

# Chapter 13: Environment and Industry





# Environment and Industry

## 1. Introduction

Industry is an important part of Ireland's economy, providing jobs and vital goods for modern society. Over 18% of the workforce in Ireland, 2.3 million people in 2022, was employed in industry (CSO, 2023), with the industrial sector third behind the healthcare and retail sectors in terms of workforce size. The total value of products manufactured in Ireland in 2022 was €132 billion. The three largest industry sectors accounted for two-thirds (or almost €90 billion) of total net selling value – pharmaceutical products (32%), food products (18%) and chemicals and chemical products (17%) (CSO, 2023). Ireland is the world's third largest exporter of pharmaceuticals; there are now more than 84,000 highly skilled people directly and indirectly employed in the wider chemical and pharmaceutical manufacturing sector. Bord Bia (2024) reported an increase in Irish food and drink exports of 22% in 2022, worth €16.7 billion. This decreased by 4% in 2023 but remains 24% higher than it was in 2019.

While these sectors provide significant benefits to the Irish economy, they also present potential risks to the environment that require appropriate management and regulation. Industrial activities are a source of pressure on the environment, mainly in the form of waste generation, resource consumption and emissions to the atmosphere, soil and water ecosystems.

Studies have shown that air pollution from industrial facilities across Europe has significant costs associated with its impacts on human health, ecosystems, infrastructure and climate. Across Europe, more than 100 industrial facilities (none from Ireland) are responsible for 50% of the damage caused by air pollution, mostly emitted by energy suppliers within Germany, Poland, Italy, France and Spain (EEA, 2024).

Some industrial sites cause local issues with water and air quality and can create noise and odour problems which impact a community's ability to enjoy its local environment.

## 2. European policy context

### European Green Deal

The European Green Deal is Europe's strategy to ensure a climate-neutral, clean and circular economy by 2050, optimising resource management and minimising pollution while recognising the need for deeply transformative policies (EC, 2019). It provides a roadmap for industries to transition towards more sustainable practices, while also fostering innovation and competitiveness. It aims to reach zero pollution for a toxic-free environment under the Zero Pollution Action Plan (EC, 2021). One of the pillars of the Green Deal is 'a predictable and simplified regulatory environment'.

### Strategic Agenda 2024-2029

Adopted by the European Council in 2024, the Strategic Agenda 2024-2029<sup>1</sup> sets priorities for the European Union (EU) for the next 5 years in line with the EU's ambition to become the first climate-neutral continent, focusing on green and digital industries and technologies. Agreed priorities include more support for the scale-up of Europe's manufacturing capacity for net-zero technologies and products, the development of a more circular and resource-efficient economy and an ambition to simplify business permitting. There is a continued commitment in the Strategic Agenda to protect nature, reverse the degradation of ecosystems and strengthen water resilience. See Chapter 15 for more on the circular economy and Chapters 7 and 8 for further discussion of nature and water protection.

### Industrial Emissions Directive

The revised Industrial Emissions Directive (IED) (2024/1785/EU)<sup>2</sup> is the main piece of EU legislation for preventing and reducing pollution from large industries (Topic Box 13.1). The amount of air pollutants emitted by these industries is seven times less than it was 20 years ago (EC, 2021). Table 13.1 maps the IED to selected European Green Deal policies.

1 [www.consilium.europa.eu/media/4aldqfl2/2024\\_557\\_new-strategic-agenda.pdf](http://www.consilium.europa.eu/media/4aldqfl2/2024_557_new-strategic-agenda.pdf) (accessed 15 July 2024).

2 Amending IED Directive (2010/75/EU) and Landfill Directive (1999/31/EC).



### Topic Box 13.1 Industrial Emissions Directive

The IED (2024/1785/EU) which amended IED (2010/75/EU) is the primary instrument in place to control and mitigate environmental and health impacts arising from industrial emissions in Ireland and across the EU. The Environmental Protection Agency (EPA) is the competent authority in Ireland for the IED.

In the revised directive, additional intensive agriculture and large-scale battery production activities will be brought into scope. The revision will require a greater focus on energy, water and material efficiency and reuse, in addition to promoting the use of safer, less toxic or non-toxic chemicals in industrial processes. Licences issued under the revised IED will include tighter controls on air and water emissions, additional monitoring where a derogation has been granted and enhanced public access to information. There is also a requirement to have greater synergies with the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH) Regulation<sup>3</sup> and with authorities, particularly in relation to chemical management systems at installations and in developing sector-specific good practice for chemical manufacture.

The revised directive will offer better protection to human health and the environment by reducing harmful emissions from industrial installations while promoting energy efficiency, a circular economy and decarbonisation.<sup>4</sup>

There are approximately 50,000 installations in Europe operating in accordance with IED licences across 65 industrial activity types such as cement, chemical and power plants (Figure 13.1).

**Table 13.1** Mapping of Industrial Emissions Directive to selected European Green Deal policies<sup>a</sup>

POLICY AREA	EXAMPLES OF IED CONTRIBUTION AND RELEVANCE
<b>Zero Pollution Action Plan</b>	<ul style="list-style-type: none"> <li>Prevents and reduces emissions of pollutants to air, water and soil</li> <li>Seeks to ensure that emissions do not lead to exceedances of environmental quality standards defined in air and water legislation</li> <li>Regulates transfers of industrial pollutants to urban waste water treatment plants</li> </ul>
<b>Climate change and energy policies</b>	<ul style="list-style-type: none"> <li>Takes GHG emissions of pollutant reduction techniques into account</li> <li>Regulates emission of GHGs not covered by the ETS (e.g. methane)</li> <li>Identifies energy efficiency techniques and established energy performance levels for specific processes</li> <li>Requires transformation plans (under the revised IED)</li> </ul>
<b>Sustainable chemicals</b>	<ul style="list-style-type: none"> <li>Reduces the presence of harmful chemicals in the environment</li> <li>Will require chemical management systems at installations and the development of sector-specific good practice for chemical manufacture (under the revised IED)</li> </ul>
<b>Circular economy/waste</b>	<ul style="list-style-type: none"> <li>Promotes the efficient use of materials, water and energy and encourages waste prevention/recycling and the use of secondary raw materials</li> <li>Reduces emissions of pollutants from waste management installations</li> </ul>
<b>Nature and biodiversity</b>	<ul style="list-style-type: none"> <li>Contributes to protecting biodiversity, by curbing pollutant emissions, one of the drivers of biodiversity loss</li> </ul>

<sup>a</sup> [eur-lex.europa.eu/resource.html?uri=cellar:8695b069-b5a9-11ec-b6f4-01aa75ed71a1.0001.02/DOC\\_1&format=PDF](https://eur-lex.europa.eu/resource.html?uri=cellar:8695b069-b5a9-11ec-b6f4-01aa75ed71a1.0001.02/DOC_1&format=PDF)

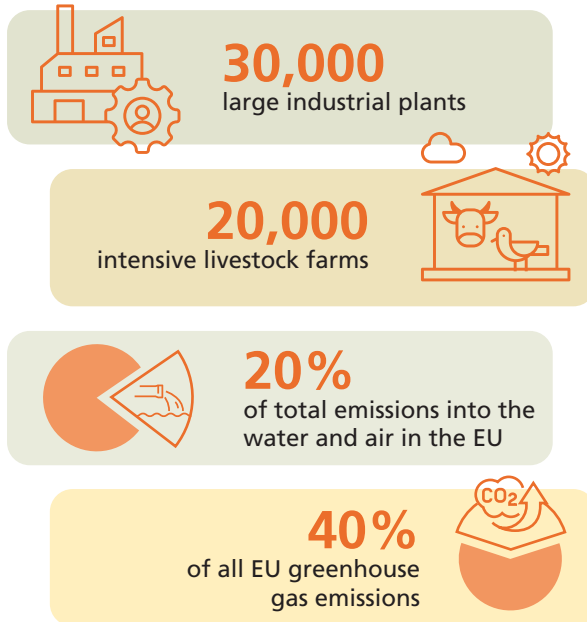
ETS, Emissions Trading System; GHG, greenhouse gas.

<sup>3</sup> [eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006R1907-20221217](https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX:02006R1907-20221217) (accessed 15 July 2024).

<sup>4</sup> [www.consilium.europa.eu/en/press/press-releases/2024/04/12/industrial-emissions-council-signs-off-on-updated-rules-to-better-protect-the-environment/](https://www.consilium.europa.eu/en/press/press-releases/2024/04/12/industrial-emissions-council-signs-off-on-updated-rules-to-better-protect-the-environment/) (accessed 15 July 2015).



**Figure 13.1** IED regulation across Europe



Source: Adapted from the European Council<sup>5</sup>

The objective of the IED licensing system is to provide an integrated management approach that concurrently considers environmental pressures on air and water quality and in terms of waste generation. IED licence conditions must be based on the use of best available techniques (BATs),<sup>6</sup> which are the most environmentally effective of the economically viable techniques available. Within Europe there is a legal requirement that industry must report on emissions via the Industrial Emissions Portal,<sup>7</sup> and these data are then made available to the public.

Installations covered by the IED currently account for 20% of total emissions to water and air in the EU. The IED applies to large combustion plants with a rated thermal input capacity over 50 MWth (megawatts thermal), including standby plants, which emit large quantities of pollutants to air. The Medium Combustion Plant Directive ((EU) 2015/2193) applies to all combustion plants with a rated thermal input capacity of between 1 and 50 MWth. These directives control emissions to air of sulphur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>) and particulate matter. The introduction of the Medium Combustion Plant Regulation (S.I. No. 595/2017) will bring a reduction in emission limit standards for all new and existing plants in Ireland by 2025.

Across the EU, IED installations account for 40% of all EU greenhouse gas emissions. These emissions are mainly regulated under the EU Emissions Trading System (ETS) (see Chapters 4 and 12), which the EPA is responsible for administering in Ireland. The scheme includes 112 installations nationally. Since 2005, Ireland's emissions within the scope of the ETS have decreased by 35%, with electricity generators and cement plants responsible for most of the decrease (see Chapter 4). Light industry (non-energy intensive), such as some dairy processing plants, are covered by the Effort Sharing Regulation (ESR) ((EU) 2018/842).<sup>8</sup> Under the ESR, Ireland is required to reduce its emissions from these sectors by 42% by 2030, relative to 2005 levels.

Industrial sites licensed under the IED are located in all 26 counties. Ireland has a lower proportion of what is considered traditional heavy industry than its European counterparts (e.g. metal processing or mineral extraction) and a higher proportion than EU Member States of licensable industry in three specific sectors (Figure 13.2):

1. intensive agriculture – 45% of the total licensed industries in Ireland; 6% above the EU average (39%)
2. slaughtering, food and drink – 15% of Ireland's industrial installations; more than twice the EU average (7%)
3. chemicals – 11% of the total of licensed sites in Ireland; 2% above the EU average (9%).

<sup>5</sup> [www.consilium.europa.eu/en/infographics/industrial-emissions-directive-key-figures/](http://www.consilium.europa.eu/en/infographics/industrial-emissions-directive-key-figures/) (accessed 15 July 2024).

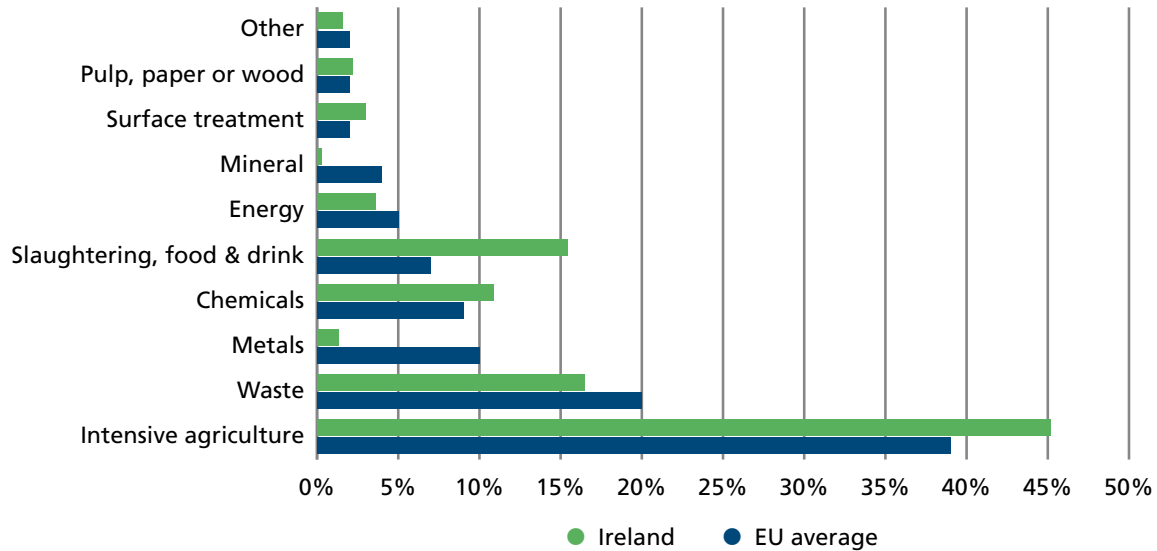
<sup>6</sup> For further information on BATs, the BAT Reference Document and BAT Conclusions, visit [www.epa.ie/our-services/licensing/industrial/industrial-emissions-licensing-ied/industrial-emissions-licensing-process-explained/-bat--bref--cid/](http://www.epa.ie/our-services/licensing/industrial/industrial-emissions-licensing-ied/industrial-emissions-licensing-process-explained/-bat--bref--cid/) (accessed 15 July 2024).

<sup>7</sup> [industry.eea.europa.eu/#/home](http://industry.eea.europa.eu/#/home) (accessed 15 July 2024). The information contained in the portal is reported annually and requested under the IED via the EU Registry on Industrial Sites (EU Registry) and the European Pollutant Release and Transfer Register. The European Industrial Emissions Portal replaced the European Pollutant Release and Transfer Register website in 2021.

<sup>8</sup> National binding targets (for the period 2021-2030) are covered by the ESR. This includes emissions from agriculture, transport, buildings and light industry.



**Figure 13.2** Composition of Industrial Emission Directive licensed industry (% of total licensed sites) in Ireland compared with EU Member States



Source: Compiled from European Council data<sup>9</sup>

### Corporate Sustainability Reporting

The Corporate Sustainability Reporting (CSR) Directive ((EU) 2022/2464), arising from the European Green Deal's climate change action objectives, requires that companies disclose climate and environmental data (Topic Box 13.2).



#### Topic Box 13.2 Corporate Sustainability Reporting Directive

The CSR Directive requires companies that fall within its scope to disclose information on what they see as the risks and opportunities arising from social and environmental issues and on the impact of their activities on people and the environment. This information informs and assists investors, consumers and other stakeholders evaluating the sustainability performance of companies. The requirement of this directive is being implemented in Ireland and in other EU Member States in 2024 (for companies with more than 500 employees), with a phased implementation planned over the coming years until full implementation is in place in 2028.

The directive ultimately aims to increase transparency and ensure stakeholder access to reliable and comparable information about companies across a wide range of environmental and social issues.

Transformation plans and reporting as envisaged under the IED revision will complement the CSR requirements, providing a means for the concrete implementation of these requirements at the installation level.

<sup>9</sup> [www.consilium.europa.eu/en/infographics/industrial-emissions-directive-key-figures/](http://www.consilium.europa.eu/en/infographics/industrial-emissions-directive-key-figures/) (accessed 15 July 2024).



### 3. Environmental regulation in Ireland

The EPA is the environmental regulator for large industrial and waste installations in Ireland (Figure 13.2). Licensing, permitting, inspections and the enforcement of permits form the core of the EPA's regulatory work. Further details of the EPA's work in this area are outlined later in this chapter.

Local authorities regulate industries that are not required to have a licence from the EPA, through single media permits (air, water), licences or waste permits. Other enforcement bodies, including Inland Fisheries Ireland, the Loughs Agency, the National Parks and Wildlife Service and Waterways Ireland, may investigate cases of unauthorised discharges to water or assess the impact of emissions to water from an industrial site.

Some industrial activities may cause or increase the risk of a major accident with potentially harmful consequences for the environment and/or human health. These plants are covered by the Seveso Directive (2012/18/EU), which is transposed nationally under the Chemicals Act Regulations 2015.<sup>10</sup> These regulations place specific emphasis on prevention measures, public information and the management of accidents. There are currently over 100 such installations in Ireland, and the lead regulator for these regulations is the Health and Safety Authority. Many of these installations are also licensed by the EPA under the IED.

Furthermore, the Commission for Regulation of Utilities is responsible for the regulation of some large-scale petroleum and natural gas installations, power generation plants and waste-to-energy plants. In some circumstances, the enforcement of environmental regulations may also have a cross over with planning authorities. The Maritime Area Regulatory Authority has a role in the licensing and enforcement of offshore development consents (see Chapter 9).

Enforcement networks play a crucial role in enhancing cooperation and coordination among the agencies responsible for preventing and combating illegal activities (Topic Box 13.3).

The EPA is Ireland's competent authority for issuing and enforcing industrial emissions (IE) licences in Ireland. There are over 650 IE licensed installations in Ireland regulated by the EPA (Figure 13.3).

#### Topic Box 13.3 Enforcement networks

There are several national and European enforcement networks where regulators can meet and share information. These networks ensure that environmental regulations are consistently enforced. The two most prominent networks are the European Union Network for the Implementation and Enforcement of Environmental Law (IMPEL) and the Network for Ireland's Environmental Compliance and Enforcement (NIECE).<sup>11</sup>



##### IMPEL

IMPEL is an international association of environmental authorities of the EU Member States, the UK, acceding and candidate countries of the EU, European Economic Area and European Free Trade Association countries and potential candidates that wish to join the European Community. IMPEL's mission is to ensure the effective implementation and enforcement of environmental law in Europe.



##### NIECE

NIECE is structured around key priority areas for environmental enforcement in Ireland, such as waste, water and air/climate. Members include representatives of local authorities, state agencies and government departments. The network provides a forum that encourages individuals and organisations to work together to deliver improvements in these priority areas.

The continued development of enforcement networks is essential to ensure both an effective and harmonised approach to environmental enforcement in Ireland and proactive communications with the public.

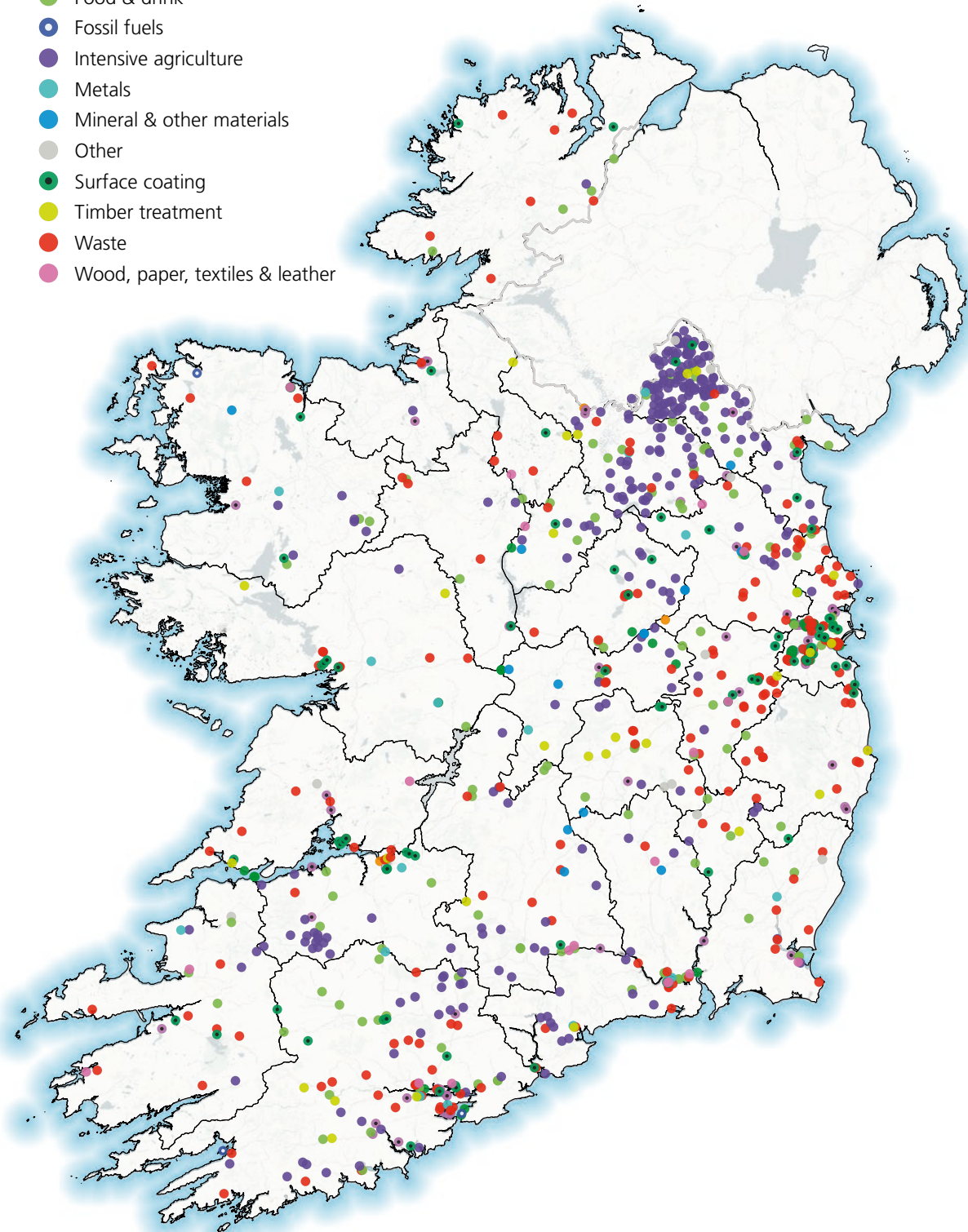
10 Chemicals Act (Control of Major Accident Hazards Involving Dangerous Substances) Regulations 2015 (S.I. No. 209/2015). The Seveso Directive was named after an accident that occurred in 1976 in a chemical plant near Seveso, Italy, resulting in emissions of air pollutants (dioxins) affecting residents and the environment.

11 [www.impel.eu/en](http://www.impel.eu/en) (accessed 15 July 2024); [www.epa.ie/our-services/compliance--enforcement/support-and-supervision-of-local-councils/niece-network/](http://www.epa.ie/our-services/compliance--enforcement/support-and-supervision-of-local-councils/niece-network/) (accessed 15 July 2024).



Figure 13.3 EPA-licensed industrial sites in Ireland, by sector

- Cement
- Chemical
- Energy
- Food & drink
- Fossil fuels
- Intensive agriculture
- Metals
- Mineral & other materials
- Other
- Surface coating
- Timber treatment
- Waste
- Wood, paper, textiles & leather



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Once the EPA has issued a licence to a facility, it monitors compliance to ensure that installations do not have significant impacts on human health or the environment and that they are carrying out their activities in accordance with their licences. The EPA's annual inspection plan provides a baseline for site visits based on requirements set out in the IED (EPA, 2022). The EPA assesses performance reports, records and information that are sent by operators as part of their licence requirements. The agency also carries out inspections to make sure that operators are complying with their licences. Where non-compliances are noted, appropriate and proportionate enforcement actions are taken.

The EPA published its revised compliance and enforcement policy in 2019, following extensive consultation with various stakeholders such as licensees, industry representative bodies and the public (Topic Box 13.4).

The EPA's strategic outcome to deliver a protected and healthy environment by 2026 states that,

**“any regulated operators polluting the environment or impacting public health will be held to account”.**

#### Topic Box 13.4 EPA Legal activity

The EPA's enforcement approach<sup>12</sup> is underpinned by the principles of:

- proportionality in applying environmental law and securing compliance
- consistency of approach
- transparency in how the EPA operates
- targeting enforcement action where it is needed
- implementing the polluter pays principle.

Prosecutions are a key tool used by the EPA as part of its wide-ranging enforcement powers. While most of the cases taken are summary prosecutions in the District Court, more serious prosecutions are taken on indictment, through the Office of the Director of Public Prosecutions.

Between January 2021 and June 2024, the EPA took District, Circuit and High Court action. Figure 13.4 shows the number of legal cases brought by the EPA: 48 criminal legal cases which concluded in relevant District Courts and two in the Circuit Court. The majority of these were prosecutions taken against companies in the industrial and waste sectors, and Uisce Éireann (formerly Irish Water). Of the two Circuit Court cases finalised in the period, one incurred fines for the company involved of €34,000, plus costs, the other the sentencing of a waste company director to 3 years imprisonment, with 12 months suspended.

The EPA also initiated District Court prosecutions and a High Court injunction regarding the unauthorised extraction of peat.

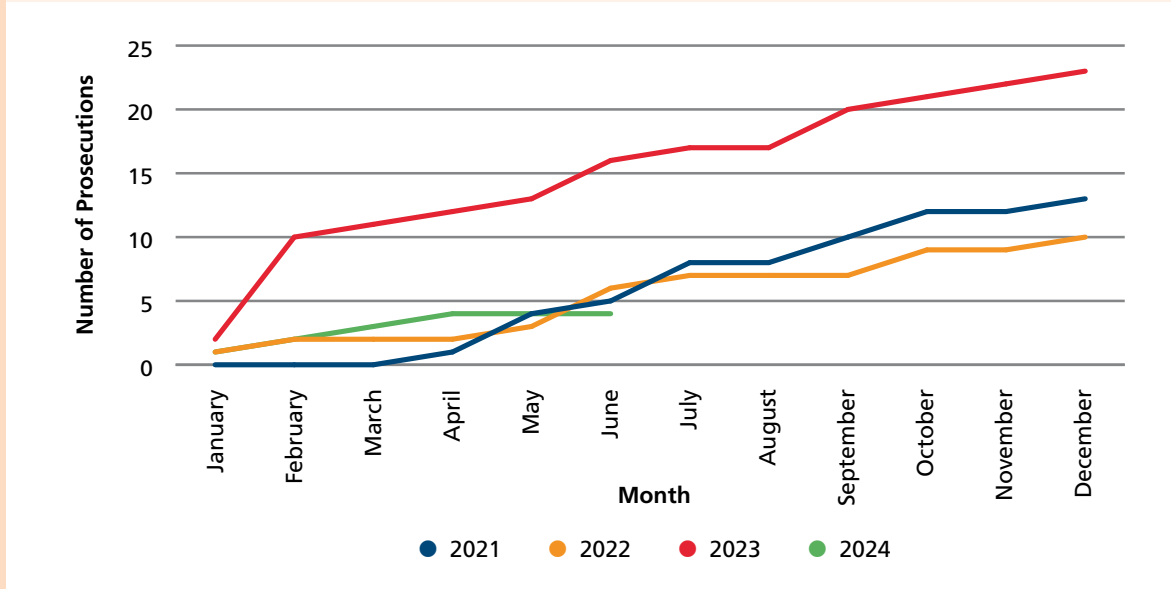


Tralee Courthouse

<sup>12</sup> Compliance and Enforcement Policy: [www.epa.ie/our-services/compliance--enforcement/whats-happening/compliance-and-enforcement-policy/](http://www.epa.ie/our-services/compliance--enforcement/whats-happening/compliance-and-enforcement-policy/) (accessed 15 July 2024).



**Figure 13.4** District and Circuit Court prosecutions concluded in the period January 2021-June 2024



The EPA received 13 challenges to decisions issued by judicial review in the High Court in the January 2021-June 2024 period. In addition, the EPA was a notice party in two High Court challenges against planning decisions. Most cases related to decisions on industrial emission licences. The number of decided cases in the High Court or the Court of Appeal was four, with the outcome finding in favour of the EPA in all cases. Two challenges were dismissed as being premature and four judgments were challenged in the Court of Appeal, with a successful outcome in two and judgement awaited in two.

EPA legal cases are expected to increase with a move to the Commercial Court and subsequently the Planning and Environmental Court, bringing additional resource requirements due to a strictly enforced and compressed timeline.

Since its establishment in 1993, the EPA has been committed to conducting its regulatory work in an open and transparent manner and to providing public access to regulatory correspondence related both to the licensing of major industrial, waste management and comparable activities and to the enforcement and monitoring of the environmental performance of licensed operators. This policy is in line with the Aarhus Convention (UN, 1998) and associated EU and national law.<sup>13</sup> With the introduction of the Licensing and Enforcement Access Portal (LEAP Online) in 2023, the public can access enforcement and compliance records on the EPA website (Topic Box 13.5).



EPA inspection

<sup>13</sup> Principally the Access to Information on the Environment Regulations 2014 as amended (S.I. No. 615/2014), which enacted the Aarhus Convention in Irish law and the Access to Information on the Environment Regulations 2014.



### Topic Box 13.5 LEAP Online



LEAP Online<sup>14</sup> provides enhanced online public access to regulatory records issued or received by the EPA, subject to certain exceptions provided for in law, including the General Data Protection Regulation, the Freedom of Information Act and Access to Information on the Environment Regulations. These records are the formal compliance and enforcement correspondence exchanged between the EPA and holders of EPA licences and permits. The regulatory records that can now be viewed online include EPA site inspection reports (and licensee responses), air, water and noise monitoring returns and annual environmental reports.

LEAP Online has greatly improved the public's ability to learn about licensed activities in Ireland, and it provides operators with an effective way of communicating with their neighbours and the wider community. The portal's development complies with Article 5.3 of the Aarhus Convention to:

**“ensure that environmental information progressively becomes available in electronic databases which are easily accessible to the public through public telecommunications networks.”**

LEAP Online provides access to regulatory records for the current and prior 7 calendar years. It covers integrated pollution control (IPC), IED, waste, waste water, dumping at sea and radiological licences/permits. The upload of regulatory records to LEAP Online is deferred for a period of 30 calendar days following their acceptance or issue by the EPA. LEAP Online is hosted on the 'Our Services' tab on the EPA website ([www.epa.ie](http://www.epa.ie)).

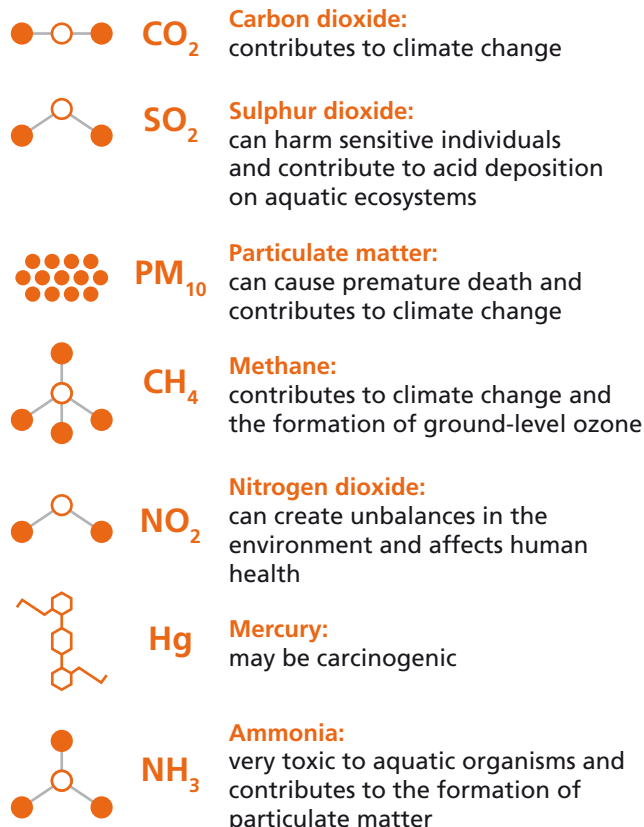
## 4. Emissions from industry

The IED currently regulates more than 50,000 industrial installations across Europe, including 650 in Ireland. Since 2020, the majority of IED permits issued in Ireland have been in the energy and intensive agriculture sectors. Approximately 75% of permits issued since 2020 in the energy sector are for data centres while 84% in the intensive agriculture sector are for poultry rearing facilities. Examples of the pollutants regulated under the IED are set out in Figure 13.5.

**Figure 13.5** Examples of over 90 pollutants for which the Industrial Emissions Directive sets annual emission thresholds across Europe

### +90 pollutants regulated under the IED

Some examples:



Source: Adapted from the European Council<sup>15</sup>

14 [leap.epa.ie/confirm?returnUrl=https%3A%2F%2Fleap.epa.ie%2F](http://leap.epa.ie/confirm?returnUrl=https%3A%2F%2Fleap.epa.ie%2F) (accessed 15 July 2024).

15 [www.consilium.europa.eu/en/infographics/industrial-emissions-directive-key-figures/](http://www.consilium.europa.eu/en/infographics/industrial-emissions-directive-key-figures/) (accessed 15 July 2024).



### Emissions to water

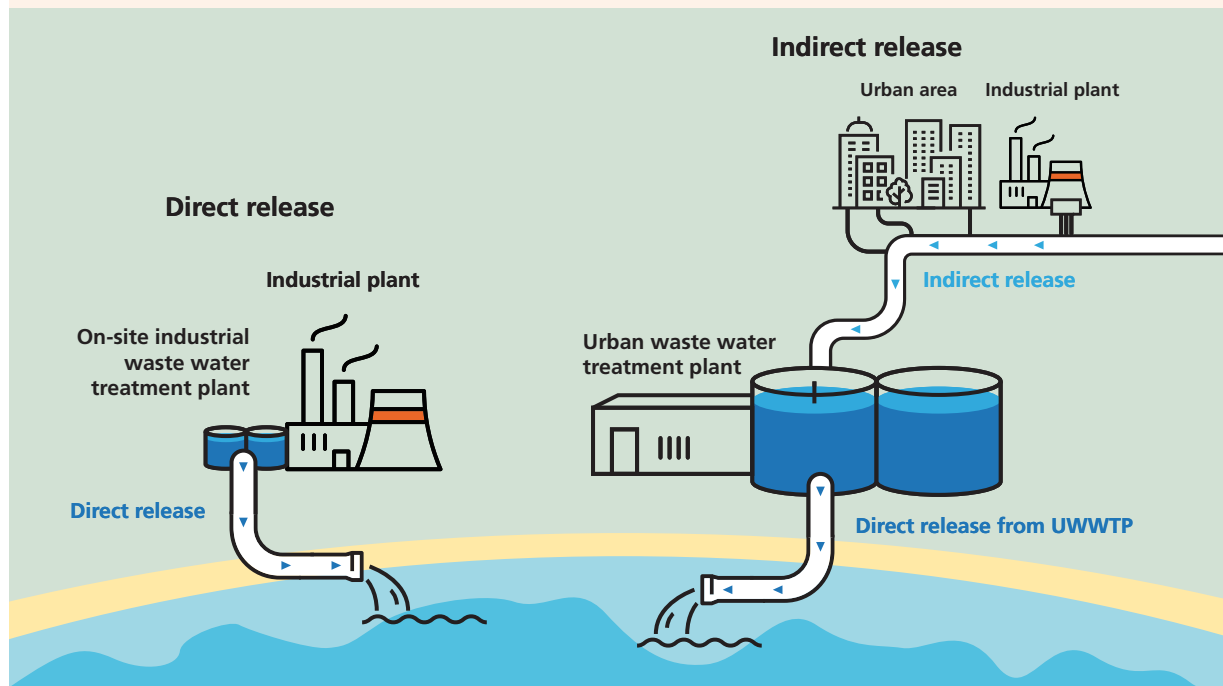
Industrial pollutant emissions can impact both surface water and groundwater. Emissions from industry to surface water can be direct – from an on-site waste water treatment system or stormwater drainage network – or indirect, via sewers, subject to consent from Uisce Éireann, for discharge into its sewer and subsequent treatment in an EPA-regulated municipal waste water treatment plant. The impact that emissions from industry can have on water depends greatly on the nature of the water into which the pollutant is discharged. The effect that pollutants may have on surface water can be measured by examining physical, chemical and biological impacts.

**Surface water.** In Ireland, industrial emissions to surface water are not a main pressure on water quality when compared with the emissions of other sectors. As discussed in Chapters 8 and 9, emissions from industry rank ninth out of 11 significant pressures on water quality. Industry's impact on water quality is far less

than that of other sectors, as industrial facilities that discharge to surface water have emission limit values with which they must comply. Where they have failed to comply with their emissions limit values, installations may have negatively impacted surface water quality by depleting oxygen levels and/or having toxic effects on aquatic life in receiving waters.

Industrial pollutant releases to surface water include compounds that contain nutrients such as nitrogen (referred to as total nitrogen) and phosphorus (total phosphorus) which can cause eutrophication in surface waters. Releases are also described in terms of their total organic carbon content. High levels of organic content in a natural water body will undermine an ecosystem's operation by, for example, affecting oxygen levels in the water. The IED permits issued by the EPA to operators set out limits for emissions to water that ensure that industrial activities do not have detrimental effects on the receiving environment. Emissions to water from industry can be direct or indirect via sewer and urban waste water treatment plants, as illustrated in Figure 13.6.

Figure 13.6 Direct and indirect releases of treated waste water to water from industrial sites



UWWTP, urban waste water treatment plant.



Other relevant pollutants are heavy metals such as arsenic, copper, nickel and zinc, which can also have detrimental impacts on human and environmental health. Emerging and trace pollutants such as persistent pharmaceutical and cosmetic products, microplastics, trace organics and residues present a potentially serious threat from industry to human health and ecosystems. A review of the Water Framework Directive (2000/60/EC) in 2022 identified 25 new priority substances in waters, such as per- and polyfluoroalkyl substances (discussed in Chapter 14), bisphenol A and various veterinary pharmaceuticals. The revised IED will ensure that permit requirements related to these substances (and other emerging pollutants) are better controlled and more integrated. The implementation of the revised IED is projected to result in a 10-30% reduction in some of these substances from IED installations.<sup>16</sup>

With the exception of emissions of some metals, direct releases from industry are minor compared with discharges from urban waste water treatment plants (EPA, 2020). There has been a significant decrease in emissions of metals to water (Figure 13.7) from industry in the past 15 years, which reflects the more stringent requirements resulting from reviews of licence conditions and emission limit values undertaken by the EPA. These requirements arose from the EPA-initiated licence reviews of 87 industrial licences, which reduced limits to ensure compliance with standards by 2015. Large improvements from the mining sector accounted for most of the significant decreases.

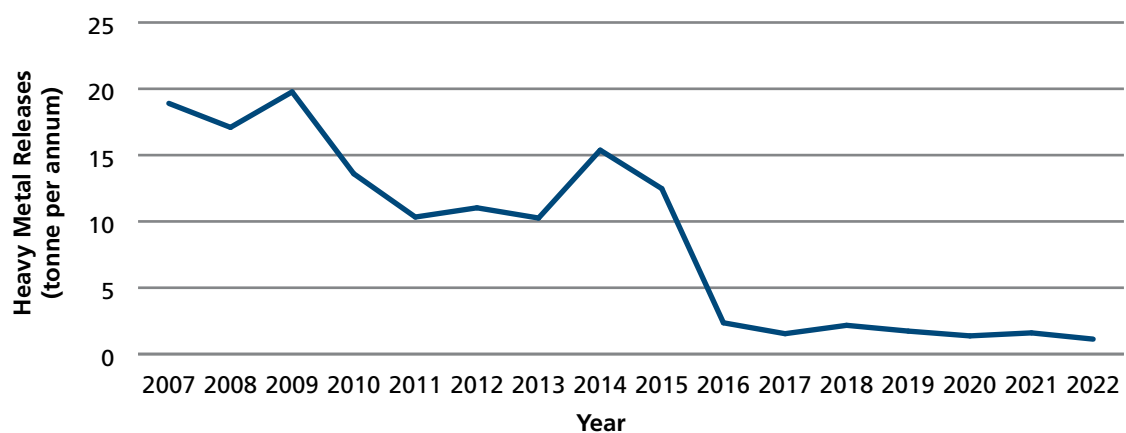
**Groundwater.** Direct emissions to groundwater are prohibited under the European Communities Environmental Objectives (Groundwater) Regulations 2010 (S.I. No. 9/2010) and 2022 (S.I. No. 287/2022), and no industry in Ireland is licensed to have direct discharges to groundwater.

Many industrial facilities are required to monitor and report on the quality of groundwater beneath their installations. Although industry is not a significant source of surface water or groundwater pollution in Ireland, there have been historical and accidental industry releases to groundwater that have caused groundwater quality issues that continue to be assessed and remediated.

Regarding groundwater contamination from industry, the parameters of concern tend to be associated with historical unlined landfills, hydrocarbons from the spillage of fuel and other oils, and industrial chemicals such as halocarbons. Compared with surface water pollution, groundwater pollution is often harder to detect, and it is also more difficult to fully understand the extent and nature of contamination. Many of the groundwater pollution issues associated with industry can persist for many years and intervention may be required to return groundwater quality to a satisfactory status.

The Water Framework Directive requires all Member States to protect and improve water quality in all waters (see Chapter 8). The impact of emissions from industry from nine different sectors (Figure 13.8) are recorded as 'significant pressures' in water catchment assessments.

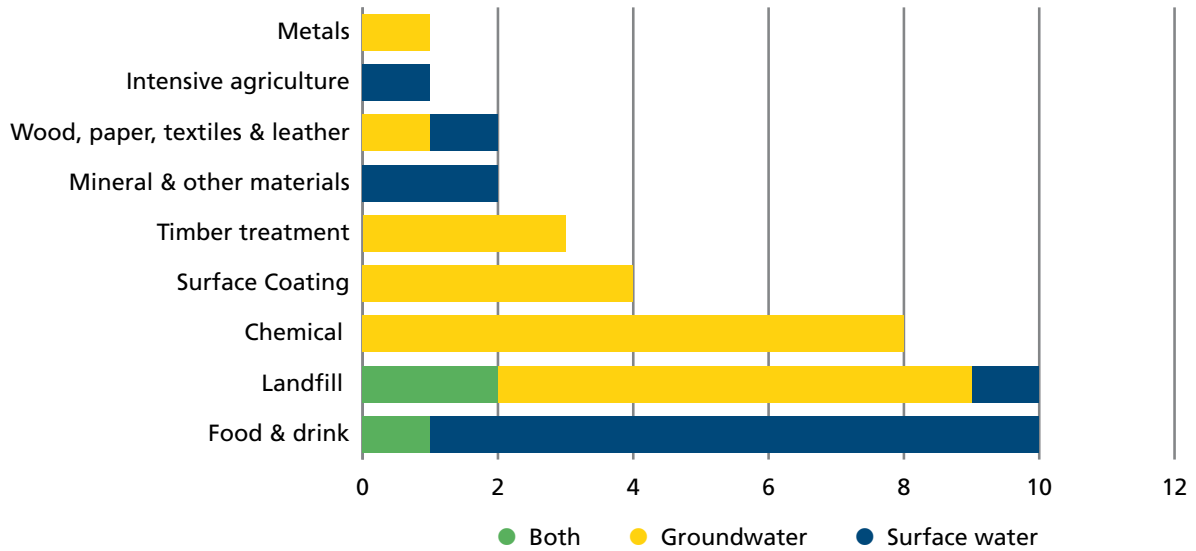
**Figure 13.7** Heavy metal releases to water from industry, 2007-2022



16 [environment.ec.europa.eu/document/download/a5e95ed4-88d6-4222-a3fa-8e2f17f0b2e1\\_en?filename=Staff%20Working%20Document%20-%20Impact%20Assessment%20Report%20accompanying%20the%20Proposal\\_0.pdf](https://environment.ec.europa.eu/document/download/a5e95ed4-88d6-4222-a3fa-8e2f17f0b2e1_en?filename=Staff%20Working%20Document%20-%20Impact%20Assessment%20Report%20accompanying%20the%20Proposal_0.pdf) (accessed 15 July 2024).



**Figure 13.8** Number of sites within EPA-licensed sectors (April 2024) identified as placing significant pressures on groundwater or surface water under the Water Framework Directive



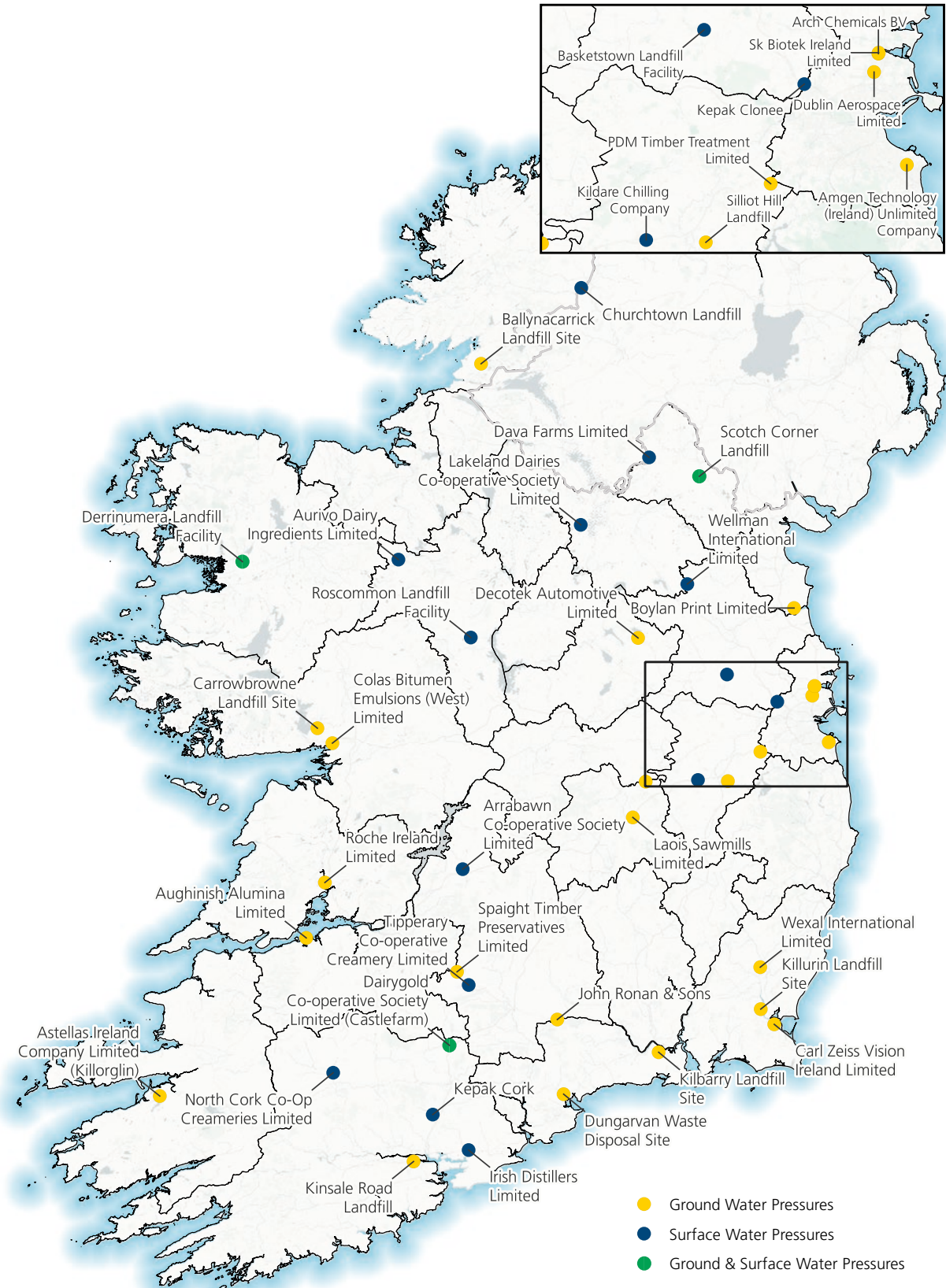
In 2022, 41 industrial sites were identified as placing significant pressures on water quality, representing less than 5% of all EPA-licensed industry in Ireland (Figure 13.9). Of these, 14 were placing significant pressures on surface water quality, 24 on groundwater quality and three on both surface water and groundwater quality. The EPA has developed a series of site-specific enforcement plans for these sites, which are spread across 20 different counties. The requirements for each site vary depending on the source and cause of the pressure and can include replacing on-site drainage networks, enhancing waste water treatment capacity and removing historical contamination.



EPA inspection at an intensive agriculture site



**Figure 13.9** Industrial sites placing significant pressures on surface water or groundwater under the Water Framework Directive





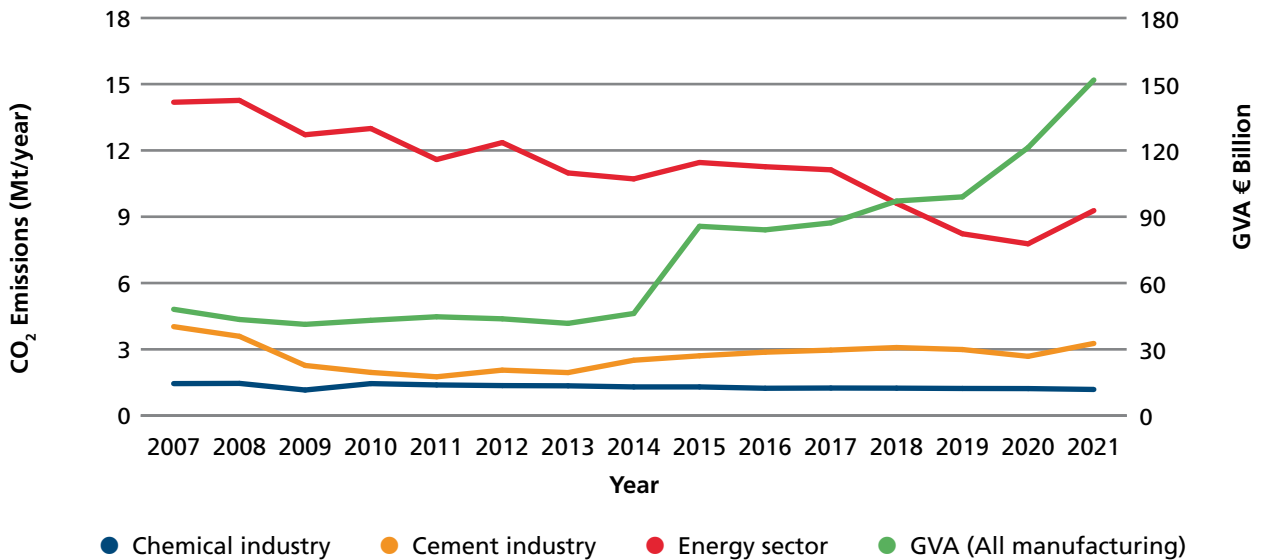
### Emissions to air

Significant air pollutants from industrial sources include acidifying pollutants e.g. sulphur oxides (SO<sub>x</sub>) and other pollutants that damage human health and the environment, such as NO<sub>x</sub>, particulate matter, non-methane volatile organic compounds and ammonia. Overall, across Ireland and Europe, emissions of some significant pollutants have decreased from industrial sources over the past 20 years. The overall downward trend in levels of these pollutants illustrates the tighter emission limits, improved abatement technologies and the move to cleaner fuel sources. Emissions to air from

industrial sites represent a significant proportion of Ireland's emissions to air: 37% of SO<sub>2</sub>, 17% of NO<sub>x</sub> and 16% of fine particulate matter (EPA, 2024a). Over 80% of these emissions come from two sectors – the energy sector and the mineral sector (cement).<sup>17</sup>

Figure 13.10 illustrates the decline in carbon dioxide (CO<sub>2</sub>) emissions, the most significant greenhouse gas, for key industrial sectors compared with gross value added (GVA)<sup>18</sup> for all manufacturing sectors in Ireland from 2007 to 2021.

**Figure 13.10** Air releases: carbon dioxide emissions by industry sector in Ireland compared with gross value added (constant prices) for all manufacturing sectors in Ireland, 2007-2021



Source: Compiled from European Environment Agency and Central Statistics Office data

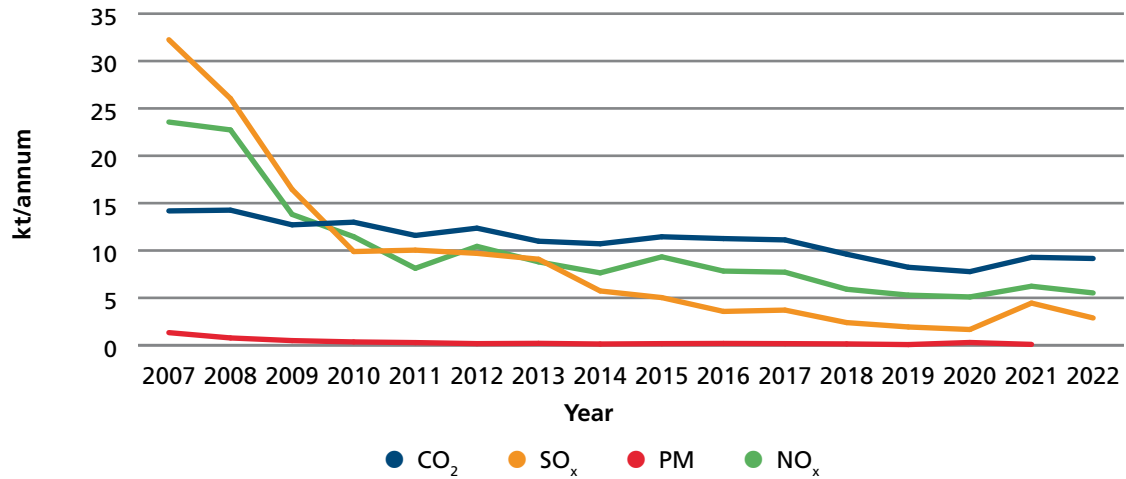
17 [industry.eea.europa.eu/analyse/air](https://industry.eea.europa.eu/analyse/air) (accessed 15 July 2024).

18 GVA figures for Ireland, particularly after 2015, have been distorted by the introduction of an accounts system applied by Eurostat (Regulation (EU) 549/2013). Modified gross national income gives a truer measure of how the Irish economy is growing. Even when emissions intensity is mapped against modified gross national income there is still a significant decoupling between emissions and economic growth.



Figure 13.11 shows a steady decline in some of the main emissions to air over the past 15 years from the licensed energy sector in Ireland.

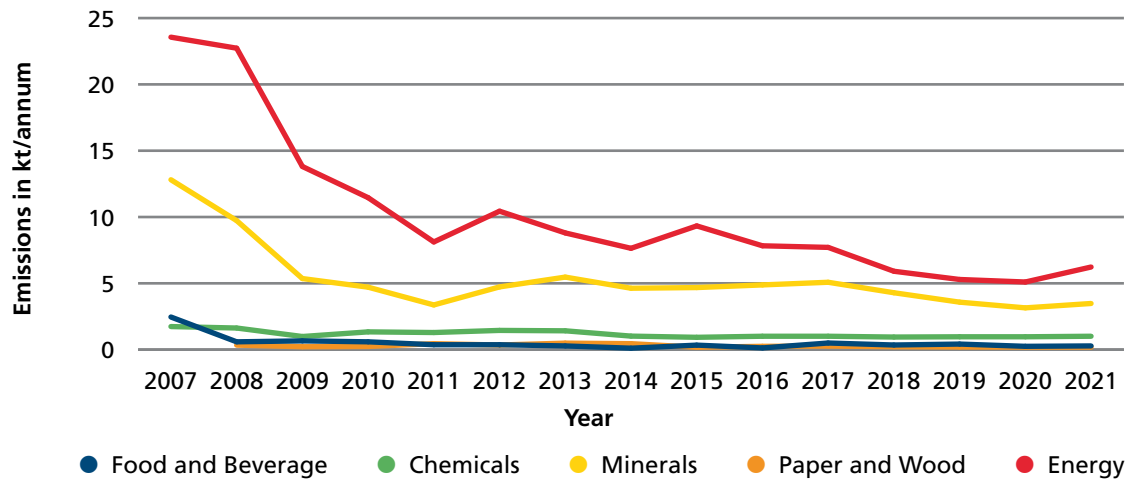
**Figure 13.11** Emission trends in main pollutants from the energy sector in Ireland, 2007-2022



PM, particulate matter.

Figure 13.12 shows NO<sub>x</sub> emission levels released from various industrial sectors nationwide.

**Figure 13.12** Air releases: nitrogen oxide emissions by sector in Ireland, 2007-2021

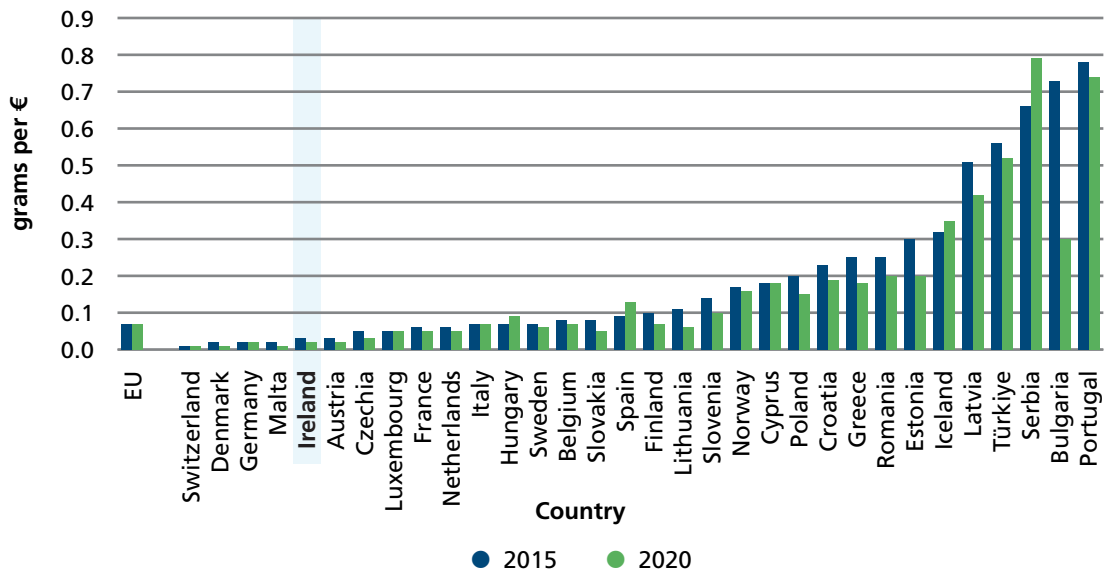


Source: [Air releases \(europa.eu\)](https://air-releases.europa.eu)





Figure 13.13 Air emissions intensity of industry by country for 2015 and 2020 (based on particulate matter emissions)



Source: Eurostat

As outlined in the section on surface water above, Ireland has a low proportion of heavy industry compared with its European counterparts. One of the United Nations Sustainable Development Goals (SDG 9.7)<sup>19</sup> compares air emissions intensity<sup>20</sup> with industrial economic output. Figure 13.13 shows that Ireland is ranked among the EU Member States with the lowest air emissions intensity of industry.

### 5. Cumulative impacts

An important element when addressing the impact of an industry is to assess the expected impact of two or more nearby installations on the environment. The cumulative impact of pollutants caused by intensification of industry in a relatively small geographical area has the potential to cause localised exceedances of environmental quality standards or critical levels/loads (Topic Box 13.6).

### Impacts on amenity

When not appropriately controlled, emissions from industry may directly reduce the amenity of the environment and of the local communities nearby. Indications of this impact are the levels and types of complaints that arise from members of the local community. The number of EPA-licensed industrial sites that are frequently complained about is small, with just 17 sites receiving ten or more complaints in 2023. Most complaints relate to odour and noise issues. Nuisance issues tend to have an impact on people’s amenity and private dwellings, and such issues often become emotive. The number and types of complaints received by the EPA between 2018 and 2023, in relation to EPA-licensed industry, are shown in Figure 13.14: 88% of all complaints related to nuisance odour and noise. Seven of the ten most complained about industrial facilities are situated in urban areas or within 500 m of residential areas.

19 [ec.europa.eu/eurostat/statistics-explained/index.php?title=SDG\\_9\\_-\\_Industry,\\_innovation\\_and\\_infrastructure&oldid=563873#Air\\_emissions\\_intensity\\_of\\_industry](https://ec.europa.eu/eurostat/statistics-explained/index.php?title=SDG_9_-_Industry,_innovation_and_infrastructure&oldid=563873#Air_emissions_intensity_of_industry) (accessed 15 July 2024).

20 Emissions intensity is calculated by dividing the sector’s particulate matter emissions by its GVA, which is defined as output (at basic prices) minus intermediate consumption (at purchaser prices).



### Topic Box 13.6 Potential cumulative impact of pollutants

**Impact of ammonia emissions to air from intensive agriculture on Natura 2000 Sites.** Natura 2000 is a European network of important ecological sites (as outlined in Chapter 7). The potential impacts in Natura 2000 sites from intensive pig and poultry installations are ammonia emissions to air and resultant nitrogen deposition. When above critical levels, ammonia adversely impacts biodiversity through eutrophication, acidification or direct toxic effect. Nitrogen deposition has been identified as one of the leading causes of global biodiversity decline, alongside changing land use practices and climate change. Associated with this, Ireland has been served with an infringement notice by the European Commission because of non-compliance with ammonia reduction commitments. In Ireland there is a significant concentration of licensed intensive agriculture sites in Counties Cavan and Monaghan (see Figure 13.3). Over 70% of all EPA-licensed poultry farms are in County Monaghan. Owing to the density of intensive agriculture and the presence of Natura 2000 sites in the same region, the planning, development and permitting of intensive agriculture sites in this area needs to be carefully examined and managed to ensure that the sensitive Natura 2000 sites are protected.

EPA-funded research assessed the impact of ammonia emissions from intensive agriculture installations on special areas of conservation and special protection areas (Kelleghan *et al.*, 2020). The EPA has since issued guidance for prospective licence applicants on conducting assessments of the potential impact of emissions on Natura 2000 sites (EPA, 2023). The cumulative impact of air emissions from the existing intensive agriculture sector in a relatively small region has resulted in a restriction on the potential expansion of the sector in that area. The EPA is reviewing over 200 licensed intensive agriculture sites to ensure that licences are brought into line with the most recent BAT to control emissions from these facilities, including emissions of ammonia to air. The revised licences for this sector will require new technologies and practices to be implemented that will reduce ammonia emissions to air.

**Data centres.** The continued growth and evolution of the technology sector in Ireland is an important component of the national economy. The number of data centres, an associated aspect of this industry, has increased significantly in Ireland in recent years. Data centres provide storage and processing capacity for digital data and are an essential component of our digital economy.

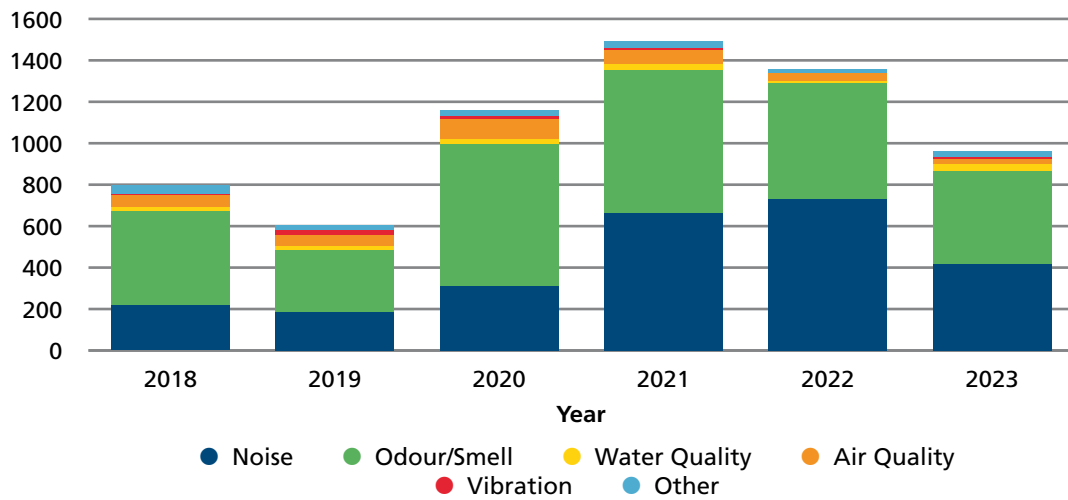
Data centres require a continuous supply of electricity to operate, which is often provided by a connection to the national grid. However, outside normal operating conditions, for example in the case of a loss of the national grid as a power source, data centres typically rely on both on-site battery storage (uninterruptable power supplies) and on-site power generators. Typically, the generators will be brought online in the event of grid power supply issues, if critical power system maintenance work is being undertaken or if there is a request from the grid operator to reduce grid electricity load.

The use of on-site power generation has brought data centres into the EPA's licensing regime under the IED. The IED applies to installations with generating capacity of 50 MWth and above, including standby plants. There are over 20 licensed IED installations in Ireland, mostly in north County Dublin and County Meath.

The primary emissions of concern from these data centres are emissions to air from the on-site power generation units, in particular NO<sub>x</sub>. There is now a high concentration of these types of installations in a relatively small geographical area around Dublin.



**Figure 13.14** Number of complaints received by the EPA about industry, by issue, 2018-2023



The sectors about which most complaints are received are the food and drink (56%) and waste (20%) sectors. Odour complaints peaked in April 2020. This peak may reflect people’s increased presence in their communities during the COVID-19 pandemic. Many of the industrial sites experiencing high levels of complaints have residential areas right up to the site boundary. The closer proximity of housing to industrial sites does require operators to enhance their environmental performance to ensure that facility emissions do not give rise to nuisance issues. Local authorities, in exercising their zoning and planning functions, need to be cognisant of such issues when considering siting residential areas alongside industrial sites.

## 6. Unauthorised industrial activities

All industrial activities that are included in the Environmental Protection Agency Act 1992 (EPA Act 1992) require a licence from the EPA to operate. To ensure consistency and conformity with statutory requirements, the EPA actively pursues operators of industrial activities that either have not applied for or do not hold a current licence for their activities.

## Commercial peat extraction

Peat extraction on a commercial level in Ireland involves the harvesting of peat from large areas of peatland for subsequent processing and use (Figure 13.15). Commercial peat extraction in Ireland is governed by a complex set of regulations, an outline of which is presented in Figure 13.16. The EPA regulates the larger activities (greater than 50 hectares) while local authorities have key roles in regulating all commercial peat extraction, specifically regarding planning permission and requirements to undertake Environmental Impact Assessment and Appropriate Assessment.

**Figure 13.15** Commercial extraction of peat





**Figure 13.16** Regulation of commercial peat extraction

**More than 50 hectares** EPA License  
Planning permission  
Environmental Impact Assessment  
Appropriate Assessment

**30-50 hectares** Planning permission  
Environmental Impact Assessment  
Appropriate Assessment

**Less than 30 hectares<sup>a</sup>** Planning permission  
Environmental Impact Assessment  
Appropriate Assessment

- a Planning permission is required for the extraction of peat from an area exceeding 30 hectares or from an area less than this where it is likely to have a significant effect on the environment.

The EPA issued nine IPC licences to Bord na Móna (Class 1.3 of the EPA Act 1992) for the commercial extraction of peat. However, since extraction has ceased at these peatlands in recent years, rehabilitation works are progressing.

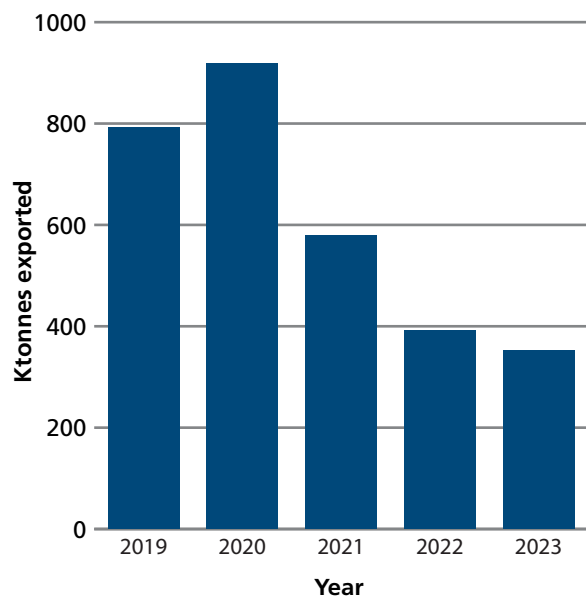
Currently, several other commercial peat extraction activities continue to operate despite the absence of any authorisation from either the EPA or relevant local authorities. These operations are primarily based in the midland counties (Longford, Westmeath, Kildare, Offaly, Tipperary and Roscommon). The EPA has had significant concerns about the lack of local regulation of the commercial peat sector for a number of years. All of these activities continue to operate in the absence of any planning permission, and, with the exception of the nine IPC licensed peatlands, environmental regulation is largely absent. To protect Ireland's peatlands, planning policy must proactively address the issue of unauthorised peat extraction operations.

The EPA has deployed significant resources to control the unregulated commercial peat sector and will continue to target its enforcement interventions at these operations. The EPA has successfully taken legal proceedings against illegal operators in the District Court and High Court, which has resulted in the cessation of illegal peat extraction on a number of peatlands.

The EPA has also a specific role, under Section 63 of the EPA Act, to supervise local authorities' performance of their statutory duties to protect the environment. The EPA is exercising its powers under this legislation to ensure that local authorities take the appropriate regulatory and enforcement actions against unauthorised commercial peat extraction.

Traditionally, a significant amount of the extracted peat was used for the generation of electricity in Ireland, however this practice ceased in recent years. In addition, the global exportation of Irish peat has been declining. While Ireland exported 919,000 tonnes of peat in 2020, this figure decreased to 351,000 in 2023 (Figure 13.17).

**Figure 13.17** Annual tonnage of peat exported from Ireland, 2019-2023



Source: CSO, 2024

Impacts on water quality and river habitats arising from illegal peat extraction and drainage include the release of ammonium and fine-grained suspended sediments and the physical alteration of aquatic habitats. The installation of extensive drainage networks can result in the lowering of water tables, disrupting the ecosystem balance and thereby providing flow pathways for sediment and dissolved organic carbon to reach water bodies.

## 7. Resource use in industry

Operators of industrial installations are required to use resources such as energy and water more efficiently and to minimise waste as a condition of their EPA-issued industrial emissions licences.

### Energy management

The industrial sector accounted for approximately 18% of final energy consumption in Ireland in 2022.<sup>21</sup> Efforts to improve energy efficiency and transition to more sustainable energy sources are crucial to reduce environmental impacts. Many licensed installations have implemented the requirements of their industrial emissions licence in terms of energy auditing and plans to reduce emissions but have then exceeded the minimum emissions criteria by installing renewable energy systems and infrastructure. In recent years, many industrial facilities have moved away from oil-

and gas-fuelled electrical power generation and steam generation. The installation of solar-powered systems is one area where there has been significant investment. The provision of ground-mounted solar farms adjacent to industrial facilities is increasing (Topic Box 13.7), and several planning applications for such developments are under consideration by the planning authorities.

### Water use

Many industries in Ireland use significant amounts of water, mainly in the following processes.

- **Water as a product ingredient.** Water is used in the brewing and distilling sector and in other aspects of drinks manufacturing, where large volumes of water are blended with other ingredients to make a final product.

#### Topic Box 13.7 Going beyond compliance

##### Case study: Eli Lilly, Cork

During 2021, Eli Lilly installed the single largest solar farm in Ireland at the time of installation (Figure 13.18). The capacity of phase 1 of the project was 5.6 MW (megawatt) maximum output. Phase 2 added an additional 3.4 MW capacity, bringing the total maximum output capacity to approximately 9.0 MW. The 6.5-hectare farm will power a significant proportion of the company's Cork site.

**Figure 13.18** Eli Lilly solar farm adjacent to its plant in County Cork



21 [www.seai.ie/data-and-insights/seai-statistics/key-statistics/energy-use-overview/](http://www.seai.ie/data-and-insights/seai-statistics/key-statistics/energy-use-overview/) (accessed 15 July 2024).



- **Cooling water.** Many industrial sectors abstract water for the purposes of cooling parts of their processes. Power generation, data centres and dairy processing facilities all require large volumes of water to operate. Usually, this water can be discharged back to the environment after it has been used.
- **Wash water.** Many industries use large volumes of water for cleaning production areas and equipment. Much of this water requires further treatment prior to discharge to the environment.

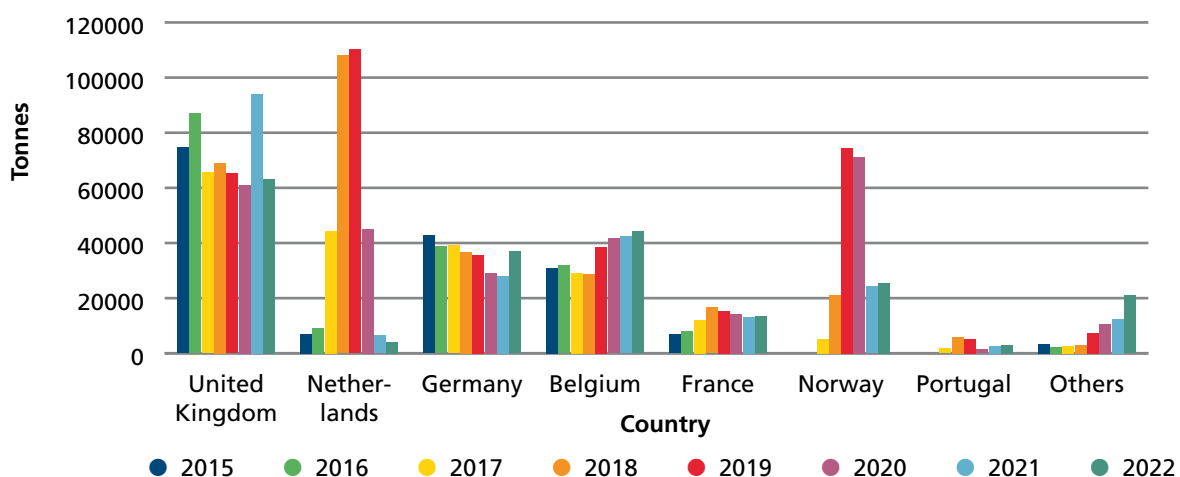
The Water Framework Directive, along with the associated statutory instruments, identifies that the removal of a water resource can pose as great a risk to the quality of the environment as any physio-chemical or biological impact. Currently, any enterprise abstracting more than 25,000 litres of water per day is required to register its abstraction with the EPA. Of the 1800 entities registered with the EPA, just 171 are abstracting water for use at industrial installations. The industrial sectors with the highest numbers of sites registered for water abstraction are intensive agriculture, energy generation, chemicals, and food and drink.

### Waste arisings and the circular economy

Together with wider society, industry needs to move away from a linear economy and towards a more circular economy (see Chapter 15). The industrial licensing regime has longstanding requirements to reduce waste arisings and to recover or recycle as much waste as possible. The current waste policy,<sup>22</sup> the National Hazardous Waste Management Plan<sup>23</sup> and the National Waste Management Plan for a Circular Economy<sup>24</sup> set out how to implement circular economy principles across a range of areas.

Industrial facilities remain the largest source of hazardous waste in Ireland, followed by the construction and demolition sector and municipal sources, which produce small amounts of hazardous waste in comparison. The types of industrial hazardous waste generated include waste treatment by-products, industrial solvents, sludges, oils, waste electrical and electronic equipment, batteries and infectious healthcare waste. Ireland does not have the facilities required to treat the full range of hazardous waste that it generates, and much of it is exported for treatment (Figure 13.19). In 2021, for the first time, a higher percentage of hazardous waste was treated in Ireland (52%) than was exported (48%). This is dealt with in greater detail in Chapter 15.

**Figure 13.19** Destination of hazardous waste exported from Ireland, 2015-2022



Source: EPA

22 A Waste Action Plan for a Circular Economy Ireland's National Waste Policy 2020-2025, Department of Communications, Climate Action and Environment. [gov – Waste Action Plan for a Circular Economy \(www.gov.ie\)](http://www.gov.ie) (accessed 25 July 2024).

23 National Hazardous Waste Management Plan 2021-2027, EPA. [National Hazardous Waste Management Plan 2021-2027 | Environmental Protection Agency \(epa.ie\)](http://www.epa.ie) (accessed 25 July 2024).

24 National Waste Management Plan For a Circular Economy 2024-2030, Local Government Ireland, Regional Waste Management Planning Offices. [National Waste Management Plan for a Circular Economy 2024-2030 – MyWaste](http://www.local.gov.ie) (accessed 25 July 2024).



## 8. Responses to environmental challenges

It is critical that industry has a stable and consistent compliance base from which to work. While overall there is a good level of compliance across many industrial sectors in Ireland, there are several specific issues that are being addressed. These include operators that have not yet complied with their obligations to seek an environmental licence or permit and those whose operations are negatively impacting the environment.

On the other end of the spectrum are facilities that are going beyond complying with the requirements of their licences to achieve high levels of environmental performance in their resource management.

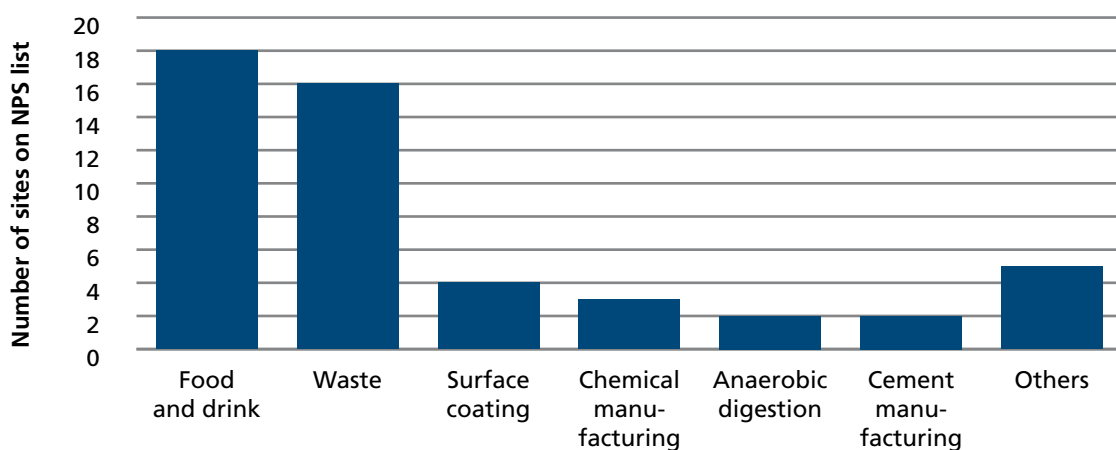
### Addressing environmental performance

**Inspection and monitoring.** The EPA's Office of Environmental Enforcement (OEE) continually assesses the levels of compliance and the environmental performances of facilities licensed under the IED. Since 2020, the OEE has carried out over 5000 individual inspections at these facilities to assess compliance. Over the same period, the OEE opened over 200 investigations where significant issues were identified that required corrective actions or where an environmental risk was detected that required preventative measures to be implemented.

**National priority sites.** The EPA uses a national priority sites (NPS) system to identify and publish the names of licensed sites that are deemed an enforcement priority. Since the NPS system began in 2017, 50 licensed facilities have been listed. Issues that result in facilities being listed include emissions to water and air, nuisance complaints (odour and noise) and poor waste management. The food and drink sector and the waste sector have appeared on the NPS list more than any other sector (Figure 13.20).

Dairy processing and animal slaughtering plants have appeared more often than any other licensed industry type, constituting almost one-third of all sites on the NPS system (see Topic Box 13.8). Issues with poor waste water management and odour emissions are common at the dairy processing sites on the NPS list. As with the dairy sector, many of the issues at animal slaughtering plant sites relate to waste water and odour emissions because of delayed investment in and provision of suitable environmental control infrastructure such as noise and odour abatement technology.

Figure 13.20 National priority sites list, by sector, 2017-2023





### Topic Box 13.8 Dairy processing in Ireland and dairy processors on the national priority sites list

The amount of milk entering Irish milk processing plants has risen by over 50% since the abolition of milk quotas in 2015, with volumes peaking at 8824 million litres in 2022 compared with 5648 million litres in 2014. The volume of milk processed decreased slightly during 2023, to 8459 million litres.<sup>25</sup>

In recent years, while some parts of the dairy processing sector have invested significantly to ensure compliance with environmental standards (Figure 13.21), many plants have failed to maintain compliance with their environmental obligations during this expansion period. The inclusion of nine dairy sites on the EPA NPS list, representing 30% of all EPA-licensed dairy processing plants in Ireland, highlights a significant issue that the sector needs to address. The provision of environmental controls and the associated infrastructure in the sector has often lagged behind other sectors.

**Figure 13.21** Waste water treatment at a dairy processing plant in Ireland



Processing milk into various products (powder, butter, cheese, etc.) results in significant volumes of waste water that require treatment prior to being discharged to the environment. It is the poor management of this waste water treatment process that has given rise to issues in the industry.

Nuisance odour from dairy sites is usually associated with waste water treatment processes. The presence of dairy fats in certain conditions, such as warm weather, can lead to the generation of offensive odours. An analysis of odour complaints from the food and drink sector over the past five years indicates an overall increase in odour complaints between March and September. This coincides with the main milk processing season.

While the dairy processing sector has taken the commercial opportunity to increase production levels, it has not matched this with investment in environmental controls at a number of processing sites. With sufficient investment and infrastructure, treatment of waste water from the dairy sector can readily comply with statutory requirements.

The waste industry in Ireland has evolved over the past 20 years, with the closure of many landfills, the development of waste-to-energy plants and the expansion of waste transfer and processing facilities. Transfer stations handling non-hazardous waste were the main waste facility type to be placed on the NPS list, mainly because of a lack of adequate capacity and suitable infrastructure. Non-hazardous waste transfer stations handle all domestic waste and the majority of commercial and industrial waste generated in Ireland. Handling waste without creating nuisance impacts, such as those caused by odour, noise and flies, must be a priority for site operators, who need to take a proactive approach to addressing these issues. Four of the five landfill site issues that appeared on the NPS list related to poor post-closure management of landfill gas and leachate. While the closures of many of the older local authority-operated landfills were accelerated as a result of the requirements of the Landfill Directive (1999/31/EC), thus resolving many operational issues such as odour, litter and pests (e.g. flies, birds, vermin), there remain legacy issues that have not been appropriately managed. The continued management of closed landfills is a challenge that needs to be prioritised by local authorities.

**Maturity of environmental management and compliance.** The enforcement function of the EPA continues to be a keystone driving good environmental industry performance in Ireland. The overall context has evolved since the EPA first licensed industry in 1994. Industry has moved from a period of early regulation into the current period of advanced environmental management, where most industry now provides adequate financial and human resources to achieve and maintain compliance, including going beyond compliance in many instances.

A progression in compliance can often be seen across regulated communities through the implementation of management systems that drive continuous improvement. The EPA's licensing process requires all licensed installations to prepare and implement an environmental management system. This has resulted in a steady shift from 'reactive' to 'optimised and resilient' compliance (Figure 13.22).

25 Data Milk Statistics September 2023 – Central Statistics Office (accessed 25 July 2024).





**Figure 13.22** Evolution and maturing of environmental compliance



The effective implementation of an environmental management system at a regulated installation creates a platform for operators to consider how they can go beyond the basic requirements of their licence.

### Beyond compliance

‘Going beyond compliance’ refers to organisations willingly and deliberately searching for ways to exceed their regulatory requirements (Keely *et al.*, 2020). This can be done by fostering an innovative and

communicative culture, analysing working processes and instigating and cultivating new management systems. Within the industrial community, the EPA has noted a movement towards going beyond compliance in recent years, with most sectors reporting examples to the Agency in their respective annual environmental reports. Going beyond compliance demonstrates a maturity in environmental performance and occurs when key drivers and favourable conditions are in place and when a consistent level of compliance with environmental requirements is maintained (Table 13.2).

**Table 13.2** Internal and external drivers and barriers to environmental performance

	DRIVERS	BARRIERS
<b>Internal</b>	<ul style="list-style-type: none"> <li>Financial benefit to the organisation</li> <li>Organisational culture</li> <li>Leadership commitment</li> <li>Individual employee ethics and attitudes</li> <li>Operational risks from a large environmental footprint</li> </ul>	<ul style="list-style-type: none"> <li>Lack of available funding</li> <li>Organisational culture (norms, structure, learning and communication)</li> <li>Pressure on staffing and financial resources</li> <li>Lack of knowledge and information</li> <li>Lack of leadership commitment</li> <li>Lack of employee acceptance and participation</li> </ul>
<b>External</b>	<ul style="list-style-type: none"> <li>National government and EU legislation</li> <li>Risk to organisational reputation</li> <li>Media, NGOs, community groups and wider society</li> <li>Competitors</li> <li>Shareholders, investors and customers</li> <li>Supply chain partners</li> <li>Financial institutions, including insurance providers</li> </ul>	<ul style="list-style-type: none"> <li>Intransigent regulations</li> <li>Market demands</li> <li>Consumer behaviour</li> <li>Lack of available funding</li> <li>Lack of shareholder acceptance</li> </ul>

NGO, non-governmental organisation.

Source: Keely *et al.*, 2020.



Many industries in Ireland are working together to improve the overall quality of water. An example of this is Water Stewardship Ireland,<sup>26</sup> a voluntary, industry-led network of companies that enables businesses to access peer-to-peer expertise, water stewardship innovations and programmes, international certification and research insights. Working in partnership with Irish and European agencies (regulatory and developmental), key national stakeholders and industry, Water Stewardship Ireland consists of 300 of the largest production and service facilities across Ireland, all working to deliver improved water quality and make efficient use of water in their operations.

Many of the recent examples of going beyond compliance in Ireland overlap with other national policies. For example, the drive to decarbonise industry and reduce emissions, in keeping with the national Climate Action Plan, has been a common goal of such projects, where companies have adopted the use of solar technologies.

While enhancing environmental management systems and actively working towards going beyond compliance is welcome, it is important that industry first establishes a stable and consistent compliance base from which to work. Some industry sectors have moved into optimised systems with ease, while others have not maintained basic-level compliance.

## 9. Industry and climate action

The European Green Deal commits to delivering net-zero greenhouse gas emissions at the EU level by 2050, with Ireland committed to achieving a 51% reduction in emissions from 2021 to 2030. Ireland's commitments are set out in the Climate Action and Low Carbon Development (Amendment) Act 2021. Together, the ETS and ESR (described in Section 2 above) will facilitate the achievement of the EU-wide target of at least a 55% greenhouse gas emissions reduction by 2030 (DECC, 2024). Emissions from industry have broadly aligned with economic activity; however, there are some positive signs of a decrease in manufacturing combustion emissions from economic growth, with emissions having decreased by 7.1% in 2022 relative to 2021 and, overall, by 9.1% relative to 2018.

The Climate Action Plan outlines the actions required to be taken, including implementing carbon budgets and emission reduction targets and ceilings on a sectoral basis (DECC, 2024). The sectoral emissions ceiling for industry in the 2021-2025 carbon budget period is set at 30 Mt CO<sub>2</sub> eq (megatonnes of carbon dioxide equivalent) and proposed to be reduced to 24 Mt CO<sub>2</sub> eq for the 2026-2030 budget period. Current projections show that industrial sector emissions are currently not aligned to Ireland's reduction targets. The EPA's 2023 National Inventory Report shows that 66.7% of the budget has been used in the first 3 years. To meet the sectoral emissions ceiling in the first budgetary period, the industry sector will now need to achieve average reductions of 14% in 2024-2025 (EPA, 2024b).

The Climate Action Plan 2024 sets out key performance indicators to be realised by industry to achieve the requisite carbon abatement in each budget period. These include:

- reduce fossil fuel use in the industry sector from 64% of final consumption (2018) to 45% by 2025. Reduce to 30% of final consumption by 2030
- achieve a 50-55% share of carbon-neutral heating in total fuel demand by 2025, increasing to a 70-75% share by 2030
- reduce industry fossil fuel demand by 7% by 2025 and 10% by 2030 by adopting energy-efficient measures in manufacturing processes
- achieve at least 1 TWh (terawatt hour) consumption of zero-emissions gas for industrial heating by 2025, increasing to 2.1 TWh consumption by 2030.

Manufacturing combustion emissions are projected to reduce by between 6% and 22% from 2021 to 2030 with the implementation of efficiency measures and renewable heat generation. However, industrial process emissions are projected to increase by 5% from 2021 to 2030 due to an anticipated increase in cement production (EPA, 2024c).

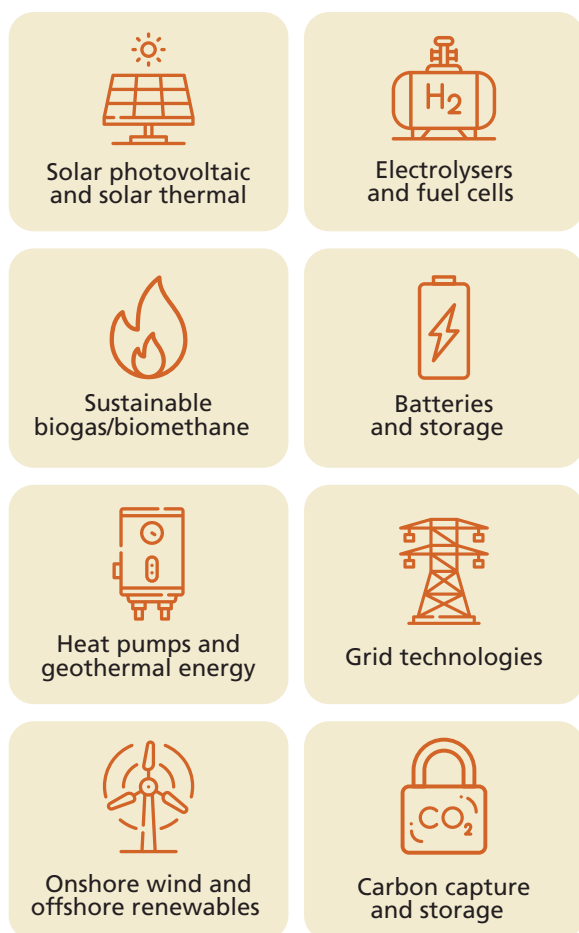
At present, the policy approach is to transition industry to clean energy using voluntary and incentive-based instruments. The specific areas where industry needs to take action include carbon-neutral heating, carbon capture, use and storage (CCUS), use of zero-emissions gas and improved energy efficiency. Enterprise Ireland and IDA Ireland are working with industry to decarbonise the sector's operations, and many incentive schemes are being made available to industry to bring about this change. Over €55 million has been made available through the Emissions Reduction Investment Fund (€30 million) and the Climate Planning Fund for Business (€25 million).



There are signs of progress in some areas. The move from carbon-intensive fuel oil to cleaner gas fuel is a likely cause. Further movement from combustion-sourced heating to electrification in industry will see this decoupling of emissions from economic growth continue.

One clear change arising from the climate emergency and wider energy crisis is to rapidly progress the provision of net-zero technologies (see Figure 13.23) and energy efficiencies within industry.<sup>27</sup> These are considered in Chapter 12.

**Figure 13.23** Key net-zero technologies that are commercially available and have potential for a rapid scale-up



Source: European Commission<sup>28</sup>

### Research on industry and the environment

The government has put in place a number of research programmes to support companies in the industry sector in their green transition. Some of the more notable include various Enterprise Ireland programmes,<sup>29</sup> including the Irish Manufacturing Research Centre, which is dedicated to assisting manufacturers and their supply chains to switch from linear to circular business models, and the Nimbus Research Centre, which looks at the potential for innovative water reuse within industry. Significant funding is also made available under the Science Foundation Ireland research centres,<sup>30</sup> linking scientists in partnerships across academia and industry to tackle key environmental challenges. These include:

- BiOrbic – converting food waste residues to higher value products
- VistaMilk – sustainable agri-tech
- MaREI – researchers working with 50 companies on energy transition and climate action approaches.

Since 2019, the EPA has funded nearly 30 new research projects relevant to the environment and industry area, a commitment of €3.12 million. Funding comes from the EPA Research Programme (2021-2030) and the EPA Green Enterprise Scheme.

Research is vital for providing integrated solutions for many of the complex challenges facing the industrial sectors in Ireland. A team at University College Cork demonstrated the effective treatment of dairy waste water while generating products that can strengthen the local economy and create new relationships between farmers, dairy processors and innovative rural industries (Walsh *et al.*, 2022).

Following a successful EPA-funded pilot project with major industrial water users in Ireland (Stockil *et al.*, 2016), a research team based in Limerick is part of a significant Horizon Europe funding programme (€20 million) that is developing novel digital technologies aimed at maximising water and energy recovery and modernising industrial waste water management practices.

27 Energy Efficiency Directive (EU/2023/1791)

28 [commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan/net-zero-industry-act\\_en](https://commission.europa.eu/strategy-and-policy/priorities-2019-2024/european-green-deal/green-deal-industrial-plan/net-zero-industry-act_en) (accessed 25 July 2024).

29 e.g. Climate Enterprise Action Fund; Enterprise Ireland/IDA Ireland technology centres and Enterprise Ireland technology gateways.

30 [www.sfi.ie/sfi-research-centres/](https://www.sfi.ie/sfi-research-centres/) (accessed 15 July 2024).



Another project identified key climate change risks and opportunities facing Ireland's business sectors, including chemicals, electronics and food manufacturing (Deignan *et al.*, 2022). By translating climate impacts into business and financial risk, opportunity and commercial imperatives, it is hoped that businesses will be encouraged to take appropriate action to ensure that they remain resilient (Deignan *et al.*, 2022).

Research from the Economic and Social Research Institute has found that smaller Irish enterprises are less prepared for the climate transition – for instance, 83% of micro firms have no climate plan in place (ESRI, 2023). A key factor that appears to strongly motivate climate action is the proportion of company expenditure that is allocated to energy.

## 10. Conclusions

For the past 30 years there has been a decrease in the main pollutants arising from industry in Ireland, such as emissions of SO<sub>x</sub> and NO<sub>x</sub> to air. At the same time, production and employment in the sector has increased overall. This decoupling of emissions from growth of the industry sector is the result of investment and technological progress, overseen by strong, integrated environmental regulation.

The planned transition to more renewable energy sources, and away from combustion-sourced heating systems to electrification, is a shift that could see greenhouse gas emissions from industry significantly decrease. Decoupling greenhouse gas emissions from the growth of industry is essential to ensure that Ireland delivers on its environmental and economic goals. Achieving the targets and staying within the ceilings for industry set out in Ireland's Climate Action Plan will be a significant challenge but are necessary to fulfil our commitments to reduce greenhouse gas emissions.

There are some sectors within Irish industry that must further improve their environmental performance.

- The dairy processing sector needs to ensure that it prioritises environmental performance and improves compliance with limits on odour and water emissions.
- Waste transfer site operators need to take a proactive approach in handling waste without creating nuisance impacts while legacy issues remain at closed landfill sites in the waste sector. The continued management of such sites is a challenge that needs to be prioritised by local authorities.
- There is an urgent need for significant uptake of abatement techniques to control and reduce ammonia emissions to air from the intensive agriculture sector to ensure the protection of sensitive habitats in some parts of Ireland.

Nationally, industry must operate within the statutory framework long established and implemented in Ireland. The continued operation of unauthorised commercial peat extraction at the expense of Ireland's natural habitats is not acceptable and should cease.

It has been 30 years since the EPA issued the first licence to industry, and there has been a significant shift in industry's compliance and environmental performance in those 30 years. The presence of an established, structured environmental regulation system in Ireland, led by the EPA and other regulatory authorities, provides a stable and predictable setting for industry to operate in. Overall, Irish industry maintains a good level of compliance with environmental requirements. As envisaged in the European Green Deal, the implementation of the revised IED will drive further improvements in the environmental performance of industry.

While improvements in compliance culture, reductions in emissions and environmental controls are welcome, the challenges of further reducing greenhouse gas emissions and resource use are significant.



### Key chapter messages

- 1.** Industrial pollution in Ireland is decreasing, thanks to a blend of regulation, developments in manufacturing, control technology and environmental initiatives. However, despite these improvements, some sectors of industry are still responsible for a significant burden on our environment. Continued investment and change are needed to ensure compliance with tighter environmental standards and to achieve the targets and reductions that are required under industry's climate commitments.
- 2.** Compliance with environmental regulation across industry in Ireland is high overall. Many sectors have advanced environmental systems in place that demonstrate a maturity in their approach to environmental compliance. However, a disproportionate number of sites in the food and drink sector, in particular dairy processing sites, and in the waste sector are not performing optimally and are regularly cited on the EPA's list of national priority sites for not complying with their licence conditions.
- 3.** The unauthorised harvesting and extraction of peat on an industrial scale is causing destruction of Ireland's natural habitats and compromising the vital role of peatlands in helping society mitigate the impacts of and adapt to climate change. It is essential that planning policy clearly prioritises the regulation and control of these operations. The EPA will continue to exercise its authority over operators and other regulators to ensure the cessation of such unauthorised activities





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