind and hydro)

Since 2021, there have been significant increases in prices in the international oil and gas markets, due to increased demand as the post-COVID 19 recovery continues and the disruption to traditional energy supplies following the Russian invasion of Ukraine. The resultant sharp increase in energy prices underlines the importance for Ireland to eliminate our dependency on fossil fuels and that an increase in renewable energy generation, along with supporting flexibility and demand management measures, is necessary for our future energy security.

Government set out its response to these challenges in the National Energy Security Framework, published in April 2022. This Framework details Government action to manage the impacts for energy users, ensuring continued security of supply, and reducing dependency on fossil fuels in the long term. It also highlights the work required in strengthening the grid to ensure a secure supply of electricity.

12.1.2 Electricity Sectoral Ceiling and Carbon Budgets

Table 12.3 – Required Level of Decarbonisation for Electricity for Carbon Budgets 1 and 2

Sectoral Carbon Budget 2021 to 2025 $MtCO_2eq.$	Cumulative Emissions to 2021	Remaining Sectoral Carbon Budget 2022 to 2025 $MtCO_2eq.$	Sectoral Carbon Budget 2026 to 2030 $MtCO_2eq.$
40	9.98	30.02	20

Table 12.4 – Required Level of Decarbonisation for Electricity only

2018 Emissions $MtCO_2eq.$	Indicative Target for 2025 Emissions $MtCO_2eq.$	Indicative Target % Reduction for 2025	2021 Emissions $MtCO_2eq.$	% Increase (+) / Reduction (-) to date
10.1	6	-42	9.98	-3.1

The electricity sector has a ceiling of 40 $MtCO_2eq.$ for the first budgeting period (2021-2025), equating to an average of 8 $MtCO_2eq.$ per annum. As emissions in 2021 were 9.98 $MtCO_2eq.$, electricity will need to achieve average annual emissions of circa 7.5 $MtCO_2eq.$ from 2022 to 2025.

The scale of the challenge to meet the carbon budget programme is immense and requires policies to be moved from an 'end of decade' target trajectory to a 'remaining carbon budget' target.

At a time when the energy system is under severe pressure to ensure security of supply, amid projections of rapid electricity growth over the coming decade, the electricity sector has been set one of the smallest carbon budget allocations and the steepest decline (-75%) of all sectors. The scale of the challenge to meet the carbon budget programme is immense and requires policies to be moved from an 'end of decade' target trajectory to a 'remaining carbon budget' target. This chapter sets out the scale of the challenge for the electricity sector and the policies, measures, and actions required to meet this challenge. The chapter provides specific actions to be taken during the first carbon budget period, including those that will deliver emissions reductions during the second and third budget periods, to address projected emissions levels during the first carbon budget period.

12.1.3 The Scale of the Challenge

Transformational policies, measures and actions, and societal change are now required to meet the electricity sector's carbon budget programme and sectoral emissions ceilings.

During the second carbon budget, Ireland's enormous potential for offshore wind will start to be realised, setting the country on a long-term trajectory for a net zero electricity system and allowing Ireland to supply renewable energy to, and offset emissions in, other European countries. In the meantime, a major acceleration and increase in onshore wind turbines across the country, transformation of land use from other activities such as agriculture to solar PV, and a hitherto unseen level of electricity network upgrades and construction will be required, as a minimum.

As importantly, rapid delivery of flexible gas generation is needed at scale and in a timeframe to replace emissions from coal and oil generation before the second carbon budget period.

Government supports these investments, which should be delivered, where feasible, through a plan-led and competitive framework that encourages public participation and delivers strong community benefits. There is evidence of increasingly positive public attitudes to wind and solar farms, which are seen as providing a shield against high fossil fuel prices, particularly in response to Russia's invasion of Ukraine. Inclusive community engagement and amenities for recreational access such as walking, running, and cycling routes around windfarms, are changing the public's relationship with renewable energy infrastructure.

A new drive for solar energy with an ambitious target of up to 5 GW of solar by 2025 will have impacts for land-use and allow farmers and communities to participate in the energy transition, through diversification of income to self-supply, and sell their own power to the grid. Use of brownfield sites, infrastructure corridors for renewables, energy parks and multi- activity sites, off grid solutions, existing windfarm connections, and private wires, will open up the potential for solar energy to supply a growing amount of Ireland's electricity demand and offset emissions from fossil fuel.

Further co-operation on electricity with our neighbours will be required to increase and maximise the use of electricity interconnections. Of particular importance is continued all-island cooperation through the Single Electricity Market, as well as enabling infrastructure such as the North-South Interconnector and alignment of renewables targets. Recent research conducted by the Economic and Social Research Institute (and produced in partnership with the Shared Island Unit in the Department of the Taoiseach) has found that aligned renewable energy targets in Ireland and Northern Ireland support lower costs across the island[28] .

Ireland needs to be a global leader in delivering an investment framework for storage and new technologies for system operation services to replace fossil fuels. Longer term, green hydrogen can play a significant role in sector coupling (the increased integration of energy supply and end-use sectors), and in minimising the overall cost of decarbonisation across all sectors. Additional flexible demand will help to offset fossil fuel production, opening up high wind speed sites both offshore and onshore in grid constrained locations.

All of these investments are necessary for an electricity system that is expected to accommodate even higher levels of renewable energy from offshore wind during the third carbon budget period. Nonetheless, the scale, cost, and capacity required to deliver it should not be underestimated.

Given the increasing number of households in energy poverty and rising energy costs for businesses, it is critical that markets are designed so that consumers receive the full benefit of low-cost renewable energy, that oversupply of renewables is minimised, and that the industry plays a leadership role in ensuring that consumers fully benefit from the enormous investment in new infrastructure required to deliver on the targets. The levels of renewable energy targeted under this plan will be kept under review and optimised to ensure adequate investment while protecting households and businesses.

Equally, developers and industry must ensure the high quality of their applications and provide workable solutions to meeting administrative, regulatory, and technical requirements/standards. A supportive investment framework and supply chains must be coupled with realised and identifiable benefits to consumers and the public.

Supply side measures alone will not be sufficient to meet the electricity sector carbon budgets. Demand side measures to mitigate and manage electricity demand, increases will be required. The electricity sector will facilitate the decarbonisation of heat, transport and industry through increased electricity demand, and this, in addition to the increased demand from large energy users, has been factored into the development of this plan. The electrification of heat in industry is expected to lead to an increase of 3.5 TWh of electricity demand.. The draft recast EU Energy Efficiency Directive may require the introduction of energy reduction targets across the economy and so a trade-off will be required between the sources of demand on the electricity system over each carbon budget.

Clear policy choices can facilitate economic growth alongside decarbonisation and energy efficiency, particularly regarding the levels of demand increases expected from large energy users. Our Industrial Strategy and Climate Action Plans will need to be fully aligned into the future.

In addition, incentives are needed for electricity consumers to move their consumption to high renewable output and off-peak hours. The pattern and use of electricity by households, businesses, and large energy users will have to profoundly change to one where consumption is matched to, and incentivised by, times of high renewable generation (for example, wind at night or solar PV during peak daily output). Electrification is also key to decarbonisation in other sectors including

28 https://www.esri.ie/publications/all-island-coordination-of-energy-infrastructure-and-renewable-energy-supports

transport, heating, and industry. For example, investment in our electricity grid capacity and generation will further facilitate up to 3.5 TWh of new industrial heat pumps to provide for the decarbonising of manufacturing processes.

Large energy users will need to play a critical role in the decarbonisation acceleration that is required for the sector in delivering high levels of flexibility across time and geographical locations, and matching energy consumption with renewable energy generation on an hourly basis. Innovation in tariff design and new concepts, such as making use of surplus renewable energy for households, in particular those in fuel poverty, are to be encouraged. Local flexibility market arrangements will also be an important supporting framework in this regard. More granular certification processes will be required, including 'time stamped' guarantees of origin, so that energy intensive users can demonstrate that they are using zero emissions electricity during the same hour and geographical location to match all of their consumption on a 24-hours a day, seven days a week basis.

A reliable, resilient, and flexible electricity network will facilitate customer-centric solutions for citizens to become active participants in the energy system. The National Smart Metering Programme will replace over 2.4 million electricity meters by end of 2024 and smart meter customers are now able to avail of new Time of Use tariffs and smart services being made available from electricity suppliers. This, in addition to the development of green electricity tariffs to incentivise the use of electricity at times of high wind and solar generation, will be a key measure to deliver on demand innovation and will continue to play an increasingly more important role in enabling consumers to participate in the energy transition to a decarbonised system.

12.1.4 Measures to meet the Challenge

To meet the level of emissions reduction required by the carbon budget programme and sectoral ceilings for electricity, we will:

- Limit CO2eq. emissions over the first two budget periods in line with the sectoral emissions ceilings to 60 $MtCO_2eq.$ (40 $MtCO_2eq.$ for 2021-2025 and 20 $MtCO_2eq.$ for 2026-2030);
- Reduce annual $CO_2eq.$ emissions from the sector to 3 $MtCO_2eq.$ by 2030 (75% reduction compared to 2018).

Achieving further emissions reductions between now and 2030 requires a major step up across three key measures:

- Accelerate and increase the deployment of renewable energy to replace fossil fuels;
- Deliver a flexible system to support renewables and demand;
- Manage electricity demand.

Accelerate Renewable Electricity Generation

- Accelerate the delivery of onshore wind, offshore wind, and solar through a competitive framework to reach 80% of electricity demand from renewable energy by 2030;
- Target 6 GW of onshore wind and up to 5GW of solar by 2025;
- Target 9 GW onshore wind, 8 GW solar, and at least 5 GW of offshore wind by 2030 (and an additional 2 GW offshore wind for green hydrogen production);
- Complete a revised version of Shaping our Electricity Future to define the required new construction and reinforcement of the electricity transmission and distribution system across the country required to achieve sectoral ceilings and carbon budgets;
- Having regard to the interaction between the planning and grid consenting systems and

the overall timeframes for permitting, deliver a streamlined electricity generation grid connection policy and process and remove barriers for installation of renewables and flexible technologies without the need to build new grid, including hybrid (wind/solar/storage) connections and private wires;

- Align the relevant constituent elements of the planning and permitting system to support accelerated renewable energy development, supported by national policy and associated methodologies to inform regional and local planning policies, noting that Development Plans are obliged to set out objectives to facilitate energy infrastructure;
- In line with the emerging EU frameworks, ensure that renewable energy generation projects, and associated infrastructure, will be considered to be in the overriding public interest;
- All relevant public bodies to carry out their functions to support the achievement of the 80% renewable electricity target;
- Support at least 500 MW of local community-based renewable energy projects and increased levels of new micro-generation and small-scale generation.

Deliver and Accelerate a Flexible System to Support Renewables

- Deliver in the order of 2 GW of new flexible gas-fired power generation;
- Phase out and end the use of coal and peat in electricity generation;
- System operators to transform the flexibility of the electricity system through changes to policies, standards, services, and tools, funded and incentivised through regulatory price controls;
- As an urgent priority, establish the investment framework and competitive market arrangements needed to deliver zero carbon system services;
- Delivery of at least three new transmission grid connections or interconnectors;
- Explore further interconnection potential, including hybrid interconnectors.

Manage Electricity Demand Growth

- Ensure that 15-20% of electricity system demand is flexible by 2025, increasing to 20-30% by 2030, to reduce peak demand and move to times of high renewable output;
- Deliver a demand side strategy that facilitates zero carbon demand, incentivises low carbon electricity consumption and aligns with the EU energy efficiency requirements, while facilitating electrification targets.

12.2 2025 and 2030 KPIs

Table 12.5 – Key Metrics to Deliver Abatement in Electricity

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO^2$ eq.	2031-2035 measures
Accelerate Renewable Energy Generation	50% renewable electricity share of demand 6 GW onshore wind capacity Up to 5 GW solar PV capacity including at least 1 GW of non-new grid solar	1.3	80% renewable electricity share of demand 9 GW onshore wind capacity At least 5 GW offshore wind capacity 8 GW solar PV capacity including 2.5 GW of non-new grid solar Green Hydrogen in production from surplus renewable electricity	8.7	Roadmap for a net-zero power system Green Hydrogen Production via 2 GW Offshore Wind
Accelerate Flexibility	Level of renewables at any one time on grid: 85% Dispatch down (excluding oversupply) of renewables below 7% Minimise oversupply Required long term storage (4 hour plus) in place		Level of renewables at any one time on grid: 95-100% Dispatch down (excluding oversupply) of renewables below 7% Minimise oversupply Required Long term storage (4 hour plus) in place At least 2 GW of new flexible gas fired generation Zero Emission gas fired generation from biomethane and hydrogen commencing by 2030		Long Duration Storage technologies Increased zero emission gas generation to enable a net zero power system
Demand Management	Demand Side Flexibility 15-20% Zero carbon demand growth	0.86	Demand Side Flexibility 20-30% Zero carbon Demand growth	0.86	Roadmap for a net-zero power system Green Hydrogen Production via 2 GW Offshore Wind

12.3 Measures to Deliver Sectoral Emissions Ceilings

Our 2030 decarbonisation ambition will require all sectors to increase emission mitigation actions if we are to achieve our national and EU targets. For the electricity sector, the following measures will be critical to success:

12.3.1 Accelerate Renewable Electricity Generation

Grid Scale Renewables

The following measures will support Ireland's renewables acceleration programme:

- Establish an Accelerating Renewable Electricity Taskforce by Q1 2023 to coordinate the fast-track and increased deployment and output of renewable electricity generation and supporting technologies in the near term;
- EirGrid will carry out further grid, operational, and market studies, through an updated version of Shaping Our Electricity Future, due Q1 2023, and updated regularly thereafter, to assess additional supply and demand side measures, beyond current plans;
- Strengthen the electricity system by upgrading the network and building supporting infrastructure at key strategic locations;
- Having regard to the interaction between the planning and grid consenting systems and the overall timeframes for permitting, develop by Q1 2023, as an urgent priority, an electricity generation grid connection policy which facilitates timely connecting of sufficient volumes of renewable electricity generation and supporting flexible technologies aligned to required timelines for permitting renewable energy installations in EU Directives and Regulations;
- Deliver competitive auctions under the Renewable Electricity Support Scheme (RESS), at least annually, and support other routes to market;
- The CRU, EirGrid, and ESB Networks will enable hybrid technology grid connections, maximising the utilisation of existing grid infrastructure, to accelerate connection of new renewable generation and associated storage;
- Develop a policy on 'private wires' and, if necessary, pass any required facilitating legislation by end 2023;
- Enable the use of the public road and potentially the rail networks for routing of new public and private electricity circuits;
- Ensure a flexible and supportive spatial planning policy framework for onshore and offshore renewable electricity generation development that seeks to delivers a strong pipeline of renewables;
- Ensure that renewable energy generation projects and associated infrastructure are considered to be in the overriding public interest;
- Set out the onshore wind energy and grid-scale solar national and regional targets in the Renewable Electricity Spatial Policy Framework and publish a revised Methodology for Local Authority Renewable Energy Strategies;
- Following publication of a Regional Roadmap, Regional Assemblies will publish and implement Regional Renewable Electricity Strategies, enabling a unified methodology for national and regional spatial and capacity targets, identifying areas suitable for renewable electricity deployment at regional and county level;
- Within six months of the adoption of the Regional Renewable Electricity Strategies, and commensurate with the preparation of the Local Authority Climate Action Plans in accordance with section 14B of the Climate Action and Low Carbon Development Act 2015, as amended, Local Authorities shall include a statement within their Local Authority Climate Action Plan which identifies the methods or processes that will be used to implement the required policy supports to achieve renewable electricity targets.

- Publish a revised draft of the Wind Energy Development Guidelines;
- Fully implement the EU Regulation laying down a framework to accelerate the deployment of renewables, as well as the recast Renewable Energy Directive and future revisions under RePowerEU and provide clarity and certainty in respect of development management timelines through the review of the Planning and Development Acts;
- Subject to the final recast Renewable Energy Directive, identify the land, sea, or inland water areas necessary for the installation of renewable energy generation that is required to meet the 2030 renewable energy target, and designate renewable 'go to' areas for renewable energy project development;
- Ensure that Local Authorities, An Bord Pleanála, and the Maritime Area Regulatory Authority have sufficient and appropriate expertise and resources to meet the State's needs in this area;
- As approved by Government in October 2022, establish a specific division of the High Court to deal with planning and environment cases, where they arise, as expeditiously as possible.

Offshore Renewables

The Offshore Wind Delivery Taskforce will publish a system-wide plan for the delivery of offshore wind in Q1 2023, including identifying all aspects of work on the critical path and opportunities relating to supporting infrastructure development, supply chain opportunities, and workforce planning.

- Complete the Offshore Renewable Energy Development Plan, to quantify Ireland's offshore renewable potential and provide an evidence base for the assessment of areas suitable for offshore renewable energy projects beyond 2030;
- Facilitate substantial investment in the development of grid infrastructure, port development, and ensuring a skilled workforce;
- Establish the Maritime Area Regulatory Authority (MARA) to be operational in Q2 2023;
- Prepare Maritime Area Plans to designate specified areas for the development of offshore renewable energy.

Microgeneration, Small-Scale and Community Projects

- The Microgeneration Support Scheme will support the deployment of new micro (<50 kW) renewable generation;
- The Commission for the Regulation of Utilities (CRU) will expedite the decision and mechanism for the Clean Export Premium (CEP) feed-in tariff to support new non-domestic microgeneration installations between 6kWe and 50kWe;
- The CRU will expedite the decision and mechanism for the Premium Export Guarantee to facilitate significant on-site generation investments on larger commercial premises;
- Deliver the Small-scale Generation Support Scheme (SSG) to support non-domestic renewable electricity generators above 50kW, and community energy and SME projects up to 6 MW. ESB Networks will develop streamlined connection processes for such projects;
- The Community Energy Framework will be strengthened by providing new routes to market for community energy projects (SSG) and addressing any barriers identified in particular grid connections.

12.3.2 Accelerate Flexibility

Already a world leader in flexible power system design, Ireland accommodates one of the highest global percentages of variable renewable generation on the grid. However, to maximise the output of renewables, the electricity system must increase its flexibility further.

The key measures to ensure security of electricity supply and reduce emissions are:

- The CRU and EirGrid will ensure an adequate level of conventional dispatchable generation capacity and deliver at least 2 GW of new flexible gas-fired generation.
- Expand the gas network to accommodate 2 GW of new gas-fired generation.
- Deliver at least three new transmission grid connections or interconnectors to Northern Ireland, Great Britain, and the EU.
- The CRU and EirGrid will, as a priority, deliver the competitive market arrangements for zero carbon system services, to an accelerated timetable, ensuring that reserve requirements are fully provided by zero-carbon technology by the end of 2023 and procurement of reserve services from carbon sources phased out by end 2027.
- EirGrid and ESB Networks will undertake an in-depth analysis of local, regional, and system-level flexibility requirements, identifying opportunities and internal changes required to facilitate demand flexibility and provide flexibility to support the system operation and local network congestion management.
- EirGrid will monitor and reduce emissions resulting from its non-market actions, procuring appropriate system services, and constructing necessary infrastructure to relieve network constraints as required in line with regulatory arrangements.
- ESB Networks will, under approved regulatory arrangements and in coordination with EirGrid, introduce local flexibility market arrangements, designed to incentivise investment in commercial storage facilities at scale, providing local network capacity for low-carbon technologies.
- Develop a policy framework for electricity storage based on electricity system needs.

12.3.3 Electricity Demand Management

Improved electricity demand management will require more flexible demand, improved infrastructure, and supportive policies.

As electrification and decarbonisation of the other sectors continues, there will be an increase in electricity demand and a transferring of emissions from those sectors to the electricity sector. Limiting peak demand when renewable resources are unavailable, through improved flexibility and demand management, will be vital[29] .

In the short- and medium-term, new demand growth from large energy users, such as data centres, will have to be moderated to protect security of supply and ensure consistency with the carbon budget programme[30] .

29 For example, Entso-e have indicated that a 5% electricity demand reduction can have a significant impact on Security of Supply in Ireland, with a resulting impact on emissions be reducing the need for the highest emitting generators

30 https://enterprise.gov.ie/en/publications/government-statement-on-role-of-data-centres-in-enterprise-strategy.html

Key measures to manage electricity demand flexibility and growth are:

- The CRU will deliver a Demand Side Strategy, with the aim of 20 to 30% of electricity demand to be flexible by 2030 (15-20% flexibility by 2025), facilitating active participation by citizens and businesses in the energy market. Large Energy Users (LEUs) will be expected to make a higher proportional contribution to the target, and a review will be carried out of the gas and electricity connection policies for new LEUs.

A suite of market incentives will be developed to match electricity demand with renewable energy generation including:

- The incentivisation of demand to switch to times of high wind or solar by passing through price signals to end consumers (for example water heating, and EV charging), including the development of dynamic 'green electricity tariffs' where consumers can avail of low-cost power at times of high wind and solar output that would otherwise be lost through constraint or curtailment;
- The incentivisation of non-firm demand that would not be guaranteed supply for times of low wind or solar that could facilitate the partial electrification of industrial heat demand, hydrogen production, or other appropriate flexible demand;
- A Smart Energy Services Working Group will be established, supporting the EU Smart Energy Expert Group, to develop, and implement, measures to facilitate and empower consumers and energy communities to benefit from engagement in the energy transition through active participation in the energy market and flexible demand management services;
- Develop policies that support extra-large energy users to achieve carbon-free demand in Ireland so that electricity decarbonisation, demand efficiency and flexibility, and enterprise growth can go hand in hand. To include connection agreements; hybrid connections; non-firm connections where appropriate; onsite dispatchable generation; onsite storage; emissions reporting; and renewable PPAs in particular within the scope of this work;
- In line with the Roadmap on Corporate Power Purchase Agreements, the SEAI, the CRU, and the System Operators, will work with LEUs and enterprise development agencies to increase the demand flexibility of LEUs through enhanced reporting and matching of demand with usage of lower carbon energy sources, including increased transparency of emissions data, and regulatory incentives and disincentives;
- ESB Networks, through its National Network, Local Connections Programme, will deliver a suite of actions to enable and incentivise demand-side flexibility to meet the requirements of the strategy developed by the CRU. This will include customer education and behavioural initiatives, consumer and system operator technology, local flexibility markets, and dedicated community energy and flexibility schemes.

12.3.4 Further Measures

The third carbon budget (2031-2035) is expected to require continued electrification of industry, the built environment, and transport, leading to substantial electricity demand growth which will need to be almost fully decarbonised. In that context, SEAI will report to the Department of the Environment, Climate and Communications in 2023 on an evidence-based decarbonisation pathway for the electricity system to net zero, in order to provide support future iterations of the Climate Action Plan; inform future carbon budgets; and provide a basis for a long-term electricity system development strategy to achieve our 2050 objective. This may require the following potential policies in the third carbon budget period:

- A policy to require future dispatchable generation to be zero carbon gas ready;
- The continued delivery of required levels of variable renewable electricity generation and supporting infrastructure as we electrify buildings, industry and transport;

- Zero carbon demand growth supported by an industrial spatial strategy to locate new industrial development with renewable generation opportunities;
- The continued delivery of demand flexibility, outlined in this chapter, to incentivise demand when low carbon variable renewable electricity is available;
- Further policies to incentivise the construction of short and long duration storage to provide for smoothing of electricity supply and demand between times of high variable renewable production and low variable renewable production;
- Policies to ensure that zero carbon gases, like hydrogen, are utilised in the electricity sector to provide zero carbon dispatchable electricity at sufficient scale;
- Policies to support the development of inter seasonal storage of hydrogen;
- Development of further interconnectors with other European markets;
- Industrial spatial strategy to locate new industrial development with renewable generation opportunities.

12.4 Actions

Table 12.6 sets out a roadmap of actions to 2025, and Table 12.7 specifically describes the actions for delivery in 2023.

Table 12.6 – Key Actions to Deliver Abatement in Electricity for the Period 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
Accelerate Renewables	DECC: Establish a Task Force to Accelerate Renewables	Accelerate Renewables Task Force to oversee delivery	Accelerate Renewables Task Force to oversee delivery
	DECC: Publish the Renewable Electricity Spatial Policy Framework Regional Assemblies: Publish a roadmap for the development and implementation of Regional Renewable Electricity Strategies	Regional Assemblies: Deliver Regional Renewable Electricity Strategies Designate Go-To Areas for onshore renewables	
	DHLGH: Prepare new draft Wind Energy Development Guidelines for onshore renewables, supported by DECC	DHLGH: Publish the Wind Energy Development Guidelines for onshore renewables, supported by DECC	
	EirGrid: Complete analysis to update Shaping Our Electricity Future to accommodate 80% renewables and align with carbon budgets and sectoral emissions ceilings for electricity		

Measure	2023 Actions	2024 Actions	2025 Actions
Accelerate Renewables	CRU/EirGrid/ESBN: Ensure electricity generation grid connection policies and regular rounds of connection offers which facilitate timely connecting of renewables, provides a locational signal and supports flexible technologies	CRU/EirGrid/ESBN: Ensure electricity generation grid connection policies and regular rounds of connection offers which facilitate timely connecting of renewables, provides a locational signal and supports flexible technologies	CRU/EirGrid/ESBN: Ensure electricity generation grid connection policies and regular rounds of connection offers which facilitate timely connecting of renewables and supporting flexible technologies, provides a locational signal and supports flexible technologies
	Renewable Energy Ireland: Publish annual report setting out identifiable public benefits delivered by renewable energy sector including employment and skills/ training metrics, local investment and community benefits	Renewable Energy Ireland: Publish annual report setting out identifiable public benefits delivered by renewable energy sector including employment and skills/ training metrics, local investment and community benefits	Renewable Energy Ireland: Publish annual report setting out identifiable public benefits delivered by renewable energy sector including employment and skills/ training metrics, local investment and community benefits
		DECC: Complete economic and spatial analysis to inform the development of a roadmap for the enduring ORE regime	
	DHLGH: Ensure MARA commences the consenting processes under its remit	MARA in operation, fulfilling its obligations for consenting	MARA in operation, fulfilling its obligations for consenting
	Offshore Wind Delivery Taskforce: Publish a system-wide plan for the delivery of ORE in Ireland	Offshore Wind Delivery Taskforce to continue to implement the system wide plan for the delivery of ORE in Ireland	Offshore Wind Delivery Taskforce to continue to implement the system wide plan for the delivery of ORE in Ireland
	DECC: Deliver onshore and offshore RESS auctions as per the annual RESS auction calendar	DECC: Deliver onshore and offshore RESS auctions as per the annual RESS auction calendar	DECC: Deliver onshore and offshore RESS auctions as per the annual RESS auction calendar
	CRU: Publish decision and mechanism for Premium Export Guarantee to facilitate larger on-site generation investments		
	CRU: Publish implementation plan for Clean Export Premium (CEP) feed-in tariff in support of rooftop solar > 6 kWe < 50kWe		
	DECC: Publish the Small-Scale Generation (SSG) high-level design and launch scheme to support the deployment of rooftop and ground mounted solar	Delivery and operation of SSG scheme	Delivery and operation of SSG scheme

Measure	2023 Actions	2024 Actions	2025 Actions
	CRU, EirGrid, and ESB Networks to ensure that hybrid technology grid connections are facilitated, and remaining barriers removed		
	DECC: Publish public consultation on Private Wires (Q1 2023) with published policy to follow and, if necessary, Government to enact facilitating legislation		
Flexibility	DECC: Publish Updated Interconnection Policy to reflect Ireland's increased climate and energy ambition, the revised EU TEN-E Regulation, Brexit challenges and the increased significance of hybrid interconnectors CRU: Following completion of DECC Interconnector Policy, to update its Interconnection Policy by Q3 2023		EirGrid: construction of the North-South Interconnector under way, further connecting the electricity grids of Ireland and Northern Ireland, for completion by 2026
	CRU: Complete and Publish System Services Future Arrangements Phase III: Detailed Design and Implementation Transition Pathway by Q1 2023 EirGrid: Implementation Plan for Future Arrangements for System Services by Q2 2023 EirGrid: Procurement of low-carbon inertia services Phase I by 2023, to be operational by 2025	EirGrid: Phase II procurement of low-carbon inertia services by 2024, to be operational by 2026	
	EirGrid and ESBN, with CRU: Carry out further studies to identify the investments and upgrades needed to facilitate 80% renewable electricity annual share		
	DECC: Publish a policy framework for electricity storage based on electricity system needs CRU: Review the regulatory treatment of storage including licensing, charging and market incentives	All relevant bodies: Implementation of key actions as contained in Electricity Storage Policy Framework, 2023	All relevant bodies: Implementation of key actions as contained in Electricity Storage Policy Framework, 2023

Measure	2023 Actions	2024 Actions	2025 Actions
Electricity Demand Management	CRU: Complete and Publish Electricity Demand Side Strategy and Implementation Plan	CRU/All relevant bodies: Implementation of Demand Side Strategy	CRU/All relevant bodies: Implementation of Demand Side Strategy
	DECC: Establish Smart Energy Services Working Group to support consumer participation in energy market and flexible demand management services	CRU: implement Dynamic Green Electricity tariffs	
	ESBN: Publish a suite of tools and supports to increase community participation in electricity demand flexibility	ESBN: Enable distributed flexible customers to participate in wholesale and system services markets	Implementation of ESBN tools
		ESBN: Establish national programme of consumer communications, educational and behavioural initiatives based on research relevant to demand side flexibility	
	SEAI with CRU/EirGrid/Enterprise Agencies: Delivery of an enhanced emissions reporting framework for electricity emissions for large energy users	SEAI with CRU/EirGrid Enterprise Agencies: Implementation of enhanced emissions reporting framework for electricity emissions for large energy users	

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex. Delivery will be kept under constant review with further policies, measures and actions brought forward to address any failure or projected failure as required, including as part of the annual update of the Climate Action Plan.

Table 12.7 – 2023 Actions

Action Number	2023 Action
EL/23/1	Establish a taskforce to accelerate renewables
EL/23/2	Publish the Renewable Electricity Spatial Policy Framework
EL/23/3	Publish a roadmap for the development and implementation of Regional Renewable Electricity Strategies
EL/23/4	Prepare new draft Wind Energy Development Guidelines for onshore renewables
EL/23/5	Complete analysis to update Shaping Our Electricity Future to accommodate 80% renewables and align with carbon budgets and sectoral emissions ceilings for electricity
EL/23/6	Ensure electricity generation grid connection policies and regular rounds of connection offers which facilitate timely connecting of renewables, provides a locational signal and supports flexible technologies
EL/23/7	Publish an annual report setting out identifiable public benefits delivered by renewable energy sector including employment and skills/ training metrics, local investment and community benefits
EL/23/8	Ensure MARA commences the consenting processes under its remit
EL/23/9	Publish a system-wide plan for the delivery of ORE in Ireland
EL/23/10	Deliver onshore and offshore RESS auctions as per the annual RESS auction calendar
EL/23/11	Publish decision and mechanism for Premium Export Guarantee to facilitate larger on-site generation investments
EL/23/12	Publish implementation plan for Clean Export Premium feed-in tariff in support of rooftop solar > 6 kWe < 50kWe
EL/23/13	Publish the Small-scale Generation high-level design and launch scheme to support the deployment of rooftop and ground mounted solar
EL/23/14	Ensure that hybrid technology grid connections are facilitated, and remaining barriers removed
EL/23/15	Publish public consultation on private wires with published policy to follow and, if necessary, Government enact facilitating legislation
EL/23/16	Publish updated Interconnection Policy to reflect Ireland's increased climate and energy ambition, the revised EU TEN-E Regulation, Brexit challenges and the increased significance of hybrid interconnectors
EL/23/17	Following completion of DECC Interconnector Policy, CRU to update its Interconnection Policy
EL/23/18	Complete and publish System Services Future Arrangements Phase III: Detailed Design and Implementation Transition Pathway
EL/23/19	Prepare Implementation Plan for Future Arrangements for System Services
EL/23/20	Procure low-carbon inertia services Phase I by 2023, to be operational by 2025
EL/23/21	Carry out further studies to identify the investments and upgrades needed to facilitate 80% renewable electricity annual share
EL/23/22	Publish a policy framework for electricity storage based on electricity system needs
EL/23/23	Review the regulatory treatment of storage including licensing, charging and market incentives
EL/23/24	Complete and publish Electricity Demand Side Strategy and Implementation Plan
EL/23/25	Establish Smart Energy Services Working Group to support consumer participation in energy market and flexible demand management services
EL/23/26	Publish a suite of tools and supports to increase community participation in electricity demand flexibility
EL/23/27	Deliver an enhanced emissions reporting framework for electricity emissions for large energy users

13 Industry

13. Industry

Key Messages

Sectoral Emission Ceilings

- Carbon Budget 1: 30 $MtCO^2eq.$
- Carbon Budget 2: 24 $MtCO^2eq.$
- Emissions Abatement (on 2018): -35% (4 $MtCO^2eq.$ per annum by 2030)
- Emissions up to 2021: 7.1 $MtCO^2eq.$

Trends in the Sector

This sector accounted for 10.2% of Ireland's greenhouse gas emissions in 2021. Compliance with the sectoral emissions ceiling requires changes in the way we produce, consume, and design our goods and services. Decarbonising our manufacturing industry is vital for Ireland's economy and future competitiveness. The linkages between fossil fuel use and economic progress must be decoupled.

Key Targets

Target	2025	2030
Carbon-neutral heating in industry	50-55% share of carbon neutral heating	70-75% share of carbon neutral heating
Decrease embodied carbon in construction materials	Decrease by 10% for materials produced and used in Ireland	Decrease by at least 30% for materials produced and used in Ireland
Reduce fossil fuel demand through energy efficient measures	Reduce by 7%	Reduce by 10%

Measures and Actions

- Electrification of new and current manufacturing processes displacing using fossil fuel where possible and as soon as possible
- Low and zero carbon product substitution for construction materials and a reduction in the clinker content for cement where practical
- Utilisation of biomass, and low and zero emission gas as key fuels for the decarbonisation
- Expand and enhance supports from the Sustainable Energy Authority of Ireland, IDA Ireland and Enterprise Ireland with a focus on achieving energy demand reduction, electrification, and biomass adoption in industry
- Develop policies for hydrogen, and carbon capture and storage for the third carbon budget period

13.1 State of Play

13.1.1 Emissions Profile to Date

Industry emissions accounted for 10.2% of Ireland's total emissions in 2021[31], similar to its share in 2020. Under the sectoral emissions ceiling agreed in July, industry must reduce emissions by 35% by 2030 relative to 7 $MtCO^2eq$. in 2018.

The currently proposed EU Renewable Energy Directive contains a target to increase the share of renewables for energy and non-energy purposes in this sector by minimum average annual increase of at least 1.1 percentage points for renewables for the periods 2021 to 2025, and 2026 to 2030.

The sharp increase in energy prices following Russia's invasion of Ukraine, gives industry a further incentive to reduce costs through driving efficiencies, and accelerating the move from fossil fuels towards sustainable and cheaper renewables.

The currently proposed EU Corporate Sustainability Reporting Directive updates the existing rules for non-financial reporting by companies operating in the EU, again increasing energy transparency. Once it enters into force, Ireland and other Member States will then have 18 months to transpose it.

Table 13.1 – Industry GHG Emissions 2021

Industry Emissions $MtCO_2eq.$	Share of Total GHG Emissions	Industry Emissions per $tCO_2eq.$ per capita
7.1	10.2%	1.4

Table 13.2 – Trends in Industry GHG Emissions

Timeframe	EU ETS/Non-ETS	Percentage Change	Absolute Change $MtCO_2eq.$
2005-12	ETS	-36.1	-2.4
	Non-ETS	-21	-0.6
	Total	**-31.1**	**-3**
2012-20	ETS	24	1.1
	Non-ETS	-4	-0.1
	Total	**15.1**	**1**

Industry emissions arise from two main activities: combustion for heat required during manufacturing, including combined heat and power plants; and process emissions. Process emissions are those generated during the manufacturing process, such as the release of CO^2 from limestone during cement clinker production.

Combustion emissions largely align with economic trends. There was a decrease in emissions following the 2008-09 recession, with a steady increase since 2012. Emissions have remained relatively stable in recent years, with an increase of 0.9% in 2021. Fuel switching from more carbon intensive oil and coal to lower carbon natural gas has been one of the drivers for the reduction in

[31] https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/EPA-Ireland's-Provisional-GHG-Emissions-1990-2021_July-2022v3.pdf

this area.[32]

In 2021, the bulk of the 4.6 $MtCO_2eq.$ emissions came from manufacturing combustion. Space heating emissions for building and offices are dealt with in Chapter 14.

Industrial process emissions are linked to economic activity. Rising demand in construction results in a greater demand for cement. Emissions from industrial processes dipped in 2019, following a consistent rise in the previous years, and dipped again during the COVID-19 pandemic. Emissions rose again by 16.8% (0.35 Mt $CO_2eq.$) in 2021 over 2020 largely due to a return of construction activity post the COVID-19[33] lockdown.

Industrial process emissions, at 2.5 $MtCO_2eq.$ make up the balance of the sector's 7.1 $MtCO_2eq.$ in 2021. These emissions are widely accepted to be harder to abate as their release is a fundamental part of product manufacture.

Most industry operators are part of the EU's Emissions Trading System (EU ETS). The EU ETS is a cornerstone of the EU's policy to combat climate change and it is a key tool for reducing greenhouse gas (GHG) emissions cost-effectively. It is the world's first major carbon market and remains the biggest one.

13.1.2 Industry Sectoral Ceiling and Carbon Budgets

Table 13.3 – Required Level of Decarbonisation in Industry for Carbon Budgets 1 and 2

Sectoral Carbon Budget 2021 to 2025 $MtCO_2eq.$	Cumulative Emissions to 2021	Remaining Sectoral Carbon Budget 2022 to 2025 $MtCO_2eq.$	Sectoral Carbon Budget 2026 to 2030 $MtCO_2eq.$
30	7.1	22.9	24

To meet the sectoral ceiling in the first budgeting period, the industry sector will need to achieve annual average emissions of around 5.75 $MtCO_2eq.$ from 2022 to 2025.

The sectoral ceiling in the first budgeting period (2021-25) is 30 $MtCO_2eq.$ This equates to 6 $MtCO_2eq.$ per annum. Emissions in 2021 were 7.1 $MtCO_2eq.$ To meet the sectoral ceiling in the first budgeting period, the industry sector will need to achieve annual average emissions of around 5.75 $MtCO_2eq.$ from 2022 to 2025. Current forecasts[34] indicate that industry emissions in 2022 will be of a similar scale to 2021, further increasing the burden on the remaining 3 years.

Table 13.4 – Required Level of Decarbonisation for Industry

2018 Emissions $MtCO_2eq.$	Indicative Target for 2025 Emissions $MtCO_2eq.$	Indicative Target % Reduction for 2025	2021 Emissions MtCO2eq.	% Increase (+) / Reduction (-) to date
7	6	20%	7.1	+1.4%

[32] https://www.seai.ie/publications/Energy-in-Ireland-2021_Final.pdf

[33] https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/manufacturing-and-industry/

[34] https://www.epa.ie/our-services/monitoring--assessment/climate-change/ghg/manufacturing-and-industry/

Carbon abatement in industry requires improvements in energy efficiency; greater electrification of low-to-medium temperature heating; and increased supply and use of biomethane and green hydrogen. Uptake of these opportunities can be accelerated through policies that facilitate business investment in low carbon processes, providing appropriate support, and reviewing regulatory conditions.

Consumers are continuing to become more aware of the environmental impact of their purchases, increasing the power of the 'green euro'. Businesses that adapt operations and evolve their business model to supply this demand will gain new customers while retaining existing ones. Government support is required to reduce high upfront investment costs and improve access to low carbon technologies. These technologies include commercial heat-pumps and large-scale use of renewable gases.

13.2 2025 and 2030 KPIs

The below table presents the key measures required to achieve carbon abatement targeted in each of the successive carbon budgets. While the time periods indicate when we will likely see the abatement achieved, the actions do not necessarily begin in those periods. For example, we will need to start preparing regulatory and policy frameworks for longer-term measures such as hydrogen, and carbon capture and storage (CCS) in the near-term for abatement to be achieved in the third carbon budget period.

Table 13.5 – Key Metrics to Deliver Abatement in Industry

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2$ eq.	2031-2035 measures
Overarching Transition Measurement	Reduction in fossil fuel use in industry sector from 64% of final consumption (2021) to 45%[35]	Abatement set out in KPIs below	70-75% share of carbon neutral heating in total fuel demand as outlined below and made up of: 55% of low/medium heat to be electrified 20% of low/ medium grade heat to be converted to sustainable biomass 88% of high-grade heat to be converted to direct/hybrid electrification technology ~20% decrease in embodied carbon in construction materials through alternative fuels	Abatement set out in KPIs below	Further reductions in fossil fuel use in industry sector

[35] Including alternative fuels for cement

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2$ eq.	2031-2035 measures
Carbon-neutral Heating in Industry	50-55% share of carbon neutral heating in total fuel demand as outlined below and made up off: 35% of low/ medium heat to be electrified 12% of low/ medium grade heat to be converted to sustainable biomass 64% of high grade heat to be converted to direct/hybrid electrification technology	0.4	70-75% share of carbon neutral heating in total fuel demand as outlined below and made up of: 55% of low/medium heat to be electrified 20% of low/ medium grade heat to be converted to sustainable biomass 88% of high grade heat to be converted to direct/hybrid electrification technology	1.3	60-70% share of carbon neutral heating in total fuel demand
Construction Materials	Decrease embodied carbon in construction materials produced and used in Ireland by 10% Product substitution for construction materials and reduction of clinker content in cement Decrease energy related emissions associated with cement production through fuel switching and efficiencies	0.2	Decrease embodied carbon in construction materials produced and used in Ireland by at least 30% Product substitution for construction materials and reduction of clinker content in cement	0.4	Implementation of CCS Framework Product substitution for construction materials and reduction of clinker content in cement

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2$ eq.	2031-2035 measures
Fossil Fuel Demand Reduction through Energy Efficiency Measures	Reduce industry fossil fuel demand through energy efficient measures in manufacturing process by 7%	0.2	Reduce industry fossil fuel demand through energy efficient measures in manufacturing process by 10%	0.2	Further reductions in industry energy demand
Increasing use of zero emission gas	At least 1.2 TWh consumption of zero emission gas for industrial heating	0.3	At least 2.1 TWh consumption of zero emission gas for industrial heating	0.4	Measures on green hydrogen to be developed following publication of Hydrogen Strategy and Roadmap

To meet the level of emissions required by 2025 we will:

- Expand and enhance supports from the Sustainable Energy Authority of Ireland (SEAI), IDA Ireland and Enterprise Ireland (EI) with a focus on achieving energy efficiency, electrification and biomass adoption in industry aligned with the above KPIs;
- Develop and deliver policies to ensure increased supply of zero-emission gases aligned with the above KPIs;
- Actively deliver a series of measures to reduce embodied carbon in construction materials; promote the swapping to lower embodied carbon construction materials wherever possible; and reduce emissions from cement production aligned with the above KPIs;
- Promote alternative construction materials through robust carbon lifecycle assessment of construction projects. Switching from high global warming potential (GWP) materials to low GWP materials, as well as reducing the GWP of individual materials;
- Reduce Ireland's annual industry emissions from 7 MtCO2eq. in 2021 to 5.7 MtCO2eq. annually by the end of the period 2023 to 2025;
- Reduce Ireland's annual industry emissions to meet carbon budget for 2025 to 2030.

To meet the level of emissions required by 2030 we will:

- Expand and enhance supports from the SEAI, IDA Ireland and EI with a focus on achieving energy efficiency, electrification and biomass adoption in industry aligned with the above KPIs;
- Develop and deliver policies to ensure increased supply of zero-emission gases aligned with the above KPIs;
- Actively deliver a series of measures to reduce embodied carbon in construction materials, and emissions from cement production.

13.3 Measures to Deliver Sectoral Emissions Ceilings

Our 2030 decarbonisation ambition will require all sectors to increase emission mitigation actions if we are to achieve our national and EU targets. For industry, the following measures will be critical to success:

13.3.1 Carbon-neutral Heat for Industry

A large amount of the emissions from industry arise from the demand for heat in manufacturing. We must reduce demand through efficiencies and displacing fossil fuels with renewable electricity and biofuels. Low and medium temperature heating can be provided through high efficiency heat pumps powered by renewables.

High temperature heat demands can be provided via indigenously produced biomethane produced from food waste and agricultural feedstocks. In the longer-term, green hydrogen can be used in these types of processes but is expected to have limited impact until after 2030.

13.3.2 Reduction in Embodied Carbon in Construction Materials

Industrial process emissions from cement production are recognised as being hard to abate. Options that are available include reducing the clinker content of the final product; using alternative construction materials and methods to displace cement; and physically preventing the emissions from going into the atmosphere by capturing them and placing them in long-term storage.

Cement Demand Management

The adoption of modern methods of construction (MMC) has the potential to dramatically improve construction sector productivity, innovation, speed of delivery, sustainability and ultimately, costs. Products such as cross-laminated timber and timber frame can replace concrete and steel in many applications such as floors, roofs, walls and stairs due to its strength and versatility. Timber framed buildings are increasingly common in Ireland making up approximately 25% of the Irish market .[36] Support is required to further increase the market share for timber construction and to displace the demand for cement in the construction sector.

To promote the widespread adoption of MMC, the Department of Enterprise, Trade and Employment (DETE) is leading a cross-Department and cross-Agency MMC Leadership and Integration Group. This is the overarching leadership mechanism to ensure integration and coordination across a range MMC entities and initiatives, including Ireland's National Construction Technology Centre, which will include a focus on sustainable construction. The Department of Further and Higher Education, Research, Innovation and Science are leading on the establishment of a MMC Demonstration Park that at Mount Lucas, to showcase the latest innovations in residential construction technology.

Product Reformulation

By reducing the clinker content of cement through the use of novel binders and fillers we can reduce the carbon intensity of cement without compromising its integrity. This action is technically feasible and widely used in the EU. Ireland will need to follow suit, and the public sector – collectively the State's largest purchaser of construction projects – will lead by specifying lower carbon cement and concrete for future construction projects.

[36] Modern Methods of Construction, CFI 2021

EI will also support the high-risk research and development phase of work with cement and construction materials companies to develop novel cementitious materials; innovative products; and more efficient production technologies.

Carbon Capture and Storage

CCS is the process of capturing carbon dioxide before it enters the atmosphere, transporting it, and storing it for centuries or millennia. It is particularly suited to capturing the emissions from large point sources such as arise in industrial and energy production. A CSS strategy is essential to provide a clear policy framework to guide long-term investment decisions.

13.3.3 Increasing Use of Zero Emissions Gas

Decarbonised gases such as biomethane and green hydrogen are a critical component for Ireland's energy ecosystem. In particular, they provide a decarbonisation pathway for combustion emissions arising medium and high temperature processes. To facilitate investment, we will bring forward policies and regulatory frameworks to stimulate domestic biomethane production and use, and the development of a sizeable hydrogen sector.

EI and IDA Ireland, with the support of the SEAI, will work closely with their client companies in manufacturing sectors to assess which processes and operations can utilise biogas or biomethane sustainably and cost effectively. Our enterprise agencies will work to support these businesses decarbonise their processes and align any supports with the incentives and interventions under a Renewable Heat Obligation, or any support provided to the agriculture supply chain for such a fuel.

The SEAI's National Heat Study states that optimal application for biomethane is in the decarbonisation of operations with high direct heat demands for which alternatives such as electrification are more challenging. The Department of Agriculture, Food and the Marine and the Department of the Environment, Climate and Communications (DECC) will establish a Biomethane Working Group to develop a National Biomethane Strategy.

EI, IDA Ireland and the SEAI will provide grant funding for carbon abatement in high impact sectors through the Green Transition Fund, developed under Ireland's EU National Recovery and Resilience Plan.

DECC will develop a policy and regulatory roadmap for green hydrogen as part of the Hydrogen Strategy for Ireland. Green hydrogen will be reserved for use where alternative energy sources are not feasible.

13.3.4 Energy Efficiency

The more efficient we make our production process the less energy we require. Even as we seek to electrify many of our production process, we must be aware that we risk shifting the burden to the electricity sector. We require a range of cross-cutting energy efficiency measures to reduce not only industry emissions but also to lower energy demand.

To accelerate energy efficiency measures in industry, the following actions will be adopted:

- Energy management systems will be mandatory for organisations who use more than 100TJ of energy per annum;
- The SEAI's Large Industry Energy Network will support organisations on adopting energy management systems, developing emissions management systems, improving energy

performance metrics, and adopting best practice in energy efficiency and emissions reductions;

- The SEAI's Excellence in Energy Efficient Design (EXEED) programme will support large energy users with developing exemplar energy efficiency approaches to new and existing assets, including energy efficiency design and capital support;
- Energy audits will be mandatory for organisations who use more than 10TJ of energy;
- Measures within mandatory energy audits with payback periods of less than 5 years should be implemented within 2 years of the energy audit;
- The top 15 energy users in Ireland will report energy performance and emissions data via the SEAI's Large Industry Energy Network annually, and energy performance metrics will be published;
- DECC will assess whether mandated caps on any increase in fossil fuel demand by large energy users could be put in place from 2026.

13.3.5 EU Emissions Trading System

The EU ETS is an important measure for reducing industry GHG emissions. The Fit for 55 proposals for the reformed EU ETS will increase emissions reductions in this sector from the current 43% to 61%, in the period 2005 to 2030. Changes include a steeper annual reduction in the emissions ceiling and reductions in free allowances, alongside the corresponding introduction of a carbon border adjustment mechanism.

13.3.6 Carbon Pricing

The Finance Act 2020 legislated for annual increases in the rate of carbon tax to reach €100 per tCO2 by 2030, and manufacturers outside the EU ETS will be further incentivised by the carbon price trajectory set by Government. The current rate of carbon tax is €48.50 per tCO2. As we progressively decarbonise our economy, policy will prevent a large gap emerging between carbon pricing in the EU ETS and non-ETS sectors to ensure an ongoing strong signalling effect for decarbonisation.

13.3.7 Agency-led Engagement and Supports for Business

It is necessary to promote and provide supports for the adoption of low carbon options for industry. EI and IDA Ireland will continue to align grant funding and supports with progress towards achieving our emissions reductions targets for industry. This includes the full introduction of climate impact into the current economic appraisal model. The Agencies will work with client companies of the highest emitting industrial sectors to assist businesses prepare detailed decarbonisation implementation strategies.

EI and IDA Ireland will administer the Green Transition Fund (GTF) and other funding sources to support the decarbonisation of Irish industry. The GTF is part of Ireland's National Recovery and Resilience Plan, and it commits to accelerating the decarbonisation of the industry sector by: providing supports for Irish small and medium enterprises and exporters to address their emissions; and investing in carbon measurement and abatement technologies for manufacturing companies. Schemes under the Enterprise Emissions Reduction Investment Fund target enterprises in the manufacturing sector, while the Climate Planning Fund for Business targets EI and Local Enterprise Office clients of all sizes.

The Sustainable Energy Authority of Ireland (SEAI) offers a range of initiatives and supports to improve business energy efficiency. These include Government-funded EXEED and Support Scheme for Renewable Heat (SSRH). The SEAI also continues to support energy audits, provides free training for businesses, and provides financial supports to those businesses that want to invest in energy efficiency.

The National Standards Authority of Ireland (NSAI) through the provision of technical infrastructure services (measurement, standards and certification schemes) in critical areas such as emerging technology, low carbon and modern methods of construction, climate adaptation, carbon capture and use of alternative fuels, supports European and national policy delivery in the area of climate change. NSAI also offers a carbon footprint auditing and verification service and a range of ISO energy and environmental schemes to businesses. It is also the national Agrément certification provider for innovative, non-standardised building systems and construction products.

13.3.8 Further Measures

The third carbon budget (2031-2035) is expected to require a continuation of the measures outlined above, with a significant role for green hydrogen in meeting high temperature heat demands post 2030, and CCS potentially capturing the emissions from large point sources such as arise in industrial and energy production.

13.4 Actions

Table 13.6 sets out a roadmap of actions to 2025, and Table 13.7 specifically describes the actions for delivery in 2023.

Table 13.6 – Key Actions to Deliver Abatement in Industry for the period 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
Carbon-neutral Heating in Industry	Continue the roll out the Green Transition Fund incentives to decarbonise industrial heating	DETE: Continue the roll out of Green Transition Fund incentives to decarbonise industrial heating	DETE: Continue the roll out of Green Transition Fund incentives to decarbonise industrial heating
	Complete the 2023 Annual Review of the Support Scheme for Renewable Heat	DECC: Implement the revised SSRH	DECC: Implement the revised SSRH
	Prepare a decarbonisation roadmap for industrial heat based on the recommendations of the SEAI National Heat Study	DETE (with DECC and the SEAI): Implement the Decarbonisation Roadmap for Industrial Heat based on the recommendations of the SEAI National Heat Study	DETE (with DECC and the SEAI): Implement the Decarbonisation Roadmap for Industrial Heat based on the recommendations of the SEAI National Heat Study
	Identify actions to accelerate and drive system wide delivery of industrial heat decarbonisation	Heat and Built Environment Acceleration Taskforce: Identify main actors and implement actions to accelerate and drive system-wide delivery of industrial heat decarbonisation	Heat and Built Environment Acceleration Taskforce: Identify main actors and implement actions to accelerate and drive system-wide delivery of industrial heat decarbonisation

Measure	2023 Actions	2024 Actions	2025 Actions
Increasing Use of Zero-emission Gas	Assess client requirements for decarbonised gas and potential supply chains	Enterprise Agencies: Support their clients to implement the use of zero-emission gas	Enterprise Agencies: Support their clients to implement the use of zero-emission gas
	Conduct feasibility assessments on carbon capture storage	DECC: Advance policy position on CCS depending on feasibility assessments	
	Develop a policy/regulatory roadmap for green hydrogen use	DETE: Identify industry clusters near suitable suppliers of biomethane	DETE: Identify industry clusters near suitable suppliers of biomethane
Fossil Fuel Demand Reduction through Energy Efficiency Measures	Determine the best energy efficiency measures through additional requirements in energy audits and the Large Industry Energy Network	SEAI: Determine the best energy efficiency measures through additional requirements in energy audits and the Large Industry Energy Network	SEAI: Determine the best energy efficiency measures through additional requirements in energy audits and the Large Industry Energy Network
Reduction in Embodied Carbon in Construction Materials for Industry	Publish a report on actions to decrease embodied carbon in the whole life-cycle of construction materials	Continue implementation of recommended actions from report to align with sectoral targets	SEAI: Commence developing an embodied carbon building rating calculation methodology taking account of CPR (where available) and EPBD
	Identify case study which highlights suitability and opportunities for alternative construction materials		
Leading by Example Reduction in Embodied Carbon in Construction Materials for the Public Sector	Prepare and submit to Government a public procurement policy to facilitate public bodies incorporating the principle of low carbon construction methods and materials and whole life-cycle analysis approaches in all publicly procured projects	Implement the policy through the Office of Government Procurement	Implement the policy through the Office of Government Procurement
	Specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects from 2023	Public Bodies: Specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects	Public Bodies: Specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects
	Publish new Green Public Procurement Strategy and Action Plan, identifying an appropriate monitoring and reporting protocol that includes the monitoring of the implementation of low carbon construction in public tenders and grant schemes	Implementation of GPP Strategy and Action Plan	Implementation of GPP Strategy and Action Plan.

Measure	2023 Actions	2024 Actions	2025 Actions
Cross-cutting	Ensure implementation of ecodesign legislation and lead negotiations on the proposed Ecodesign for Sustainable Products Regulation		DECC: Complete review on the adequacy of existing policy supports for energy efficient technologies
			DETE: Deliver the programmes to decarbonise industry outlined in the NDP and Resilience and Recovery Fund submissions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex. Delivery will be kept under constant review with further policies, measures and actions brought forward to address any failure or projected failure as required, including as part of the annual update of the Climate Action Plan.

Table 13.7 – 2023 Actions

Action Number	2023 Action
EN/23/1	Continue the roll out the Green Transition Fund incentives to decarbonise industrial heating
EN/23/2	Complete the 2023 Annual Review of the Support Scheme for Renewable Heat
EN/23/3	Prepare a decarbonisation roadmap for industrial heat based on the recommendations of the SEAI National Heat Study
EN/23/4	Identify actions to accelerate and drive system wide delivery of industrial heat decarbonisation
EN/23/5	Assess client requirements for decarbonised gas and potential supply chains
EN/23/6	Conduct feasibility assessments on carbon capture storage
EN/23/7	Develop a policy/regulatory roadmap for green hydrogen use
EN/23/8	Determine the best energy efficiency measures through additional requirements in energy audits and the Large Industry Energy Network
EN/23/9	Publish a report on actions to decrease embodied carbon in the whole life-cycle of construction materials
EN/23/10	Identify case study which highlights suitability and opportunities for alternative construction materials
EN/23/11	Prepare and submit to Government a public procurement policy to facilitate public bodies incorporating the principle of low carbon construction methods and materials and whole life-cycle analysis approaches in all publicly procured projects
EN/23/12	Specify low carbon construction methods and low carbon cement material as far as practicable for directly procured or supported construction projects from 2023
EN/23/13	Publish new Green Public Procurement Strategy and Action Plan, identifying an appropriate monitoring and reporting protocol that includes the monitoring of the implementation of low carbon construction in public tenders and grant schemes
EN/23/14	Ensure implementation of ecodesign legislation and lead negotiations on the proposed Ecodesign for Sustainable Products Regulation

14 Built Environment

14. Built Environment

Key Messages

Sectoral Emission Ceilings

- Carbon Budget 1: Residential: 40 $MtCO_2eq.$ / Commercial/Public: 7 $MtCO_2eq.$
- Carbon Budget 2: Residential: 23 $MtCO_2eq.$ / Commercial/Public: 5 $MtCO_2eq.$
- Emissions up to 2021: Residential: 7 $MtCO_2eq.$ / Commercial/Public: 1.5 $MtCO_2eq.$

Trends in the Sector

The built environment accounted for 12.3% of Ireland's greenhouse gas emissions in 2021, down from 13.6% in 2020

Key Targets

- All new dwellings designed and constructed to Nearly Zero Energy Building (NZEB) standard by 2025, and Zero Emission Building (ZEB) standard by 2030
- Equivalent of 120,000 dwellings retrofitted to BER B2 or cost optimal equivalent by 2025, and 500,000 dwellings by 2030
- Up to 0.8 TWh of district heating installed capacity by 2025, and up to 2.7 TWh by 2030
- 170,000 new dwellings using heat pumps by 2025, and 280,000 by 2030
- 45,000 existing dwellings using heat pumps by 2025, and 400,000 by 2030
- Up to 0.4 TWh of heating provided by renewable gas by 2025, and up to 0.7 TWh by 2030

Measures and Actions

- An ambitious National Residential Retrofit Plan
- Strengthening our existing Building Regulations
- Supporting the growth and development of district heating, electrification of heating and geothermal energy
- A roadmap to support the decarbonisation of commercial buildings
- Supports for the public sector to decarbonise its building stock

14.1 State of Play

The built environment comprises the residential, public and commercial sectors, and accounted for 12.3% of Ireland's greenhouse gas emissions in 2021, down from 13.6% 2020. The effect of the restrictions related to the COVID-19 pandemic, that forced many of us to spend more time at home, resulted in an increase in emissions from this sector in 2020. Data for 2021 reflects the loosening of COVID-related restrictions in the second half 2020. The increase in emissions in 2020 underlines the continued heavy reliance on fossil fuels for heating, with the Sustainable Energy Authority of Ireland's (SEAI) most recent Energy in Ireland report indicating that fossil fuels are used as the heat source in 73% of dwellings. Sustained action to decarbonise heating in this sector will also help to address acute cost increases currently being experienced by householders and

businesses, and will increase security of supply by moving away from fossil fuel dependence to home-grown renewable energy sources.

Table 14.1 – Built Environment GHG Emissions 2021[37]

Sector	Built Environment Emissions $MtCO_2eq.$	Share of Total GHG Emissions	Electricity Emissions tCO_2 per capita
Residential	7	10.2%	1.4 t
Commercial/Public	1.5	2.1%	0.3 t
Total	8.5	12.3%	1.7 t

Since 2005, Ireland has experienced some success in reducing the share of national emissions from this sector, reducing from 13% of total emissions in 2005 to 12.3% in 2021. This was achieved despite a large increase in our building stock over the same period. This reduction reflects the introduction of significant improvements in the Building Regulations that commenced in 2006, improved efficiency through retrofit, the adoption of new low-carbon technologies and fuel switching.

Table 14.2: Trends in Built Environment GHG Emissions

Sub-Sector	Timeframe	Percentage Change	Absolute Change $MtCO_2eq.$
Residential	2005-12	-13.75%	-1.2
	2012-20	2.12%	0.15
Commercial/Public	2005-12	-19.11%	-0.3
	2012-20	8.41%	0.12
Total	2005-12	-15%	-1.5
	2012-20	3%	0.27

The decrease in emissions in the period 2005 to 2012 reflects the economic situation at the time. Conversely, the increase in the period 2012 to 2020 reflects the increased economic activity post-recession, and the impact of COVID-19 restrictions in the residential sector in 2020.

The sectoral ceiling for the built environment has been set at 36 $MtCO_2eq.$ for 2021-2025 and 28 $MtCO_2eq$ for 2026-2030. These ceilings have been further subdivided between the residential and commercial/public sub-sectors as set out in table 14.3.

37 Data based on EPA Provisional data for 2021, see https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2021.php

Table 14.3 – Required Level of Decarbonisation for Built Environment for Carbon Budgets 1 and 21

	Sectoral Carbon Budget 2021 to 2025 $MtCO_2eq.$	Cumulative Emissions to 2021	Remaining Sectoral Carbon Budget 2022 to 2025 $MtCO_2eq.$	Sectoral Carbon Budget 2026 to 2030 $MtCO_2eq.$
Residential	29	7	22	23
Commercial/Public	7	1.5	5.5	5

Table 14.4 – Required Level of Decarbonisation for Built Environment

	2018 Emissions $MtCO_2eq.$	Indicative Target for 2025 Emissions $MtCO_2eq.$	Indicative Target % Reduction for 2025	2021 Emissions $MtCO_2eq.$	% Increase (+) / Reduction (-) to date
Residential	7	5.45	~20%	7	-0.62%
Commercial/ Public	1.5	1	~20%	1.5	-2.76%

To achieve these highly ambitious targets, we must significantly and urgently reduce the use of all fossil fuels (coal, natural gas, oil, and peat) to heat our buildings and support a major expansion in retrofit activity to underpin this reduction, with resulting benefits for homeowners in terms of efficiency, comfort, and health and wellbeing. All buildings will need to switch to heat pumps or district heating by 2050, meaning that the gas grid will no longer supply existing homes and commercial premises. It will also require the urgent ending of new gas connections or the installation of new fossil heating systems in new or refurbished buildings. Where heating systems are being upgraded, this should be to non-fossil fuel systems.

While there are common challenges and solutions that apply to the residential, commercial and public sub-sectors, the policy pathways to achieve decarbonisation in each sub-sector are distinctive. These pathways will build on the progress we have already achieved in the areas of retrofit and decarbonisation, building regulations and standards, and in establishing a district heating steering group and regulatory framework. The use of zero-emissions gas in heating will also contribute to decarbonisation of heat in buildings on our pathway to 2030. Actions to further develop the supply chain for this alternative to fossil gas are set out in chapter 16.

To accelerate and drive delivery in this key area, a Heat and Built Environment Delivery Taskforce has been established. This Taskforce will focus on the acceleration of system-wide project and programme delivery, ensuring blockages are removed in relation to retrofitting, renewable heat, district heating networks, decarbonisation of heating, and operational energy use optimisation in the building stock. High-level actions to be taken in respect of these areas will be set out in this and subsequent Climate Action Plans. The work of the taskforce will also be informed by the outcomes of the National Climate Stakeholder Forum and the findings of the Climate Conversations process. It is expected that in order to establish the structures required in the heating sector to accelerate the move to renewable sources, for example district heating, primary legislation will be required.

Long-term decarbonisation of the built environment will also require us to address the wider impact

of emissions associated with production, construction and demolition. This will mean significant technological changes to construction. The State's role in this transition will need to include a range of measures to facilitate, encourage and drive the necessary innovations and technology adoptions.

This will be driven, at EU level, by forthcoming changes to the EU Energy Performance of Buildings Directive and Construction Products Regulation (CPR), which will create a harmonised framework to assess and communicate the environmental and climate performance of construction products in the EU single market.

The Government will work to advance this agenda by taking steps to plan for the significant work required to implement this EU legislation, including the development of necessary databases and assessment methodologies, adapting to EU harmonised technical specifications, and preparing the construction industry for these changes. Our initial steps will focus on immediate opportunities for material substitution in construction and on stimulating greater use of embodied carbon assessment approaches, or whole life-cycle analysis at project design stage. Actions will include a programme of work to require public bodies to specify low carbon cement products, where practicable, for public sector construction projects, and to identify suitable construction projects to assess the carbon impact of alternative construction materials through suitable whole life-cycle analysis approaches. Further details on these actions are provided in chapter 13.

14.2 2025 and 2030 KPIs

Table 14.5 – Key Metrics to Deliver Abatement in the Residential Sector

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2$ eq.	2031-2035 measures
Standards and Regulations	All new dwellings designed and constructed to NZEB standard 170,000 new dwellings using heat pumps	0.3[38]	All new dwellings designed and constructed to ZEB standard 280,000 new dwellings using heat pumps	0.4	Minimum Energy Performance Standards for all dwellings
National Retrofit Plan	120,000 dwellings retrofitted to BER B2 cost optimal or carbon equivalent 45,000 existing dwellings using heat pumps	0.9	500,000 dwellings retrofitted to BER B2 cost optimal or carbon equivalent 400,000 existing dwellings using heat pumps	2	Increased number of dwellings retrofitted and using heat pumps in line with activity by 2030 and minimum energy performance standards for all dwellings

38 Measures related to new homes are calculated to prevent growth in emissions by 0.3 Mt in 2025 and 0.4 Mt in 2030 relative to business-as-usual projections. These measures do not however provide any additional abatement impact vs. 2018 emissions

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2$ eq.	2031-2035 measures
Decarbonisation of Residential Heating	Up to 0.7 TWh of district heating	0.2	Up to 2.5 TWh of district heating	0.6	Increased ambition for heating supplied from district heating networks
	Up to 0.4 TWh of heating provided by renewable gases to be delivered through agriculture-based supply chains	0.1	Up to 0.7 TWh of heating provided by renewable gases to be delivered through agriculture-based supply chains	0.1	Increased ambition for heating supplied with renewable gases
	Reduction of demand due to energy efficiency responses to mitigate reliance on fossil fuels[39]	0.7	Reduction of demand due to energy efficiency responses to mitigate reliance on fossil fuels	0.4	Embedding of sustained reductions in household heat demand

39 Additional abatement associated with fossil fuel price and supply effects may not be embedded in household heat demand over the longer term and will require successful implementation of policies and measures to sustain reduced demand. Ongoing monitoring of demand/consumption will be required in order to assess the need for changes to existing measures or the introduction of additional measures to sustain reductions in energy consumption

Table 14.6 – Key Metrics to Deliver Abatement in the Commercial/Public Sector

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2eq.$	2031 – 2035 measures
Standards and Regulations	All new buildings designed and constructed to NZEB standard and using renewable energy sources	N/A[40]	All new buildings designed and constructed to ZEB standard	N/A	Minimum energy performance standards for all commercial and public buildings
Decarbonisation of Public and Commercial Heating	Up to 0.1 TWh of district heating	0.03	Up to 0.2 TWh of district heating	0.04	Increased ambition for heating supplied from district heating networks
	Support public and commercial buildings to deliver savings of 375 Kt CO_2	0.4	Support public and commercial buildings to deliver savings of 735 Kt CO_2	0.7	Increased number of buildings with installed heat pumps in line with levels of deployment activity during 2026-2030
	Up to 0.2 TWh of heating provided by renewable gases to be delivered through agriculture-based supply chains	0.04	Up to 0.4 TWh of heating provided by renewable gases to be delivered through agriculture-based supply chains	0.1	Increased ambition for heating supplied with renewable gases to be delivered through agriculture-based supply chains

40 Additional abatement arising from application of NZEB and ZEB standard comes from heat pump installation in new commercial and public buildings. No additional savings are recorded relative to 2018 emissions

To meet the required level of emissions reduction, by 2025 we will:

Residential

- Complete the equivalent of 120,000 residential retrofits, including 45,000 using heat pumps, to achieve a B2 BER/cost optimal level;
- Finalise and implement report of the District Heating Steering Group to supply up to 0.7 TWh of district heating to decarbonise residential heating;
- Develop the appropriate policies and safeguards, as set out in chapter 16, to supply up to 0.4 TWh of renewable gas to decarbonise residential heating;
- Publish a new National Policy Statement on Heat to guide the Government's overall response to the National Heat Study across all sectors, which will also take into account the need for a medium-term pathway for the phase-out of fossil fuels for space and water heating;
- Develop proposals for legislation to underpin the structures necessary to remove blockages and to accelerate the transition to renewable heat;
- Introduce a new Renewable Heat Obligation by 2024 to drive accelerated introduction of renewable gases;
- Support homeowners to better manage their energy demand through measures, including information campaigns, the rollout of smart meters and the availability of grants for heating controls.

Commercial/Public

- Support the delivery of emissions savings of 375 $KtCO_2$ in commercial and public sector buildings;
- Finalise and implement the report of the District Heating Steering Group to supply up to 0.1 TWh of district heating infrastructure to decarbonise heating in commercial and public buildings;
- Support public sector bodies in developing Building Stock Plans, to determine optimum management of property portfolios for decarbonisation;
- Commence the installation of rooftop solar PV in schools; Support the retrofit of buildings owned by public bodies;
- Promote and support building automation and control optimisation and smart building technologies to increase energy efficiency and monitoring, and the upgrade of existing building energy management systems to high-efficiency and zero-carbon equivalents.

To meet the required level of emissions reduction, by 2030 we will:

Residential

- Complete 500,000 residential retrofits, including 400,000 heat pumps, to achieve a B2 BER/cost optimal or carbon equivalent, installed in existing buildings as part of the National Residential Retrofit Plan;
- Implement the Energy Performance of Buildings Directive ZEB standard for all new dwellings;
- Supply up to 2.5 TWh of district heating to decarbonise residential heating;
- Supply up to 0.7 TWh of renewable gas to decarbonise residential heating;
- Continue to support homeowners to better manage their energy demand.

Commercial/Public

- Support the delivery of emissions savings of 735 Kt CO_2 in commercial and public sector buildings;
- Supply 0.2 TWh of district heating infrastructure to decarbonise heating in commercial and public buildings;
- Implement the Energy Performance of Buildings Directive ZEB standard for all new commercial and public buildings;
- Scale up energy retrofit programmes to support the deep retrofit of buildings owned by public bodies;
- Prioritise the installation of rooftop solar PV on buildings with useful floor area over 250m² on new public and non-residential buildings by 31 December 2026 in line with Energy Performance of Buildings Directive and subject to permitting processes;
- Develop the appropriate policies and safeguards to supply renewable gas for use in commercial and public buildings of up to 0.4 TWh;
- Implement Public Sector Building Stock Plans and continue the phasing out of fossil fuels.

14.3 Measures to Deliver Sectoral Emissions Ceilings

All new buildings are now designed so that they do not require fossil fuels to provide space and water heating, and consequently the main challenge lies with decarbonising our existing building stock. The National Residential Retrofit Plan, published in Climate Action Plan 2021 (CAP21), sets out how we will achieve our national residential retrofit and heat pump targets. The retrofit programme will be complemented by other measures, such as deployment of zero-carbon heating through district heating and renewable gases, and promoting retrofit technologies for buildings other than dwellings.

The use of smart technologies and upgrading of existing heating systems to modern equivalents will also play a significant role in reducing the overall energy requirements of a building. 'Smart homes' technologies, allowing automated management of energy use, enabled by high-speed broadband connectivity, will enable greater consumer control over their energy consumption and will play an important role in decarbonising the residential sector. Initiatives such as the ongoing 'Reduce Your Use' campaign will also play a key role in helping consumers to reduce energy demand. The rollout of the Smart Meter Programme will allow homeowners to access the information they need to make more informed choices about energy consumption. The availability of SEAI supports for heating controls will also help homeowners to maintain comfort levels without wasting energy. This is particularly important in the context of the current high energy prices which are also impacting behaviour and energy demand.

The shift away from fossil fuel use in the built environment must be done in a manner that is consistent with the principles of a just transition, considering the needs of particular groups in society and addressing energy poverty. This plan, therefore, includes a series of measures aimed at supporting those least able to afford to retrofit in private dwellings and commitments to continue the existing programme of retrofits in our social housing stock.

The National Heat Study indicates that although rapid decarbonisation is imperative, some consumers are likely to continue to choose fossil fuel technologies, even as fossil fuel prices continue to rise. We will continue to strengthen our regulation of heat sources, and to make zero-

carbon sources more attractive and accessible to the end-user. A new National Policy Statement on Heat will guide the Government's overall response to the National Heat Study across all sectors and a key driver of change will be a new Renewable Heat Obligation, to be introduced by 2024.

> *this level of growth still points to the substantial number of career opportunities in the green economy while also highlighting the potential challenge of filling that number of roles.*

Ongoing efforts to scale up and upskill our workforce to meet our climate ambitions for the built environment will require skills in areas such as retrofit, heat pumps, district heating, and solar PV. As indicated by the Expert Group on Future Skills Needs, the retrofit programme alone will require the workforce to increase from 3,990 full-time equivalents in 2021 to at least 17,400 in the coming years.[41] The increased market participation, retrofit activity and output are contributing to this effort. However, this level of growth still points to the substantial number of career opportunities in the green economy while also highlighting the potential challenge of filling that number of roles. A growing workforce will also need to be supported by increased training provision across the tertiary education system, with the overall framework provided through the Green Skills for Further Education and Training (FET) Roadmap 2021-2030, launched during 2022

Five Centres of Excellence currently provide training in areas such as green skills, sustainability, and retrofit and NZEB, with over fifty programmes also running across the FET sector. The opening of additional Centres of Excellence will allow increased demand for skills in retrofit and NZEB to be met, with an overall NZEB training target for 2022 of 4,550.

14.3.1 Residential Sector

> *Oil and liquid petroleum gas are no longer used as the primary heating source in new dwellings, with heat pumps now used in 84% of new dwellings, a percentage which will continue to increase as a result of the 2019 NZEB regulations*

Standards and Regulations

The introduction of the NZEB standard has seen a 70% reduction in the emissions of new buildings. Oil and liquid petroleum gas are no longer used as the primary heating source in new dwellings, with heat pumps now used in 84% of new dwellings, a percentage which will continue to increase as a result of the 2019 NZEB regulations, so that all fossil fuels will be effectively phased out in new dwellings by the end of 2023 and will be completely replaced by renewable energy heat pumps as the main heating system.

It is planned to implement a similar phase-out of fossil fuel boilers through performance-based regulations for new non-residential buildings and existing buildings undergoing major renovation (where more than 25% of the external surface of the building is renovated).

NZEB Regulations introduced in 2018 for new buildings other than dwellings have helped to accelerate the phase-out of fossil fuel boilers in these buildings by introducing renewable energy

41 https://www.skillsireland.ie/all-publications/2021/skills-for-zero-carbon.html

requirements for all new non-residential buildings and reducing their energy requirements and carbon emissions by 60%

It is intended that Building Regulations will be further updated to adopt the 2023 cost optimal calculations no later than Q1 2025, three years in advance of the statutory requirement of the Energy Performance of Buildings Directive. This will further strengthen the performance requirements for new non-residential buildings and major renovations to existing residential and non-residential buildings to effectively phase out fossil fuel boilers, where practical.

Roadmap for Ending Fossil Fuel Heating

As well as taking action through the building regulations to end the installation of fossil fuel heating systems in both new and existing residential and non-residential buildings, we are committed to accelerating the wider phase-out of fossil fuels for heating in all sectors and to putting in place the required supporting measures to achieve this. We will publish a detailed roadmap, by December 2023, including the required policy and regulatory instruments, to accelerate the electrification of heating and the phase-out of fossil fuels for heating. This roadmap will include examination of financial and regulatory incentives and disincentives for the switch to non-fossil heat in use in Ireland, informed by experience across the EU, and a regulatory framework review on ending new connections to the gas grid for the provision of heat less than 140°C.

We have already decided, through an updated Public Sector Climate Action Mandate published with this Climate Action Plan, that the public sector will not install heating systems that use fossil fuels after 2023, subject to specified exceptions.

We will continue to drive the development of the supply chain to support the achievement of our heat pump targets so that this technology will become the default solution for householders outside of a district heating network in choosing a new heating system in the coming years.

Impact of EU Regulations

We will continue to see the effects of high regulatory standards as new building construction gains momentum towards delivering the targets set out in Housing for All. As technology and construction are constantly evolving, policy and regulation will continue to change, setting high standards and targets in relation to construction and materials, to ensure that we can achieve a climate neutral built environment by 2050.

The recast of the EU Energy Performance of Buildings Directive (EPBD), expected to be finalised by mid-2023, plans to include:

- A new ZEB standard which does not cause any on-site carbon emissions from fossil fuels;
- The inclusion of a Declaration of Global Warming Potential on Building Energy Rating Certificates;
- Mandatory Whole Life Carbon Assessment at building design stage;
- The introduction of Building Renovation Passports;
- The introduction in legislation of Minimum Energy Performance Standards for all buildings;
- Mandatory installation of rooftop solar panels on all buildings, with earlier dates for public buildings;
- A rescaling of the existing Building Energy Rating (BER) scale, information on which will need to be shared with the general public, construction professionals and other stakeholders.

The recast of Energy Efficiency Directive (EED) will set out a national energy saving target which all Member States need to achieve by 2030. An energy saving target of at least 9% below the "reference scenario" has already been agreed, and this could be increased further as part of the ongoing negotiations. This will require all energy-using sectors to play their part in delivering improved energy efficiencies and reduced energy use. The recast EED is also expected to include sector-specific energy saving targets, including for public sector energy saving and building renovation.

Similarly, the Renewable Energy Directive (RED) is being recast and will aim to raise the 2030 target for renewable energy in the EU's final energy consumption from the current target of 32%. The recast RED will also strengthen the sectoral provisions to achieve this new target and reduce emissions from the energy sector. Specifically, the basis of the target for renewable heat (or RES-H) will change from an indicative nature to a binding nature and this requirement will underpin the National Heat Policy Statement being developed and also the proposals for legislation to underpin the structures necessary to remove blockages and to accelerate the transition to renewable heat.

Addressing the Rental Sector

In the residential rental sector, the incentives to invest in energy efficiency upgrades are misaligned between landlords and tenants, which impacts negatively on the energy performance of the sector. Housing for All commits the Government to acting in this area. This 'split-incentive' problem is being examined by the Economic and Social and Research Institute, who will report by early 2024. We will address the findings of that research, where appropriate, in future Climate Action Plans. As part of this approach, the Minister for Finance introduced a new tax incentive in the Finance Act 2022 for small-scale landlords who undertake retrofitting works while the tenant remains in situ, which has the aim of attracting and retaining small-scale landlords in the private rental market.

Update to the National Retrofit Plan

The National Retrofit Plan sets out how the Government will deliver on the targets of retrofitting the equivalent of 500,000 homes to a BER of B2/cost-optimal and installing 400,000 heat pumps in existing homes to replace older, less efficient heating systems by the end of 2030.

The plan is designed to address barriers to retrofit across four key pillars: (i) driving demand and activity; (ii) financing and funding; (iii) supply chain, skills and standards; and (iv) governance. For each pillar, barriers were identified, and time-bound policies, measures and actions were put in place to address them.

A particularly important aspect of the Retrofit Plan was the launch, in February, of a new package of enhanced SEAI retrofit supports. The key measures included:

- A new National Home Energy Upgrade Scheme providing increased grant levels of up to 50% of the cost of a typical deep retrofit to a B2 BER standard;
- A new network of registered One Stop Shops to offer a hassle-free, start-to-finish project management service, including access to financing, for home energy upgrades;
- A new approach to prioritising the worst performing homes under the Warmer Homes Scheme with expanded delivery;
- A special enhanced grant rate, equivalent to 80% of the typical cost, for attic and cavity wall insulation for all households, to urgently reduce energy use as part of the Government's response to current, exceptionally high energy prices.

Since the launch of these supports, alongside the implementation of the other Retrofit Plan actions, demand for SEAI schemes has been very high. As of the end of October 2022:

- Almost 41,000 applications for support have been received – a 152% increase on the same period last year;
- Over 18,400 home energy upgrades have been completed – a 59% increase on the same period last year;
- Over 3,600 homes been upgraded under SEAI energy poverty schemes – a 122% increase on the same period last year;
- Almost 6,000 homes have been upgraded to a BER of B2 or better – a 79% increase on the same period last year.

The actions included in this year's Retrofit Plan build on the strong progress made in 2022 using the same "four pillar" approach.

District Heating

District heating is a proven technology, offering the potential to supply low- and zero-carbon heat to homes, businesses and public buildings from a central source. Significant ramp-up in the deployment of district heating networks will be required to 2030 and beyond. The National Heat Study has identified that district heating could, in time, provide as much as 50% of building heat demand in Ireland. A District Heating Steering Group, established in 2022 and due to report annually to Government, will address:

- Supports for the rollout of district heating in Ireland;
- Development of a regulatory framework to protect consumers and suppliers;
- The manner in which national, regional and local planning frameworks encourage and facilitate the development of district heating;
- Development of a roadmap for district heating, informed by the evidence of the National Heat Study;
- Financing mechanisms to support the delivery of district heating projects, including appropriate financial incentives similar to the retrofit grant programmes;
- Regulatory and legislative tools to enable the rollout of district heating infrastructure.

Geothermal Energy

The 'Policy Statement on Geothermal Energy for a Circular Economy' is expected to be proposed to the Government in Q1 2023. This publication will identify pathways to progress the development of geothermal energy in Ireland and will help inform the implementation of our national policy on heating. Actions specific to the development of geothermal energy will follow from this policy statement.

14.3.2 Commercial and Public Sectors

The challenge facing the commercial sector is similar to that facing the residential sector: building regulations will ensure that new buildings meet NZEB (and in the future, ZEB) regulations, but it is existing buildings that will require the most effort to decarbonise. Technologies such as heat pumps in the residential sector are also suitable for commercial buildings. The scaling-up in deployment of solutions such as district heating and renewable gases will also benefit commercial and public

buildings.

Existing measures that support the decarbonisation of this sector include:

- Supporting businesses in retrofitting their premises and moving away from fossil fuel-based heating sources, through funding and services such as energy audits, technical supports, training and advice;
- Maintaining a regime of Accelerated Capital Allowances for energy efficient equipment, which is supporting the reduction of energy use in the workplace, and awareness of energy efficiency standards in appliances and products;
- Implementing a revised Energy Efficiency Obligation Scheme, to support energy users (financially or otherwise) to implement energy saving practices or to carry out energy upgrades on their properties.

Existing grant schemes are being updated and supplemented with further schemes to expand and streamline assistance for this sector on each stage of its journey to decarbonisation.

The application of innovative approaches to not only replace fossil fuel technology but to maximise efficiencies in building operation will be important levers in this sector. This includes the use of smart technologies to optimise, control and monitor a building's performance. Intelligent controls and monitoring will be a requirement for particular buildings by the end of 2025 under the European Union (Energy Performance of Buildings) Regulations (SI 393 of 2021). Upgrading of existing heating systems to modern, variable, demand-driven and grid balancing equivalents can produce significant emissions savings.

The proposed changes to the EPBD, outlined above, will have implications for the commercial sector. In the long term, this will also drive market expectations for the energy performance of buildings leased in this sector and increase demand for retrofit works to bring existing buildings up to a higher standard. The Carbon Risk Real Estate Monitor tool is one methodology that can be used to assist landlords in this process and provide them with the information they need on when to retrofit a building.

The Department of Enterprise, Trade and Employment, the Department of the Environment, Climate and Communications, and the Department of Housing, Local Government and Heritage will co-develop a roadmap in 2023 to set out the key policy interventions to achieve the objectives set out for decarbonising our commercial building stock. This will include the financial, technical and advisory supports available or required to assist businesses to decarbonise their buildings through the SEAI, the enterprise development agencies and otherwise. The roadmap will further set out the standards and regulations that will drive the required changes in heating systems, minimum equipment efficiencies, and smart operational and monitoring strategies and technologies; as well as in building fabric, to comply with the ceiling for this cohort of emissions. The roadmap will develop actions for inclusion in the next Climate Action Plan and will address the three carbon budget periods up to 2035.

As traditional buildings represent a significant resource of 'sunk' or embodied carbon, their retention and reuse will be critical to avoiding unnecessary emissions associated with demolition and replacement. A retrofitting guidance document for traditional buildings, which represent some 18% of Ireland's total building stock, is currently being developed. Specialised skills in specifying and installing retrofit measures will be required to meet the demand in this area.

Decarbonising our Public Sector Buildings

The public sector must continue to play a leading role in meeting Ireland's climate ambition and its decarbonisation targets. A new Public Sector Strategy and updated Public Sector Climate Action Mandate will direct the ambition of public sector bodies towards achieving an overall ambition to reduce CO_2eq. emissions from the sector by 51% relative to a 2016-2018 baseline. Specific requirements will continue to apply to schools, Local Authorities and to the commercial semi-State sector.

> *While many of the technology solutions are common to all buildings, the public sector will be required to do more and do it sooner.*

While many of the technology solutions are common to all buildings, the public sector will be required to do more and do it sooner. Revisions of both the EPBD and EED will include specific obligations in relation to public sector buildings, including significantly more ambitious energy efficiency requirements and targets for the renovation of the public sector building stock.

Ireland's public sector portfolio comprises almost 11,500 buildings, and includes education buildings, hospitals, offices and Garda stations, that provide a wide variety of services to the public. Many of these buildings provide services of a critical nature, must remain operational at all times and may require fossil fuel sources to provide back-up/emergency power for some time to come. The public sector building portfolio also includes traditional buildings. Decarbonisation solutions such as district heating and the use of renewable gases may be appropriate for a large proportion of these buildings. For district heating, public sector customers can also provide an important anchor to projects. However, there is no "one size fits all" solution to decarbonising public sector buildings.

Responsibility for the management of public sector buildings is spread across several organisations including large estate managers such as the Office of Public Works (OPW), the Department of Education, Local Authorities[42] and the Health Service Executive. The shared responsibility and variety of buildings in use adds additional complexity to the retrofit and decarbonisation of public sector buildings. A key deliverable under this plan is the development of a Public Sector Building Register as part of an enhanced Monitoring and Reporting (M&R) System, managed by the SEAI. This enhanced M&R system will provide important insights into which buildings are generating the most emissions and will help to prioritise and sequence capital investments for decarbonisation strategies across the sector.

This work will also be informed by an OPW report published in April 2022, following a commitment in CAP21, which examined how and when fossil fuel heating systems could be phased out of public buildings[43]. It proposed the following five-pillar approach to the decarbonisation of public sector buildings:

- Enabling measures to overcome barriers to renewable heat;
- No new fossil fuel-based heating systems in new buildings;
- Portfolio-based approach to replacing fossil fuels in existing buildings;
- Restrictions on leasing buildings with fossil fuel heating systems;
- Provision of funding for phased retrofit programmes.

42 Retrofit of social housing falls within the scope of the National Residential Retrofit Plan

43 https://assets.gov.ie/229236/557bf6fd-6734-4cba-8f23-edbf48c989f9.pdf

Guidance on Public Sector Bodies Climate Action Roadmaps, published by the SEAI, states that public sector organisations will discontinue the installation of heating systems that use fossil fuels after 2023, unless certain exemption criteria apply[44]. The phase-out of the use of fossil fuels in public buildings will require data gathering and upskilling of the relevant staff in public sector bodies. Public bodies will need to prepare Building Stock Plans that will set out how they intend to decarbonise their portfolio through a combination of new buildings construction, retrofit of existing buildings, and the management of leased properties.

The Public Sector Pathfinder Programme, administered by the SEAI, supports public sector organisations to deliver deep retrofit of their buildings and trial renewable heat solutions. The aim of the programme is, with its public sector partners, to improve the energy performance of various buildings throughout the public sector. This is helping to build capacity in the sector and provides an evidence base for larger-scale investments in the future. The programme also allows professionals and contractors to develop the skills necessary for retrofit. Learnings from the delivery of this programme can be leveraged by public sector bodies as they continue on their individual decarbonisation journeys.

Budget 2023 sets out supports for the installation of solar PV, including specific funding to provide for the installation of PV panels with an output of 6 kW in all schools. This scheme will be developed and commenced in 2023. The Minister for Education will open applications for a Climate Multi-Annual Summer Works Scheme for schools in 2023.

The Taskforce for the Built Environment will undertake a detailed assessment of the options available to support the delivery of the public sector's decarbonisation objectives, with a particular focus on incentivising early action by public sector bodies and achieving an enhanced level of activity. This taskforce will report to Government with conclusions and recommendations by Q3 2023 at the latest. The work programme will consider, among other options, the introduction of measures which will support public bodies that demonstrate leadership in decarbonising their operations and will hold those that fail to meet their targets to account.

14.3.3 Further Measures

The third carbon budget (2031-2035) is expected to require a continuation of the policies and measures outlined in the first and second carbon budget periods. It is relatively clear that the continued rollout of electrification, district heating and energy efficiency in all buildings will be required out to 2050. Additional potential policies to drive this activity may be required as follows:

- Minimum energy performance standards for all buildings in line with the EPBD;
- Policies and measures to ensure that Ireland has the necessary skilled workforce and supply chain capacity;
- Fiscal incentives or regulatory measures to increase the rate of retrofit of rented properties;
- Fiscal incentives to increase the number of dwellings retrofitted, or electrification, in line with or greater levels of retrofit activity by 2030;
- Phase-out of the installation of new fossil fuel boilers to increase the level of electrification or uptake of district heating networks;
- Fiscal incentives to increase the heat supplied from district heating network powered by zero-carbon energy sources or waste heat;
- Introduction of Whole Life Carbon declarations in accordance with the EPBD and CPR for

44 https://www.seai.ie/publications/Public_Sector_Bodies_Climate_Action_Roadmaps_Guidance.pdf

all new buildings over 2,000m^2, or lower floor area, if required;
- Fiscal incentives to increase the energy supplied with renewable gases;
- Mandatory installation of solar PV on all existing commercial and public buildings commencing with those with useful floor area greater than 250m^2;
- Increasing of standards for the policy to require all public buildings and buildings leased to public sector clients to have minimum energy performance standards and a minimum contribution of renewable sources for heating requirements (subject to specific sectoral operational requirements).

14.4 Actions

Tables 14.7 and 14.8 set out roadmaps of actions to 2025, and Table 14.9 specifically describes the actions for delivery in 2023.

Table 14.7 – Key Actions to Deliver Abatement in the Residential Sector for the Period 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
Standards and Regulations	Complete and publish review of cost-optimal performance requirements for Part L (Conservation of Fuel and Energy) of the Building Regulations	Development of regulations to effectively ban fossil fuel boilers in new non-residential and existing buildings undergoing major renovation where practical	Update energy efficiency standards for major renovations for new non-residential buildings to effectively ban fossil fuel boilers where practical
	Develop and publish roadmap, under auspices of Heat and Built Environment Delivery Taskforce, to phase out fossil fuel heating systems in all buildings	Commence implementation of Roadmap actions	Continue implementation of Roadmap actions
	Commence development of report on the split incentive for rental properties	Publication of split incentive report and commence implementation of recommendations	Co-ordination of the implementation of split incentive report recommendations
Residential Retrofit	**Pillar 1: Driving Demand and Activity**		
	Implement a national awareness and demand generation campaign for residential retrofit	Implement a national awareness and demand generation campaign for residential retrofit	Implement a national awareness and demand generation campaign for residential retrofit
	Provide a record budget allocation for SEAI residential and community retrofit schemes in 2023	Continue to implement SEAI schemes in line with budget allocation	Continue to implement SEAI schemes in line with budget allocation
	Expand the number of SEAI registered One Stop Shops	Expand the number of SEAI registered One Stop Shops	Expand the number of SEAI registered One Stop Shops

Measure	2023 Actions	2024 Actions	2025 Actions
Residential Retrofit	Ensure that SEAI supports for aggregated retrofit projects are available	Ensure that SEAI supports for aggregated retrofit projects are available	Ensure that SEAI supports for aggregated retrofit projects are available
	Utilise Sustainable Energy Communities to drive Community Activation	Utilise Sustainable Energy Communities to drive Community Activation	Utilise Sustainable Energy Communities to drive Community Activation
	Implement the Energy Efficiency Obligation Scheme	Implement the Energy Efficiency Obligation Scheme	Implement the Energy Efficiency Obligation Scheme
	Support those least able to afford to retrofit	Support those least able to afford to retrofit	Support those least able to afford to retrofit
	Continue rollout of Social Housing National Retrofitting programme with retrofitted properties to reach BER B2 or equivalent and incorporating heat pump deployment targets	Continue rollout of Social Housing National Retrofitting programme with retrofitted properties to reach BER B2 or equivalent and incorporating heat pump deployment targets	Continue rollout of Social Housing National Retrofitting programme with retrofitted properties to reach BER B2 or equivalent and incorporating heat pump deployment targets
	Pillar 2: Financing and Funding		
	Support the delivery of Low-Cost Finance for home retrofit to consumers	Support the delivery of Low-Cost Finance for home retrofit to consumers	Support the delivery of Low-Cost Finance for home retrofit to consumers
	Introduce a new tax incentive to encourage small-scale landlords to undertake retrofitting works while tenants remain in situ		
	Pillar 3: Supply Chain, Skills and Standards		
	Support the Heat Loss Indicator pilot study to incorporate up to 1,000 homes. Build capacity with the pilot to take this number of homes and meet market demand		
	Publish new Standards and Guidance Documents for retrofit		
	Increase the number of new registered retrofit providers and BER assessors	Increase the number of new registered retrofit providers and BER assessors	Increase the number of new registered retrofit providers and BER assessors
	Support and accelerate the design, development and implementation of apprenticeships meeting green skills needs for the future	Support and accelerate the design, development and implementation of apprenticeships meeting green skills needs for the future	Support and accelerate the design, development and implementation of apprenticeships meeting green skills needs for the future

Measure	2023 Actions	2024 Actions	2025 Actions
Residential Retrofit	Delivery of courses across six Centres of Excellence	Delivery of courses across six Centres of Excellence	Delivery of courses across six Centres of Excellence
	Host CPD programmes aimed at developing expertise for practising engineers in the area of Climate Action: Environmental Essentials for Engineering Projects and Retrofitting Domestic Buildings for Energy Efficiency	Host CPD programmes aimed at developing expertise for practising engineers in the area of Climate Action: Environmental Essentials for Engineering Projects and Retrofitting Domestic Buildings for Energy Efficiency	Host CPD programmes aimed at developing expertise for practising engineers in the area of Climate Action: Environmental Essentials for Engineering Projects and Retrofitting Domestic Buildings for Energy Efficiency
	Help to address the split incentive issue for rental properties	Help to address the split incentive issue for rental properties	Help to address the split incentive issue for rental properties
	Introduce measures to encourage the growth of the supply chain	Introduce measures to encourage the growth of the supply chain	Introduce measures to encourage the growth of the supply chain
	Pillar 4: Structures and Governance		
	Further develop and resource the SEAI as the National Retrofit Delivery Body	Further develop and resource the SEAI as the National Retrofit Delivery Body	Further develop and resource the SEAI as the National Retrofit Delivery Body
	Develop implementation plan for the Heat and Built Environment Delivery Taskforce	Implement recommendations from the Heat and Built Environment Delivery Taskforce	Implement recommendations from the Heat and Built Environment Delivery Taskforce
	Enhance the monitoring and reporting of the progress on, and effect of, home retrofit	Enhance the monitoring and reporting of the progress on, and effect of, home retrofit	Enhance the monitoring and reporting of the progress on, and effect of, home retrofit
	Provide Local Authorities with the supports necessary for them to take an exemplar role in residential retrofit	Provide Local Authorities with the supports necessary for them to take an exemplar role in residential retrofit	Provide Local Authorities with the supports necessary for them to take an exemplar role in residential retrofit
Decarbonisation of Residential Heating	Publish a National Heat Policy Statement	Implement National Heat Policy Statement	Implement National Heat Policy Statement
	District Heating		
	Accelerate delivery of existing schemes under consideration and in development, including the Dublin District Heating Scheme	Commence spatial planning of decarbonisation solutions	Implementation of spatial decarbonisation plans
	Implement recommendations of District Heating Steering Group report in accordance with implementation timetable	Continued development of district heating sector in accordance with District Heating Steering Group recommendations	Continued development of district heating sector in accordance with District Heating Steering Group recommendations
Decarbonisation of Residential Heating	**Geothermal**		
	Publish Geothermal Policy Statement	Implement Geothermal Policy Statement	Implement Geothermal Policy Statement

Table 14.8 – Key Actions to Deliver Abatement in the Commercial/Public Sector for the Period 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
Standards and Regulations	Promote the statutory requirement for installation of building automation systems with a heating/cooling load greater than 290 kW	Continue to promote the statutory requirement for installation of building automation systems with a heating/cooling load greater than 290 kW	Building automation systems in operation in buildings with a heating/cooling load greater than 290 kW
Commercial Sector	Develop a detailed roadmap for long-term decarbonisation of the commercial sector, including requirements arising from recast EU legislation, with specific actions to be published in Climate Action Plan 2024	Publish guidance documentation on retrofitting commercial buildings, building on existing retrofit publications in the built environment	
Public Sector	**Public Sector Building Stock Plans**		
	Public sector bodies to collate relevant information on their building stock that will inform the development of Building Stock Plans, as per the Public Sector Climate Action Mandate	Public Sector Building Stock Plans and data-gathering	Public Sector Bodies to prepare for the Transposition of the EPBD and EED using their Building Stock Plans
	Public Sector Retrofit		
	Roll out approach to cost-effectively retrofitting of the public sector building stock as part of the Pathfinder Programme	Continue the retrofit of public sector buildings and roll out an approach to the cost-effective retrofit of public sector buildings	Expansion of Public Sector Pathfinder Programme
	Expansion of retrofit in the Education, and Further and Higher Education Sectors	Expansion of retrofit in the Education, and Further and Higher Education Sectors	Expansion of retrofit in the Education, and Further and Higher Education Sectors
	Construct two exemplar public sector buildings using alternative construction techniques and materials, and monitor performance	Integrate learnings from exemplar buildings into new projects	Integrate learnings from exemplar buildings into new projects

Measure	2023 Actions	2024 Actions	2025 Actions
Adaptation	Develop specific climate maps and weather files for use in building design to enhance resilience in support of climate change adaptation		
	Carry out a condition assessment of a sample of heritage sites/ properties in public ownership to establish a baseline for heritage resources	Develop a coordinated approach to vulnerability assessment of heritage sites to support Local Authorities and other sectors	Compile statistics relating to climate change impacts on heritage sites
	Publish a review of relevant sources and a general training template that addresses specific actions and objectives of the Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage for Local Authority staff	Develop and publish guidelines/ recommendations on increasing the resilience of heritage resources to current and future climate conditions, for use by Local Authorities	
	Develop a Memorandum of Understanding with the SEAI on issues relating to climate action and historic/traditional buildings	Assess existing communication gaps and strategy for public engagement together with a report published on public engagement activities initiated/ facilitated by the heritage sector	

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex. Delivery will be kept under constant review with further policies, measures and actions brought forward to address any failure or projected failure as required, including as part of the annual update of the Climate Action Plan.

Table 14.9 – 2023 Actions

Action Number	2023 Action
BE/23/1	Complete and publish review of cost optimal performance requirements for Part L (Conservation of Fuel and Energy) of the Building Regulations
BE/23/2	Develop and publish a roadmap, under the auspices of Heat and Built Environment Delivery Taskforce, to phase out fossil fuel heating systems in all buildings
BE/23/3	Commence development of a report on the split incentive for rental properties
BE/23/4	Implement a national awareness and demand generation campaign for residential retrofit
BE/23/5	Provide a record budget allocation for the SEAI residential and community retrofit schemes in 2023
BE/23/6	Expand the number of SEAI registered One Stop Shops
BE/23/7	Ensure that SEAI supports for aggregated retrofit projects are available
BE/23/8	Utilise Sustainable Energy Communities to drive community activation

BE/23/9	Implement the Energy Efficiency Obligation Scheme
BE/23/10	Support those least able to afford to retrofit
BE/23/11	Continue rollout of the Social Housing National Retrofitting Programme with retrofitted properties to reach BER B2 or equivalent and incorporating heat pump deployment targets
BE/23/12	Support the delivery of low-cost finance for home retrofit to consumers
BE/23/13	Introduce a new tax incentive to encourage small-scale landlords to undertake retrofitting works while tenants remain in situ
BE/23/14	Support the Heat Loss Indicator pilot study to incorporate up to 1,000 homes. Build capacity with pilot to take this number of homes and meet market demand
BE/23/15	Publish new standards and guidance documents for retrofit
BE/23/16	Increase the number of new registered retrofit providers and BER assessors
BE/23/17	Support and accelerate the design, development and implementation of apprenticeships meeting green skills needs for the future
BE/23/18	Delivery of courses across six Centres of Excellence
BE/23/19	Host CPD programmes aimed at developing expertise for practising engineers in the area of climate action: Environmental Essentials for Engineering Projects and Retrofitting Domestic Buildings for Energy Efficiency
BE/23/20	Help to address the split incentive issue for rental properties
BE/23/21	Introduce measures to encourage the growth of the supply chain
BE/23/22	Further develop and resource the SEAI as the National Retrofit Delivery Body
BE/23/23	Develop an implementation plan for the Heat and Built Environment Delivery Taskforce
BE/23/24	Enhance the monitoring and reporting of the progress on, and effect of, home retrofit
BE/23/25	Provide Local Authorities with the supports necessary for them to take an exemplar role in residential retrofit
BE/23/26	Publish a National Heat Policy Statement
BE/23/27	Accelerate delivery of existing schemes under consideration and in development, including the Dublin District Heating Scheme
BE/23/28	Implement recommendations of District Heating Steering Group report, in accordance with implementation timetable
BE/23/29	Publish Geothermal Policy Statement
BE/23/30	Develop a detailed roadmap for long-term decarbonisation of the commercial sector, including requirements arising from recast EU legislation, with specific actions to be published in Climate Action Plan 2024
BE/23/31	Promote the statutory requirement for the installation of building automation systems with a heating/cooling load greater than 290 kW
BE/23/32	Public sector bodies to collate relevant information on their building stock that will inform the development of Building Stock Plans, as per the Public Sector Climate Action Mandate
BE/23/33	Roll out approach to cost-effectively retrofitting public sector building stock as part of the Pathfinder Programme
BE/23/34	Expansion of Retrofit in the Education, and Further and Higher Education Sectors
BE/23/35	Construct two exemplar public sector buildings using alternative construction techniques and materials, and monitor performance
BE/23/36	Develop specific climate maps and weather files for use in building design to enhance resilience in support of climate change adaptation

BE/23/37	Carry out a condition assessment of a sample of heritage sites/properties in public ownership to establish a baseline for heritage resources
BE/23/38	Publish a review of relevant sources and a general training template that addresses specific actions and objectives of the Climate Change Sectoral Adaptation Plan for Built and Archaeological Heritage for Local Authority staff
BE/23/39	Develop a Memorandum of Understanding with the SEAI on issues relating to climate action and historic/traditional buildings

15 Transport

15. Transport

Key Messages

Sectoral Emission Ceilings

- Carbon Budget 1: 54 $MtCO_2eq$.
- Carbon Budget 2: 37 $MtCO_2eq$.
- Emissions Abatement (on 2018): 50%
- Emissions up to 2021: 10.9 $MtCO_2eq$.

Trends in the Sector

- The constraints on travel in 2020 as a result of COVID-19 resulted in transport sector emissions levels falling to 10.3 Mt CO_2eq., relative to its 12.2 Mt CO_2eq. emissions baseline. 2021 saw a 6.1% increase in emissions over 2020 levels, largely driven by the cessation of public health restrictions that had artificially reduced transport demand
- 20.2% of the first sectoral carbon budget was expended in 2021. While this level is consistent with the sector being compliant with its carbon budget to 2025, a further increase in transport emissions is expected in 2022. Though not yet at risk of a projected failure to comply with its sectoral emissions ceiling, the need to substantially accelerate transport emissions abatement is clear
- This update to the 2021 Climate Action Plan (CAP21) transport decarbonisation pathway has been informed by two core analyses of the Irish transport system undertaken over the past year: the Organisation for Economic Co-operation and Development's (OECD) Redesigning Irish Transport review, undertaken at the request of the Climate Change Advisory Council; and refreshed transport decarbonisation pathway modelling, undertaken by the National Transport Authority's modelling team and the Department of Transport

Targets

- Meeting our 2030 transport abatement targets will require transformational change and accelerated action across all key decarbonisation channels. The key performance indictors provided in Table 15.6 illustrate the level of change required
- CAP21 targets have been revised to meet this higher level of ambition, including a 20% reduction in total vehicle kilometres, a reduction in fuel usage, and significant increases to sustainable transport trips and modal share
- Fleet electrification and use of biofuels will continue to provide the greatest share of emissions abatement in the medium term, and vehicle targets, while unchanged, have been reframed as a percentage share of total fleet and new registrations, to better embed our vehicle strategy within our wider Sustainable Mobility Policy

Measures and Actions

- In recognition of the OECD report's findings that the Irish transport system embeds car-dependency and increased emissions by design, the Avoid-Shift-Improve framework for transport sustainability has been applied to categorise all actions, emphasising the crucial role of spatial and land-use planning in designing transport systems that can support our net-zero ambition
- Key policies and strategies that will support the sector's decarbonisation have been identified, and all the main work programmes and high impact actions are summarised in Table 15.7

15.1. State of Play

The emissions ceilings for transport agreed by Government set the required level of abatement to be achieved at the maximum of the range previously set out in CAP21, i.e., 50%. The tables below set out the challenge in quantitative terms.

Table 15.1 – Transport GHG Emissions 2021[45]

Transport Emissions ($MtCO_2eq.$)	Share of Total GHG Emissions	Transport Emissions tCO_2 per capita
10.9	15.7%	2.1

Table 15.2 – Required Level of Decarbonisation for Transport for Carbon Budgets 1 and 2

Sectoral Carbon Budget 2021 to 2025 Mt $CO_2eq.$	Cumulative Emissions to 2021	Remaining Sectoral Carbon Budget 2021 to 2025 Mt $CO_2eq.$	Sectoral Carbon Budget 2026 to 2030 Mt $CO_2eq.$
54	10.9	43.1	37

Table 15.3 – Required Level of Decarbonisation for Transport

2018 Emissions Mt $CO_2eq.$	Indicative Target for 2025 Emissions Mt $CO_2eq.$	Indicative Target % Reduction for 2025	2021 Emissions Mt $CO_2eq.$	% Increase (+) / Reduction (-) to date
12.2	10	20%	10.9 Mt	-11

In setting sectoral emissions ceilings, Government recognises that the scale of systems and behavioural change required is transformational and unprecedented. The transport sector presents a unique set of challenges:

- Travel preferences are deeply embedded through settlement patterns, policies, and mindsets, which favour private car usage over more sustainable transport modes. There is also a clear correspondence between travel demand and economic and demographic growth. Systemic change is required at many levels as summarised in Box. 15.1;
- Dispersed and low-density development has led to high levels of transport poverty in certain regions and for certain cohorts of society. This is a particular, although not unique, challenge to rural communities;
- There are significant lead-in times associated with the delivery of major transport infrastructure and the rollout of additional public transport services, often hindered further by delays arising from protracted consultation processes; resource, capacity and capability constraints (e.g., skills shortages); planning; administrative and legal delays; and the complexity and technical aspects involved in the design and detailed implementation of schemes;
- Public acceptance, supported by broad political support nationally and locally, is vital to deliver the scale of behavioural change required. Demonstrating and communicating the wider societal benefits (e.g., health, air quality, reduced noise pollution, and improved place-making) will form part of a compelling public engagement strategy;
- Governance and oversight across all relevant policies and action plans impacting transport

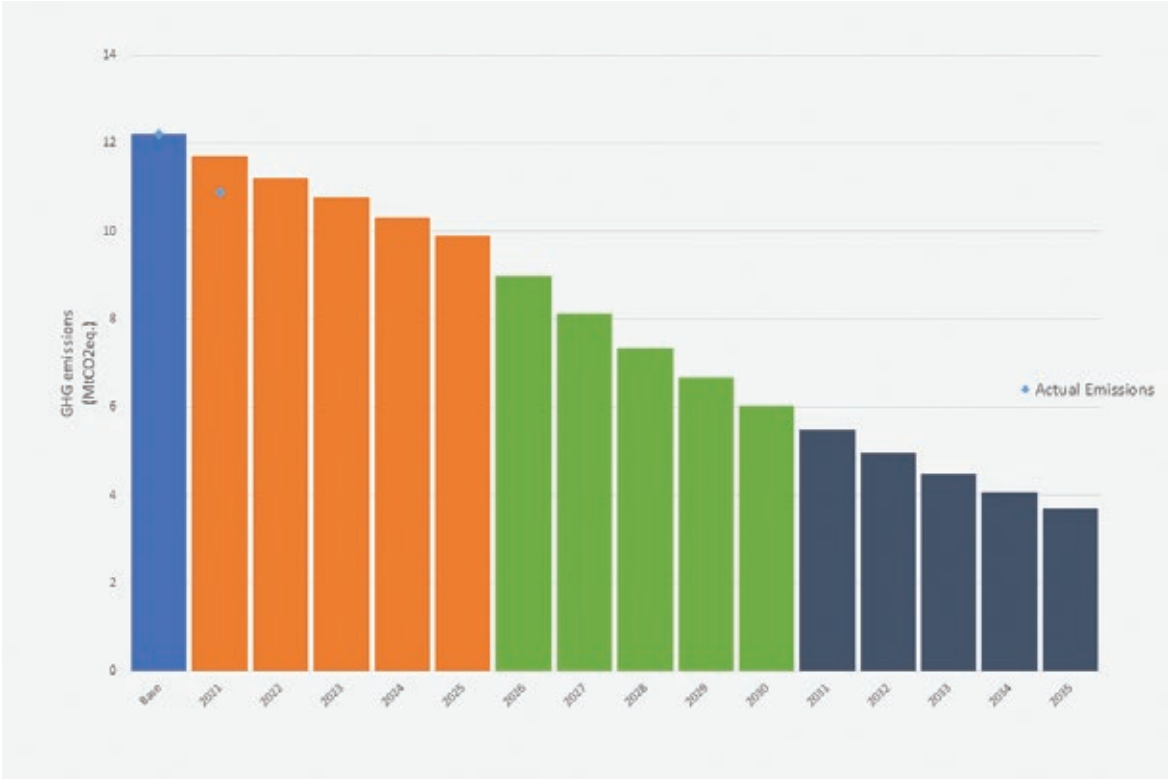
45 EPA data.

decarbonisation, particularly at Local Authority level, will be important in focusing resources on measures that will deliver the greatest impact.

Figure 15.1 – Indicative decarbonisation pathway for the transport sector that is consistent with the agreed sectoral emissions ceilings:

- 2021 – 2025: carbon budget of 54 Mt CO2eq., emissions reduction of 4.1% per annum;
- 2026 – 2030: carbon budget of 37 Mt CO2eq., emissions reduction of 9.4% per annum;
- 2031 – 2035 - indicative only.

Also shown (diamonds), actual EPA-reported emissions data for 2018 and 2021. The imperative for early interventions to ensure the sector's ability to comply with the agreed carbon budgets is clear.



Box 15.1 – OECD Redesigning Ireland's Transport for Net Zero: towards systems that work for people and the planet.

Transport Strategies for Net Zero

A recently published report undertaken by the OECD and the Irish Climate Change Advisory Council, 'Redesigning Ireland's Transport for Net Zero: towards systems that work for people and the planet', which viewed the Irish Transport system through a systems innovation and well-being lens has determined that:

1. The Irish transport system fosters growing car use and emissions by design, and is thus unfit to enable the country to meet its greenhouse gas reduction goals while improving well-being.
2. Aiming at decarbonising the system via private vehicle improvements is unlikely to lead to substantially different patterns of behaviour, rapid emissions reductions, and large well-being improvements.
3. Implemented policies and those expected to bring the highest emission reduction shares according to Ireland's Climate Action Plan 2021 are unlikely to help the country transform its car-dependent system.
4. Ireland could unleash enormous opportunities by prioritising policies with a high potential for transforming its car-dependent system.
5. Policies with a high transformative potential include road space reallocation, the mainstreaming of on-demand shared services and communication efforts to address car-centric mindsets.

Key recommendations of report:

1. Redefine the goal of the transport system as sustainable accessibility in order to challenge ingrained mindsets and shift away from identifying high mobility, in terms of reduced travel time, with well-being.
2. Prioritise the up-scaling of policies with high potential to transform car-dependent systems.
3. Redefine the electrification strategy to support the transition towards a sustainable transport system.
4. Embrace a systemic approach to policy decision-making across government departments.

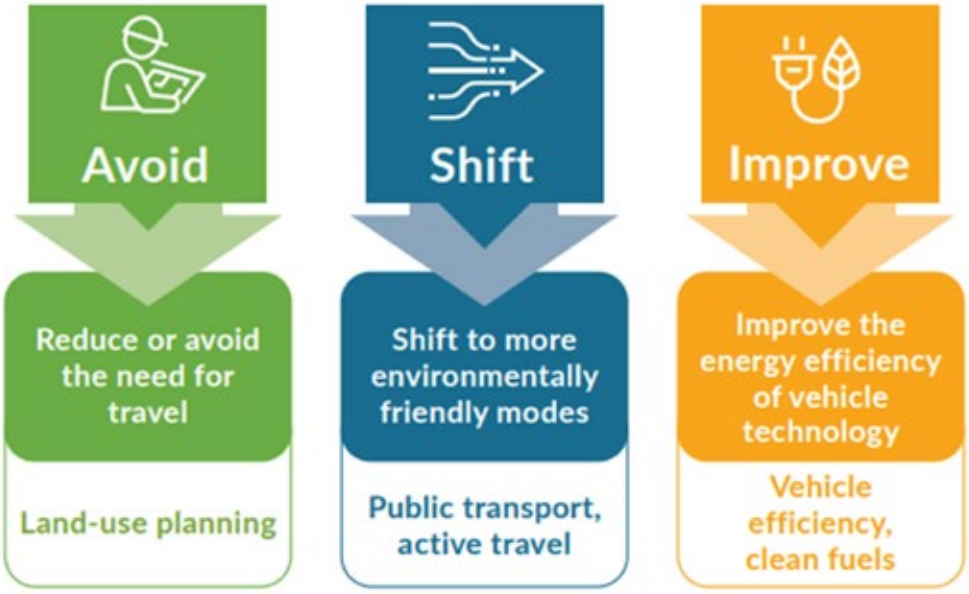
This transport chapter will be guided by five key principles, which will be embedded across the measures identified under Section 15.3.:

1. Systems innovation;
2. Just transition;
3. Accelerated implementation;
4. Communication and citizen engagement;
5. Enhanced governance, particularly at local authority level.

A net-zero decarbonisation pathway for transport must seek to reduce demand, through mechanisms that lessen or avoid the need for unnecessary travel by unsustainable means. This Climate Action Plan reframes the previous pathway outlined in CAP21 under the Avoid-Shift-Improve Framework.

15.1.1 Avoid - Shift - Improve Framework

The Avoid-Shift-Improve approach to transport decarbonisation (below) is a hierarchical framework that prioritises actions to achieve the systemic and behavioural change needed.



Avoid measures aim to reduce or avoid the need for travel through enhanced spatial planning. Integrated transport and spatial planning are critical for reducing our greenhouse gas (GHG) emissions and will bring significant co-benefits – promoting safer, low-carbon, and more people-focused transport, and ensuring long-term transport sustainability.

Shift measures encourage modal shift to more sustainable modes of transport. These measures can also include those which reduce the private car 'competitive advantage' by installing bus-gates, and the reclamation of road-space currently.

Improve measures typically refer to technology-based measures that improve the GHG efficiency of residual vehicle-based transport or the efficiency of the network itself. While less directly transformative than avoid and shift measures in terms of behaviour, fleet electrification and biofuels will continue to play a pivotal role in decarbonising transport, particularly for populations living in more isolated areas.

15.2. Targets and 2025 and 2030 KPIs

15.2.1 Vision

Transformative behavioural and systemic change will be required to achieve our emissions abatement ambition in transport, not just for 2030 but also for 2050. These changes will improve public and personal 'well-being', providing a positive and compelling impetus to act.

Building on the OECD's 'well-being lens' approach to the design of net-zero transport strategies, the National Sustainable Mobility Policy (SMP) vision captures this broader concept of a future transport system that will enhance societal well-being as well as reducing GHG emissions.

To connect people and places with sustainable mobility that is safe, green, accessible and efficient.

The Government recognises that there are costs associated with change. The concept of 'transport poverty' needs to form part of a just transition for transport. Communities living in certain areas can be 'locked-in' to car ownership.

Several actions aim to address transport poverty including the expansion of the National Transport Authority's (NTA) Connecting Ireland Rural Mobility Programme. For many, however, the car will remain the dominant mode of transport and the appropriate solution will be to improve the GHG efficiency of vehicle-based transport and the efficiency of the network itself.

Based on this vision, and applying the Avoid-Shift-Improve framework, a series of highly challenging, outcome-focused indicators are set out for 2025 and 2030 below.

To meet the required level of emissions reduction, by 2025 we will:

- Enable the transition of a significant part of the vehicle fleet to electric;
- Regulate for higher biofuel blends in existing technologies as a vital transitionary measure;
- Drive implementation and acceleration of identified measures to reduce car kilometres, guided by the SMP action plan and a new National Demand Management Strategy;
- Communicate and demonstrate the well-being and co-benefits that accompany enhanced place-making and sustainable transport behaviour;
- Expand the number of safe, accessible, walking and cycling routes, including through the provision of 500 Safe Routes to School schemes and the rollout of over 1,000 kilometres in active travel infrastructure;
- Work with key stakeholders to implement the National Planning Framework (NPF), focusing on improving placemaking and accessibility;
- Enhance the integration of sustainable transport considerations into the spatial planning system;
- Improve air quality, particularly through the transition of our vehicle fleets along with reduced car dependency.

To meet the required level of emissions reduction, by 2030 we will continue to develop many of the measures initiated in 2025 while we will also:

- Address transport poverty through the Connecting Ireland programme and by prioritising public transport projects and demand responsive services that enhance regional and rural connectivity;
- Communicate the benefits of a shift away from private car usage and facilitate the provision of the required infrastructure and services to bring about a very significant modal shift to public transport and active travel, and away from car journeys (internal combustion engine and electric vehicle (EV));
- Ensure that all new car registrations are EVs;
- Shift a significant proportion of new freight vehicle registrations to zero-emission.

15.2.2 Recalibration of the Decarbonisation Pathway for Transport

The NTA modelling team has undertaken a significant programme of work to refresh, revalidate and recalibrate the decarbonisation pathway that was developed for CAP21. This identified additional measures to close the 'gap' to delivering 50% emissions abatement by 2030.

The modelling provides a pathway to 50% emissions abatement that is based on technology improvements; the introduction of zero (tailpipe) emissions vehicles and increases in biofuel blends; large-scale improvements in the availability and attractiveness of sustainable alternatives; and demand management measures, which include the potential for increasing fossil fuel prices on a polluter pays principle as a measure to reduce the frequency and length of fossil-fuelled vehicle trips.

The range of measures modelled includes known public transport schemes as set out in the National Development Plan (NDP); further acceleration of road space reallocation towards public and active travel modes; car-free urban centres; increased parking constraints (including measures to remove incentives/subsidies for workplace car parking); continued remote and flexible working; the introduction of congestion charging in cities; and speed limit reductions on the national road network.

The associated service enhancements in terms of frequency, pricing and capacity are significant and aim to ensure public transport can compete favourably against the car. These enhancements are not costed as part of the model and will require detailed design in each case.

The expected levels of emissions change to 2025 and 2030 based on the modelling are presented in Tables 15.4 and 15.5 below and referenced in Table 15.6.

The modelling assumptions are not agreed policy measures. However, they provide a series of specific interventions, which, based on the parameters of the model, demonstrate that the required reduction in sectoral emissions can be achieved.

Box 15.2 – Transport Decarbonisation Pathway: Modelling Recalibration

Transport Decarbonisation Pathway: Modelling Recalibration

The recalibrated decarbonisation pathway has been developed using the NTA's Regional Modelling System which provides robust estimates of the travel responses to potential interventions and policy measures and is supplemented by a Carbon Footprinting Tool developed from a detailed inventory of energy use in transport, the National Household Travel Survey and other transport databases, and a detailed profile of the Irish car fleet. Together, these three tools forecast the combined impact of vehicle fleet electrification, biofuel usage, behavioural change measures, and speed limit changes on transport emissions.

The resulting modelled pathway comprises a potential basket of measures that can collectively achieve a 50% reduction, grouping measures in four broad packages:

- Promoting Behavioural Change by incentivising more sustainable forms of travel, including through interventions such as road-space reallocation, and expanding car-free urban core centres; improvements to school transport options and modes; and complementary measures that help to reduce the need to travel.
- Improvements to Public Transport Availability and Competitiveness by increasing the availability of rural transport and inter-urban connections; ramping-up the frequency and reliability of public transport through priority infrastructure and better integration of services; and reducing public transport fares (the modelled scenario considered a 50% reduction relative to 2018 prices).
- Disincentivising Private Vehicle Use through such measures as the removal of free workplace parking; minimum parking charges introduced in all urban areas and application of congestion charges for journeys across marked cordons. Consideration will also be given to implementing an increase in fuel costs (modelled as an increase of 65% by 2030 relative to 2018 prices, incorporating already planned carbon tax increases) if other measures are not deemed successful.
- Harnessing the Potential of New Technology to support the decarbonisation of transport, including through electrification, increased biofuel blending, vehicle technology improvements, and the use of open data for mobility services.

Modelling assumptions are not agreed policy measures. The modelling framework described above simulates many of the interventions in terms of delivering behavioural change as a function of the relative attractiveness of car versus other modes in terms of generalised cost. For that reason, it places particular emphasis on those interventions that impact cost and travel times directly (e.g., fuel input costs). In certain cases, there may be non-fiscal interventions that can achieve the same objectives. While the modelling provides a high degree of specificity in terms of the impacts from a carbon emissions perspective, it does not provide detailed design of the specific interventions or policies involved. This Climate Action Plan includes further actions in respect of progressing detailed policy development and scheme design. The model is kept under constant review.

Table 15.4 – Expected Levels of Emissions Change to 2025

Modelled Growth/Reduction in Emissions	Car	HGV	LGV	PT	Other	Total (Mt CO_2eq.)
Demographic Growth	0.04	0.48	- 0.08	- 0.01	0.34	0.77
Sustainable Transport and Behavioural Change	- 0.36	- 0.21	- 0.06	-	- 0.09	- 0.72
Electrification and Vehicle Technology	- 1.33	-	- 0.10	- 0.17	- 0.36	- 1.96
Biofuels	- 0.22	- 0.14	- 0.04	- 0.02	- 0.11	- 0.53
Total	- 1.87	0.14	- 0.28	- 0.19	- 0.23	- 2.45

Table 15.5 – Expected Levels of Emissions Change to 2030

Modelled Growth / Reduction in Emissions	Car	HGV	LGV	PT	Other	Total (Mt CO_2eq.)
Demographic Growth	0.62	0.73	0.01	- 0.01	0.48	1.84
Sustainable Transport and Behavioural Change	- 1.06	- 0.27	- 0.08	-	- 0.68	- 2.09
Electrification and Vehicle Technology	- 2.99	- 0.29	- 0.22	- 0.38	- 0.86	- 4.74
Biofuels	- 0.36	- 0.36	- 0.11	- 0.02	- 0.24	- 1.08
Total	- 3.79	- 0.19	- 0.40	- 0.41	- 1.30	- 6.08

The remainder of this chapter sets out the immediate policy interventions required to deliver on this pathway, some of which are already underway and some of which will need to be developed.

Table 15.6 – Key Metrics to Deliver Abatement in the Transport Sector

Theme	2025 Abatement/KPI	2030 Abatement/KPI
Avoid (encompassing a range of behavioural change and sustainable transport measures)		
	Total abatement -0.72 $MtCO_2eq$.	**Total abatement -2.09 $MtCO_2eq$.**
Vehicle Kilometres	n/a	20% reduction in total vehicle kms 20% reduction in total car kms 20% reduction in 'commuting' car kms
Fuel Usage		50% reduction in fuel usage
Shift (encompassing a range of behavioural change and sustainable transport measures)		
	Total abatement -0.72 $MtCO_2eq$.	**Total abatement -2.09 $MtCO_2eq$.**
Sustainable Transport Trips	• Additional 125,000 sustainable journeys • Roll-out of sustainable demand management measures informed by National Demand Strategy • Delivery of Pathfinder Programmes	• 50% increase in daily active travel journeys • 130% increase in daily public transport journeys. • 25% reduction in daily car journeys.
Daily Journeys Modal Share		• Shift in Daily Mode Share 2018: 72% (car), 8% (PT), 20% (AT) 2030: 53% (car), 19% (PT), 28% (AT)
Escort to Education Journeys		• 30% shift of all E-to-E car journeys to sustainable modes
Improve		
	Total abatement –1.96 $MtCO_2eq$.	**Total abatement –4.74 $MtCO_2eq$.**
Fleet Electrification	• 175,000 passenger EVs • 20,000 commercial vans • 700 low-emission HGV • 300 EV buses in PSO bus fleet • Expansion of electrified rail services	**Private Car Fleet** EV share of total passenger car fleet (30%) EV share of new registrations (100%) 845,000 Private EVs[46] **Commercial Fleet** 20% EV share of total LGV fleet. 95,000 commercial EVs 30% ZE share of new heavy duty vehicle registrations 3,500 HGVs **PT Services** 1,500 EV buses in PSO bus fleet; Expansion of electrified rail services.
	Total abatement –0.53 $MtCO_2eq$	**Total abatement –1.08 $MtCO_2eq$**
Biofuels Blend Rate	E10:B12	E10:B20

46 Private car EV targets will be kept under review and may be subject to recalculation pending further work to assess the abatement potential of e-bikes in transport modelling.

15.3 Measures to Deliver Sectoral Emissions Ceilings

This section describes the high-level measures and actions required to deliver the sectoral emissions targets for transport - categorised as Horizontal, Avoid, Shift, and Improve.

15.3.1 Horizontal

Engaging the Citizen on Climate Action and Sustainable Mobility

Achieving a shift to transport modes with zero- or low-carbon emissions, such as active travel (walking and cycling) and public transport, will require unprecedented levels of public buy-in and engagement. There is a need for a strong, Government-led communications campaign, using clear messaging, firstly to raise awareness about the systemic changes in public and active travel that are already taking place, and secondly, encouraging behavioural change wherever possible. This will mean new ways to communicate the climate, well-being, and the other benefits of a widespread shift from private car dependency to sustainable mobility.

We will develop a targeted communications strategy to promote action being taken by Government, and the citizen's role, in climate action in the transport sector. The strategy will seek to engage and motivate the citizen to make sustainable travel choices, supported by robust research. The effectiveness of regulatory measures relating to advertising will also be considered

As well as motivating individuals to make a shift in how they travel, the strategy will clearly communicate Government measures and policies to support the changes needed and seek to facilitate greater public acceptance of the various developments and infrastructural projects required to support these objectives.

Accelerating Implementation

In May 2022, a Leadership Group, comprising senior level decision-makers, was established to oversee and drive implementation of the SMP.

This Group is looking to practical models for accelerating delivery in the transport domain. In October 2022, the Group approved the SMP Pathfinder Programme detailed in Box 15.3. It has also completed an in-depth analysis of the delays and barriers common to the implementation of infrastructural and sustainable mobility projects, with a view to developing solutions and mitigations. The output of this work is being fed into the review of the Planning and Development Acts; a review by the Department of Transport (DoT) of the Transport Appraisal Framework under the Public Spending Code; and an overall review of the Public Spending Code.

The programme of review and update of transport appraisal guidance recognises several common challenges internationally with fully reflecting the costs and benefits of climate change, and other key impacts such as the impact of a scheme on accessibility, which are difficult to monetise within existing cost-benefit analysis methodologies.

In addition to better reflecting a scheme's alignment with the strategic investment priorities and hierarchies set out in the National Investment Framework for Transport in Ireland (NIFTI), the DoT will update its transport appraisal processes to provide decision-makers with a broader set of information about a scheme's potential climate, social and environmental impacts, while maintaining a strong focus on value for money as required under the Public Spending Code.

The sectoral emissions ceilings for transport require transport planning and appraisal to prioritise

interventions in line with the SMP:

- avoiding stimulating or facilitating increased GHG emissions from transport, especially over the next 20 years;
- supporting a shift to active travel and public transport, including by the reallocation of road space;
- the maintenance of existing transport infrastructure;
- the adaptation and resilience of existing, redesigned, and new transport infrastructure to the impacts of climate change.

Transport infrastructure decisions and the revised appraisal processes will give effect to these priorities.

Separately, as outlined in Chapter 10, the public sector will lead by example, embedding climate action as a central value and objective across all organisations in the sector, and play an important leadership role as a catalyst for ambitious climate action across all sectors, including transport.

Box 15.3 – Ireland's SMP Pathfinder Programme

Ireland's SMP Pathfinder Programme

The National Sustainable Mobility Policy creates a strategic framework for supporting active travel and public transport use in Ireland up to 2030. The policy will also lay the foundations for the required system change in transport that will help achieve net-zero emissions by 2050.

A Leadership Group oversees the delivery of the policy's actions and targets; it has established a SMP Delivery Team to identify 'pathfinder' projects that demonstrate the opportunities from sustainable mobility interventions and build capacity for accelerated replication and scaling-up.

The SMP Pathfinder Programme includes 35 projects and activities in 19 counties, with a strong emphasis on experimental and innovative approaches, to be delivered at pace (by 2025). Many of the projects will incorporate aspects of road space reallocation, shared mobility, rural community-based transport solutions, behavioural change, and communications. They will also meet key criteria on issues such as health, well-being, place-making, permeability, and universal design.

Enhanced Governance

The DoT is developing a Project Management Office (PMO) to oversee delivery of the SMP action plan. This will include a detailed implementation plan with critical path analysis for all high impact actions, overseen by the SMP Leadership Group. The lessons from this will be applied to wider management and governance of the transport aspects of the Climate Action Plan to ensure a more integrated and uniform approach to governance and delivery.

The role of Local Authorities is critical to delivery of climate action. Transport will feature strongly in the new guidelines for Local Authority Climate Action Plans. In order to support the transport objectives in this Climate Action Plan, Local Authorities will need to take account of sustainable accessibility and connectivity in all plan-making and consenting decisions. This is of particular importance for proposed new developments, where the reinforcement of unsustainable travel practices can be addressed at the planning and design stage. These considerations should be

applied throughout the relevant planning processes – from Development Plans to Area-based Plans – and including individual development consents, to ensure sustainable accessibility is embedded by design, wherever possible.

15.3.2 Avoid

Enhanced Spatial and Land Use Planning – Enabling Systems Change

Decades of focus on dispersal of residential settlements, commercial zones, and workplaces in peripheral areas, instead of concentrating on central areas and locations served by public transport, has led to an over-reliance on the private car. To deliver systems change, policy measures aimed at better aligned transport and spatial and land use planning are critical. Policies already in place in this context are the NPF, Housing for All (HfA) and Town Centres First (TCF), and a number of relevant actions are already reflected in the SMP. Embedding transport-oriented development at all stages of planning and development is key, particularly the siting of services and multi-use development at transport nodes.

While governance for these policies remains with the Department of Housing, Local Government and Heritage (DHLGH), the Regional Assemblies, and Local Authorities, it is proposed to capture relevant actions as part of the implementation plan for the SMP to ensure visibility and improve system effectiveness and integration.

Quality of life is key to attracting people to live in compact cities, towns and villages, and place-making is therefore central to both HfA and TCF. The Urban Regeneration Development Fund (URDF) provides €2 billion out to 2027 for a range of projects to support more compact and sustainable development in Ireland's five cities and other large towns. The interaction between URDF and active travel funding, along with other relevant funding programmes, presents an opportunity to maximise the overall well-being benefits as well as managing travel demand.

Accessibility requires the creation of permeable paths and street networks that allow users to move through an area directly and via many different routes. The Design Manual for Urban Roads and Streets (DMURS) highlights how the prioritisation of private vehicle movement has resulted in a legacy of street environments that are hostile to pedestrians/cyclists. The DHLGH and the DoT will continue to work closely to ensure widespread and consistent implementation of DMURS. The NTA will continue to support Local Authorities in retrospectively addressing these legacy issues. The recently launched SMP Pathfinder Programme includes initiatives to identify and tackle gaps in education, training and communication.

The availability and price of car parking also plays a major role in people's choice to use a car, and impacts not only on climate emissions, but also on traffic congestion and the efficient operation of urban areas. The quantum, pricing and form of parking needs to be managed carefully so as to favour sustainable modes over car usage.

The NPF recommends that there should generally be no car parking requirement for new development in or near the centres of the five cities, and a significantly reduced requirement in the inner suburbs of all five.

The Sustainable Urban Housing: Design Standards for New Apartments (DHLGH, 2020) require planning authorities to have regard to circumstances under which parking can be minimised, substantially reduced or wholly eliminated.

Broadly speaking, planning authorities should not require specific minimum levels of car parking with the exception of disabled parking. At locations with good public transport, maximum levels for car parking provision should be applied. Issues relating to the quantum and form of parking will be addressed further in the forthcoming Sustainable Compact Settlement Guidelines and other relevant guidelines which are subject to future review.

In addition, public authorities should transition towards market pricing of car parking which they provide to avoid subsidising car use.

Public authorities should work towards a reduction of on-street car parking spaces where it complements measures to prioritise active travel and public transport and to improve the public realm.

Strategic Transport Planning - Systems Change in Practice

Integrated land-use planning and transport planning in the cities will also be led through the Metropolitan Area Transport Strategies (MATS), which set out programmes of proposed transport investment in active travel, bus and rail for each city over a 20-year period.

Outside the Greater Dublin Area, the MATS are currently non-statutory plans developed by the NTA in co-operation with the relevant Local Authorities and other Agencies. Under the SMP, there is an explicit action to bring forward legislation to extend the remit of the NTA to all cities, which will bring a coherent approach consistent with the Climate Action Plan objectives for transport.

Digital Access to Services, Remote Working and Wider Systemic Behavioural Change

Some of the changes in lifestyle and work practices, accelerated by the COVID-19 pandemic, have become mainstream and have altered the base patterns of demand for transport.

As set out in Our Rural Future, Government's Rural Development Policy for the 2021 to 2025 period, the establishment of a comprehensive and integrated national network of 400 remote working hubs throughout the country, and investment that supports and enables people in our rural communities to live and work locally, can bring significant benefits –revitalising our rural towns and villages, and reducing the number of lengthy commuting journeys that are typically undertaken by private car.

Our challenge is to recognise these opportunities and sustainably incorporate these systemic changes and innovations within our way of life, continuing support for policies that best leverage reductions in our GHG emissions on a long-term basis.

15.3.3 Avoid and Shift

Demand Management Strategy – Reducing Travel Demand with Improved Sustainable Mobility Alternatives

We must address the base demand for transport, as well as managing residual movements of people and goods on the network. This will require a strong strategic direction at a national level, involving a variety of Departments and Agencies, with implementation required at national and Local Authority levels - stakeholder engagement will also be critical in this context.

A new National Demand Management Strategy (DMS) to be developed in 2023 will consider the broad range of measures required, their relative impacts both in terms of demand reduction and

wider economic impacts, and their sequencing/timing in parallel with the delivery of improved sustainable mobility alternatives.

Based on the evidence set out in the Five Cities Demand Management Study and the NTA's modelling analysis, potentially effective measures include removing free workplace parking; increased parking charges; introduction of congestion and road user charging; and increased fossil fuel prices. Demand management will also be supported by road space reallocation and other planned measures, such as shared mobility and mobility-as-a-service.

Development of the DMS will require a strong evidence basis, a public consultation process and cross-Government collaboration given the linkages with policies on taxation, planning, and urban and rural regeneration. Demand side measures will only be effective and acceptable when alternative, more sustainable, options are available.

Road Space Reallocation

Greater prioritisation and reallocation of existing road space towards public transport and active travel will be a key supporting element for the new DMS. This already forms a crucial element of the BusConnects programme in each of our five cities. It is also a key recommendation from the OECD's Redesigning Ireland's Transport for Net Zero report.

Not only can road-space reallocation redirect valuable space from on-street car-parking and public urban roadways to public transport and active travel infrastructure (such as efficient bus lanes, and more spacious footpaths and segregated cycle-lanes), it also leads to significant and wide-scale improvements in our urban environments. The concept of road-space reallocation features prominently in the SMP Pathfinder Programme, as well as in other national policies and programmes.

15.3.4 Shift

Active Travel Infrastructure Programme

Safe and high-quality active travel infrastructure can significantly increase the scope for active travel to become a default mode of mobility – particularly when used with e-bikes (and other forms of e-mobility) that can cater for a wider variety of users and over longer distances.

In terms of active travel, the Programme for Government includes a commitment of €360 million per year to cycling and pedestrian projects for the lifetime of the Government. The role of Local Authorities is critical in delivering these programmes. For that reason, funding has been provided for approximately 250 new posts in Local Authorities to expand walking and cycling facilities all over the country.

To complement these resource commitments, the DoT and the NTA, through the Sustainable Mobility Policy and the Pathfinder Programme, have committed to an ongoing range of capacity building and technical supports. A variety of actions are set out which seek to enable and equip Local Authorities to deliver effectively and at pace.

Major Public Transport Infrastructure Programme

The major public transport infrastructure programme that has been set out in the NDP continues the Programme for Government commitment to rebalance the share of capital expenditure to favour new public transport schemes over road projects.

Key milestones have already been achieved on major infrastructural projects, including BusConnects in each of our 5 cities and the Greater Dublin Area's DART+ Programme and Metrolink, which will continue to be progressed through public consultations and the planning systems.

Through this work programme, we will also see the delivery of Phase 1 of the Cork Area Commuter Rail Programme; expansion in low- and zero-emission bus fleet capacity; additional regional rail services (which will be informed by the forthcoming Strategic Rail Review); and continued appraisal, planning and feasibility studies for new light rail services, along with increased provision of park and ride/share services at transport interchanges in line with each of our cities' MATS.

Public Transport Services Investment

Significantly improving the attractiveness, capacity and frequency of public transport services is necessary to achieve the level of modal shift and associated reduction in fossil-fuelled vehicle kilometres travelled. This will require large-scale improvements to Public Service Obligation (PSO) public transport services; the continuation of recent reductions to Public Transport fares; and ensuring that rural communities are explicitly catered for through the NTA's Connecting Ireland - Rural Mobility Programme. The level of service enhancements needed to drive the required modal shift is significant (e.g., NTA modelling work applies a 3-fold increase in service frequency to drive modal shift). These enhancements will require detailed design and costing and will be subject to any necessary Public Spending Code procedures.

Some key constraints on current (operating) funding have already been identified regarding the levels of funding required to ensure both the PSO and the Connecting Ireland programme can deliver the required emissions abatement. Not only will costs of existing services need to be met, but delivering the required modal shift to public transport is predicated on significant further expansion in services and frequency. Recent reductions in public transport fares and provision of free school transport services, which were introduced as cost-of-living measures, are beginning to encourage an uptake in demand. Greater clarity as to the availability of current funding over longer time-horizons is required to facilitate better longer-term planning and implementation of new and upgraded PSO services.

NTA Connecting Ireland – Rural Mobility Programme

During the Department's engagement with stakeholders over the past year, the issues and challenges faced by rural communities arose as a key challenge to achieving emissions reduction.

The NTA's Connecting Ireland – Rural Mobility Programme is based on a nationwide study that looked at settlement patterns and trip origins/destinations, as well as audited existing services and connectivity levels. It aims to expand and improve the current approach by enhancing existing services and introducing new public transport services.

The NTA's Connecting Ireland programme will prioritise public transport projects that enhance regional and rural connectivity. In practice, this means ensuring that 70% of people in rural Ireland have access to public transport service that provides at least three return trips daily to the nearby town (currently at approximately 50%). Over 100 rural villages will benefit from frequent public transport service (at least three return trips daily) for the first time.

Escort to Education Journeys

Escort to education journeys currently undertaken by private car represent a significant component

of travel demand. A new target set out above, that seeks a 30% reduction in private car escort-to-education journeys, reflects the high ambition to reverse the growing trend in 'school run' trips. This ambition will be supported with a variety of measures including the Safe Routes to School (SRTS) Programme, and the introduction and take-up of local initiatives, such as cycle buses to schools which can be greatly enhanced through the provision and promotion of infrastructure. A new pathfinder project under the SMP will see a further acceleration of the SRTS over the next three years.

The SRTS programme will be complemented by the Department of Education's School Transport Scheme (STS). The additional public demand for an expansion of this scheme was made evident this year, following the introduction of free school transport as a cost-of-living measure. In the current school year to date, over 150,000 children are availing of school transport scheme services on approximately 6,200 buses on over 8,100 routes, on a daily basis.

A review of the STS commenced in February 2021, involving an in-depth analysis of the scheme and how it can work in liaison with the SRTS Programme.

Smart, Shared and Integrated Mobility and the Promotion of Alternatives to the Private Car

An effective mechanism in reducing the dependency on car ownership is the promotion of 'on-demand' shared mobility services, such as car-share clubs, e-scooter- or bike-share schemes, as well as other short-term rental or sharing models. The OECD Report recognises the transformative potential of on-demand shared services, including in the area of active travel and micromobility. The DoT is committed to working closely with shared mobility services providers and partnerships to develop more coherent policy and supports, including technical innovation and the development of appropriate regulation, to scale up shared mobility services around the country.

The sharing of e-mobility assets (e.g., shared bike schemes, e-bike schemes, e-cargo bike schemes, e-car schemes) as a service also has increasing potential to enable modal shift from private car ownership across all types of settlements. This potential for shared services, more broadly, is already recognised through an array of actions in the SMP.

The DoT also sees specific and immediate benefits in promoting the proliferation of e-bikes and e-cargo bikes (in both owned and shared modes). The Department will continue to undertake policy initiatives to support access to e-bikes and e-cargo bikes, and will conduct additional research on the abatement potential of e-bikes as a viable alternative to private car use.

15.3.5 Improve

Zero Emission Vehicles Ireland Work Programme and Electrification Strategy

Significant progress has already been achieved in promoting the electrification of the public and private vehicle fleet. Further investment and policy supports will be required to maintain momentum and achieve very challenging targets, against prevailing supply chain and other headwinds.

Zero Emission Vehicles Ireland (ZEVI) was established in July 2022 as a dedicated office to support consumers, the public sector, and businesses to continue to make the switch to zero-emission vehicles. ZEVI will lead on the delivery of the Ireland's ambitious targets to have an expected 30% of our private car fleet having switched to electric vehicles by 2030 (i.e., our 845,000 private EV target).

A draft National EV Charging Infrastructure Strategy was published for consultation in March 2022 and the final version is due for publication in early January. It will set common standards and policies for the rollout of EV charging and will provide guidance on the fair and efficient rollout of charging infrastructure to meet the needs of the CAP21 target of 940,000 vehicles in total by 2030 (845,000 passenger EVs, and 95,000 light goods vehicles).

As set out in the Annex of Actions, a number of additional ZEVI actions will launch in 2023 with a focus on providing public charging infrastructure along with a gradual move to reduce reliance on vehicle grants expected as the EV sector matures and becomes mainstream within the overall vehicle market.

Several 'Destination Charging' schemes will also be launched to facilitate top-up charging at critical locations. Additionally, ZEVI will work with policy partners in the DoT and across Government to develop further supports for the electrification of transport through consideration of 'eMobility hub' models in the 5 cities, which would consist of charging infrastructure for shared electric mobility solutions such as e-bikes and e-scooters, as well as car clubs operating EVs for short-term hire.

Renewable Transport Fuels

Biofuels have played a significant role in reducing transport emissions and will remain a core transitional measure for the medium-term reduction of GHG emissions.

The Renewable Fuels for Transport Policy Statement 2021-2023 sets out an indicative trajectory of annual increase in the obligation rate for renewable transport fuel supply to meet the 2030 target of the CAP21 - an approximate blend of E10 (i.e., up to 10% by volume bioethanol blend in petrol) and B20 (i.e., up to 20% biodiesel blended into diesel). As proposed in the policy, and subject to enabling legislation, the transition to E10 in Ireland is envisaged by 2023.

The consultation for the next iteration of the Renewable Transport Fuel Policy 2023-2025 will include consideration of the recommendations in the recently published Biofuel Study Report concerning sustainability and availability of biofuels, as well as reflecting on the stakeholder inputs from the 2022 consultation on policy. It will explore the opportunities to expand the scope of the obligation, reflecting EU proposals under the EU Fit for 55 Package, and the opportunities to broaden supply of a more diverse range of renewable transport fuel types and feedstocks – in particular, the supply of advanced biofuels and renewable fuels of non-biological origin.

The DoT, in co-operation with the Department for Economy in Northern Ireland, under the Department of the Taoiseach's Shared Island Fund, is undertaking research on the safety regulation and interoperability of green hydrogen refuelling on the island of Ireland, with outputs of this research expected in early 2023. A second phase of this research is to be progressed in 2023 concerning the feasibility of green hydrogen transport refuelling on a cross-border basis, aligned to EU proposals for alternative fuel infrastructure under the forthcoming Alternative Fuels Infrastructure Regulation (AFIR).

In line with expected AFIR requirements, the DoT will also prepare an updated National Policy Framework on Alternative Fuels Infrastructure for Transport by 2025 that will set out further plans for the use of renewable fuels in transport over the second carbon budget period.

Special Focus: Haulage and Heavy Goods Road Freight Sector

A particularly difficult challenge for the decarbonisation of the transport sector has been in the

haulage and heavy goods road freight sector, which together with emissions from light commercial vehicle fleet, constitutes c.38% of total transport emissions.

Collectively, the commercial goods fleet comprises over 385,000 commercial vehicles (end December 2021), of which approximately 40,000 are heavy-goods vehicles (HGVs), which are heavily reliant on the use of diesel-fuel for their operations. Approximately 22,000 of these HGVs are operated by licensed hauliers – the majority of whom are small operators, often with fleets of less than 5 HGVs, who operate in a highly competitive market. The other 19,000 HGVs are operated by businesses that self-provide their own transport such as in manufacturing, retail or construction.

The importance of this sector to the efficient functioning and resilience of our economy and society has been made clear through the recent shocks of Brexit and COVID-19.

While there has been a high level of uncertainty as to the likely technological pathway for decarbonising this sector, major manufacturers have made public commitments regarding their intention to increase the availability and supply of e-trucks to the market by mid-decade. Such declarations will be supplemented with legislative mandates under the forthcoming revision to the EU's CO2 standards for heavy-duty vehicles (HDV), which is expected to compel manufacturers to increase the supply of zero- or low-emission vehicles to the market, with a full phase-out of the production of new fossil-fuelled HDVs at a European level by 2040.

Together with the expected requirements that will be set out under the forthcoming AFIR under the EU's Fit for 55 Package, which will obligate Member States to provide a sufficiently dense electric charging point and alternative fuel network, it is expected that the beginning of the transition to battery electric vehicles for this sector will be possible in the near future. In recognition of this fact, new KPIs have been set out targeting 30% of new registrations of medium and heavy-duty vehicles (MHDV)[47] to be zero-emission by 2030, in line with Ireland becoming a signatory to the Global Memorandum of Understanding on Medium- and Heavy-Duty Vehicles at the recent COP27 in Egypt.

Biofuels will play an important transitionary role – the renewable transport fuel obligation scheme will see the renewable fuel blend in diesel increase to 20% by 2030.

Nonetheless, the modelled decarbonisation pathway to achieving 50% abatement recognises that, in the interim, the lack of immediate alternatives means a majority of HGV operators will be subject to a continued reliance on diesel fuel. As the majority of emissions abatement by 2030 will be carried by decarbonisation of the private car fleet and shift to sustainable transport, the overall abatement required of the heavy goods sector will be to deliver a c.10% reduction in emissions relative to 2018 levels.

This will be achieved and supported via the DoT's Road Haulage Strategy 2022-2031, which sets out 39 specific actions for the sector. These measures will not only deliver in terms of emissions abatement through, for example standardising eco-driving training programmes to improve operational efficiency, but also through wider labour, safety, and skills measures to help support the sector.

ZEVI will also play a key role in providing both direct supports to the sector through the

47 For purposes of the MOU, MHDVs are vehicles with gross vehicle weight above 3,500 kilograms used for freight and passenger transport i.e. trucks and buses

continuation of the Alternatively Fuelled Heavy-Duty Vehicle grant scheme, and through the provision of enabling high-capacity charging infrastructure on the national network.

In recognition of the sector's exposure to the rising fuel cost trajectory envisioned under carbon tax increases that will be required to reduce the 'competitive advantage' held by fossil-fuelled vehicles over sustainable alternatives, the DoT is engaged in further research regarding taxation and renewable fuels used in the sector. This will also be carried out in the context of proposed EU energy taxation changes. Research into the role and placement of logistics hubs and consolidation centres will inform the potential for greater integration with low-carbon alternatives for 'last-mile' delivery and support the realisation of enhanced logistic efficiencies.

15.3.6 Adaptation

Transport infrastructure and networks are critical to the operation of Irish society and, as set out in the Sectoral Adaptation Plan for the Transport sector, transport networks are increasingly exposed to the effects of climate change with increased storms, flooding and high temperatures posing challenges for the operation and resilience of roads, rail networks, ports, and airports.

The Transport Sector Adaptation Plan maps out the steps that are necessary over the coming years to adapt transport infrastructure to 2030 and beyond. The transport adaptation actions included in this Climate Action Plan are the incremental steps that will be taken this year to achieve the multi-annual recommendations and actions outlined in the Sectoral Adaptation Plan and to accelerate the transport sector's adaptation to climate change.

15.3.7 Further Measures

The 'toolkit' for further decarbonisation over the third carbon budget period is not expected to exhibit significant differences to the approach outlined above – with several key policies and strategies having a 10-year plus horizon.

Rather, the emphasis will be on maintained and renewed focus on the acceleration, implementation and (where necessary), amplification of measures, in accordance with the Avoid – Shift – Improve framework. This reinforcement can be further leveraged as major public transport infrastructural projects are completed and as new services come online, and through the continued transition of our vehicle fleet. Additional policies and measures post 2030 will include:

- Continued progression and advancement of Haulage Strategy actions/Long-term Enablers;
- To progress the use of advanced fuels in maritime transport, promotion of Green Shipping corridors, reduction in particulate matter pollutants and policy options for introduction of Emission Control Areas in Irish waters, and the promotion of Sustainable Aviation Fuels.

15.4 Actions

Table 15.7 sets out a roadmap of actions to 2025, and Table 15.8 specifically describes the actions for delivery in 2023.

Table 15.7 – Key Actions to Deliver Abatement in Transport for the Period 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
HORIZONTAL			
Enhanced Governance and Accelerated Implementation	• Finalise SMP Leadership Group work programme, including oversight and delivery of SMP Action Plan • Support Agency and LA Capacity Building via active travel units and training programme • Establish a Project Management Office to support SMP and CAP delivery, and progression of SMP Pathfinder Programme • Ensure Local Authority Climate Action Plan Guidelines under Section 14B(8) of the Climate Action and Low Carbon Development Act (as amended) include specific actions and indicators in respect of accessibility, modal shift and active travel	• Finalise SMP Leadership Group work programme, including oversight and delivery of SMP Action Plan • Support Agency and LA Capacity Building via active travel units and training programme • Progression of SMP Pathfinder Programme	• Finalise SMP Leadership Group work programme, including oversight and delivery of SMP Action Plan • Support Agency and LA Capacity Building via active travel units and training programme • Progression of SMP Pathfinder Programme
Communications Strategy	• Convene National Sustainable Mobility Stakeholder Forum • Finalise Transport 'Climate Action and Sustainable Mobility Communications Strategy', and progress engagement and media campaigns • Advance ZEVI Information and Engagement work programme • Support Research and Evidence Base (informed by SMP Research Network)	• Convene National Sustainable Mobility Stakeholder Forum • Targeted Transport Communications Campaign roll-out, and progress engagement and media campaigns • Advancing ZEVI Information and Engagement work programme • Supporting Research and Evidence Base (informed by SMP Research Network)	• Convene National Sustainable Mobility Stakeholder Forum • Targeted Transport Communications Campaign roll-out, and progress engagement and media campaigns • Advancing ZEVI Information and Engagement work programme • Supporting Research and Evidence Base (informed by SMP Research Network)

Measure	2023 Actions	2024 Actions	2025 Actions
Haulage and Logistics	• Establish Road Freight Forum and advance Road Haulage Strategy work programme • Support EU Green Freight Package – including AFIR, CO2 Standards for HDVs, EURO VII files	• Advancement of Road Haulage Strategy work programme • EU Green Freight Package – including AFIR, CO2 Standards for HDVs, EURO VII files	• Advancement of Road Haulage Strategy work programme • EU Green Freight Package – including AFIR, CO2 Standards for HDVs, EURO VII files
AVOID			
Enhanced Spatial and Land Use Planning	• SMP Leadership Group to monitor and support progression of related actions across NPF, HfA and TCF policies to ensure transport decarbonisation impacts are being prioritised and delivered • Transport Oriented Design – advance interdepartmental group work programme (including publication of s28 Guidelines for Planning Authorities on Sustainable and Compact Settlements) • Enhance transport appraisal guidance on spatial and land-use considerations in line with NIFTI Implementation plan • Promote widespread, consistent and accelerated implementation of the Design Manual for Urban Road and Streets (DMURS) to ensure improved placemaking and accessibility, including delivery of 10-Minute Towns and 15-Minute Cities • Review Planning Guidelines to ensure that a graduated and performance-based approach is applied to the quantum and form of car parking with regard to the proximity of urban centres and public transport services	• SMP Leadership Group to monitor and support progression of related actions across NPF, HfA and TCF policies to ensure transport decarbonisation impacts are being prioritised and delivered. • Transport Oriented Design – advance interdepartmental group work programme	• SMP Leadership Group to monitor and support progression of related actions across NPF, HfA and TCF policies to ensure transport decarbonisation impacts are being prioritised and delivered • Transport Oriented Design – advance interdepartmental group work programme • Regional and Spatial Economic Strategies review to include analysis of land-use development potential based on accessibility to public transport network • Promotion widespread, consistent and accelerated implementation of the Design Manual for Urban Road and Streets (DMURS) to ensure improved placemaking and accessibility, including delivery of 10-Minute Towns and 15-Minute Cities
Strategic Transport Planning	• Legislative Programme – expand NTA strategic transport planning remit to regional cities • Metropolitan Area Transport Strategies – publication of GDA and update to Galway Transport Strategy • Engage with Local Authorities on development of LA Climate Action Plans	• Legislative Programme – expand NTA strategic transport planning remit to regional cities	• Legislative Programme – expand NTA strategic transport planning remit to regional cities • Metropolitan Area Transport Strategies – Commence review of Cork Metropolitan Area Transport Strategy

Measure	2023 Actions	2024 Actions	2025 Actions
AVOID + SHIFT			
Demand Management Strategy	• Publish National Demand Management Strategy • Advance Speed Management and Enforcement work programme • Support Research and Evidence Base - (including update of GDA Cost of Congestion study and Better Road User Charging Evaluation) • Promote the development and uptake of Remote/Blended Working Policies through Climate Action and other communication strategies, wherever these can directly reduce car commuting journeys • Promote sustainable travel practices in Remote Working Hubs	• Publish GDA Demand Management Scheme • Advance Speed Management and Enforcement work programme • Implement National Demand Management Strategy measures with Regional and Local Authorities • Supporting Research and Evidence Base • Promote the development and uptake of Remote / Blending Working Policies through Climate Action and other communication strategies, wherever these can directly reduce car commuting journeys • Promote sustainable travel practices in Remote Working Hubs	• Advance Speed Management and Enforcement work programme • Implement National Demand Management Strategy measures with Regional and Local Authorities. • Supporting Research and Evidence Base • Promote the development and uptake of Remote/ Blended Working Policies through Climate Action and other communication strategies, wherever these can directly reduce car commuting journeys • Promote sustainable travel practices in Remote Working Hubs
Road Space Reallocation	• SMP Pathfinders: support LAs in progression of relevant schemes and accelerated delivery of demonstrator projects - underpinned by guidelines to road authorities relating to traffic calming measures (under section 38 (6) of the Road Traffic Act 1994; SMP Action 38) and the updated National Cycle Manual to incorporate updated cycle scheme design guidance aligned with the safe system approach • LAs to identify roads and streets suitable for road space reallocation • Guidelines for Local Authority Climate Action Plans to include specific actions and indicators in respect of accessibility, modal shift and active travel • Pedestrian enhancement plans developed for five metropolitan areas • Review of road traffic policy and legislation to prioritise the safety of walking and cycling	• SMP Pathfinders: support LAs in progression of relevant schemes and accelerated delivery of demonstrator projects • Progression of relevant schemes in line with LA Climate Action Plans • Pedestrian enhancement plans developed for regional towns	• SMP Pathfinders: support LAs in progression of relevant schemes and accelerated delivery of demonstrator projects • Progression of relevant schemes in line with LA Climate Action Plans

Measure	2023 Actions	2024 Actions	2025 Actions
SHIFT			
Active Travel Infrastructure Programme	• Advance roll-out of 1,000 km walking/cycling infrastructure • Advance roll-out of National Cycle and Greenway Networks • Advance widespread and consistent implementation of National Cycle Manual guidance and the Design Manual for Urban Roads and Streets (DMURS) with DHLGH • Leverage of Protection and Renewal road infrastructure programme to enhance safety of sustainable mobility users • Smart and Sustainable Mobility Training Workshops – pathfinder programme on capacity-building and education initiative for Local Authorities (LAs), Councillors and Public Participation Networks (PPNs) delivering training programmes for Local Authorities, including Active Travel teams • Identify and implement mechanisms for improved multiple Local Authority delivery of strategic, network-based Active Travel projects (e.g., NTA-led projects, Section 85 agreements under the Local Government Act, 2001) in line with the objective of CycleConnects pathfinder project	• Advance roll-out of 1,000 km walking/ cycling infrastructure • Advance roll-out of National Cycle and Greenway Networks • Advance widespread and consistent implementation of National Cycle Manual guidance and the DMURS with DHLGH • Leverage of Protection and Renewal road infrastructure programme to enhance safety of sustainable mobility users • Smart and Sustainable Mobility Training Workshops – pathfinder programme on capacity-building and education initiative for LAs, Councillors and PPNs delivering training programmes for Local Authorities, including Active Travel teams	• Advance roll-out of 1,000 km walking/ cycling infrastructure • Advance roll-out of National Cycle and Greenway Networks. • Advance widespread and consistent implementation of National Cycle Manual guidance and the DMURS with DHLGH • Leverage of Protection and Renewal road infrastructure programme to enhance safety of sustainable mobility users • Smart and Sustainable Mobility Training Workshops – pathfinder programme on capacity-building and education initiative for LAs, Councillors and PPNs delivering training programmes for Local Authorities, including Active Travel teams
Major Public Transport Infrastructure Programme	• Advance BusConnects programme in 5 cities • Advance Metrolink planning pending ABP approval • Advance DART+ programme • Advance Cork Commuter Rail Programme • Advance PSO electric bus fleet procurement including depot charging upgrades • Continue investment in passenger and freight rail, informed by outcomes of Strategic Rail Review	• Advance BusConnects programme in 5 cities • Advance Metrolink planning pending ABP approval • Advance DART+ programme • Advance Cork Commuter Rail Programme • Advance PSO electric bus fleet procurement including depot charging upgrades • Continued investment in passenger and freight rail, informed by outcomes of Strategic Rail Review	• Advance BusConnects programme in 5 cities • Advance Metrolink planning pending ABP approval • Advance DART+ programme • Advance Cork Commuter Rail Programme • Advance PSO electric bus fleet procurement including depot charging upgrades • Continued investment in passenger and freight rail, informed by outcomes of Strategic Rail Review

Measure	2023 Actions	2024 Actions	2025 Actions
Public Transport Services and Escort to Education Journeys	• Prioritise and accelerate delivery of NTA Connecting Ireland and new town services, via conventional and non-conventional modes of public transport services • Roll-out Demand Responsive Transport pilot initiatives • Develop a high-level and multi-annual costed programme of PT Services to meet pathway assumptions • Develop strategy for the transition of long-distance PSO and commercial bus services to low-emission technologies • Identify pathway to appropriate decarbonisation of interurban rail services, informed by Strategic Rail Review • SMP Pathfinder: Accelerate implementation of Safe Routes to School Programme through improved resourcing and focus on more rapid implementation of front-of-school treatments - providing immediate safety improvements to school surroundings • Identify measures to improve sustainability of School Transport Scheme, informed by Phase 3 review	• Prioritise and accelerate delivery of NTA Connecting Ireland and new town services • Roll-out of Demand Responsive Transport pilot initiatives • SMP Pathfinder: Accelerate implementation of Safe Routes to School Programme • Identify measures to improve sustainability of School Transport Scheme, informed by Phase 3 review	• Prioritise and accelerate delivery of NTA Connecting Ireland and new town services • Roll-out of Demand Responsive Transport pilot initiatives • Identify measures to improve sustainability of School Transport Scheme, informed by Phase 3 review • SMP Pathfinder: Accelerate implementation of Safe Routes to School Programme
Smart, Shared and Integrated Mobility	• Development and rollout of 'eMobility Hub' shared electric mobility solutions model in the 5 cities • Expand operation and availability of bike share schemes nationally • Industry engagement on development of shared mobility policy • Enact legislation and regulations to permit safe use and design of personal powered transporters on public roads • Establish new Unit within the Department of Transport to actively engage with shared Mobility Operators/Partnerships, Local Authorities and the NTA to develop and guide policy around Shared Mobility and promote use of Shared Mobility nationally • Undertake a detailed Scoping Assessment of policy models for the development and management of shared micro-mobility schemes in the Greater Dublin Area, for subsequent nationwide implementation • Develop incentives to promote access to or purchase of e-cargo and e-bikes as viable alternatives to private car use	• Development and rollout of 'eMobility Hub' shared electric mobility solutions model in the 5 cities • Expand operation and availability of bike share schemes nationally • Industry engagement on development of shared mobility policy • Establish governance framework for implementation & operation of Mobility-as-a-Service, encompassing all transport modes • Progress incentives to promote access to or purchase of e-cargo and e-bikes as viable alternatives to private car use	• Development and rollout of 'eMobility Hub' shared electric mobility solutions model in the 5 cities • Expand operation and availability of bike share schemes nationally • Industry engagement on development of shared mobility policy • Progress incentives to promote access to or purchase of e-cargo and e-bikes as viable alternatives to private car use • Rollout of Next Generation Ticketing, National Journey Planner and Automated Vehicle Location systems on PSO bus services

Measure	2023 Actions	2024 Actions	2025 Actions
IMPROVE			
ZEVI and Electrification Strategy	• Advance Destination Charge Point Scheme – including sports clubs, community centres and State operated visitor sites, as well as commercial destinations • Advance LA Residential Charging Scheme and shared charging app pilot. • Develop Regional Assembly and Local Authority EV network plans to deliver accessible and low-cost charging • Publish a high-powered charging strategy • Review financial incentives to further the transition of vehicle fleets, considering actions to support and deliver a just and equitable EV transition • Undertake planning and enabling works for AFIR high-power charging requirements on TEN-T network	• Ongoing delivery of Destination Charge Point Scheme – including sports clubs, community centres and State operated visitor sites, as well as commercial destinations • Delivery and Funding for LA Residential Charging Schemes • Implement Regional Assembly and Local Authority EV network plans to deliver accessible and low-cost charging • Roll out of en route High-Powered Charging Network • Review of financial incentives to further the transition of vehicle fleets, considering actions to support and deliver a just and equitable EV transition	• Ongoing delivery Destination Charge Point Scheme – including sports clubs, community centres and State operated visitor sites, as well as commercial destinations • Ongoing delivery of LA Residential Charging Schemes • Ongoing implementation of Regional Assembly and Local Authority EV network plans to deliver accessible and low-cost charging • Roll out of en route High-Powered Charging network • Review of financial incentives to further the transition of vehicle fleets, considering actions to support and deliver a just and equitable EV transition
Renewable Fuels for Transport	• Publish draft National Policy Framework on Alternative Fuels • Complete implementation of RTF Policy Statement 2021-2023 work programme, including communications on transition to E10 (10% bioethanol) • Publish a RTF Policy Statement for 2023-2025 • Promotion of Renewable Fuel Use in Maritime Transport – examination and planning for shore-side electricity in ports under AFIR and Fuel EU Maritime Regulations • Rollout of Project Causeway and Green Connect CNG refuelling infrastructure	• Publish and submit final National Policy Framework on Alternative Fuels to EU Commission • Advance RTF Policy Statement 2023-2025 work programme • Promotion of Renewable Fuel Use in Maritime Transport: examination and planning for shore-side electricity in ports under AFIR and Fuel EU Maritime Regulations • Rollout of Project Causeway and Green Connect CNG refuelling infrastructure	• Advance National Policy Framework on Alternative Fuels work programme • Advance RTF Policy Statement 2023-2025 work programme • Promotion of Renewable Fuel Use in Maritime Transport – examination and planning for shore-side electricity in ports under AFIR and Fuel EU Maritime Regulations • Rollout of Project Causeway and Green Connect CNG refuelling infrastructure
ADAPTATION			
Transport Adaption for Enhanced Climate Resilience	• Progress Adaption and Resilience work programme • Support Research and Evidence-base, including progression of targeted research, increasing adaptive capacity, knowledge sharing and cross-sectoral coordination	• Update and progress Sectoral Adaptation Plan for Transport work programme • Support Research and Evidence-base, including progression of targeted research, increasing adaptive capacity, knowledge sharing and cross-sectoral coordination	• Progress Sectoral Adaptation Plan for Transport work programme • Research and Evidence-base, including progression of targeted research, increasing adaptive capacity, knowledge sharing and cross-sectoral coordination

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex. Delivery will be kept under constant review with further policies, measures and actions brought forward to address any failure or projected failure as required, including as part of the annual update of the Climate Action Plan.

Table 15.8 – 2023 Actions

Action Number	2023 Action
TR/23/1	Finalise SMP Leadership Group work programme, including oversight and delivery of SMP Action Plan
TR/23/2	Support Agency and LA Capacity Building via active travel units and training programme
TR/23/3	Establish a Project Management Office to support SMP and CAP delivery, and progression of SMP Pathfinder Programme
TR/23/4	Ensure Local Authority Climate Action Plan Guidelines under Section 14B(8) of the Climate Action and Low Carbon Development Act (as amended) include specific actions and indicators in respect of accessibility, modal shift and active travel
TR/23/5	Convene National Sustainable Mobility Stakeholder Forum
TR/23/6	Finalise Transport 'Climate Action and Sustainable Mobility Communications Strategy', and progress engagement and media campaigns
TR/23/7	Advance ZEVI Information and Engagement work programme
TR/23/8	Support Research and Evidence-base (informed by SMP Research Network)
TR/23/9	Establish Road Freight Forum and advance Road Haulage Strategy work programme
TR/23/10	Support EU Green Freight Package – including AFIR, CO2 Standards for HDVs, EURO VII files
TR/23/11	SMP Leadership Group to monitor and support progression of related actions across NPF, HfA and TCF policies to ensure transport decarbonisation impacts are being prioritised and delivered
TR/23/12	Transport Oriented Design – advance interdepartmental group work programme (including publication of s28 Guidelines for Planning Authorities on Sustainable and Compact Settlements)
TR/23/13	Enhance transport appraisal guidance on spatial and land-use considerations in line with NIFTI Implementation plan
TR/23/14	Promote widespread, consistent and accelerated implementation of the Design Manual for Urban Road and Streets to ensure improved placemaking and accessibility, including delivery of 10-Minute Towns and 15-Minute Cities
TR/23/15	Review Planning Guidelines to ensure that a graduated and performance-based approach is applied to the quantum and form of car parking with regard to the proximity of urban centres and public transport services
TR/23/16	Legislative Programme – expand NTA strategic transport planning remit to regional cities
TR/23/17	Metropolitan Area Transport Strategies – publication of GDA and update to Galway Transport Strategy
TR/23/18	Engage with Local Authorities on development of LA Climate Action Plans
TR/23/19	Publish National Demand Management Strategy
TR/23/20	Advance Speed Management and Enforcement work programme
TR/23/21	Support Research and Evidence-base - (including update of GDA Cost of Congestion study and Better Road User Charging Evaluation)
TR/23/22	Promote the development and uptake of Remote/Blended Working Policies through climate action and other communication strategies, wherever these can directly reduce car commuting journeys

Action Number	2023 Action
TR/23/23	Promote sustainable travel practices in Remote Working Hubs
TR/23/24	SMP Pathfinders: Support LAs in progression of relevant schemes and accelerated delivery of demonstrator projects - underpinned by guidelines to road authorities relating to traffic calming measures (under section 38 (6) of the Road Traffic Act 1994) and the updated National Cycle Manual to incorporate updated cycle scheme design guidance aligned with the safe system approach
TR/23/25	LAs to identify roads and streets suitable for road space reallocation
TR/23/26	Guidelines for Local Authority Climate Action Plans to include specific actions and indicators in respect of accessibility, modal shift and active travel
TR/23/27	Pedestrian enhancement plans developed for five metropolitan areas
TR/23/28	Review of road traffic policy and legislation to prioritise the safety of walking and cycling
TR/23/29	Advance roll-out of 1,000 km walking/cycling infrastructure
TR/23/30	Advance roll-out of National Cycle and Greenway Networks
TR/23/31	Advance widespread and consistent implementation of National Cycle Manual guidance and the Design Manual for Urban Roads and Streets with DHLGH
TR/23/32	Leverage of Protection and Renewal road infrastructure programme to enhance safety of sustainable mobility users
TR/23/33	Smart and Sustainable Mobility Training Workshops – pathfinder programme on capacity-building and education initiative for LAs, Councillors and PPNs delivering training programmes for Local Authorities, including Active Travel teams
TR/23/34	Identify and implement mechanisms for improved multiple LA delivery of strategic, network-based Active Travel projects (e.g., NTA-led projects, section 85 agreements under the Local Government Act, 2001) in line with the objective of CycleConnects pathfinder project
TR/23/35	Advance BusConnects programme in 5 cities
TR/23/36	Advance Metrolink planning pending ABP approval
TR/23/37	Advance DART+ programme
TR/23/38	Advance Cork Commuter Rail Programme
TR/23/39	Advance PSO electric bus fleet procurement including depot charging upgrades
TR/23/40	Continue investment in passenger and freight rail, informed by outcomes of Strategic Rail Review
TR/23/41	Prioritise and accelerate delivery of NTA Connecting Ireland and new town services, via conventional and non-conventional modes of public transport services
TR/23/42	Roll-out Demand Responsive Transport pilot initiatives
TR/23/43	Develop a high-level and multi-annual costed programme of PT Services to meet pathway assumptions.
TR/23/44	Develop strategy for the transition of long-distance PSO and commercial bus services to low-emission technologies
TR/23/45	Identify pathway to appropriate decarbonisation of interurban rail services, informed by Strategic Rail Review
TR/23/46	SMP Pathfinder: Accelerate implementation of Safe Routes to School Programme through improved resourcing and focus on more rapid implementation of front-of-school treatments - providing immediate safety improvements to school surroundings
TR/23/47	Identify measures to improve sustainability of School Transport Scheme, informed by Phase 3 review
TR/23/48	Development and rollout of 'eMobility Hub' shared electric mobility solutions model in the 5 cities
TR/23/49	Expand operation and availability of bike share schemes nationally

Action Number	2023 Action
TR/23/50	Industry engagement on development of shared mobility policy
TR/23/51	Enact legislation and regulations to permit safe use and design of personal powered transporters on public roads
TR/23/52	Establish new Unit within the DoT to actively engage with shared Mobility Operators/ Partnerships, LAs and the NTA to develop and guide policy around Shared Mobility and promote use of Shared Mobility nationally
TR/23/53	Undertake a detailed Scoping Assessment of policy models for the development and management of shared micro-mobility schemes in the GDA, for subsequent nationwide implementation
TR/23/54	Develop incentives to promote access to or purchase of e-cargo and e-bikes as viable alternatives to private car use
TR/23/55	Advance Destination Charge Point Scheme – including sports clubs, community centres and State operated visitor sites, as well as commercial destinations
TR/23/56	Advance LA Residential Charging Scheme and shared charging app pilot
TR/23/57	Develop Regional Assembly and Local Authority EV network plans to deliver accessible and low-cost charging
TR/23/58	Publish a high-powered charging strategy
TR/23/59	Review financial incentives to further the transition of vehicle fleets, considering actions to support and deliver a just and equitable EV transition
TR/23/60	Undertake planning and enabling works for AFIR high-power charging requirements on TEN-T network
TR/23/61	Publish draft National Policy Framework on Alternative Fuels
TR/23/62	Complete implementation of RTF Policy Statement 2021-2023 work programme, including communications on transition to E10 (10% bioethanol)
TR/23/63	Publish a RTF Policy Statement for 2023-2025
TR/23/64	Promotion of Renewable Fuel Use in Maritime Transport – examination and planning for shore-side electricity in ports under AFIR and Fuel EU Maritime Regulations
TR/23/65	Rollout of Project Causeway and Green Connect CNG refuelling infrastructure
TR/23/66	Progress Adaption and Resilience work programme
TR/23/67	Support Research and Evidence-base, including progression of targeted research, increasing adaptive capacity, knowledge sharing and cross-sectoral coordination

16 Agriculture

16. Agriculture

Key Messages

Sectoral Emission Ceilings

- Carbon Budget 1: 106 $MtCO_2eq.$
- Carbon Budget 2: 96 $MtCO_2eq.$
- Emissions Abatement (on 2018): -25% (17.25 $MtCO_2eq.$ per annum by 2030)
- Emissions up to 2021: 23.09 $MtCO_2eq.$

Trends in the Sector

Agriculture accounted for 33.33% of Ireland's greenhouse gas (GHG) emissions in 2021, down from 34% in 2020. Following the abolition of milk quotas, emissions have risen to just beyond the 1998 previous peak of 22.93 $MtCO_2eq.$ to 23.09 $MtCO_2eq.$ in 2021. Overall emissions in the sector have grown 19% over the last decade. The trend is already turning with expected reductions in emissions in 2022 – this needs to be sustained and accelerated, which will be done through, and supported by, Government policy.

Key Targets

Targets	2021-2025 $MtCO_2eq.$	2026-2030 $MtCO_2eq.$	Total $MtCO_2eq.$
Reducing chemical N use to a maximum of 300,000 tonnes	0.4 – 0.45	0.1 – 0.2	0.5 – 0.65
Increased adoption of protected urea	0.35 – 0.45	0.08 – 0.12	0.43 – 0.57
Earlier finishing of beef cattle (3 – 3.5 months reduced finishing age)	0.25	0.48	0.73
Reduce age at first calving of suckler beef cows	0.03	0.07	0.1
Improved animal breeding by focusing on low methane traits	0.0	0.3 – 0.5	0.3 – 0.5
Organic farming (75k ha to 450k ha)	0.1	0.2	0.3
Improved animal feeding	0.2	0.4	0.6
Miscellaneous measures, including extended grazing and roll out of a methane-reducing slurry additive	0.2	0.3	0.5
Total Core	1.5 – 1.7	1.9 – 2.3	3.4 – 4.0

Key Targets	2021-2025 $MtCO_2eq.$	2026-2030 $MtCO_2eq.$	Total $MtCO_2eq.$
Addition of a slow-release bolus pasture-based feed additive	0	0.6	0.6
Mobilise recommendations of the Food Vision sectoral groupings and support land use diversification options for livestock farmers, such as anaerobic digestion, forestry and tillage to incentivise voluntary livestock reductions	1.3	0.2	1.5
Total Further	1.3	0.8	2.1
All Measures	2.8 – 3.0	2.7	– 3.1

Measures and Actions

The agriculture sector is undergoing a significant transformation to deliver the reduction in GHG emissions required which will impact across Ireland's agriculture and food production systems. Guided by the Food Vision 2030 Strategy, Irish farmers and food producers will further prioritise delivery of environmental, social, and economic sustainability. We will do this through actions in the following areas:

- Reducing nitrogen emissions;
- Reducing methane emissions;
- Increasing carbon capture;
- Enhancing biodiversity;
- Providing diversification options for livestock farmers;
- Enhancing adaptation;
- Supporting the development of new research.

16.1 State of Play

16.1.1 Emissions Profile to Date

The agriculture sector is the largest contributor to Ireland's greenhouse gas (GHG) emissions. While challenging from an Irish perspective, and unusual in an international context, this fact reflects the economic, and historical, importance of agriculture, relative to other industries in the Irish economy.

Reducing emissions in agriculture is not a uniquely Irish challenge – throughout Europe, reducing GHG emissions in agriculture has proven difficult. What sets Ireland apart from its EU counterparts is the scale of our beef and dairy primary production industries relative to our population and land size, and the lack of heavy industry in Ireland's economic make-up.

The impact of actions from within this sector has profound effects on other sectors, for example grasslands on drained organic soils, which constitute circa 8% of the total grassland area, have a disproportionately high level of emissions relative to the area they cover. Yet the reporting of these emissions occurs in the Land Use, Land Use Change and Forestry (LULUCF) sector, not in the agricultural sector. Likewise, feedstock to be grown for biomethane from this sector, although generating an alternate income and diversification opportunity in agriculture, will provide for

reductions in the transport and industry sectors as fossil fuels are displaced. In addition to developing renewable energy streams, the agriculture sector has a key role to play in developing bioeconomy innovation, e.g., bioproducts, biomaterials and biochemicals. Altered practices across land uses, under the correct conditions, can also yield significant co-benefits for ecosystem services including water quality, drought management, flood attenuation and biodiversity.

These interactions underline the importance of the whole-of-Government approach to climate action and the bioeconomy. Recognising that each sector is not isolated from the others, and that actions in one sector can have positive and/or negative impacts outside their sector beyond carbon management, mechanisms need to be in place to mutually support each sector's endeavour.

Agriculture accounted for 33.33% of Ireland's GHG emissions in 2021, down from 34% in 2020. However, this was not due to fewer emissions from the sector, but rather the overall increase of emissions elsewhere in the economy. Provisional data for 2021 shows that emissions from agriculture increased by 0.66 $MtCO_2eq.$, or 2.9%, to a total of 23.09 $MtCO_2eq.$

Table 16.1 – Agriculture GHG Emissions 2021

Agriculture Emissions $MtCO_2eq.$	Share of Total GHG Emissions	Agriculture Emissions tCO_2 per capita
23.09	33.33%	4.5

Emissions from this sector since 1990 have ranged from 20.07 $MtCO_2eq.$ in 1990 to a historical peak of 22.93 $MtCO_2eq.$ in 1998 and a low of 19.36 $MtCO_2eq.$ in 2011. Following the abolition of milk quotas, emissions have risen to a point short of the previous peak, to 23.09 $MtCO_2eq.$ in 2021. Overall emissions in this sector have grown 19% over last decade.

Table 16.2 – Trends in Agriculture GHG Emissions

Timeframe	Percentage Change	Absolute Change $MtCO_2eq.$
1998-2011	-15.6%	-3.57
2011-2021	+19%	+3.74

The overall increase in agricultural emissions can be related almost entirely to the removal of milk quotas, which has led to an expansion in the dairy sector. Emissions on the average dairy farm, as reported by Teagasc, are mainly responsible for the 2021[48] increase as herd sizes have grown. There is also an impact from an increase in liming activity. This liming activity is positive from an emissions perspective, resulting in a lower requirement for nitrogen-based fertilisers over time, but it does result in increased carbon dioxide emissions in the short term.

GHG emissions per hectare on dairy farms have increased to a lesser degree, as the average dairy farm area has also increased. Additionally, progress in breeding and feeding strategies meant that the average kilogramme of milk is produced with a lower carbon footprint. However, this improvement in emissions intensity is being offset by a higher volume of milk produced by larger herds. Hence, absolute farm level GHG emissions increased on dairy farms in 2021. Should emissions from the dairy sector continue to grow, even with a corresponding reduction in the beef

[48] National Farm Survey - 2021 Sustainability Report, Teagasc 2022

sector, overall agriculture emissions will grow despite efficiency gains.

AgClimatise, the sector's roadmap to climate neutrality, acknowledges this challenge. It calls for a stabilisation of methane emissions[49] alongside a significant reduction in fertiliser-related nitrous oxide emissions, to achieve an absolute reduction in the agricultural GHG inventory by 2030. It further states that '*Any increase in biogenic methane emissions from continually increasing livestock numbers will put the achievement of this target in doubt*'.

Table 16.3 – Required Level of Decarbonisation for Agriculture for Carbon Budgets 1 and 2

Sectoral Carbon Budget 2021 to 2025 $MtCO_2eq.$	Cumulative Emissions to 2021	Remaining Sectoral Carbon Budget 2022 to 2025 $MtCO_2eq.$	Sectoral Carbon Budget 2026 to 2030 $MtCO_2eq.$
106	23.09	82.91	96

The first carbon budget allocates 106 $MtCO_2eq.$ for the agriculture sector over the five-year period of 2021 to 2025. Preliminary data indicates that 23.09 $MtCO_2eq.$ of this budget has already been used in 2021. Therefore, the sector will need to reduce emissions by 4.1% annually for 2022, 2023, 2024 and 2025 to meet this first carbon budget. Due to the increased cost of chemical fertiliser in 2022, it is expected that emissions in the sector will fall slightly due to the decline in chemical nitrogen sales. The challenge is to ensure through actions that this becomes the longer-term trend for the sector.

Table 16.4 – Required Level of Decarbonisation for Agriculture

2018 Emissions $MtCO_2eq.$	Indicative Target for 2025 Emissions $MtCO_2eq.$	Indicative Target % Reduction for 2025	2021 Emissions $MtCO_2eq.$	% Increase (+) / Reduction (-) to date
23	20	~10	23	0

Emissions reduction in the agriculture sector is particularly challenging because it is a biological system. There will always be residual emissions associated with food production. Some time is needed to develop the technological and innovative solutions, and also to determine whether the measures are having the desired impact. However, the implementation of measures to mitigate agricultural emissions, such as the use of protected urea fertilisers, have valuable co-benefits for other environmental concerns.

Livestock grazing out of doors dominates Irish agriculture and our agriculture sector has a reputation for high quality and sustainably produced food. Maintaining and verifying that reputation is an imperative for our agri-food industries. Ireland is already well placed through the success of the Origin Green programme and can maintain and build on this competitive advantage, provided changes are made over the years ahead to enhance the sector's environmental credentials.3.

[49] Methane associated with ruminant livestock production (i.e. enteric fermentation and manure management) accounts for 68% of Irish agricultural GHG emissions (Teagasc 2022)

Table 16.5 – Agriculture Sector GHG Emissions International Comparisons, 2020

	Ireland	Poland	Spain	Italy	EU 27
Share of Total GHG	31.30%	9.60%	14.46%	9.12%	11.78%
Emissions, $tCO_2eq./capita$	4.18	0.90	0.81	0.55	0.85
Change Since 2005	+7.54%	+7.44%	-0.53%	-4.41%	-1.69%

The Department of Agriculture, Food and the Marine's (DAFM) 'Food Vision 2030 - A World Leader in Sustainable Food Systems' strongly advocates for sustainability as we develop our agri-food sector to meet the highest standards of sustainability across all three pillars – economic, environmental, and social. The strategy recognises the challenges ahead, while proposing solutions and charting a pathway towards sustainability.

Most recent climate projections have found that specifically in relation to agriculture, increases in temperature, heatwaves, heavy precipitation and dry periods/droughts, along with decreases in frost and ice days, will have direct and substantial effects on agriculture in Ireland by the middle of the century.

Ireland, through Food Vision 2030, aims to be a world leader in sustainable food systems, delivering food security and nutrition for all in such a way that the economic, environmental, and social bases to generate food and nutrition for future generations are not compromised. In demonstrating the Irish agri-food sector meets the highest standards of sustainability, it also provides the foundation for the continuing competitive advantage of the sector. Food Vision 2030 sets out 22 goals under the following four high-level missions that the sector must achieve if it is to fulfil this ambition:[50]

- A Climate Smart, Environmentally Sustainable Agri-food Sector;
- Viable and Resilient Primary Producers, with Enhanced Wellbeing;
- Food that is Safe, Nutritious and Appealing, Trusted and Valued at Home and Abroad;
- An Innovative, Competitive and Resilient Sector, Driven by Technology and Talent.

The strategy has the objective of achieving a climate-neutral food system by 2050, with verifiable progress achieved by 2030, encompassing emissions, biodiversity, and water quality, as well as a range of other targets for forestry, fisheries, organic farming, and food waste.

[50] The Strategy and more information on Food Vision 2030 is published at : gov.ie - Food Vision 2030 - A World Leader in Sustainable Food Systems (www.gov.ie)

16.2 2025 and 2030 KPIs

Table 16.6 – Key Metrics to Deliver Abatement in Agriculture

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2eq.$	2031 - 2035 measures
Reducing Chemical N Use	Maximum usage of 330,000 tonnes	0.4 – 0.45	Maximum usage of 300,000 tonnes	0.1 – 0.2	Ensure that new mitigation technologies and innovations are adopted as they become available through incorporation in agri-food strategy and policy
Increased Adoption of Protected Urea	Target 80-90% uptake of protected urea on grassland farms	0.35 – 0.45	Target 90-100% uptake of protected urea on grassland farms	0.08 – 0.12	
Earlier Finishing of Beef Cattle (26 to 22-23 months)	Continue current trajectory of earlier finishing Target 24-25 months average finishing age by 2025	0.25	Target 22-23 months average finishing age by 2030	0.48	
Mobilise recommendations of the Food Vision sectoral groupings for livestock farmers and support land use diversification options such as anaerobic digestion, forestry and tillage	Production of up to 1 TWh of Biomethane by 2025 Construction of up to 20 AD plants of scale Target up to 250,000 ha of organics by 2025 Target up to 360,000 ha of tillage by 2025	1.3	Production of up to 5.7 TWh of Biomethane by 2030 Construction of up to 200 AD plants of scale Target up to 450,000 ha of organics by 2030 Target up to 400,000 ha of tillage by 2030	0.2	Further development of diversification options

To meet the required level of emissions reduction by 2025, we will implement the recommendations from the Food Vision sectoral groupings regarding:

- Significantly reducing our use of chemical nitrogen as a fertiliser;
- Increasing the uptake by farmers of low-emission slurry spreading to 90%;
- Improving how farmers feed their animals by reducing the crude protein content of their feed;
- Increasing the focus on low-methane traits within animal breeding programmes;
- Encouraging processors and farmers to reduce the average age of slaughter to 24 – 25 months;
- Increasing the resilience of the sector through the integration of climate adaptation considerations in policy planning;
- Supporting livestock farmers' transition to alternative land uses through the provision of

diversification options including:

- Increasing the level of organic farming to 250,000 hectares;
- Expanding the indigenous biomethane sector through anaerobic digestion, reaching up 1 TWh of biomethane;
- Increasing the area of tillage to 360,000 hectares;
- Contributing to the delivery of the LULUCF targets for afforestation and reduced management intensity of organic soils.

To meet the required level of emissions reduction by 2030, we will:

- Take steps to continue to reduce the use of chemical nitrogen as a fertilizer on farms;
- Continue to focus on low-methane traits within animal breeding programmes;
- Take steps to improve how farmers feed their animals by reducing the crude protein content of their food;
- Encourage a reduction in the average age of slaughter to 22-23 months;
- Support a further transition to alternative land uses through diversification options, including:
  - Incentivising an increase in the level of organic farming to 450,000 hectares;
  - Expanding the indigenous biomethane sector through anaerobic digestion, reaching up 5.7 TWh of biomethane;
  - Supporting an increase in the area of tillage to 400,000 hectares;
  - Contributing to the delivery of the LULUCF targets for afforestation and reduced management intensity of organic soils.
- Continuing to increase the resilience of the sector through the integration of climate adaptation considerations in policy planning.

16.3 Measures to Deliver Sectoral Emissions Ceilings

Our 2030 decarbonisation ambition will require all sectors to increase emission mitigation actions if we are to achieve our national and EU targets. For the agriculture sector, the following measures will be critical to success:

16.3.1 Significant Reduction in Nitrous Oxide Emissions by Changing Farm Management Practices in relation to Nutrient Use

Nitrogen, phosphorus and potassium are the key nutrients which fertilise our land and ensure that plants, crops and trees can grow. In farming, chemical fertilisers are widely used to ensure the significant growth of plants, grass, crops, etc. Nitrous oxide is then produced by microbes in these fertilised soils, as well as in animal wastes. Nitrous oxide is a powerful GHG, with a long atmospheric life. Agriculture is responsible for 90% of nitrous oxide emissions in Ireland.

Sales of chemical fertiliser are the means of measuring its use. Over the last number of years, sales of fertiliser have increased. Using nitrogen as an indicator, the sector has increased its use from 367,000 tonnes in 2019 to 399,000 tonnes in 2021.[51] The Russian invasion of Ukraine has increased the cost of chemical fertiliser. As of August 2022, fertiliser prices were up 127% on the same month in the previous year.[52] This increase in fertiliser price has curtailed its sale and usage.

[51] Fertiliser Sales - CSO - Central Statistics Office

[52] Agricultural Price Indices August 2022 - CSO - Central Statistics Office

The challenge now is to continue this trend, by putting in place appropriate supports, financial, behavioural, and technical.

This sector has the opportunity to realise lower levels of chemical fertiliser use by the end of the decade, with a maximum usage target of 300,000 tonnes set for the sector.

16.3.2 Increase Focus on Low Methane Traits within Animal Breeding Programmes

Preferential genetic breeding of animals can realise a material difference in emissions per animal. However, in order to achieve this, the rate of data collected per animal needs to be increased, so as to make informed and evidence-based breeding choices. For example, currently only half of our dairy cows are recorded for milk production. This must increase to 90% by the end of the decade. This increased data recording will encourage the breeding of more efficient animals. The carbon sub-index has been recently incorporated into the Economic Breeding Index which will help the sector achieve its breeding goals.

16.3.3 Support Transition to Alternative Land Uses through Diversification Options

There is a clear need to enhance the sector's contribution across food production; climate change mitigation and resilience; and energy security of a decarbonising system. There are also issues to be addressed around food security and food demand, and the importance of not impacting both from a food availability and affordability standpoint. Increasing the volume of home-grown proteins and cereals to support our livestock sector is a key objective.

In order to address these areas, recommendations arising from the Food Vision sectoral groupings will be mobilised. To have an impact, it is essential that any voluntary reduction is structured in a way that ensures that reductions in breeding ruminants on a participating farm are not offset by increases in breeding ruminant numbers. Livestock farmers will be provided with diversification options, for example, in the following key areas:

- Organics;
- Agri-centric biomethane production;
- Tillage;
- Afforestation (addressed in Chapter 17);
- Reduced management intensity of grasslands (water table management) on drained organic soils (addressed in Chapter 17).

Increase Domestic Organic Farming

Ireland's current level of organic farming, at less than 3%, is low when compared to the rest of Europe, which is at an average of 9.1%. Roughly 110,000 hectares of land is currently used for organic farming, in an agricultural landbank of 4,883,600 hectares. Under the EU Farm to Fork Strategy, the EU has committed to an overall target of reaching at least 25% organic farming by 2030. The target is considerably larger than our current rate of organic farming, requiring an almost 5-fold increase to reach 450,000 hectares by 2030. This will help to further reduce fertiliser and pesticide use, resulting in associated environmental benefits. Ireland's Common Agricultural Policy Strategic Plan incentivises a dramatic increase in organic farming.

Agri-centric Biomethane Production

Biomethane is a renewable gas made from biological feedstocks including food waste and agricultural feedstocks (such as animal manures, grass, grass silage, etc.), through a process known as Anaerobic Digestion (AD).

The anaerobic digestion process produces biogas from feedstocks, through the breaking down of organic material by micro-organisms in large oxygen-free tanks. A by-product of this process is known as digestate, which can be used as an organic fertiliser. The biogas can then be 'cleaned' or upgraded to biomethane which is structurally identical to natural gas and can therefore be used as a direct substitute.

The Government is firmly committed to tripling its ambition from Climate Action Plan 2021, to now deliver up to 5.7 TWh of indigenously produced biomethane, based on agricultural feedstocks. This will provide both a diversification opportunity for farmers and a land-use alternative to livestock production.

AD and the production of biomethane is at a nascent stage of development in Ireland, although it is extensively developed elsewhere in the EU, with Germany having over 200 plants. There is a need for an all-of-Government approach to deliver on this ambition. This will require a multiplicity of stakeholders across Government, farmers, businesses, and regulators to come together and align policy, incentives, regulation, and markets to ensure that the agriculture sector can deliver on its sectoral emissions reduction target; businesses can decarbonise their processes; and Ireland can meet its renewable heat targets for 2030.

DAFM in partnership with the Department of the Environment, Climate and Communications (DECC) is developing a National Biomethane Strategy that will identify all the necessary actions to deliver on this ambition. The strategy will be agri-led, farmer-centric and will contribute positively to the sectoral emissions ceiling for agriculture as well as to the decarbonisation of the energy system.

In response, and in recognition of the requirement of an operational support mechanism, the Government recently agreed to introduce a Renewable Heat Obligation Scheme by 2024. This obligation will incentivise suppliers of all fuels in the heat sector to ensure that a certain proportion of the energy supplied is renewable. Sustainability must remain a key consideration as Ireland looks to change the way we source our energy. The design of policies will focus on the need to avoid negatively impacting on biodiversity, land use and food security.

Initiating an AD/biomethane industry in Ireland will require intervention in order to build out the infrastructure required to meet up to 5.7 TWh by 2030. Delivering on such scale requires in the region of 150 to 200 AD plants. DAFM in partnership with DECC will assess available financial opportunities and mobilise funds where available.

This renewable fuel will be essential to decarbonising other sectors of the economy, such as high-temperature industrial heat needs in manufacturing processes.

Tillage

The tillage and horticulture sectors are the most carbon-efficient sectors of Irish agriculture, and it is important that the area under cultivation in these sectors is increased. In 2022, there were approximately 348,500 hectares of tillage crops (cereals, legumes, beet, maize, oilseed rape, and

potatoes) produced. This increase in 2022 was supported by a tillage incentive scheme. There is scope to further increase this area, despite increasing land competition from the dairy sector. There is also an opportunity for industry to exploit opportunities for high-value crops, based on changing consumer preferences, creating opportunities for the primary producer both in new food markets and bioeconomy efforts. There is a very clear opportunity to increase the volume of Irish grain being used in the high-value drinks industry, and as a source of protein for the livestock industry. For example, cereals are a key raw material for the Irish whiskey sector, a growing national industry. Tillage and horticulture by-products (for example stalks, stems, husks, wash water, and peelings) also hold value as part of the EU-supported circular bioeconomy for further chemical, packaging, medical, and construction material, and energy uses.

Over the next decade, there is the potential to produce 40,000 hectares of beans which would provide a native source of proteins. At a producer level, there are several nitrogen use efficiency measures that tillage farmers can consider to further reduce the environmental footprint of their holdings.

16.4 Actions

Table 16.7 sets out a roadmap of actions to 2025, and Table 16.8 specifically describes the actions for delivery in 2023.

Table 16.7 - Key Actions to Deliver Abatement in Agriculture for the Period 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
Changing How We Fertilise Our Land	Introduce a national fertiliser database Increase the adoption of protected urea Continue to fund LESS to contribute to nitrogen reductions Provide support for the Protein Aid Scheme to support the production of legumes, which play an important role in fixing nitrogen from the atmosphere, resulting in reduced chemical nitrogen fertiliser usage	DAFM to fund establishment of multispecies and clover swards to reduce N dependence Review maximum nitrogen limits as set out in Nitrates Legislation by Q2 2024, which is separate to reviewing conditions for granting of derogation status Continue to fund LESS to contribute to nitrogen reductions Provide support for the Protein Aid Scheme to support the production of legumes, which play an important role in fixing nitrogen from the atmosphere, resulting in reduced chemical nitrogen fertiliser usage	Continue to fund LESS to contribute to nitrogen reductions Provide support for the Protein Aid Scheme to support the production of legumes, which play an important role in fixing nitrogen from the atmosphere, resulting in reduced chemical nitrogen fertiliser usage

Measure	2023 Actions	2024 Actions	2025 Actions
Improving the Effiency of Our Animals	Provide data and analysis to farmers on the benefits of improved animal feeding through knowledge transfer Promote improved animal breeding through focusing on low-methane traits Improved animal feeding – continue to work with all stakeholders to develop a slow-release bolus pasture-based feed additive Develop a methane-reducing slurry additive	Promote improved animal breeding through focusing on low-methane traits Improved animal feeding – continue to work with all stakeholders to develop a slow-release bolus pasture-based feed additive Develop a methane-reducing slurry additive	Promote improved animal breeding through focusing on low-methane traits Improved animal feeding – continue to work with all stakeholders to develop a slow-release bolus pasture-based feed additive Develop a methane-reducing slurry additive
Expanding Our Organic Sector	Provide financial support to farmers who convert to organic farming	Provide financial support to farmers who convert to organic farming	Provide financial support to farmers who convert to organic farming
Providing options to livestock farmers	Mobilise recommendations of the Food Vision sectoral groupings and support land use diversification options for livestock farmers such as anaerobic digestion, forestry and tillage	Mobilise recommendations of the Food Vision sectoral groupings and support land use diversification options for livestock farmers such as anaerobic digestion, forestry and tillage	Mobilise recommendations of the Food Vision sectoral groupings and support land use diversification options for livestock farmers such as anaerobic digestion, forestry and tillage
Expanding Our Domestic Biomethane Industry	Start-up of the Teagasc biomethane anaerobic digestion pilot plant in Grange Continue support for European Innovation Partnership pilot project – Small Biogas Demonstration Programme and dissemination of learnings Deliver a National Biomethane Strategy within 6 months, co-led by DAFM and DECC, under the auspices of Heat and Built Environment Delivery Task Force Seek financial opportunities for capital support for the development of a biomethane industry in Ireland Identify and address the research and knowledge gaps around supply of feedstocks, the role of digestate and the sequestration potential regarding biomethane production	Introduce obligation in the heat sector, incentivising the production of indigenously-produced biomethane Seek financial opportunities for capital support for the development of a biomethane industry in Ireland	

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex. Delivery will be kept under constant review with further policies, measures and actions brought forward to address any failure or projected failure as required, including as part of the annual update of the Climate Action Plan.

Table 16.8 – 2023 Actions

Action Number	2023 Action
AG/23/1	Introduce a national fertiliser database
AG/23/2	Increase the adoption of protected urea
AG/23/3	Continue to fund LESS to contribute to nitrogen reductions
AG/23/4	Provide support for the Protein Aid Scheme to support the production of legumes, which play an important role in fixing nitrogen from the atmosphere, resulting in reduced chemical nitrogen fertiliser usage
AG/23/5	Provide data and analysis to farmers on the benefits of improved animal feeding through knowledge transfer
AG/23/6	Promote improved animal breeding through focusing on low methane traits
AG/23/7	Improved animal feeding – continue to work with all stakeholders to develop a slow-release bolus pasture-based feed additive
AG/23/8	Develop a methane-reducing slurry additive
AG/23/9	Provide financial support to farmers who convert to organic farming
AG/23/10	Mobilise recommendations of the Food Vision sectoral groupings and support land use diversification options for livestock farmers, such as anaerobic digestion, forestry and tillage, to incentivise voluntary livestock reductions.
AG/23/11	Start-up of the Teagasc biomethane anaerobic digestion pilot plant in Grange
AG/23/12	Continue support for European Innovation Partnership pilot project - Small Biogas Demonstration Programme and dissemination of learnings
AG/23/13	Deliver a National Biomethane Strategy within 6 months
AG/23/14	Seek financial opportunities for capital support for the development of a biomethane industry in Ireland
AG/23/15	Identify and address the research and knowledge gaps around the supply of feedstocks, the role of digestate and the sequestration potential regarding biomethane production

17 Land Use, Land Use Change, Forestry

17. Land Use, Land Use Change and Forestry

Key Messages

Sectoral Emission Ceilings and Trends in the Sector

In June 2022, with work on the sectoral ceilings almost complete, the Environmental Protection Agency published its latest emissions projections, showing net Land Use, Land Use Change and Forestry (LULUCF) emissions as being projected to rise to 11 MtCO2eq. in 2030. This represented a significant development in our scientific knowledge of net LULUCF emissions, and materially altered the parameters for setting the LULUCF sectoral emissions ceiling. For this reason, it was decided to defer finalising the LULUCF sectoral emissions ceiling to coincide with the completion of a Land-use Review.

Key Targets

Pending the putting in place of a sectoral emissions ceiling in 2023, this Climate Action Plan commits to accelerating the taking of measures and actions to achieving accelerated emissions reductions in the sector, with KPIs set out in Table 17.6 below.

Measures and Actions

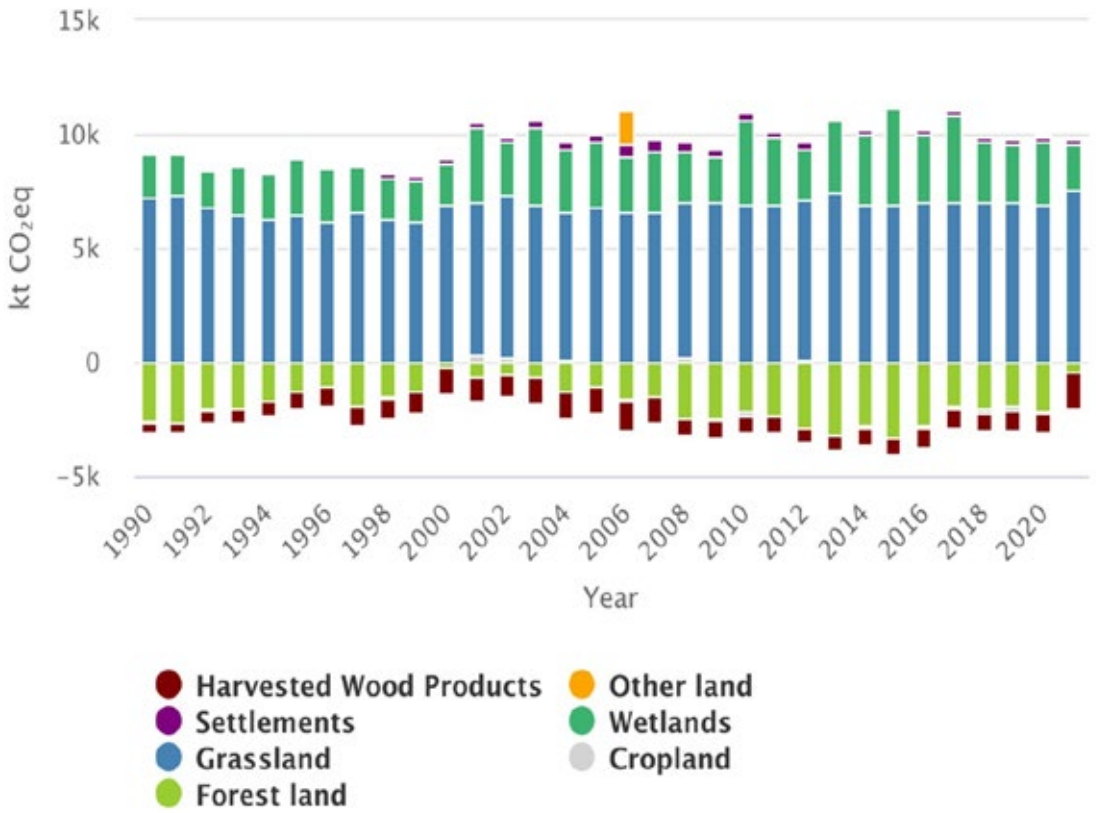
- Increase our annual afforestation rates from approximately 2,000 hectares (ha) per annum in 2021 and 2022 to 8,000 ha per annum from 2023 onwards, to deliver an additional 28,000 ha of afforestation across the first carbon budget period
- Develop, assess, and adopt as appropriate the new Forestry Programme and Coillte's Strategic Vision
- Promote forest management initiatives in both public and private forests to increase carbon sinks and stores
- Improve our management for carbon sequestration of 200,000 ha of grasslands on mineral soils
- Reduce the management intensity of grasslands on 25,000 ha of drained organic soils
- Rehabilitate 33,000 ha of peatlands as part of the Bord na Móna Enhanced Decommissioning, Rehabilitation and Restoration Scheme and LIFE People and Peatlands programmes

17.1 State of Play

17.1.1 Emissions Profile to Date

Across the EU-27 since 1990,[53] the Land Use, Land Use Change and Forestry (LULUCF) sector has been a net sink for greenhouse gas (GHG) emissions, primarily due to extensive forest cover. In contrast, the Irish LULUCF sector has been a net source of GHG emissions in all years from 1990 to 2021. This is largely due to carbon emissions from *Grassland* and *Wetlands*, as shown in Figure 17.1. *Forest land* and *Harvested Wood Products* have been a significant carbon sink since 1990. However, this sink is in decline. Forest cover in Ireland represents 11.6% of the total land area in comparison to the EU average of 38%. Since the foundation of the State, forest cover in Ireland has grown significantly from 1.4% of the land area to current levels but is still below the current national target of 18%[54,55]. *Grassland* and *Wetlands* in Ireland are considerable sources of emissions as a result of the drainage of organic soils. The land-use category *Cropland* fluctuates between being a small net sink in some years and a small source of emissions in others. However, all of these categories have the potential to be managed as net sinks for GHG emissions in the longer term.

Figure 17.1 – LULUCF Emissions and Removals 1990-2021



53 The start of the time period covered by UNFCCC National Inventory Reporting

54 DAFM (2014) Forests, products and people Ireland's forest policy – a renewed vision, https://assets.gov.ie/118982/818a0e65-c5ae-4902-a720-17ef4d72b9e1.pdf

55 DAFM (2022) Ireland's Forest Strategy Implementation Plan – Draft for public consultation, https://assets.gov.ie/237551/b0af026a-cc3a-4e92-a833-80ed6ae846fe.pdf

Provisional data[56] show that LULUCF accounted for 11.2% of Ireland's GHG emissions in 2021.

Table 17.1 – LULUCF GHG Emissions 2021

LULUCF Emissions $MtCO_2eq.$	Share of Total GHG Emissions	LULUCF Emissions tCO_2 per capita
7.8	11.2%	1.55

Table 17.2 – Trends in LULUCF GHG Emissions

Timeframe	Percentage Change	Absolute Change $MtCO_2eq.$
2005-12	-20.7%	-1.6
2012-20	+11.5%	+0.7

Ireland's LULUCF sector is currently a net source of emissions, and emissions reductions for this sector are set to become increasingly challenging, as the age profile of the forest stock matures and harvesting levels increase in line with projected forecasts. When considered alongside comparable EU Member States, we can see that there is a significant challenge over the medium- to longer-term in managing and reducing LULUCF emissions.

Table 17.3 – LULUCF Sector GHG Emissions International Comparisons, 2020

	Ireland	Denmark	Austria	Finland	EU 27
Emissions, tCO_2 eq./capita	1.39	0.53	-0.14	-3.13	-0.51

Ireland has a high proportion of peaty or organic soils, with peatlands covering approximately 20% of the national land area. These provide significant carbon stores when appropriately managed. Legacy features of the LULUCF sector in Ireland pose challenges for this sector and they include afforestation on organic soils; drainage of organic soils for conversion to agricultural lands; and the commercial extraction of peat for purposes such as power generation and horticultural products – all of which create GHG emissions rather than carbon stores.

For the purposes of inventory reporting, the GHG emissions associated with organic soils are spread across a number of different categories within the LULUCF sector. Land on peaty or organic soils, which has been converted to other uses such as grazing or forestry, is no longer categorised as ***Wetlands*** and falls into other categories such as ***Grassland*** or ***Forest land***. Therefore, the ***Wetlands*** category in terms of reporting, does not represent all of our emissions from peaty or organic soils and are reported under the ***Grassland***, ***Forest land*** and ***Cropland*** categories.

56 EPA (2022) Ireland's Provisional Greenhouse Gas Emissions 1990-2021 https://www.epa.ie/publications/monitoring--assessment/climate-change/air-emissions/irelands-provisional-greenhouse-gas-emissions-1990-2021.php. Provisional data for the LULUCF sector are based on projections and are subject to revision when final data are submitted to the EU and UN in 2023

Table 17.4 – LULUCF Categories and Emissions, 2021[57]

LULUCF Category	Emissions/Removals MtCO2eq.
A. Forest land	-0.43
B. Cropland	-0.01
C. Grassland	7.57
D. Wetlands	2.00
E. Settlements	0.21
F. Other land	0.04
G. Harvested wood products	-1.61
Total LULUCF	7.8

The proportion of agricultural land cover in Ireland is one of the highest in Europe at approximately 68% (the EU average is 39%). The vast majority of this is grassland and consequently the ***Grassland*** category is the predominant land use in Ireland. Ireland's grasslands can be subdivided into those on mineral soils which can sequester carbon, and those on peaty or organic soils which emit carbon as they have been drained. Grasslands on organic soils only represent 8.1% of grasslands in Ireland but are responsible for a disproportionately high level of emissions relative to the area they cover. This negates the carbon removals provided by grasslands on mineral soils, despite the fact that grasslands on mineral soils cover an area approximately ten-fold in size relative to grasslands on organic soils. As a result, the ***Grassland*** category is a net emitter, with emissions of approximately 7.6 $MtCO_2eq.$ projected for 2021.

Forestry on peat soils also generates emissions, and the extent of these lands in Ireland's forestry sector is significant, representing approximately 38% of the ***Forest land*** category. Again, this presents significant challenges with regard to emissions.

Our understanding of the GHG emissions associated with the LULUCF sector has fundamentally changed since the publication of Climate Action Plan 2021 and the Environmental Protection Agency's (EPA) National Inventory Report (NIR) 2021. This is primarily due to the revision of the emission factor for forestry on peaty or organic soils. We now know that the emissions from planting trees on this type of soil are far higher than previously envisaged.

Ireland's most recent NIR 2022[58] indicated a significantly higher 2018 baseline of 6.9 MtCO2eq. compared to the previous 2018 baseline of 4.8 MtCO2eq., and proportional increases to the associated LULUCF emissions per head of population as shown in Table 17.5. The LULUCF sector is the only sector to have seen a significant revision in the 2018 baseline data. LULUCF now represents a greater share of the total economy-wide emissions and substantially increases the gap to targets. This is an example of the uncertainty that is evident in the LULUCF sector with regard to the underlying data and emissions factors. This uncertainty is being reduced through several research projects and, over the short to medium term, further substantial revisions are forecast.

57 As previous, provisional data for the LULUCF sector are based on projections and are subject to revision when final data are submitted to the EU and UN in 2023

58 On a Fifth Assessment Report of the United Nations Intergovernmental Panel on Climate Change (AR5) basis

Table 17.5 – Changes to the Land Use, Land Use Change and Forestry GHG Emissions 2018 Baseline

	LULUCF Emissions $MtCO_2eq.$	LULUCF Emissions tCO_2 per capita	Share of Total GHG Emissions
NIR 2021 (AR5 basis)	4.8	0.97	7%
NIR 2022 (AR5 basis)	6.9	1.41	10%

In addition to a changed understanding of historical emissions, the projected emissions for LULUCF have also been revised. Ireland's forest sink is in decline and is projected to become a source of emissions from 2022 onwards. Based on current EPA projections, Ireland's net LULUCF emissions will reach 11.1 MtCO2eq. in 2030. All of these issues underline the need for additional time to, not only carefully agree the sectoral emissions ceiling, but also the actions required to achieve it.

Box 17.1 – Emerging EU Legislation

The national state of play, described above, is also set to be further influenced by a number of EU legislative proposals currently being progressed.

The proposed EU Nature Restoration Law seeks to repair European habitats that are in poor condition and bring back nature to all ecosystems. The aim is for nature restoration measures to apply to a proportion of the EU's land and sea areas by 2030 and to eventually extend these measures to all ecosystems in need of restoration by 2050. The national implementation of the proposed EU Nature Restoration Law will be led by the Department of Housing, Local Government and Heritage on the basis of a whole-of-Government approach.

There are further proposals from the EU to reduce the use and risk of chemical pesticides and a new Soil Health Law to significantly improve the state of soils, and protect soils on the same legal basis as air and water. The EU Nature Restoration Law will have implications for all land users in Ireland and these will be taken into consideration as part of the second phase of the Land-use Review (see section 17.3 for further details of the Land-use Review).

In November 2022, provisional political agreement was also reached in relation to the proposed new LULUCF Regulation that is part of the Fit for 55 Package. Pending formal adoption, this will set an overall EU-level objective of 310 MtCO2eq. of net removals in the LULUCF sector in 2030, under which Ireland will have a new target to reduce net land-use emissions to 3.7 MtCO2eq. by 2030.

The EU recently proposed a new regulation to develop a regulatory framework for certifying carbon removals, which aims to offer incentives to farmers to upscale carbon farming within the EU. It is to be adopted by Member States on a voluntary basis.

17.2 2025 and 2030 KPIs

Table 17.6 – Key Metrics to Deliver Abatement in LULUCF

Theme	2025 KPI	2030 KPI
Forestry and Harvested Wood Products	28 kha of afforestation	68 kha of afforestation
	Develop, assess, and adopt as appropriate the new Forestry Programme and Coillte's Strategic Vision	
Cropland	25 kha of cover crop planted	50 kha of cover crop planted
	35 kha of cereal area to incorporate straw directly into soil	55 kha of cereal area to incorporate straw directly into soil
Grassland	200 kha of mineral grassland managed better to improve sequestration	450 kha of mineral grassland managed better to improve sequestration
	25 kha of drained organic soils with reduced management intensity	80 kha of drained organic soils with reduced management intensity
Wetlands	33,000 ha of peatlands rehabilitated as part of Bord na Móna EDRRS and LIFE People and Peatlands	35,900 ha of peatlands rehabilitated as part of Bord na Móna EDRRS and LIFE People and Peatlands
		41,700 ha of additional peatlands to be funded and rehabilitated

To set this sector (pending the putting in place of a sectoral emissions ceiling in 2023) on the pathway to achieving accelerated emissions reductions by 2025[59] we will:

- Incentivise an increase to our annual afforestation rates from approximately 2,000 hectares (ha) per annum in 2021 and 2022 to 8,000 ha per annum from 2023 onwards, to deliver an additional 28,000 ha of afforestation across the first carbon budget period;
- Develop, assess, and adopt as appropriate the new Forestry Programme and Coillte's Strategic Vision;
- Promote forest management initiatives in both public and private forests to increase carbon sinks and stores;
- Increase the store of carbon in harvested wood products in line with projected forecasts;
- Increase the inclusion of cover crops in tillage to 25,000 ha;
- Increase the incorporation of straw to 35,000 ha of tillage (cereal) area;
- Improve the management for carbon sequestration of 200,000 ha of grasslands on mineral soils;
- Reduce the management intensity of grasslands on 25,000 ha of drained organic soils;
- Rehabilitate 33,000 ha of peatlands as part of Bord na Móna's Enhanced Decommissioning, Rehabilitation and Restoration Scheme (EDRRS) and LIFE People and Peatlands Programmes.

To further reduce emissions in the LULUCF sector (pending the putting in place of a sectoral emissions ceiling in 2023), by 2030[60] we will:

- Incentivise an increase to the area of afforestation by 68,000 ha;
- Develop, assess, and adopt as appropriate the new Forestry Programme and Coillte's Strategic Vision;
- Promote forest management changes and initiatives across public and private forests to increase carbon sinks and stores;

59 Figures to be delivered by 2025 are relative to 2020 and will be delivered across the 2021-2025 budget period

60 Figures to be delivered by 2030 are cumulative increases relative to 2020 and will be delivered across both the 2021-2025 and the 2026-2030 budget periods.

- Increase the inclusion of cover crops in tillage to 50,000 ha;
- Increase the incorporation of straw to 55,000 ha of tillage (cereal) area;
- Improve the management for carbon sequestration of 450,000 ha of grasslands on mineral soils;
- Reduce the management intensity of grasslands on 80,000 ha of drained organic soils;
- Rehabilitate 35,900 ha of peatlands as part of the Bord na Móna's EDRRS and LIFE People and Peatlands programmes, and 41,700 ha of additional peatlands, to provide a total of 77,600 ha of rehabilitated peatlands.

17.3 Measures to Deliver Sectoral Emissions Reductions

The Government is committed to peatland rehabilitation and enhanced delivery of afforestation. This will be realised through:

- An enhanced new Forestry Programme which includes a range of forest creation measures, including native woodland expansion and planting of small native trees areas;
- The work of Project Woodland to address the issues with the licencing backlog and streamline the licensing process for the future;
- An Inter-Departmental Working Group to facilitate coordination of the relevant actions to implement the Forest Strategy and Forestry Implementation Plan 2023-2030;
- Continued funding to the EDRRS for 33,000 ha of post-production peatlands across the Midlands.

We will establish a pathway for our LULUCF sector to become a long-term sustainable net sink, making a positive contribution to combating climate change, and supporting our transition to a carbon neutral economy and society no later than 2050.

17.3.1 Increase Afforestation and Improve Forest Management for Carbon Storage

Forests and forest products play an important role in mitigating climate change. Sustainably managed forests are a net absorber of carbon. Afforestation is one of the largest land-based, long-term climate change mitigation measures available to Ireland. Management of our existing forests also provides opportunities to increase carbon stores. The Department of Agriculture, Food and the Marine (DAFM) will finalise the development of a new Forest Strategy in 2023 that will recognise the multiple benefits that forests provide, focusing on climate, nature, wood, people and the economy. We will:

- Incentivise increased afforestation to 8,000 ha per annum, in order to start increasing planting to a rate consistent with realising our 2030 ambition and contributing to achieving carbon neutrality;
- Launch a new Forestry Programme in 2023 focusing on the importance of climate-smart forestry;
- Develop, assess, and adopt as appropriate Coillte's Strategic Vision which aims to capture additional carbon dioxide in its forests, soils and wood products by 2050;
- Continue to manage the Coillte estate to increase carbon storage by:
  - Managing the age profile of our forest estate to improve its carbon efficiency;
  - Expanding proactive silvicultural management of our broadleaf estate;
  - Redesigning peatland forests to improve the carbon balance.
- Continue to support sustainable forest management (SFM) interventions across the entire forestry sector.

17.3.2 Increase Area of Cover Crop Planted

Maintaining a green cover over the winter period has many environmental, agronomic and economic benefits, including taking up any remaining nutrients after harvest, especially nitrogen, and reducing potential nitrate leaching over the winter period; improving soil structure and soil drainage; protecting soils from winter rainfall; and adding valuable soil organic matter over time. We will:

- Increase the inclusion of cover crops in tillage to at least 50,000 ha by 2030;
- Launch the Common Agricultural Policy Strategic Plan (CSP) which will include a Cover Crop Measure and a capital support measure for investments in the tillage sector;
- Develop the necessary research and data to facilitate the inclusion of this measure in the national emissions inventories.

17.3.3 Increase Incorporation of Straw

Chopping and incorporating the straw into the soil increases soil organic carbon, as organic matter is directly inputted back into the soil. We will:

- Increase the incorporation of straw to at least 55,000 ha of tillage (cereal) area by 2030;
- Continue to fund the Straw Incorporation Measure;
- Launch a capital support measure for investments in the tillage sector as part of the CSP;
- Develop the necessary research and data to facilitate the inclusion of this measure in the national emissions inventories.

17.3.4 Improve Management of Grasslands on Mineral Soils for Increased Carbon Sequestration

Improved management practices of grasslands include increased time to reseeding; expanding legumes in the pasture sward (including clover and multi-species swards); avoiding compaction; and long-term pasture management plans. We will:

- Improve the management of at least 450,000 ha of grassland on mineral soils for carbon sequestration by 2030;
- Include measures in the CSP to improve sequestration on mineral grasslands under the Agri-Environment and Climate Measure (AECM) and Eco-Schemes;
- Impose mandatory requirements under derogation to enhance carbon sequestration under the Nitrates Regulations;
- Install the remaining GHG towers on mineral soil sites as a part of the National Agricultural Soil Carbon Observatory (NASCO);
- Develop the necessary research and data to facilitate the inclusion of this measure in the national emissions inventories.

17.3.5 Reduce Management Intensity of Grasslands on Drained Organic Soils

Reducing the management intensity of drained, agricultural, managed carbon-rich soils offers significant potential for reducing the carbon dioxide emissions from the land-use sector. There are also co-benefits in terms of improved water quality, increased biodiversity, and enhanced resilience to changing weather patterns. We will:

- Reduce the management intensity of at least 80,000 ha of drained, agricultural, managed, carbon-rich soils by 2030;
- Launch the CSP and include a Low Input Peat Grassland Measure under the AECM;
- Open a new fund under the CSP to extend funding for the European Innovation Projects (EIP);
- Aim to improve peatland mapping by continuing to fund the RePEAT Project;
- Leverage opportunities from the EU Just Transition Fund to support research, knowledge transfer and monitoring activities of farmed peat soils;
- Install the remaining GHG towers on peat soil sites as a part of the NASCO;
- Develop the necessary research and data to facilitate the inclusion of this measure in the national emissions inventories.

17.3.6 Peatland Rehabilitation

Peatlands cover 21% of our land area, and 64% of our total soil organic carbon stock. They are the largest store of carbon in the Irish landscape. However, this carbon store is very vulnerable, for example, to drainage and prolonged periods of drought and can contribute to climate change due to the oxidation of peat soil. The rehabilitation of degraded peatlands to a condition in which they regain their ability to deliver specific ecosystem services has considerable potential for initial mitigation gains and future carbon sequestration. Additional benefits of peatland restoration include positive socio-economic outcomes for the Midlands, increased natural capital, enriched biodiversity, and improved water quality and flood attenuation. We will:

- Restore/rewet raised bog Special Areas of Conservation and Natural Heritage Areas – such restoration measures, and hydrological management of our protected peatlands, will halt and reduce peat oxidation and carbon loss;
- Undertake further research to assess the potential to sequester, store and reduce emissions of carbon through the management, restoration and rehabilitation of peatlands as outlined in the National Peatlands Strategy;
- Upgrade land-use and habitat mapping systems to establish the baseline condition of wetlands, and inform the development of best-practice guidelines for wetland management, including the management of degraded sites and peatlands currently exploited for energy peat extraction;
- Develop further measures to help rehabilitate exploited and degraded peatlands, including as part of national land-use planning and the new Common Agricultural Policy, while recognising that strategies may need to differ between regions;
- Rehabilitate 35,900 ha of peatlands as part of the Bord na Móna's EDRRS and LIFE People and Peatlands programmes, and 41,700 ha of additional peatlands, to provide a total of 77,600 ha of rehabilitated peatlands by 2030.
- Develop the necessary research and data to facilitate the inclusion of this measure in the national emissions inventories.

17.4 Actions

Table 17.7 sets out a roadmap of actions to 2025, and Table 17.8 specifically describes the actions for delivery in 2023.

Table 17.7 – Key Actions to Deliver Abatement in the LULUCF Sector 2023-2025

Measure	2023 Actions	2024 Actions	2025 Actions
Increase Afforestation Planting Rate	Develop, assess, and adopt as appropriate the new Forestry Programme 2023-2027, which aims to introduce new afforestation measures and increased financial supports	Continue to support capital investments in afforestation	Continue to support capital investments in afforestation
Forest Management	Develop, assess, and adopt as appropriate Coillte's Strategic Vision, which aims to capture additional carbon dioxide in its forests, soils and wood products by 2050	Continue to manage the Coillte estate to increase carbon storage	Continue to manage the Coillte estate to increase carbon storage
	Develop, assess, and adopt as appropriate the new Forestry Programme 2023-2027, which aims to introduce new supports to promote SFM	Continue to support SFM interventions	Continue to support SFM interventions
Increase Use of Cover Crops in Tillage to Increase Soil Organic Carbon Levels	Launch the CSP and include a cover crop measure	Continue to include a cover crop measure in the CSP	Continue to include a cover crop measure in the CSP
	As part of CSP, launch a capital support measure for investments in the tillage sector	Continue to support capital investments in the tillage sector in the CSP	Continue to support capital investments in the tillage sector in the CSP
Increase the Incorporation of Straw in Cereal Area to Increase Soil Organic Carbon Levels	Continue to fund the Straw Incorporation Measure	Continue to fund the Straw Incorporation Measure	Continue to fund the Straw Incorporation Measure
	As part of CSP launch a capital support measure for investments in the tillage sector	Continue to support capital investments in the tillage sector in the CSP	Continue to support capital investments in the tillage sector in the CSP

Measure	2023 Actions	2024 Actions	2025 Actions
Improved Management of Grasslands on Mineral Soils for Carbon Sequestration	Launch the CSP and include measures on mineral grasslands to improve sequestration under the AECM and Eco-Schemes	Continue to include carbon sequestration measures in the CSP	Continue to include carbon sequestration measures in the CSP
	Under the Nitrates Regulations impose mandatory requirements under derogation to enhance carbon sequestration	Continue to impose mandatory requirements under derogation to enhance carbon sequestration	Continue to impose mandatory requirements under derogation to enhance carbon sequestration
	Install the remaining GHG towers on mineral soil sites as a part of the NASCO	Continue the management and processing of flux data from GHG towers on mineral soil sites as a part of NASCO	Continue the management and processing of flux data from GHG towers on mineral soil sites as a part of NASCO
Reduced Management Intensity of Grasslands on Drained Organic Soils	Launch the CSP and include a Low input Peat Grassland Measure under the AECM	Continue to include a Low Input Peat Grassland Measure in the CSP	Continue to include a Low Input Peat Grassland Measure in the CSP
	Open a new fund under the CSP to extend funding for the EIPs	Continue funding the EIPs	Continue funding the EIPs
	Aim to improve peatland mapping by continuing to fund the RePEAT Project	Continuation of the funding, monitoring and evaluation of the RePEAT project	Finalise RePEAT project and use outputs of project to enhance digital map of peatland soils to act as support tool for actions on peat soils
	Leverage opportunities from the EU Just Transition Fund to support research, knowledge transfer and monitoring activities of farmed peat soils (subject to approval of Just Transition Funding Programme)	Launch Centre of Excellence (subject to approval of Just Transition Funding Programme)	Support Centre of Excellence under the Just Transition Fund (subject to approval of Just Transition Funding Programme)
	Install the remaining GHG towers on peat soil sites as a part of NASCO	Continue the management and processing of flux data from GHG towers on peat soil sites as a part of NASCO	Continue the management and processing of flux data from GHG towers on peat soil sites as a part of NASCO

Measure	2023 Actions	2024 Actions	2025 Actions
Rehabilitate Peatlands as part of Bord na Móna EDRRS and LIFE People and Peatlands	Continue to restore and rehabilitate former peatland production lands. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies	Continue to restore and rehabilitate former peatland production lands. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies	Continue to restore and rehabilitate former peatland production lands. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies
Rehabilitate Additional Peatlands	Seek opportunities for the public and private funding of peatland rehabilitation	Seek opportunities for the public and private funding of peatland rehabilitation	Seek opportunities for the public and private funding of peatland rehabilitation
Restoration of Natura 2000 and Natural Heritage Area (NHA) Sites by the National Parks and Wildlife Service (NPWS)	Continuation of NPWS restoration programme on Special Areas of Conservation (SAC) and NHA protected raised and blanket bog. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies	Continuation of NPWS restoration programme on SAC and NHA protected raised and blanket bog. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies	Continuation of NPWS restoration programme on SAC and NHA protected raised and blanket bog. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies
Coordinate the Actions in the Programme for Government regarding Peatlands to Maximise the Benefits for Biodiversity	Commission a review of all peatland restoration work carried out across Ireland by different Government Agencies, organisations, NGOs and others	Produce a report of all peatland restoration work carried out across Ireland by different Government Agencies, organisations, NGOs and others. Input to LULUCF reporting as appropriate	Follow up on any conclusions and recommendations made in the National Peatland Restoration Review and continue to input to LULUCF reporting as appropriate

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex. Delivery will be kept under constant review with further policies, measures and actions brought forward to address any failure or projected failure as required, including as part of the annual update of the Climate Action Plan.

Table 17.8 – 2023 Actions

Action Number	2023 Action
LU/23/1	Develop, assess, and adopt as appropriate the new Forestry Programme 2023-2027, which aims to introduce new afforestation measures and increased financial supports
LU/23/2	Develop, assess, and adopt as appropriate Coillte's Strategic Vision, which aims to capture additional carbon dioxide in its forests, soils and wood products by 2050
LU/23/3	Develop, assess, and adopt as appropriate the new Forestry Programme 2023-2027, which aims to introduce new supports to promote Sustainable Forest Management
LU/23/4	Launch the CAP Strategic Plan and include a cover crop measure
LU/23/5	As part of CAP Strategic Plan, launch a capital support measure for investments in the tillage sector
LU/23/6	Continue to fund the Straw Incorporation Measure
LU/23/7	Launch the CAP Strategic Plan and include measures on mineral grasslands to improve sequestration under the Agri-Environment and Climate Measure and Eco-Schemes
LU/23/8	Under the Nitrates Regulations impose mandatory requirements under derogation to enhance carbon sequestration
LU/23/9	Install the remaining GHG towers on mineral soil sites as a part of the National Agricultural Soil Carbon Observatory
LU/23/10	Launch the CAP Strategic Plan and include a Low Input Peat Grassland Measure under the Agri-Environment and Climate Measure
LU/23/11	Open a new fund under the CAP Strategic Plan to extend funding for the European Innovation Projects
LU/23/12	Aim to improve peatland mapping by continuing to fund the RePEAT Project
LU/23/13	Leverage opportunities from the EU Just Transition Fund to support research, knowledge transfer and monitoring activities of farmed peat soils (subject to approval of Just Transition Funding Programme)
LU/23/14	Install the remaining GHG towers on peat soil sites as a part of the National Agricultural Soil Carbon Observatory
LU/23/15	Continue to restore and rehabilitate former peatland production lands. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies
LU/23/16	Seek opportunities for the public and private funding of peatland rehabilitation
LU/23/17	Continuation of NPWS restoration programme on Special Areas of Conservation and National Heritage Area protected raised and blanket bog. Impact of activities on carbon emissions assessed using a network of flux towers, hydrometric stations and strategic flux chambers from representative ecologies
LU/23/18	Commission a review of all peatland restoration work carried out across Ireland by different Government Agencies, organisations, NGOs and others

18 The Marine Environment

18. The Marine Environment

Key Messages

State of Play

- Significant developments are currently under way in the planning and consenting regime for the marine environment to support our ambitions for decarbonising our energy sector through the development of offshore renewable energy
- Alongside this, work is being undertaken to designate further marine Special Areas of Conservation and Special Protection Areas in the marine environment and to allow for the designation and management of Marine Protected Areas
- This will facilitate the development of offshore renewable energy to progress at pace alongside the conservation, protection, and recovery of marine biodiversity

Current and Future Action

- We will support the new State-led consenting regime for the maritime area by establishing a new Maritime Area Regulatory Authority; adopting a statutory Marine Planning Policy Statement; developing Marine Planning Guidelines; progressing designation of marine Special Areas of Conservation and Special Protection Area sites; and the mapping of all Irish offshore waters through the INFOMAR Programme
- We will develop comprehensive stand-alone legislation for the identification, designation, and management of Marine Protected Areas in Ireland's maritime area, which will include comprehensive criteria for nature-based carbon storage and resilience to climate change, and ocean acidification
- We will develop national marine climate indicators to monitor and assess the effects of climate change on the marine environment and develop a pilot national monitoring and assessment programme to assess the effects of climate change
- We will advance marine adaptation and mitigation by: developing the new National Marine Research and Innovation Strategy, Ocean Knowledge 2030; continuing to progress investment in research to address marine climate change issues; developing climate adaptation tools to guide future policy making and protection strategies for our coastal communities and seafood infrastructure; examining the reduction of fossil fuel dependency across the fishery harbours centres; and developing ocean climate outreach material in order to engage with our coastal communities

Expected Outcomes

- A comprehensive planning and consenting regime for the marine environment supporting our ambitions for decarbonising our energy sector through the development of offshore renewable energy
- Alongside this, a series of designated Special Areas of Conservation and Special Protection Areas in the marine environment
- A stronger evidence base to support future marine policy-making
- Improved public understanding of the impacts of climate change on our seas and oceans

18.1 State of Play

Climate change is causing fundamental and potentially irreversible changes to our marine environment, with consequences for all of society. Global ocean warming and ocean acidification may result in dire consequences for our marine ecosystems. At the same time, the intensity of storm events has increased, threatening coastal communities and infrastructure. These threats put at risk the many benefits provided by our seas, including food, energy, minerals, climate regulation, coastal protection, transport, leisure, and health and well-being.

In order to ensure that our marine environment is more climate-resilient, we need to increase our understanding of its mitigation and adaptation potential, and the marine industries it supports, to inform our future policies.

Identifying critical knowledge gaps, finding the steps needed to build resilience in the marine environment and address climate threats, and expanding our ocean literacy and awareness of the value of Ireland's seas and oceans will all be important to ensuring support for a sustainable approach to managing our marine resources.

Across the marine sector, a number of actions have been progressed under Climate Action Plan 2021 (CAP21), including identifying areas of climate action appropriate to the Seafood Development Programme 2021-27, and completing the National Strategic Plan for Sustainable Aquaculture.

18.1.1 National Marine Planning Framework and Maritime Area Planning Act 2021

There have been a number of very significant developments over the past year which demonstrate Ireland's commitment to the sustainable development of our maritime area. The National Marine Planning Framework (NMPF) provides for long-term forward planning for Ireland's maritime area and will enhance the effective management of marine activities and more sustainable use of our marine resources.

The Maritime Area Planning (MAP) Act 2021 provides the legal underpinning to an entirely new marine planning system, which will balance harnessing our huge offshore wind potential with protecting our rich and unique marine environment. Enactment of the MAP Act has delivered a new legislative basis, allowing, for the first time, for the regulation of Ireland's maritime area usage outside the 12 nautical mile coastal zone. The comprehensive and coherent marine planning regime in the MAP Act provides clarity to developers on the offshore wind consenting system for developments in our maritime area. Removing barriers in the permitting and consenting process, while ensuring a more facilitative and supportive planning framework, is essential to achieving our green transition as quickly as possible.

One of the main features of the MAP Act is the creation of a new State consent, the Maritime Area Consent (MAC), as a first step in the new planning process. Under the special transition provisions in the MAP Act, the Minister for the Environment, Climate and Communications has responsibility for assessing and granting MACs for a first phase of offshore projects. Applicants that are granted a MAC can then proceed to enter the planning process with An Bord Pleanála. This marks an important step towards reaching our 2030 targets.

18.1.2 Offshore Renewable Energy Potential

With a maritime area more than seven times the size of its landmass, ideal wind conditions, and our location at the edge of the Atlantic Ocean, Ireland's potential for offshore wind energy is significant.

Ireland has significant potential for offshore renewable energy and is now implementing measures to develop our wind potential in particular. With a maritime area more than seven times the size of its landmass, ideal wind conditions, and our location at the edge of the Atlantic Ocean, Ireland's potential for offshore wind energy is significant. Offshore wind will play a vital role in meeting our ambitious national and European targets. Achieving the full potential of Ireland's offshore wind resource offers major opportunities for the development of offshore wind electricity, and associated transmission technologies and technology services, as well as products such as hydrogen and ammonia for energy storage.

The MAP Act provides that the Minister for Housing, Local Government and Heritage may designate public bodies as competent authorities for the purpose of preparing Designated Maritime Area Plans (DMAPs). A DMAP is a forward-looking sub-national plan that will contribute to the overall management of the maritime area. DMAPs will support sustainable development of the maritime area and facilitate coherent and transparent decision-making. This paves the way for plan-led development of offshore renewable energy. DMAPs will be consistent with the Marine Planning Policy Statement (MPPS), the NMPF, and any other relevant Ministerial guidelines or policy directives. Following on from the Offshore Renewable Energy Development Plan II (OREDP II), preparation of DMAPs for ORE will commence.

The energy sector is transforming rapidly, and the green energy transition has become more urgent since Russia's invasion of Ukraine. It is anticipated that Ireland's domestic electricity requirements from offshore wind will be met early in the next decade. The development of Ireland's offshore wind energy potential can not only help to improve the sustainability of our national and European energy sector, but it will improve our security of supply and its affordability.

Details on specific targets and actions related to offshore renewable energy are set out in Chapter 12. Importantly delivery on these targets is dependent on the effective and timely implementation of all elements of the new marine planning system and environmental initiatives that are being progressed at the same time.

18.1.3 Maritime Area Regulatory Authority

The Climate Action Plan commits to the establishment of a new Agency, the Maritime Area Regulatory Authority (MARA), to manage consenting, licensing, and enforcement activities in our marine space. This work is being led by the Minister for Housing, Local Government and Heritage, and the Agency is scheduled to be established in early 2023. Development and activities, for which the Minister for Agriculture, Food and the Marine is the appropriate Minister, will continue to be regulated under the Fisheries (Amendment) Act 1997 and the 1933 Foreshore Act as amended and are excluded from the scope of MARA.

18.1.4 An Bord Pleanála – Marine Planning Directorate

The MAP Act 2021 provides the legal authority for the Minister for the Environment, Climate and Communications to assess MAC applications from a set of pre-qualified offshore renewable energy projects. A significant milestone was reached this year, with the receipt of MAC applications from this first phase of offshore renewable energy projects. Projects granted a MAC under the new regime will be entitled to enter the planning process with An Bord Pleanála. This marks an important step towards reaching our 2030 climate targets.

18.1.5 Marine Biodiversity

Achievement of Ireland's objectives under the EU Marine Strategy Framework Directive and Natura Directives will help ensure nature-based solutions are included in Ireland's mitigation, resilience, and adaptation actions. This includes building on Ireland's network of existing protected sites and measures. The Government is committed to developing comprehensive legislation to enable the identification, designation, and management of Marine Protected Areas (MPAs) and realise our 10% target as soon as practicable, aiming for 30% MPA coverage of our maritime area by 2030.

In tandem, work is under way by the National Parks and Wildlife Service to designate further marine Special Areas of Conservation (SAC) and Special Protection Areas (SPA) to meet national and EU obligations concerning certain habitats and species. Offshore renewable energy targets, and the conservation, protection and recovery of marine biodiversity will be considered in tandem in order to ensure both the biodiversity and climate crises are robustly addressed.

The proposed EU Nature Restoration Law, which is currently at the early stages of negotiation among Member States, will also have a positive impact on Ireland's marine biodiversity. This law seeks to repair European habitats that are in poor condition and bring back nature to all ecosystems. The aim is for nature restoration measures to apply to a proportion of the EU's land and sea areas by 2030, and to eventually extend these measures to all ecosystems in need of restoration by 2050. Included in the current proposals are targets to restore marine habitats such as seagrasses and benthic sediment, and also the habitats of iconic marine species.

18.1.6 Increasing our Knowledge of Interactions in the Marine Environment

The NMPF has been designed to enable and support co-existence and co-location of activities in the marine area. An increased focus on understanding the interactions between activities in the marine environment and their potential effects is needed e.g., the co-location of wind farms with certain types of fishing activity. Delivery of targeted research to inform policy development in areas such as this will better inform the development of plans to ensure the sustainable use of our waters, while also delivering benefits for those, particularly in coastal and island communities, who interact with them.

18.1.7 Blue Carbon

Blue Carbon refers to carbon which is stored, or sequestered, in the ocean, its sediments, and vegetated habitats around our coast.

Following its special report, Blue Carbon and Marine Carbon Sequestration in Irish Waters and Coastal Habitats, the Marine Institute launched a research call that will build our national capacity and provide advice and evidence to inform policy decisions. Two projects, co-funded by the

Environmental Protection Agency have been launched:

- BlueC – Investigating Ireland's Blue Carbon Potential through a Scientific, Socio-economic and Legislative Approach;
- Quest – Quantification, characterisation, source, and fate of past and present carbon storage in coastal and offshore sediments for effective marine management.

18.2 Measures to Deliver

The marine environment is a key area in which multiple stakeholders need to operate, and co-operate, in order to utilise our seas and oceans in a sustainable manner. The challenge, therefore, is to provide for pathways to maximise our use of this shared resource while maintaining and enhancing its inherent value and characteristics.

18.2.1 State-led Consenting Regime for the Maritime Area

The establishment of MARA will support a comprehensive, State-led marine consenting system that is better able to manage the step change in scale and complexity of offshore projects that are required to meet our climate action targets, provide greater energy security, and provide for improved enforcement mechanisms. This is a high priority measure for delivering on the ambitions for ORE set out in Chapter 12.

The MPPS will sit at the top of the hierarchy of State marine plans, setting out the Government's principles and priorities in relation to maritime planning.

The MPPS will prioritise the development of ORE and energy-related projects. All State Consenting Authorities will be required to have particular regard to the MPPS and NMPF in assessing renewable energy projects and supporting infrastructure applications. The MPPS will also strengthen and support the work of the recently established Offshore Wind Delivery Taskforce.

We will:

- Establish a new MARA;
- Adopt a statutory Marine Planning Policy Statement;
- Develop Marine Planning Guidelines to support decision making by An Bord Pleanála;
- Progress designation of marine SAC and SPA sites at pace, in line with Government decisions;
- Progress the mapping of all Irish offshore waters through the INFOMAR Programme to support all marine activities, including climate effect monitoring; site selection for offshore energy; and improving the scientific knowledge base on coastal and marine habitat types.

18.2.2 Identify, Designate and Manage Marine Protected Areas

The Government is committed to developing a network of MPAs. This aligns with international obligations under the UN Convention on Biological Diversity, the EU Marine Strategy Framework Directive's obligation to develop spatial protection measures as part of national programmes of measures, and the EU Biodiversity Strategy for 2030 to increase the coverage of MPAs to 30% by 2030.

Ireland is currently finalising stand-alone legislation to enable the identification, designation, and management of MPAs in accordance with our national ambitions and international commitments. It is expected to be enacted as early as possible in 2023. The proposed legislation will include provisions for an Ocean Environment Policy Statement to be adopted in 2023 and revised on a 6-year basis. This will set priorities for the protection of Ireland's marine environment and for the designation of Marine Protected Areas. It will be grounded in a participatory, ecosystem-based approach to expand the focus of marine protection in our seas and oceans, and to include ecosystem services such as those provided by "Blue Carbon" habitats and by climate-resilient features. It will also mandate the establishment of management plans for individual MPA sites. The designation of MPAs and the development of their management plans will incorporate the best available scientific evidence. Again, this is a high priority measure to ensure that protection of the marine environment goes hand in hand with the development of ORE, as set out in Chapter 12. This will allow Ireland to achieve coverage of at least 10% of the maritime area to be designated as MPAs as soon as possible and achieve 30% MPA coverage by 2030.

We will:

- Develop comprehensive stand-alone legislation for the identification, designation, and management of MPAs in Ireland's maritime area;
- Include comprehensive criteria for the selection and designation of MPAs to include nature-based carbon storage, and resilience to climate change and ocean acidification.

18.2.3 Marine Climate Change Monitoring and Assessment

> *Government invests significantly in marine scientific research and the improvement of knowledge on our marine environment, its biodiversity and its interactions with human activities and associated pressures.*

It is clear that climate change will continue to shift the baselines for marine plant and animal life, impacting the functioning of marine ecosystems and potentially their resilience to pressures. Ireland's ability to mitigate and adapt to climate change will be informed by an understanding of these impacts. Government invests significantly in marine scientific research and the improvement of knowledge on our marine environment, its biodiversity and its interactions with human activities and associated pressures. Along with monitoring programmes established under the EU Birds and Habitats Directives and the Marine Strategy Framework Directive (e.g., species monitoring, habitat monitoring, and the ObSERVE Programme), we will continue to identify knowledge gaps and research needs, engage in prioritisation processes, and invest further in research actions to address the ongoing challenges presented by climate change and its effects.

There is a need to review current monitoring of climate change and its signals in Irish waters; to identify national maritime indicators of importance (e.g., physio-chemical, and biological) and gaps

in long-term datasets; and to develop methodologies to assess impacts. Addressing these needs will allow for the development of a coherent climate change monitoring and assessment programme for Ireland's marine environment. The delivery of this measure will also ensure the integrated delivery of wider regional and EU commitments under the Convention for the Protection of the Environment of the North-East Atlantic (OSPAR) and the EU Marine Strategy Framework Directive. This monitoring programme will further inform the measures which Ireland will need to take to address the effects of climate change in our seas and oceans.

We will:

- Develop national marine climate indicators to monitor and assess the effects of climate change on the marine environment;
- Develop a pilot national monitoring and assessment programme to assess the effects of climate change and ensure integrated delivery of regional and EU commitments.

18.2.4 Marine Adaptation and Marine Mitigation

The seafood industry (fishing and aquaculture) is one of the key stakeholders operating in the marine area and plays a vital role in the sustainability of our coastal communities.

Our coastal communities and maritime sectors will play a significant role in contributing to our climate goals and will continue to be consulted and supported in being part of the transition. The seafood industry (fishing and aquaculture) is one of the key stakeholders operating in the marine area and plays a vital role in the sustainability of our coastal communities. Over 16,500 people are employed around our coast both directly and indirectly. The seafood industry will continue to support initiatives to improve our understanding of our marine area and ensure sustainable resource use, including through bio and circular economy initiatives.

- The new National Marine Research and Innovation Strategy, Ocean Knowledge 2030 will be developed to provide a future framework within which funding for marine research can be targeted most effectively to areas of strategic importance;
- As a follow-on to CAP21, which sought to identify the priority steps towards building climate change resilience in the seafood sector, the Marine Institute will continue to progress investment in research to address climate change issues such as rising sea level, ocean acidification, fish distribution and abundance changes;
- To increase the resilience of our coastal infrastructure to the impacts of climate change we will develop climate adaptation tools to guide future policy making and protection strategies for our coastal communities and seafood infrastructure;
- We will also examine the ways in which we can reduce fossil fuel dependency across the fishery harbours centres e.g., by increasing shore power and providing electric vehicle charging points in the harbours;
- We will develop ocean climate outreach material in order to engage with our coastal communities to increase understanding and inform behaviours towards our marine environment and its resources. Knowledge transfer conferences will be held with the seafood industry on the outputs of the Blue Carbon Footprint Report.

18.3 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
MA/23/1	Establish the new Maritime Area Regulatory Authority
MA/23/2	Adopt a statutory Marine Planning Policy Statement and develop Marine Planning Guidelines to support decision making by An Bord Pleanála
MA/23/3	Progress at pace the designation of marine Special Areas of Conservation and Special Protection Area sites, prioritised in line with the Government decisions
MA/23/4	Progress the mapping of all Irish offshore waters through the INFOMAR Programme to support all marine activities, including climate effect monitoring and site selection for offshore energy
MA/23/5	Develop comprehensive legislation for the identification, designation, and management of Marine Protected Areas in Irish marine waters
MA/23/6	Develop criteria for Marine Protected Areas to include nature-based carbon storage and resilience to climate change and ocean acidification
MA/23/7	Develop national marine climate indicators to monitor and assess the effects of climate change on the marine environment
MA/23/8	Finalise and launch the new National Marine Research and Innovation Strategy – Ocean Knowledge 2030
MA/23/9	Develop a roadmap for the efficient upgrading of existing infrastructure within the Fishery Harbour Centres
MA/23/10	Reduce fossil fuel dependency/consumption across Fishery Harbour Centre infrastructure
MA/23/11	Improve ocean climate literacy
MA/23/12	Complete a series of workshops on the results of the Seafood Carbon Footprint Report and its impacts on the industry to increase awareness around the need to reduce inputs and fuel use
MA/23/13	Complete a pilot study on improving the carbon efficiency of fishing gear design
MA/23/14	Complete a report on alternative fuels and their environmental protection potential
MA/23/15	Maintain and seek ways to improve on the participation rate of 96% in the Clean Oceans Initiative
MA/23/16	Establish the mitigation potential of low trophic species such as shellfish and seaweeds cultured in an integrated multi-trophic aquaculture context

19 The Circular Economy

19. The Circular Economy and Other Emissions

Key Messages

State of Play

- The circular economy offers an alternative to today's linear ('take-make-waste') model of production and consumption. Ireland has a circularity rate of 1.8%, some way behind the EU average of 12.8%
- Ireland's material consumption is well above the EU average, indicating that there is scope for savings in greenhouse gas (GHG) emissions through maximising the efficiency of our material usage
- Other emissions arise from F-gases, waste and petroleum refinement; and accounted for 2.8% of Ireland's GHG emissions in 2021
- Emissions in this 'other' category have reduced 10% since 2018, and there is a 25% reduction target by 2025 and a 50% reduction target by 2030

Current and Future Action

- Implement the Waste Action Plan for a Circular Economy and the Whole-of-Government Circular Economy Strategy
- Priority areas for prevention planning are in plastics, food, construction and commercial waste
- Encourage recycling and reuse
- Reduce emissions from F-gases and from petroleum refinement

Expected Outcomes

- Savings in GHG emissions through maximising the efficiency of our material use

19.1 State of Play – the Circular Economy

The circular economy offers an alternative to today's linear ('take-make-waste') model of production and consumption. Previously, we extracted great quantities of natural resources to make things that we may use only once before throwing them away.

Transforming our approach to consumption and production in line with modern circular economy principles entails the use of waste and the minimisation of new resource use. Superior design preserves product value for as long as possible, through durability and repair. When a product has reached the end of its life, its parts can readily be used to create further useful products.

Ireland has scope for major progress in relation to all aspects of the circular economy.

This involves a change to our mindset to demand the highest level of protection for our environment, and its natural and manufactured resources. Ireland has scope for major progress in relation to all aspects of the circular economy. Government is adopting a suite of measures

to support reduced resource consumption, waste prevention, and increased levels of re-use and recycling.

The focus of the Waste Action Plan for a Circular Economy 2020-2025 (WAP) is on increasing recycling and minimising waste generation by prioritising the prevention of waste at every opportunity through eco-design, reuse, and repair; and increasing segregation. Fundamentally, the WAP commits to fully embracing the opportunities to become a circular economy in the decade ahead.

The Whole-of-Government Circular Economy Strategy 2022-2023 builds on the approach set out in the WAP and codifies Ireland's strategic goal to be a circular economy leader among EU Member States by 2030. This first iteration of the strategy sets out an overall policy approach. Subsequent versions of the strategy will adopt an action-plan format, setting out key targets and metrics for the circular transition.

The circular economy and climate action are inherently interlinked. An Organisation for Economic Co-operation and Development study of four countries' GHG emissions found emissions arising from material management accounted for between 55% and 65% of national emissions. Ireland's material consumption is well above the EU average, indicating that there is scope for savings in GHG emissions through maximising the efficiency of our material use.

An estimated one tonne of waste per home per year which is composted, landfilled or incinerated leads to GHG emissions. Avoiding waste in the first instance is a climate action we can take every day.

Our current linear production and consumption model (based on produce, use and dispose) is significantly carbon and resource intensive. We need to move to a more sustainable production and consumption model by changing how we consume materials and resources; how we design the products that households and businesses use; and how we extend the productive life of all goods and products in our society and economy. An estimated one tonne of waste per home per year which is composted, landfilled or incinerated leads to GHG emissions. Avoiding waste in the first instance is a climate action we can take every day.

Certain circular economy actions have the potential to directly reduce emissions in specific sectors. However, savings generated by a widespread adoption of circular economy principles will not be directly credited to any sector. They will be triggered across society through a radical change in the way we think about the circular economy and the avoidance of waste at every level, from the producer, the processor and the retailer, to the consumer.

Considerable progress was made in 2022 with the enactment of the Circular Economy and Miscellaneous Provisions Act 2022, which underpins Ireland's shift from 'take-make-waste' towards a circular economy by defining the circular economy in Irish law for the first time.

We are:

- Incentivising the use of reusable and recyclable alternatives to a range of wasteful single-use disposable packaging and other items through the phased introduction of new environmental levies;
- Re-designating the existing Environment Fund as a Circular Economy Fund, which will remain ring-fenced to provide support for environmental and circular economy projects;

- Introducing a mandatory segregation and incentivised charging regime for commercial waste, similar to what exists for the household market. This will increase waste separation and support increased re-cycling rates;
- Placing the Whole-of-Government Circular Economy Strategy and National Food Loss Prevention Roadmap on a statutory footing, establishing a legal requirement for Government to develop and periodically update these two policies;
- Placing the EPA's Circular Economy Programme on a statutory footing;
- Streamlining the national processes for end-of-waste and by-products decisions, tackling the delays which can be encountered by industry, and supporting the availability of recycled secondary raw materials in the Irish market;
- Consolidating the Government's policy of keeping fossil fuels in the ground by introducing prohibitions on exploration for and extraction of coal, lignite, and oil shale.

50% of total GHG emissions come from resource extraction and processing, while if food waste were a country, it would be the third largest global GHG emitter exceeded only by China and the United States.

From a climate perspective, the shift to a circular economy is particularly important at both the resource extraction and disposal phases of the product or material lifecycle. For example, 50% of total GHG emissions come from resource extraction and processing, while if food waste were a country, it would be the third largest global GHG emitter exceeded only by China and the United States. Reducing the resource intensity of our economy is, therefore, an essential component of achieving net zero emissions.

With a circularity rate of 1.8%, Ireland lags well behind the EU average of 12.8%. Improving this rate will yield savings not only in tonnes of materials wasted, but also in carbon emitted. The Whole-of-Government Circular Economy Strategy provides an overall national policy framework for the circular transition to significantly improve Ireland's circularity performance above the EU average by 2030. These measures will make provision for Circular Economy Sectoral Roadmaps which will, in turn, develop targets in sectors where increasing circularity will have a significant impact, such as construction, transport, agri-food and consumer goods, and sustainable product innovation.

19.2 Measures to Deliver a Circular Economy

Detailed actions are set out at the end of the chapter. The following are the three key actions:

1. Publication of the second Whole-of-Government Circular Economy Strategy;
2. Revision of National Policy on Green Public Procurement 'Green Tenders';
3. Phased introduction of environmental levies on a range of single-use disposable items, beginning with disposable hot drink cups.[61]

61 Circularity rate indicates the share of material which is recovered and fed back into an economy.

19.2.1 Prevention

Plastics, food, construction, and commercial waste are priority areas for prevention planning.

The National Food Waste Prevention Roadmap 2023-2025 will set out how Ireland will deliver on its commitment to reduce food waste by 50% by 2030.

Modulated producer responsibility scheme fees will be extended to encourage the use of recyclable components in packaging products.

Ongoing work to support the adoption of modern methods of construction, including the use of circular design, will contribute to reducing the material footprint of the construction sector.

19.2.2 Recycling and Reuse

It will be a significant challenge to reach the plastic recycling target of 55% by 2030, with a 90% collection target for beverage containers. However, a number of initiatives will be introduced to assist in attaining these goals, including:

- Expanding the Extended Producer Responsibility Scheme to new waste streams;
- Introducing a deposit and return scheme for plastic and aluminum beverage containers;
- Promoting trials of better public recycling opportunities on street and at Bring Centres;
- Working with industry to expand initiatives such as the Plastics Pledge;
- Working with industry to improve labelling to avoid confusion or ambiguity;
- Targeting the improvement of key capture rates by extending segregated collection where it is not now available, and promoting better practice;
- Implementing the target of 30% replacement of virgin plastic to recycling;
- Introducing levies on disposables where sustainable alternatives are available;
- Improving segregation and collection performance to increase recycling and reduce contamination.

Using our strengthened enforcement structures and measures to ensure we maximise segregated material collection, we will drive transparency and information-sharing in materials management. Householders, businesses and the public sector as consumers of resources need clear and reliable information about their behaviour, and its impact, before sustained behaviour change can take place. To achieve this, we will examine ways to strengthen data reporting and appropriate information sharing to build stakeholder confidence by:

- Using research and development funding to drive innovative developments;
- Promoting the optimal use of data to explore and identify opportunities for efficiencies and synergies in our use and reuse of material resources.

19.3 Other Emissions (F-Gases, Waste and Petroleum Refinement)

In the design of the sectoral emission ceilings, a number of emitting activities in our economy did not fit into traditional sectors. The ‘other emissions’ category was created to account for emissions related to F-gases, waste and petroleum refinement.

F-gases (or fluorinated gases) are predominately used in refrigeration and air-conditioning systems, fire protection, high voltage switch gear, and semiconductor production; as well as in foams,

aerosols and metered dose inhalers.

Sources of waste emissions include solid waste disposal, composting, waste incineration (excluding waste to energy), open burning of waste, and wastewater treatment and discharge. Landfills are the largest source of these emissions.

Petroleum refining emissions arise from the conversion process for turning crude oil into other products such as kerosene, light gas oil, heavy fuel oil, liquid petroleum gas, and propane.

19.3.1 State of Play

These sources accounted for 2.8% of Ireland's GHG emissions in 2021, down from 3% in 2020. Waste is the largest of the three emission sources in the sector, accounting for 1.4% of Ireland's GHG emissions in 2021, down from 1.5% in 2020.

Table 19.1 – Other GHG Emissions in 2021

Emissions $MtCO_2eq.$	Share of Total GHG Emissions	Industry Emissions per $tCO_2eq.$ per capita
2	2.8%	0.38

Between the years of 2005 and 2012, a steady decline resulted in an overall emissions reduction from these activities of 34%, or 1$MtCO_2eq.$. However, in the last decade we have seen a slight increase in emissions from these activities.

Table 19.2 – Trends in Other GHG Emissions

Timeframe	Percentage Change	Absolute Change $MtCO_2eq.$
2005-12	-34%	-1
2012	2.8%	0.05

Table 19.3 – Required Level of Decarbonisation for 'Other Emissions' for Carbon Budgets 1 and 2

Sectoral Carbon Budget 2021 to 2025 ($MtCO_2eq.$)	Cumulative Emissions to 2021	Remaining Sectoral Carbon Budget 2021 to 2025 ($MtCO_2eq.$)	Sectoral Carbon Budget 2026 to 2030 ($MtCO_2eq.$)
9	2	7	8

The first carbon budget allocates 9 $MtCO_2eq.$ to 'other emissions' for the first budget period (2021-2025). 2$MtCO_2eq.$ has already been emitted in the first year of the carbon budget, leaving 7$MtCO_2eq.$ to be emitted by 2025. The sector also has a reduction target of 25% based on 2018 emissions by 2025. Emissions in this sector have already decreased 10% from the baseline of 2.2 $MtCO_2eq.$ The additional 15%, or 0.5$MtCO_2eq.$, must be realised in the coming four years.

Table 19.4 – Required Level of Decarbonisation for 'Other Emissions'

2018 Emissions $MtCO_2eq.$	Indicative Target for 2025 Emissions $MtCO_2eq.$	Indicative Target % Reduction for 2025	2021 Emissions $MtCO_2eq.$	% Increase (+) / Reduction (-) to date
2.2	1.5	25%	2	-10%

19.3.2 F-Gases

Emissions from F-gases decreased by 14.5% from 2019 to 2020, following a decrease of 1.4% in 2019. These decreases are mainly due to changes in the refrigeration and air-conditioning sector where high global warming potential (GWP) hydrofluorocarbons are being phased out in favour of low-GWP alternatives. This phase-out is taking place at EU level and is the main measure introduced by Regulation (EU) No. 517/2014 to tackle F-gas emissions. The EU proposes to further regulate to raise ambition regarding the phase-down in the use of F-gases, which will facilitate Ireland, and the EU as a whole, in meeting our climate commitments in the coming years.

19.3.3 Waste

Waste emissions are predominantly methane arising from disposal to landfill. The gains in reducing material use, and substituting virgin material with recycled material, will be credited back up the supply chain. Minimising waste generation, and improving segregation, reuse and recycling will lead to fewer emissions associated with waste transport and treatment. Material management, which leads to waste treatment, accounts for 1.4% of Ireland's total GHG emissions in 2021.

Waste emissions per head are lower in Ireland compared to the EU average and emissions have fallen since 2005. Ireland has made significant progress in managing waste streams, particularly in improving recycling rates and diversion from landfill.

The key policy tools which have been successful in Ireland are:

- Levy on landfill and diversion regulations;
- Widespread segregation of waste, capturing recyclables and biodegradable waste;
- Industry-supported recycling operations;
- Regional waste planning.

To achieve our targets, all these areas need improvement, particularly developing better prevention strategies; improving capture rates; and reducing both contamination and the amount of non-recyclable materials.

The Circular Economy and Miscellaneous Provisions Act 2022 provides a legal basis for many of these additional measures and will be complemented by other actions such as the introduction of a Deposit Return Scheme for plastic bottles and aluminium cans, and the expansion of Extended Producer Responsibility schemes to additional material and product categories.

Waste policy measures outlined in the Waste Action Plan for a Circular Economy will have a significant effect on waste minimisation, reuse and recycling rates over the next four years. The latest release of data on biodegradable municipal waste (BMW) to landfill, reports that Ireland met the 2010, 2013 and 2020 targets under the Landfill Directive (1999/31/EC). Ireland's success in

diverting waste from landfill is underpinned by two key levers: increases in the levy for disposal of waste to landfill; and the requirements to divert BMW from disposal to landfill under the Landfill Directive targets.

19.3.4 Petroleum Refining

Petroleum refining processes are the chemical engineering processes used in petroleum refineries (also referred to as oil refineries) and other facilities to transform crude oil into useful products such as liquefied petroleum gas, gasoline or petrol, kerosene, jet fuel, diesel oil, and fuel oils. The majority of emissions from petroleum refining processes are carbon dioxide and are covered by the EU Emissions Trading System.

19.3.5 2025 and 2030 KPIs

Table 19.5 – Key Metrics to Deliver Abatement in 'Other Emissions'

Theme	2025 KPI	2025 abatement (vs 2018) $MtCO_2eq.$	2030 KPI	2030 abatement (vs 2018) $MtCO_2eq$	2031 - 2035 measures
F-gases	Implementation of Regulation (EU) No 517/2014 on F-Gases	0.4	Reduce emissions from F-Gases by 80% compared to 2014 and implement any further measure required by EU regulation	0.7	Consider measures that go beyond the EU Regulation
Waste	Separate collection obligations extended to include hazardous household waste by end of 2024, bio-waste by end of 2023 and textiles by end of 2024	0.2	Recycle 70% of packaging waste Recycle 55% of plastic waste Reduce food waste by 50% 90% collection of plastic drinks containers by 2029 Ensure all plastic packaging is reusable or recyclable by 2030	0.4	Reduce the amount of municipal waste landfilled to 10% by 2035 Recycle 65% of municipal waste by 2035
Petroleum Refining	Energy and process efficiencies	0.1	Energy and process efficiencies	0.2	Energy and process efficiencies

19.3.6 Measures to Deliver Sectoral Emissions Ceilings

The following measures will be critical to success.

Phase-down High-GWP F-gases

We will support the EU proposal to raise ambition regarding the phase-down in the use of F-gases and promote the early implementation of the measures contained in a new regulation.

Reduce Waste sent to Landfill and/or Incineration

Irish and regional waste policy is based on the waste hierarchy: waste prevention; preparing for reuse; recycling; and energy recovery; with disposal being the least desirable option. It is implemented by the Government, Local Authorities and the EPA. We are transforming our approach to waste in line with modern, circular economy principles. Ireland has scope for major progress in all the key areas of the waste hierarchy.

Landfill Reliance

- Limit diversion of biodegradable municipal waste to landfill to maximum limit of 427,000 tonnes
- Reduce the amount of municipal waste landfilled to 10% by 2035

Recycling

- Recycle 65% of municipal waste by 2035
- Recycle 70% of packaging waste by 2030
- Recycle 55% of plastic packaging waste by 2030
- Separate collection obligations extended to include hazardous household waste (by end 2024), bio-waste (by end 2023), and textiles (by end 2024)

Food

- Reduce food waste by 50% by 2030

Single-use Plastics

- Provide for 90% collection of plastic drinks containers by 2029
- Achieve the waste reduction targets through prescribed measures no later than 2026
- Ensure all plastic packaging is reusable or recyclable by 2030

Reduce Emissions from Petroleum Refining

- Encourage the use of renewables in the petroleum refining process
- Investigate applicability of use of biomethane in the petroleum refining process.
- Reduce use of petroleum-based fuel, which is discussed further in the chapter 15

Box 19.1 – Global Methane Pledge

Global Methane Pledge

The environmental impact of methane has a very different warming impact than carbon dioxide, due to its higher Global Warming Potential (GWP). Recent analysis from the UN indicates that methane contributes 84 to 86 times more to global warming per unit of mass than carbon dioxide during the first twenty years. This means that rapidly reducing methane emissions from energy, agriculture, and waste activities can achieve significant progress in slowing down of the warming of our planet.

In recognition of this, at COP26 in 2021, 121 countries (including Ireland and the wider European Union) signed up to The Global Methane Pledge which aims to collectively reduce methane emissions by 30% between 2020 and 2030.

This 30% methane reduction target is a collective one which will be accomplished by reducing methane emissions across various sectors, including the production of energy, agriculture, and waste management.

Ireland will reduce the fugitive methane emissions which arise from the production and transportation of fossil fuels, especially natural gas, by increasing renewable energy and decreasing the demand for fossil fuels.

Waste can also contribute to methane emissions. We will reduce methane from waste by sending less waste to landfill by 2030; by reducing waste overall; by adopting a circular economy which ensures products are renewable and reusable; and by ensuring that waste is a last resort.

We will also reduce the methane profile within our agriculture sector by introducing new feed technologies, with more efficient animals, and by providing diversification opportunities to farmers.

19.4 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
CE/23/1	Publish a Whole-of-Government Circular Economy Strategy and promote the circular economy, including focusing on awareness raising, Green Public Procurement and international partnerships
CE/23/2	Establish a Circular Economy Innovation Scheme, focusing on providing funding for a limited number of regional and/or national scale circular economy projects, with the capacity to significantly raise awareness of the circular economy and/or improve consumption patterns in relation to specific product categories or within specific sectors
CE/23/3	Reduce demand for virgin raw materials and support re-use, by keeping material out of waste streams through streamlined end-of-waste and by-product decision-making processes, and national end-of-waste decisions for specific construction and demolition waste streams
CE/23/4	Continue to drive the rollout of CirculEire, the national programme for circular manufacturing and innovation
CE/23/5	Develop a Food Waste Prevention Roadmap that sets out a series of actions to deliver the reductions necessary to halve our food waste by 2030 and promote our transition to a circular economy
CE/23/6	Enhance food waste segregation, collection and treatment (anaerobic digestion and composting)
CE/23/7	Develop and implement new Regional Waste Management Plans that will guide our transition to a circular economy
CE/23/8	Develop new and expanded environmental levies to encourage reduced resource consumption and incentivise higher levels of re-use and recycling
CE/23/9	Begin work on consumer information actions to inform consumer choice aimed at driving improvements in the environmental sustainability of the electronic communications sector
CE/23/10	Implement Regulation (EU) No 517/2014 on F-Gases
CE/23/11	Separate collection obligations extended to include bio-waste by end of 2023

20 International Climate Action

20. International Climate Action

Key Messages

State of Play

- This year's catastrophic drought in the Horn of Africa and devastating flooding in Pakistan remind us of the urgency of addressing climate impacts. The most vulnerable people continue to be disproportionately affected
- The scale of change necessary requires an enormous increase in global ambition and investment, to limit further devastation and progress climate justice. International cooperation remains the critical enabler for achieving the goals of the Paris Agreement

Current and Future Action

- Ireland is committed to supporting accelerated action towards fulfilling the SDGs, the Rio Conventions and the goals of the Paris Agreement. Enhanced engagement through multilateral climate and environment processes will be progressed, as well as supporting greater participation of women, young people and other marginalised groups
- Ireland has committed to provide €225 million climate finance to developing countries by 2025. Support will continue to focus on leaving no one behind and on gender-sensitive and locally led climate action

Expected Outcomes

- Ireland's climate diplomacy will strengthen the voice of those who are most vulnerable to climate change, championing a human rights-based approach to global climate action
- Ireland's climate finance will support climate resilience and adaptation, work to avert further loss and damage and mobilise innovation for climate action
- Proactive participation and engagement at international fora on climate issues will assist with mainstreaming climate considerations in policy development advancing sustainable and climate resilient development

20.1 State of Play

Through our diplomatic efforts and our provision of climate finance, Ireland will continue to support individuals and communities in Least Developed Countries (LDCs) and Small Island Developing States (SIDS)

The Stockholm Declaration, adopted at the 1972 United Nations (UN) Conference on the Human Environment, was the first to recognise the interconnections between development, poverty, and the environment, and placed environmental issues at the forefront of international concerns. Fifty years on, strong multilateralism remains critical to effectively address the triple planetary crises –

climate change, biodiversity loss, and pollution.

As we continue to witness the impact on our changing planet, the 2022 reports from the Intergovernmental Panel on Climate Change (IPCC) starkly remind us that the window to effectively manage and limit further climate change is closing rapidly. The reports highlight the urgent need for a global phase-out of fossil fuels and for transformative changes to energy systems, land use, industry, buildings, cities and associated systems. Climate change impacts, both direct and indirect, continue to disproportionately harm those who have contributed the least to the problem. The scale of change necessary to avert and minimise the worst effects of climate breakdown requires an enormous increase in investment across the world, but particularly for the most climate vulnerable countries, to limit further devastation and progress climate justice.

Ireland is committed to supporting accelerated action towards fulfilling the Sustainable Development Goals, the Rio Conventions[62] and the objectives of the Paris Agreement. Increased international collaboration is the key to determining our way towards a greener, healthier, and safer future for all. Through our diplomatic efforts and our provision of climate finance, Ireland will continue to support individuals and communities in Least Developed Countries (LDCs) and Small Island Developing States (SIDS). In particular, Ireland remains committed to engaging strongly in multilateral fora on climate action. This includes our work through the European Union (EU), the UN, International Financial Institutions (IFIs), the Organisation for Economic Co-operation and Development and others.

In a practical demonstration of Ireland's commitment to a fossil free future, Ireland joined the Beyond Oil and Gas Alliance to work with an international coalition in leading the transition from global oil and gas production

20.1.1 Developments in International Climate Policy

Following a two-year absence of in-person negotiations due to the COVID-19 pandemic, the 26th Conference of the Parties (COP26), which took place in Glasgow in November 2021, was regarded as the most significant COP since the adoption of the Paris Agreement (COP21) with ambitious commitments set out in the overarching COP26 Decision, the Glasgow Climate Pact. The Taoiseach joined over 120 leaders at the Leaders' Summit, and the Minister for the Environment, Climate and Communications led Ireland's National Delegation for the continuation of the high-level segment during the second week of COP26.

The Taoiseach announced Ireland's new climate finance target of providing at least €225 million per year to developing countries by 2025, a more than doubling of Ireland's climate finance. As a founding member of the Champions Group on Adaptation Finance established in 2021, Ireland remains committed to increasing the level, accessibility, and effectiveness of adaptation finance, which aligns with calls from developing countries for increased supports for adaptation action.

In a practical demonstration of Ireland's commitment to a fossil free future, Ireland joined the Beyond Oil and Gas Alliance to work with an international coalition in leading the transition from global oil and gas production and was also a signatory to the Global Methane Pledge which commits countries to collectively reduce global methane emissions by 30% by 2030.

62 UN Framework Convention on Climate Change; UN Convention to Combat Desertification; and UN Convention on Biological Diversification

Building on the momentum from COP26, Ireland participated at the UN Environment Assembly, the world's highest-level decision-making body on the environment, which adopted a historic resolution63 in March 2022 to end plastic pollution, including in the marine environment, and forged the way for an international legally binding agreement, by the end of 2024. Ireland also participated in the UN Ocean Conference, where €10 million was committed to fund ocean science, including support to Small Island Developing States to tackle the threats facing the ocean as a result of human activity and climate change.

The urgent need for action cannot be denied, and the outcomes and decisions adopted at these international meetings reaffirm a resolve at a global level to strive towards maintaining the 1.5 degree temperature goal contained in the Paris Agreement.

Linking with human rights is an essential element of inclusive climate action. In July, Ireland co-sponsored a landmark resolution64 adopted by the UN General Assembly recognising the right to a clean, healthy, and sustainable environment as a human right. The universal recognition of this right is a powerful response by countries to scale up efforts that in the context of the triple crises of climate change, biodiversity loss, and pollution, can catalyse a transformative change. The resolution also helps to strengthen the conditions for the effective investment of Ireland's climate and environmental finance contributions.

The urgent need for action cannot be denied, and the outcomes and decisions adopted at these international meetings reaffirm a resolve at a global level to strive towards maintaining the 1.5 degree temperature goal contained in the Paris Agreement. Ireland stands ready to enhance its efforts on the global stage in parallel to delivering climate action at home, for a better quality of life and well-being.

20.2 Responding to the Global Climate Challenge

20.2.1 Climate Diplomacy

Ireland continues to strengthen its climate diplomacy across all fora and use its position and voice to advocate for those who are most vulnerable to climate change. Ireland continues to focus on adaptation and resilience, and loss and damage relating to severe impacts of climate change, as well as greater ocean protection by promoting a sustainable blue economy. Within the United Nations Framework Convention on Climate Change (UNFCCC), Ireland is particularly engaged on advancing matters related to adaptation, loss and damage, gender, and championing a science-based approach to future action. Ireland recognises that climate change has many complex impacts on international peace, security, and stability, and actively engages with partners, within the UN system, the EU and in other fora on managing the risks of climate change on security and promoting synergies between climate action and peace.

Ireland's All-of-Government International Climate Finance Roadmap, published in July 2022, sets out the strategy for achieving Ireland's international climate finance targets which involves more than doubling its funding for developing countries by 2025. The principles outlined in the roadmap

63 UNEP/EA.5/Res.14 'End Plastic Pollution: Towards an internationally legally binding instrument'

64 A/76/L.75 'The human right to a clean, healthy and sustainable environment

include a focus on leaving no one behind, on gender-sensitive and locally led climate action. The roadmap also aims to maintain a human rights-based approach and a commitment to the transparency of our climate finance. The thematic priorities of the roadmap centre on strengthening climate resilience and adaptation, and expanding Ireland's support for marine protection, loss and damage and innovation for climate action. These principles and priorities will inform Ireland's international climate diplomacy bilaterally and in the context of the UN, the EU, multilateral climate and environment funds, and with Multilateral Development Banks and other partners.

20.2.2 Biodiversity and Sustainable Oceans

Ireland's seas are rich in biodiversity, hosting deep-water coral gardens, carbonate mounds, and diverse coastal habitats, from exposed rocky shores to sheltered sandy bays and undersea meadows. Our maritime area is home to over 20 species of whales and dolphins, some of which, like the blue whale, remain highly endangered today, decades after their exploitation was curbed.

Ireland is committed to the protection and restoration of biodiversity, including marine biodiversity, recognising that such actions can also help us adapt to climate change. As an island nation, Ireland recognises the crucial role that oceans and the sustainable blue economy play in supporting marine biodiversity, climate resilience, and sustaining livelihoods, particularly for coastal LDCs and SIDS. Meeting the targets of Sustainable Development Goal 14 is of paramount importance to Ireland.

Ireland is committed to building on efforts and supporting partnerships to achieve a clean, healthy, and biologically diverse ocean, which is productive, used sustainably, and resilient to the effects of climate change and ocean acidification. Ireland is already striving to mitigate and eliminate marine pollution and enhance biodiversity through participation in the Oslo and Paris (OSPAR) Convention for the Protection of the Marine Environment of the North-East Atlantic, and collaboration through EU policies such as the Nature Restoration Law, Marine Strategy Framework Directive and the Birds and Habitat Directives. The OSPAR North East Atlantic Strategy 2020-2030 commits to achieving a clean, healthy and biologically diverse sea through concrete actions. We are further committed to protecting and conserving our rich biodiversity by expanding our network of Marine Protected Areas to cover at least 30% of our marine region by 2030.

Ireland stands ready to engage with international partners to support efforts to deliver better policies to protect biodiversity and our oceans and eliminate the negative environmental impacts of plastics production to ultimately restore our ecosystems for future generations. In the near term, this includes engaging in negotiations to agree on a Global Biodiversity Framework at the Conference of the Parties to the Convention on Biological Diversity (COP15); the commencement of negotiations towards a legally binding agreement on plastic pollution; and an internationally binding agreement on marine biodiversity of areas beyond national jurisdiction.

20.2.3 Climate Finance

Ireland's long-term vision for its international climate finance is one where the poorest and most vulnerable people, especially those living in the LDCs, SIDS, and fragile states and communities, are supported and empowered to meet the challenges posed by climate change

As reaffirmed in the International Climate Finance Roadmap, Ireland's long-term vision for its

international climate finance is one where the poorest and most vulnerable people, especially those living in the LDCs, SIDS, and fragile states and communities, are supported and empowered to meet the challenges posed by climate change, including measures to build resilience and progress sustainable development objectives.

The roadmap aims to ensure that Ireland's international climate finance continues to align with Ireland's other development cooperation priorities, as set out in *A Better World*, and with principles for effectiveness and transparency. It details pathways for Ireland's climate finance in the short and medium terms. In the 2022 to 2023 period, this will primarily involve increased engagement and public funding via multilateral channels, including more targeted multilateral funding to key initiatives that support LDCs, SIDS and fragile states.

It also aims to increase financing through the introduction of new programmes aligned with the roadmap's themes and priorities.

Notable, new actions identified in the Roadmap include:

- Establishment of a First Mover Fund to incentivise climate action in Ireland's bilateral development programmes;
- Creation of a climate and environment funding window integrated into existing funding schemes for Irish Civil Society Organisations engaged in international development programming;
- Exploration of single or multi-donor trust funds targeting themes and geographic focus areas of Ireland's roadmap;
- Exploration of opportunities to engage the private sector in climate action, including where appropriate, ongoing efforts to establish Ireland as a global hub for sustainable and green finance;
- In an EU context, exploration of the potential to support and engage in Team Europe Initiatives more systematically, particularly those most aligned with Ireland's thematic priorities.

20.3 Integrating Action from Local to Global

Effectively addressing the climate crisis requires countries working collectively together to adopt commitments to protect and restore the planet from future harm. At a basic level, this requires integrating climate change decisions into national policies and plans to enable effective, country-owned climate action. In this regard, we will strive to continue strengthening the coherency between our international climate cooperation agenda and our domestic climate action ambition.

20.3.1 Action for Climate Empowerment

Action for Climate Empowerment (ACE) is a term adopted by UNFCCC which involves six elements – education, training, public awareness, public participation, access to information, and international cooperation, to improve the effectiveness of climate action. As outlined in Chapter 9, Ireland remains committed to increased and deepening levels of engagement with the public on climate action and will promote these approaches and share our learnings with other countries.

All Parties to the UNFCCC are encouraged to appoint a National ACE Focal Point, which Ireland did in 2021, to represent Ireland in ACE workshops and meetings, act as a liaison between the UNFCCC and relevant national policymakers and advocate for climate action supported by the six ACE elements referenced above.

To enable greater awareness and engagement with international climate action, Ireland will support active participation of young people in international climate change policy and processes and ensure Ireland's delegation benefits from perspectives and knowledge from youth in its work. Establishing a Climate Youth Delegate Programme will ensure young people in Ireland have the opportunity to participate as part of the official climate delegation attending international climate meetings such as the climate COP.

20.3.2 Gender

Climate change impacts more on women and other marginalised groups, peoples, and communities through the exacerbation of pre-existing inequalities

Climate change impacts more on women and other marginalised groups, peoples, and communities through the exacerbation of pre-existing inequalities, including varying impacts in a just transition, and access to social and healthcare infrastructure in extreme climate events.

Gender-sensitive climate action is a key principle guiding Ireland's international development assistance and climate finance support. Ireland supports gender activities under the UNFCCC, including the implementation of the Gender Action Plan. Ireland also works with a range of partners and non-governmental organisations and grassroots organisations to empower communities who are at the forefront of climate change. Supporting partners, including the Women's Environment and Development Organisation (WEDO), which who work to strengthens women's participation and contribution to national and international climate discussions through training, capacity building, and the provision of travel funds. We also aim to enhance reporting on Ireland's international climate finance and to strengthen the climate resilience of gender equality programmes through our forthcoming work on climate proofing Ireland's Official Development Assistance.

Ireland maintains an active role in gender negotiations at the UNFCCC. COP25 adopted the enhanced Lima Work Programme on Gender as well as a Gender Action Plan. As part of implementing the Gender Action Plan, Ireland appointed a National Gender and Climate Change Focal Point to participate in negotiations, advocate for gender balance and responsiveness within delegations, and act as a liaison between the UNFCCC and relevant national policymakers.

20.3.3 Championing a Science Based Approach to Climate Action

Ireland is an active member and strong supporter of the work of the IPCC, the UN body which

provides authoritative large-scale scientific assessments on climate change and options to address climate change through adaptation and mitigation of greenhouse gas emissions. It is currently conducting its Sixth Assessment (AR6) and is expected to start its next 7th assessment cycle in 2023. It also provides shorter Special Reports and Good Practice Guidelines to assist governments in the development of their national greenhouse gas inventories.

Through the Department of the Environment, Climate and Communications, in cooperation with the EPA and other Government Departments, Ireland hosted a number of key IPCC meetings during the AR6. This included scoping and lead author meetings for the IPCC Special Report on Land, and a lead author meeting for the AR6 Synthesis Report. The success of these meetings, and the publication of reports from the AR6 cycle, provide critical inputs to inform positions and actions under the UNFCCC process, in particular its periodic review of the long-term global goal (temperature goal) and the Global Stocktake under the Paris Agreement, as well as actions by individual governments and other stakeholders in businesses and institutions.

Ireland will continue to provide space and visibility for the importance of science-informed policy. In Europe, Ireland is striving to advance greater European scientific assessment and stocktaking processes, focused on future challenges related to managing the transition and transformation to a climate neutral and resilient economy. This will follow a two-year cycle, building on European investments and leadership in climate research and observation systems, to enable Europe to have enhanced opportunities to consider the latest science and responses to addressing the challenges posed by climate change.

20.4 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
IC/23/1	Provide at least €225 million per year in Climate Finance to developing countries by 2025
IC/23/2	Promote awareness, enhance participation and international cooperation on climate issues in international climate negotiations and processes
IC/23/3	Constructive participation across multilateral environment fora

21 Sustainable Development Goals

21. Sustainable Development Goals

Key Messages

State of Play

- Strategic Objective 1 of the SDG National Implementation Plan 2022-2024 is to 'embed the Sustainable Development Goals (SDG) framework into the work of Government Departments to achieve greater Policy Coherence for Sustainable Development'
- Action 23 of the Plan sets out that 'all new national policies should incorporate reference to relevant SDGs and targets, and reflect how the policy interacts with Agenda 2030'

Current and Future Action

- In accordance with commitments set out in the SDG National Implementation Plan 2022-2024, each chapter in the 2023 Climate Action Plan (CAP23) has been assessed for SDG impact at SDG target level. In addition, each chapter references the SDGs and targets to which it is contributing
- The SDG assessment carried out indicated that CAP23 is contributing to the progression of 85 out of 169 SDG targets

Expected Outcomes

- Situating CAP23 within the framework provided by the 2030 Agenda for Sustainable Development, marks an important step towards achieving PCSD where:
  - national policies are fully informed by the 2030 Agenda
  - greater dialogue is promoted between policy makers across sectors
  - a high-level analysis of the principal national policies is possible to identify areas of strength, gaps, synergies and conflicts for progressing the SDGs

21.1 Background

The actions and objectives set out in this Climate Action Plan (CAP23) also contribute to the progression of Ireland's commitment to achieving the *2030 Agenda for Sustainable Development*.

The 2030 Agenda was adopted by all 193 United Nations Member States in 2015. It is a "plan of action for people, planet and prosperity" and provides an internationally agreed framework to balance the economic, social and environmental aspects of sustainable development. The framework is made up of the 17 Sustainable Development Goals (SDGs) and 169 targets with the overall objective of achieving a more sustainable, prosperous and peaceful future in which no one is left behind.

Ireland has adopted a whole-of- Government approach to the implementation of the SDGs and the *SDG National Implementation Plan 2022-2024* sets out the overarching national governance, coordination and monitoring framework for the SDGs. The detailed policy approaches to progress individual SDGs and targets are addressed in relevant national policies65, including in CAP23.

65 See the SDG Policy map found on www.gov.ie/sdgs for further information on the contribution of national policies to SDG targets

21.2 The Contribution of the Climate Action Plan to the SDGs

In fulfilment of SDG target 17.14 to achieve greater Policy Coherence for Sustainable Development, each chapter in CAP23 has been assessed for SDG impact at SDG target level. In addition to this specific SDG chapter, which evaluates the overall contribution of CAP23 to SDG progression, each chapter references the SDGs and targets to which it is contributing.

The information provided by the assessment has allowed for a greater understanding of the scope and impact of the Climate Action Plan in terms of progression of the SDGs. While it is evident that CAP23 plays an important role in contributing to environment-related SDGs, in particular SDG 13 Climate Action, the result of the assessment demonstrates that the CAP23's impact extends well beyond climate action to span all three dimensions of sustainable development: the economic, social and environmental.

The findings of the assessment highlight that all 17 SDGs are being progressed by actions set out under the CAP23. This demonstrates the comprehensive and cross-cutting work required to progress climate action and the importance and value of CAP23 in terms of promoting and progressing sustainable development in Ireland.

At target level, 85 out of 169 SDG targets are being progressed by actions set out under CAP23 as illustrated in the below infographic:

Where targets are not being progressed under CAP23, this is generally because:

- They do not fall under the policy remit of CAP23 and are being progressed under other, more relevant national policies66;
- They are international in focus and being progressed under Ireland's foreign or international development policies67 and/or through international agreements and/or legislation.

The top 5 overall SDGs which CAP23 is contributing to include:

	**SDG 13 Climate Action**	The actions set out in CAP23 progress all 5 targets under SDG 13.
	**SDG 2 Zero Hunger**	The actions set out in CAP23 progress all 8 targets under SDG 2.
	**SDG 11 Sustainable Cities and Communities**	The actions set out in the CAP23 progress 8 out of 10 targets under SDG 11.
	**SDG 7 Affordable and Clean Energy**	The actions set out in CAP23 progress 4 out of 5 targets under SDG 7.
	**SDG 12 Responsible Consumption and Production**	The actions set out in CAP23 progress 8 out of 11 targets under SDG 12.

The assessment also pointed to a number of key themes arising across chapters in CAP23, including in particular:

- The integration of climate change measures into national policies, strategies and planning (target 13.2);
- Building the resilience of the poor and those in vulnerable situations, and reducing their exposure and vulnerability to climate-related extreme events and other economic, social and environmental shocks and disasters (target 1.5);
- Sustaining per capita economic growth in accordance with national circumstances (target 8.1);
- Improving education, awareness-raising and human and institutional capacity on climate change mitigation, adaption, impact reduction and early warning (target 13.3);
- Increasing the share of renewable energy (target 7.2).

66 For example, reduction of poverty under a Roadmap for Social Inclusion 2020 – 2025; access to sexual and greater access to reproductive health care under The National Sexual Health Strategy 2015-2020; and protection and conservation of biodiversity under the National Biodiversity Action Plan, etc.

67 See for example: A Better World, Ireland's policy for international development; and The Global Island, Ireland's foreign policy

The result of the SDG assessment of CAP23 will feed into a wider analysis of Ireland's main national policies to identify synergies, gaps and conflicts to better implement the SDGs in an integrated manner. This in turn strengthens the whole-of-Government approach and the position of the key Government bodies responsible for the implementation of SDGs.

22 Adaptation

22. Adaptation

Key Messages

State of Play

- Reports from the Intergovernmental Panel on Climate Change reinforced the urgent need for greater action on climate adaptation globally
- Observations show that Ireland's climate is changing in terms of sea level rise, increases in average temperature, changes in precipitation patterns, and weather extremes
- Climate change is expected to have diverse and wide-ranging impacts on Ireland's environment, society, and economic development, including on managed and natural ecosystems, water resources, agriculture and food security, human health, and coastal zones
- The most immediate risks to Ireland from climate change are predominantly those associated with changes in extremes, such as floods, droughts, and storms

Current and Future Action

- Ireland's primary adaptation policy response to these challenges is set out in our first statutory five-year National Adaptation Framework (NAF), which was published in January 2018. The NAF identifies 12 key sectors requiring Sectoral Adaptation Plans. These plans were approved by Government and published in October 2019
- The development of an updated NAF will be a priority action in 2023 reflecting the increasingly important role of adaptation in addressing the locked-in impacts of climate change. The revised NAF will underpin the development of a new cycle of Sectoral Adaptation Plans
- Under the Climate Action and Low Carbon Development (Amendment) Act 2021, every Local Authority will develop a comprehensive Climate Action Plan covering mitigation, adaptation, and citizen engagement

Expected Outcomes

- While there is no single metric for measuring the success of adaptation to climate change, our policies aim to improve the climate resilience of individuals, communities and businesses by protecting our key infrastructures and addressing local climate risks

22.1 What is Climate Adaptation?

Adaptation is the process of adjustment to actual or expected climate change and its effects. It is not a one-time emergency response, but a series of proactive measures that are taken over time to build the resilience of our economy and society to the impacts of climate change. This can ultimately help minimise the emergency response that is necessary when severe weather events occur. Adaptation can also ensure that slower onset impacts, such as sea-level rise, biodiversity loss or water supply issues, are accounted for ahead of time, and that measures to minimise their future impact are put in place.

Unlike climate mitigation, there is no single metric for measuring the success of adaptation to climate change. The policy targets for adaptation at global and European Union (EU) levels are extremely context-specific but generally aim to improve the climate resilience of existing systems. Work on measuring progress on adaptation is continuing at national level.

Successful adaptation generally requires that an analysis of the future impacts of climate change is mainstreamed into decision-making and policies across a large number of sectors that are vulnerable to climate change impacts. In Ireland, work undertaken in the area of flood-risk management provides a good illustration of this principle. Flood-risk prevention strategies make use of assessments of long-term changes in flood intensity and frequency based on climate projections. This informs the building of long-term resilience into flood defences by designing them to cope with conditions that may arise in the future.

Adaptation seeks to minimise the costs of climate change impacts and maximise any opportunities that may arise.

Adaptation measures take many forms, depending on the unique context of a country, region, community, business or organisation. Adaptation seeks to minimise the costs of climate change impacts and maximise any opportunities that may arise. Adaptation actions range from building adaptive capacity (e.g., increasing awareness, sharing information, and targeted training) through to policy development, implementation and financing.

Although the importance of adaptation is increasingly recognised at global, EU and national levels, multiple reports highlight a general lack of preparedness across the globe. Reports of extreme weather events and their impacts are an almost constant presence in the media, and the increased intensity and frequency of weather events due to climate change is a growing feature in global policymaking.

22.2 Global and EU Position

The Intergovernmental Panel on Climate Change (IPCC) Working Group I and II Reports, which are part of IPCC 6th Assessment Report (AR6), have increased our understanding of the impacts of climate change at a global and regional levels.

it is unequivocal that human influence has warmed the atmosphere, ocean, and land, and that widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred.

The Working Group I Report states that the scale of recent changes across the climate system, and the present state of many aspects of it, are unprecedented over many centuries to many thousands of years. It further states that it is unequivocal that human influence has warmed the atmosphere, ocean, and land, and that widespread and rapid changes in the atmosphere, ocean, cryosphere, and biosphere have occurred.

Global warming of 1.5°C and 2°C will be exceeded this century unless deep reductions in CO_2 and other GHG emissions occur in the coming decades.

The report shows that emissions of greenhouse gases (GHGs) from human activities are responsible for approximately 1.1°C of warming since 1850 to 1900, and finds that averaged over the next 20 years, global temperature is expected to reach or exceed 1.5°C of warming. It projects that global surface temperature will continue to increase until at least mid-century under all emissions scenarios considered. Global warming of 1.5°C and 2°C will be exceeded this century unless deep reductions in CO_2 and other GHG emissions occur in the coming decades.

The Working Group I Report[68] makes several high-level projections for Europe as a whole, and of more specific relevance in the Irish context. Further projections are made for the Northern Europe region. The report projects that there will be:

- An observed increase in pluvial flooding attributed to human influence and projected further increase at global warming of 1.5°C (medium confidence) and 2°C and above (high confidence);
- A projected decrease in river flooding at global warming of 2°C and above (medium confidence);
- A projected increase in severe windstorms at global warming of 2°C and above (medium confidence).

The IPCC Working Group II Report[69], published in February 2022, assesses the impacts of climate change, looking at ecosystems, biodiversity, and human communities at global and regional levels, and is more relevant to reviewing vulnerabilities, and the capacities and limits of the natural world and human societies to adapt to climate change.

The report finds that climate change, and the related increase in the frequency and intensity of extreme weather events, has caused widespread adverse impacts and related loss and damage to both nature and people. It further finds that the impacts and risks of climate change are becoming more complex and increasingly difficult to manage. Interaction between multiple climatic and non-climatic risks will result in compounding overall risk, and risks cascading across sectors and regions. The report highlights the urgency of immediate and far-reaching climate action, finding that near-term actions that limit global warming to close to 1.5°C would substantially reduce projected loss and damage related to climate change in human systems and ecosystems (compared to higher warming levels). However, it cannot eliminate them all.

The report states that economic damage from climate change has been detected in climate-exposed sectors, with regional effects on agriculture, forestry, fishing, energy, and tourism. It further states that key infrastructures, including sanitation, water, health, transport, communications, and energy, will be increasingly vulnerable if design standards do not account for changing climate conditions. In addition, it states that biodiversity loss and degradation, and damage to and transformation of ecosystems, are already key risks for every region due to past global warming and will continue to escalate with every increment of temperature increase.

It does, however, also conclude that the scale and scope of actions to reduce climate risks have increased worldwide, while individuals and households, along with communities, businesses,

68 Climate Change 2021: The Physical Science Basis. Working Group I Contribution to the IPCC Sixth Assessment Report

69 Climate Change 2022: Impacts, Adaptation and Vulnerability. Working Group II Contribution to the IPCC Sixth Assessment Report

religious groups, and social movements, have begun to adapt already. The report finds that climate change risks and impacts can be reduced, within limits, if humans and nature adapt to the changing conditions.

> *For the European Economic Area member countries, total economic losses from weather- and climate-related events of between €450 billion and €520 billion (in 2020 euros), were recorded for the 41-year period 1980 to 2020.*

The EU has noted that the world concluded the hottest decade on record during the 2010s, during which the record for the hottest year was exceeded eight times[70]. The World Meteorological Organisation's State of Climate Report 2021[71] indicates that global mean sea level reached a new record high in 2021, rising an average of 4.5mm per year over the period 2013 to 2021. Europe experienced some of its most severe flooding on record in mid-July 2021, with this event resulting in economic losses in Germany exceeding US$20 billion. For the European Economic Area member countries, total economic losses from weather- and climate-related events of between €450 billion and €520 billion (in 2020 euros), were recorded for the 41-year period 1980 to 2020.

These impacts are affecting not only the economy, but also the health and well-being of Europeans, who increasingly suffer from heatwaves (globally, the deadliest disaster of 2019 was the European heatwave with 2,500 deaths). Climate change is also posing risks to food security, worsening existing social inequalities, and threatening cultural heritage.

> *This means that by 2050, when the EU aims to have reached climate neutrality, it will also have reinforced its adaptive capacity and minimised its vulnerability to climate impacts.*

The European Green Deal, the EU's growth strategy for a sustainable future, is grounded in the green transformation as an opportunity; failure to act on climate change is regarded as a huge cost. The EU long-term vision is that by 2050 the EU will be a climate-resilient society, fully adapted to the unavoidable impacts of climate change. This means that by 2050, when the EU aims to have reached climate neutrality, it will also have reinforced its adaptive capacity and minimised its vulnerability to climate impacts.

In February 2021, the EU published a new EU Climate Change Adaptation Strategy[72], Forging a Climate-resilient Europe. The new strategy was developed in recognition of adaptation as a crucial component of the long-term global response to climate change. The strategy aims to increase and accelerate the EU's efforts to protect nature, people, and livelihoods against the unavoidable impacts of climate change. It outlines a long-term vision of creating a climate resilient EU by 2050 by making adaptation smarter, more systemic and swifter, and by stepping up international action. Implementation of the strategy is ongoing.

In 2021, as part of the strategy, details of the EU's first Climate Change Risk Assessment, which will be concluded by 2024, were announced. A Risk Data Hub was also announced, as well as the EU Mission on Adaptation under the Horizon Europe Programme, which aims to support at least 150

70 EU https://ec.europa.eu/commission/presscorner/detail/en/IP_21_663

71 WMO State of the Global Climate Report 2021

72 EU Adaptation Strategy (europa.eu)

European regions and communities to move towards climate resilience by 2030.

22.3 Policy Measures for Ireland

Observations show that Ireland's climate is changing in terms of sea level rise, increases in average temperature, changes in precipitation patterns, and weather extremes. Satellite observations indicate that the sea level around Ireland has risen by approximately 2 to 3mm a year since the early 1990s. There is evidence of an increase in river flows across the country between 1972 and 2017. However, there is also evidence in recent years of an increase in the frequency and intensity of potential drought conditions, especially in the east of Ireland.

Temperatures in Ireland have increased by about 0.9°C during the period 1900 to 2019, or an average of about 0.075°C per decade. Fifteen of the top twenty warmest years on record have occurred since 1990. The overall temperature trend is upwards and consistent with global patterns of change.

Climate change is expected to have diverse and wide-ranging impacts on Ireland's environment, society, and economic development, including on managed and natural ecosystems, water resources, agriculture and food security, human health, and coastal zones. The most immediate risks to Ireland from climate change are predominantly those associated with changes in extremes, such as floods, droughts, and storms.

Ireland's primary adaptation policy response to these challenges is set out in our first statutory five-year National Adaptation Framework (NAF)[73], which was published in January 2018. The NAF identifies 12 key sectors requiring Sectoral Adaptation Plans. These plans were approved by Government and published in October 2019. The Sectoral Adaptation Plans are grouped under four themes as set out in Table 22.1.

Table 22.1 – Sectoral Adaptation Plans and Themes

Theme	Sector Level	Lead Department for Sectoral Adaptation Plans
Natural and Cultural Capital	Seafood	Department of Agriculture, Food and the Marine
	Agriculture	
	Forestry	
	Biodiversity	Department of Housing, Local Government and Heritage
	Built and Archaeological Heritage	
Critical Infrastructure	Transport Infrastructure	Department of Transport
	Electricity and Gas Networks	Department of the Environment, Climate and Communications
	Communications Networks	
Water Resource and Flood Risk Management	Flood Risk Management	Office of Public Works
	Water Quality	Department of Housing, Local Government and Heritage
	Water Services Infrastructure	
Public Health	Health	Department of Health

73 gov.ie - National Adaptation Framework (NAF) (www.gov.ie)

The completed sectoral plans[74] describe and assess the extent of the risks presented by climate change to a sector, and present contingency plans to address these risks and ensure climate resilience. They include actions to mainstream adaptation into policy and administration at sectoral level, as well as to improve cooperation and coherence within and across other sectors.

Box 22.1 – Potential Impacts of Climate Change in Ireland

Some of the impacts of climate change that could potentially impact priority sectors in Ireland include:

- Precipitation extremes and flooding, resulting in disruption of transport services, unsafe driving conditions and gradual deterioration of infrastructure;
- Increased water demand because of the increased frequency of heatwaves, leading to further strain on water transmission and distribution networks, as well as on supply (abstraction and storage);
- Projected increases in the frequency of extreme precipitation events may result in more water-borne disease (e.g., E. coli) from contamination of drinking water because of overland flows of pollutants. Projected increases in annual average temperature, combined with wetter conditions, may result in enhanced environmental conditions for bacterial growth and viral survival with a potential increase in food-borne disease;
- Projected increases in sea levels and storm surge will result in increased frequency of coastal flooding and erosion, with significant impacts for coastal and heritage sites situated in proximity to the coast and on estuaries;
- Projected increases in the intensity of windstorms and in the duration of the growing season, may result in increased windthrow leading to damage to overhead power lines;
- Projected increases in the frequency of heatwaves will result in degradation of communications infrastructure (e.g., street cabinets), potentially leading to an increased requirement for active cooling;
- Projected changes in temperature and precipitation will result in the arrival of invasive species more suited to changed climate conditions, some of which may have negative impacts on the economy (e.g., via impacts on farming and fisheries);
- Projected increases in the frequency of extreme precipitation events will result in increased levels of run-off and potential water quality issues, with implications for slurry storage and land spreading;
- Projected increases in the frequency of heatwaves and drought, resulting in the increased frequency of wildfires damaging forests stands.

Following a review of the existing NAF under the 2021 Climate Action Plan, the development of an updated NAF will be a priority action in 2023, reflecting the increasingly important role of adaptation in addressing the locked-in impacts of climate change. The revised NAF will underpin the development of a new cycle of Sectoral Adaptation Plans.

22.3.1 Whole-of-Government Response

The NAF recognises the importance of a whole-of-Government response to climate adaptation. While 'climate proofing' Ireland is a collective responsibility for both Government and civil society, Government will:

- Lead and coordinate the adaptation effort;

74 gov.ie - Sectoral Adaptation Planning (www.gov.ie)

- Ensure the necessary information and incentives are in place for independent adaptation actions by private actors;
- Be proactive in addressing market failures;
- Work cooperatively across sectors to tackle complex challenges and to support the adaptation objectives set out in national policy.

22.4 Local Adaptation

The NAF clearly identifies the critical role of Local Authorities in building climate resilience. Four Government-funded Local Authority Climate Action Regional Offices (CAROs) supported the preparation of Local Adaptation Strategies in all 31 Local Authorities. Building on their success, the CAROs have been given an enhanced role covering mitigation, adaptation and citizen engagement under the Climate Action and Low Carbon Development (Amendment) Act 2021. They will have a key role to play in coordinating the development of comprehensive Local Authority Climate Action Plans.

22.5 Climate Impact Information for Ireland

22.5.1 Met Éireann

Met Éireann is leading on the development of a new National Framework for Climate Services (NFCS) which will ensure collaboration and sharing of information between key stakeholders. The NFCS will be a key focus in the development of the new NAF. Met Éireann has also collaborated with University College Dublin and the Irish Centre for High-End Computing to contribute to the development of a new global climate model (EC-Earth), which can provide analysis of the impacts of global climate change on Ireland to inform policymaking.

22.5.2 Climate Ireland

Climate Ireland is our national web-based resource of up-to-date climate information and adaptation tools. It serves local, regional and sectoral decision-makers. It plays a key role in increasing awareness of, and building capacity for, adaptation planning through one-to-one support and the provision of tailored adaptation planning workshops and seminars. We will continue the development of Climate Ireland as a key priority.

22.5.3 Global Climate Observing System

The Global Climate Observing System National Committee for Ireland (GCOS-Ireland), which includes Met Éireann, the Environmental Protection Agency and the Marine Institute, promotes the GCOS principles for observing essential climate variables of relevance to Ireland. The GCOS-Ireland Climate Status Report for Ireland 2020 provides high quality evidence to support the development of appropriate climate mitigation and adaptation solutions.

22.5.4 Office of Public Works

The Office of Public Works' national flood information portal, www.floodinfo.ie[75], provides access to historical and projected flood data for Ireland, supporting adaptation and emergency response planning, and empowering individuals and communities to respond to flood risk.

75 https://www.floodinfo.ie

22.6 Actions

The detailed implementation maps for actions, including timelines and responsible organisations, are set out in the accompanying Annex.

Action Number	Action
AD/24/2	Develop a new National Adaptation Framework
AD/23/1	Identify a methodology for the use of climate indicators in sectoral adaptation planning process
AD/23/2	Produce guidance on the assessment of adaptation measures and the development of Climate Change Adaptation Plans for past and new flood relief schemes
AD/23/3	Update the existing Minor Works Programme to ensure applications consider the potential impacts of climate change and, where necessary, that any measures proposed provide for, or are adaptable to, possible future changes in flood risk
AD/23/4	Develop options for the delivery of a National Implementation Strategy for Nature-Based Solutions and interim guidance to the management of rainwater and surface water runoff in urban areas
AD/23/5	Produce climate change groundwater flood maps and assess predicted climate change impacts to groundwater flooding at four pilot sites
AD/23/6	Finalise scoping report on coastal change management
AD/23/7	Make TRANSLATE the national standard set of climate projections
AD/23/8	Develop Climate Ireland portal as Ireland's climate information platform as part of the NFCS
AD/23/9	Operationalise ANYWHERE system
AD/23/10	Mainstream climate change adaptation into energy policy and strategic objectives to 2050
AD/23/11	Incorporate adaptation to climate change in the ongoing programme of renewal and maintenance by EirGrid, ESB Networks and Gas Networks Ireland
AD/23/12	Publish a report following completion of ComReg's network resilience project: 'Climate Change and its Effect on Network Resilience in Ireland', and where appropriate implement the findings and key take-aways
AD/23/13	Collate and review the various methodologies available to calculate the environmental impact of electronic communications networks and promote the harmonisation of such measurement indicators across the EU
AD/23/14	Improve the resilience of Ireland's water infrastructure to the impacts of climate change
AD/23/15	Develop a better understanding of the health impacts of climate change in Ireland by undertaking analysis and research to obtain baseline information on the impacts of severe weather, flooding and drought on public health
AD/23/16	Develop a new public health heat wave plan and seek to ensure more uniform system-wide planning for heatwaves
AD/23/17	Build the knowledge base required to improve health infrastructure resilience to severe weather events: severe wind, heat waves, flooding, and extreme cold snaps
AD/23/18	Engage with key stakeholders and adaptation practitioners in relation to building climate resilience and the importance of adapting to climate change

AD/23/19	Increase awareness of water conservation and the importance of protecting Ireland's water resources among students through the Green-Schools Partnership programme

Version 2

Department of the Environment,
Climate and Communications

Rialtas na hÉireann
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