

The EPA and Climate Change



Environmental Protection Agency
2009

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Foreword

'Global climate change threatens to disrupt the well-being of society, deter economic development and alter the natural environment, making it a key policy concern for the 21st Century'

(OECD, 2009)

Although we are a small country, Ireland's greenhouse gas emissions per person are amongst the highest on the planet. If we are to address the threats that climate change poses we must as a nation, reduce the emissions caused by all of our activities and adapt to the changes in climate that we face.

This climate change document describes the responsibilities that the Environmental Protection Agency (EPA) has in the fight against climate change. It details our role and key work in this area as well as the key challenges facing Ireland. With challenges come risks, but also opportunity. Through our work on climate change issues, we in the EPA are fully committed to helping Ireland to transition to a low carbon and sustainable economy and to working with our stakeholders to achieve this goal.

An important function of the EPA is to provide up to date and relevant information on the Ireland's environment through our State of the Environment reports. In our '2020 Vision' Strategy, the EPA highlights the issue of climate change and states that addressing this issue is a key challenge in the coming years.

We welcome engagement from all our stakeholders on effective means to tackle climate change in Ireland.

Laura Burke

November 2009

Laura Burke
Director
Office of Climate, Licensing and Resource Use
Environmental Protection Agency



Background

The EPA's **2020 Vision** strategy sets out our vision for Ireland's environment over the coming decade and beyond. The strategy is focused on delivering positive outcomes in a number of critical environmental areas, including climate change, and is set within the overall context of sustainable development.

We recognise that social, economic and environmental issues are interconnected and that good decisions and policy should encompass these three elements in a balanced and harmonious way.

2020 Vision outlines six environmental goals, reflecting the main challenges identified by the EPA for Ireland as well as key issues at global and EU levels. These goals are:

- Limiting and adapting to climate change
- Clean air
- Protected waters
- Protected soil and biodiversity
- Sustainable use of natural resources
- Integration and enforcement

Limiting and adapting to climate change is the key focus of this document. As Figure 1 shows, all of the EPA 2020 Vision goals are inextricably linked to tackling climate change.

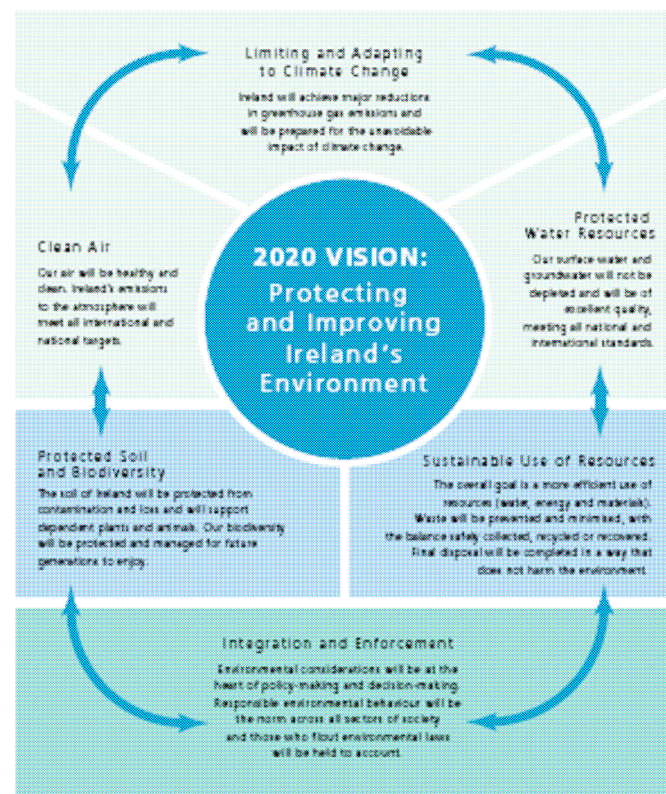


Figure 1: Linkages between EPA 2020 vision goals

2 EPA Climate Change Programme

The **National Climate Change Strategy (NCCS)** 2007 to 2012¹ sets out the Irish Government's plans to tackle climate change. The EPA is tasked with many actions under this strategy which are incorporated into the EPA Climate Change Programme. The main work areas from this programme are summarised below.

National Emissions Inventories

Greenhouse gas (GHG) emissions² arise from many different activities. The EPA has responsibility for the compilation of GHG emission figures for Ireland. This includes emissions to and removal from the atmosphere of GHGs arising from industrial and commercial, energy, residential, agricultural, transport and waste sectors. We submit this data annually to the European Union, the UNFCCC³ Secretariat and the UNECE⁴ Secretariat. This information allows progress towards our international emission reduction targets to be measured and helps identification of measures that could be taken in certain sectors to reduce emissions. Figure 2 below displays a breakdown of Ireland's GHG emissions for 2007. Our total emissions in 2007 were 69.2 Megatonne CO₂equivalent⁵ (Mt CO₂eq).

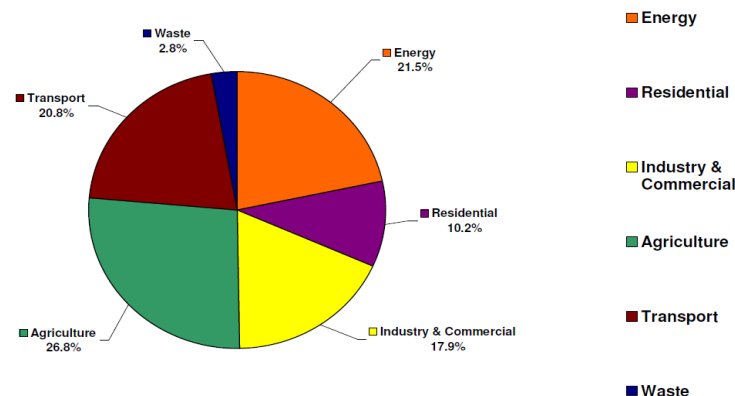


Figure 2: Ireland's Greenhouse gas emissions by sector for 2007 (Source: EPA 2009)

Agriculture is the single largest contributor to the overall emissions, at 26.8% of the total, followed by **Energy** (power generation & oil refining) at 21.5% and **Transport** at 20.8%. The remainder is made up by **Industry and Commercial** at 17.9%, the **Residential** sector at 10.2%, and **Waste** at 2.8%.

National Emissions Projections

The National Climate Change Strategy designated the EPA with responsibility for developing annual national emission projections for GHGs, for all key sectors of the economy, in collaboration with relevant State and other bodies. Developing GHG emissions projections is a complex process involving several strands of analytical and modeling work such as energy supply, demand forecasts, and policy measures that may impact on the level of emission from a given sector.

The main aim of developing national emissions projections is to monitor progress in meeting our national and international emission targets if current and planned policies and programmes are implemented. GHG projections are reported on a sectoral basis to give priority to those sectors that have the most impact on emission levels. They are published annually to assist in the identification of measures and policies to enable us to reach our emissions reduction targets. The

¹ National Climate Change Strategy (2007 to 2012), Department of Environment Heritage.

² The most important long-lived greenhouse gases are carbon dioxide (CO₂), nitrous oxide (N₂O), and methane (CH₄).

³ United Nations Framework Convention on Climate Change

⁴ United Nations Economic Commission for Europe

⁵ CO₂eq – Carbon dioxide equivalent – the emission of any GHG expressed as tonnes CO₂ using the Global Warming Potential (GWP) values (e.g. the emission of one tonne of methane is equivalent to the emission of 21 tonnes of CO₂.)

latest projections report can be found at:
<http://www.epa.ie/whatwedo/climate/emissionsinventoriesandprojections/nationalemissionsprojections/>

Emissions Trading Scheme

The Emissions Trading Scheme is one of the key policies introduced by the EU to tackle emissions of carbon dioxide and other greenhouse gases. The scheme began on 1 January 2005, with the first phase from 2005 – 2007 and the second phase from 2008-2012 to coincide with the first Kyoto period. It is the largest “cap and trade” scheme in the world covering 27 EU States and around 12,000 installations.

The EPA was assigned responsibility for the implementation of the scheme in Ireland (S.I. 437 of 2004) and is currently implementing Ireland’s second National Allocations Plan for the period 2008-2012.

Some 100 of Ireland’s largest emitters are covered, representing about one third of our national GHG emissions. The ETS provides an assurance that, within the European wide allocation cap, emissions reductions can be made in the most economic way possible.

Under the Kyoto Protocol and the EU ETS, Ireland is required to establish and implement a *National Registry* to track the creation, holding, transfer and compliance processes associated with Assigned Amount Units, Kyoto Project Units and European Allowance Units. Each national registry must conform to detailed technical standards.

The EPA is responsible for the implementation and management of the *National Registry* in Ireland including security and governance.

Research and capacity building for the future

If Ireland is to meet the challenges that climate change will bring, we must be as informed as possible about the problems we face. Our **Climate Change Research Programme** co-ordinates and publishes research in a very wide range of areas from climate modelling to the social and economic. The EPA and Climate Change

consequences of climate change. The research programme is structured according to four linked thematic areas with a strong cross cutting emphasis:

<i>Theme 1</i>	<i>Greenhouse gas emissions and mitigation</i>
<i>Theme 2</i>	<i>Impacts and adaptation</i>
<i>Theme 3</i>	<i>Technology and socio-economic analysis</i>
<i>Theme 4</i>	<i>Transboundary air pollution</i>

This research is essential to address key gaps and uncertainties in the science of climate change and also to inform government policy for mitigating and adapting to climate change.

The EPA chairs the climate change research coordination committee in Ireland which has members from all the key stakeholders including government departments and state bodies. We are a partner in the CIRCLE2⁶ project, with other European Member States which aims to coordinate and share the findings of climate change impacts research, as well as organise joint research calls between countries. Further information on our research programme can be downloaded at <http://www.epa.ie/whatwedo/climate/>

Air and Climate Science and Observation Systems

Science has been the main driver of international actions on issues such as climate change and air pollution at global and regional levels. Complex links exist between these areas and synergies and trade-offs occur in the development of responses to climate change and air pollution.

The EPA funds integrated assessment modeling⁷ to better understand the impacts of climate, energy and air pollution policies on national targets. We also aim to promote researcher participation in key international bodies such as the Intergovernmental Panel on Climate Change (IPCC) and Task

⁶ CIRCLE2 – Climate Impact Research Coordination for a Larger Europe
www.circle-era.net

⁷ IMP Ireland <http://www.impireland.ie/index.html>

Force Groups under the Convention on Long Range Transboundary Air Pollution (CLRTAP).

Observation systems are an integral part of monitoring the environment. For example satellite monitoring systems are increasingly being used to track pollution events such as forest fires and oil spills and minimise the impacts they have on the environment through improved response. They are also being used to monitor land use change and habitats.

The National Climate Change Strategy expressed its commitment to ensuring *that Ireland has an adequate and modern capability for climate observation*. The EPA works with national stakeholders such as Met Eireann, the Marine Institute and the OPW in addressing the requirements of an integrated national climate observation system in Ireland⁸. A national system will be a crucial means of monitoring the future impacts of climate change in Ireland.

Monitoring and analysis

Our Water Data Unit works in cooperation with other stakeholders such as Local Authorities, and Office of Public Works to monitor the physical, chemical and biological properties of surface water bodies throughout the country. With projected water resource impacts from climate change this monitoring work is essential to determine climate signals in the data collected.

In 2010 Ireland will formally become involved in the ICOS project⁹ which aims to provide an accurate greenhouse gas emission monitoring network across Europe.

⁸ EPA, Current Status and Required Actions for National Climate Observing Systems (2009).

⁹ Integrated Carbon Observation System <http://www.icos-infrastructure.eu/>
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3 Ireland's greenhouse gas emissions

The EPA is responsible for compiling Ireland's Greenhouse Gas inventories using guidelines established by the IPCC. Figure 3 below shows a breakdown of Ireland's GHG emissions for different sectors from 1990 to 2007.

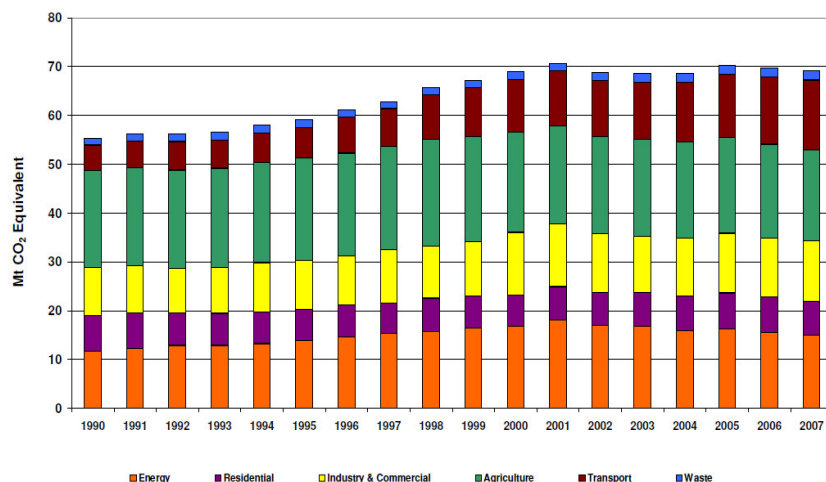


Figure 3: Ireland's GHG emissions 1990 to 2007 (Source EPA 2009)

This figure shows that our total emissions have increased from a level of approximately 55 MtCO₂eq in the early 1990s to over 69 MtCO₂eq in 2007. On a sectoral basis, very significant increases have occurred in the transport sector in particular.



Transport

The rise in transport emissions due to increased car ownership in recent years poses a particular challenge for Ireland. Examples of actions being undertaken to reduce emissions from this sector include;

- Investment in public transport
- Vehicle labeling and taxation
- Bike to work scheme.
- Promotion of electric car network
- Achieving 10% electric road vehicles by 2020

Agriculture

Agriculture is an important part of our economy and way of life. However, even though they have decreased slightly since 1990, emissions from this sector remain the largest contributor to our national greenhouse gas total. Significant challenges remain in reducing emissions from agricultural activities in the future.

4 Greenhouse gas emissions limits

Ireland is currently faced with meeting two limits with respect to greenhouse gas emissions;

- 1 The first of these is the **Kyoto Protocol** to the United Nations Framework Convention on Climate Change (UNFCCC). Under the Kyoto Agreement, Ireland has committed to limiting the increase of greenhouse gases to 13 % above the 1990 baseline year when our emissions were 55.6 MTCO₂ eq, resulting in a Kyoto limit for Ireland during the period 2008 to 2012 of just under 63 Mt. However due to economic growth our total greenhouse gas emissions in 2007 were 69.2 Mt. Compliance can be achieved through an emissions reduction programme, and/or emissions allowances that can be purchased from countries that have successfully lowered their own emissions.
- 2 The Kyoto Protocol is, however, only a first step in addressing the serious global threat of climate change. The ultimate goal of the UNFCCC is to stabilise atmospheric concentrations of greenhouse gases at a level that prevents dangerous human interference with the climate system. Therefore, in early 2009 the EU Commission agreed a package of proposals that will deliver on the **European Union's commitments** to fight climate change and promote renewable energy up to 2020 and beyond. The package seeks to deliver a 20% reduction in total EU greenhouse gas emissions by 2020 (relative to 1990 levels) and at the same time to increase to 20% the share of renewable energies in energy consumption. The emissions reduction will be increased to 30% by 2020 if a new global climate change agreement is reached.

Distance to Kyoto limit

Ireland faces challenges in meeting its Kyoto limit. The global economic downturn and current economic challenges in Ireland may assist in reducing emissions, however it is critical that greenhouse gas emissions are decoupled from economic growth. Figure 4 below shows Ireland's challenge in meeting the Kyoto limit.

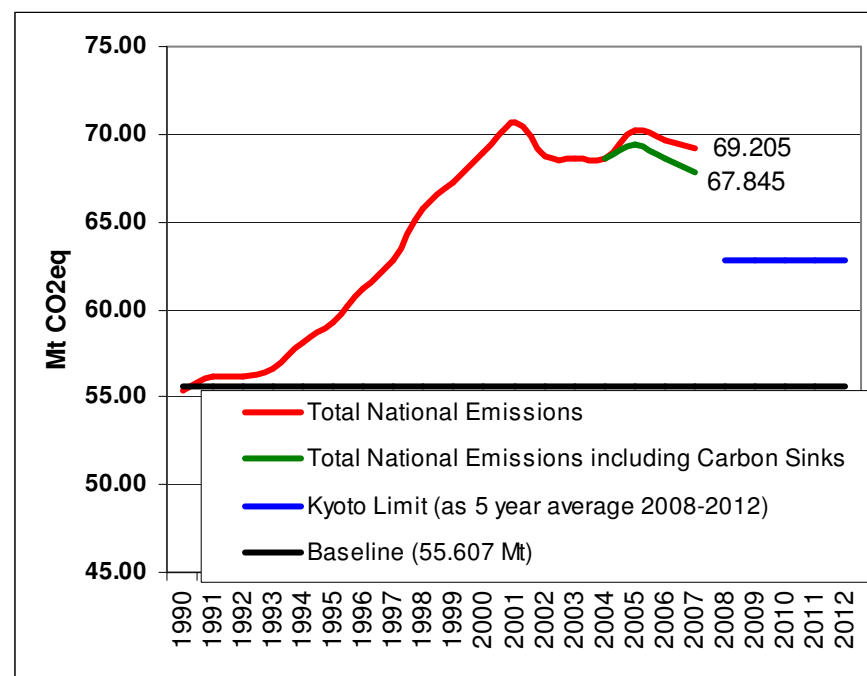


Figure 4: Distance to Ireland's Kyoto Limit (Source: EPA 2009)

The government's White Paper on *Delivering a Sustainable Energy Future for Ireland* and the *National Bioenergy Action Plan* includes other targets such as:

- a target of **12 per cent renewable energy** share in the heating sector;
- achieving a **10 per cent** penetration of **biofuels** in road transport;
- achieving **33 per cent of electricity consumption** from **renewable energy sources**;
- installing **500MW ocean energy** capacity; and
- achieving **800MW** from **combined heat and power**.

EPA current projections reflect the reduced activity due to the economic downturn, but even with this, and with all plans and measures implemented on time and delivering to their fullest extent, there is still an ongoing challenge for Ireland to meet its obligations under both the Kyoto Protocol and under the EU 2020 binding targets.

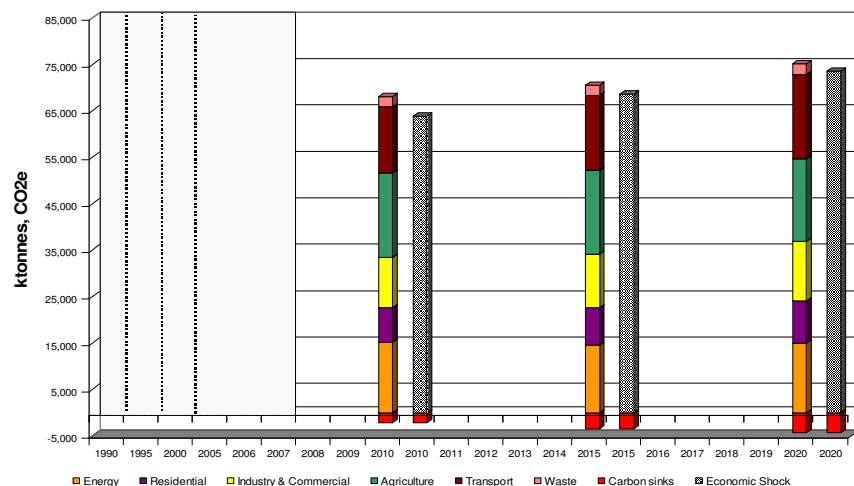


Figure 5: Projected greenhouse gas emissions to 2020 (EPA, 2009)

Current projections show Ireland will still exceed its Kyoto Protocol limit by an average of 1.3-1.8 million tonnes of CO₂eq

annually in the period 2008-2012. Additional domestic policies and measures and/or Government purchases of carbon credits will be required to bridge this gap.

In the longer term to 2020, Ireland's unique position within the EU as the country with the highest national proportion of agricultural emissions, together with further projected growth in transport emissions, will present this country with major challenges in meeting the EU's proposed future emission reduction targets. In the best case scenario, non-Emissions Trading Scheme sector emissions are projected to be 7 million tonnes of CO₂ higher in 2020 than the binding target for that year. This gap will be even larger if the EU target is further educed in the event of an appropriate international agreement to follow the Kyoto Protocol.



5 Climate change: Indicators and impacts for Ireland

Recent findings from our **Climate Change Research Programme** show that Ireland's climate has changed over the past 100 years. This change is similar to patterns seen globally. The clearest trend is in temperature records but there is also a trend towards more intense and frequent rainfall. Some indicators of this change are as follows:

- Ireland's mean annual temperature increased by 0.7°C between 1890 and 2004.
- Six of the 10 warmest years have occurred since 1990. Our climate will continue to warm with possible increases of 3° to 4°C towards the end of the century.
- The average rate of increase is 0.06°C per decade, but as Ireland experiences considerable climate variability, the trend here is not linear.
- The highest ten-yearly rates of increase have occurred since 1980, with a warming rate of 0.42°C per decade.
- There has been a reduction in the number of frost days and a shortening of the frost season length.
- The annual rainfall has increased on the north and west coasts, with decreases or small increases in the south and east. These changes are reflected in the ecosystem, with an increase in the growing season as well as greater numbers of wildlife and fauna suited to warmer climates being evident in Ireland and its surrounding waters.

Climate change impacts are projected to increase in the coming decades and during the rest of this century and uncertainties surround the magnitude and extent of these impacts, particularly for the second half of the century. The

greatest uncertainty lies in how effective global actions will be in reducing GHG emissions. Predicted negative changes in Ireland include:

- The sea-level is projected to rise by between 18cm and 59cm this century
- There will be more intense storms and rainfall events
- There will be an increased likelihood and magnitude of river and coastal flooding; increased storm surges
- There will be water shortages in summer in the east, and a need for the irrigation of crops
- There will be negative impacts on water quality
- Changes in the distribution of species will occur, and it is possible we will see the extinction of vulnerable species requiring cooler conditions, e.g. the Arctic char
- There will be effects on fisheries that are sensitive to small changes in temperature, e.g. cod
- There will be an increased frequency of wild fires and pest infestation.



6 Our role in a low carbon economy

If Ireland is to achieve its GHG targets we must strive to become a low carbon economy with efficient energy use, and the development and use of low carbon technology in our daily lives.

Research

Along with the Climate Change Research Programme, the EPA **STRIVE** research programme and **Cleaner Greener Production Programme** (CCPP) produce policy and commercially relevant outputs that contribute to a sustainable knowledge economy.

Licensing and Enforcement

The EPA regulates the emissions produced by industry and by waste sites in Ireland through a combination of licensing and the Emissions Trading Scheme (ETS). Large industrial and waste sites are licensed by the EPA and they are monitored to make sure they comply with the terms and conditions of these licences.

The EPA works with industrial and waste sites to find ways of reducing their emissions and their use of energy and fuel. Sites with EPA licences must produce *Resource Use and Energy Efficiency* reports and these measures help licensees to track their efforts and their expenditure in relation to energy and emissions.

Resource Efficiency

Our National Waste Prevention Programme (NWPP) aims to explore practical ways to minimise and prevent waste, so as to break the link between economic growth and the environmental impacts associated with the generation of

waste. Examples of nationwide projects promoting the prevention of waste, water and energy use include:

- Green Hospitality Award www.gha.ie
- Green Business www.greenbusiness.ie
- Local Authority Prevention Demonstration Programme www.lapd.ie and
- Green Home Programme– www.antisce.ie

All of these projects are concerned with quantifying and reducing the consumption of resources. These reductions have a knock-on benefit in terms of reduced emissions to the atmosphere and potential savings for the organisations concerned. The recently commissioned work on food waste prevention/home composting has the potential to divert biodegradable waste from landfill, thereby preventing the formation of methane, a powerful greenhouse gas.

EPA Green Team

The EPA strongly believes that public sector organisations should be setting an example in terms of its own environmental performance and carbon footprint.



An **Environmental Management System** (EMS) is in place for the EPA. Detailed energy audits have been undertaken and Display Energy Certificates have been received for all

inspectories. Local **Green Teams** are working in each of our offices to minimise the impacts of our activities such as transport, hazardous material, energy and water use and waste management. Regular internal audits are undertaken and targets set to improve our performance.

In terms of green procurement, the EPA aims to use the most environmentally friendly suppliers and products and is increasingly using environmental criteria in our tender specifications. A recently completed extension to the EPA Headquarters building in Wexford incorporated renewable energy such as photovoltaics, solar water heating, solar gain, rainwater recycling and a woodchip burner to reduce the carbon footprint of the building on the environment. Our Cork inspectorate is also heated using a wood chop boiler.

7 Communicating Climate Change Issues

Communication is an integral part of our work not only on climate change, but on the state of the environment in general. We regularly communicate the impacts and challenges that climate change poses for Ireland to policy makers, the research community and the public at large. The mission of our climate change communications strategy is:

- To **provide expert, independent scientific advice** and information on climate change
- To **lead the debate** in Ireland
- To be the **first port of call for information** on climate change
- To be **recognised as an expert** educator and communicator on climate change and its impacts for all interest levels
- To **provide informed advice** to policy makers on emissions reduction strategies and adaptation measures
- To **be an authority on the actions required** to address the causes and consequences of climate change
- To **promote climate change research** in Ireland as a support to action across all sectors
- To be a **respected regulator**

Our **public lecture series** on climate change issues will continue in 2009 and into 2010 and continues to be well attended by stakeholders and the general public. The lectures can also be viewed on our website.

Our **climate change webpages** offer:

- Frequently Asked Questions on climate change
- The latest research findings from EPA funded projects
- Up to date information from international climate negotiations

- Links to international organisations working on climate change
- Carbon calculator tools for personal and business use.

We also partner with TV programmes like *The Investigators* and *Eco Eye* on RTE. Through our National Waste Prevention Programme we fund innovative initiatives such as *An Taisce's Green Homes* bringing information on climate change to over 9000 homes throughout Ireland.

Where possible, we publish relevant local environmental research data in regional newspapers so that people are regularly informed about issues like recycling, water quality and green technologies.

A key message in all our communications is that we all need to play our part, no matter how small in fighting climate change. We welcome suggestions and engagement from our stakeholders on this ongoing challenge.



8 Future Challenges

'We basically have three choices –mitigation, adaptation, and suffering. We're going to do some of each. The question is what the mix is going to be. The more mitigation we do, the less adaptation will be required, and the less suffering there will be.'

(John Holdren, Science Adviser for US President Barack Obama)

Adapting to climate change

Even if global greenhouse gas levels were reduced now, some impacts would be unavoidable, due to the lifespan of certain GHGs in the atmosphere. The EPA is currently working on a *National Adaptation Strategy* for Ireland in conjunction with relevant government departments to identify the main risks posed and how to best manage them.

We continue to participate in climate change negotiations and are active at national, European and International levels. Through our research and communication programmes we will provide up to date and relevant information on climate change to all of our stakeholders.

Mitigation

Ireland has national and international obligations to reduce its greenhouse gas emissions and minimise the impacts of climate change. We are committed to playing a leading role in these challenges in the EPA.

What can you do?

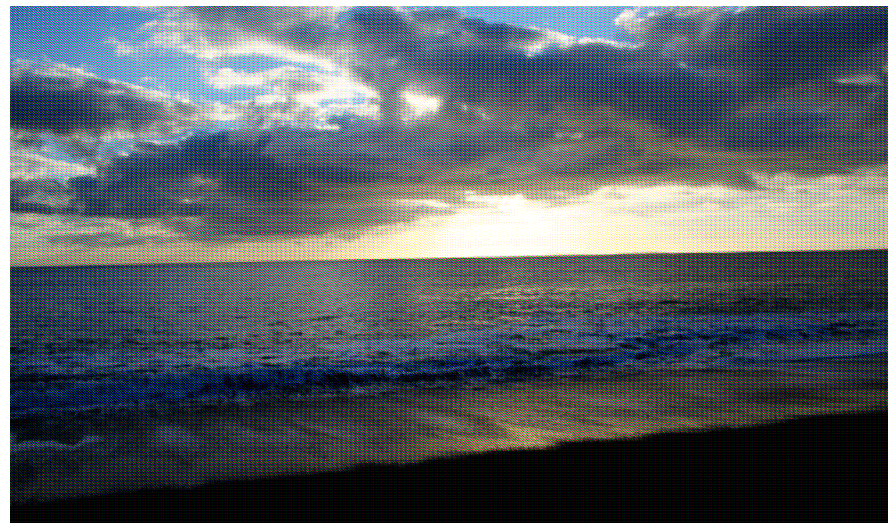
Whether you are at home, at work, in school or in college everyone can play a part in tackling climate change. By improving energy efficiency, investing in renewable energy and adopting sustainable transport and development practices, we can reduce our contribution to climate change

while creating a cleaner, greener and more prosperous country.

For actions to reduce your personal greenhouse gas emissions check out your carbon number on the [Change.ie carbon calculator](http://Change.ie/carbon-calculator).

For businesses, the [Carbon Management Tool](http://Carbon-Management-Tool) is a free online service designed to help your organisation reduce its carbon emissions.

Play your part in tackling climate change! Learn how to reduce your impact on the environment, increase your green credentials and save money on energy and resources.



For more detailed information on climate change contact the EPA Climate Change Unit by any of the following means:

Climate Change webpages at www.epa.ie/whatwedo/climate/

E-mail: info@epa.ie

Telephone: +353 - 1 - 2680100.

The Environmental Protection Agency

The EPA protects the environment for everyone in the country. We regulate and police activities that might otherwise cause pollution. Our priorities are protecting the Irish environment and ensuring that development is sustainable. Our mission is :

“To protect and improve the natural environment for present and future generations, taking into account the environmental, social and economic principles of sustainable development.”

We are responsible for:

- Environmental licensing of large scale waste and industrial activities
- National environmental policing of EPA-licensed facilities overseeing local authorities' environmental protection responsibilities.
- Monitoring, analysing and reporting on the environment
- Regulating Ireland's greenhouse gas (GHG) emissions
- Environmental research and development
- Strategic environmental assessment
- Environmental planning, education and guidance
- Proactive waste management and waste prevention

