

# Air Quality in Ireland 2018



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# Ambient air quality in Ireland

[www.epa.ie/air/quality](http://www.epa.ie/air/quality)

## Poor air quality causes

Stroke



Heart disease



Lung cancer and both chronic and acute Respiratory diseases, including asthma



# 1,180

Premature deaths a year in Ireland due to poor air quality

## Sources

Transport



Residential solid fuel burning



## Solutions



Clean public transport systems

Recharge network for electric vehicles should be expanded



Pedestrian and cycle-friendly networks



Low-emission zones

More energy efficient buildings



City or district heating



Restrictions on solid fuel use systems

Updating of old heating systems

## What can you do?

Think about each journey you make? Is there a cleaner alternative?

Consider an electric vehicle for your next purchase



Do you really need to light your open fire or stove?

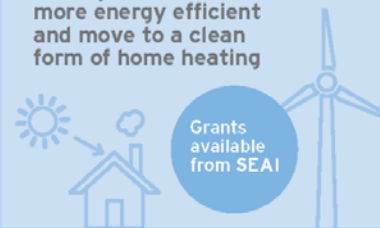
If you must, consult the

EPA's 'better ways to heat your home'



Make your house more energy efficient and move to a clean form of home heating

Grants available from SEAI



for Twitter Alerts sign up to @EPAAirQuality

## Key findings...

### Air quality in Ireland 2018 ...

- Levels at monitoring sites in Ireland were **below** the EU legislative limit values in 2018.
- Ireland was **above** World Health Organization (WHO) air quality guideline value levels at a number of monitoring sites for fine particulate matter, ozone and nitrogen dioxide (NO<sub>2</sub>).
- Ireland was **above** the European Environment Agency reference level for PAH, a toxic chemical, at three monitoring sites.

### Problem pollutants ...

- **Particulate matter** from burning of solid fuel
- **Nitrogen dioxide** from **transport** emissions in urban areas.
- Indications that we will **exceed EU limit** values for NO<sub>2</sub> in the near future.

### What should be done ...

- To tackle the problem of particulate matter we should:
  - Move towards clean ways of heating our homes, see Figure 6.
  - Improve energy efficiency of homes.
- To reduce the impact of NO<sub>2</sub> we can:
  - Implement the transport options in the Government's Climate Action Plan.
  - All, as individuals, consider our transport choices.

### National ambient air quality monitoring

- Currently 57 monitoring stations in the network
  - 17 new monitoring stations were installed in 2018.
  - 9 existing stations were upgraded to provide real-time particulate monitoring.
- Citizen science and citizen engagement activities
  - GLOBE project in partnership with An Taisce
  - CleanAir@School in partnership with the EEA



### **How do we assess air quality?**

The EPA monitors air pollutants levels and compares them to EU legal limit values and World Health Organisation (WHO) guideline values. The following pollutants are assessed by the EPA

- Particulate matter – PM<sub>2.5</sub> and PM<sub>10</sub>
- Nitrogen oxides (NO<sub>2</sub> & NO)
- Sulphur dioxide (SO<sub>2</sub>)
- Ozone (O<sub>3</sub>)
- Carbon monoxide (CO)
- Benzene and ozone precursors
- Benzo(a)Pyrene, a Polycyclic Aromatic Hydrocarbon (PAH) - both in PM<sub>10</sub> and deposition
- Heavy metals - both in PM<sub>10</sub> and deposition
- Chemical composition of PM<sub>2.5</sub>
- Mercury

### **How can I find out about air quality?**

The best way to get information on air quality is to visit the EPA's air quality website [www.airquality.ie](http://www.airquality.ie) or sign up to the EPA's @EPAAirQuality Twitter channel for automatic daily updates and see @EPAIreland for further information on the environment.

The air quality information on that site includes real-time data for each automatic monitoring station. You can also access the Air Quality Index for Health (AQIH) on this website.

The AQIH is a colour-coded map of Ireland on which you can quickly see what air quality is like in your area. It also includes health advice for both the general population, and for those who are more sensitive to air pollution – for example, people with heart or lung problems. The AQIH instructions explain how to determine what to do if you or your child is likely to be at risk from air pollution.

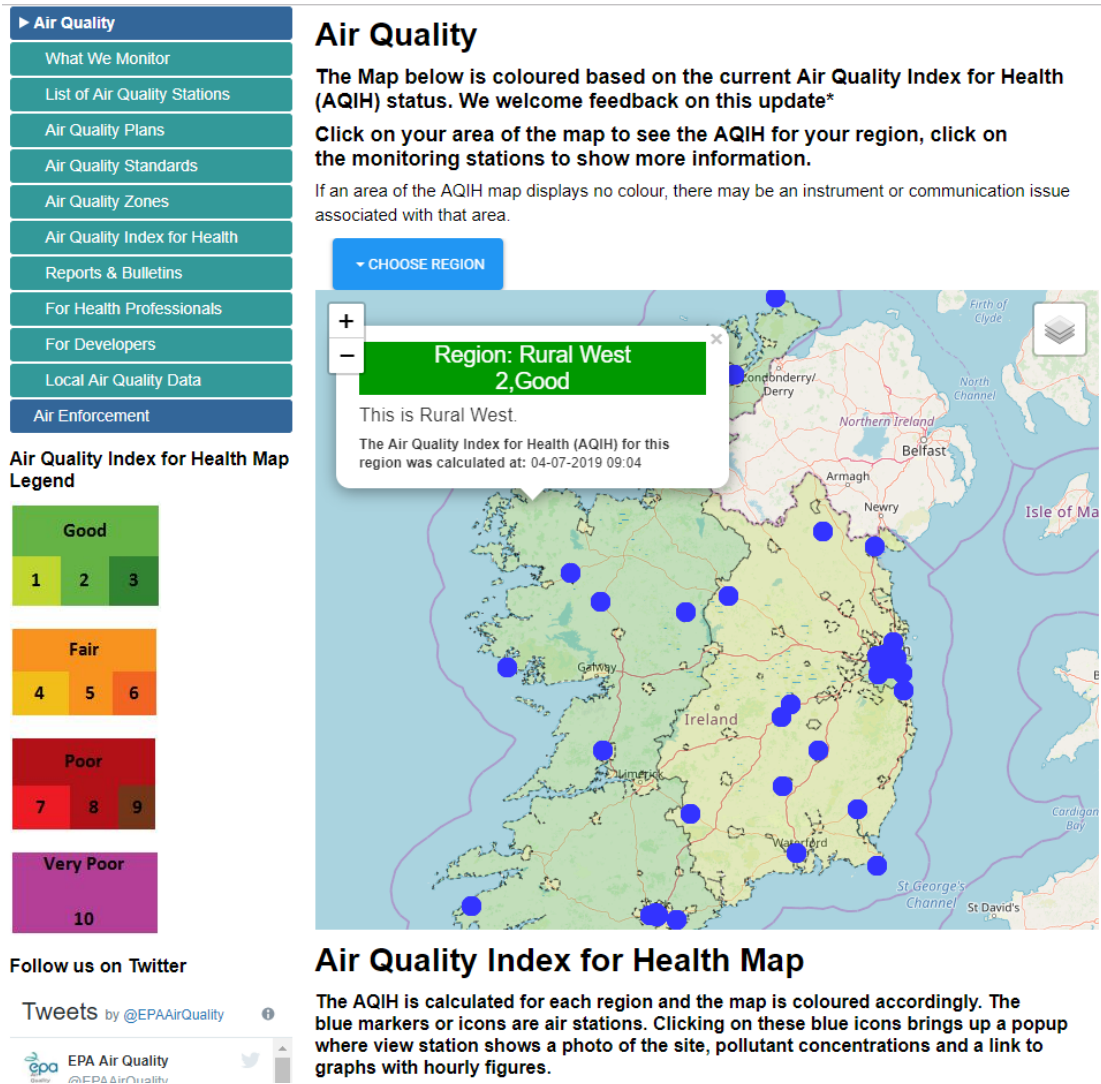


Figure 2 The Air Quality Index for Health

**Why is poor air quality a problem?**

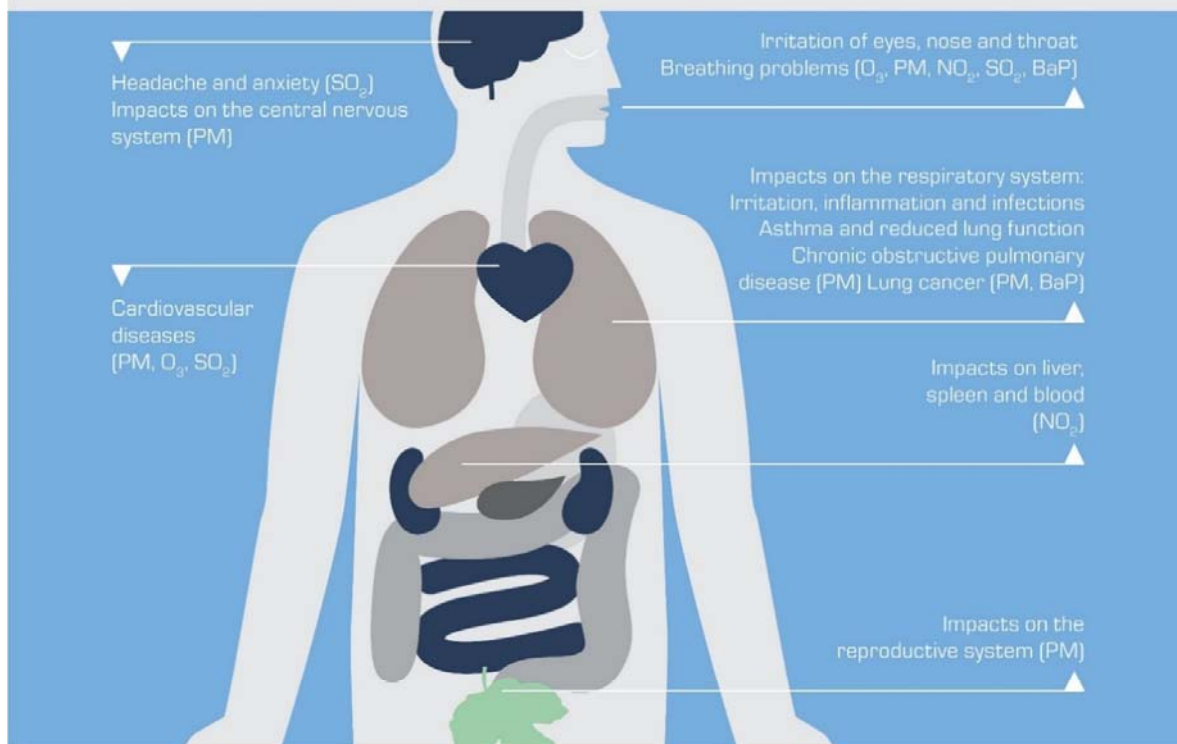
Poor air quality has serious health implications both in the short-term (acute – temporary illnesses like headache, breathing difficulty or eye irritation) and the long-term (chronic – ongoing illnesses like asthma, reduced liver function or cardiovascular disease).

Figure 3 Health impacts of air pollution (source European Environmental Agency) summarises the health impacts of air pollution.



### Health impacts of air pollution

Air pollutants can have a serious impact on human health. Children and the elderly are especially vulnerable.



**Particulate matter (PM)** are particles that are suspended in the air. Sea salt, black carbon, dust and condensed particles from certain chemicals can be classed as a PM pollutant.

**Nitrogen dioxide ( $\text{NO}_2$ )** is formed mainly by combustion processes such as those occurring in car engines and power plants.

**Ground-level ozone ( $\text{O}_3$ )** is formed by chemical reactions (triggered by sunlight) involving pollutants emitted into the air, including those by transport, natural gas extraction, landfills and household chemicals.

**Sulphur dioxide ( $\text{SO}_2$ )** is emitted when sulphur containing fuels are burned for heating, power generation and transport. Volcanoes also emit  $\text{SO}_2$  into the atmosphere.

**Benzo(a)pyrene (BaP)** originates from incomplete combustion of fuels. Main sources include wood and waste burning, coke and steel production and motor vehicles' engines.

Figure 3 Health impacts of air pollution (source European Environmental Agency)

## 2 National Ambient Air Quality Monitoring Programme (AAMP)

Following a review of ambient air quality monitoring in Ireland, a national ambient air quality monitoring programme commenced at the end of 2017. Currently being rolled out, this programme is providing more comprehensive, real-time localised air quality information linked to public health advice.

The programme involves a greatly expanded national monitoring network supported by increased modelling and forecasting capability to provide air quality forecasts to the public. The programme also aims to involve the public by engaging with citizens through various citizen science initiatives to encourage greater public understanding of and involvement with air quality issues.

### New monitoring stations established in 2018

There were 17 new monitoring stations established under the AAMP in 2018 (12 full monitoring sites and 5 'local' monitoring sites). They include:

#### Dublin

- St John's Road,
- St Anne's Park, and
- Davitt Road (reopened).

#### Cork

- UCC Distillery Road, and
- Cobh.

#### Other locations

- Dundalk in Co Louth,
- Carlow Town,
- Ragoon Road in Galway,
- Browne's Road in Waterford City,
- Malin Head in Donegal,
- Carnsore Point and Enniscorthy in Wexford, and
- Roscommon Town.

There were also **5 new 'Local Monitoring' sites** added to the network in 2018. For further information please see section 7.

There were **9 upgrades** to existing monitoring stations in 2018. These upgrades focused on providing real-time information about particulate matter pollution to the network.

### Air quality forecasting and modelling

Traditionally Ireland has focused on measurements to assess the quality of the air we breathe. It has become clear that there is a greater need to provide more 'local' air quality information throughout Ireland. Under the AAMP, the EPA is developing the capability for general ambient air quality modelling at urban and regional scales and ambient air quality forecast modelling.

To date, work in this area has been progressed through a research project involving Aarhus University, Denmark. More information on the project can be accessed at <http://projects.au.dk/mapeire/>. Initial results of this modelling project were recently used to assess nitrogen dioxide (NO<sub>2</sub>) across the urban area of Dublin. The findings of this analysis was released as the Urban Environmental Indicators Report available for download at <http://www.epa.ie/pubs/reports/air/quality/urbanenvironmentalindicatorsnitrogendioxidelevelsindublin.html>. For further information see section 4.

### Citizen science and citizen engagement

The EPA has progressed a number of citizen science/ citizen engagement initiatives. Two of these – the GLOBE project and the CleanAir@School initiative – are described below.

### GLOBE project

GLOBE is an international science education programme running in over 120 countries across the world. In Ireland, it is co-ordinated by the Environmental Education Unit of An Taisce in partnership with the EPA. During the spring of 2019, students from 30 schools across Ireland measured the air quality around their schools as part of the GLOBE Air Quality Campaign. Students used diffusion tube samples to measure nitrogen dioxide (NO<sub>2</sub>) – a principal pollutant from car exhaust emissions – at locations around their schools for the month of February. They then

analysed the results and examined potential impacts on their health and wellbeing. Overall, the findings indicated generally good air quality. For most schools, the results ranged from ‘excellent’ to ‘pretty good’. NO<sub>2</sub> levels were higher for schools in major towns and cities when compared to schools in rural areas. Schools noted a deterioration in air quality at the school gate when compared to more sheltered areas, such as school yards.



**Figure 4 Laura Burke, Director General of the EPA with Michael John O'Mahony Director, Environmental Education Unit, An Taisce**

### “CleanAir@School initiative”

CleanAir@School is a joint initiative between the European EPA Network and the European Environment Agency (EEA) focusing on air quality around schools.

Citizen science monitoring campaigns are being carried out through the participating EPAs who are supporting schools to measure nitrogen dioxide (NO<sub>2</sub>) levels in the school environment. Ultimately, the goals of the initiative are to educate children about air quality as well as raising awareness amongst pupils and their parents of the impacts of road transport on air quality. The initiative also aims to explore whether parents adapt their choice of transport for bringing children to school as a result of increased awareness. In addition, the initiative explores how data collected by citizens might complement official air quality monitoring performed by EPAs to improve understanding of local air quality.

In Ireland, the first stage of the CleanAir@School measurements has been carried out as part of the GLOBE programme. Further measurements are planned for the autumn of 2019.



**Figure 5 diffusion tube sampler that will later be analysed for NO<sub>2</sub> levels**

### 3 Particulate matter and solid fuel burning

This section of the report introduces one of the main types of pollutant that impacts people's health in Ireland – particulate matter.

#### What is 'particulate matter'?

Particulate matter is very small particles which can be solid or liquid. Some of these particles occur naturally, and many are man-made. Particulate matter is usually referred to as PM with a number after it to show how small the PM is. The EPA monitors two types of PM and compares levels to limit values in the CAFE (Clean Air for Europe) Directive and WHO guidelines. These are PM<sub>10</sub> and PM<sub>2.5</sub>.

PM<sub>10</sub> means that the particulate matter is 10 microns or less in diameter, small enough so you could lay 10 of these particles across the width of an average human hair. PM<sub>2.5</sub> signifies that it is particulate matter of 2.5 microns or less in diameter – you could lay 40 of these particles across the width of an average human hair.

#### What are the main sources of PM in Ireland?

In Ireland the main source – especially of the smaller and more dangerous PM<sub>2.5</sub> particles – is **solid fuel burning** for home heating. PM<sub>10</sub> can be made up of several sources. Some can be **natural sources** such as pollen, or wind-blown sea salt. Others are **man-made sources** such as pollution from road transport and agriculture.

#### Why is solid fuel burning so bad for air quality?

Burning solid fuel in stoves and especially in open fires is an inefficient process – not all the solid fuel is fully burned. These unburnt particles leave the fireplace or stove by the chimney, or directly into the room they are heating. This causes both indoor and outdoor PM air pollution. This PM air pollution is then breathed in and leads to the health effects described in section 1. This direct link between solid fuel burning in Ireland and PM has been established both by EPA monitoring and EPA-funded research projects such as the SAPPHIRE project and AEROSOURCE project.

#### Summary of results for 2018

PM<sub>10</sub> was monitored at 26 monitoring stations in 2018. There were no exceedances of the EU limit values (annual and daily). However, the World Health Organisation (WHO) air quality guideline daily limit value was exceeded at 2 monitoring stations for a total of 7 days.

PM<sub>2.5</sub> was monitored at 20 monitoring stations in 2018. There were no exceedances of the EU annual limit value. However, the WHO air quality guideline annual limit was exceeded at one monitoring station. The WHO air quality guideline daily limit value was exceeded at 7 monitoring stations for a total of 87 days.

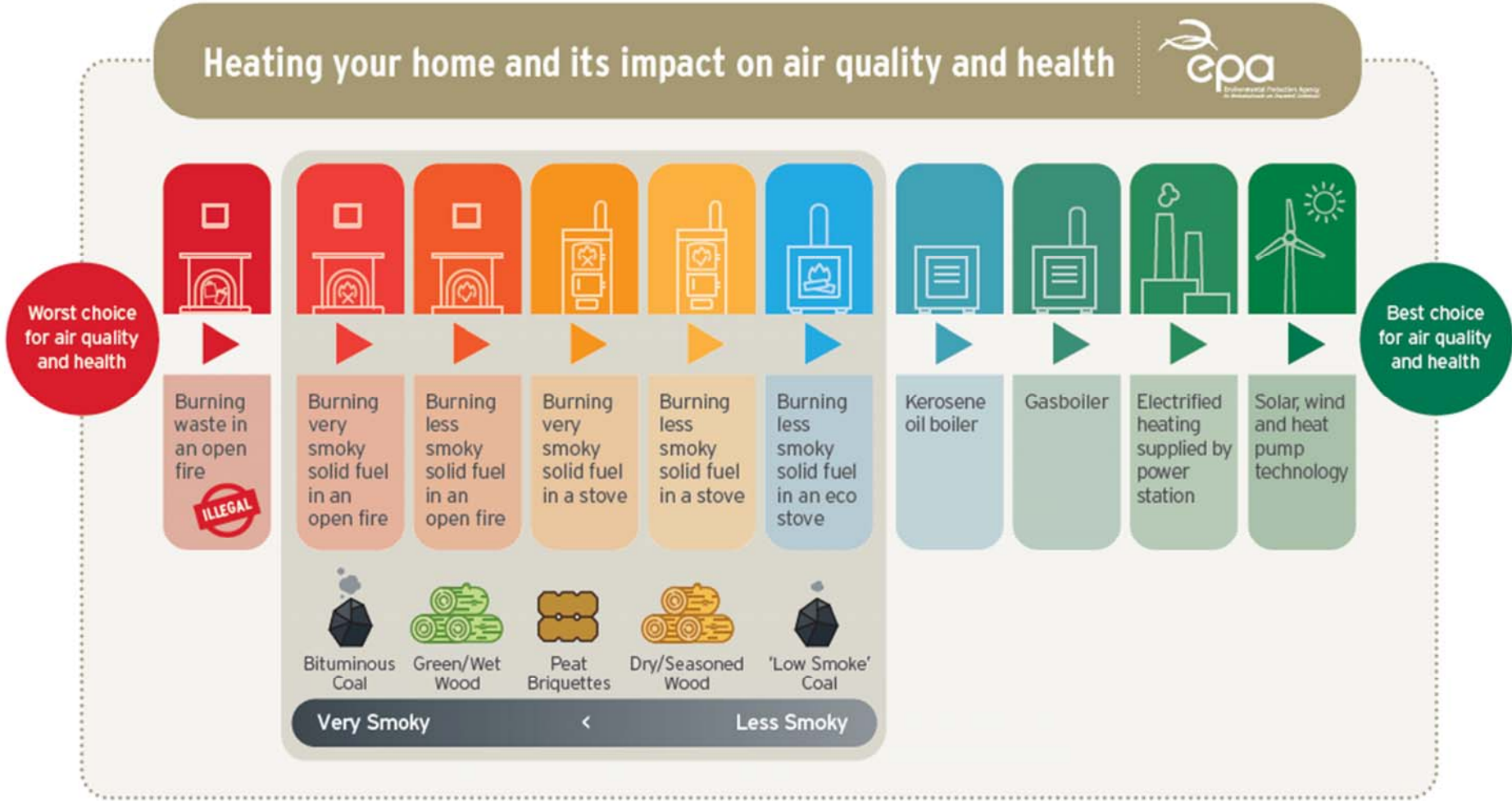
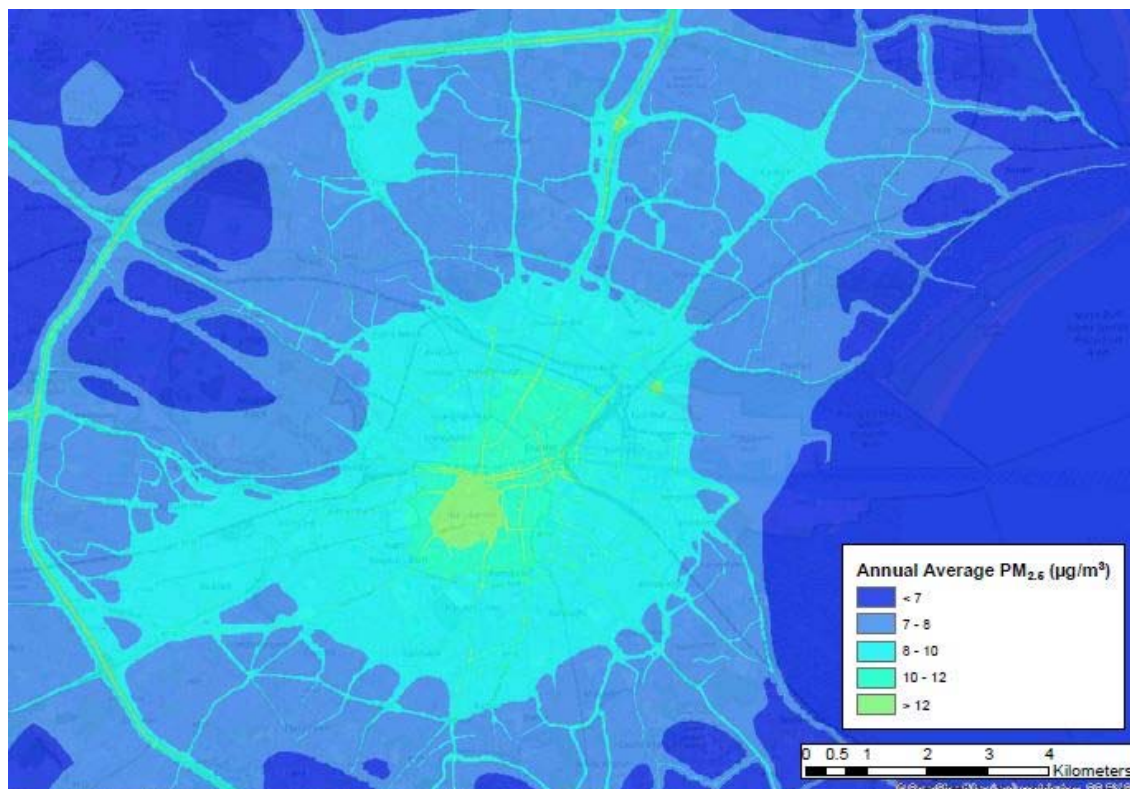


Figure 6 better ways to heat your home

### Modelling of PM<sub>2.5</sub> concentrations in Dublin

Figure 7 shows modelled annual average PM<sub>2.5</sub> concentrations for 2015 in Dublin. This map has been produced as part of a dispersion model study of nitrogen dioxide and particulate matter levels in Dublin. It clearly indicates that we are above the WHO guideline values for PM<sub>2.5</sub> across the urban area of Dublin. These indicative results support monitoring carried out by the EPA and the conclusion of previous Air Quality in Ireland reports.



**Figure 7 Modelled annual average PM<sub>2.5</sub> concentrations for 2015 in Dublin**

### What can be done?

Ultimately, the best way to reduce PM in Ireland is to move to cleaner ways of heating our homes. This will dramatically reduce our PM levels in ambient air in Ireland, leading to much improved health outcomes for people. This is particularly important for at-risk individuals, such as young children and those with breathing problems.

In the short-term, any movement towards the ‘best choice for air quality and health’ depicted in the infographic (Figure 6) on better ways to heat your home will reduce PM and improve air quality.

### The link between PM, home heating and climate change

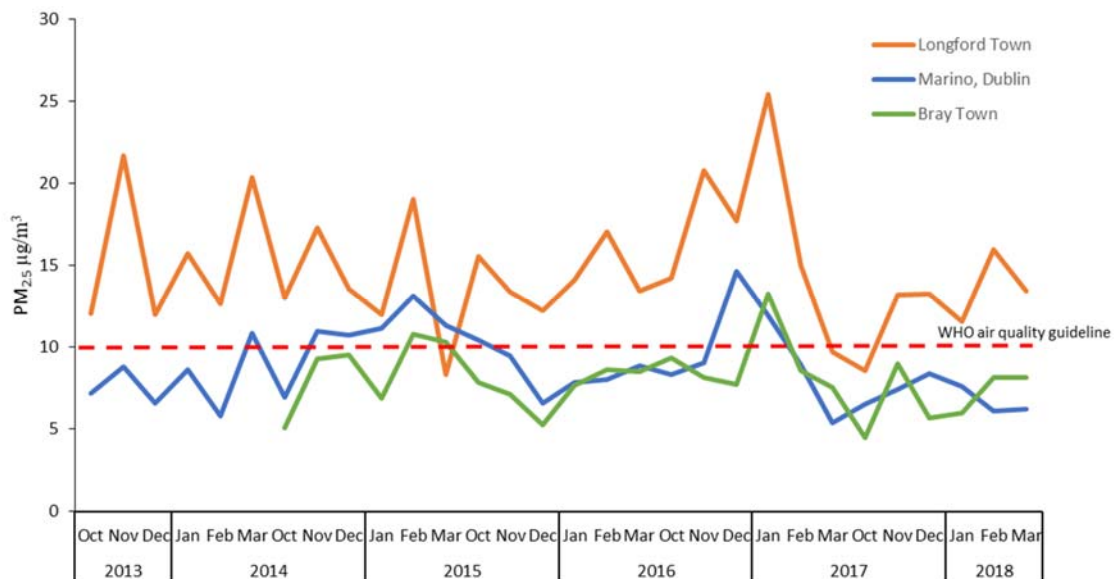
There is a clear link between the reduction in harmful PM and climate change. As we make our homes more energy efficient, we will need less energy to heat our homes. If that energy comes in the form of solid fuel burning, then any reduction in that energy demand will lead to less production of PM and consequently less green-house gas formation.

Improving our housing stock's energy efficiency and moving to clean home heating choices will have the twin benefit of lowering emissions of the greenhouse gas CO<sub>2</sub>, and improving air quality in Ireland

Also, if we move towards the 'best choice for air quality and health' for heating your home, shown in Figure 6, we will also reduce our emissions of green-house gases. Thus, dealing with our air quality issues will be better for our health and lead to long-term benefits for climate change. Many of the strategies that are outlined in the Government's Climate Action Plan should be progressed immediately and will have a beneficial outcome for air quality and health.

### Longford and Bray – A Tale of Two Towns

The towns of Longford and Bray can be used to highlight the impact that solid fuel use has on air quality. Bray has a ban on the sale and use of bituminous coal. It is also part of the Gas Network. In contrast Longford has no ban on the sale and use of bituminous coal. It is also not connected to the Gas Network.



**Figure 8 PM<sub>2.5</sub> concentrations for winter heating season 2013 - 2018 at selected monitoring stations**

Figure 8 shows the concentration of PM<sub>2.5</sub> measured during the winter heating season (January to March and October to December) for the years 2013 – 2018 at Bray Town, Longford Town and for comparison Marino in Dublin, which is a suburban background location. This graph allows us to see the discrepancy between the two locations and the impact that additional solid fuel use has on air quality. Although the air at all three locations at times does not meet the WHO air quality guideline for PM<sub>2.5</sub>, it is worse in the smaller town of Longford due to the increased use of solid fuel for home heating. This situation is likely to be reflected across many towns in Ireland where solid fuel burning is prominent. The EPA has

developed an infographic outlining the 'spectrum' of solid-fuels for home heating in Ireland ranging from 'very smoky' to 'less smoky'. Any movement along the spectrum towards 'less smoky' will have a subsequent improvement on air quality. However, by far the greatest benefit will be seen with movement towards home heating that is 'the best choice for air quality and health'.

## 4 Nitrogen oxides and transport

This section of the report introduces another of the main pollutants that impacts people's health in Ireland – nitrogen oxides.

### What are nitrogen oxides?

Nitrogen oxides – or  $\text{NO}_x$  – are the gases nitrogen oxide (NO) and nitrogen dioxide ( $\text{NO}_2$ ). Both of these are pollutants that are emitted in ambient air when petrol or diesel is burned in internal combustion engines.  $\text{NO}_2$  is more important from an ambient air quality perspective due to its increased impact on health, see section 1.

### What are the main sources of $\text{NO}_2$ in Ireland?

In terms of ambient air quality, the main source of  $\text{NO}_2$  in Ireland is from road transport. Diesel engine vehicles produce more  $\text{NO}_2$  than petrol vehicles. Other sources of  $\text{NO}_2$  in Ireland include non-road mobile machinery (for example, JCBs and ride-on lawnmowers), industrial and construction activities, and electricity and heat production equipment.

### Summary of results in 2018

$\text{NO}_2$  was measured at 17 monitoring stations in Ireland in 2018. There were no exceedances of the EU annual limit values, however there was one monitoring station at St. John's Road in Dublin for which initial indications are, that it will exceed the EU limit value in the near future. There was one monitoring station which was above the WHO Air Quality Guidelines for hourly  $\text{NO}_2$  levels (Ballyfermot in Dublin).

### What can be done?

The actions related to transport in the Government's recently published Climate Action Plan are aimed at reducing our reliance on internal combustion vehicles and will thus have improvements for air quality and health. They include

- Accelerating the take up of EV cars and vans so that we reach 100% of all new cars and vans being EVs by 2030.
- Making economic growth less transport intensive through better planning, remote and home-working and modal shift to public transport.
- Conversion of public transport fleets to zero carbon alternatives

Immediately we can ask ourselves: Is there a 'clean air' alternative to making this journey by car? Can I use public transport? Can I walk or cycle? If I must take a car, – could I car pool?

### The link between transport, air quality and climate change






Decarbonisation of our transport systems will, in the short-term, lead to a reduction in  $\text{NO}_2$  but it will also have the additional benefit of reducing Ireland's emissions of the greenhouse gas  $\text{CO}_2$ . In this way, an aim to reduce  $\text{NO}_2$  for immediate health benefits can be used to deliver long-term benefits for the environment.









# Air quality & transport in Ireland

[www.epa.ie/air/quality](http://www.epa.ie/air/quality)




## Transport - What is the problem?

<p>Diesel and petrol vehicles produce the toxic gas <b>NO<sub>x</sub></b> and particulate matters</p> <p>PM<sub>10</sub> NO<sub>x</sub> PM<sub>2.5</sub></p> 	<p>They also contribute to climate change</p> 	<p>Health implications of poor air quality from transport impacts the liver, lungs and spleen</p> 	<p>Ireland is also facing exceedances of the EU limit values in our urban areas</p> 
<p>Transport is contributing to 20% of Ireland's greenhouse gas emissions</p> 			

## What can be done?

<p>Is it necessary to make your journey in a diesel or petrol car? <b>Is there an alternative?</b></p> 	<p><b>Walk and Cycle friendly networks</b> making it easier for individuals to make the cleaner/healthier choice</p> 	<p>Consider an <b>EV as your next vehicle purchase</b></p> 
<ul style="list-style-type: none"> <li>&gt; Use public transport</li> <li>&gt; Car pool/sharing</li> <li>&gt; Walking and cycling</li> </ul>	<p><b>Air Quality</b> ↑</p> <p><b>Decarbonisation</b> of the public transport system also has benefits for air quality</p>  <p>CO<sub>2</sub> ↓</p>	<p><b>Expansion of the electric vehicle recharging network</b> - making it as easy to charge an EV as it is to fill up with petrol/diesel</p> 
<p><b>Low-emission zones</b></p> 		

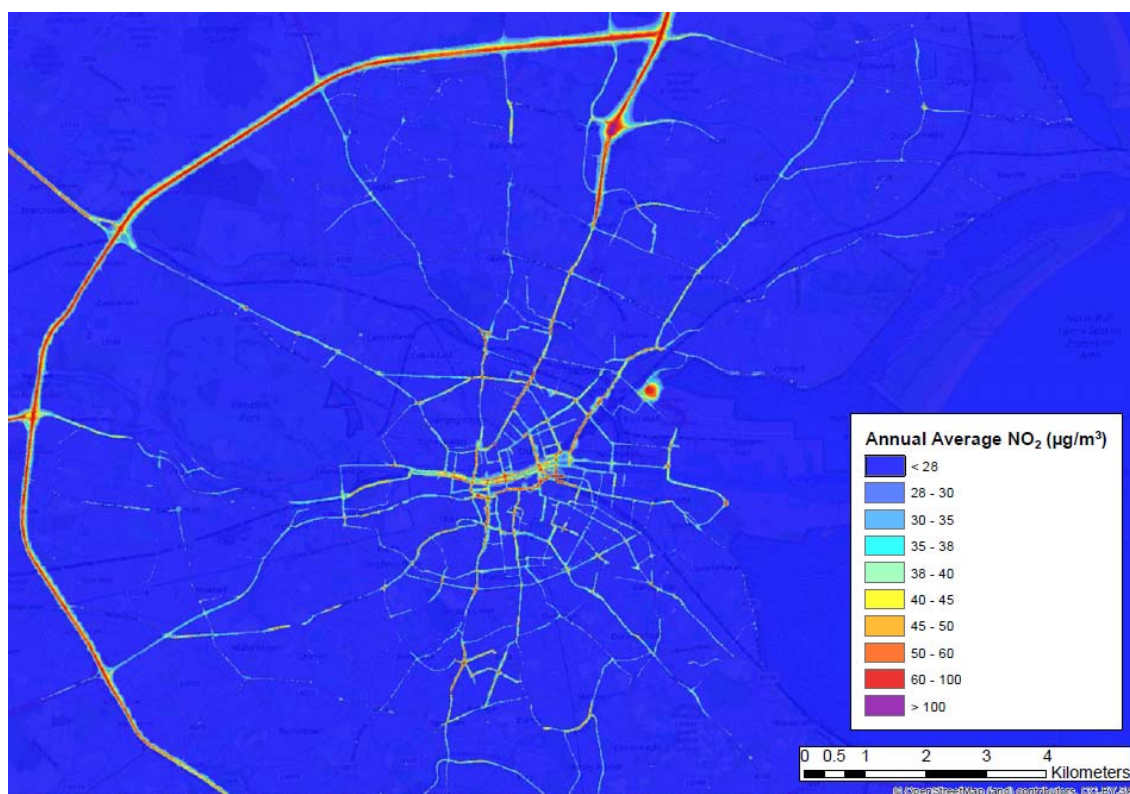
## Outcomes

<p><b>Better air quality - better health for you</b></p> 	<p><b>Compliance with EU limit values</b></p> 	<p><b>Lower greenhouse gas emissions - better for the planet</b></p> 
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## Potential future exceedances

The recently published 'Urban Environmental Indicators Report' - used indicative sampling and dispersion modelling techniques to assess the impact of NO<sub>2</sub> across the urban areas of Dublin. The findings of this study show that concentrations of NO<sub>2</sub> at many locations in Dublin are potentially above **EU NO<sub>2</sub> annual limit value of 40µg/m<sup>3</sup>**. The modelled concentrations of NO<sub>2</sub> were highest around the M50 motorway, around certain city centre streets, around the entrance / exit of the Dublin Port tunnel. The results obtained in the indicative diffusion tube assessment are strongly reflected in the modelled concentrations, see Figure 9.



**Figure 9 Modelled annual average NO<sub>2</sub> concentrations for 2015 in Dublin**

Regarding actual monitored concentrations - although there were no exceedances of the legal EU limit values in 2018, the short amount of monitoring we carried out at St John's Road in Dublin supports the findings of the Urban Environmental Indicators report. Monitoring at St John's Road in Dublin was carried out from 28 November 2018 to 31 December 2018, which is too short a time to capture enough data (minimum data capture required is 85%) for a true comparison against the EU annual limit value of 40 µg/m<sup>3</sup> (micrograms per cubic meter of air). However, even in that short time period, NO<sub>2</sub> concentrations at St. John's Road were measured at 44 µg/m<sup>3</sup> (in excess of the annual limit). These results coupled with findings of the Urban Environmental Indicators report show we are almost certainly facing exceedances of the legal limit value in the near future.

## 5 Ground level ozone

This chapter highlights a pollution episode that occurred during the warm weather spell Ireland experienced in June 2018.

In general, for ozone in 2018 – it was measured at 15 monitoring stations and there was no exceedance of the EU limit values. However, the WHO air quality guideline for ozone was exceeded at 13 of these monitoring stations.

### What is ground level ozone?

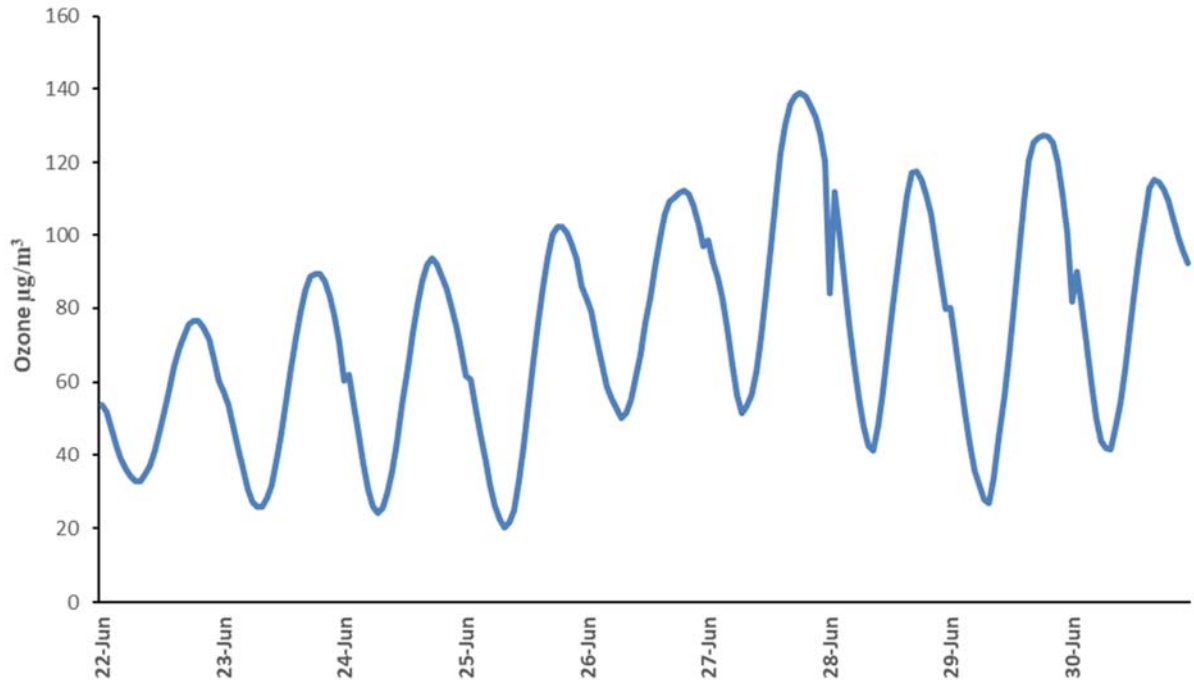
Ground level ozone is a pollutant formed in urban areas when you have car exhaust emissions mixing together and undergoing chemical reactions in sunny weather. Ground level ozone can be bad for your health, see section 1 for further details.

### What are the main sources of ground level ozone in Ireland?

Normally, ozone is a **'transboundary'** pollutant in Ireland – this means that the sources of the ozone are outside Ireland (normally mainland Europe). Then, the pollutants are carried in an air mass across the sea to impact here. There is also a natural component to the ozone normally measured in Ireland. However, when weather conditions are suitable – namely dry, hot, sunny weather – then ozone can be produced by reactions of NO<sub>x</sub> and other emissions from car exhausts to produce a brown, hazy atmosphere which is called 'photochemical smog'.

### Ground level ozone 'episode' in Ireland, June 2018

In June 2018, there was a typical 'photochemical smog' episode across the urban areas of Ireland, where traffic is a problem, which led to large amounts of ground-level ozone being produced. During this episode, the concentrations reached ~160 µg/m<sup>3</sup>. If they had reached **180 µg/m<sup>3</sup>** it would have triggered a Public Information Alert, to tell the public of the health impacts of elevated (raised) ozone concentrations. These impacts are detailed in section 1. Figure 10 shows the pattern of ground-level ozone production that was observed during this episode in June 2018 at the monitoring station at UCC Distillery Road in Cork. This pattern follows an increase in ozone levels during the day when the sun is shining followed by a fall in levels during the night-time, with an overall increase in pollutant levels during the episode. This episode showed that ground level ozone is a potential problem pollutant in Ireland if suitable weather conditions are experienced again in the future.



**Figure 10 Ground level ozone concentrations at UCC Distillery Road 22 to 30 June 2018**

#### **What can be done?**

The main way to reduce the impact of ground-level ozone in Ireland is to reduce the levels of  $\text{NO}_x$  in our urban areas. Again, a modal shift away from the internal combustion engine powered vehicles will also reduce the impact of ground-level ozone in Ireland. Reduction in the impact of transboundary ozone (outside Ireland) is more problematic as it will take a Europe-wide reduction in ground-level ozone formation – something which will be difficult to achieve given current  $\text{NO}_x$  concentrations across Europe.

## 6 Other pollutants in 2018

This section of the report presents a highlight of the EPA's findings on the rest of the pollutants we assessed in 2018. Full details of air quality results can be found at [www.epa.ie/air/quality/reports/aqsupp/](http://www.epa.ie/air/quality/reports/aqsupp/). For a summary of the findings see Table 1.

### Dioxins

'Dioxins' is a collective term for a group of chemical compounds that can be formed when carbon containing material is burned at low-temperature. This happens predominantly from residential combustion and backyard burning of waste. Dioxins were again monitored in 2018 at selected locations across Ireland. This pollutant is measured in samples of cow's milk and compare to European standards. Concentrations observed in 2018 were in line with previous years' measured results and well below European limit values. All other pollutants measured in Ireland in 2018 were below limit or target values for 2018.

### PAH

Polycyclic aromatic hydrocarbons (PAH) are chemical compounds which consist of two or more fused aromatic rings made entirely from carbon and hydrogen. PAH are emitted domestically from the combustion of solid fuels, such as peat, wood and coal. PAH and in particular benzo (a) pyrene (BaP), which is used as a marker for PAH, are known carcinogens.

Pollutant	Number of stations where monitored 2018	EU legal limit values	WHO Air Quality Guideline (AQG) level or EEA reference level
<b>PM<sub>10</sub></b>	26	No exceedances	Above WHO AQG level at 2 of the 26 stations
<b>PM<sub>2.5</sub></b>	20	No exceedances	Above WHO AQG at 7 of the 20 stations
<b>NO<sub>2</sub></b>	17	No exceedances	Above WHO hourly AQG level at 1 station
<b>Ozone</b>	15	No exceedances	Above WHO AQG level at 13 stations
<b>PAH</b>	4	No exceedances	Above EEA reference level at 3 stations
<b>Dioxins</b>	37	No exceedances	n/a
<b>All other pollutants</b>		No exceedances	Below AQG levels

**Table 1 selected pollutants measured in 2018 and their adherence to EU legal limit values and WHO air quality guideline values**

### 7 Local Air Quality Monitoring Network

As part of the AAMP Ireland now has a network of ‘Local’ air quality monitoring stations. These monitoring stations have lower cost monitoring equipment that is used to give people a rapid and up to date indication of air quality in their locality. This information can then be used to inform decisions about siting of further monitoring stations. There were 5 ‘local’ air quality monitoring stations established in 2018, adding to existing ‘local monitoring sites’ that were in operation by Local Authorities. These monitoring stations are measuring the pollutants PM<sub>10</sub> and PM<sub>2.5</sub>. Figure 11 and Figure 12 show monthly average concentrations of these pollutants that was observed in 2018. These monthly average concentrations are useful to examine the impact on air quality of the ‘Winter heating season’ which in Ireland generally runs from November to March/April.

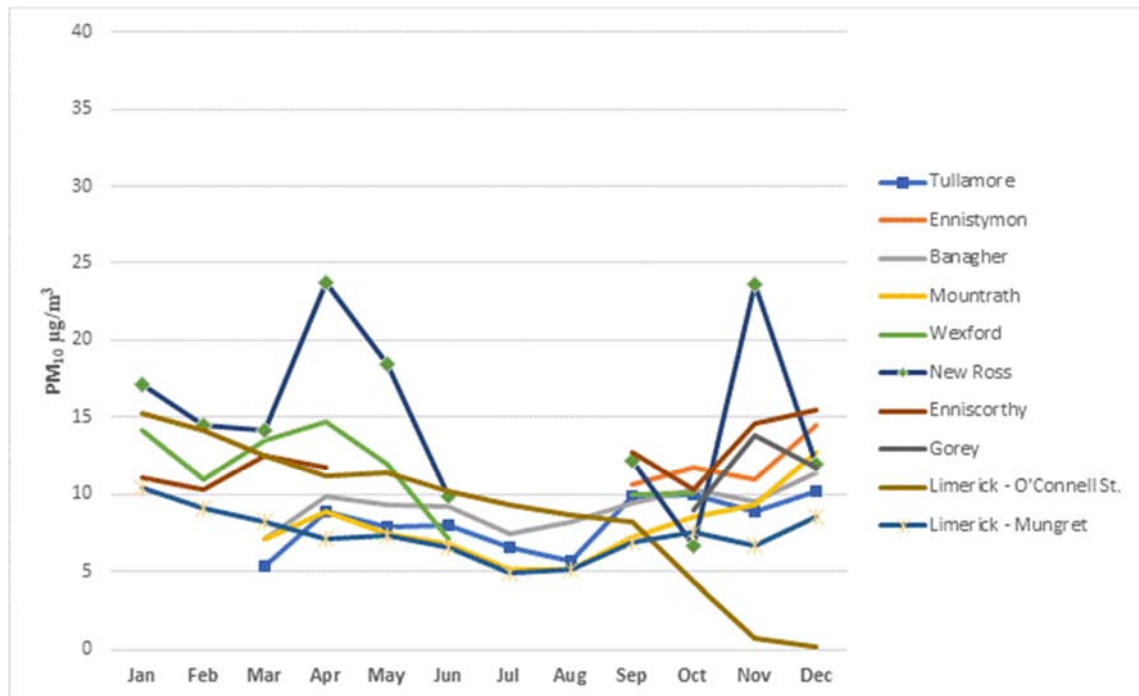
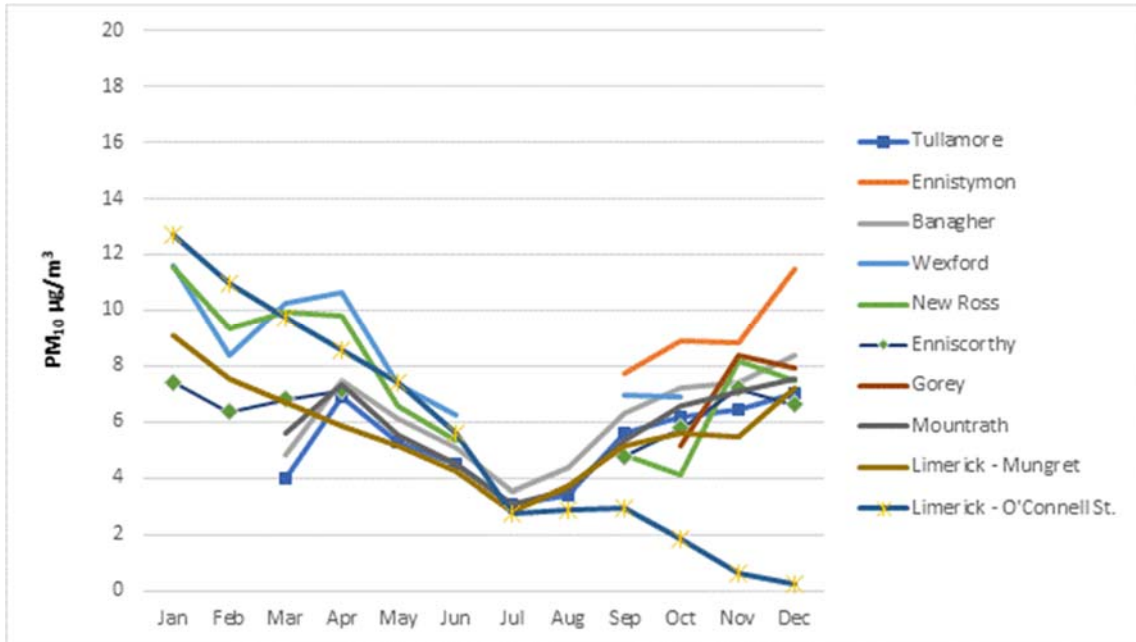


Figure 11 PM<sub>10</sub> monthly average concentrations at stations in the Local Air Quality Monitoring Network in 2018<sup>2</sup>

<sup>2</sup> Gaps in data are due to instrument downtime or evident instrument malfunction



**Figure 12 PM<sub>2.5</sub> monthly average concentrations at stations in the Local Air Quality Monitoring Network in 2018<sup>3</sup>**

These graphs outline the impact that the winter-heating season has on PM levels in Ireland. These 'local monitoring' sites give a clear indication that the sources of PM in these towns is related to the colder winter temperatures and the use of solid-fuel burning for home heating.

<sup>3</sup> Gaps in data are due to instrument downtime or evident instrument malfunction

## 8 Conclusions

Air pollution and the poor air quality it causes is a major environmental health risk (WHO 2018). The European Environment Agency estimates that there were 1,180 premature deaths in Ireland in 2016 due to poor air quality, with a figure of 538,014 premature deaths across the wider EU<sup>4</sup>.

### **EU limits met in 2018 but not the WHO guideline values for health**

Ambient air quality monitoring carried out by the EPA in 2018 shows that Ireland met all the legal requirements under the CAFE Directive by being within statutory limit and target values. All dioxin levels recorded in the 2018 survey remain low and compare favourably with those from previous surveys and from other EU countries. The highest levels observed are still well below the legal limits.

However, the WHO air quality guidelines are stricter, and we are above these guideline values for some key pollutants, including particulate matter (PM<sub>10</sub> and PM<sub>2.5</sub>), ozone and NO<sub>2</sub>. We are also above the EEA reference level for PAH – Polycyclic aromatic hydrocarbons which are pollutants produced from solid fuel burning.

These WHO guidelines are the new benchmarks for good air quality globally, and so exceeding there is a cause for concern, particularly with respect to pollutants such as fine particulate matter (PM<sub>2.5</sub>). This pollutant has been highlighted by the EEA as being predominantly responsible for most of the 1,180 estimated premature deaths.

From our measurements there are also initial indications that we will soon exceed the NO<sub>2</sub> EU limit value at St. John's Road West in Dublin.

### **Domestic use of solid fuel such as coal, peat and wood is having a negative impact on our air quality**

The use of solid fuel burning for home heating has been identified by EPA-funded Irish research as the leading contributor to fine particulate matter (PM<sub>2.5</sub>) concentrations across Ireland. PAH in ambient air also come from burning of solid fuels.

### **Indications that we will exceed NO<sub>2</sub> legal limit values**

As signalled in the recently published 'Urban Environmental Indicators Report' and following preliminary monitoring at our St. John's Road West site in Dublin, it remains likely that we **will exceed the EU annual limit value for NO<sub>2</sub>** in the near future. The largest contributor to ambient levels of NO<sub>2</sub> is from **the transport sector**, particularly in urban areas. There are other contributions from residential heating, energy and industry.

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<sup>4</sup> Air Quality in Europe 2018 – European Environment Agency

## What can be done?

### - Solid fuel

Encouraging people to move to using cleaner fuels, more efficient methods of using those fuels and with effective implementation and enforcement of the proposed nationwide ‘smoky’ coal ban can all help reduce air pollution. This approach follows the principle that any movement towards an ultimately clean home-heating choice will benefit air quality. See Figure 6 on page 13 for an illustration of the impact of different home heating choices on our local air quality and health.

In the longer-term, a reduction in the amount of heating required through improved energy efficiency of homes is an important part of the solution. This, along with a move to clean heating technology, will improve air quality. It will also reduce Ireland’s greenhouse gas emissions and thus aid in tackling climate change.

### - Transport

Once an exceedance is confirmed, then Local Authorities in Dublin and its suburbs, will be legally required to prepare air quality action plans to address this exceedance. This will involve examining both the causes and providing solutions in the affected areas. The Department of Climate Change Action and the Environment (DCCAE) together with the Department of Transport (DOT) announced the establishment of a joint task force to address this issue, which is welcomed by the EPA.

Examples of measures other European cities use to address similar issues include the promotion of alternatives to the private car – public transport, carpooling, cycling and walking together with moving to cleaner modes of public transport and an expansion of the re-charging network for electric vehicles. The establishment of low-emission zones within urban areas is also an option. Although policy change will certainly play a major role in the reduction of NO<sub>2</sub> in our urban areas, the most important factor will be recognition by the public that they can make a difference in their choice of transport option for each journey they make. The transport options in the Government’s Climate Action Plan, chiefly aimed at decarbonisation of our public transport system and generally reducing our reliance on internal combustion vehicles, if implemented will have the twin benefit of lowering greenhouse gas emissions as well as reducing NO<sub>2</sub> emissions and improving health.

## Public awareness and behavioural change

Key to improving air quality will be increasing **public awareness** of the impacts that our home-heating choices and modes of transport have on air quality and facilitating **behavioural change** to improve air quality and our health.

Encouraging and supporting the public to make cleaner choices in the context of a sustainable society and economy will be important. In this regard, the EPA looks forward to the impending publication of the Government’s first ‘Clean Air Strategy’. Together with the recently published Climate Action Plan to address climate change, which also contains many measures which will have air quality benefits, these documents will point the way forward from a policy perspective. The adoption of the WHO guideline values across Europe would signal the commitment of Member States to the improvement of air quality and subsequent health

improvements. To then tackle the problem of air pollution in Ireland, the incentivisation, promotion and support of the continued shift in society away from solid fuel as a method of home heating to clean alternatives and a promotion of clean transport options must be supported.

Finally, the continued implementation of the AAMP by the EPA will not only provide increased availability of the public to high quality real-time air quality information but it will be used to engage with the public and assist and support them to consider the impact of their heating and transport choices on the air quality in their neighbourhood and then act in improving air quality and health in their communities.

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## AN GHNÍOMHAIREACHT UM CHAOMHNÚ COMHSHAOIL

Tá an Gníomhaireacht um Chaomhnú Comhshaoil (GCC) freagrach as an gcomhshaoil a chaomhnú agus a fheabhsú mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaoil a chosaint ó éifeachtaí díobhálacha na radaíochta agus an truaillithe.

## Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

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

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

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

## Ár bhFreagrachtaí

### Ceadúnú

Déanaimid na gníomhaíochtaí seo a leanas a rialú ionas nach ndéanann siad dochar do shláinte an phobail ná don chomhshaoil:

- saoráidí dramháiola (*m.sh. láithreáin líonta talún, loisceoirí, stáisiúin aistrithe dramháiola*);
- gníomhaíochtaí tionsclaíoch ar scála mór (*m.sh. déantúsaíocht cógaisíochta, déantúsaíocht stroighne, stáisiúin chumhachta*);
- an dionalmhaíocht (*m.sh. muca, éanlaith*);
- úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe (*OGM*);
- foinsí radaíochta ianúcháin (*m.sh. trealamh x-gha agus radaiteiripe, foinsí tionsclaíochta*);
- áiseanna móra stórála peitрил;
- scardadh dramhuisce;
- gníomhaíochtaí dumpála ar farraige.

### Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

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

### Bainistíocht Uisce

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

## Monatóireacht, Anailís agus Tuairiscí ar an gComhshaoil

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

## Rialú Astaíochtaí na nGás Ceaptha Teasa in Éirinn

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

## Taighde agus Forbairt Comhshaoil

- Taighde comhshaoil a chistiú chun brúnna a shainiú, bonn eolais a chur faoi bheartais, agus réitigh a sholáthar i réimsí na haeraíde, an uisce agus na hinbhuanaitheachta.

## Measúnacht Straitéiseach Timpeallachta

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

## Cosaint Raideolaíoch

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

## Treoir, Faisnéis Inrochtana agus Oideachas

- Comhairle agus treoir a chur ar fáil d'earnáil na tionsclaíochta agus don phobal maidir le hábhair a bhaineann le caomhnú an chomhshaoil agus leis an gcosaint raideolaíoch.
- Faisnéis thráthúil ar an gcomhshaoil ar a bhfuil fáil éasca a chur ar fáil chun rannpháirtíocht an phobail a spreagadh sa chinnteoireacht i ndáil leis an gcomhshaoil (*m.sh. Timpeall an Tí, léarscáileanna radóin*).
- Comhairle a chur ar fáil don Rialtas maidir le hábhair a bhaineann leis an tsábháilteacht raideolaíoch agus le cúrsaí práinnfhreagartha.
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## Múscailt Feasachta agus Athrú Iompraíochta

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

## Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an gníomhaíocht á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóirí. Déantar an obair ar fud cúig cinn d'Oifigí:

- An Oifig um Inmharthanacht Comhshaoil
- An Oifig Forfheidhmithe i leith cúrsaí Comhshaoil
- An Oifig um Fianaise is Measúnú
- Oifig um Chosaint Radaíochta agus Monatóireachta Comhshaoil
- An Oifig Cumarsáide agus Seirbhísí Corparáideacha

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



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