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Assessment of Actions to Support the Work of the Climate and Clean Air Coalition

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Rialtas na hÉireann
Government of Ireland

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- Office of Evidence and Assessment
- Office of Radiation Protection and Environmental Monitoring
- Office of Communications and Corporate Services

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EPA RESEARCH PROGRAMME 2014–2020

Assessment of Actions to Support the Work of the Climate and Clean Air Coalition

(2015-CCRP-SS.5)

EPA Research Report

Prepared for the Environmental Protection Agency

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DISCLAIMER

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Executive Summary

The Climate and Clean Air Coalition (CCAC) brings together governments, civil society organisations and private sector actors committed to improving air quality and protecting the climate in the next few decades by reducing short-lived climate pollutants (SLCPs). Complementary to mitigating carbon dioxide (CO_2) emissions, the CCAC acts as a catalyst to create, implement and share immediate solutions. These solutions address near-term climate change to capture the health co-benefits of reducing air pollution by reducing fossil fuel consumption and to ensure sustainable development for future generations.

Ireland became a member of the CCAC in 2013 to demonstrate commitment to climate and air pollution issues and to improve policy coherence between climate and air policy.

This small-scale study, commissioned by the Environmental Protection Agency (EPA) in 2015:

1. reviews the work of the CCAC, in particular initiatives seeking to promote near-term reductions of SLCPs;
2. identifies ongoing and potential national actions that contribute to the work of the CCAC.

This report provides information on the CCAC, and its initiatives and partners. It also presents an overview of Ireland's current actions that contribute to the work of the CCAC with a focus on agriculture, cookstoves, hydrofluorocarbons (HFCs), waste, health, finance, diesel and regional assessments. The findings of the report are informed by stakeholder interviews with government officials, CCAC members and civil society organisations and an expert meeting to allow consultation on the findings of the research.

The report finds that there are actions ongoing in Ireland across the full range of CCAC initiatives analysed in this study but that the level of relevant activity varies from sector to sector. It identifies ways in which Ireland can both contribute to and benefit from its participation in the CCAC.

The informal and voluntary nature of the CCAC means that Ireland can participate as much or as little as it wants. The challenge is to maximise the return from a realistic and manageable investment of human capacity and resources. Undoubtedly, participation in the CCAC could help Ireland access information, tools and experiences that could inform emerging policy and action in the area of SLCPs. However, Ireland also has experience to share, particularly in relation to:

1. pro-poor approaches to the delivery and scaling-up of clean cookstoves through its overseas development programme;
2. research and practice in reducing methane emissions from agriculture;
3. air quality, informed by policies to reduce and soon eliminate the burning of smoky coal.

1 Introduction

1.1 Purpose of Study

On Environment Day 2013, during Ireland's Presidency of the European Union (EU), Phil Hogan, then Minister for Environment, Community and Local Government, announced that Ireland would join the Climate and Clean Air Coalition (CCAC) initiative being promoted by a number of countries including Sweden and the USA. The overarching objective of the CCAC, established in 2012, is to advance complementary actions on air quality and climate change. Air pollutants have adverse impacts on air quality and human health, and on climate in the form of short-lived climate pollutants (SLCPs). The CCAC aims to identify and support complementary and additional measures to those being developed to address climate change. The CCAC is under the overall stewardship of the United Nations Environment Programme (UNEP).

The CCAC aims to reduce SLCPs and highlight the near-term health co-benefits of reducing air pollution by reducing fossil fuel consumption and other actions to address these pollutants. It is a partnership of governments, intergovernmental organisations and representatives of the private sector, the environmental community and other members of civil society. Although it is government-led, it is highly co-operative and voluntary and was the result of an initiative by Sweden and the USA, which from the start stressed that action to address SLCPs should be additional to pre-existing actions to reduce carbon dioxide (CO_2), the predominant greenhouse gas (GHG), which has a multi-century atmospheric lifetime.

Announcing Ireland's membership of the CCAC, Minister Hogan commented that "I believe that it is hugely important that we in Ireland affirm our own commitment to achieving environmental improvements in both air quality and climate policies. It is also important that we assist others through sharing our experiences and expertise in addressing national and cross-border effects of air pollution through, for example, our smoky coal ban which has been so successful in improving urban air quality in Ireland and which I recently extended to additional towns."[1]

The motivation for Ireland to join the CCAC was to demonstrate commitment to climate and air pollution issues domestically; to improve policy coherence between climate and air policy – locally, nationally and internationally; to share experience with other members of the CCAC; and to capture health and climate benefits from actions to reduce SLCPs such as black carbon and ozone.

In 2015, 2 years after Ireland joined the CCAC, a small-scale study was commissioned by the Environmental Protection Agency (EPA) to:

1. review the work of the CCAC, in particular initiatives seeking to promote near-term reductions of SLCPs;
2. identify ongoing and potential national actions that contribute to the work of the CCAC.

This report presents the findings of the small-scale study. Chapter 2 presents the methodology used to conduct the research, while Chapter 3 presents information on the CCAC, its initiatives and partners. Chapter 4 presents Ireland's current actions that contribute to the work of the CCAC, while the final chapter proposes some options for future engagement with the CCAC.

1.2 Short-lived Climate Pollutants, Climate Change and Air Pollution

SLCPs are important in the fight against climate change and in tackling air pollution and its associated impacts on health. They have relatively short lifetimes in the atmosphere – a few hours to a few decades (Figure 1.1) – and a warming influence on climate.[2] The main SLCPs are black carbon, methane and tropospheric ozone, which are the most important contributors to the human enhancement of the global greenhouse effect after CO_2.

1 https://environmentalpillar.ie/environmental-pillar-welcomes-irelands-participation-in-the-climate-and-clean-air-coalition/

2 http://www.ccacoalition.org/en/science-resources

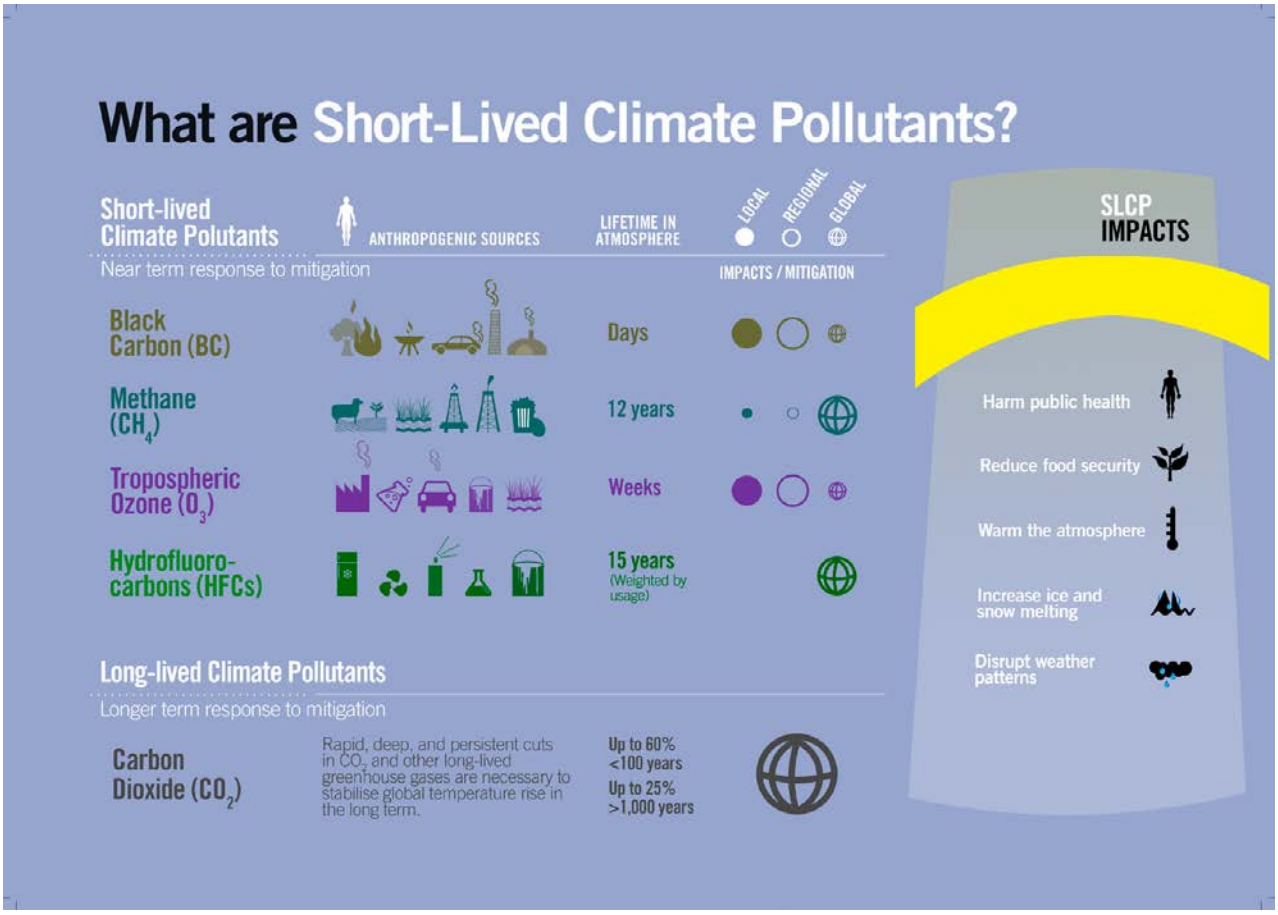

Figure 1.1. Characteristics of SLCPs. Reproduced with permission from the Climate and Clean Air Coalition (www.ccacoalition.org).

These SLCPs are also hazardous air pollutants with various detrimental impacts on human health, agricultural production and ecosystems. Other SLCPs include some hydrofluorocarbons (HFCs), which have a lifetime in the atmosphere of approximately 15 years. While HFCs are currently present in small quantities in the atmosphere, their contribution to climate forcing is projected to climb to as much as 19% of global CO_2 equivalent emissions by 2050 based on a global warming potential (GWP) of 100, as described in the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4) (IPCC, 2007) to determine CO_2 equivalent.[3]

Action on SLCPs is an important complement to action on GHGs with longer lifetimes, in particular CO_2, but not a replacement for actions on CO_2. See Annex 3 for a table illustrating the lifetimes and GWPs of non-CO_2 gases.

1.3 Short-lived Climate Pollutants and Climate Change Mitigation

In 2011, a scientific assessment co-ordinated by UNEP and the World Meteorological Organization (WMO) identified 16 SLCP control measures. If implemented globally by 2030, these measures could deliver significant benefits for near-term climate protection and air quality (UNEP and WMO, 2011).

These control measures involve technologies and practices that already exist and have been implemented around the world, targeting primary SLCP-emitting sectors, including fossil fuel production and distribution; energy use in the residential, industry, and transport sectors; waste management; and agriculture (UNEP, 2014).

If globally implemented by 2030, these 16 measures could reduce global methane emissions by about 40% and global black carbon emissions by about 80%,

3 http://www.ccacoalition.org/en/science-resources

relative to a "reference" scenario (UNEP and WMO 2011). About half of these emission reductions could be achieved through net cost savings over the lifetime of the measures (UNEP, 2014).

The relatively short lifetimes of SLCPs mean that climate benefits could be achieved quickly after the mitigation action occurs – however, a delay in cuts could lead to a failure to reap multiple near-term benefits (UNEP, 2014). For CO_2, the slower climate response to mitigation means that, the longer mitigation is delayed, the more severe the long-term and permanent warming and resulting impacts will be.

If action is not taken now, the inertia in the climate system would cause temperatures to pass the 2°C threshold within this century, leaving people no time to adapt. Furthermore, this might push the climate over a tipping point – a point at which a chain of events escalates so fast that it is impossible to return to a previous condition (UNEP, 2014).

1.4 Short-lived Climate Pollutants and Air Pollution Mitigation

According to the World Health Organization (WHO), approximately 7 million people died as a result of air pollution in 2012. 4.3 million died from indoor air pollution in household cooking with biomass and 3.7 million from outdoor air pollution (in some cases deaths resulted from exposure to both indoor and outdoor pollution) (WHO, 2014). This mortality is due to exposure to small particulate matter 10 microns or less in diameter (PM_{10}), which causes cardiovascular and respiratory disease and cancers. These impacts are increasingly being associated with $PM_{2.5}$ (particulate matter 2.5 microns or less in diameter) or particulate matter less than 1 micron in diameter, which largely arises from combustion sources. About 88% of those premature deaths occurred in low- and middle-income countries, with the greatest number in the WHO Western Pacific and South-East Asia regions.

Policies and investments supporting cleaner transport, energy-efficient housing, power generation, industry and better municipal waste management would reduce key sources of urban outdoor air pollution. Reducing outdoor emissions from household coal and biomass energy systems, agricultural waste incineration, forest fires and certain agro-forestry activities (e.g. charcoal production) would reduce key rural and peri-urban air pollution sources.

In addition to outdoor air pollution, indoor smoke is a serious health risk for some 3 billion people who cook and heat their homes with biomass fuels and coal. Reducing outdoor air pollution also reduces emissions of CO_2 and SLCPs, such as black carbon particles and methane, thus contributing to the near- and long-term mitigation of climate change.

In 2015, the 68th World Health Assembly passed a resolution that marks the most high-level health action on air pollution to date.[4] The resolution recognises air pollution as one of the leading avoidable causes of disease and death globally, with high cost to societies.[5] The resolution acknowledges the co-benefits of measures to reduce air pollution for climate action: "Acknowledging also the complexity between improving air quality and reducing emissions of warming climate-altering pollutants, and that there can be meaningful opportunities to achieve co-benefits resulting from these actions". It urges Member States to "Redouble their efforts to identify, address and prevent the health impacts of air pollution, by developing and strengthening, as appropriate, multi-sectoral co-operation on the international, regional and national levels, and through targeted, multi-sectoral measures in accordance with national priorities".

A 2014 report by the European Environment Agency (EEA) indicates that around 1200 deaths in Ireland in 2012 were directly linked to air pollution, while for Europe the figure was approximately 400,000 deaths.[6]

Some pollutants, such as tiny airborne particles and ground-level ozone, can trigger respiratory problems, especially for people with asthma. While air quality in Ireland is generally of a good standard (EPA, 2014a), monitoring shows that levels of some pollutants are at concentrations that exceed recommended WHO levels and may impact on health, including nitrogen dioxide (NO_2), which mainly arises in large towns and cities as a result of traffic emissions (see Box 1.1). In 2015, Ireland submitted a voluntary official national inventory

4 http://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_ACONF2Rev1-en.pdf

5 http://apps.who.int/gb/ebwha/pdf_files/WHA68/A68_ACONF2Rev1-en.pdf

6 http://www.eea.europa.eu/publications/air-quality-in-europe-2014

Box 1.1. Air pollutants

The ambient air quality pollutants of most importance on an EU-wide level include sulfur dioxide (SO_2), NO_2, particulate matter and ozone. These pollutants can impact on human health and are at levels approaching the relevant EU limit value or long-term objective in Ireland.

SO_2 is produced by the combustion of fossil fuels containing sulfur species, which result in the release of SO_2. Historically, coal combustion from electricity generation has been the main source of SO_2 emissions in Ireland. NO_2 is one of the most important nitrogen oxides produced by high-temperature combustion – emissions from traffic are the main sources of nitrogen oxides in Ireland, along with electricity generating stations and some industrial sources.

Particulate matter (PM_{10} and $PM_{2.5}$): there are many sources of particulate matter (of which black carbon is an important constituent) including vehicle exhaust emissions (plus tyre and brake wear), residential heating emissions, soil and road surfaces, construction work and industrial emissions. There are higher levels of particulate matter in many cities and towns at traffic-influenced sites. However, in low-smoke fuel zones, levels of particulate matter (measured as black smoke) decreased after the ban on bituminous or "smoky" coal was introduced. Particulate matter can also arise from the chemical reactions of gaseous species in the atmosphere, e.g. between SO_2 or oxides of nitrogen, typically from combustion sources, and neutralising species such as ammonia, which has large agricultural sources. These reactions are usually catalysed in the presence of an existing particle, such as a black carbon/soot particle, and result in the formation of chemically heterogeneous particles. Particulate matter can have a lifetime of hours to days.

Ozone: at ground level, higher concentrations of ozone in the air have adverse implications for human health and for crops and other vegetation. In Irish urban areas, ozone is depleted through reactions with traffic-emitted pollutants; therefore, levels of ozone are higher in rural areas than in urban areas. Ozone concentrations are strongly influenced by meteorological conditions: higher levels of ozone can occur in warm sunny conditions when precursor pollutants are present. Ozone lifetime is from days to weeks, and levels can be determined by long-range transport of precursor species including intercontinental transport.

Source: http://www.epa.ie/irelandsenvironment/air/#.VeB5Uk0w9TA

submission[7] for black carbon, which will allow for closer monitoring of trends related to black carbon over time.

The latest information on air quality in Ireland is contained in the Air Quality Report 2014 (EPA, 2014a) released on 28 September 2015. It identifies two important areas where Ireland faces challenges in maintaining and improving air quality: solid fuel use and transport.

Solid fuel use: comparison with WHO guideline values for particulates and the EEA estimated reference level for polycyclic aromatic hydrocarbons (PAH) show the need for progress with regard to reducing levels. Essential to the goal of improving our air quality will be a shift for the Irish consumer from solid fuel to cleaner fuel alternatives and awareness of the impact our choice of fuel for home heating has on the air quality of our locality.

Transport: transport emissions are projected to show strong growth over the period to 2020 with a 13% to 19% increase compared with current levels depending on the level of policy implementation. Relative to 2005, transport emissions are projected to remain the same or, at best, decrease by 4% by 2020 (EPA, 2015a).

Increasing road transport will lead to an increase in NO_2 levels, particularly as the Irish economy continues to recover. In the short term, efficient traffic management coupled with environmentally sound consumer choice of transport mode and fuel is needed to minimise emissions. In the longer term, more

7 http://www.ceip.at/ms/ceip_home1/ceip_home/status_reporting/2015_submissions/

choices in terms of public transport are needed in towns and cities.

Regional and EU policy on air pollution: since the 1980s, the UNECE Geneva Convention on Long-range Transboundary Air Pollution (CLRTAP) has provided the framework to address transboundary air pollution in Europe through a range of protocols and policy actions. It is strongly linked to the EU work on air pollution under the Clean Air for Europe (CAFÉ) Directive (2008/50/EC), which has included CLRTAP targets in EU legislation, e.g. the Nationals Emissions Ceiling (NEC) Directive. As part of its actions under the CAFÉ Directive and CLRTAP, Ireland produces annual emissions inventories of air pollutants, and projections of these are also provided. These are reported to the UNECE and EU bodies. Ireland also participates in expert taskforce groups and observation and modelling networks, which are linked under CLRTAP and support actions under CAFÉ.

2 Methodology

2.1 Introduction

The small-scale study was desk based and comprised a literature review, interviews with stakeholders and interest groups, and an expert meeting. Before starting the work, a scoping teleconference with the focal person for the CCAC in the Department of the Environment, Community and Local Government helped set out the main parameters of the work and the priority areas to focus on. It was decided that the focus of the research would be on CCAC initiatives of most relevance to Ireland, namely agriculture, cookstoves, HFCs, waste, health and finance, as well as diesel and regional assessments. As a result, the CCAC initiatives on oil and gas and on bricks were not included in this research.

2.2 Literature Review

The literature review focused on (1) CCAC actions at the international level and (2) CCAC actions at the national level. The international literature review encompasses all publicly available CCAC publications as well as information available on the CCAC intranet (access was provided by the CCAC secretariat). National policies and strategies were reviewed where interviewees directed the researcher to them as sources of relevant information.

2.3 Semi-structured Interviews

A list of key interviewees was drawn up in collaboration with the national CCAC focal point to target the priority CCAC initiatives identified in the scoping teleconference. Introductions were made by the CCAC focal point to the interviewees, and interviews organised accordingly. In addition, the researcher identified some key international contacts for supplementary interviews and for gaining the perspectives of the CCAC secretariat, a business partner to the CCAC and a civil society champion of the CCAC.

The basic framework for the semi-structured interviews in presented in Box 2.1.

2.4 Expert Meeting

The researcher facilitated an expert meeting with the key national bodies identified during the course of the scoping, literature review and interviews, to consult on draft findings and to identify options for the further development of responses.

The draft report was shared with the participants in advance and the findings discussed and verified at the expert meeting (see agenda for the meeting in Annex 2). The outcomes of the meeting informed the final version of the report.

Box 2.1. Framing questions for semi-structured interviews

- What do you know about the Climate and Clean Air Coalition? If not, introduce the CCAC and Ireland's participation in it.
- Do you know of any activities under the remit of your department/organisation that contribute to the objectives of the CCAC?
- Two to three tailored questions related to the CCAC initiatives of most relevance to the interviewee.
- Are there actions under way or planned in your department/organisation that ought to be captured as contributions to the CCAC?

3 Overview of the International Development of the CCAC

3.1 Introduction

Established in 2012, the CCAC is a voluntary partnership of government and non-government actors committed to "achieve concrete and substantial action to accelerate efforts to reduce short-lived climate pollutants" (CCAC, 2014). In its first 3 years, the CCAC launched seven sector-specific and four cross-cutting initiatives, established a Science Advisory Panel, and grew its membership from seven to over a hundred partners, with many additional organisations, countries and sub-national entities also participating in the initiatives (CCAC, 2015a).

The CCAC is a partnership of governments and intergovernmental organisations, as well as representatives of the private sector, the environmental community and other members of civil society. Although it is government-led, it is highly co-operative and voluntary and was the result of an initiative of Sweden and the USA, which from the start stressed that action to address SLCPs should be in addition to pre-existing action to reduce CO_2, the predominant GHG. The private sector and civil society are considered important actors demonstrating leadership through their engagement with the CCAC initiatives and other voluntary actions. The CCAC is now considered the pre-eminent forum for international near-term actions on SLCP mitigation.[8]

The CCAC's primary aim is to promote measures to reduce emissions of SLCPs, which are a group of air pollutants that also contribute to global warming and hence climate change. The main SLCPs are black carbon (or "soot") particles, methane, tropospheric ozone and some HFCs. It is estimated that controlling emissions of these SLCPs or their precursors could roughly halve projected warming over the next few decades while saving millions of lives globally and increasing crop yields by tens of millions of tons annually as a result of improved air quality (UNEP and WMO, 2011).

In its first phase, the CCAC's main aim was to get SLCPs on the map for policymakers and to raise awareness in areas such as agriculture, development and health. Phase 2 is now looking at actual reductions of SLCPs in the next 5 to 10 years.

3.2 Objectives

The CCAC has four objectives and has made progress on all of these since its inception:[9]

- raising awareness of SLCP impact and mitigation strategies;
- enhancing and developing new national and regional actions, including identifying and overcoming barriers, enhancing capacity and mobilising support;
- promoting best practices and showcasing successful efforts;
- improving scientific understanding of SLCP impacts and mitigation strategies.

3.3 Initiatives

The CCAC has 11 initiatives, of which seven are sectoral and four are cross-cutting, as set out in Box 3.1.

3.4 Partners and Resources

As of May 2015,[10] the CCAC has 124 partners (58 states and 66 non-state partners). It also has actors or implementers who implement actions to reduce SLCPs and participate in the initiatives. Partners can contribute with expertise and work, in-kind contributions and financial resources allocated to the Trust Fund. The CCAC has USD 58 million in its Trust Fund and uses these resources to implement actions under the 11 initiatives. The main donors are Canada, Norway and the USA, plus the European Commission,

8 Framework for the 5-year Strategic Plan (2015–2020), tabled at the May 2015 High Level Assembly (HLA).

9 CCAC Annual Report 2014–2015, which details CCAC highlights and achievements for 2014 (CCAC, 2015b).

10 CCAC in Summary. Prepared for the May 2015 HLA (internal document).

Box 3.1. CCAC intiatives

Sector-based initiatives

1. Agriculture – addressing SLCPs from agriculture
2. Bricks – mitigating SLCPs and other pollutants from brick production
3. Cookstoves – reducing SLCPs from household cooking and domestic heating
4. Diesel – reducing black carbon emissions from heavy-duty diesel vehicles and engines
5. HFCs – promoting HFC alternative technology and standards
6. Oil and gas – accelerating methane and black carbon reductions from oil and natural gas production
7. Waste – mitigating SLCPs from municipal solid waste

Cross-cutting initiatives

8. Financing mitigation of SLCPs
9. Regional assessments of SLCPs
10. Supporting National Planning for Action on SLCPs (SNAP) Initiative
11. Health – realising health benefits from action on SLCPs in cities

Denmark, France, Germany, the Netherlands, Sweden and Switzerland.

3.5 Ways of Working

The CCAC has a governance structure that includes all the members of the Coalition and is organised as shown in Box 3.2.

3.6 Results to Date

The CCAC is catalysing actions and results at both national and international levels. The material prepared for the 2015 High Level Assembly (HLA) report indicates that, as of September 2014, 25 partners had informed the secretariat of specific actions taken at the national level to reduce SLCPs, and 14 partners had requested support for capacity building to enable them to do more. In addition, non-state actors are supporting action on the initiatives. For example, business partners are exploring ways of engaging in fast mitigation in the oil and gas, methane and transport sectors.[11]

Examples of actions to date drawn from CCAC papers are included in Table 3.1.[12]

3.6 Strategic Plan 2015–2020

The framework for the 5-year Strategic Plan 2015–2020 was discussed and adopted by the HLA in May 2015. Consultations are now ongoing on the draft strategic plan, with the final version expected to be adopted at the high-level meeting in December 2015. The framework document reemphasises the opportunities presented by cutting emissions of SLCPs to slow the rate of near-term global warming and highlights the co-benefits for health, poverty reduction, food security and energy efficiency.

The framework for the 5-year Strategic Plan contains four principal strategies, which, in combination, produce the two ingredients needed for action: political will and practical implementation capacity. The strategies are as follows:

1. Catalyse Ambitious Action – support stakeholders to develop and implement national actions,

11 Interview with Edward Cameron, BSR (private sector partner of the CCAC), 11 June 2015.

12 More up-to-date examples are now available on the CCAC intranet but are not publicly accessible.

Box 3.2. The CCAC governance structure

High Level Assembly (HLA)

Ministers of state partners and the heads of non-state partners meet at least once per year to provide strategic guidance and leadership to the CCAC.

Working Group (WG)

Focal points are appointed by each Coalition partner and come together at least two times per year to oversee all Coalition activities. Two co-chairs are nominated by the group to lead the discussions in this group.

Steering Committee (SC)

The Steering Committee is made up of the two co-chairs of the WG, four state partners, one intergovernmental organisation (IGO) representative and one non-governmental organisation (NGO) representative, elected for staggered 2-year terms. The SC meets monthly to provide oversight support and recommendations to the HLA and WG. The current SC members are Chile and Norway (co-chairs), Canada, Côte d'Ivoire, the Netherlands, the United States, the Institute for Advanced Sustainability Studies (IASS), the Institute for Governance and Sustainable Development (IGSD) and the World Bank.

A Scientific Advisory Panel (SAP)

Fourteen renowned scientists are members, including the UNEP Chief Scientist serving *ex officio*.

Secretariat

The secretariat is hosted by UNEP in Paris, France, and works to support the CCAC in the administration of the CCAC Trust Fund, supporting the initiatives, work streams and the SAP, and undertaking advocacy and communication work.

Source: CCAC, 2015.

Table 3.1. National and international actions catalysed by the CCAC

National actions	International actions
Canada is implementing a new Air Quality Management System that will reduce air pollutants such as black carbon from industrial and non-industrial sources.	Under the Montreal Protocol (MP) more than 100 countries support the need to address the reduction of high-GWP HFCs, and the CCAC is currently conducting case studies to showcase HFC alternatives.
Mexico included SLCPs in its national Special Programme on Climate Change 2014–2018, which is implemented by 14 ministries from different sectors. SLCPs are also included in Mexico's intended Nationally Determined Contribution to the UNFCCC.	The guidelines for the sixth replenishment period of the Global Environment Facility now specifically permit projects that address many of the short-lived climate forcers.
Morocco devised a number of policies and laws to improve air quality, notably through an effort to replace old vehicles and regulate vehicle imports.	The 66th World Health Assembly recognised the important links between climate, air pollution mitigation and health benefits, with a focus on SLCPs.
Norway's Air Pollution Act added regulations on waste treatment, including a prohibition on depositing biodegradable waste and requirements to extract landfill gas.	At the first United Nations Environment Assembly, a resolution on "Strengthening the role of UNEP in promoting air quality" (UNEP/EA.1/L5) was approved. It recognises the importance of the work of the CCAC in improving air quality and achieving multiple benefits.
In the United States, high-GWP HFCs have been banned under the Significant New Alternatives Policy and the government is advancing on avoiding high-GWP HFCs in public procurement whenever possible.	The CCAC played a crucial role in mobilising support for the Pilot Auction Facility for Methane and Climate Change Mitigation (PAF), developed by the World Bank, with a target capitalisation of USD 100 million for methane reduction projects.
Bangladesh, Chile, Colombia, Côte d'Ivoire, Ethiopia, Ghana, Jordan, Liberia, Maldives, Mexico, Morocco, Nigeria, Peru and Togo, with the help of the CCAC, are setting up dedicated SLCP teams or units that will work across ministries in governments to co-ordinate and enhance mitigation actions.	At the UNSG's Climate Summit in September 2014, SLCPs and clean air featured prominently – CCAC partners proposed specific commitments in green freight, HFCs, municipal solid waste, oil and gas, and agriculture.

UNFCCC, United nations Framework Convention on Climate Change.

promote peer-to-peer learning, implement the CCAC initiatives and create partnerships for international and regional action.

2. Mobilise Robust Support – engage decision makers and policymakers to build political support for SLCP reductions and increase public awareness to gain support for actions to reduce SLCPs.
3. Leverage Finance at Scale – create enabling conditions for financing national and sub-national actions, engage national and multinational development banks, leverage private sector flows and mobilise funds for the CCAC Trust Fund.
4. Enhance Science and Knowledge – address gaps and continue to make the scientific case for action on SLCPs, support partners with data and analysis and develop metrics for the multiple benefits of SLCP mitigation.

Since 2015, the CCAC has also been engaged in work to improve measurement of the impact of the coalition's work across all initiatives.

4 National Actions Contributing to the Work of the CCAC

4.1 Ireland's Representation at the CCAC

Ireland has appointed a CCAC focal point in the Environment Division of the Department of the Environment, Community and Local Government. As a partner, Ireland can attend all meetings of the HLA as well as participating in the WG, which oversees all Coalition activities. Ireland first participated in the HLA held in Paris in May 2015.

4.2 CCAC Initiatives

Ireland's actions related to the CCAC are presented below, as they correspond to the CCAC initiatives of most relevance to Ireland (as identified in collaboration with the CCAC focal point).

4.2.1 Agriculture

> Agriculture is a net emitter of GHGs including methane and other SLCPs such as black carbon (through for example the burning of crop residues). While improvements in management practices, new technologies and growing producer awareness in many parts of the world have increased the efficiency of agriculture and reduced GHG emissions per unit of production, further progress is needed.
>
> The agriculture and forestry sectors (including land use change) contribute approximately 22% of all global GHG emissions, including approximately 40% of global black carbon emissions and approximately 40% of global anthropogenic methane emissions. Enteric fermentation from livestock is the single largest global source of anthropogenic methane, responsible for 28% of global emissions (C2ES, 2009).

Ireland is very actively engaged in global efforts to reduce GHG emissions from agriculture, in particular methane emissions from enteric fermentation and manure management. 45% of non-EU Emissions Trading System emissions in Ireland are from agriculture and the major sources are enteric fermentation (57%), direct nitrous oxide (N_2O) from soil (28%) and manure management (10%).[13] Ireland is engaged in a range of international and EU initiatives working to identify ways to reduce these emissions.

International

At the international level, the Global Research Alliance on Agricultural Greenhouse Gas Emissions (GRA) brings countries together to find ways to grow more food without increasing GHG emissions. Ireland is actively involved in the GRA and participates to varying extents in all the GRA networks, in particular on issues related to soil carbon and livestock. Ireland's contribution to the GRA is through human resources and research.

The GRA and the CCAC secretariats are in the early stages of collaborating more closely to maximise the synergies between their work in the area of SLCPs. While Ireland has been actively engaged in the GRA, it has not, to date, been engaged with the Agriculture initiative of the CCAC. From an Irish perspective, the best opportunity for linking GRA and CCAC is to have them work jointly or concurrently on issues that are of relevance to Ireland. The CCAC has developed formal ties with the Global Methane Alliance and this could be a model to replicate.

In addition, at the international level, Ireland is a member of the Global Alliance on Climate-Smart Agriculture (GACSA). GACSA is an independent alliance, governed by its members through a Strategic Committee and its co-chairs. The Food and Agriculture Organization of the United Nations (FAO) hosts the Facilitation Unit of GACSA, which is supported through a multi-donor trust fund. GACSA is a voluntary alliance of partners, dedicated to addressing the challenges facing food security and agriculture under a changing climate. In particular, the alliance has the objective of up-scaling the climate-smart agriculture (CSA) approach, a concept that was originally developed by FAO.

13 Personal communication, Bernard Hyde, EPA, based on preparations for the 2015 national inventory submission (1990–2013).

Members of GACSA recognise the urgent need to act at scale and to contribute towards three aspirational outcomes:

- sustainable and equitable increases in agricultural productivity and incomes;
- greater resilience of food systems and farming livelihoods;
- reduction and/or removal of GHG emissions associated with agriculture (including the relationship between agriculture and ecosystems), where possible.

Ireland is a member of the knowledge action WG of GACSA and contributes research in the areas of methane, N_2O and soil carbon. In the area of methane research, there are overlaps with the CCAC initiative on agriculture but no formal links have been made between GACSA and CCAC.

Ireland is hoping to be one of the GACSA case study countries demonstrating how it works and what CSA is in practice. Other case studies will include Costa Rica, France, Malawi and Tanzania. These case studies could also be shared with CCAC's Partners in Action platform.

European

At the European level, the Joint Programming Initiative on Agriculture, Food Security and Climate Change (FACCE-JPI) brings together 21 countries that are committed to building an integrated European Research Area addressing the interconnected challenges of sustainable agriculture, food security and impacts of climate change. FACCE-JPI provides and steers research to support sustainable agricultural production and economic growth, and to contribute to a European bio-based economy, while maintaining and restoring ecosystem services under current and future climate change. It aims to do so with a strong transdisciplinary research base, encompassing economic and social aspects in addition to scientific ones, and with a creative approach towards the alignment of national programmes and the input of multiple actors and stakeholders.

One of the strategic research theme areas is GHG mitigation: N_2O and methane mitigation in the agriculture and forestry sector, carbon sequestration, fossil fuel substitution and mitigating GHG emissions induced by indirect land use change. The research related to methane could be relevant to and shared with the CCAC agriculture initiative.

It is also worth noting that Ireland has links with the Agricultural UK GHG Platform through Teagasc. The Platform includes a project on the measurement of methane from livestock and manure.

Overseas Aid

In the context of development co-operation, Ireland is supporting CSA through Irish Aid and non-governmental actors. For example, Ireland provides support to the CGIAR (Global Agricultural Research Partnership) programme on Climate Change, Agriculture and Food Security (CCAFS). In 2014, Irish Aid gave EUR 1 million to CCAFS. Some of this funds CCAFS work on rice paddy management – one of the benefits of which is reduced methane emissions.

Irish Aid also promotes conservation agriculture (CA) and minimum tillage in Northern Province in Zambia, and in projects in Malawi and Mozambique. This includes the incorporation of harvest residues and mulching, which could have some impact on reducing GHG emissions, although this is not the main objective – the main purpose is to promote better soil management practices to enhance productivity and resilience.

Ireland is loosely involved with the African Climate-Smart Agriculture Alliance and may engage more with this initiative in the future.

An example from the non-governmental side is the work that Concern[14] is carrying out in the area of agriculture. The organisation's work on a system for rice intensification (SRI) should reduce methane emissions from paddy rice; however, CCAFS data shows that the impact of SRI on methane emissions is highly variable. Concern also promotes CA, which helps to sequester carbon, but the levels of carbon sequestered, and how long they stay in soil, are widely debated. There is also evidence that, while CA sequesters CO_2, N_2O emissions can be higher from CA fields.[15]

14 https://www.concern.net/

15 Personal communication, Paul Wagstaff, Concern, 31 August 2015.

Concern also supports an integrated biogas pilot project in Pakistan. During the day, the biogas is fed into a modified Lister diesel irrigation pump, greatly reducing diesel consumption. At night, the biogas is used for cooking. The digestate from the biogas is mixed with irrigation water for fertilisation. Unfortunately, scale-up is limited as a result of the cost of digesters. Concern hopes to find a local entrepreneur to start making Indian-style roto-moulded plastic digesters, and that the Pakistani government will subsidise the digesters (as the Indian government does) as part of a strategy to meet its international GHG emission commitments.

National

The Institute of International and European Affairs (IIEA) has spearheaded a Leadership Forum on CSA[16] to provide a venue where elements of Irish climate-smart leadership can be collectively identified, disseminated and operationalised. The initiative aims to identify smart, ambitious and pragmatic solutions for Irish agriculture, with a view to increasing the competitiveness of the sector while reducing its environmental footprint. It will also explore how Ireland can establish a leadership position internationally. The Leadership Forum is raising awareness among stakeholders of the benefits of CSA, and identify best practice CSA policies, technologies, practices and financial frameworks. It is engaging with and building a community of national leaders and stakeholders to work with to identify climate-smart solutions.

The project has four phases, starting in May 2014 and concluding in June 2016. A consultation phase ran from May to July 2015, followed by the ongoing convening phase March to December 2015. The research phase will culminate in a final report (June 2016) to influence policy and promote a greater focus on CSA nationally and internationally to enhance Ireland's reputation as a producer of sustainable food, while reducing the sector's carbon footprint. The final phase is the communications phase when the results of the work will be disseminated widely.

Other national initiatives that have the potential to contribute to Ireland's contribution to the CCAC agriculture initiative include Bord Bia's sustainability audits under Origin Green, the Teagasc Carbon Navigator, the Sustainable Dairy Assurance Scheme (SDAS) and the Food Wise 2025 commitment to improved sustainability.

A national initiative that is ongoing at farm level and contributes to the reduction of GHG emissions from the livestock sector is the 2015–2020 Beef Data Genomics Programme. The programme aims to lower the intensity of GHG emissions by improving the quality and efficiency of the national beef herd. It will improve the genetic merit of the national beef herd through collection of data and genotypes of selected animals, which will allow for genomic selection in the beef herd. It was introduced as part of new measures agreed under the Rural Development Plan 2014–2020. The programme is for a period of 6 years and available funds are EUR 300 million. It targets up to 700,000 animals and, as part of the programme, farmers must complete the carbon navigator each year to track results and provide evidence of the benefits to farmers (Department of Agriculture, Food and the Marine, 2017).This programme will provide valuable experience that can be shared with others, as it results in tangible impacts from farm-level activities.

4.2.2 Cookstoves

Household cooking and heating are major sources of some of the most significant contributors to global climate change, including CO_2, methane, black carbon and other SLCPs. The WHO estimates that exposure to smoke from the simple act of cooking constitutes the fourth leading risk factor for disease in developing countries and causes 4.3 million premature deaths per year – exceeding deaths attributable to malaria or tuberculosis. In addition, tens of millions fall sick with illnesses that could readily be prevented with improved adoption of clean and efficient cookstoves and fuels (Department of Agriculture, Food and the Marine, 2017).

Many of today's more efficient cookstoves have been shown to reduce fuel use by 30–60%, resulting in lower levels of GHGs and black carbon emissions and reducing impacts on forests, habitats and biodiversity. Recent evidence also demonstrates that advanced (efficient and

16 http://www.iiea.com/ClimateSmartAgriculture/index.html

low-emission) cookstoves and fuels can reduce black carbon emissions by 50–90%. Improved cookstoves help to meet climate goals while achieving other health, gender, environmental and development benefits.[17]

Ireland supports the scaling-up and use of cookstoves through its aid programme, Irish Aid. Cookstove projects are currently supported in two of Ireland's programme countries: Malawi and Ethiopia. In Malawi, Irish Aid supports a project on accelerated uptake of energy-saving cookstoves. Funds were provided to this project to the amount of EUR 200,000 in 2013 and EUR 200,000 in 2014.[18] This project is piloting an innovative approach to ensure that the benefits of improved cookstoves can be enjoyed by the most vulnerable members of society (Box 4.1).

In Ethiopia, a project on promotion of cookstoves and fuelwood enhancement (implemented by GIZ[19]

Box 4.1. Distribution of stoves through the social cash transfer programme in Malawi

In early 2012 the Malawian government set itself a target of delivering 2 million energy-efficient stoves to households by 2020. A national cook-stove taskforce chaired by the government, and composed of relevant private sector, NGO, donor and government representatives, leads on actions to achieve this ambitious but attainable goal.

Irish Aid supports the taskforce and has been working with relevant government partners and Concern Universal in devising programmes to roll out stoves at scale. One such pilot is under way in Balaka district, in the central region. Irish Aid supports the Ministry of Gender in delivering social cash transfers (SCTs) to the poorest (10%) labour-constrained households in the district, which are mostly households headed by the elderly, women or children and households with the chronically ill, providing monthly electronic cash transfers to approximately 8400 homes.

Concern Universal with Irish Aid support will provide all 8400 homes with clay stoves produced by local (mainly female) groups at a cost of approximately EUR 1 and are sold in the cities for approximately EUR 2. Within the pilot scheme, all SCT recipients will be issued with a coupon that can be redeemed through a network of local distributors (merchants/shops/kiosks or agents). For each stove delivered to the SCT recipients, the distributors receive an additional stove that they can sell to other customers. In this manner, it is expected that a minimum of 16,800 stoves will be distributed or sold. EnDev and the UK government have committed to provide the necessary support to roll out stoves to a further 80,000 households in targeted SCT districts through a results-based financing mechanism. It is planned that the SCT roll-out will establish a viable production and marketing structure for stoves throughout the country.

The government has a target of scaling up their SCT programme to reach 320,000 households by the end of 2016; by receiving further donor support and using the methodology outlined above, it is hoped to reach a minimum of 640,000 households. This will be a significant contributor to reaching the 2 million by 2020 target and it is hoped that by reaching 750,000 households by the end of 2016 the country will have reached a tipping point and gained sufficient momentum to achieve the 2020 target.

Source: Irish Aid Malawi.

17 https://www.agriculture.gov.ie/media/migration/ruralenvironment/ruraldevelopment/ruraldevelopmentprogramme2014-2020/2017EvaluationofIrelandsRDP180917.pdf

18 https://www.irishaid.ie/media/irishaid/allwebsitemedia/20newsandpublications/140902-Malawi-Climate-Finance-Report-Final.pdf

19 GIZ is a German technical development co-operation agency.

Ethiopia) received EUR 500,000 in 2013.[20] A further EUR 2 million is planned to be invested in cookstoves in Ethiopia via GIZ over next 3.5 years.[21] In both Malawi and Ethiopia, cookstove projects are intended to improve livelihoods and health, contribute to gender equality, and reduce deforestation and GHG emissions.

Household energy will continue to be part of Irish Aid's work in the coming years. The Framework for Action for "One World, One Future", which is Ireland's Policy for International Development 2014–2017 states that, under the priority area climate change, there will be "Increased focus in Irish Aid programming on the adoption of climate-smart technologies for household food and energy systems by rural communities".[22]

Irish Aid also supports the adoption of clean cookstoves through its support to Irish civil society. Ongoing support to the NGO Vita includes support for their work on clean cookstoves,[23] while Concern is another example of an NGO that incorporates cookstoves in its programmes where appropriate.

Vita[24] works to combat climate change and hunger in Africa and focuses its interventions on Ethiopia and Eritrea. To date, 40,000 cookstoves have been built in Eritrea by Vita. These are known locally as "mogogo" stoves and they are very large, almost Aga-like stoves that will last 10 years. Vita has secured Gold Standard Certification for future stoves in Eritrea so that carbon credits will be generated from the use of the stoves and generate a flow of carbon finance into the communities, as well as the social, health and environmental benefits associated with stove use. Vita plans to build an additional 20,000 stoves over the next 3 years.

In Ethiopia, Vita has conducted a detailed baseline study to inform the types of stoves best suited to local preferences and conditions. A mass dissemination of cookstoves was planned in Ethiopia in 2016 using a community-led approach, which aimed to distribute 10,000 stoves. The stove used in Ethiopia is a much simpler stove (Tikkilil model). This stove lasts only 2–3 years, so Vita is designing a replacement mechanism through local enterprises to make sure stoves continue to be available. In 2016, Vita launched the Vita Green Impact Fund as a vehicle to attract EUR 2 million in loans and grants for future work.

Concern also supports some work on cookstoves, particularly in Afghanistan and Sudan. This is not a major area of work for Concern. It tends to use local best practice in each context where it is working and where the need for clean cooking solutions is an issue. Concern has documented some of its work on cookstoves as case studies and uses these to share learning with the other countries it is engaged with.

4.2.3 HFCs

HFCs are potent GHGs used as alternatives to ozone-depleting substances. HFCs are being phased out under the MP. Atmospheric observations show that the abundance of HFCs in the atmosphere is increasing rapidly. The emissions of high-GWP HFCs are increasing very rapidly at about 10–15% per year. The recent growth in emissions of HFCs at 8–9% per year is notably greater than the recent increases of about 4% per year in the case of CO_2 and about 0.5% per year in the case of methane.

If no measures are taken, the CO_2 equivalents of HFC emissions have been estimated to amount to 9–19% of total CO_2 emissions by 2050. Under the HFC initiative, the CCAC partners are supporting the development of HFC inventories and studies, information exchange on policy and technical issues, demonstration projects to validate and promote climate-friendly alternatives and technologies, and various capacity-building activities to disseminate information on emerging technologies and practices to transition away from high-GWP HFCs and minimise HFC leakages.[25]

20 https://www.irishaid.ie/media/irishaid/allwebsitemedia/20newsandpublications/140831-Ethiopia-Climate-Finance-Report-Final.pdf

21 Interview with Ben Siddle, Irish Aid, 6 July 2015.

22 https://www.irishaid.ie/media/irishaid/allwebsitemedia/20newsandpublications/publicationpdfsenglish/Action-for-Framework.pdf

23 http://www.vita.ie/improved-cook-stoves.

24 Information supplied by John Gilliland, Head of Programmes, Vita Ireland, 31 August 2015.

25 See more at: http://www.ccacoalition.org/en/initiatives/hfc

Ireland is engaged in actions to support the phase-down of HFCs. The main areas of work relate to the following:

- the MP;
- implementation of the recently amended EU Fluorinated Greenhouse Gases Regulation.

Montreal Protocol

The 1987 Montreal Protocol on Substances that Deplete the Ozone Layer is an international agreement made under the framework of the United Nations Vienna Convention for the Protection of the Ozone Layer. The MP commits contracting parties to limit and reduce the production and consumption of certain ozone-depleting substances, notably chlorofluorocarbons (CFCs), hydrochlorofluorocarbons (HCFCs) and halons. Ireland ratified the MP in 1988 and has since ratified the MP's four amendments.

Ireland has been actively involved in the work of the MP internationally since 2012 (in advance of Ireland's Presidency of the EU). This involves attending two annual meetings: the open ended WG and a meeting of the parties of the MP.

Ireland engages with the MP negotiations through the EU, which in 2016 successfully proposed an amendment to the MP to add a step-wise reduction of the consumption and production of HFCs to the control measures of the MP with a view to reducing the contribution of these substance to climate change.[26] It is considered that the MP is best placed to address HFCs given the availability of the suitable instruments, infrastructure and institutions under its remit. The reduction of HFCs (chemical production as well as consumption – for example for use in equipment or products) could be done most effectively and cost efficiently under the MP. These measures should complement efforts to reduce climate impacts under the United Nations Framework Convention on Climate Change (UNFCCC), as the UNFCCC would continue to monitor and account for the emissions associated with HFCs.

There are also three other amendment proposals on the table and, if agreement can be reached on a compromise proposal by the parties to the MP, these will form a major contribution to the work of the CCAC on HFC phase-down and replacement by low-GWP alternatives.

In addition, Ireland provides financial support to the MP. Ireland's annual contribution to the Multilateral Fund of the MP – currently just over EUR 600,000/year – supports developing countries to implement the provisions of the MP. If the amendments proposed by the EU to phase down HFCs are accepted, action to phase down HFCs around the world will be increased and developed countries will assist developing countries in these actions through contributions to the Multilateral Fund.

Implementation of the recently amended EU Fluorinated Greenhouse Gases Regulation

Fluorinated GHGs or F-gases are HFCs, perfluorocarbons (PFCs) and sulfur hexafluoride (SF_6). The EU is leading efforts globally to reduce HFCs. However, until recently, the focus was on the containment and recovery of F-gases rather than replacing them with alternatives. In 2014, the EU revised Regulation (EU) No 842/2006 and adopted Regulation No 517/2014 of 16 April 2014 on fluorinated GHGs, which initiates more stringent measures including an HFC phase-down.

A European Commission report dated 26 September 2011 on the application, effects and adequacy of Regulation (EC) No 842/2006 of the European Parliament and of the Council concluded that the current containment measures, if fully applied, could contain emissions of fluorinated GHGs at today's levels. The report also concluded that more can be done to reduce emissions of fluorinated GHGs in the EU, in particular by avoiding the use of such gases when there are safe and energy-efficient alternative technologies with no impact or a lower impact on the climate. The report states that a decrease of up to two-thirds of the 2010 emissions by 2030 is cost-effective because proven and tested alternatives are available in many sectors.

Therefore, the regulation was amended in 2014 and the Irish Presidency had a major role in the process, as the file was opened during the Irish Presidency

26 Proposed amendment to the MP submitted by EU and its Member States. Available online: https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A52017PC0051

term, with much progress made, enabling a conclusion in the subsequent Lithuanian Presidency. Member States are now taking steps to implement and meet the requirements of the new regulation.

Ireland's actions to implement the recently amended EU Fluorinated Greenhouse Gases Regulation will contribute to the phase-down of HFCs and, in time, Ireland will be able to share experiences and lessons learned with other CCAC partners.

4.2.4 Waste

> Municipal solid waste landfills are the third-largest source of global methane emissions, while the practice of open garbage burning emits black carbon and other toxic compounds, as well as GHGs.
>
> The CCAC waste initiative aims to reduce methane and air pollution across the municipal solid waste sector by securing city and country commitments to undertake a variety of best practice policies and strategies for waste management.[27]

In 2012, total emissions of GHGs [excluding the LULUCF (land use, land-use change and forestry) sector] in Ireland were 58,531.24 gigagrams (Gg) CO_2 equivalent and the waste sector accounted for 1.7% of total emissions (EPA, 2014b).

The National Greenhouse Gas Inventory 2014 states the following (author's emphasis):

> Total GHG emissions of 1,011.52 Gg CO_2 equivalent in the Waste sector in 2012, of which 6.A Solid waste disposal on land accounts for 79.9%, 6.B Waste water handling 16.2% and 6.C Waste incineration 3.9%. **The latest estimates show that emissions in the Waste sector have decreased by 27.2% from 1990 to 2012 mainly due to a 31.5% decrease in CH_4 emissions from 6.A solid waste disposal on land.**

Ireland has measures in place to reduce methane emissions from the waste sector in two main ways:

1. reducing the amount of biodegradable waste going to landfill;
2. flaring or utilisation for electricity production of methane released from landfills so that it is not released into the atmosphere.

Reducing the amount of biodegradable waste going to landfill

In the Action Plan for the 7th Environment Framework,[28] Member States of the EU agreed "to protect the environment and human health by preventing or reducing the adverse impacts of the generation and management of waste and by reducing the overall impact of resource use and improving the efficiency of such use, by applying the following waste hierarchy: prevention, preparing for re-use, recycling, other recovery, and disposal" (EU, 2013).

Ireland has national policies in the waste sector that aim to reduce the amount of biodegradable waste going to landfill, as well as increasing re-use and recycling. The most recent of these are "A resource opportunity: waste management policy in Ireland" (Department of the Environment, Community and Local Government, 2012) and the 2006 National Strategy on Biodegradable Waste (Department of the Environment, Heritage and Local Government, 2006). Any reduction in the amount of biodegradable waste going to landfill reduces the amount of methane produced by the waste sector. At present, Ireland is on course to meet its targets set by the Landfill Directive to reduce the amount of biodegradable municipal waste (BMW) going to landfill.[29]

The 2006 National Strategy on Biodegradable Waste Strategy aimed that, by 2010,[30] the amount of BMW sent to landfill would be limited to 75% of the BMW produced in 1995.

By 2010, Ireland had reduced its biodegradable waste by one-third below 1995 levels (as a response to the

27 http://www.ccacoalition.org/en/initiatives/waste

28 http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32013D1386&from=EN

29 http://www.epa.ie/nationalwastestatistics/targets/

30 16 July 2010 is the actual deadline by virtue of the date of publication of Landfill Directive 1999/31/EC in the Official Journal of the EU.

2006 National Strategy on Biodegradable Waste and EU regulations). The official figures – as published by the EPA are presented in Table 4.1 (EPA, 2014c).

The latest official figures are for 2012, when an estimated 589,259 tonnes of BMW was sent to landfill, amounting to 48.3% of the 1995 baseline. Accordingly, Ireland is well on target to meet the 2013 target of a 50% maximum (and diversion rates have reportedly improved substantially during 2013).

Flaring or utilisation for electricity production of methane released from landfills so that it is not released into the atmosphere

Ireland is undertaking measures to reduce the amount of methane emissions from landfill sites. Ireland's landfills are better managed than in the past as a result of the introduction of licensing in the late 1990s and the commitments in the Landfill Directive (1999/31/EC), which states that landfilling of waste should not lead to environmental damage. Methane gas is increasingly collected and either flared and or utilised for electricity generation at landfill sites.

In 2010, a detailed external study of flaring and utilisation for 1996–2008 was undertaken (this was important for our national GHG inventory so that efforts to reduce emissions in the waste sector would be accurately captured). Subsequent annual surveys were linked with PRTR (European Pollutant Release and Transfer Register) and led by the EPA. Fifty-three sites are now surveyed on an annual basis. Of these, 50 have flares and, in 2013, approximately 39,000 t of methane was flared and 31,000 t of methane was utilised (EPA, 2015b). Overall, the quantity of methane recovered is reducing faster than methane production is reducing. Recovery was 70% in 2010 and 61% in 2013. This results from the closure of large sites and some management issues (such as field balancing, reduced run time, reduced flow rates and gas quality).[31]

The EPA report "Ireland's Greenhouse Gas Emission Projections 2014–2035" (EPA, 2015c) states that greenhouse gas emissions from the waste sector

> are projected to decrease by 20% by 2020 on current levels which is primarily attributable to methane emissions from landfill nearly halving by 2020 compared with 2013. This is underpinned by increased recovery (including recycling and energy recovery) of waste materials and adherence to Food Waste Regulations which reduces the organic content of landfilled waste and thus its greenhouse gas production potential. It is also assumed that methane capture at landfills increases from the current level of 61% of total methane generated in 2013 to 75% in 2020.[32]

It is important to note that the Draft National Bioenergy Plan includes a reference to the promotion of anaerobic digestion and use of methane as a fuel.[33]

Table 4.1. Status of national targets on biodegradable municipal waste as per the Landfill Directive (1999/31/EC)

Target date	Specifics	Current progress to target in Ireland	Indicator
2010	BMW going to landfill reduced to 75% of the total quantity produced in 1995	860,000 t	Achieved
2013	BMW going to landfill reduced to 50% of the total quantity produced in 1995	589,000 t	On track (due July 2013)
2016	BMW going to landfill reduced to 50% of the total quantity produced in 1995	380,810 t	On track (due December 2016)

Data from EPA (2014d).

31 For source see footnote 29.

32 http://www.epa.ie/pubs/reports/air/airemissions/EPA%202015%20GHG%20Projections%20Publication%20Final.pdf

33 http://www.dcenr.gov.ie/energy/SiteCollectionDocuments/Renewable-Energy/Draft%20Bioenergy%20Plan.compressed.pdf

4.2.5 Finance

One obstacle to accelerating and up-scaling the reduction of SLCPs is the lack of relevant finance mechanisms outside CO_2-focused abatement projects. While climate finance is directed at incentivising low-carbon and resilient economies, SLCP reduction projects are usually financed implicitly, for example by financing waste management projects and the adoption of more efficient cookstoves. Fragmentation of financing is adding to the hurdles for SLCP mitigation finance and financial barriers are affected by behavioural, technological and other barriers.

Some SLCP measures are economically profitable, would pay for themselves and make sense from a social planner's perspective. However, in other cases, there is no evidence available to build the business case and SLCP-abatement projects cannot always secure private financing.[34]

Some CCAC partners provide financial support to the CCAC to support activities (capacity building, institutions, pilot projects, etc.) to reduce SLCPs in developing countries.

Ireland does not provide a financial contribution to the CCAC. Partners do not have a requirement to make a contribution to the CCAC Trust Fund and are free to contribute in other ways including through sharing experience and engaging in the CCAC initiatives.

Ireland exited the corrective arm of the Stability and Growth Pact (SGP) at the end of 2015 and transitioned to the preventative arm, which set the context for our fiscal targets from 2016 onwards. Compliance with the Expenditure Benchmark is an important pillar of the Fiscal Rules, which explicitly sets the rate at which aggregate public expenditure can grow, unless funded by the introduction of discretionary revenue measures. The Expenditure Benchmark is designed to regulate the growth in public expenditure in line with the medium-term potential growth rate of the economy, thereby making sure that the level of spending is sustainable and can continue to be supported by the economy.

From 2016 onwards, it will therefore be possible to increase overall general government expenditure only in accordance with the requirements of the preventative arm of the SGP. The Ministerial Expenditure Ceilings for 2016 were set in that context and it will fall to departments to deliver services within these ceilings. From 2016, this means that additional resources in excess of those ceilings may only be allocated in a manner that is consistent with our obligations under the preventative arm of the SGP.

Likewise, the rules of the SGP could have implications for green taxes.

Rebalancing Ireland's vehicle registration tax for cars in 2008 was very effective in reducing carbon emissions. It was estimated that it would be undertaken on a revenue-neutral basis. However, the effect was more successful in reducing emissions than forecast. This had implications for revenue yield. In 2007, the last full year before the tax was rebalanced, the yield was in the region of EUR 1.4 billion. Rebalancing was introduced in July 2008. In 2009, the yield was EUR 375 million (although there were fewer car sales).

Under the Expenditure Benchmark, such a reduction arising from a discretionary revenue measure would need to be offset by a compensatory expenditure reduction. The new rules limit the government's ability to incur additional expenditure over and above that outlined under the Expenditure Benchmark without compensating discretionary tax measures. Any potential contribution to the CCAC would need to be prioritised and agreed in advance as part of the usual budgetary process between departments.

Ireland's contributions to climate finance, for example via Fast Start Finance 2010–2012,[35] could constitute indirect contributions to efforts to reduce GHG emissions more broadly. Equally, Ireland's contribution to the MP's Multilateral Fund is a contribution to climate action – but it is not currently directed at

34 http://www.ccacoalition.org/en/initiatives/finance

35 http://unfccc.int/files/cooperation_support/financial_mechanism/fast_start_finance/application/pdf/ie-05-29_-_fsf_report.pdf

SLCPs.[36] There are no plans for financing directed at action specifically on SLCPs at the international level at present.

4.2.6 Health

> Around 7 million premature deaths annually are attributed to air pollution – one in eight premature deaths globally. A significant proportion of these deaths occur in developing cities where air pollution levels are high and growing rapidly. Indeed, only 12% of cities worldwide achieve WHO guideline levels for air pollution and some cities suffer from air pollution levels that are as much as 10 times, or more, above the guideline limits.
>
> Currently, more than half of the world's population lives in cities. By 2050, the world's urban population will double in size and most of that growth will occur in low- and middle-income cities. Acting to control urban air pollution is therefore an urgent health issue. By reducing urban air pollution levels, cities and countries can reduce the burden of disease from stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma.
>
> Urban air pollution is also a critical climate issue. SLCPs such as black carbon and methane are the main contributors to health-harmful air pollution. These SLCPs have short lifetimes in the atmosphere, meaning that harmful concentrations of SLCPs can be reduced in a matter of weeks to years, resulting in near-term climate benefits, as well as health benefits from improved air quality.[37]

The EEA has published estimates of premature deaths attributable to exposure to particulate matter ($PM_{2.5}$). The study indicates that the best estimates for premature deaths in 2011 from $PM_{2.5}$ are 39,450 for the UK and 1229 for Ireland. There were 553 adult deaths attributable to anthropogenic air pollution and 6063 life years lost in Northern Ireland in 2010 (EEA, 2014).

The Department of Health and the Health Service Executive (HSE) are engaged with the issue of air pollution in relation to the impact on public health. The Department of Health participates in the Interdepartmental Group on a National Air Strategy and the EPA Health Advisory Group.

Ireland is represented at the WHO (and Irish Aid provides core funding to the WHO amounting to EUR 1.15 million per annum) and Irish experts participate in Expert Groups on Air Quality and on Environment and Health. However, there are no particular programmes on health and air quality in the Department of Health, as the Department of Environment, Community and Local Government leads on air quality.

The Department of Health is engaged with climate change issues and has prepared work on adaptation and risk as part of the requirements of the new climate bill. The department is not actively engaged in mitigation except for sustainability policies in the department and HSE, which aim to reduce the environmental footprint of the health service. This is led by the HSE National Sustainability Office.

Urban health is the particular focus of the CCAC health initiative. An ongoing north–south study entitled "Policy Options to Reduce Emissions from 'Smoky' Coal and Other Residential Solid Fuels" aims to address the threat posed to air quality and public health by such fuels and the links between the solid fuel markets in both jurisdictions. In 2015, a nationwide smoky coal ban was announced and a consultation is underway until April 2018 on Ireland's first national Clean Air Strategy. The strategy will provide opportunities to scale up national initiatives on air quality and human health.[38]

Healthy Ireland is a Framework for Improved Health and Wellbeing 2013–2025. It articulates and sets out to implement the approach of the WHO Regional Office for Europe "Health in All Policies" as proposed

36 It is noted, however, that there is potential for this through Ireland's contribution to the Multilateral Fund of the MP, as parties to the MP have agreed to actions to leapfrog HFCs. See, for example, Decision XIX/6: "Parties to promote the selection of alternatives to HCFCs that minimize environmental impacts, in particular impacts on climate, as well as meeting other health, safety and economic considerations".

37 http://ccacoalition.org/en/initiatives/health

38 https://www.dccae.gov.ie/en-ie/environment/consultations/Pages/National-Clean-Air-Strategy-Consultation.aspx

in its framework "Health 202" and takes a whole-government approach to health. Ireland is one of the first countries to put this Health in All Policies approach into practice. This includes the environmental determinants of health – see the diagram on page 5 of the Healthy Ireland strategy (Government of Ireland, 2013) – and includes air quality as a threat to health.

Healthy Ireland co-ordinates the integration of health into all areas of government policy from transport and energy to environment and housing. It is an example of effective mainstreaming in action in Ireland. In the area of urban health, Healthy Ireland promotes physical activity, which is dependent on good-quality air. In addition, Healthy Ireland is working with the EPA to define environmental indicators for impact monitoring.

Because of the innovative model and state-of-the-art approach used by Healthy Ireland, it could constitute an area of good practice internationally and could be a vehicle for making health/air quality links.

4.2.7 Diesel

Heavy-duty diesel engines and equipment are significant sources of black carbon, toxic compounds, GHGs and other harmful emissions. An estimated 19% of black carbon emissions in the world come from the transportation sector, with a relatively large proportion coming from diesel vehicles.

Most of the emissions from older diesel vehicles come in the form of particulate matter, 75% of which is typically black carbon. Black carbon has major effects on both human health and the climate, with a GWP second only to CO_2. Particulate matter is among the top human health risk factors, resulting in millions of premature deaths worldwide every year.

Major sources of diesel emissions include road transport and non-road transport, such as construction and agricultural equipment, locomotives and marine vessels.[39]

Ireland has made great strides in recent years in reducing carbon emissions in vehicles, in particular by rebalancing the Vehicle Registration Tax to incentivise lower CO_2 emissions from vehicles (Leinert *et al*., 2013). While successful in reducing carbon emissions, this policy has led to an increase in diesel-fuelled vehicles and an associated increase in air pollution (Leinert *et al*., 2013). Many people interviewed for this study remarked on the fact that a policy designed to address climate change has had unintended negative impacts on air quality, pointing to this as a challenge for policy coherence.

The Department of Transport is engaged in a number of measures to reduce air pollution from transport through the adoption of clean fuels, vehicle regulations and supporting policies. Many of these are captured in the government's Smarter Travel Policy as well as the National Energy Efficiency Action Plan, the National Renewable Energy Action Plan and the Draft Bioenergy Plan.[40]

National initiatives

The Department of Transport is in the process of developing a policy on sustainable freight. The aim is to incentivise the freight industry to adopt hybrid technologies (gas and diesel) and to ultimately have HGVs that run on gas only. The department is working with the Irish Exporters Association to try to create behaviour change and to communicate the economic benefits of adopting hybrid technology. The Irish fleet is quite modern and, as a result, quite efficient – so the next step is to change the fuel mix. Policy incentives will also be needed to encourage the uptake of new technologies.

In the broader area of transport, Bus Éireann is now trialling buses that run on natural gas and that could, in time, be converted to other types of gas, for example methane from biodigesters. Ireland is also making strides in the adoption of electric vehicles specifically in the private car market. The Electricity Supply Board projects that by 2020 every 10th car on Irish roads will be fully powered by electricity.[41] This would represent a 10% uptake; however, recent changes in the 3rd

39 http://ccacoalition.org/en/initiatives/diesel

40 http://www.dcenr.gov.ie/energy/SiteCollectionDocuments/Renewable-Energy/Draft%20Bioenergy%20Plan.compressed.pdf

41 https://www.esb.ie/electric-cars/electric-cars-ireland.jsp

National Energy Efficiency Action Plan have reduced the level of ambition. This states (page 37):

> Initial uptake of electric vehicles [EVs] has been lower than originally anticipated and the target of 10% of the transport fleet by 2020 appears to be overly optimistic. Ireland now estimates that approximately 50,000 electric vehicles will form part of the transport fleet in 2020. This figure is based on an adoption rate of 0.5% of new EVs in 2014 rising steadily to an adoption rate of 15% of new EVs in 2020.

Celtic Linen is trialling an electric truck, which is proving positive and signals another option to replace gas in freight vehicles. Electricity and gas are also options for the nation's taxi fleets.

Recent progress in getting people out of their cars to walk and cycle may also provide lessons for efforts to reduce diesel emissions. Health is one of the reasons people converted from car-based commuting to walking and cycling, and health may also be an incentive to move away from polluting diesel vehicles to cleaner alternatives, including public transport.

Ireland has the opportunity to solve one of its transport challenges in relation to SLCP emissions while also reducing SLCP emissions from waste and agriculture. Ireland needs a reliable and affordable supply of gas to run its growing hybrid freight fleet (and also, in time, public transport, taxis, etc.). The waste and agriculture sectors, on the other hand, are looking for ways to reduce methane emissions. Increasing the use of bio-digesters (anaerobic digesters) to manage biodegradable waste and capture methane for use in the freight industry is an opportunity to reduce SLCPs from several sectors simultaneously.

A micro-example of this approach in practice was shared by the Department of Transport: a pig and chicken farmer in Roscommon is supplying Tesco with methane from a bio-digester. In addition to manure, waste food from Tesco powers the digesters, further reducing SLCPs by reducing the biodegradable waste going to landfill. This approach could be scaled up with the right incentives for HGV owners to adopt hybrid technologies and incentives for farmers and local authorities to invest in anaerobic digesters to produce methane gas. Research is ongoing in Teagasc[42] and University College Cork[43] that will inform developments in this area.

International initiatives

Ireland is a member of the Global Green Freight Action Plan, which is a registered action under the CCAC. CCAC partners endorsed a Call to Action on Green Freight to create broader awareness and encourage participation and engagement. Ireland participates in the action plan with the aim of learning how it might take on board some of the strategies contained in the plan.

The action plan commits to harmonise and expand green freight programmes and increase the uptake of alternative fuels to reduce CO_2 and other pollutants. The objective of the Global Green Freight Action Plan is to improve the energy efficiency and environmental performance of freight operations worldwide by

- developing a framework to allow stakeholders to understand what is needed to enhance freight sector energy and environmental efficiency and significantly reduce CO_2 and black carbon;
- providing a shared roadmap to help co-ordinate green freight programmes between regions and countries, and ease implementation;
- establishing roles and responsibilities for key actors to implement and support the Action Plan, as well as clear benefits and opportunities leveraged by participating in these efforts;
- providing a platform for stakeholders to share best practices and freight efficiency data, promote innovation and communicate sustainability improvements in freight transportation.

Ireland will need to adapt the approaches to suit the national context and can benchmark progress against the overall green freight plan and report this to the national GHG and air pollutant inventories.

Ireland is also involved with the Low Carbon Sustainable Rail Transport Challenge. Irish Rail is a partner in this initiative, which aims to substantially reduce transport GHG emissions through rail sector and transport authority partnerships and to achieve

42 https://www.teagasc.ie/rural-economy/rural-development/energy/bioenergy-research/

43 https://www.ucc.ie/en/serg/bioenergy/

improved rail sector efficiency, decarbonisation of rail sector energy consumption and a modal shift to rail.

As part of the challenge, Irish Rail is trialling a cleaner diesel fuel made from plastic waste. This fuel has lower particulate emissions and is lower carbon. Irish Rail is also engaged with the Irish Exporters Association to get more freight moving by rail and more efficiently.

4.2.8 Regional assessments

> Action on SLCPs needs to be underpinned by relevant science. This initiative aims to develop scientifically robust and policy-relevant integrated assessments of SLCPs for key regions, which will provide a framework for national action; underpin regional co-operation on SLCP mitigation; and provide a regional focus for engagement with policymakers, scientists, technical experts and other key stakeholders.[44]

The EPA produces annual inventories of emissions to the atmosphere of GHGs and standard air pollutants. These include species that are SLCPs, such as methane, or precursor species that give rise to SLCPs, such as ozone or secondary particulate matter. The EPA also collaborates with EU partners to share information and data and in joint research activities – but none specific to SLCPs were identified. For example, Ireland is a member of the Joint Programming Initiative on Climate, but this initiative has not yet focused on SLCPs, with work to date concentrated on issues such as climate services, climate impacts and adaptation. Inclusion of SLCPs in Joint Programming Initiative programmes in the future may be a way to advance pan-European work on CCAC initiatives.

SLCPs are considered in research related to the work of the UNFCCC and CLRTAP, as has been the case under the EPA climate change research programme/ pillar. They are also considered under regional integrated assessment modelling activities, e.g. GAINS, which has been developed at the International Institute for Applied Systems Analysis (IIASA).

However, there may be room to better address the cross-over analysis between these areas in Ireland and at a European level to better capture the climate and air quality benefits of actions to reduce SLCPs, e.g. research to identify the win–win policies and technologies for climate action and clean air.

There is some ongoing research in this area at EU level, according to the EEA,[45] including a briefing produced as part of the EEA SOER 2015 report.[46] In addition, the Air and Climate Unit of the Joint Research Centre (JRC) is working on the issues at the intersection of climate and air policy and may be well placed to support such work.

Other areas where regional assessments could be useful are (1) sharing lessons learned from the unintended negative consequences of climate policies on air quality (e.g. CO_2 emissions standards for cars increasing as a result of the uptake of diesel cars with impacts on air pollution); and (2) energy production from biomass, which could increase air pollution (the Draft Bioenergy Plan[47] could provide opportunities for further research).

44 http://ccacoalition.org/en/initiatives/assessments

45 Personal communication, John van Aardenne, EEA, 29 June 2015.

46 http://www.eea.europa.eu/soer-2015/europe/the-air-and-climate-system

47 http://www.dcenr.gov.ie/energy/SiteCollectionDocuments/Renewable-Energy/Draft%20Bioenergy%20Plan.compressed.pdf

5 Options for Future Engagement

5.1 International Context post 2015

The international landscape related to SLCPs is now shaped by Agenda 2030 and the 17 Sustainable Development Goals (SDGs), as well as by the Paris Agreement, all adopted in 2015. It will also continue to be informed by commitments on air quality and health under the WHO, as well as the continued evolution of commitments under the MP and the CLRTAP. Given the focus on implementation of the Sustainable Development Goals and recognising their indivisible nature, a renewed focus on policy coherence can create new opportunities to address SLCPs in the context of health, climate action and air quality.

5.2 Awareness Raising in Ireland

The interviews conducted as part of this study reveal that the level of knowledge among government officials and NGOs of the CCAC and of the role of SLCPs in both climate action and air quality is relatively low. As a result, it can also be assumed that the level of awareness is low among the general public.

The government could use its membership of the CCAC to raise awareness of the role of SLCPs in both climate action and air quality and engage a wider group of stakeholders in actions to reduce SLCPs. For example, the private sector is increasingly engaged in CCAC activities at international level as a result of the opportunities action on SLCPs presents to businesses eager to have near-term impacts on their GHG emissions.[48] The private sector are often the implementers of the actions needed to reduce SLCPs, and their engagement is as important as the role of governments in setting the right policy context for action on SLCPs. Stakeholder groups such as Business in the Community and IBEC may be interested in learning about the co-benefits of action on SLCPs. In addition, NGOs working in the areas of health, transport, agriculture, environment and development may be interested in playing their part.

Opportunities to raise awareness of SLCPs and Ireland's membership of the CCAC include actions associated with the roll-out of climate change legislation, public health campaigns (including Healthy Ireland) and new policy developments in the area of air quality.

It was also suggested that an interdepartmental committee looking at policies at the intersection of air quality, health and climate could provide a forum for shared thinking and policy advice in the area of SLCPs. The forum could, for example, be mandated to make specific recommendations to the National Expert Advisory Council on Climate Change and/or provide inputs to the planned national Air Quality Strategy, which was announced by the Minister for the Environment at the 2015 Clean Air Conference.[49]

As Ireland develops its plans for implementing the SDGs and defines indicators to track and report progress towards the goals, there is an opportunity to embed actions on SLCPs in the national sustainable development agenda. In addition, as government departments respond to the provisions of the Climate Action and Low Carbon Development Bill and put in place low-carbon plans for their sector, they could be provided with guidance and advice on ways to reduce SLCPs and maximise co-benefits.

It is also worth noting that health is a driver for action on climate change around the world from China to the USA. It is a powerful and effective way to engage people in the risks associated with climate change and the benefits of climate action for health (see for example Watts *et al*., 2015). Amplifying the health benefits of action on SLCPs in the short term and the longer term benefits of reduced warming due to CO_2 mitigation can be powerful narratives in engaging the public in policy and action on SLCPs.

48 Personal communication, Edward Cameron, BSR (private sector partner of the CCAC), 21 August 2015.

49 http://www.epa.ie/newsandevents/events/old/cleanairconference2015.html#.ViDbZPlViko

5.3 Engagement through the CCAC

The CCAC secretariat and partners in the CCAC all highlight experience sharing and access to practical examples as one of the main advantages of CCAC membership. Whether through engagement in the formal initiatives of the CCAC or the more informal contacts made through attendance at CCAC meetings, the partnership provides an opportunity to access the experience of other countries' actions on SLCPs. While Ireland is well networked and well connected within the EU, membership of the CCAC provides an opportunity to engage with a wider range of country experiences.

A number of areas were identified in the study in which Ireland could benefit from accessing the experience of others – for example in relation to policies to (1) incentivise the adoption of hybrid technologies in the freight industry; (2) incentivise the uptake of anaerobic digesters to both reduce emissions from biodegradable household waste and use agricultural slurry and manure to produce gas as a transport fuel; and (3) enable the substitution of HFCs.

Ireland is also eligible to access technical advice and tools for SLCPs through the CCAC SNAP Initiative. The objective of this initiative is to support rapid and large-scale implementation of SLCP mitigation at the national level. Partner countries have indicated a need for co-operative programmes to help countries understand and assess the scope of the SLCP issue and mitigation potential.

SNAP aims to:

- help governments assess the scope of the SLCP issue and mitigation potential and opportunities at the national level, and build a co-ordination mechanism among key stakeholders to support integration in relevant national strategies and sectoral plans, and implementation of identified priority measures, and to monitor and evaluate progress in implementing SLCP plans;
- develop analytical and assessment tools and disseminate information on best practices to support the development of effective integrated mitigation strategies.[50]

The study also revealed examples of areas where Ireland has valuable experience to share with CCAC members and where the CCAC secretariat felt Ireland could make a valuable contribution to the evolving work of the CCAC. Specific areas in which Ireland has experience to share with members of the CCAC include the following.

5.3.1 Cookstoves

While Ireland's engagement in the area of cookstoves is quite modest in terms of total financing, the approaches used are innovative in their targeting of the poorest and most vulnerable members of society (see Box 4.1). These approaches would complement the strictly market-led approach championed by the Global Alliance on Clean Cookstoves, the lead partner on the CCAC's cookstove initiative. In addition to Irish Aid's programmes in Malawi and Ethiopia, the work of Vita and possibly other Irish NGOs or universities (for example the uPower Stove Generator being developed in Trinity College),[51] could be used to bring a greater diversity of approaches to the CCAC's work on cookstoves.

5.3.2 Agriculture

Ireland is very aware of its special circumstances related to emissions reductions from the agriculture sector. Methane from enteric fermentation and manure management is a critical area for Ireland in relation to SLCPs. Ireland is already engaged in a number of EU and international initiatives to reduce GHG emissions from agriculture and to promote CSA. There are opportunities to share the results of this work with CCAC partners either directly or by encouraging greater collaboration between the secretariats of the various international initiatives, e.g. CCAC, GRA and GACSA.

CSA is a growing priority for Ireland both nationally and internationally. Irish Aid will increase its focus on the adoption of climate-smart technologies for household food and energy systems by rural communities,[52] including through CSA. CSA is also championed by development NGOs, including Concern, and a number

50 http://ccacoalition.org/en/initiatives/snap

51 http://www.tcd.ie/mecheng/research/fluids-heat-transfer/projects/stove.php

52 https://www.irishaid.ie/about-us/policy-for-international-development/framework-for-action/

of NGOs are participating in the IEA Leadership Forum on CSA. As Ireland develops experience and expertise in the area of CSA both at home and with developing country partners, it will be well positioned to share this with CCAC partners, in particular developing countries with economies heavily reliant on agriculture.

The Institute of International and European Affairs' Leadership Forum on CSA reported its key findings in June 2016 and follow up work could provide opportunities for further work on SLCPs.

5.3.3 Air quality

Ireland's experience with the smoky coal ban in Dublin and other urban centres has resulted in valuable experience about the impacts of regulating solid fuels on air quality (Clancy *et al*., 2002). The recent announcement by the Minister for the Environment extending the smoky coal ban nationwide commencing in 2018 offers an opportunity to document this process and its impact on air quality in order to share lessons learned. Many low- and middle-income countries are struggling to address air pollution associated with the burning of biomass and Ireland's experiences in addressing the challenge could provide valuable experience to share with other CCAC partners.

Data will be critical in documenting the benefits of this approach. As a result, it may be worthwhile, during the process of consulting on the ban and Ireland's first national Clean Air Strategy (consultation period ending in April 2018), to consider establishing a baseline of air pollution before the new measures are enacted to allow the impacts of the change in policy to be measured over time. At the EU level, information on black carbon measurements is largely missing from the Europe-wide AirBase database, and monitoring of black carbon in ambient air at urban background and traffic sites is not required by EU legislation (EEA, 2013). At present, SLCPs are not routinely measured across all monitoring sites in Ireland. While this would involve investment in new instrumentation, it would be an important step in developing a comprehensive national ambient air monitoring programme.

5.3.4 Other sectors

While Ireland is not in a leadership position internationally in areas such as waste and transport, there may be value in sharing emerging experiences with CCAC partners in developing counties. The rationale for this is that most of the transport and waste solutions championed in the CCAC are from resource-wealthy countries and, as a result, cannot be replicated in middle-income or low-income countries. If Ireland can develop least-cost measures to reduce SLCP emissions from the waste and transport sectors, these would be a valuable complement to the existing experience in the CCAC. Likewise, future work on air quality and health or on least-cost solutions to HFC phase-down and substitution could provide valuable lessons for other countries participating in the CCAC. If Ireland can find a way to address the challenges associated with the increase in diesel vehicles due to climate policy incentivising vehicles with lower carbon emissions, it will have a very useful case study to share. It is important that such a case study document both the consequences of policy incoherence and the measures taken to rectify any unintended consequences.

5.4 Benefiting from the CCAC

It is important to remember that the CCAC is an informal coalition and partners can participate as much or as little as they wish. The informal nature of the CCAC means that information and experience sharing should be facilitative and the interactions more relaxed than in, for example, intergovernmental arenas such as the MP or the UNFCCC.

Ireland can give and take as much as it wants as a CCAC partner. The challenge is to maximise the return from a realistic and manageable investment of human capacity and resources. Undoubtedly, participation in the CCAC could help Ireland to access information, tools and experiences that could inform emerging policy and action in the area of SLCPs. However, Ireland also has experience to share, particularly in relation to cookstoves and agriculture.

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Abbreviations

BMW	Biodegradable municipal waste
CA	Conservation agriculture
CAFÉ	Clean Air for Europe
CCAC	Climate and Clean Air Coalition
CCAFS	Climate Change, Agriculture and Food Security
CLRTAP	Convention on Long-range Transboundary Air Pollution
CO_2	Carbon dioxide
CSA	Climate-smart agriculture
EEA	European Environment Agency
EPA	Environmental Protection Agency
EU	European Union
FACCE-JPI	Joint Programming Initiative on Agriculture, Food Security and Climate Change
FAO	Food and Agriculture Organization of the United Nations
GACSA	Global Alliance on Climate-Smart Agriculture
GHG	Greenhouse gas
GRA	Global Research Alliance on Agricultural Greenhouse Gas Emissions
GWP	Global warming potential
HFC	Hydrofluorocarbon
HLA	High Level Assembly
HSE	Health Service Executive
IIEA	Institute of International and European Affairs
IPCC	Intergovernmental Panel on Climate Change
MP	Montreal Protocol
N_2O	Nitrous oxide
NGO	non-governmental organisation
NO_2	Nitrogen dioxide
$PM_{2.5}$	Particulate matter 2.5 microns or less in diameter
PM_{10}	Particulate matter 10 microns or less in diameter
SAP	Scientific Advisory Panel
SCT	Social cash transfer
SGP	Stability and Growth Pact
SLCP	Short-lived climate pollutant
SNAP	Supporting National Planning for Action on SLCPs
SO_2	Sulfur dioxide
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
WG	Working Group
WHO	World Health Organization
WMO	World Meteorological Organization

Appendix 1 List of People Consulted

Name	Department	Relevant CCAC initiative
Aoife Donnelly	EPA	Regional assessment
Ben Siddle	Department of Foreign Affairs and Trade, Irish Aid	Cookstoves/agriculture
Bernard Hyde	EPA	Waste
Brendan O'Neill	Department of Environment, Community and Local Government	Waste
Colette Bonner	Department of Health	Health
Edward Cameron	BSR, New York	Business partner in CCAC
Frank McGovern	EPA	Regional assessment
Georgina Hughes-Elders	Department of Public Expenditure and Reform	Finance
James Morris	CCAC secretariat, UNEP	CCAC
Jean Clarke	Department of the Environment, Community and Local Government	HFCs/MP
John Gilliland	Vita	Cookstoves
John Muldowney	Department of Agriculture, Forestry and the Marine	Agriculture
Joseph Curtin	IEA	Agriculture
Martin Diskin	Department of Transport	Transport
Martin Fitzpatrick	Dublin City Council	Environmental health, air quality
Micheal Young	Department of the Environment, Community and Local Government	Air quality/CCAC focal point
Miriam Owens	Department of Health	Health
Paul Wagstaff	Concern	Cookstoves and agriculture
Petra Woods	Department of the Environment, Community and Local Government	Climate policy
Philip O'Brien	EPA	Climate research
Romina Picolotti	Centre for Human Rights and the Environment, Argentina	Civil society member of CCAC
Siobhán McEvoy	Department of Health	Health
Thomas Sommerhalter	Concern	Cookstoves and agriculture

Appendix 2 Agenda for Expert Meeting

Stakeholder meeting to discuss the draft findings of a small-scale study on Ireland's contribution to the CCAC.

Date and time: Monday 12 October, 11:00 to 13:00.

Venue: East Room, Custom House.

Agenda

11.00–11.10	Welcome and introduction – Micheal Young, Department of Environment, Community and Local Government
11.10–11.40	Presentation of the findings of the study – Dr Tara Shine
11.40–12.40	Moderated discussion – chaired by Frank McGovern, EPA
12.40–13.00	Wrap-up and key take-aways – Dr Tara Shine and Micheal Young

Appendix 3 Lifetimes and Global Warming Potentials of Non-CO_2 Gases

GWP with and without inclusion of climate–carbon feedback (cc fb) in response to emissions of the indicated non-CO_2 gases.

Gas	Lifetime (years)		GWP_{20}	GWP_{100}
CH_4	12.4	No cc fb	84	28
		With cc fb	86	34
HFC-134a	13.4	No cc fb	3710	1300
		With cc fb	3790	1550
CFC-11	45.0	No cc fb	6900	4660
		With cc fb	7020	5350
N_2O	121.0	No cc fb	264	265
		With cc fb	268	298
CF_4	50,000	No cc fb	4880	6630
		With cc fb	4950	7350

CF_4, carbon tetrafluoride; CH_4, methane; GWP_{20}, GWP in 20 years; GWP_{100}, GWP in 100 years.
Source: information taken from Myhre *et al*. (2013).

AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL
Tá an Ghníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaol a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialú: *Déanaimid córais éifeachtacha rialaithe agus comhlíonta comhshaoil a chur i bhfeidhm chun torthaí maithe comhshaoil a sholáthar agus chun díriú orthu siúd nach gcloíonn leis na córais sin.*

Eolas: *Soláthraímid sonraí, faisnéis agus measúnú comhshaoil atá ar ardchaighdeán, spriocdhírithe agus tráthúil chun bonn eolais a chur faoin gcinnteoireacht ar gach leibhéal.*

Tacaíocht: *Bímid ag saothrú i gcomhar le grúpaí eile chun tacú le comhshaol atá glan, táirgiúil agus cosanta go maith, agus le hiompar a chuirfidh le comhshaol inbhuanaithe.*

Ár bhFreagrachtaí

Ceadúnú
Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaol:
- saoráidí dramhaíola *(m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramhaíola)*;
- gníomhaíochtaí tionsclaíocha ar scála mór *(m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta)*;
- an diantalmhaíocht *(m.sh. muca, éanlaith)*;
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe *(OGM)*;
- foinsí radaíochta ianúcháin *(m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíocha)*;
- áiseanna móra stórála peitril;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil
- Clár náisiúnta iniúchtaí agus cigireachtaí a dhéanamh gach bliain ar shaoráidí a bhfuil ceadúnas ón nGníomhaireacht acu.
- Maoirseacht a dhéanamh ar fhreagrachtaí cosanta comhshaoil na n-údarás áitiúil.
- Caighdeán an uisce óil, arna sholáthar ag soláthraithe uisce phoiblí, a mhaoirsiú.
- Obair le húdaráis áitiúla agus le gníomhaireachtaí eile chun dul i ngleic le coireanna comhshaoil trí chomhordú a dhéanamh ar líonra forfheidhmiúcháin náisiúnta, trí dhíriú ar chiontóirí, agus trí mhaoirsiú a dhéanamh ar leasúchán.
- Cur i bhfeidhm rialachán ar nós na Rialachán um Dhramhthrealamh Leictreach agus Leictreonach (DTLL), um Shrian ar Shubstaintí Guaiseacha agus na Rialachán um rialú ar shubstaintí a ídíonn an ciseal ózóin.
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Uisce
- Monatóireacht agus tuairisciú a dhéanamh ar cháilíocht aibhneacha, lochanna, uiscí idirchriosacha agus cósta na hÉireann, agus screamhuiscí; leibhéil uisce agus sruthanna aibhneacha a thomhas.
- Comhordú náisiúnta agus maoirsiú a dhéanamh ar an gCreat-Treoir Uisce.
- Monatóireacht agus tuairisciú a dhéanamh ar Cháilíocht an Uisce Snámha.

Monatóireacht, Anailís agus Tuairisciú ar an gComhshaol
- Monatóireacht a dhéanamh ar cháilíocht an aeir agus Treoir an AE maidir le hAer Glan don Eoraip (CAFÉ) a chur chun feidhme.
- Tuairisciú neamhspleách le cabhrú le cinnteoireacht an rialtais náisiúnta agus na n-údarás áitiúil *(m.sh. tuairisciú tréimhsiúil ar staid Chomhshaol na hÉireann agus Tuarascálacha ar Tháscairí)*.

Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn
- Fardail agus réamh-mheastacháin na hÉireann maidir le gáis cheaptha teasa a ullmhú.
- An Treoir maidir le Trádáil Astaíochtaí a chur chun feidhme i gcomhair breis agus 100 de na táirgeoirí dé-ocsaíde carbóin is mó in Éirinn.

Taighde agus Forbairt Comhshaoil
- Taighde comhshaoil a chistiú chun brúnna a shainaithint, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeráide, an uisce agus na hinbhuanaitheachta.

Measúnacht Straitéiseach Timpeallachta
- Measúnacht a dhéanamh ar thionchar pleananna agus clár beartaithe ar an gcomhshaol in Éirinn *(m.sh. mórphleananna forbartha)*.

Cosaint Raideolaíoch
- Monatóireacht a dhéanamh ar leibhéil radaíochta, measúnacht a dhéanamh ar nochtadh mhuintir na hÉireann don radaíocht ianúcháin.
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha.
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta.
- Sainseirbhísí cosanta ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Faisnéis Inrochtana agus Oideachas
- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaol ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaol *(m.sh. Timpeall an Tí, léarscáileanna radóin)*.
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
- Plean Náisiúnta Bainistíochta Dramhaíola Guaisí a fhorbairt chun dramhaíl ghuaiseach a chosc agus a bhainistiú.

Múscailt Feasachta agus Athrú Iompraíochta
- Feasacht chomhshaoil níos fearr a ghiniúint agus dul i bhfeidhm ar athrú iompraíochta dearfach trí thacú le gnóthais, le pobail agus le teaghlaigh a bheith níos éifeachtúla ar acmhainní.
- Tástáil le haghaidh radóin a chur chun cinn i dtithe agus in ionaid oibre, agus gníomhartha leasúcháin a spreagadh nuair is gá.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil
Tá an ghníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:
- An Oifig um Inmharthanacht Comhshaoil
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Fianaise is Measúnú
- Oifig um Chosaint Radaíochta agus Monatóireachta Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tá Coiste Comhairleach ag an nGníomhaireacht le cabhrú léi. Tá dáréag comhaltaí air agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

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Assessment of Actions to Support the Work of the Climate and Clean Air Coalition

Author: Tara Shine

Identifying Pressures

Short-lived climate pollutants (SLCPs) are hazardous air pollutants that have various detrimental impacts on human health, agricultural production and ecosystems. Control of SLCPs also has an important role to play in climate mitigation. In 2011 a scientific assessment co-ordinated by the United Nations Environment Programme (UNEP) and the World Meteorological Organisation (WMO) identified 16 SLCP control measures that, if implemented globally by 2030, could deliver significant benefits for near-term climate protection and air quality. The relatively short lifetimes of SLCPs mean that climate benefits can be achieved quickly after the mitigation action occurs, with additional benefits for air quality and health.

Informing Policy

Ireland became a member of the Climate and Clean Air Coalition (CCAC) in 2013, demonstrating its commitment to climate and air pollution issues and to improve policy coherence. The CCAC brings together governments, civil society and private sector actors committed to improving air quality and protecting the climate by reducing SLCPs. Several areas were identified in the study where Ireland could benefit from accessing the experience of others, for example in relation to policies to:

1. incentivise the adoption of hybrid technologies in the freight industry;
2. incentivise the uptake of anaerobic digesters to both reduce emissions from biodegradable household and use agricultural slurry and manure to produce gas as a transport fuel; and
3. enable the substitution of HFCs.

Developing Solutions

Participation in the CCAC will help Ireland access information, tools and experiences that could inform emerging policy and action in SLCPs. Ireland is also eligible to access technical advice and tools for SLCPs through the CCAC Supporting National Planning for Action on SLCPs (SNAP) initiative. The objective of the SNAP initiative is to support rapid and large-scale implementation of SLCP mitigation at the national level. The report also finds that Ireland has experience to share with CCAC members in relation to clean cooking (from its Development Cooperation programme), agriculture (work nationally and internationally on climate-smart agriculture) and air quality (including smoky coal bans).

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