



Rialtas na hÉireann
Government of Ireland

Draft Clean Air Strategy **Public Consultation**

March 2022



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2 Glossary

AAMP	Ambient Air Quality Monitoring Programme	EEA	European Environment Agency
AQIH	Air Quality Index for Health	EU	European Union
BER	Building Energy Rating	EVs	Electric Vehicles
Biodiversity	A short form of the phrase 'biological diversity', which means the variety of life on this planet and how it interacts within habitats and ecosystems.	FPNs	Fixed Payment Notices
Bituminous Coal	Black coal containing a tar-like substance called bitumen or asphalt, commonly referred to as "smoky coal".	GHG	Greenhouse Gases
CAP	Climate Action Plan	HEVs	Hybrid Electric Vehicles
CAFE	Clean Air for Europe	Hg	Mercury
CAS	Clean Air Strategy	HSE	Health Service Executive
CCMA	County and City Management Association	IRC	Irish Research Council
CO₂	Carbon dioxide	LAIG	Local Authority Implementation Group
DAFM	Department of Agriculture, Food and the Marine	LSZ	Low Smoke Zone
DECC	Department of the Environment, Climate and Communications	MACC	Marginal Abatement Cost Curve
DoT	Department of Transport	NAPCP	National Air Pollution Control Programme
Ecosystem	A community of organisms that depend on each other and the environment they inhabit	NECD	National Emission Ceiling Directive
EPA	Environmental Protection Agency	NH₃	Ammonia
		NIECE	Network for Ireland's Environmental Compliance and Enforcement
		NMVOCs	Non-Methane Volatile Organic Compounds
		NO₂	Nitrogen dioxide
		NO_x	Nitrogen oxides, a mix of NO and NO ₂
		NSAI	National Standards Authority of Ireland

OECD	Organisation for Economic Co-Operation and Development
PAHs	Polycyclic aromatic hydrocarbons
Particulate Matter	Fine solid or liquid particles that pollute the air and are added to the atmosphere by natural and man-. Examples of particulate matter include dust, smoke, soot, pollen and soil particles.
PM_{2.5}	Particulate matter with diameter $\leq 2.5 \mu\text{m}$
PM₁₀	Particulate matter with diameter $\leq 10 \mu\text{m}$
PSO	Public Service Obligation
REFIT	Renewable Energy Feed-in Tariff

RESS	Renewable Electricity Support Scheme
SEAI	Sustainable Energy Authority of Ireland
SFI	Science Foundation Ireland
SO₂	Sulphur dioxide
TSP	Total Suspended Particulates
UN	United Nations
UTRAP	Urban Transport-Related Air Pollution
VOCs	Volatile Organic Compounds
WAM	With Additional Measures
WERLAs	Waste Enforcement Regional Lead Authorities
WHO	World Health Organisation

Public Consultation



3 Introduction

This draft Clean Air Strategy outlines how we will enhance and protect the quality of the air that we breathe and realise the full environmental and health benefits of cleaner air. The Strategy builds upon the National Air Pollution Control Plan (NAPCP), which sets out a pathway based on a comprehensive cross-Government programme of policies and measures that will tackle all sources of air pollution, including those from the transport, agriculture and residential sectors.

The Strategy also builds upon the ambition of Ireland's Climate Action Plan which includes a range of actions required to realise the synergies between coherent air and climate policy. These include the electrification of the road transport fleet, taking action in relation to ammonia, improving the energy efficiency of our homes and reducing our reliance on solid fuels.

The provision of data from the EPA, including the annual inventory and projections, as well as our enhanced National Ambient Air Quality Monitoring Programme (AAMP), gives us a comprehensive evidence base to tackle the sources of air pollution which need to be addressed. Continued improvements to our air quality monitoring and modelling will further assist in this regard.

Clean air is essential for our quality of life. While recent decades have seen significant improvements in air quality in Ireland, air pollution continues to cause damage to both our health and environment. There is a whole of Government commitment to achieve this objective but it can only be realised through our collective efforts. The changes that are required will have positive economic and societal co-benefits, including cleaner air, warmer homes, better health, lower carbon, moving towards a more sustainable economy for the longer term.

This Strategy will complement the [National Air Pollution Control Programme \(NAPCP\)](#) which is a technical document which identifies the pathway to compliance for each pollutant. An updated NAPCP was submitted to the EU Commission in February 2021, and since then, the 2021 Informative Inventory Report (IIR) and national air pollutant emission projections have been released ([IIR 2021](#)). The most recent data is reflected in this Strategy.

The intention is that the Clean Air Strategy will be regularly reviewed in line with the IIR, updates to the NAPCP, stakeholder engagement and national policy developments.

The Clean Air Strategy provides the high level strategic policy framework necessary to identify and promote the integrated measures across government policy that are required to reduce air pollution and promote cleaner ambient air while delivering on wider national objectives. The key strategic priorities are:

1. To ensure continuous improvements in air quality across the country;
2. To guarantee the integration of clean air considerations into policy development across Government;
3. To increase the evidence base that will help us to continue to evolve our understanding of the sources of pollution in order to address them more effectively;
4. To enhance regulation and improve the effectiveness of our enforcement systems;
5. To promote and increase awareness of the importance of clean air.

4 Public Consultation Process

The Department of the Environment, Climate and Communications invites submissions on this draft Clean Air Strategy.

Respondents are welcome to provide detailed submissions via email to airquality@decc.gov.ie or post to

Clean Air Strategy Public Consultation
Air Quality Division
Department of the Environment, Climate and Communications
Newtown Road
Wexford
Y35 AP90

We also have developed some specific questions that may assist in formulating a response.

Consultation Questions

1. Do you agree with the five strategic priorities outlined in the draft strategy?
2. Do you feel there are additional strategic priorities which should be included?
3. How can pollutant emissions data be better used to inform actions at local and national levels?
4. What do you feel are the most important current and emerging air quality issues in Ireland that require further research?
5. How can we better increase awareness of the health impacts of air pollution?
6. What issues might a national clean air awareness campaign encompass and how could its impact be measured?
7. What particular metrics or benchmarks do you think should be considered in tracking the progress of a Clean Air Strategy?
8. Are there any other comments you have in relation to the draft national Clean Air Strategy?

The closing date for submissions is: Tuesday 3rd May, 2022.

Submissions and comments submitted to the Department may be subject to release under the Freedom of Information Act 2014 and/or the European Communities (Access to Information on the Environment) Regulations 2007-2018.

4.1 Overview of Strategic Priorities and Key Actions

Ensure continuous improvements in air quality across the country	<ul style="list-style-type: none">• Ireland will commit to setting more stringent legal limits for ambient air quality by 2025 taking into consideration the new WHO guideline limits• Prioritise action in relation to key air quality issues
Ensure the integration of clean air considerations into policy development across Government	<ul style="list-style-type: none">• Establish Cross-Government Air Quality Implementation Group• Each Department will report annually on progress in reducing air pollution• Ensure air quality is integrated in the development or review of national plans and policy documents• UTRAP Group to publish final report• UTRAP to become a forum for continued engagement between the key transport stakeholders
Increase the evidence base	<ul style="list-style-type: none">• Continued funding to complete the EPA AAMP expansion (to 2022)• Support the requirements of maintaining the AAMP beyond 2022• Fund and support EPA LIFE Emerald Project• Establish Clean Air Research Forum• Publish calls for evidence on specific air quality issues as required
Enhance regulation and enforcement	<ul style="list-style-type: none">• Review of Air Pollution Act (1987)• Development of Clean Air Act• Review of all Clean Air legislation• Development of new Solid Fuel Regulations• Establish Air Quality Enforcement Regional Support Structures• Strengthen multi-agency enforcement
Promote and increase awareness of the importance of clean air	<ul style="list-style-type: none">• Establish Clean Air Communication Strategy Group• Support EPA AAMP Citizen Science• Work with key stakeholders to increase citizen engagement and better public engagement in the policy process• Hold annual National Clean Air for Blue Skies Day• Host biennial Clean Air Conference• Establish Clean Air Forum
Oversight	<ul style="list-style-type: none">• Progress report of CAS to be completed in Q2 2023 and submitted to Government• Prepare annual Clean Air Progress report to Government• Review of NAPCP to be completed by Q2 2023

Clean Air Matters



5 Why Air Quality Matters

5.1 Health Effects of Poor Air Quality

Air quality is a major concern at a global level and [is considered the most significant environmental risk to human health](#). Since the 1990s, medical research has demonstrated links between air pollution and both short and long-term health impacts, including exacerbation of respiratory conditions and increased levels of strokes, cancer, and respiratory and cardiovascular disease. In 2016, [the World Health Organization estimated](#) 4.2 million premature deaths globally are linked to ambient air pollution, mainly from heart disease, stroke, chronic obstructive pulmonary disease, lung cancer, and acute respiratory infections in children. The European Environment Agency (EEA) [‘Air Quality in Europe – 2020 Report’](#) indicated that 1,410 premature deaths in Ireland in 2018 were attributable to air pollution.

In recent years, better scientific understanding of the links between air quality and public health has led to an increased awareness of the need to tackle air pollution. For example, EU air quality standards provide for a minimum level of health protection, but evidence from the World Health Organisation indicates that human health impacts occur at air pollution levels below the current EU ambient air quality limits.

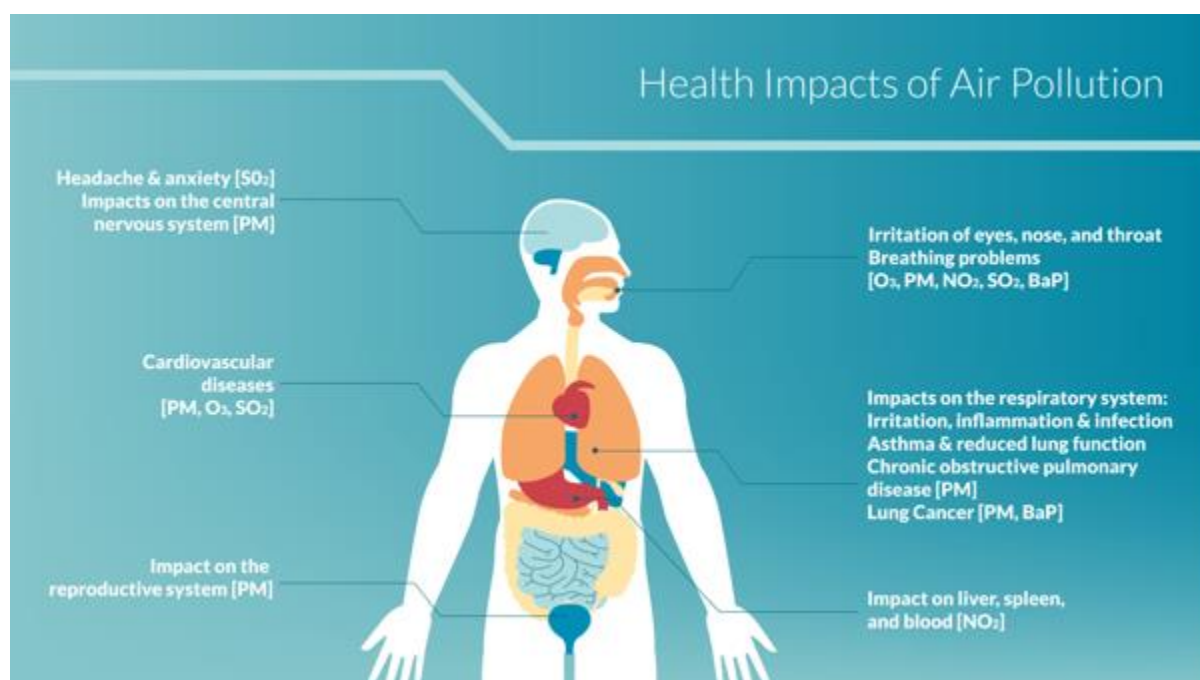
While we are all familiar with more visible forms of air pollution, such as smoke from solid fuel fires, new evidence suggests that invisible forms of pollution, such as fine particulate matter, are at least as harmful to our health as these more visible forms.

[Air pollution is perceived as the second biggest environmental concern for Europeans, after climate change](#). There has been an increase in public concern about the negative impacts of air pollution as recent evidence indicates that the health impacts of air pollution are wider ranging than previously thought (see Figure 1).

Ever-expanding research is demonstrating the links between air quality and even wider impacts on human health such as on cognitive development (Zhang et al., 2018) and mental health (Braithwaite et al., 2019). Recent Irish research has shown the negative health impacts on the Irish public (Carthy et al., 2020; Quintyne et al., 2020).

These negative health impacts come at a cost, both personally and economically. In addition to premature deaths, air pollution causes absence from work, reduced productivity, higher spending on medicines, and increased hospital admissions. [The WHO has estimated](#) the direct economic costs of air pollution to be in the region of €1.47 trillion in Europe, and for Ireland, around 1.3% of GDP or €2.3 billion per year.

Figure 1: Summary of Health Impacts of Air Pollution – (Source: European Environment Agency, 2021)



Separate estimates from the European Commission put the figure for Ireland at €2 billion per year, including the loss of 382,000 workdays per year. The Organisation for Economic Co-operation and Development (OECD) has projected that the annual global welfare costs of premature deaths from outdoor air pollution are projected to rise from €2.76 trillion in 2015 to between €16.5 and €23 trillion by 2060.

In Ireland, the Air Quality Index for Health (AQIH) provides round-the-clock information on air quality in the vicinity of all monitoring stations in Ireland and provides an indicator as to whether or not this might have an effect on the health of local people. [A map](#) is provided on the EPA website which provides an indicator of the current air quality. The AQIH ranges from one to ten, with a level of one being 'Good' air quality and ten corresponding to 'Very Poor', as outlined in Figure 2 below.

Figure 2: Air Quality Index for Health (EPA, 2020)

Band	Index	Accompanying health messages for at-risk groups and the general population	
		At-risk individuals*	General population
Good	1	Enjoy your usual outdoor activities.	Enjoy your usual outdoor activities.
	2		
	3		
Fair	4	Adults and children with lung problems, and adults with heart problems, who experience symptoms, should consider reducing strenuous physical activity, particularly outdoors.	Enjoy your usual outdoor activities.
	5		
	6		
Poor	7	Adults and children with lung problems, and adults with heart problems, should reduce strenuous physical activity, particularly outdoors, and particularly if they experience symptoms.	Anyone experiencing discomfort such as sore eyes, cough or sore throat should consider reducing activity, particularly outdoors.
	8		
	9	People with asthma may find they need to use their reliever inhaler more often. Older people should also reduce physical exertion.	
Very Poor	10	Adults and children with lung problems, adults with heart problems, and older people, should avoid strenuous physical activity. People with asthma may find they need to use their reliever inhaler more often.	Reduce physical exertion, particularly outdoors, especially if you experience symptoms such as cough or sore throat.

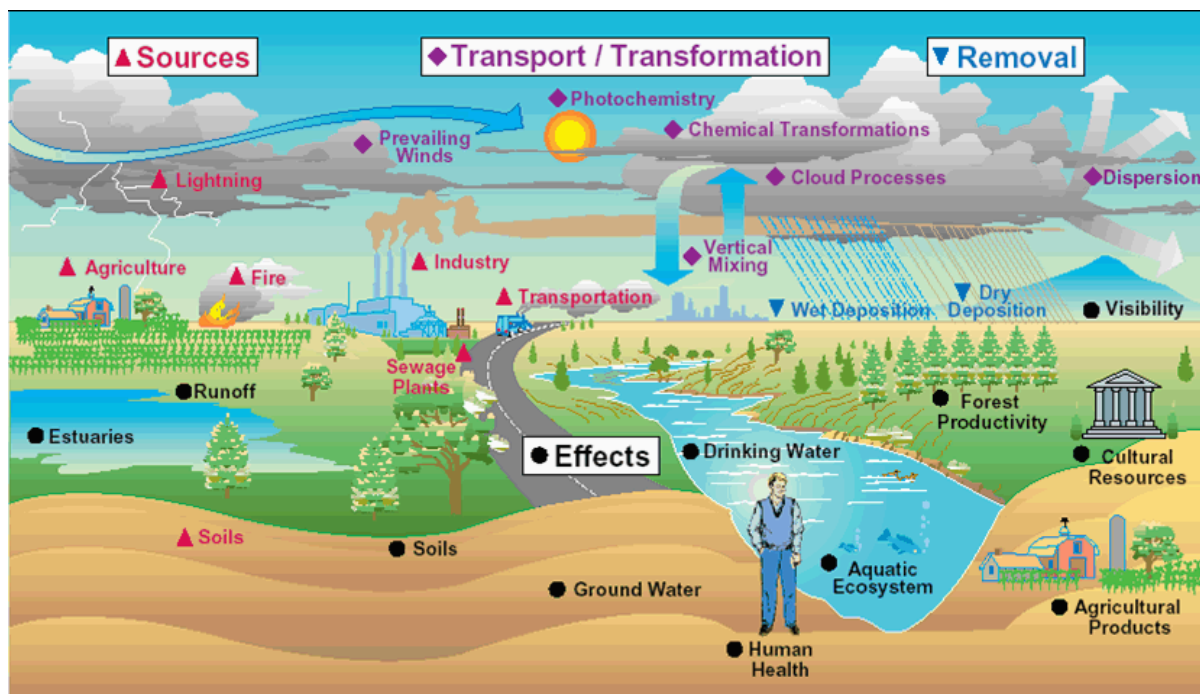
5.2 Environmental Effects of Poor Air Quality

Clean air is central to supporting life in all its forms and the environment on which we all depend. It is also synonymous with wellbeing. Clean air and a healthy environment should not be sacrificed for the sake of continued economic growth; rather they are pre-requisites for attracting inward investment and sustainable jobs. Clean air benefits our habitats and our wildlife, and contributes to the best possible environment for us as a society to live, work, grow up and grow old in.

Air pollution has a range of impacts on our environment, including biodiversity, water quality and wider ecosystems services. These can be both immediate and long-term. For example, while historic reductions in sulphur emissions have reduced the threat posed by 'acid rain', nitrogen deposition continues to affect plant communities, impacting on sensitive species and biodiversity. This has knock-on consequences for butterflies, bees, other insects, and

birds. It can also favour plants and insects that cause allergies or disease, as well as increasing algal bloom resulting in a coloured scum on the surface of our water.

Figure 3 : Pathways and Impact of Air Pollution



Another example is ozone, which is produced in the atmosphere by certain air pollutants. This aggressive gas damages plants and can significantly reduce crop yields. Current assessments, under the [United Nations \(UN\) Air Convention](#), indicate that air pollution continues to cause damage to specified sensitive elements of the environment.

5.3 Air Quality and Climate Action

[Ireland's overall greenhouse gas emissions are falling](#) with decreases observed in a number of sectors such as energy, waste and fluorinated gases. However, increases in emissions have been observed from agriculture, transport, residential, manufacturing combustion, industrial processes and commercial and public services. Air quality is closely associated with our climate and ecosystems. [Many of the sources of air pollution are also sources of CO₂ emissions](#) and there is a clear correlation between the actions required to lower air pollution and those needed to reduce greenhouse gas emissions and help our fight against climate change.

Ireland published its first [Climate Action Plan \(CAP\)](#) in 2019. This sets out an ambitious pathway to address the disruptive impact of climate change on Ireland's environment, society, economic and natural resources.

The plan sets out 183 actions which show how Ireland can reach its 2030 Greenhouse Gas targets as well as putting us on the right trajectory towards net-zero carbon in 2050. It outlines the state of play across all key sectors including electricity, transport, built environment, industry and agriculture.

The actions contained within the Climate Action Plan not only impact upon our greenhouse gas emissions, but also have positive benefits for our air quality. The co-benefits of the 2019 plan are reflected in the updated NAPCP and the annual EPA IIR.

The Climate Action Plan 2021, published in November 2021, sets an even more ambitious roadmap for taking decisive action to halve Ireland's emissions by 2030 and set the country on a pathway to reach net-zero greenhouse gas emissions by no later than 2050. The Plan provides indicative ranges of emissions reductions and associated actions for each sector of the economy. The accompanying Annex, published in December 2021, provides detailed implementation maps for actions, including specific timelines and clear lines of responsibility. Ireland's new climate legislation, the Climate Action and Low Carbon Development (Amendment) Act 2021, provides a significantly strengthened statutory framework to support delivery of our climate objectives, including providing the legal basis for our commitment to achieve climate neutral economy and society by 2050 at the latest and introduces a process for five-year carbon budgets and sectoral emissions ceilings.

5.3.1 The Impact of Covid-19 on Air Quality

The overall impact of the restrictions imposed in relation to the Covid-19 pandemic on air pollutant emissions has not yet been fully assessed. Indications point to a significant decrease of NO_x emissions from the transport sector, particularly in the early stages of the pandemic, when levels were down by up to 50% across several monitoring stations. However emissions from the residential sector may have increased as more people worked from home. The IIR projections for 2020 reflect the projected impact of Covid-19 on air pollutant emissions and the full impact will be available as part of the next IIR in 2022.

In relation to ambient air quality, the EPA report "[Ireland in the Pandemic – Environmental Observations](#)" and its [Air Quality in Ireland report in 2020](#) highlight that in the early months of restrictions, the levels of nitrogen dioxide at monitoring stations close to busy urban traffic routes dropped by up to half. This clearly shows the impact that levels of motorised traffic can have on the quality of the air in dense urban contexts in particular. It also shows that air pollutants come from a variety of sources.

The public response to Covid-19 has demonstrated the capacity and willingness to engage in rapid and profound behavioural change. The enduring experience has led to significant normative shifts in how we work, travel, and live. The changes that have occurred, if they continue, may have a lasting positive impact on air quality.

The extent to which these shifts in behaviour occur and the question as to whether they will lead to sustained shifts in behaviour over the longer term is uncertain.

6 Ireland's Clean Air Ambition

There are two key elements considered when we measure our air quality standards: the level of short-term localised emissions of pollutants (otherwise known as ambient air pollution), and our annual total emissions.

Ireland has already adopted legally binding and challenging EU targets to limit and reduce the overall levels of the five most polluting emissions to our air as part of the [NEC \(National Emissions Ceilings\) Directive](#). These commitments and our progress to date are summarised in Table 1. Substantial progress has been made to date in relation to our annual SO₂, NO_x and PM_{2.5} emissions; however significant challenges remain in relation to emissions of ammonia and NMVOCs.

Table 1: NECD Reduction Commitments for the 2020 and 2030 Periods relative to 2005

	SO ₂	NO _x	NMVOC	NH ₃	PM _{2.5}
Current reduction achieved (2005 - 2019)	-85%	-42%	-5%	+5%	-38%
EU Ceilings from 2020-2029	65%	49%	25%	1%	18%
EU Ceilings from 2030	85%	69%	32%	5%	41%

Each year we will review progress in reducing the annual emissions for each pollutant and identify priority areas for action. Ammonia is the key area of concern and achieving reductions in these emissions a key priority. How this will be achieved is discussed in more detail in the chapter on Agriculture. Additional measures must also be developed in relation to NMVOCs and this will be addressed in the Industry, Enterprise and Energy chapter.

We will continue to work towards achieving reductions beyond the annual EU emissions ceiling commitments in the coming years.

6.1 Ambient Air - Setting more ambitious targets

In 2019, Ireland was invited by the United Nations, the World Health Organisation, and the Climate and Clean Air Coalition to commit to implementing air quality and climate change policies that will achieve the World Health Organisation air quality guidelines.

Ambient air quality standards in Ireland are currently established through EU legislation, specifically the [Clean Air for Europe \(CAFE\) Directive \(2008/50/EC\)](#). However, WHO guideline values are more stringent for some pollutants, most notably particulate matter, as outlined in Tables 2 and 3 below.

Table 2: Ambient Air Quality Emission Standards and Guidelines

Pollutant	Averaging period	EU standard		WHO Guidelines (up to 2021)	
PM_{2.5} (Hourly)	One day			25µg/m ³	Not more than 3 days over limit by station per year
PM_{2.5}	Calendar year	25µg/m ³		10µg/m ³	Calendar year
PM₁₀ (Hourly)	One day	50µg/m ³	Not more than 35 days per year	50µg/m ³	Not more than 3 days over limit by station per year
PM₁₀	Calendar year	40µg/m ³		20µg/m ³	
Ozone (O₃)	Max daily 8 hour mean	120µg/m ³	Not more than 25 days per year, averaged over 3 years	100µg/m ³	
NO₂	One hour	200µg/m ³	Not more than 18 days per calendar year	200µg/m ³	
NO₂	Calendar year	40µg/m ³		40µg/m ³	

This Strategy now commits us to further cutting levels of the most damaging and dangerous pollutants to public health taking into consideration the new guideline limits recommended by the World Health Organisation in 2021. These new guidelines levels are set out in Table 3 below.

Table 3: New WHO Guideline levels¹

Pollutant	Averaging time	Interim target				AQG level
		1	2	3	4	
PM_{2.5}, µg/m³	Annual	35	25	15	10	5
	24-hour ^a	75	50	37.5	25	15
PM₁₀, µg/m³	Annual	70	50	30	20	15
	24-hour ^a	150	100	75	50	45
O₃, µg/m³	Peak season ^b	100	70	–	–	60
	8-hour ^a	160	120	–	–	100
NO₂, µg/m³	Annual	40	30	20	–	10
	24-hour ^a	120	50	–	–	25
SO₂, µg/m³	24-hour ^a	125	50	–	–	40
CO, mg/m³	24-hour ^a	7	–	–	–	4

^a 99th percentile (i.e. 3–4 exceedance days per year).

^b Average of daily maximum 8-hour mean O₃ concentration in the six consecutive months with the highest six-month running-average O₃ concentration.

The EU sets standards to avoid the build-up of excessive pollution concentrations under the CAFE Directive. As part of the European Green Deal, the EU is revising these standards, to align them more closely with the recommendations of the World Health Organization and to ensure improvements to overall EU legislation for clean air.

The Commission has published an Inception Impact Assessment, to guide the underpinning work to assess the impacts of a possible revision of the Ambient Air Quality Directives which is planned for 2022. The Department will be working closely with the Commission and the other member states to ensure that ambitious new limits are introduced and that sufficient supporting policies, measures and resources are available to ensure that we can achieve them.

¹ <https://apps.who.int/iris/handle/10665/345329>

Ireland's Air Quality



7 Ireland's Air Quality – Current status

Air quality in Ireland is generally good, and compares favourably with other European countries. Significant reductions in emissions of key pollutants have already been achieved through a range of policy measures and other developments.

Despite our generally clean air however, air pollution is still a contributory factor in approximately 1,400 premature deaths per year in Ireland, and there are localised areas of concern. In particular, there are three key issues that we need to deal with:

- Particulate Matter (PM_{2.5} and PM₁₀) – associated mainly with residential burning of solid fuel;
- Nitrogen Oxides (NO_x) – associated mainly with transport in urban areas;
- Ammonia (NH₃) – associated mainly with agriculture.

7.1 Emissions Ceilings

A key contributor to achieving better ambient air quality is ensuring we reduce our overall emissions. Directive 2001/81/EC on national emission ceilings for certain atmospheric pollutants (called the 'National Emissions Ceilings Directive' or the 'NEC Directive') set the first national emission reduction commitments for Member States and the EU for four important air pollutants:

- nitrogen oxides;
- non-methane volatile organic compounds (NMVOC);
- sulphur dioxide;
- ammonia.

As a result, since 2010, there has been an annual cap or 'ceiling' on total annual emissions of specific pollutants which EU Member States must not breach. The revised NEC Directive (2016/2284/EU) as well as other EU directives subsequently set reduction commitments for particulate matter and other air pollutants to be achieved by 2020 and 2030. The NEC directive also requires Member States to draw up, adopt and implement the NAPCP to show the pathway to compliance for the emissions ceilings in accordance with the Directive.

The NAPCP is a technical document which sets out the key policies and strategies that impact upon air quality in Ireland. It details our current air pollutant emissions (for five key pollutants) and our projected future emissions in relation to the key EU target levels. Ireland submitted [its first NAPCP](#) in 2019 and an update to the programme was submitted to the EU in February 2021. A [public consultation](#) was held between December 2020 and January

2021 to inform this update. [The report](#) has drawn on a selection of recommendations from the consultation along with cross government policy and measures to outline Ireland's pathway to compliance.

There are a number of other air pollutants which we continue to monitor as outlined in Table 3 and a detailed account of annual emissions levels by source and sector can be found in the EPA's [Informative Inventory Report](#), as set out in the requirements of the NEC Directive.

Table 4: Monitored air pollutants emissions by pollutant type

Main Pollutants (NECD)	Particulate Matter	Priority Metals	Other Metals	Persistent Organic Pollutants
Nitrogen oxides (NO_x) Ammonia (NH₃) Fine Particulate matter (PM_{2.5}) Non-methane volatile organic compounds (NMVOCs) Sulphur dioxide (SO₂)	Particulate Matter <10 µm Diameter (PM ₁₀) Particulate Matter <2.5 µm Diameter (PM _{2.5}) Total Suspended Particulates (TSP) Black Carbon (BC)	Lead (Pb) Cadmium (Cd) Mercury (Hg)	Arsenic (As) Chromium (Cr) Copper (Cu) Nickel (Ni) Selenium (Se) Zinc (Zn)	Dioxins and Furans (PCDD/F) Hexachlorobenzene (HCB) Polychlorinated Biphenyls (PCBs) Polycyclic Aromatic Hydrocarbons (PAHs)

While we continue to monitor and ensure progress in terms of reducing all the pollutants outlined above, the main air pollutants that are the key drivers for the Clean Air Strategy are those governed by the NECD as set out in Table 4. These pollutants originate from a number of sources across the State as illustrated in Figure 4 and each of the pollutants will be discussed in more detail below.

Figure 4: Key sources of pollutant emissions (Source EEA Commission)



7.2 Ambient Air Quality

Prior to 2019, Ireland had not recorded any breaches of EU limit values for ambient air quality since limits were first introduced in 2009. However, as more comprehensive real-time localised air quality information becomes available, it indicates that there are some areas of poor air quality across the country and key pollutants which will need to be addressed more comprehensively. The levels of particulate matter are of concern and in our larger urban areas we potentially face further exceedances of nitrogen dioxide limit values unless we tackle emissions from transport.

The EPA, as the Competent Authority for implementation of monitoring, modelling and reporting under the EU CAFE Directive, is responsible for monitoring ambient air quality in

Ireland and has expanded the national ambient air quality monitoring network via the national Ambient Air Quality Monitoring Programme (AAMP). Under this programme the national monitoring network has undergone a significant upgrade and expansion in recent years and has been expanded from 29 stations in 2017 to 97 (January, 2022). Monitoring stations collect air quality data for a range of pollutants in order to provide information to the public with stations providing data for assessment against European legal limit values and WHO guideline values.

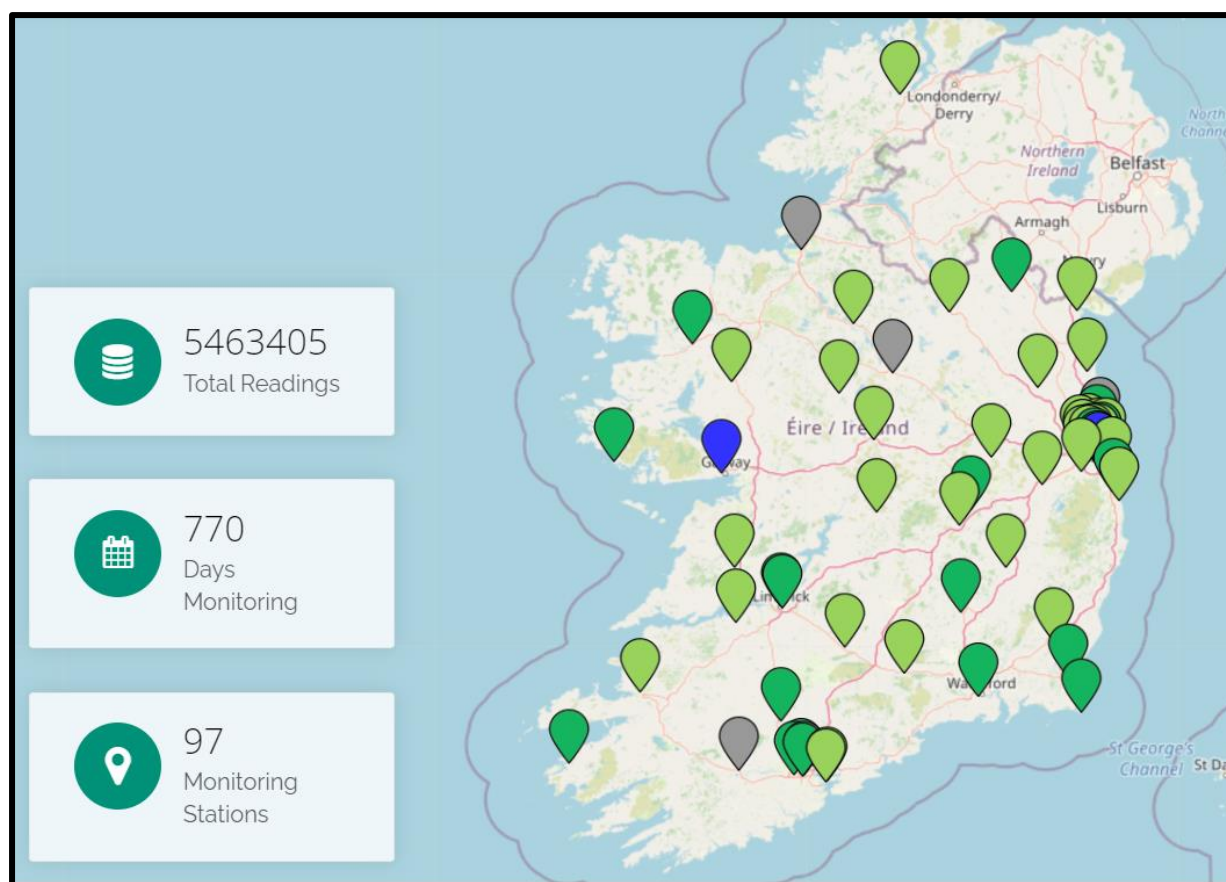
The monitoring and modelling provided through the AAMP indicate some areas of concern in relation to the levels of nitrogen dioxide and particulate matter at certain locations around the country. Given our ambition to set more stringent ambient air quality limits from 2025 onwards, we must address these observed trends when assessing air quality against the WHO guideline levels.

Table 5: Ambient air pollutants measured in 2020 with regard to EU, WHO and EEA limits
(Source, EPA 2021)

Pollutant	No of stations where monitored in 2020	EU Legal Limit exceeded 2020	No of stations where WHO/ EEA Guideline Limits exceeded (2020)
PM_{2.5}	64	0	Above annual value at 9 stations. Above daily value at 34 stations.
PM₁₀	67	0	Above annual value at 1 station. Above daily value at 14 stations.
NO₂	27	0	0
Ozone	18	0	17
SO₂	14	0	3
PAH	5	0	4
Dioxins²	22	0	N/A

² Dioxins monitoring is not carried out at monitoring stations but taken as samples in milk from selected creameries across Ireland

Image 1: Air Quality Online (EPA, January 2022)



7.3 Nitrogen Oxides (NO_x)

Nitrogen oxides (NO_x) are a group of gases that are predominantly formed during the combustion of all fuels or when nitrogen reacts with other gases present in the air.

Overall, NO_x emissions in Ireland have dropped by 41.62% between 2005 and 2019, from 167.92kt to 98.03kt, and Ireland has achieved its 2010 NO_x annual emissions ceilings target each year since 2011³.

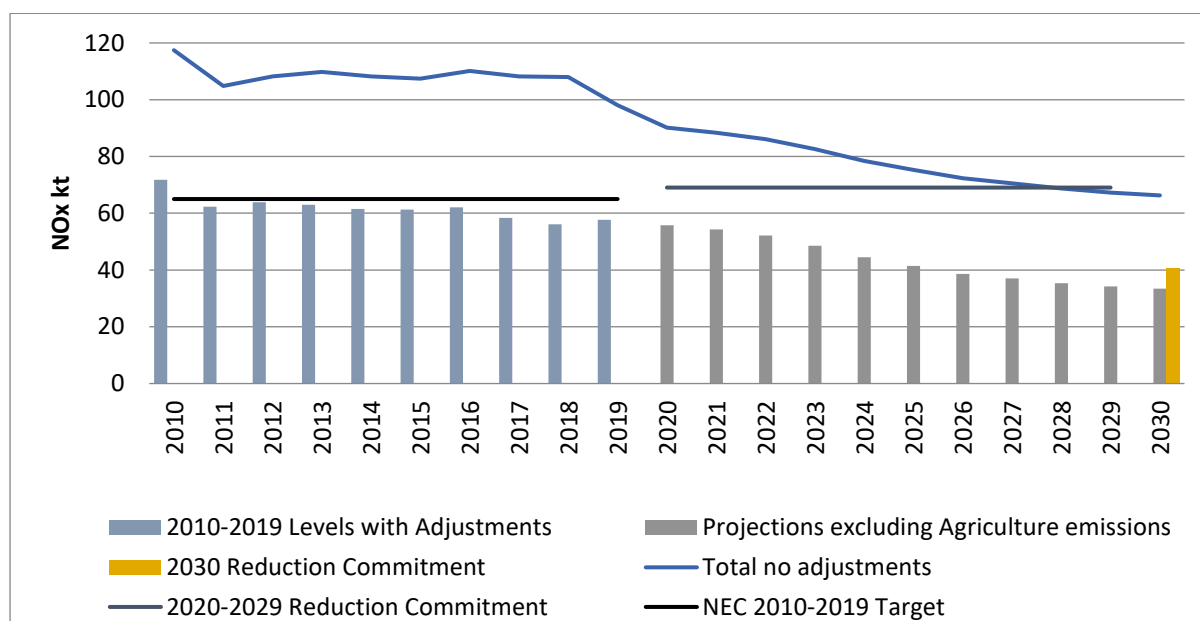
The transport sector is the largest contributor to NO_x emissions, accounting for 38.6% (37.87kt) of total NO_x emissions in 2019. Meanwhile, agricultural sources accounted for 34.4% (33.75kt). The largest sources of NO_x within agriculture are from inorganic fertiliser application, and urine and dung deposited by grazing animals.

The most recent projections (fuel used, EPA 2021) indicate that Ireland will remain in compliance with the NEC Directive targets in the with additional measures scenario and is

³ when certain adjustments and flexibilities are applied as permitted under the NEC Directive for assessment purposes. These are outlined in much greater detail in the NAPCP.

expected to continue to reduce emissions and achieve compliance with the revised 2030 target when adjustments are applied, as outlined in Figure 5.

Figure 5: NO_x Inventory, Projections (WAM) compliance with NECD Obligations (EPA, 2021)



7.3.1 Nitrogen Oxides in the Ambient Air

In 2019, there was an official monitored exceedance of the annual average EU limit for NO₂ at the St. John's Road West monitoring station in Dublin. The average annual concentration measured was 43µg/m³, in breach of the EU limit of 40µg/m³. This was as a result of heavy traffic in the area.

This exceedance has been reported to the European Commission, and in order to address the issues an [Air Quality Action Plan](#) was developed by the four Dublin local authorities supported by the EPA, this Department, the Department of Transport and the UTRAP group.

The report was submitted to the Commission in December 2021 and is currently being reviewed.

The relevant data shows no exceedance for 2020.

7.4 Sulphur Dioxide (SO₂)

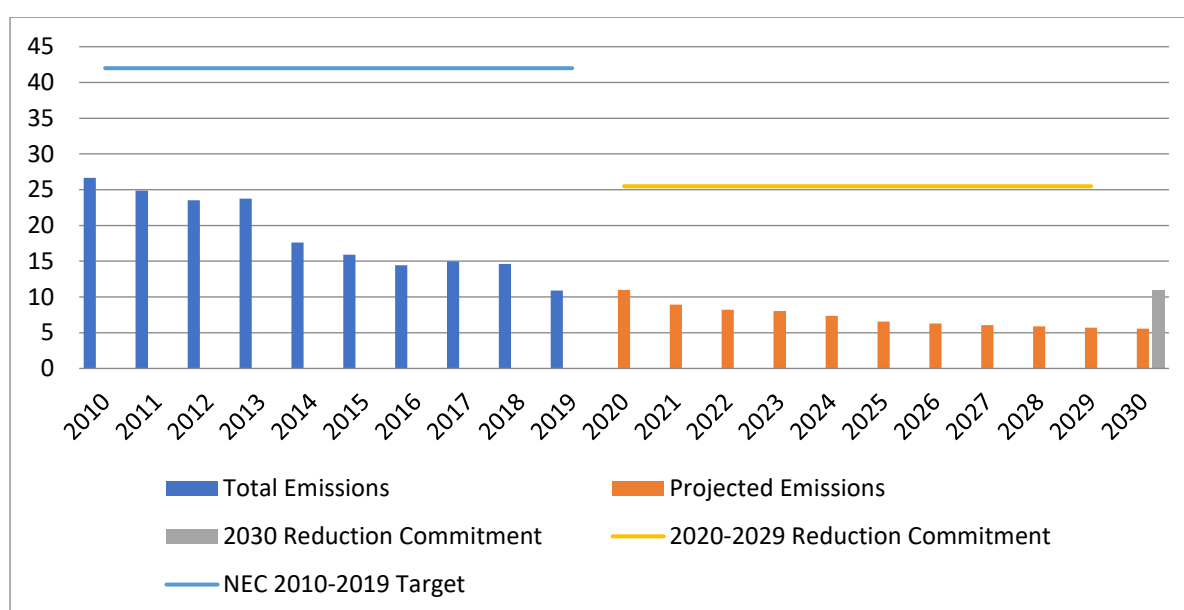
Sulphur dioxide (SO₂) is an inorganic compound, and is a heavy, pungent, colourless, hazardous gas. It can occur in nature as a result of volcanic emissions and it can also be formed by the burning of fuels containing sulphur. Sulphur dioxide emissions can cause acid deposition, can damage ecosystems and vegetation, and can be harmful to human health.

In Ireland, there has been an 85% reduction in emissions between 2005 and 2019, from 72.80kt to 10.87kt. Fuel switching in the power generation and industrial sectors has aided the achievement of such a dramatic drop in sulphur dioxide emissions. Reductions in the sulphur content of fuel oil, gas oil, diesel and gasoline and coal, in conjunction with a decrease in coal and peat use for power generation and heating in Irish homes, have helped to reduce emissions levels.

The commercial/residential and institutional sectors accounted for 62.1% (6.75kt) of the 2019 total while the public electricity and heat production sector contributed 20.6% (2.24kt). The manufacturing industries and construction sector accounted for 13.4% (1.45kt) of total emissions the same year.

Ireland's emissions ceiling target for Sulphur Dioxide (SO₂) from 2010 to 2019 is 42kt, which has been achieved every year since 2010. Current trajectories do not envisage any issue before the 2030 targets take effect, as outlined in Figure 6.

Figure 6: 2020 Inventory, Projections (WAM) and NECD Obligation – SO₂ in kt (based on EPA, 2020)



7.4.1 Sulphur Dioxide in the Ambient Air

Ireland does not exceed the EU limit values for SO₂ at any of the monitoring stations across the State. However, in 2020, there were three stations where SO₂ was above the more stringent WHO guideline value. Like with PM, localised emissions of SO₂ are primarily as a result of the burning of solid fuel in residential properties. The introduction of legislation setting sulphur standards for certain solid fuels had ensured that localised SO₂ emissions were not an area of concern until recently. However there is data emerging from a small

number of stations which indicates that sulphur emissions may be increasing, which may be linked to instances of non-compliance with the solid fuel regulations.

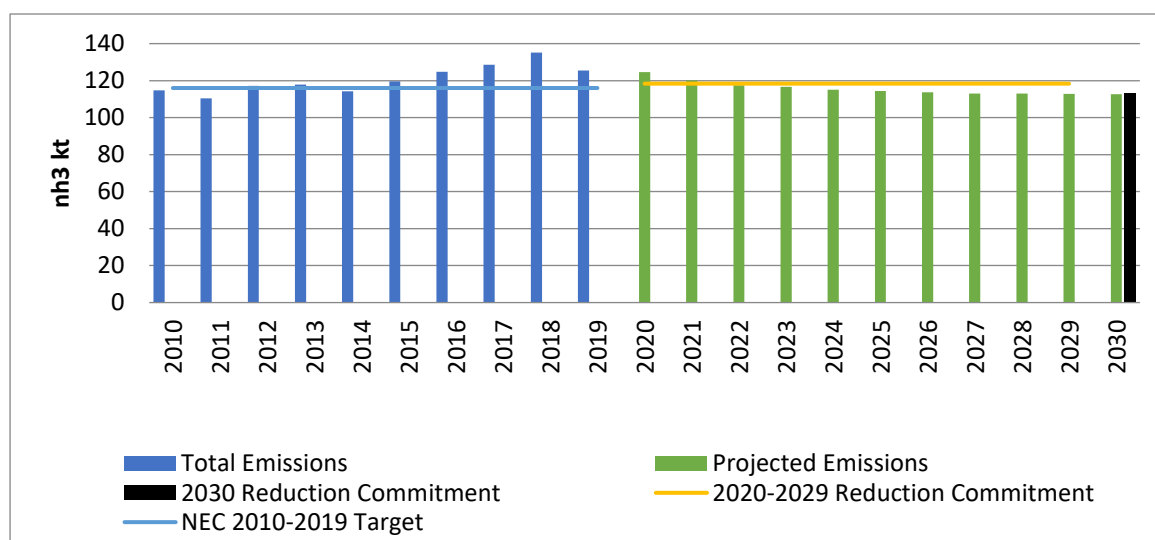
7.5 Ammonia (NH₃)

Ammonia is a gas that is emitted into the atmosphere and then either deposited back onto land or converted to secondary PM through reactions in the atmosphere. Agriculture is responsible for over 99% per cent of all ammonia emissions within the State. It is emitted in animal housing during manure storage and is also emitted by spreading of manures, slurries and fertilisers.

Livestock production has historically generated the majority of national ammonia emissions. While there was some decline in emissions in the period 2000 to 2011, the agriculture sector has expanded and intensified in recent years following the abolition of milk quotas, putting upward pressure on ammonia emissions.

Ammonia emissions have increased from 119.56kt in 2005 to 125.4kt by 2019 and Ireland has only been in compliance with the 2010 ammonia emissions ceiling of 116kt for three years since 2010. However, while emissions in 2019 were also above the 2010 limit, there was a reduction when compared against 2018 levels. This was the first year-on-year decrease observed since 2014, and it had the effect of returning levels to below those observed in 2016. However, given the gap to our 2020 target, there is an immediate requirement for continued focus on the increased implementation of abatement measures.

Figure 7: 2020 Inventory, Projections (WAM) and NECD Obligation – NH₃ in kt (based on EPA, 2021)



A continued increase in the size of the national herd and sustained high levels of synthetic nitrogen fertiliser application has contributed to a rise in emissions, and without adequate abatement measures being in place, this has resulted in Ireland breaching the NEC ceiling.

In September 2020, [a new ammonia MACC](#) was produced by Teagasc. This identified the key measures required to be implemented at farm level to ensure the necessary ammonia reductions are achieved. These have been included in the Roadmap towards Climate Neutrality, “[Ag-Climatise](#)”, which was published by the Department of Agriculture, Food and the Marine in December 2020. These new policy developments set out a pathway for compliance, which is discussed in greater detail in the Agriculture chapter.

The most recent IIR projections show that under the “With Additional Measures (WAM)” scenario, ammonia emissions in Ireland are expected to fall below the NEC Directive reduction commitments for 2020 by 2022 and the 2030 target is projected to be achieved, as illustrated in Figure 7.

7.5.1 Ammonia in the Ambient Air

The impacts of ammonia emissions on ambient air are significant. After ammonia is emitted to the air, it can be deposited on nearby vegetation which can cause substantial damage to sensitive species and habitats through acidification and eutrophication.

In addition to this direct effect, ammonia can also react with other pollutants in the air such as NO_x and SO₂ to form secondary particulate matter. These particles are reasonably stable in the atmosphere so they can be transported over significant distances, creating a regional problem rather than a localised one. The contribution of ammonia to particulate matter formation is not well characterised in Ireland and further research is required in this area. However, European studies have shown that in some areas, at particular times of the year, more than 50% of particulate matter is a result of reactions in the atmosphere involving ammonia.

7.6 Particulate Matter

Particulate matter refers to both solid and liquid particles, organic and inorganic, which are suspended in the air. It involves a complex mixture of particles which can vary in size and can consist of a variety of components such as pollen, metals, acids, sea salt, soot, smoke, soil, and dust.

Emissions of particulate matter of up to 10µm (PM₁₀) amounted to 27.69kt in 2019. This is a reduction of 41.7% from 1990 levels. The main source of PM₁₀ emissions is agriculture, which accounted for a 31.8% share of the national total in 2019, with combustion in the

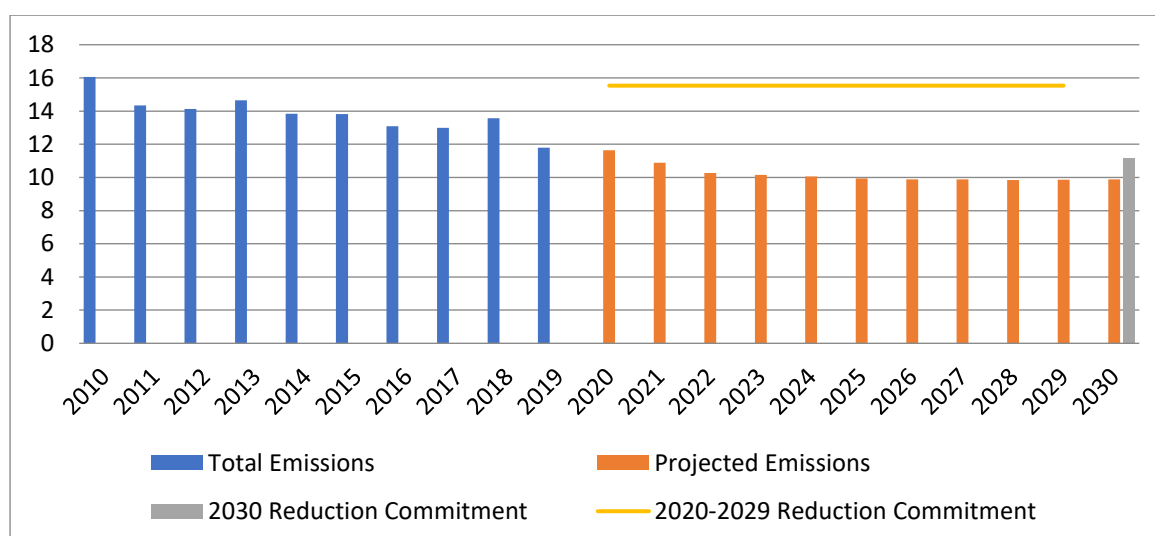
combined sectors of residential and commercial/institutional⁴ accounting for an additional 24.7% share of the total.

National PM_{2.5} emissions in 2019 amounted to 11.79kt, which is a 37.76% reduction from the 2005 baseline figure of 18.94kt. The dominant source of PM_{2.5} is residential solid fuel combustion which represents a 55.27% share of the total national PM_{2.5} emissions in 2019. There has been a reduction of 29.38% in emissions from this sector between 2005 and 2019.

Reduced use of coal and peat, with increased use of gas oil, kerosene and natural gas in the commercial and residential sectors has resulted in a reduction in the contribution to the national total.

The latest projections predict Ireland will be in compliance with the annual emissions target for PM_{2.5} for 2020. Future levels of PM₁₀ are not currently projected but are expected to fall in line with levels of PM_{2.5} as outlined in Figure 8.

Figure 8: 2020 Inventory, Projections (WAM) and NECD Obligation – PM_{2.5} in kt (based on EPA, 2020)



7.6.1 Particulate Matter in the Ambient Air

Ireland has not exceeded the EU limit values for PM_{2.5} or PM₁₀ at any of the monitoring stations across the State. However, data from the expanded monitoring network indicates that there are a number of locations where particulate matter levels in the ambient air are a cause for concern, especially when compared to the 2005 WHO standards. Each year as the station numbers increase, we also see an increase in the number of events where emissions

⁴ These two sectors are combined in IIR so are reported together here for consistency

are above the WHO guideline values. These instances have been predominantly linked to the burning of solid fuel in residential properties.

7.7 Non-Methane Volatile Organic Compounds (NMVOCs)

Non-Methane Volatile Organic Compounds (NMVOCs) are a collection of organic compounds that differ widely in their chemical composition but display similar behaviour in the atmosphere. NMVOCs emissions are linked to paint and solvent use, the production of food and spirits, agriculture and transport. NMVOCs can have direct and damaging impacts on human health and also contribute to the formation of ground-level ozone, causing respiratory and cardiovascular problems.

Total NMVOC emissions have decreased by 5.28% since 2005, from 120.09kt to 113.75kt in 2019. The agriculture sector is the single largest contributor to NMVOC emissions, accounting for 40% (45.46kt) of the total in 2019. The food and beverage industry contributed 25.7% (29.27kt) of total emissions in 2019. Significantly, this is an increase of 114% from its 2005 level of 13.67kt.

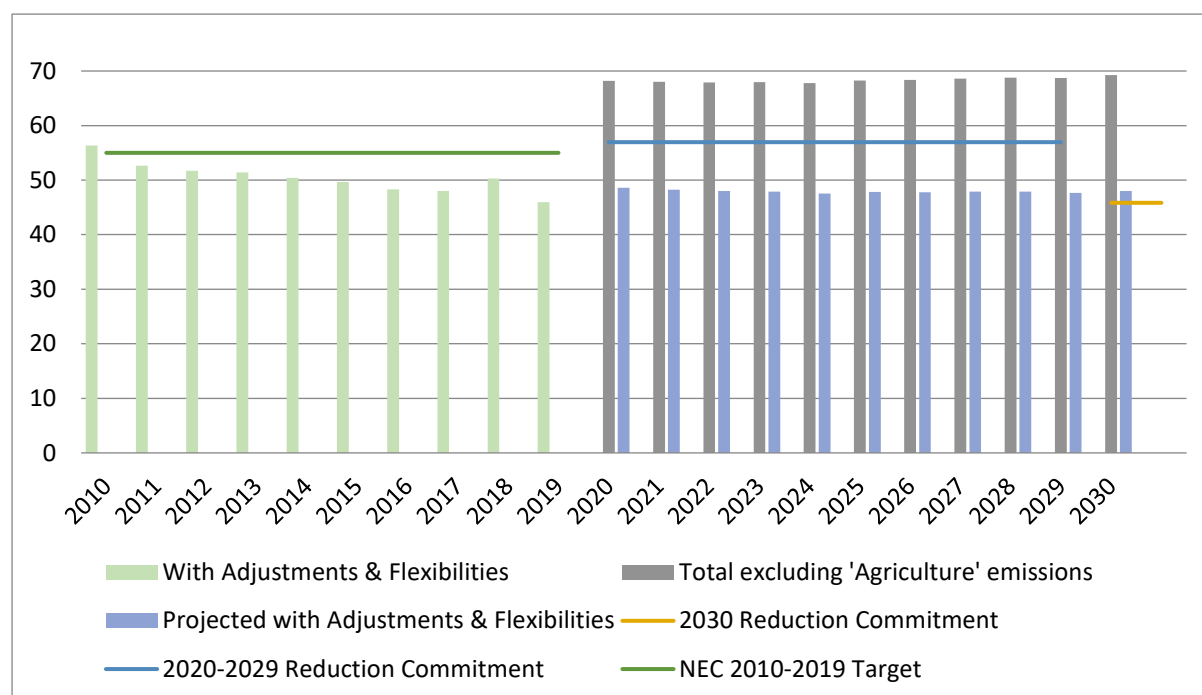
The combined solvents and fugitive emissions from oil sectors emissions produced 19.7% (22.45kt) of total NMVOC emissions in 2019. Other sources were combustion in the residential and commercial/institutional sectors (7.3%, 8.28kt) and emissions from motor vehicles (3.5%, 4.01kt)

The EU National Emissions Ceilings (NEC) Directive has set a target of 55kt of NMVOC emissions for 2010 to 2019, equivalent to a 62.2% reduction from the 1990 baseline figure. Article 4(3) of the NEC Directive provides that emissions of NMVOCs from manure management and agricultural soils are not included for the purposes of complying with 2020 and 2030 targets. Taking account of allowable adjustments, Ireland was in compliance for the period 2011 to 2019.

The most recent EPA projections indicate that we will also be in compliance with our 2020 ceiling limits if adjustments are approved, however achieving our 2030 limit will be more challenging. The overall projections are for a slight increase in emission levels between now and 2030. While currently this is expected to impact on our ability to comply with our 2030 emissions ceiling commitments, we will continue to work with colleagues across Government to move towards reductions in these sectors in the coming years.

As a first step, the Department will commission a research project to better understand emissions profile across all sectors and develop proposed actions to achieve increased reductions.

Figure 9: Inventory, Projections (WAM) and NECD Obligation – Adjusted NMVOC in kt (based on EPA, 2021)



Residential



8 Residential

8.1 State of Play

The built environment sector is a significant source of annual emissions of SO₂, NMVOC and PM_{2.5}. Between 1990 and 2019 the sector has achieved an 82.2% reduction in SO₂, a 72% reduction in NMVOC, and a 73% reduction in PM_{2.5}. This change has been heavily influenced by shifts away from coal and peat use, toward better heating choices and cleaner fuels at our power stations and in our homes.

Combustion in the residential sector is one of the principal sources of these emissions, contributing 60% of SO₂ emissions, 30% of CO emissions and 55% of PM_{2.5} in 2019. This sector also contributes 42% of Pb and 26% of Hg emissions in 2019. This sector is also one of the principal sources of emissions of Dioxins and PAHs, contributing 69% and 90% respectively in 2019.

Significant fuel switching has been seen in the residential sector since 1990. A 72% reduction in the use of coal and a 75% reduction in use of peat (75%), combined with significant increased use of liquid fuels such as gas oil and kerosene (up by 200%), natural gas (up 404%) and renewables (up 62%) in these sectors has resulted in significant decreases in emissions since 1990.

Improvements in this area have been achieved through a strategic approach to the built environment sector focusing upon energy management, energy efficiency, encouraging the use of less polluting fuels and better regulation. Some examples of the specific measures and actions that have been implemented to date are outlined below.

8.1.1 Building Energy Ratings (BER)

The Building Energy Rating (BER) system and associated energy labelling encourages and enables consumers to make more informed decisions about the energy efficiency of their homes. As of April 2021, over one million homes in Ireland have had their energy performance assessed and have received a BER certificate.

8.1.2 Grant Schemes

In parallel with the BER system, a range of grant schemes focusing on improving residential energy efficiency has been introduced. These schemes, funded by DECC and administered by the SEAI include partial grants for homeowners, supports for community energy efficiency projects, and free energy upgrades for lower income households. Since 2009, SEAI has

provided over €600 million in grant support towards energy upgrades in over 450,000 homes.

8.1.3 Solid Fuel Regulation

Bituminous coal has been regulated in specific Low Smoke Zones (LSZ) since the first zone came into effect in Dublin in 1990. It has proven very successful in reducing air pollution in Dublin, with research indicating it has resulted in up to 350 fewer annual premature mortalities in the capital. This policy has been recognised internationally as an effective air policy intervention and served as a precursor to considerable improvements in urban air quality and observed health impacts.

The current solid fuel regulations prohibit the marketing, sale, distribution and burning of specified solid fuels in all towns in the country with populations greater than 10,000⁵ people. This encompasses approximately 50% of all residents of the State.

8.2 The Challenge

The annual EPA Air Quality Reports have for a number of years highlighted that the main source of the smaller and more dangerous PM_{2.5} particles is solid fuel burning for home heating. This demonstrates how the choices we make in heating our homes can have a large bearing on our own health and that of the communities in which we live. Emissions from solid fuel use (coal, peat and wet wood) contribute to localised high levels of particulate matter, PAH and other pollutants during the heating season. While we continue to meet EU ambient air quality targets based on the evidence from the monitoring network, the more stringent WHO guidelines for PM₁₀ and PM_{2.5} which are mainly associated with residential solid fuel burning warrant additional action.

The levels of particulate matter in the air are of concern, especially during the winter months when residential solid fuel burning can directly impact on air quality and on our health. The main health effects of this type of air pollution include stroke, heart disease, lung cancer, and both chronic and acute respiratory diseases, including asthma. These conditions can lead to premature mortality as well as sickness and ill health.

8.2.1 Enforcement Challenge

A key enforcement challenge associated with the current Low Smoke Zone approach is the movement of fuel from areas outside Low Smoke Zones into regulated areas and townlands, for personal use and, in some circumstances, for unauthorised sale. The prohibition on such

⁵ according to the 2016 Census

movement of fuel is difficult to enforce and adversely impacts upon retailers appropriately adhering to the regulations.

There is concern that poor enforcement is contributing to increased illicit trade in solid fuels, which in turn is distorting the market and adversely impacting on the environmental and health benefits which the Regulations are designed to achieve.

The EPA Local Authority Environmental Enforcement - Activity Report (2020) points to low levels of air quality enforcement and recommends that Local Authorities review the level of resources being allocated to this activity. Measures proposed to address these issues are detailed in the Enforcement chapter of this Strategy.

8.3 Measures to Deliver Results

The WHO recommends that we progressively reduce public exposure to particulate matter as well as highlighting the co-benefits of reducing [residential heating emissions](#). The energy efficiency and energy transition measures captured in the Climate Action Plan, NAPCP and 2021 EPA projections are designed to deliver on national and international air quality obligations, recommendations and commitments.

These measures are aimed at protecting human health, the environment and the climate by phasing out the most polluting fuels used for residential heating in Ireland and supporting a transition to less polluting fuels.

8.3.1 Home Energy Efficiency

A reduction in the amount of heating required in our homes will be delivered through improved energy efficiency. There is a link between the causes of harmful PM and climate change. The Climate Action Plan (CAP) sets a goal of achieving 600,000 heat pump installations by 2030. This includes a target in the National Retrofit Plan, to install 400,000 heat pumps in existing premises to replace older, less efficient heating systems. The Plan also aims to achieve the equivalent of 500,000 homes retrofitted to a Building Energy Rating of B2/ cost optimal or carbon equivalent by end-2030. These targets represent a very significant increase in both the volume and depth of retrofit activity in Ireland.

These two measures combined will deliver a greater reduction in energy demand from the built environment, and will serve to both decarbonise and clean emissions from the sector. Whilst the CAP has a carbon focus on displacing oil users, it is also recognised that targeting homes using solid fuel for both retrofit and heat pump installation can offer a valuable dividend in terms of air, climate and Just Transition outcomes.

The measures already in place will also lead to an improvement in our ambient air quality and our ability to reach our commitment in relation to the WHO standards, but further action is required to ensure future compliance and greater improvements to the air we breathe.

8.3.2 Building Regulations

Part L of the National Building regulations sets the requirements for the energy performance of buildings. These requirements have increased significantly over the past number of years and the most recent update to the regulations (SI 183/2019) set minimum requirements for new and substantially renovated dwellings which are estimated to reduce carbon dioxide emissions by 70% compared to 2005 (Nearly Zero Energy Building (NZEB) Standard) and requires those undergoing major renovation to achieve a B2 equivalent BER. These will be progressively extended to improve energy efficiency performance. Already the regulations have resulted in a significant increase in the use of heat pumps for main space heating and the effective elimination of solid fuel use as a primary heating system in new homes.

8.3.3 Ecodesign stoves

In 2022 the new EU Ecodesign Directive came into force, which means that all new stoves need to meet the agreed emission standards to raise the standard of new appliances across the country. The primary purpose of the Ecodesign Directive is to reduce particle emissions, lower carbon monoxide emissions and improve efficiency levels through better fuel standards and sustainability.

A number of stoves on the market in recent years already complied with these standards. While moving to these appliances may support a transition to cleaner ways to heat our homes, the broader regulation of solid fuels will support the 'in use' real world air quality benefits they deliver.

8.3.4 New Solid Fuel Regulations

The current solid fuel regulations have been very successful in reducing air pollution within Low Smoke Zones and encouraging a move from the most polluting solid fuels to cleaner options.

However in order to achieve our ambitions in relation to improvements in health and meeting WHO guidelines for ambient air quality, further action must be taken. Now is the time to proceed with a more comprehensive regulation of solid fuels so that the benefits can reach every part of our country.

A public consultation was held between 18 February and 2 April 2021 on the development of new legislation to regulate to a broader extent the use of solid fuels in the residential sector, and prohibit the sale of the most polluting fuels. This consultation was designed to elicit views on a range of matters including:

- assessing the merit of a national approach,
- gathering evidence to inform the development of regulations,
- determining what solid fuels should be regulated,
- understanding how solid fuels should be regulated,
- setting out an appropriate timeline for implementation of any new regulations, and
- allowing a better understanding of behaviour, culture and experience in relation to solid fuel use.

This consultation process provided an opportunity for all stakeholders such as householders, retailers, producers, NGOs and industry to provide input into the development of new and more comprehensive regulation in this area, and the introduction of measures to support householders to transition from the most polluting fuels to cleaner alternatives.

The consultation received just over 3,500 responses through a combination of an online public survey, a more detailed online technical questionnaire, email, and post. All details of the consultation can be found [here](#).

8.3.5 New solid fuel standards

There was a wide variety of submissions to the consultation regarding suggested regulatory approaches for solid fuels. The responses ranged from no regulation on any solid fuel to a complete ban on all solid fuels. The scope of responses is illustrated further in the [consultation summary document](#). Ultimately there was a broad consensus that the regulations should prioritise the most polluting fuels, including bituminous coal, peat and wet wood.

While there have been calls for an immediate ban on all solid fuels, it needs to be recognised that a portion of households remain reliant on burning solid fuels to heat their homes. While the pace of retrofitting and appliance upgrades is increasing, it will take time for all households to remove dependency on solid fuels. The Department is also committed to a Just Transition and is cognisant of the impact a full ban would have on those experiencing fuel poverty and workers employed in the solid fuel industry. A more prudent phased approach to reducing solid fuel use is the preferred policy option.

This allows regulation of the most polluting fuels to be prioritised while still providing options for people largely reliant upon solid fuels for their heating needs until they can transition to more sustainable, cleaner heating systems.

Having considered the submissions from the public consultation, a framework for legislation was developed and draft regulations are being finalised. Revised registration, certification and labelling systems are also being developed to enhance enforcement, ensure that approved products are of the highest quality, and to provide reassurance to consumers regarding the standard of the product they are purchasing.

8.3.5.1 Coal and Manufactured Solid Fuels

In line with the Programme for Government, this Strategy affirms that the benefits that have already been brought to our cities and towns through the current regulation of solid fuels will be extended nationwide.

The purpose of new and enhanced regulation in this area is to introduce minimum product standards for solid fuels through a suite of measures which will ensure only the least polluting residential solid fuels will be available for sale.

The measures that will be taken will serve to protect human health and the environment, and are consistent with our climate commitment of phasing out the most polluting fuels. We need to transition from an over-reliance on coal products towards less polluting alternatives and ultimately a transition to low carbon, low air pollutant fuels.

As such, from September 2022 coal, coal-based products, and any manufactured solid fuel or peat briquettes will be required to have a smoke emission rate of less than 10g/hour, reducing to 5g/hr by 2025. It is not proposed to make any changes to the smoke emission rate for biomass products (that contain coal), as this is already set at 5g/hr. The permissible sulphur content for all fuels will be reduced from 2% to 1%.

8.3.5.2 Wood

Burning wood with a high moisture content (i.e. wet wood) produces more smoke than burning dry wood, as the moisture content of wood has an impact on the combustion temperature. As a result, burning wet wood results in significantly increased smoke emissions than those produced when seasoned or dry wood is burned. Burning wood with high moisture content also significantly reduces the heat output and increases the risks of chimney fires. In order to improve the quality of wood fuel for consumers and reduce harmful emissions, minimum product standards for wood will be introduced.

Wood sold in single units under 2m³ will be required to have a moisture content of 25% or less (moving to 20% within 4 years) and wet wood sold over these volumes will be required to come with instructions for the purchaser on how to dry this wood. This measure will capture bags of wood typically sold by retailers such as garage forecourts, supermarkets and local shops, to consumers purchasing logs for convenience and immediate use. It will still provide householders, particularly in rural areas, with the option of seasoning wet wood at home by following the appropriate advice.

8.3.5.3 Sod Peat

The contribution of peat to fine particulate matter levels can be considerable, particularly in areas such as the midlands where peat extraction occurs. Sod peat is comparatively low in energy, is not convenient to handle and leaves significant ash residues. It is primarily a rural fuel, used where peat bogs are a local and traditional source of energy, and in many cases is harvested directly by the homeowner solely for their own use. However there is increasing evidence which indicates that sod peat is being traded through the 'grey market' and is being used in urban settings where it has a greater impact on air quality than in rural areas.

The National Peatlands Strategy acknowledges the tradition of burning peat in Ireland but also recognises that the associated emissions to the air contain a range of pollutants. Recent EPA research also shows that the contribution of peat to air pollution levels is significant.

Turf cutting by citizens for use in their own homes is a traditional activity across many peatlands. Measures are required to reduce the emissions associated with burning peat but which respect these traditions.

Due to the nature of sod peat usage, a different regulatory approach is required. In order to accommodate those with rights to harvest sod peat, no ban on its burning will be introduced, but a regulatory provision will be made to prohibit the marketing, sale or distribution of sod peat. This approach will facilitate those with turbary rights to continue to cut and burn sod peat for their own domestic purposes, while also reducing the use of sod peat in urban areas.

8.3.6 Supporting Measures

Alongside these new regulations, the Department will be initiating a significant education and awareness campaign commencing in 2022, which will focus on the key messages required to encourage people to reduce burning, burn better fuels and burn properly.

In order to support a transition away from the use of high polluting fuels the Department will continue to promote and encourage the removal of solid fuel heating systems through its national retrofit schemes. It will be particularly important to target measures and incentivise action in communities where air quality is adversely impacted most frequently.

8.3.6.1 Energy Poverty and Just Transition

A review of the implementation of the Strategy to Combat Energy Poverty will be completed this year and will inform the next steps in the development of a new strategy. Alleviating energy poverty is also a key consideration for the National Retrofit Plan .

The Programme for Government has committed to legislate to pledge all additional carbon tax revenue into a Climate Action Fund. Among other priorities, this Fund will be used to: ensure that increases in the carbon tax are progressive by spending €3 billion on targeted social welfare and other initiatives to prevent fuel poverty and ensure a just transition; and to provide €5 billion to part fund a socially progressive national retrofitting programme targeting all homes, but with a particular emphasis on the Midlands region and on social and low-income tenancies.

The Just Transition Fund will also help regions that face significant difficulties in the local labour market from the phasing out of peat and coal for electricity generation and will assist those regions in the transition to a low carbon emissions economy. Up to €84.5 million from the Fund is to be made available for specific projects by businesses, local authorities and communities.

8.3.7 Next Steps

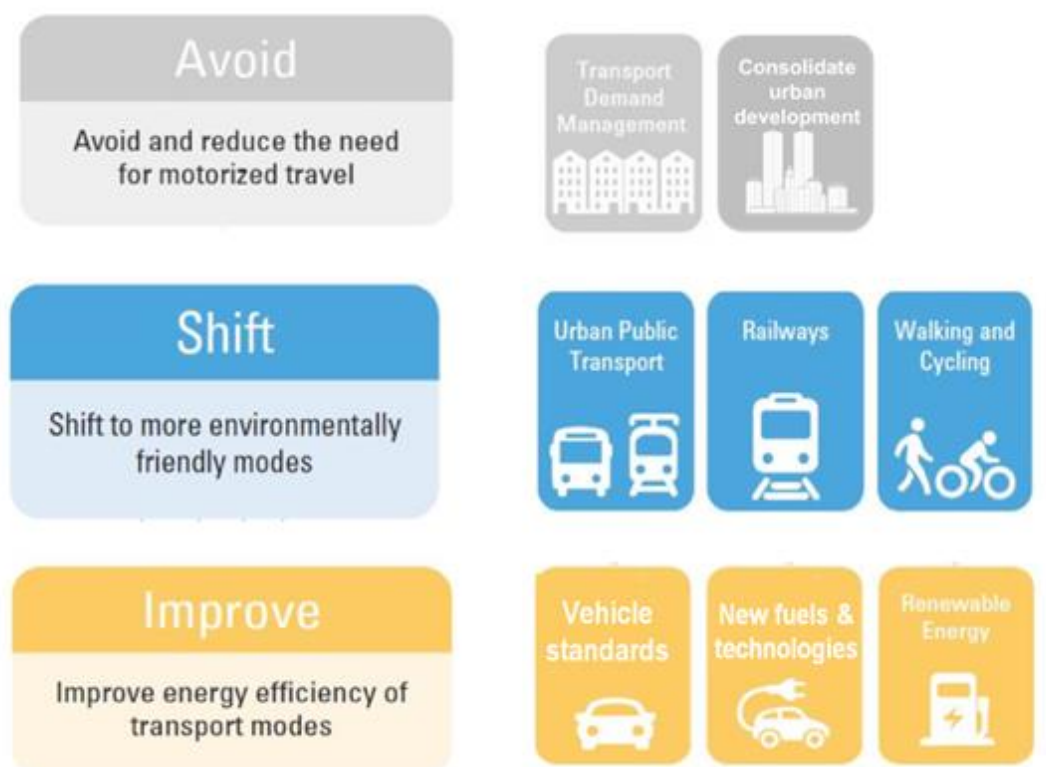
In the coming months the Department will be working through the key stages in the development and implementation of the new regulations which will be brought before Government in early 2022. The new fuel standards will be in place in time for the 2022 heating season. Market suppliers and consumers should begin to prepare for and adapt immediately for the fuel quality measures outlined above.

Transport



9 Transport

Transport is a key enabler of our society and economy, and ensuring that it is efficient, sustainable and integrated is a key component of Government policy. Through the Climate Action Plan 2021, electric vehicle and sustainable mobility strategies, the Government has defined the pathways to achieving more sustainable modes of travel and to maximising the air quality, carbon reduction and the environmental benefits this will bring. Over the coming decade, a greater focus will be placed on reducing the number of journeys, transitioning to cleaner, less polluting vehicles, increasing the frequency and accessibility of public transport and encouraging active travel i.e. walking and cycling. Additionally, in recognition that all forms of transport will have to move away from the use of fossil fuels, co-ordinated actions at the EU and international level will need to be taken in the maritime and aviation sectors to reduce air pollutant emissions.



9.1 State of Play

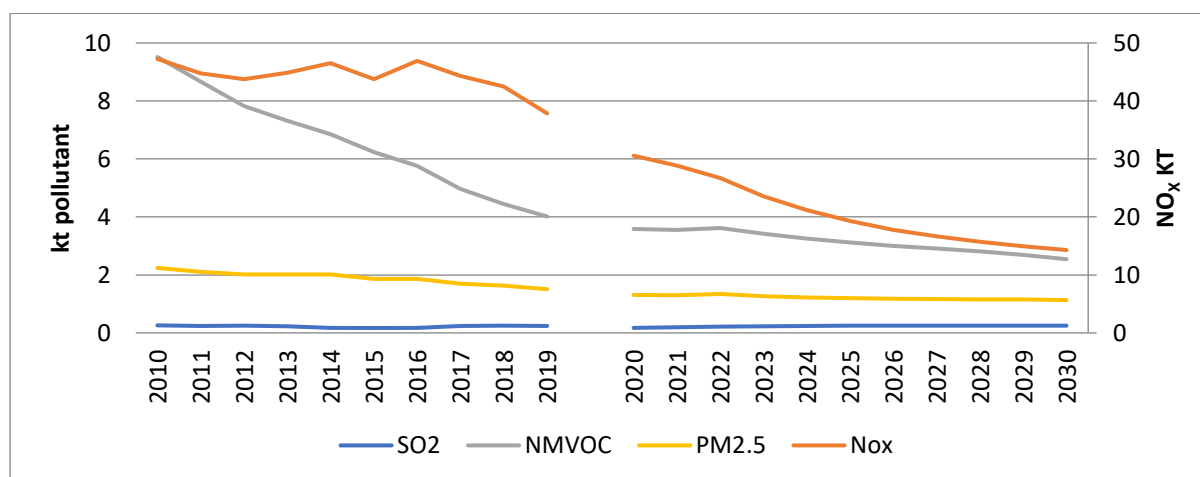
In Ireland, due to our historically dispersed settlement pattern, low population densities and dependence on fossil fuels, the transport sector as a whole has a significant impact on national emissions levels of particular pollutants. For example, in 2019, Ireland's vehicle fleets accounted for 20.3% of the country's total CO₂ emissions (according to the EPA's

[Provisional Greenhouse Gas Emissions report](#)) and 40.6% of nitrogen oxide (NO_x) emissions (according to the [Informative Inventory Report](#)). Diesel-fuelled engines, particularly older diesel engines, while emitting lower levels of GHG, emit more NO₂ than their petrol equivalents, although both types of engine are sources of NO₂ and other NO_x.

The make-up of the Irish vehicle fleet plays a significant role in determining ambient air pollution levels. The [CSO Transport Omnibus](#) shows that nationally, just over 2.8 million vehicles were registered and taxed in Ireland at the end of December 2020, representing an increase of approximately 55,000 from December 2019. The Transport Omnibus also show there has been an annual rise in the level of vehicles registered on the road between 2014 and 2020, which has been driven by the economic recovery. Private passenger cars accounted for over three quarters of the vehicles on the road in 2020.

At both an EU and a national level, steps have been taken to reduce emissions generally. Between 1990 and 2019, NO_x (fuel used basis), NMVOC and PM_{2.5} achieved reductions of 34%, 88% and 41% respectively. Figure 10 demonstrates the changing levels in the four key pollutants for transport between 2010 and 2019 and the projected levels from 2020 to 2030.

Figure 10:



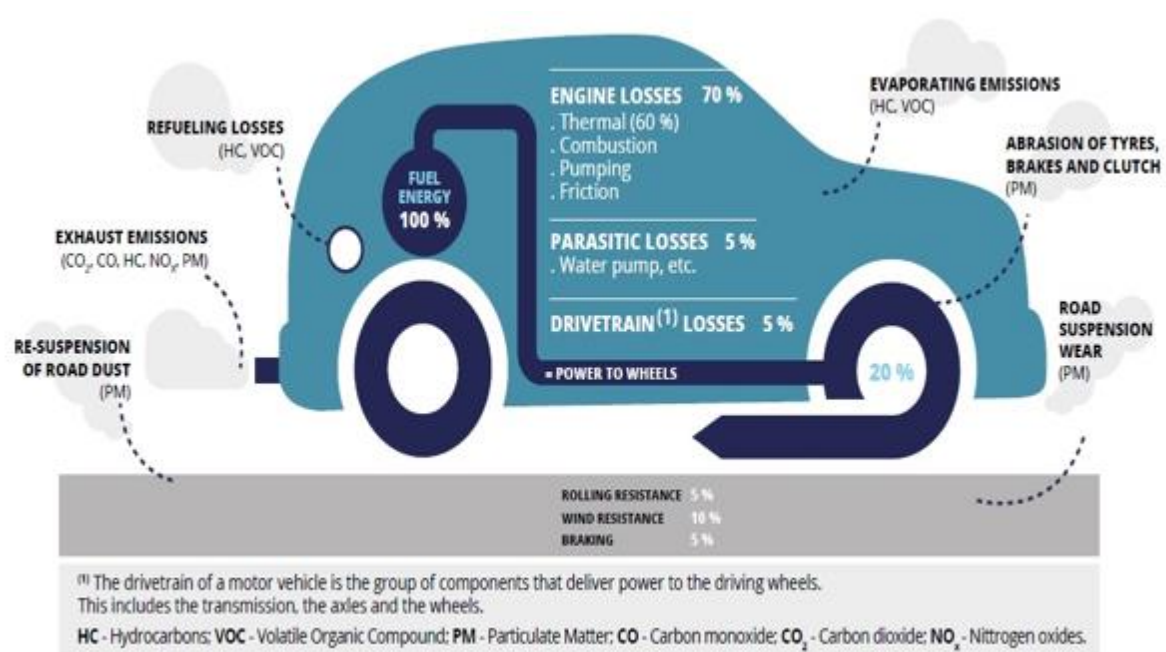
There are several key measures supported and implemented in Ireland that aim to reduce emissions from road transport. These measures have been designed to control overall transport emissions, reduce congestion, promote fuel efficiency, and in doing so, promote health and well-being.

The impacts of existing policies and measures and those set out in the Climate Action Plan are expected to have a significant impact on overall NO_x emissions levels over the coming decade. The proposed pathway to reducing carbon and air pollutant emissions in transport is focused on accelerating the electrification of road transport, the use of biofuels, and a

modal shift to transport modes with lower energy consumption (e.g. public and active transport).

Our vehicles are a major source of air pollution. In addition to more visible exhaust emissions, there are other sources of pollution including braking and tyre friction (see Figure 11). Though petrol and diesel road vehicles have improved to meet progressively tighter EU emission limits, known as Euro standards, an increase in road traffic and a move towards more diesel vehicles means that there is still a significant impact on air quality. While diesel engines are more efficient than petrol, they produce higher emissions of certain air pollutants including NO_x, particulate matter and black carbon. Additionally, many of the efficiencies and improvements which have been made are being offset by the purchase of heavier, higher emitting vehicles such as SUVs. Our move to cleaner alternatives like full electric vehicles (EVs) in the coming years will significantly reduce air (and noise) pollution. Our shift to active travel (cycling and walking) and to increased sustainable transport modes like public transport will also bring significant benefits in terms of reduced air pollution, noise and better public health.

Figure 11: Summary of emissions from fossil fuelled vehicles – (source EEA, 2016)



9.2 The Challenge

Transport-related air pollution tends to be most severe at densely-trafficked locations where it can be difficult for air pollutants to disperse resulting in a build-up of emissions. This means that the negative impacts of air pollution from transport are primarily concentrated in urban areas with high congestion.

Rising traffic levels in recent years have meant that it is becoming increasingly challenging to maintain high standards of air quality in Ireland. While we are currently projected to be on track to meet our 2020 and 2030 annual NO_x emissions targets, it is highly dependent upon a significant modal shift and a substantial move towards electrification of the fleet.

An exceedance of the EU ambient air quality limit value for NO₂ was recorded at a monitoring station in Dublin in 2019. This followed previous work undertaken by the EPA, including the [Urban Environmental Indicators Report](#), which had served as an early warning of potential exceedances and suggested that on certain heavily trafficked streets in Dublin, nitrogen dioxide (NO₂) levels were an area of concern.

As a result of the EPA report, the Urban Transport-Related Air Pollution Working Group ([UTRAP](#)) was established in autumn 2019, to consider and address concerns about the level of transport-generated air pollution in urban areas. The group includes representatives from government departments, environmental, health and transport agencies, local authorities, and additional key stakeholders.

9.3 Measures to Deliver Results

The answer to the emission reduction challenge in the transport sector must be an irreversible shift to low-emission mobility.

The key measures projected to help reduce our overall annual emissions are set out in greater detail in the NAPCP, with taxation policy and increasing the electrification of the national fleet delivering the most significant reductions. These will be complemented by increased vehicle emissions standards, fuel standards and a move to more sustainable modes of transport, particularly in our towns and cities.

Transport is a key area of the [Climate Action Plan](#), and a number of actions which have been set out in the Plan will also support the overall reduction of air pollution emissions from this sector. The following actions are underway:

- 261 new electric-hybrid buses for PSO bus fleets were delivered in 2021: 179 double-deck hybrids; 29 single-deck coaches and 53 double-deck coaches.
- Planning underway to increase public bus networks and capacity;

- Completion of low emissions bus trials in Dublin and Cork;
- No diesel-only buses have been purchased since July 2019;
- A fleet of nearly 48,000 EVs is on Irish roads.
- Rollout of a range of sustainable mobility projects, including [DART expansion](#) , [Metro Link](#) and the [BusConnects](#) programme;
- Contract signed for largest ever DART fleet expansion with potential for up to 750 electric/battery-electric carriages, with initial purchase 95 units (65 battery electric & 30 electric units), with the first of the units entering service in 2025.
- Expanded capacity of Luas Green Line: 26 tram extensions and 8 new additional trams were in service by Q1 2021.
- Increased funding for the provision of dedicated cycling and walking infrastructure across the country, including the Safe Routes to School Programme, and increased funding for sustainable urban transport projects.
- An additional 248 staff were allocated across the 31 local authorities and National Roads Offices in 2021 to assist with the delivery of the significantly increased number Active Travel projects.
- Development of a new rural transport strategy, including an integrated public transport network and car sharing initiatives.

Air quality considerations have also been integrated into the ongoing development of the National Investment Framework for Transport in Ireland (NIFTI), which is the Department of Transport's new high-level strategic framework for prioritising future investment in the land transport network. The NIFTI is also the Department of Transport's contribution to Project Ireland 2040, Government's long-term strategy for accommodating population growth in a sustainable manner and making Ireland a better country for its entire people. It will ensure that our transport sectoral strategy is underpinned by and supports the achievement of the spatial objectives and National Strategic Objectives set out in the National Planning Framework.

9.3.1 Supporting the Electrification of the Fleet and the Transition from Fossil Fuels

One of the most important transport-related changes to improve air quality is the transition from a petrol or diesel vehicle to an electric vehicle (EV).

Electric vehicles are the most prominent transport mitigation measure in the Climate Action Plan, and Ireland has set an ambitious target to have 936,000 EVs on our roads by 2030. This is equivalent to one-third of the circa 2.8 million vehicles currently on the road in Ireland.

This target is challenging but indicates the scale of the transformation that is needed across all sectors if Ireland is to achieve its climate targets in the coming years. It will require very significant and sustained growth from the current level of approximately 45,000 EVs as of December 2021.

To achieve this growth in EV numbers, challenges to be addressed include policy measures, expenditure and supply factors. In terms of supply, it is expected that with the continuing development of European EV markets and the introduction of a wider variety of EV models with longer drive ranges by an increasing number of manufacturers, the numbers of EVs on Ireland's roads will continue to grow. In terms of policy measures and expenditure, Government has already committed significant funding to support EVs through the National Development Plan and in 2022 alone, €100 million will be dedicated to the EV Grant Scheme.

Current Government supports to help drivers to transition to EVs include:

- Purchase grant of up to €5,000 for new battery electric vehicles (BEVs). A grant eligibility price cap of €60,000 applies.;
- A grant of up to €600 towards the installation cost of a domestic charge point for new and second-hand BEVs or Plug in Hybrid EVs.(PHEVs);
- VRT relief of up to €5,000 for the purchase of BEVs;
- BEVs qualify for a 0% Benefit-in-Kind rate up to €50,000 without mileage conditions. This will be extended out to 2025 with a tapering effect on the vehicle value. This measure will take effect from 2023. For benefite in kind (BIK) purposes, the original market value of an electric vehicle will be reduced by €35,000 for 2023; €20,000 for 2024; and €10,000 for 2025;
- Accelerated Capital Allowances for businesses;
- Low rate of annual motor tax; and
- Tolling reductions of 50% for BEVs and 25% for PHEVs.

As well as these supports for private car owners to switch to EVs, a national Electric Small Public Service Vehicle (SPSV) Grant Scheme was established in 2018 to support the electrification of the taxi, hackney and limousine fleets. The establishment of the Scheme reflects the fact that switching this sector to electric vehicles can have an immediate beneficial effect on local air quality, particularly in urban areas where SPSVs can travel high mileages with frequent stops, starts and idling. The eSPSV grant scheme initially provided grants of up to €7,000 for battery electric vehicles and up to €3,500 for plug-in hybrid electric vehicles.

To encourage greater take-up the grant levels were increased in 2020 to €10,000 and €5,000 for BEVs and PHEVs respectively. Between 2018 and 2020 this initiative supported the registration of 101 electric SPSVs through grants of €627,000. However, grants for PHEVs were discontinued in 2021, and the policy is now to promote BEVs instead.

The Scheme has also been amended to allow grants of up to €20,000 for BEVs/Fuel Cell Electric Vehicles (FCEVs), €25,000 for Wheelchair Accessible Vehicles (WAVs), BEVs or FCEVs and €15,000 for WAV and PHEVs. PHEVs, other than WAVs, are no longer eligible for the grant. Between 2018 and 2020 this initiative supported the registration of 101 electric SPSVs through grants of €627,000. The scheme for 2022 is currently under review.

Additionally, in 2020, €1.5 million was allocated to support a Small Public Service Vehicle Recharging Network Scheme, which will see the installation of SPSV dedicated EV fast recharging infrastructure at transport hubs around the country. Chargers were installed at Dublin and Cork Airports as well as Heuston (Dublin), Kent (Cork) and Colbert (Limerick) train stations. An additional €3m was allocated to this project in 2021 with further charge points to be installed at designated Irish Rail stations in 2022.

As well as providing supports to switch the private car and taxi sector to electric vehicles, in March 2021, the Department of Transport introduced an Alternately-Fuelled Heavy Duty Vehicle (AFHDV) Purchase Grant. The AFHDV Grant was introduced to accelerate the decarbonisation of the disproportionately high-emitting heavy-duty transport sector, which includes trucks, buses and coaches. The Scheme aims to help applicants to bridge the difference in price between conventionally- and alternately-fuelled HDVs. To accord with EU State Aid rules, grant levels under the Scheme are calculated as a percentage of the difference in price between a conventionally-fuelled diesel HDV and its alternately-fuelled equivalent. Maximum grant levels for eligible vehicles depend on the size of the company or enterprise applying for the grant, and on the fuel-type of the vehicle that the applicant wishes to buy.

Applicants may be eligible for up to 40% to 60% of the difference in price between a conventionally-fuelled HDV and its alternately-fuelled equivalent, depending on the size of the applicant's business. Individual applicants (including affiliates) may apply for support for up to 20 vehicles up to a maximum total funding amount of €500,000.

The various supports provided by Government have helped increase the uptake of EVs in Ireland and have gone some way to bring the lifetime cost of an EV purchased in 2020 closer to that of a petrol or diesel car. This is particularly important for families or everyday commuters who are considering the switch to EVs. Early adoption of EVs by Irish consumers

over the course of the next 10 years will pay increased dividends from a climate change and clean air perspective, and sustained high level support for EV uptake will be critical in this regard.

The Department of Transport convened the Electric Vehicle Policy Pathway (EVPP) Working Group to produce a roadmap to achieving the 2030 EV target. The EVPP Working Group comprises senior officials and has considered regulatory, financial, and taxation policies to help drive a significant ramp-up in passenger EVs and electric van sales.

The recommendations of the EVPP Working Group were approved by Government and the full report is now available online.

The Working Group examined the issue of price parity between EVs and ICE vehicles. The Report finds that there is divergence within the research community as to when TCO in economic terms cost parity will be achieved with some studies estimating that it is likely to occur in the middle of this decade, driven by falling battery prices and savings due to economies of scale, while others argue that the cross-over point may not occur until towards the end of the decade.

In the meantime, to support the transition to EVs, the Group recommended that the generous suite of EV supports already in place in Ireland should be retained until at least end-2022. Additional measures to further incentivise EVs and/or disincentivise fossil-fuelled vehicles will also be necessary.

As per recommendations from the EVPP report, An Office for Low Emission Vehicles will be established, to co-ordinate the implementation of existing and future EV measures and infrastructure. The new Office will also take charge of developing and launching an extensive communication and engagement campaign, whole of Government in coverage, to drive the availability and understanding of key information regarding EVs, tailored to household, business and public sector consumers.

The Department of Transport is currently in the process of developing National EV Charging Infrastructure Strategy which will seek to prioritise the delivery of fast and rapid charge point infrastructure over the next 5 years. This is line with the Programme for Government and includes engagement with all relevant stakeholders in order to help identify appropriate locations within both urban and rural settings across the country for the installation of charge points.

Charging while at home will continue to account for over 80% of EV charging as it is the most convenient and most cost effective way to charge an electric vehicle.

9.3.2 Urban Air Quality – Public and Active Travel Measures

The transport measures will have a significant impact on our national annual emissions levels. However, more attention needs to be given to the development of measures which help improve air quality in urban areas that have suffered from increased congestion and localised transport related emissions. To achieve this goal, under the revised National Development Plan the Government has committed €35 billion to transform our transport systems. Over the next decade:

- €11.6 billion will be allocated to new public transport infrastructure;
- €1bn will be allocated to specific carbon reduction measures;
- €3.8 billion will be allocated to public transport protection and renewal, including fleet renewal which will greatly improve air quality in our towns and cities,
- BusConnects will be substantially delivered in all five cities across the country;
- €350m will be invested in renewing and expanding rural fleets and services across the country;
- In rail, the NDP will support major transport-led developments in Galway, Limerick and Waterford, as well as an increase investment in expanding commuter rail infrastructure and services in Cork, Galway, Limerick and Waterford.;
- In Dublin, DART+ and MetroLink will be the largest investment programme in the rail network and the largest ever public investment project in the history of the State respectively. National and regional rail will benefit from increased investment over the period – improving journey times, enhancing reliability and maintaining safety across the network;
- By 2030, 500,000 more additional daily journeys are taken by foot, on a bike or on expanded public transport services across the country.
- Continued and steady spend of nearly €1 million per day across the whole of Government for the delivery of nationwide walking and cycling infrastructure, including Greenways, amounting to €3.6 billion over 10 years.
- The NDP will enable a spend of €8 billion on the protection and renewal of national, regional and local roads over the 10-year period until 2030 and a further €1 billion on PPP payments.
- €5.8 billion will be spent on new road investment including €675 million on new regional and local roads over the next 10 years. This will facilitate the provision of a number of bypasses including Athy, Killaloe, Athenry, Tralee Northern Relief Road and an Eastern Garavogue Bridge in Sligo which is part of the Cranmore regeneration project.

9.3.3 The role of Cities and local authorities

Many cities across Europe are also taking local action to improve air quality, transitioning to zone restrictions and bans of older, more polluting vehicles that fall under earlier Euro emission standards.

It is important that Ireland does not become the dumping ground for vehicles no longer permitted access to urban areas in other jurisdictions, particularly the UK which already supplies a large portion of our second-hand car market. Budget 2020 replaced the 1% surcharge with a surcharge tied to NO_x emissions levels based on the “polluter-pays” principle, where the greater the level of NO_x a car emits, the higher the surcharge. Budget 2021 adjusted the structure of the NO_x surcharge, with the effect of adding €200 to high emission vehicles.

The establishment of low emission zones, as well as other demand management measures, in our cities is something which was considered in the [‘Five Cities Demand Management Study’](#) which was commissioned by the DoT in relation to Action 81 of the 2019 Climate Action Plan designed to support a further decrease in NO₂ levels in the five largest urban areas: Dublin, Cork, Waterford, Limerick, and Galway.

The assessment of these measures, which would limit the most polluting of vehicles from entering certain areas, is important and will be developed further in the implementation of this strategy and will require the collaboration of a number of key stakeholders.

Currently, while PM monitoring at various locations across Dublin suggest the spread of sea-derived emissions such as sea salt across the city, the contribution of shipping to the overall air pollutant emissions profile of the city and wider port area is poorly understood.

International research has indicated, however, that air pollutant emissions from shipping can have a significant impact on the air quality of coastal cities. An air pollutant emissions source-apportionment study to assess air pollutant emissions in and around Dublin Port is currently being progressed by the EPA with the support of DoT and other stakeholders.

9.3.4 UTRAP

The UTRAP working group is jointly chaired by the Department of the Environment, Climate and Communications (DECC) and the Department of Transport (DoT). [An interim progress report](#) was published in 2021, which provided an overview of the sector and captured the first stage of work completed by the UTRAP group. This report also demonstrates the work

to date, sets out the initial recommendations for actions and enables the implementation of these actions to begin.

The work of the group is also complimented by the '[Five Cities Demand Management Study](#)' which was commissioned by the DoT in relation to Action 81 of the 2019 Climate Action Plan. The study was designed to consider key demand management drivers in an Irish context (e.g. congestion, air quality, climate considerations) as part of an examination of the role of demand management measures in Irish cities, including low emission zones and parking pricing policies

As part of the study, measures were reviewed in light of international best practice and national stakeholder engagement in order to assess their impact in reducing emissions, tackling congestion, improving air quality, and improving the overall urban environment of the five cities. The study was published in two phases to inform the direction of complementary demand management policy measures at a local and national level.

An [interim recommendations report](#) was published in March 2021, concluding Phase 1 of the study. This examined the qualitative elements of shortlisted demand management measures, and a set of user-friendly Toolkits to enable stakeholders, such as Local Authorities, to quickly identify appropriate demand management measures for their local contexts. The Phase 1 Report examines measures that could be applied in different ways according to the different circumstances of each of the five cities. These measures include parking prices, Slow Zones, car clubs, flexible working, School Streets, and variable speed limits. The Toolkits provide an assessment of the implementation of these measures and offer flexibility and additional options for local and national interventions.

The [Phase 2 Report](#), published in November 2021, predicted the impact of a number of demand management measures by using the NTA's Greater Dublin Area and Regional Transport models.

Together, the Phase 1 and Phase 2 Research Reports provide a series of evidence-based demand management recommendations for each of our five cities (ranked in order of effectiveness) along with a national roadmap for delivery of reduced congestion, carbon and air pollutant emissions in those cities.

This Demand Management Study report and the Dublin Air Quality Action Plan will feed into the final recommendations of the UTRAP report which is expected in Q3 of 2022.

Agriculture



10 Agriculture

Agriculture has a critically important social, economic and environmental value to Ireland with our primary food production systems based on small to medium-sized family farms of an average of 32 hectares, of which there are 137,000. The sector has ambitious strategies and targets in place to grow the value added of the agricultural sector across the State. However, such strategies can introduce pressure on absolute emissions, largely through the higher levels of activity and herd sizes that can result. It is also an important national and regional sector, and as such managing the balance of policy priorities is important. From an air quality perspective, the expansion of the dairy sector has pushed environmental boundaries with respect to ammonia emissions and other environmental concerns and this will need to be addressed through appropriate implementation of abatement measures at farm level.

10.1 State of Play

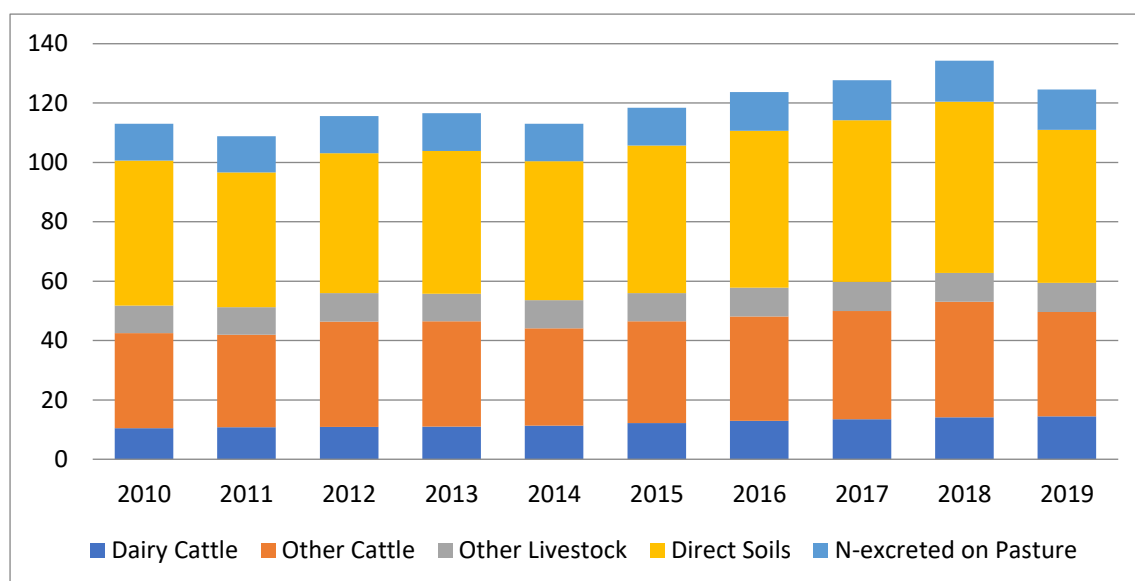
Agriculture is the dominant source sector for ammonia (NH₃) emissions in Ireland, contributing to some 99% of total national emissions. Annual emissions of NH₃ increased each year from 2014 to 2018, driven in large part by strategies to develop and grow the sector in Ireland, without sufficiently increasing the levels of application of appropriate mitigation measures to counteract this growth.

Agriculture is also a significant contributor to national emissions of NO_x (34.4% in 2019) and NMVOCs (39.9% in 2019). The most recent projections (2021) show minimal reductions expected in these pollutants from the sector from now until 2030. The sector contributes very little to overall emissions of PM_{2.5}; however ammonia is understood to play a significant part in the formation of secondary particulate matter.

Whilst the emissions trajectory for ammonia has been mostly upward for much of the last decade (Figure 12), in 2019 a decrease of almost 10kt was observed on 2018 levels. In recent years a number of specific initiatives and actions have been put in place at farm level to counter or suppress emissions growth. These include:

- Reduction in the crude protein content of pig feed;
- Low emission spreading of cattle and pig slurry;
- Introduction of clover into grass swards.

Protected Urea : The use of Protected Urea as a chemical Nitrogen fertiliser at farm level.Figure 12: Emission Trend for Ammonia in Agriculture, 2010 – 2019 (EPA, 2021)



10.2 The Challenge

Continued exceedances of our ammonia emissions commitment under the EU NEC Directive is an area of concern. The key areas of agricultural activity which contribute to ammonia emissions are fertiliser use and manure management practices. These also impact upon the levels of NO_x and NMVOC emissions from the sector⁶ and they pose a significant challenge for Ireland in reducing overall pollutant emissions.

The 2021 EPA projections show Ireland coming into compliance with the 2020 target for NH₃ by 2022 and on track to reach the 2030 NH₃ target. However this is predicated on the adoption of the measures outlined in the Teagasc ammonia MACC, Climate Action Plan 2021 and AgClimatise in full. The challenge in implementing these measures and target adoption levels should not be underestimated. We will continue to engage with the Department of Agriculture, Food and the Marine, across Government and its agencies to monitor progress on the adoption of measures and to identify any additional measures and to identify supports required to assist the increased uptake of existing abatement measures to help further reduce agricultural air pollution emissions.

⁶ Note: NO_x and NMVOC from Agriculture are not included in the compliance assessments for 2020 or 2030 for those pollutants.

10.3 Measures to Deliver Results

There are a number of measures and programmes already in place which are working towards improving the management of manure and fertilisers used in Irish agriculture, in order to reduce ammonia emissions. A number of these are outlined in Table 6.

Table 6: Existing Measures and Programmes

Measure/Programme	Description
Code of Good Agricultural Practice (2019)	Guidance document that outlines the best practice measures for removing or lowering ammonia emissions associated with agricultural activities
Nitrates Action Programme (2019)	Programme of measures encouraging sustainable and efficient agricultural practices and requiring intensive farmers to put ammonia abatement measures in place
Targeted Agricultural Modernisation Scheme	Provides financial aid to farmers to help towards the cost of new low emissions slurry-spreading equipment
Beef Data and Genomics Programme	Lowering the intensity of emissions of both ammonia and greenhouse gases through breeding more environmentally efficient animals
Green Low Carbon Agri-Environment scheme	Supporting abatement measures on Irish farms such as the use of low emissions slurry-spreading equipment
Knowledge Transfer Programme	Transfer of new research to farm level through the farm advisory network
Teagasc National Farm Survey	Provides new data to track developments in environmental efficiency
Teagasc Sign Post Programme 2021	Establishes 100 demonstration farms across Ireland with a focus on implementing new technologies to reduce greenhouse gas and ammonia emissions
Teagasc Ammonia MACC 2020	Identifies 13 abatement measures for implementation on Irish farms
Ongoing Research	Numerous research projects are ongoing across Ireland at Teagasc centres and universities to establish new abatement measures. These projects are supported by Irish Government funding
Ag-Climatise 2020	A DAFM roadmap for Ireland to meet greenhouse gas and air quality targets within the agricultural sector
Climate Action Plan 2021	Climate Action Plan 2021 builds on the commitments made for this sector in Ag Climatise and goes further by committing to changes to ammonia related activities including changing animals diets, reducing chemical nitrogen use and improving fertiliser management

10.4 Ag-Climatise – A roadmap for air quality in the agricultural sector

There are a number of measures included in Ag-Climatise and Climate Action Plan 2021 which will ensure we deliver the necessary compliance in the 2020 and 2030 periods, the most significant of which include:

- Achieving a target of 60% of all slurry spread by low emissions slurry spreading (LESS) by 2022; 80% by 2025; and 90% by 2027.
- Reducing chemical nitrogen use to a maximum of 325,000 tonnes annually by 2030, with an interim target of 350,000 tonnes by 2025.
- Prohibiting the use of urea, replacing with a urease inhibitor treated urea product (protected urea) by end of 2023.
- Requiring an incorporation and maintenance of clover (and mixed species) in all grassland reseeds, facilitating a reduction in chemical nitrogen usage.
- Supporting the use of non-chemical nutrients such as bio-fertilisers.
- Reducing the crude protein content of livestock feeding stuffs to minimise ammonia loss.
- Genotyping the entire national herd by 2030 to facilitate the breeding of more environmentally efficient animals.

This is subject however to full implementation by the Department of Agriculture, Food and the Marine and this will need to be monitored in the coming years.

Farmers are at the heart of Ireland's rural economy and produce food to the highest quality and standards. They are also the custodians of much of our countryside, delivering many ecosystem services, managing biodiversity, maintaining our hedgerows and landscapes and providing habitats for our wildlife.

Irish farmers also have a broader responsibility with respect to our environment and Ag-Climatise is designed to help the agriculture sector to work together to tackle climate change and air quality. It represents the start of our ambition to ensuring there is no compromise between protecting the air that we breathe and the sector remaining at the forefront of globally sustainable food production systems.

Industry, Enterprise and Energy



11 Industry, Enterprise and Energy

Industry, enterprise and energy production in Ireland contribute to air pollution emissions in a number of ways, including:

- the energy used to heat and light our homes and businesses;
- the release of chemicals in the production and operation processes, and
- the transportation of goods and raw materials.

While the last element is captured in the transport chapter, this section will focus on the impact of energy generation and the production processes on air quality.

Ireland traditionally does not have a large industrial processing sector and the sector is not a large source of air pollution emissions. The examples of the types of industrial and enterprise areas which could be included in Ireland's air pollution inventory are outlined by category Table 7.

Table 7: Categories of Industrial and Enterprise areas

Mineral Products	Solvent and Other Product Use
<ul style="list-style-type: none"> • Cement Production • Lime Production • Quarrying and mining of minerals • Construction and demolition • Storage, handling and transport of mineral products • Other mineral products 	<ul style="list-style-type: none"> • Fugitive and Solvent Use including fungicides • Road Paving with asphalt • Coating Application • Degreasing and Dry Cleaning • Chemical Products, Manufacture and Processing • Printing • Other Use of Solvents and Related Activities • Food and Beverage Industry • Other production, consumption, storage, transportation or handling of bulk product • Leakage from Electrical Equipment • Fragmentisers and Shredders
Chemical Industry	
<ul style="list-style-type: none"> • Metal Production • Iron and Steel • Ferroalloys Production • Aluminium Production • Lead Production • Other Metal Production 	

11.1 State of Play

In relation to the five key pollutants, commercial activity is the largest contributor to overall NMVOC emissions (Food and beverage industry 26%, Fugitive and Solvents, 20%) after agriculture. Power Generation (20.6%) is the second largest source of SO₂ emissions followed by Industry (13%). Industry is also a contributor to PM_{2.5} (11.5%), NO_x (8%) and ammonia (less than 0.1%). The sector also contributes to other pollutants such as priority heavy metals and other metals. A more detailed breakdown of these can be found in the Informative Inventory Report.

The electricity generation sector has traditionally been a significant source of emissions of SO₂ and NO_x. However, the shift to natural gas and the reduced use of coal for electricity generation together with the application of extensive NO_x emission control technology and more modern plants, has delivered a 97.8% reduction in SO₂, and an 87% reduction in NO_x between 1990 and 2019.

Since 2000, the Electricity Supply Board (ESB) has replaced peat burning stations with new gas-fired stations and has been engaged in a major retrofit and improvement programme for plants in general.

11.2 The Challenge

Pollutant levels in these sectors are very low overall. Since 1990 Ireland has achieved significant reductions in emissions of persistent organic pollutants and heavy metals in line with its international and EU commitments.

The main pollutant of concern for this sector is NMVOCs. While emissions of this pollutant in Ireland (114kt in 2019) are significantly below the average levels across the EU (<5,000kt in 2018), according to the European Environment Agency's [air pollutant emissions data viewer](#), we can still seek to achieve further reductions.

The key contributors to the NMVOC levels are emissions from Fugitives and Solvents as well as the Food and Beverage industry. These sectors will need to be monitored closely over the coming years and further research should be carried out to identify opportunities for reductions in the future.

Changes in electricity production have also had a significant impact upon levels of sulphur dioxide and nitrogen oxides. However, these changes must also be balanced with ensuring adequate available capacity on the national electricity grid which may be challenging as residential heating and transportation transition to greater levels of electrification.

11.3 Measures to Deliver Results

11.3.1 Licencing and Enforcement

The most significant industrial sources of air pollution are regulated and licenced by the EPA under the Industrial Emissions Directive or related national regulations, and these licenced facilities are subject to emission limits for certain pollutants. Breaches of licence conditions can result in enforcement action.

The EPA is also the competent authority for the [enforcement of the Decorative Paints and Solvents Directives](#), with the local authorities responsible for enforcement activities at non-

EPA licensed sites. These Directives control emissions of NMVOCs from a range of industrial and commercial sectors (e.g. dry cleaning, car refinishing), and by enforcing maximum emission levels in various products (e.g. paints, varnishes). Fixed Penalty Notices (FPNs) have been introduced in Ireland to assist enforcement but lack of awareness of responsibilities and capacity of operators, particularly among smaller businesses, is a challenge.

11.3.2 Moneypoint Retrofit

Moneypoint power station is Ireland's only coal-fired power plant. Since 2008, the plant has undergone a €355m retrofit to cut emissions of both SO_x and NO_x. This played a major part in national SO_x emissions from the power sector, dropping from circa 31kt in 2007 to 2.24kt in 2019. Similarly, national NO_x emissions from the power sector reduced from 28kt in 2007 to just under 6kt in 2019.

11.3.3 Peat in Electricity generation

In line with the sustainability strategy outlined by Bord na Móna, there is a plan in place to phase out the use of peat in electricity generation. Bord na Móna's Edenderry power station (EPL) plant is expected to cease the use of peat by 2024. EBS plants at West Offaly and Lough Ree were both decommissioned in December 2020. The exit from peat will mean that at least 1.25 million tonnes of carbon will be saved each year and emissions will reduce by up to 9 million tonnes up to 2027. Ultimately the wind-down of peat-fired generation in Ireland will have a positive impact on air quality outcomes from this sector.

11.3.4 Renewable Energy Feed-in Tariff (REFIT)

The REFIT schemes support renewable electricity development in Ireland. The schemes were designed to provide certainty to renewable electricity generators by providing them with a minimum price for each unit of electricity exported to the grid over a 15-year period. The REFIT schemes have been designed to incentivise the development of renewable electricity generation in order to support Ireland in meeting its renewable energy targets. It is funded by a Public Service Obligation (PSO) which is paid for by all electricity consumers. Non-combustion renewables such as wind and solar power contribute to both climate and clean air goals. These schemes and supporting actions are supporting a gradual shift away from more polluting forms of power generation (e.g. coal and peat generation); to enable higher shares of renewables alongside gas fired generation.

11.3.5 Renewable Electricity Support Scheme (RESS)

The RESS aims to promote the generation of electricity from renewable sources. The new scheme is framed within the context of the Climate Action Plan and the European Union's Clean Energy Package (EU Clean Energy Package), in particular the Renewable Energy Directive and the development of Ireland's National Energy and Climate Plan. The RESS will be consistent with the EU Clean Energy Package and the EU Guidelines on State Aid for Environmental Protection and Energy 2014-2020. The RESS will rely on competitive forces to achieve renewable energy ambitions at the lowest feasible cost to electricity customers while delivering technology diversity and significant community participation. The RESS includes developments both onshore and offshore (ORESS).

Governance and Enforcement



12 Governance and Enforcement

Ensuring that Ireland's air quality continues to improve requires a concerted effort across society, strong leadership and continued collaboration across Government to ensure that progress is made.

The responsibility to develop and implement the policies and measures required to deliver results for a number of the key sectors lies with other Departments and agencies, however the Department of the Environment, Climate and Communications is responsible for ensuring the incorporation of air quality considerations into all national policy making. This can only be achieved through enhanced co-ordination, collaboration and increased monitoring and oversight of progress made to date.

Significant progress has been made in this area with increased collaboration and interaction between Departments regarding the development of new policies and strategies.

Additionally, under the Public Spending Code, projects are required to provide an estimate of their impact on PM_{2.5}, NO_x, SO_x and NMVOCs based on damage costs set out in the [PSC Guidance](#).

12.1 Delivery of the Clean Air Strategy

The key ambition of this Clean Air Strategy is to drive delivery to achieve societal change.

This is reflected in the key aims of the Strategy, which are to:

- Ensure priority air pollution issues are addressed in a timely manner;
- Integrate clean air considerations into policy development across Government;
- Increase the evidence base to help us understand and address air pollution;
- Enhance regulation and increase the effectiveness of enforcement, and
- Promote and raise awareness of the importance of clean air.

The actions and recommendations established throughout the Strategy to deliver on these will be reviewed regularly, along with annual inventory and projections reports and the results of the ambient air quality monitoring programme, to assess progress and determine if new actions are required.

12.2 Review of the Strategy

This Strategy will be a living document, subject to review and update, to reflect ongoing policy developments, stakeholder engagement and feedback, emerging research and the most up to date evidence.

A first review and progress report will be completed in 2023, following the publication of the next IIR and in conjunction with the preparation of Ireland's next National Air Pollution Control Plan.

12.3 Governance of the Challenge

12.3.1 Clean Air Strategic Implementation Group

In order to deliver on the ambition of this Strategy and realise the associated environmental and health benefits, it is important that the correct governance structure is established.

As detailed above, this Strategy will be monitored on an ongoing basis and will be updated on an annual basis. This will ensure that this Strategy remains a living document, with new actions being added as appropriate, informed by the enhanced monitoring network and ongoing research.

We will establish a Clean Air Strategic Implementation Group which will hold each government department and public body accountable for delivering on the actions that will ensure reductions in air pollution. The Group will be chaired by an Assistant Secretary General of the Department of the Environment, Climate and Communications. An annual progress report will be presented to the Cabinet Committee and the Cabinet, and subsequently published. The Group will discuss and review our progress in achieving air quality improvements and actions that may be required to deal with emerging issues.

The Department will continue to liaise with all other relevant Government Departments and public bodies and will invite them to provide a report on their actions to support air quality on an annual basis. A reporting framework and template will be established in 2022 with the first reports to be submitted to the Department in 2023.

Given the synergies with climate and the complimentary measures required to deliver on both our clean air and climate ambition, this strategy will continue to be aligned with the Climate Action Plan with a view to also being placed on a statutory basis in order to support the governance of the measures proposed.

12.4 Regulation

Air pollution is governed in primary legislation under the Air Pollution Act 1987. Over the years, a number of amendments have been made to the Act to ensure it is fit for purpose and can support the requirements of air quality enforcement.

Additionally, EU air quality legislation has been transposed into Irish legislation through a number of statutory instruments and these have been joined by other secondary legislation

to set standards, ensure appropriate monitoring, measurement, reporting and planning across a range of air quality areas.

It is clear that a new Clean Air Act is now required to ensure that our legislation is fit for purpose as we increase our ambition in this area.

As such, a review of the Air Pollution Act and all relevant air quality legislation will be undertaken in the coming year in order to ensure we can continue to provide the most comprehensive legislative framework to tackle air pollution and protect people's health.

A group has already been established under the auspices of the EPA NIECE network to examine the enforcement provisions of the 1987 Act (as amended), and is expected to produce a report and recommendations in the coming months. Following this, a broader group, representative of all regulatory stakeholders, will be put in place in 2022 to undertake a comprehensive review of the Act and make recommendations as to any legislative amendments required to ensure that we have the most robust framework in place.

12.5 Enforcement

Effective enforcement of air quality legislation is vital in reducing air pollution, particularly in tackling key sources of harmful PM_{2.5} emissions. Under our Air Pollution legislation, local authorities and the EPA are the primary responsible agents for licencing and enforcement activities.

12.5.1 Role of the EPA

The EPA is responsible for implementing environmental legislation across a wide range of activities including air quality, to ensure compliance with environmental requirements.

Through both licencing and enforcement, they regulate activities to ensure they do not emit pollutants to the extent that they would endanger human health or harm the environment.

Table 8:

Licencing and Permitting	Enforcement
<ul style="list-style-type: none">• Industrial Emissions• Integrated Pollution Control• Waste• Medium Combustion Plants• Coal Baggers and Specified Fuel Suppliers• Intensive agriculture• Large petrol storage facilities	<ul style="list-style-type: none">• Local Authorities• Licenced Facilities• Chemicals and Controlled Substances

The EPA also has a supervisory role in terms of the environmental protection activities of local authorities, through the Environmental Enforcement Performance Network. Each year local authorities develop enforcement plans to allocate resources where they are needed most, and data on these activities are submitted to the EPA. The EPA then produces [annual reports](#) on the performance of Local Authorities in this regard.

The relationship between the EPA and local authorities helps to establish trends in enforcement actions, assists in the setting of annual priorities, and provides information for Government to make better informed decisions regarding local authority environmental enforcement. This is supported by the Network for Ireland's Environmental Compliance and Enforcement ([NIECE](#)), where the EPA and local authorities work together to capture best practice and expertise in order to develop collective resources to co-ordinate a consistent and more effective approach to the enforcement of environmental legislation in Ireland.

12.5.2 Role of Local Authorities

Local authorities have a key role in dealing with air-related complaints and ensuring compliance with legislation at the local level. Local authorities have specific powers to address emissions of air pollutants including enforcement of legislation on solid fuel regulations, decorative paints and solvent regulations and petroleum vapour regulations.

12.6 Strengthening Enforcement

The EPA reviews the performance of local authorities in relation to enforcement of environmental legislation and in its 2020 review highlights the need for increased air quality enforcement – in particular ‘smoky coal’ enforcement. The report cited a number of recommendations for consideration.

The overall national performance rating allocated by the EPA to air quality enforcement was ‘Below Target’, as it has been since 2015. These reports continue to highlight that enforcement continues to be inconsistent nationwide, with some local authorities completing all planned inspections and others having a very low percentage completion rate.

12.6.1 New Enforcement Structure

As part of the Programme for Government there is a commitment to develop a new approach to air quality enforcement in collaboration with the Local Authority Sector in order to improve enforcement.

The Department is committed to working with the Local Authority sector to ensure that dedicated resources are put in place to provide co-ordination, expertise and advice to

support effective and consistent implementation of air quality legislation across the country. The process will ensure greater consistency of approach in terms of objectives, decisions, actions, and final environmental outcomes, as well as facilitating co-ordinated enforcement activities with other authorities such as An Garda Síochána and the Revenue Commissioners.

Regional enforcement models have already been established in other areas. The impact has been very positive, in particular in the waste area where Waste Enforcement Regional Lead Authorities (WERLAs) have been in operation for a number of years, and this joint approach has resulted in enhanced outcomes.

We are working with the County and City Management Association (CCMA) and Local Authority air quality experts to establish a robust air quality enforcement support system in order to bring greater consistency and coordination to tackling the most pressing enforcement challenges.

These supports should facilitate the co-ordination of air quality enforcement actions, set priorities and common objectives for air quality enforcement, and ensuring consistent enforcement of air legislation across the country, while still leaving local authority personnel as first responders on the ground to specific breaches of the regulations. This is intended to facilitate a transformation from process-driven enforcement, structured around separate implementation of individual regulations, to one that focuses greatest effort on the air quality enforcement issues that matter most and to take swift, proportionate and effective action.

12.6.2 Multi-Agency Enforcement

Multi-agency enforcement is recognised as an increasingly effective tool in environmental enforcement. It fulfils a growing inter-agency requirement from various enforcement authorities, to encompass a horizontal approach across law enforcement. They facilitate more Garda-led multi-agency operations, intelligence sharing and the development of a more strategic approach to environmental crime. They also serve to enhance inter-agency relationships, facilitate knowledge sharing and result in an increase in intelligence-led investigations which improve enforcement efficiencies on suspected unauthorised activity.

There is already very good use of multi-agency operations being applied in waste enforcement at a regional level, with supporting national structures. Such a coordinated approach is now required to clamp down on the sale of high sulphur content fuel imported from outside the State, the continued marketing of restricted fuels in designated current Low Smoke Zones, and to ensure compliance with future regulations.

Given the links between burning of solid fuels and the health effects of air pollution, as well as the potential for market distortion for businesses properly adhering to the regulations, increased multi-agency inspections and enforcement, including the use of fixed payment notices, are required and will be delivered.

This will be achieved by maximising synergies with existing networks and the development of supporting structures for the new regional supports. A National Air Quality Enforcement Steering Committee will be established with membership drawn from other Government Departments as well as law enforcement agencies, including An Garda Síochána. This will create a network of regulatory bodies with a link to illegal activity in this area and will position the sector to react to the threat of such activity with a coordinated and strategic response. It will also serve to set enforcement priorities and facilitate increased use of multi-agency operations at local level.

12.6.3 Supporting increased testing and compliance checks

A key element in enhancing enforcement is the development of an appropriate indigenous system for testing and compliance. This is particularly important as new standards are introduced for solid fuels.

There is currently no suitable Irish-based laboratory service to check compliance with the existing solid fuel regulations and Local Authorities must use UK-based laboratories. This situation will be addressed through further investigations to determine the optimum approach to the establishment of an Irish-based testing facility.

Strengthening our Evidence Base



13 Strengthening our Evidence Base

To support development of policy in the future it will be essential to continue to ensure that we learn from evaluations of current programmes, build more knowledge through better data capture and analysis and to learn from existing best practice and research.

13.1 Monitoring, Modelling and Forecasting

It is essential that we can access localised, up-to-date air quality information to enable the public to make informed decisions and to better inform national and regional policy. A high quality modelling and forecasting system is also required to allow us to identify issues as they emerge.

The EPA is responsible for monitoring ambient air quality as the designated competent authority in Ireland and has expanded the national ambient air quality monitoring network under the national Ambient Air Quality Monitoring Programme (AAMP). This has been running since 2017 and is built around three pillars:

- A greatly expanded national monitoring network providing enhanced real-time information to the public;
- Modelling and forecasting capability, to provide an ongoing air quality forecast to the public, and
- Encouraging greater understanding and involvement of the public in air quality issues.

The AAMP has undergone a significant upgrade in recent years and has expanded the network of stations from 29 to 97 (as of January 2022), with the network heading towards 110 stations. All stations collect air quality data for a range of pollutants in order to provide information to the public and for assessment against European legal limit values and WHO guideline values.

Ireland has traditionally focused on measurements from monitoring stations to assess air quality. It has become clear however that there is a greater need to provide more local air quality information throughout Ireland, including at locations which do not have a monitoring station.

The information generated through monitoring will be augmented by a newly developed modelling and forecasting capability, with the aim of providing an ongoing air quality forecast to the public.

As such a review of the AAMP will be conducted in 2022 in order to identify the most suitable options for delivery going forward.

The work of the programme is also being complemented by a new EU LIFE funded project called LIFE Emerald, which began in January 2021 and will run to June 2024, and which is also receiving funding support from DECC.

Project deliverables include:

- Production of a three-day national forecast system;
- Nowcast maps providing estimates of air quality across the country between monitoring points;
- Production of historical national and city level baseline maps;
- Development of an air quality management dashboard to predict and assess air quality;
- Spatial representativeness study of the Irish Monitoring Network, and
- Availability of hourly modelled data for the independent verification of performance for EU policy verification purposes.

13.1.1 Ecosystems Monitoring

The NEC Directive (2016/2284) requires that Member States ensure the monitoring of negative impacts of air pollution upon ecosystems based on a network of sites that is representative of their freshwater, natural and semi-natural habitats and forest ecosystem types, taking a cost-effective and risk-based approach. Whilst some initial activities have been completed to define a monitoring network for Ireland, additional work will be undertaken to further refine the network and associated monitoring requirements.

DECC will continue to work with key stakeholders to ensure that the modelling and monitoring capacity across the state is harnessed to provide the evidence base required to improve policy making in this area.

13.2 Research

Ireland has a vibrant environmental research community including internationally recognised centres for atmospheric research. The EPA alone has funded 17 new research projects relevant to the air area since 2016, involving a commitment of €3.3 million. Other significant funders in this space include the SEAI, Science Foundation Ireland (SFI), The Irish Research Council (IRC) and the Department of Agriculture, Food and the Marine (DAFM).

One of the most important outcomes of any research conducted is to ensure that the findings and recommendations are communicated to as wide an audience as possible, and in

particular to the relevant policy makers, to ensure that policy development is based on the most up to date evidence.

In order to achieve this, the Department will establish a Clean Air Research Forum which will bring together researchers, policy makers and other key stakeholders to share information, results and discuss knowledge gaps and future research priorities.

Through this group we will:

- Collaborate with the Department of Further and Higher Education, Research, Innovation and Science to highlight the importance of air quality research and in particular research that provides the evidence base for informed policy making;
- Work with government partners, research funders and enterprise agencies to identify opportunities to foster further collaboration and engagement between policy makers and researchers, and to increase awareness of the research and innovation supports available within the State and the EU;
- Seek to ensure that research priorities related to air quality are addressed in the research strategies and prioritisation exercises of the various research funding bodies, and
- Build stronger linkages between DECC and the publicly-funded research centres.

Citizen Engagement and Adaptation Awareness



14 Citizen Engagement and Adaptation Awareness

Clean Air is influenced by the manner in which we use energy in our homes and businesses, the transport choices we make, our use of the land and our farming practices. Our vision for this Strategy will only be achieved through public support and greater citizen and stakeholder engagement. Our aim is to work with the wider community with the goal of improving our understanding, empowering action and supporting change.

While Ireland now has a world-class ambient air quality monitoring network, with real-time data available online, its effectiveness and potential can only be realised once the general public becomes more aware and more knowledgeable about how to access and interpret its data.

Similarly, measures to encourage people to switch to less polluting methods of home heating or to make different transport choices can only achieve maximum success if we gain sufficient levels of public support through increased public awareness, improved understanding and the promotion of positive behaviours.

We need to clearly communicate the benefits of clean air and the measures being taken to achieve it to all stakeholders, from members of the public through to NGOs and other State bodies. An effective and inclusive communications plan will be central to achieving these aims.

Citizen Science provides an avenue for members of the public to become involved in air quality monitoring and engage with the broader issues of air quality to better understand their local air quality and how their actions have an impact. Work in this area is currently supported through one of the pillars of the Ambient Air Quality Monitoring Programme which operates [the Globe Programme](#) and [Clean Air Together](#).

Citizen Science through the GLOBE project

Citizen science work focussing on the priority of clean air has been implemented through the GLOBE programme carried out in partnership with An Taisce was launched in 2017, with spring and autumn campaigns carried out each year. To date, a total of 64 teachers have completed the GLOBE training and actively participated in the programme with their students. Over 3,000 observations have been uploaded to the GLOBE website by Irish students and GLOBE teachers and students have also shared their experiences of collecting and analysing air quality data at several national and international events. 103 schools participated in the spring 2021 campaign.

Clean Air Together

The EPA and An Taisce are working in partnership to deliver this project. The overall purpose of the project is to deliver a large-scale citizen-based nitrogen dioxide monitoring project that will increase public awareness of and engagement with the topic of air quality. The project also aims to effect policy change and evaluate the impact of citizen-based air quality monitoring on behaviour change. A pilot of Clean Air Together was being carried out in Dublin, while the main project was carried out in Dublin in Autumn 2021 and another is expected to be completed in Cork in 2022.

There are currently a number of other citizen science projects ongoing across the country in relation to air quality. The Department will consider and assess the feasibility of working more closely with these projects with a view to incorporating and empowering citizen science in relevant research and publications.

There are also a number of other initiatives supported by DECC which engage with people across the state such as the Green Schools programme and the National Dialogue on Climate Action, and we will examine how best to enhance and develop these to better incorporate clean air considerations.

These and other initiatives will be showcased at event for the [International Day of Clean Air for Blue Skies](#) which is celebrated each September.

14.1 Communication

A co-ordinated national air quality communications strategy is required in order to raise public awareness at all levels (individual, community and business) that clean air is important for health, productivity, the economy and the environment.

The Department will address this through the establishment of a National Clean Air Communications Strategy Group which will be drawn from a range of stakeholders. The group will also work in conjunction with the Strategic Implementation Group and the Air Quality Research Forum.

The group will establish actions to be taken in the coming year, which will include:

- Targeted air quality awareness campaigns;
- Supporting awareness campaigns operated by the local authorities;
- Promoting air quality awareness through schools;
- Providing further information online on the choices people can make to help to improve air quality;
- Producing guidance and information on key air quality issues;

- Facilitating local awareness events;
- Working with behaviour change experts to refine messaging, and
- Utilising international awareness initiatives such as the UN Clean Air for Blue Skies Day to promote air quality messages and awareness.

In the longer term this group will inform the development of a continuous and sustainable communications campaign, building on best practice examples and maximising synergies with other well established environmental awareness initiatives

We will also host the first biennial Clean Air Conference in 2023 which will invite national and international speakers to discuss key air quality issues.

14.2 Engagement and Consultation

As part of the Government's commitment to enhancing public engagement, the Department is seeking to facilitate a more innovative, positive and ongoing engagement process with the environmental NGO sector and the general public on air quality issues. We will continue to run standard one-off consultations on the development of plans and programmes that emerge from the implementation of this Clean Air Strategy. We will also look to develop more novel and inclusive consultation forums on key air quality issues.

As a first step the Department will be creating a Clean Air Forum comprised of key stakeholders which will meet twice a year to discuss key air related topics. To do this we will prepare a short issues paper for consultation in 2022 which will feed into the establishment, membership, engagement strategy and terms of reference of the Forum.

