UNITED KINGDOM METHANE MEMORANDUM

COP26 PRESIDENCY UK 2022

DELIVERING THE GLASGOW CLIMATE PACT

1. INTRODUCTION

Cutting methane emissions is one of the fastest and most cost effective tools available to limit global temperature rise to 1.5°C. Due to methane's short atmospheric lifetime, taking action can rapidly reduce atmospheric concentrations and in turn rates of warming across the next decade. According to the UN Environment Programme's (UNEP) Global Methane Assessment, reducing methane emissions can avoid up to 0.3°C of warming by 2040[1].

The UK has a robust record of tackling methane emissions at both the international and domestic level. Through its UK COP Presidency, the UK played a key role in catalysing global action on methane. At COP26, the final decision text (the Glasgow Climate Pact) secured an agreement to reduce methane emissions by 2030, a COP first[2]. With support from the UK, COP26 also saw the launch of the Global Methane Pledge (GMP) (led by the United States and the European Union), with the commitment to collectively reduce global methane emissions by at least 30% by 2030. The UK was one of the first countries to support the Pledge. The GMP now has over 120 country participants who together are responsible for 50% of global human-caused methane emissions[3].

Domestically, the UK has adopted early and ambitious measures to tackle methane emissions. Between 1990 and 2020, UK methane emissions dropped by 62%, more than any other OECD country. Methane now accounts for approximately 13% of the UK's net greenhouse gas emissions[4].

The UK Government recognises the urgency to do more, and is pursuing efforts to secure further emission reductions across the next decade and up to 2050, driven by its Net Zero Strategy and carbon budgets[5].

This memorandum outlines how the UK has achieved world-leading reductions in methane emissions and how it continues to explore and implement measures to secure future progress. The UK remains dedicated to capitalise on the critical opportunity to tackle climate change through action on methane.

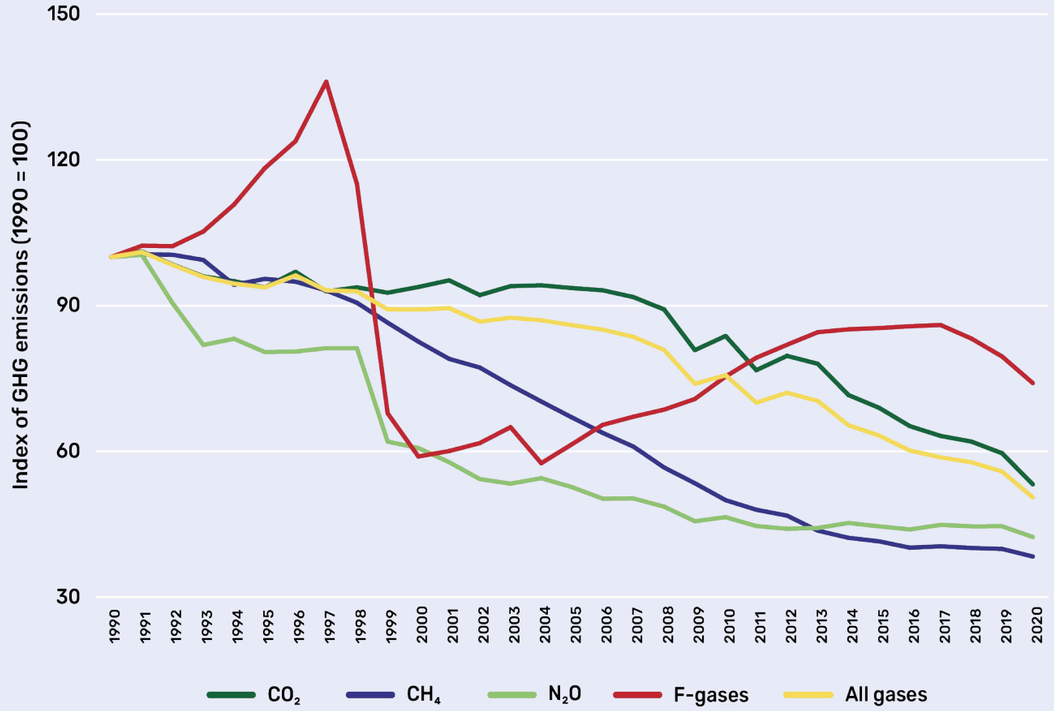


Figure 1: UK net greenhouse gas emissions trend relative to 1990 (million tonnes CO2 equivalent). Source: BEIS, UK 1990-2020 Greenhouse Gas Inventory

2. WHY ACT?

Methane is a potent greenhouse gas that has a far more powerful global warming effect than carbon dioxide, around 80 times greater per tonne emitted than carbon dioxide over 20 years and around 30 times greater over 100 years[6].

Scientific research estimates that 25% of today's warming is driven by methane from human activities[7]. Compared to carbon dioxide, methane has a considerably shorter atmospheric lifetime of 12 years rather than centuries[8]. This means that taking action can rapidly reduce atmospheric concentrations and in turn rates of warming in the near term.

Since pre-industrial times, methane's atmospheric concentration has more than doubled. According to the latest report of the Intergovernmental Panel on Climate Change (IPCC), methane accounts for about half of the 1.0°C net rise in global average temperature since the pre-industrial era[9]. Current concentrations are now well above levels in the 2°C scenarios used in the IPCC's sixth assessment report (AR6) and are also increasing faster than since the 1980s[10]. Emissions are projected to continue rising without additional policies in place[11].

As well as contributing to deaths caused by extreme heating, methane also contributes to the formation of ground-level ozone, a dangerous air pollutant. This causes approximately half a million premature deaths per year globally and harms ecosystems and crops[12].

Taking action on methane is therefore crucial to meeting the Paris Agreement temperature goals. The recent IPCC AR6 states that the "evolution of methane emissions strongly influences the chances of limiting warming to 1.5°C"[13]. Rapidly reducing methane emissions is complementary to action on carbon dioxide and other greenhouse gases. Slowing today's unprecedented rate of warming can help avert our most acute climate risks, including crop loss, wildfires, extreme weather and rising sea levels.

Action on methane is therefore recognised as the 'last low hanging fruit' in tackling climate change because measures are readily available and in some cases very cost effective. 40% of current methane emissions could be avoided at no net cost (IEA) and available measures could reduce emissions by up to 45% by 2030 across energy, waste and agriculture[14].

Methane abatement delivers additional important benefits, including improved public health and agricultural productivity. According to the Global Methane Assessment from the Climate and Clean Air Coalition and UNEP, achieving the 2030 goal can prevent over 200,000 premature deaths, hundreds of thousands of asthma-related emergency room visits, and over 20 million tons of crop losses a year by 2030 by reducing ground-level ozone pollution caused in part by methane[15].

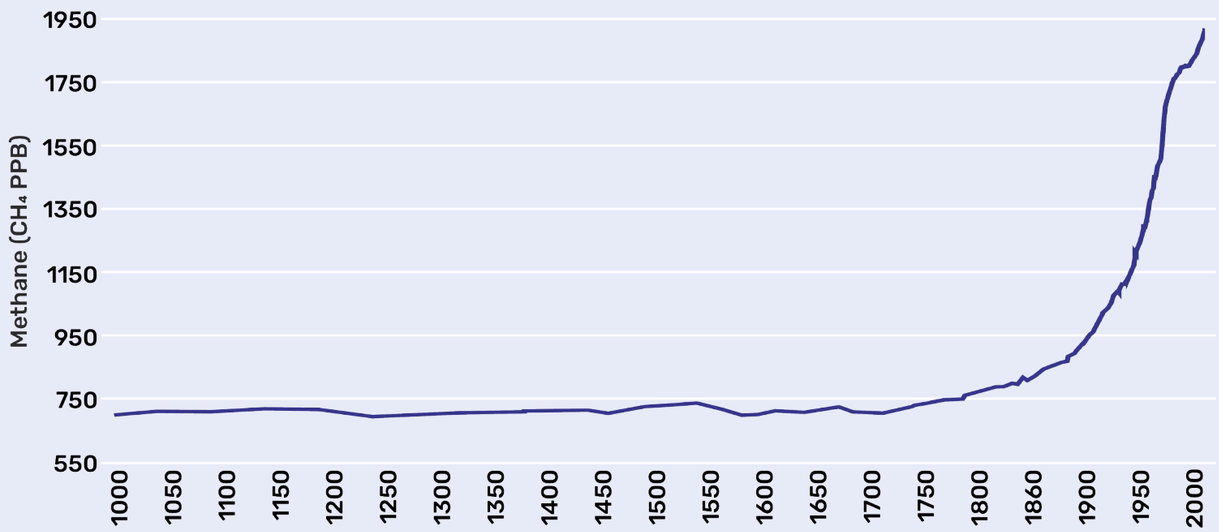


Figure 2: Global methane levels. Source: 2 Degrees Institute, 2022

3. UK PROGRESS TO DATE

The UK is a global leader on reducing methane emissions. In 1990, UK methane emissions made up 17% of UK greenhouse gas emissions (135 $MtCO_2e$). By 2020 methane emissions had significantly declined by 62%, making up approximately 13% of total greenhouse gas emissions (52 $MtCO_2e$)[16]. This percentage reduction is more than any other OECD country. Over the same period, the US and EU-27 have reduced methane emissions by 15% and 41% respectively[17]. In 2020, UK methane emissions per capita were around 0.8 tCO_2e, substantially below the US (2.1 tCO_2e) and EU-27 average (1.0 tCO_2e)[18].

For the UK, the largest falls since 1990 have come from the waste sector (e.g. landfill sites) down by 47 $MtCO_2e$ (or 75%), energy sector (e.g. coal mining and handling) down by 32 $MtCO_2e$ (or 84%) and agriculture sector (e.g. enteric fermentation from cattle) down by 4 $MtCO_2e$ (or 15%)[19]. This section will provide an overview of how the UK has achieved reductions across each sector.

3.1 ENERGY

Methane emissions from the UK energy sector have reduced by 84% in 2020 compared to 1990 levels. Methane emissions in this sector are now 6 $MtCO_2e$, or 11% of total UK methane emissions. This is the result of a number of measures and interventions implemented across the whole energy supply chain, as outlined below. The closure of the UK coal industry and a declining North Sea basin have been major drivers in reductions across this sector as well as local gas mains replacement (i.e. moving from iron pipes to plastic ones).

3.1.1 COAL

In the UK coal seams generally contain methane ranging from close to zero up to 20m³/tonne. During mining this methane is released from the coal and surrounding strata and continues to do so for many years albeit at a declining rate.

Methane from mines escapes to the atmosphere either through active ventilation when the mines are working or through pathways to the surface when mines are abandoned. These pathways are predominantly the mine entries that were created to work the mines but can also include permeable or broken strata and geological faults.

Coal mining in the UK has been in long term decline reflecting falling domestic demand. There are only a handful of operational mines remaining. In turn, UK coal production fell from 93 million tonnes in 1990 to an all time low of just over 1 million tonnes in 2021[20]. Following the closure of the last three deep mines in 2015 (Hatfield, Thoresby and Kellingley), production fell to a fraction of the previous values. Methane emissions from UK coal mining and handling have reduced by 21 $MtCO_2e$ between 1990 and 2020[21].

When coal mines are abandoned, pumping ceases and over a period of time water will

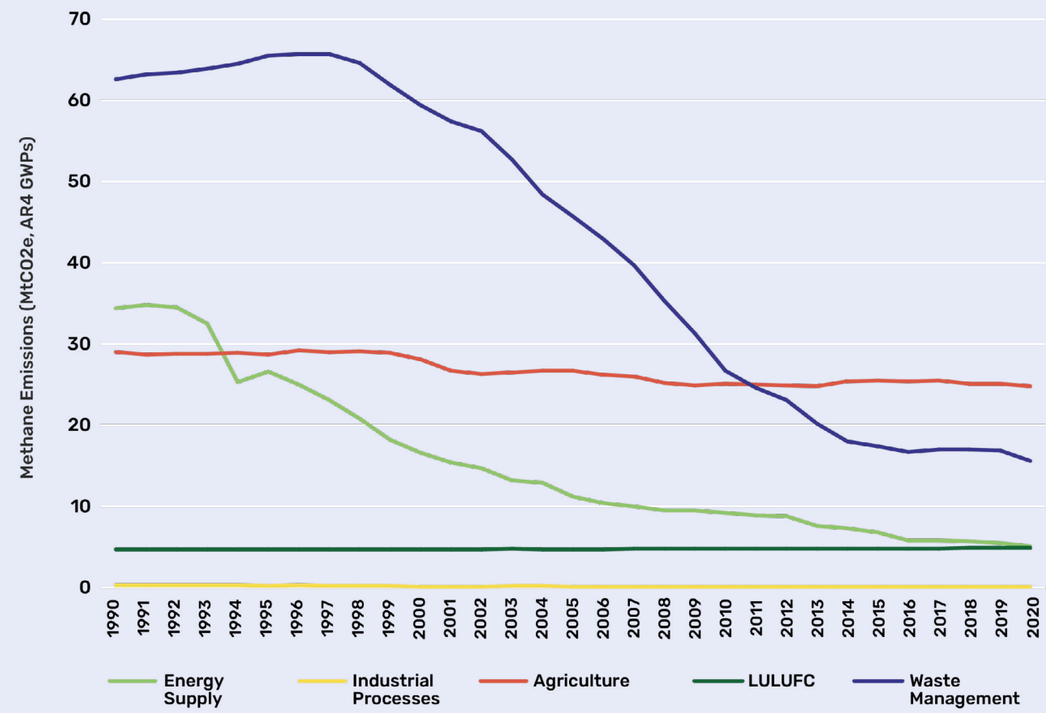


Figure 3: UK methane emissions by IPCC sector (UK only, excluding emissions from CDs and OTs). Source: BEIS, UK 1990-2020 Greenhouse Gas Inventory.

flood the mine workings. Rising mine water will modify the emission of methane from abandoned coal mines in two ways, firstly by displacing methane from the mine workings forcing it to the surface pathways or in the longer term by completely flooding the mine workings cutting off the flow of gas from the coal seams.

In the UK, the Coal Authority manages the effects of past coal mining and has a network of gas monitoring points across the coalfield areas. The majority of coal mines are now fully flooded and no longer pose a risk from methane emissions. In the more recently closed coal mining areas mine water levels are still recovering and these are being monitored.

Where high levels of methane in abandoned coal mines are known, these are licensed by the North Sea Transition Authority for gas extraction and use. This is carefully controlled to ensure safe extraction and use, limiting greenhouse gas potential through converting methane to carbon dioxide and water and extracting the energy. The combination of abandoned coal mines flooding and the utilisation of abandoned mine methane where it exists in economic quantities has also significantly reduced methane emissions from coal mines since the 1990s

It can be difficult to completely plug or seal abandoned mines and there remains some coal related methane that is emitted to the atmosphere. Where it exists in smaller or intermittent quantities the Coal Authority has installed passive vents or engineered schemes that provide safe pathways to the atmosphere preventing it from accumulating in hazardous concentrations. Work is currently being carried out to quantify these residual levels of methane.

For power, coal's share of UK electricity generation fell from 72% in 1990 to around 2% 2019-2021. For the first time ever, in March this year (2022) coal-fired power plants did not participate in the four-year ahead Capacity Market auction, which secures the electricity capacity Great Britain needs to cope with peaks in demand in 2024 to 2025 at a low cost to consumers. Going forward, coal power plants will not be able participate in any future Capacity Market auctions due to the introduction of Emissions Limits to the Capacity Market.

In 2012, coal accounted for 40% of the UK's power generation, dropping dramatically to only 1.8% in 2020. Ending unabated coal generation in 2024 will mean that we will have reduced it from almost a third of our electricity supply to zero in the space of just 10 years.

3.1.2 MIDSTREAM GAS NETWORK

The UK has adopted measures to make sure the gas network is as effective as possible at minimising gas leakage and associated emissions, in the context of gas demand decreasing between now and 2050. Since 2000, methane emissions from gas leakage in the network have fallen by 50%, predominantly through replacing iron pipes with plastic[22].

The Iron Mains Risk Reduction Programme (IMRRP) is a key driver to upgrade the gas network from iron pipes to plastic pipes. This improves the safety and resilience of the local gas network and reduces leakages of methane where the pipes have been changed. The IMRRP was introduced in 2002 to address 'societal concern' regarding the potential for failure of cast iron gas mains and the consequent risk of injuries, fatalities and damage to buildings. It has been designed to secure public safety whilst efficiency, environmental, strategic and customer service factors have also driven forward the programme.

The objective of the IMRRP was to decommission all cast iron mains within 30 metres of property in 30 years - the IMRRP is often referred to as the '30/30 programme'. The IMRRP accelerated the replacement of cast iron mains with plastic to a level that was estimated to be as fast as practicable at that time. The replacement to plastic is also suitable for hydrogen which means the replaced pipes will be hydrogen ready.

A review of the policy was undertaken in 2010-11 between the UK's Health and Safety Executive (HSE), and Office of Gas and Electricity Markets (Ofgem). This found the IMRRP to be successful and had kept up to pace with network deterioration, allowing for future use of the Programme. In particular, there was significant reduced leakage of greenhouse gases, and in turn financial savings from reduction in loss of gas from a leaking network and greater network reliability for the consumer.

3.1.3 UPSTREAM FUEL SUPPLY

Methane emissions offshore typically occur from venting of gas, from unburnt methane released via flaring and via combustion plants, from fugitive emissions from the facility and from the loading of oil tanks.

Methane emissions from the upstream oil and gas industry have fallen by roughly 60% between 1990 and 2006 and have since remained relatively flat at an average of 1.6 $MtCO_2e$ per year[23]. While this is mostly due to the UK Continental Shelf (UKCS) being a maturing basin with production decline and older facilities ceasing production, there have also been proactive abatement initiatives such as facilities installing flare gas recovery systems, increasing equipment efficiency and using leakage detection systems. The drop in emissions was also influenced by a reduction in offshore flaring levels and venting levels – despite gas and oil production increasing, reduction in exploration well drilling and testing and reduction in terminal and oil loading emissions.

In the years prior to 2018, a number of Field Development Plans and FDP Addendums for projects were all consented on a zero routine flare basis by the NSTA. These projects have flare gas recovery systems and automatic ignite flare systems to significantly reduce methane emissions.

Since 2018, methane emissions have fallen further below 2006 due to further proactive steps taken from existing fields, rather than from older fields coming offline. Specific steps have included (but are not limited to): better flare and venting management practices with increased focus on flare uptime (and less cold flaring), replacement of leaky seals on topsides equipment and investment in flare gas recovery systems.

3.2 WASTE

Methane emissions from the UK waste sector have reduced by 75% in 2020 compared to 1990 levels. Methane emissions in this sector are now 16 $MtC0_2e$, or 31% of total UK methane emissions[24].

In the UK, the largest contributor to methane emissions from the waste sector is landfill, accounting for 81% of emissions from the sector, with the remaining emissions coming from wastewater treatment and biological treatment of waste[25].

Over the last 25 years, landfill emissions have been tackled in two ways – by reducing the amount of biodegradable waste going to landfill (the landfill tax being a key driver) as shown in Figure 4 and also by increasing the efficiency of methane collection from landfills already containing biowaste (with a requirement for operators to develop and maintain a landfill gas management plan).

3.2.1 CASE STUDY: THE LANDFILL TAX

Operating on the 'polluter pays' principle, the Landfill Tax was introduced in October 1996 and is levied on disposal of waste to landfill, with very limited exemptions. Landfill operators are liable for the tax on all consignments of waste accepted for landfill disposal. In practice, the cost of the tax is passed through the waste management chain to the waste producer as well as Local Authorities disposing of municipal waste. Introductory tax rates were set in 1996 at £7 per tonne of active waste (mainly biodegradable waste), and £2 per tonne of inactive, inert waste e.g. mineral waste. The Landfill Tax 'escalator' was announced in 1999 and the rates now stand at close to £98.60 per tonne for active waste and just above £3.15 per tonne for inactive waste.

The tax was intended to promote diversion of waste from landfill by increasing the economic viability of sustainable waste practices, such as re-use, recycling, anaerobic digestion and composting. For local authorities (in charge of municipal waste collection and disposal), the tax acts to make separate collection of recyclable material from households and businesses economically preferable to disposal in landfill. Similarly, the differential in rates acts to incentivise sorting of mixed waste for further recycling in order to maximise volumes qualifying for the lower rate. A percentage of the landfill tax has also been used to provide a fund for the benefit of local communities around landfill sites.

The imposition of the tax has discouraged the disposal of wastes that contain biodegradable material from landfill and helped to generate viable business cases for recycling and recovery alternatives - composting, anaerobic digestion and energy from waste - further 'up' the waste hierarchy. The declining trend of local authority managed waste in England being disposed of in landfill is demonstrated in Figure 5, decreasing from 22 million tonnes in 2000/2001 to 2 million tonnes in 2019/2020.

The linked increase in recycling and increase in energy recovery which lead to the reductions in disposal to landfill are evident in these figures for Local Authority collected waste.

3.2.2 LANDFILL METHANE CAPTURE AND RENEWABLE ELECTRICITY GENERATION

The efficient collection and utilisation of methane from landfill sites has been simultaneously addressed through a combination of regulation, industry led best practice and financial incentivisation of the utilisation of the collected methane for energy (electricity) production.

For the biodegradable waste already in landfill, regulation has been used to require the capture of the methane and other gases produced. The Pollution Prevention and Control Regulations 2000 introduced a permitting system to allow for targeted control of the environmental impact of landfill sites, including gas, by the regulator

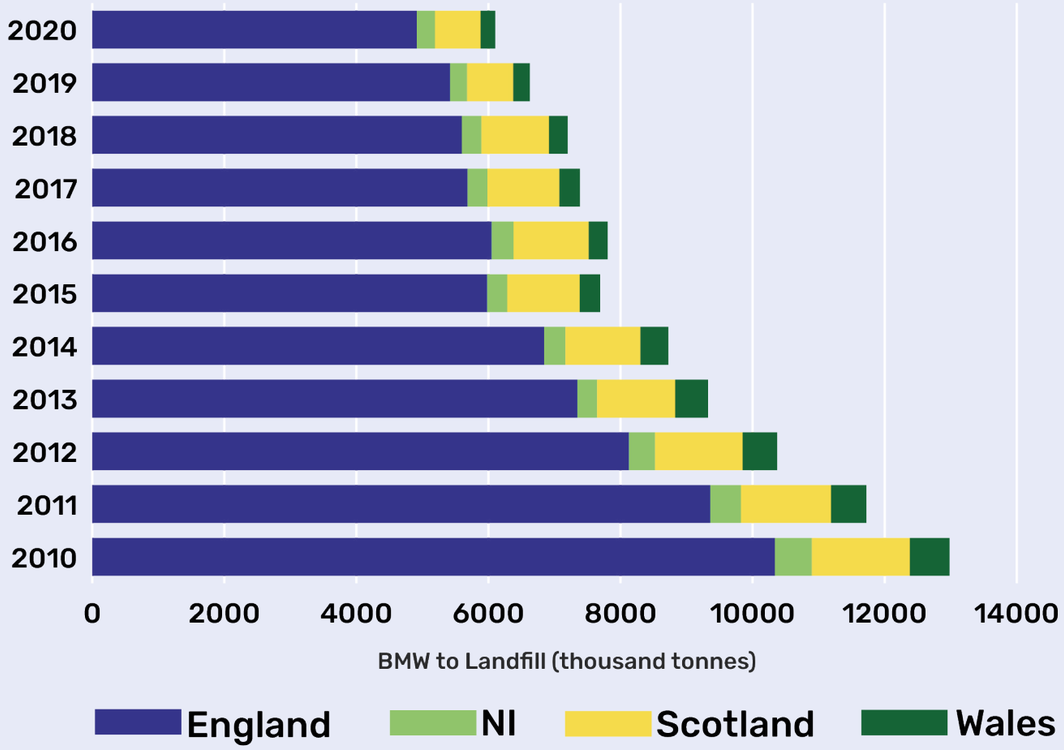


Figure 4: Biodegradable municipal waste (BWM) to landfill UK and country split (2022 UK statistics on waste). [Source: UK Statistics on Waste].

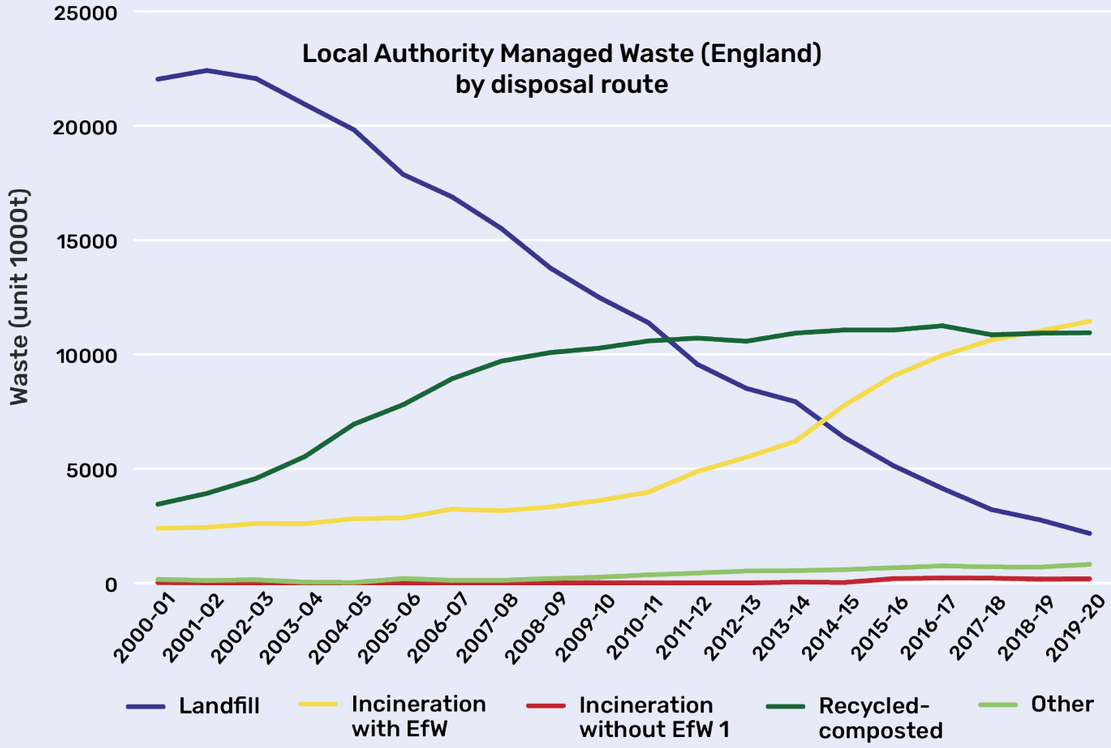


Figure 5: LA ENV-18 ENV18 - Local authority collected waste: annual results tables. Source: GOV.UK (www.gov.uk).

(for example, the Environment Agency in England). Additionally, the Landfill Regulations 2002 required that all new landfill sites install landfill gas capture equipment, with energy recovery being the preferred option for its treatment.

The Renewables Obligation scheme for the incentivisation of renewable energy was introduced in April 2002 and applied to the generation of electricity by landfill gas. This was designed to encourage generation of electricity from eligible renewable sources in the UK. Landfill gas is collected and used to power turbines which generate power for the grid, generating 3,500 GW/hour in 2020.

3.3 AGRICULTURE

Agricultural methane emissions are produced primarily from enteric fermentation and waste management of cattle, and enteric fermentation in sheep. Agriculture makes up a larger proportion of the UK's methane emissions compared to other similar economies. This is not due to a lack of action in the sector, but rather is indicative of the significant progress already made in reducing methane emissions from energy and fuel supply sectors.

In fact, agricultural methane emissions have reduced by 15% between 1990 and 2020 with many farms across the whole United Kingdom using more efficient agricultural practices. Methane emissions in this sector were 25 $MtCO_2e$ in 2020, making up 48% of total UK methane emissions[26].

Both a decline in cattle populations in response to external stimuli (for example sectoral and subsidy reforms) and productivity improvements contributed to a reduction in agricultural methane emissions between 1999 and 2009.

The Government has and continues to work with industry to reduce emissions through improved productivity. Defra emissions and production statistics show that since 1990 we are producing a litre of milk with 21% less greenhouse gas emissions, and a kilogram of pork with 40% less GHG emissions[27]. Efficiency gains in dairy farming mean that we are now producing 11% more milk than we were in 2000 with 24% fewer cows.

Delivery of productivity improvements in cattle production systems have largely been achieved through an increased prevalence of high yielding breeds, and changes in management including different approach to housing and diet (high quality mixed feed rations).

The Government is committed to continue efforts to reduce these emissions, including by enhancing the efficiency of livestock production in the UK and reducing the emissions intensity associated with producing healthy, nutritious food.

3.4 INTERNATIONAL

The UK signed up to the Global Methane Pledge at COP26, which aims to collectively reduce global anthropogenic methane emissions by at least 30 percent below 2020 levels by 2030. Under the Pledge, the UK has also committed to moving towards using the highest tier IPCC good practice inventory methodologies, as well as working to continuously improve the accuracy, transparency, consistency, comparability, and completeness of national greenhouse gas inventory reporting under the UNFCCC and Paris Agreement, and to provide greater transparency in key sectors.

The UK is also a state partner of the Climate and Clean Air Coalition, a core implementing partner of the Pledge, and a member of the Oil and Gas Methane Partnership Steering Group. In December 2020, the UK Government set out its commitment to the World Bank's 'Zero Routine Flaring by 2030' initiative, and plans to work with regulators towards eliminating this practice as soon as possible in advance of this date[28].

During the UK's G7 Presidency, the G7 "recognise[d] the importance of ambitious and urgent action to reduce emissions and leakage of methane […]"[29]. G7 Ministers of Climate, Energy and the Environment met in Berlin earlier in 2022 under Germany's Presidency, where they highlighted the importance of reducing the methane emissions associated with energy production and consumption in other countries, in addition to national efforts, and agreed to "consider providing increased support to methane reduction and elimination projects in developing and emerging economies", in particular, other oil and gas producing countries[30]. The UK will continue its national and international efforts to promote and support deep methane emissions reductions in order to limit global warming to 1.5°C.

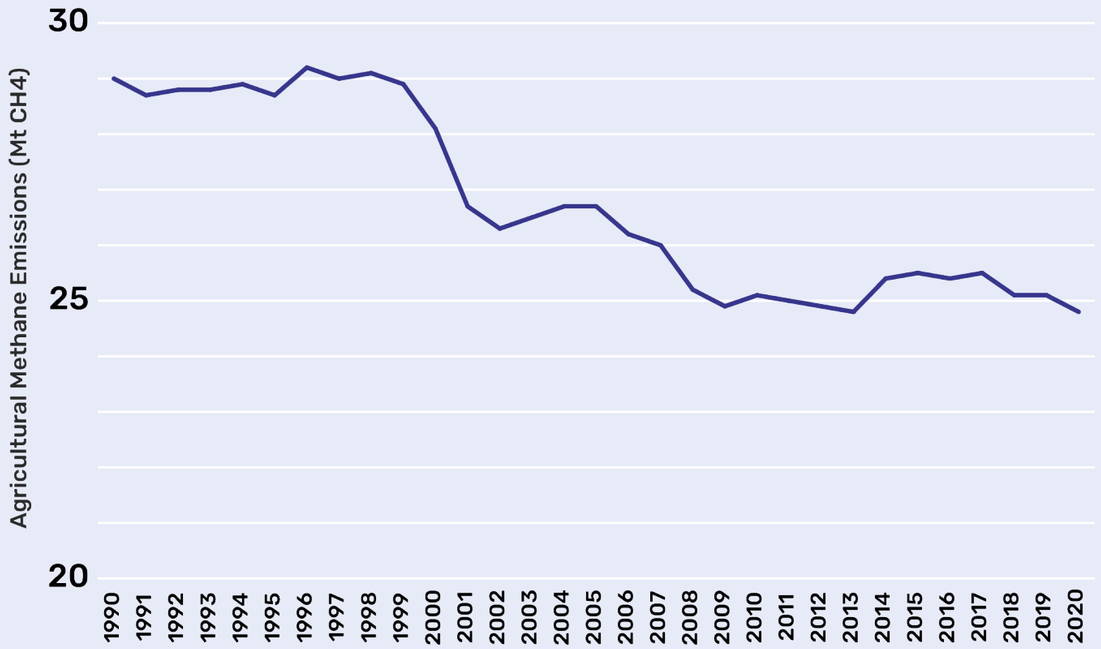


Figure 6: Methane emissions from agriculture, UK 1990-2020 (MtCO2e). Source: BEIS, UK 1990-2020 Greenhouse Gas Inventory

4. FORWARD LOOK

The UK continues to explore and implement further measures to secure future progress, and remains dedicated to capitalise on the critical opportunity to tackle climate change through action on methane.

4.1 UK'S SIXTH CARBON BUDGET, NATIONALLY DETERMINED CONTRIBUTION AND NET ZERO STRATEGY

The UK's Net Zero Strategy (NZS) is a long-term plan to meet our Nationally Determined Contribution (NDC) and Sixth Carbon Budget, cutting emissions by at least 68% by 2030 and approximately 77% (including international aviation and shipping) by 2035 on 1990 levels respectively, and reaching net zero by 2050[31]. The strategy sets out our plans for reducing greenhouse gas emissions from each sector of our economy, including cutting methane emissions which remain primarily associated with the energy, agriculture, and waste sectors.

On September 8, 2022, the Prime Minister announced an independent review of the Government's approach to meeting its net zero 2050 target, led by Chris Skidmore MP. This is to ensure we deliver our legal commitment to reach net zero by 2050 in a way that is pro-business and pro-growth, given the change in the economic landscape. Reporting by the end of 2022, it will ensure delivering the net zero target is not placing undue burden on businesses or consumers. While further detail will be announced in due course, the Net Zero Strategy remains a government priority and policy and schemes in progress will continue.

4.1.1 ENERGY

4.1.1.1 UPSTREAM FUEL SUPPLY

Through the NZS we have also committed to support existing supply sector facilities to achieve zero routine flaring and venting targets by 2030 or sooner. We have set out the aim to support the increased requirement for fuel switching to low carbon alternatives, with an ambition to replace around 50 TWh of fossil fuels per year by 2035.

The North Sea Transition Authority (NSTA) Strategy, which came into force in February 2021, incorporates a range of net zero obligations for the UK oil and gas industry, including a requirement for relevant persons to, in securing that the maximum value of economically recoverable petroleum is recovered, take appropriate steps in meeting the net zero target. This includes reducing greenhouse gas emissions from sources such as flaring and venting.

The NSTA expects industry to adhere to the following principles in relation to flaring and venting across all UKCS areas and oil and gas lifecycle stages:

- flaring and venting and associated emissions should be at the lowest possible levels in the circumstances
- zero routine flaring and venting for all by 2030
- all new developments should be planned and developed on the basis of zero routine flaring and venting.

Last year, total gas flared and vented gas reduced by 20.1% and 22.2% respectively, relative to 2020 (total gas flared in 2021 was 25.8 bcf and vented gas 2.8 bcf). Between 2020 and 2021 methane emissions decreased by 14% taking the total estimated reduction (and when compared with the baseline year of 2018, to 38%).

For a second consecutive year, the primary driver behind this reduction is gas venting which decreased by 15.1%. The decreasing trend in methane emissions is a result of different factors, a reduction in production levels due to shutdowns and maintenance activities plus industry pursuing proactive initiatives to reduce flaring and venting such as increasing equipment efficiency and leakage detection systems. The NSTA updated flaring and venting guidance strengthens stewardship, performance monitoring and benchmarking.

The sector has also made plans to replace older hydrocarbon-sourced power generation with low-carbon power – typically through electrification – to help meet emission reduc-

tion targets in the North Sea Transition Deal (NSTD) agreed between industry and government in 2021. The remaining emissions are mainly the result of flaring – release of ignited gas, and venting – release of unignited gas, where it is not feasible for the gas to be used, exported or re-injected; both of which the industry has plans to reduce.

As set out in the NZS, government has endorsed industry's commitment in the NSTD to accelerate reductions beyond the World Bank's 'Zero Routine Flaring by 2030' initiative and the NSTA published new guidance in 2021 setting the expectation for zero routine flaring and venting by 2030 or sooner.

Furthermore, the NSTA is helping drive emissions reductions via its regulatory role underpinned by a revised strategy with a Central Obligation on industry to assist meeting the UK's net zero target. Through the new Net Zero Stewardship Expectation, new field developments will need to demonstrate initiatives to reduce emissions such as low carbon power generation or zero routine flaring and venting before approval and all operators will need to write and implement Greenhouse Gas Emission Reduction Action Plans, including reviewing low-carbon power generation and reducing or removing routine flaring and venting[32].

Today, at the licensing stage, the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED) provides advice to the NSTA on operators' capability to manage their environmental impacts, including greenhouse gas emissions, at a high level. At the stage of project approvals, OPRED regulates the Environmental Impact Assessment process that considers greenhouse gas impacts, including methane emissions, which will consider measures for managing emissions. During operations, OPRED's regulatory remit regarding methane covers the small amounts of methane that are emitted via combustion plant on offshore installations, which are monitored, while the main sources of methane from flare and vent come within NSTA's control via their flare and vent consent process.

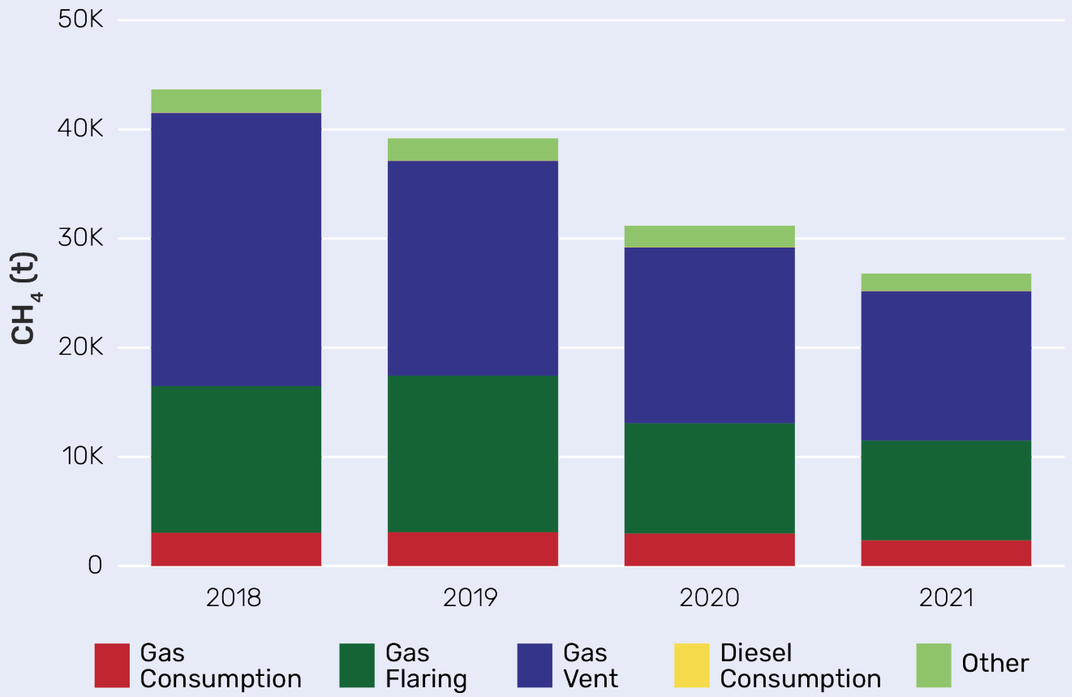


Figure 7: Offshore emission sources by groups (diesel consumption, gas consumption, gas flaring, gas vent and other), 2018–2021 Source: North Sea Transition Authority, Emissions Monitoring Report 2022 (excludes terminals)

OPRED also regulates the UK Emissions Trading Scheme (UK-ETS) for offshore oil and gas developments, and, while methane emissions are currently not included in the scheme, this is something that was included in the consultation on developing the UK-ETS undertaken in 2022 by the UK ETS Authority and is being considered for inclusion in the future.

OPRED also examines and consents any venting or flaring of gas during decommissioning operations. Fugitive emissions of methane (losses from minor leaks from connections, valves, pumps etc.) are calculated by operators for each facility taking into account the type of facility, the age of the facility and the number of components on the facility from which fugitive releases can occur.

Methane emissions are reported into OPRED's Environmental and Emissions Monitoring System (EEMS), where the data is used for the purpose of compiling annual datasets for the Pollutant Release and Transfer Register (UK-PRTR) and the National Atmospheric Emissions Inventory (NAEI). The data is also used in NSTA's emissions monitoring reports. OPRED is currently involved in scientific research to better understand the levels of methane emitted from offshore installations. OPRED is committed to continued regulatory cooperation with NSTA on the monitoring, reporting and management of emissions via the North Sea Transition Deal.

In 2021, the UK offshore oil and gas industry published its Methane Action Plan to reduce emissions and flaring[33]. The Plan commits to a 50% methane emission reduction by 2030 (against a 2018 baseline). Furthermore, the sector will:

a. through individual assets, seek to accelerate compliance with the World Bank 'Zero Routine Flaring' Initiative ahead of 2030;

b. commit to the Oil and Gas Climate Initiative (OGCI) 2025 methane intensity commitment – currently 0.25%* (ambition 0.20%).

4.1.1.2 CASE STUDY ON FUTURE REDUCTION IN THE ENERGY SECTOR: IRON MAINS RISK REDUCTION PROGRAMME

According to Ofgem, methane leakage makes up approximately 85% of gas leaked through the GB distribution network. There are currently strategies underway which are expected to reduce the overall demand for methane from the gas distribution network, and thus, act to reduce methane leakage. These include the production of hydrogen and increasing the use of electrification as an alternative to natural gas.

Through network price controls, Ofgem has set gas distribution companies a target to replace 15,500 km of iron mains and associated services in five years, from April 2021. To reduce the level of methane leaked through the distribution network, the Distribution Network Operators have been given a financial incentive in the RIIO-2 price control to reduce leakage levels by means of lowering system pressures and improved gas conditioning levels.

The Health and Safety Executive led Iron Mains Risk Reduction Programme (IMRRP) also addresses safety issues caused by gas leakages through the gas distribution network by replacing a percentage (95%) of iron mains with plastic pipes within 30 metres of buildings through to 2032.

Over the 2022-2026 RIIO-GD2 period, it is assumed that emissions from leakage will be reduced by 485 kilotons (0.485 $MtCO_2e$, a reduction of around 19% of their current levels). This is forecast to fall by a further 23% by the end of the Programme in 2032. By this time, it is estimated that the programme will have achieved a 66% reduction in carbon dioxide equivalent emissions from the gas distribution network (since 2014) with around 5% of iron mains remaining.

BEIS continues to work with Ofgem to explore additional options leading to and post 2032 to reduce methane leakage as far as is practicable as part of the UK's wider net zero agenda.

4.1.2 WASTE

The NZS repeated our intention to meet the commitments in the Resources and Waste Strategy 2018, which set out the overall ambition and direction of travel for the waste sector[34]. It made a commitment to increase municipal recycling rates to 65% and to ensure that no more than 10% of municipal waste is landfilled by 2035. Biodegradable waste sent to landfill today, however, slowly breaks down anaerobically, emitting methane for many years afterwards. Faster action will mean greater emissions savings. We will therefore explore policies to work towards the near elimination of biodegradable municipal waste to landfill by 2028, including by rolling out the waste reforms announced in the Resources and Waste Strategy: consistent collections, a deposit return scheme for drinks containers, and an extended producer responsibility scheme for packaging.

The Environment Act 2021 will require all local authorities in England to separately collect household food waste on a weekly basis, preventing it from being sent to landfill. To support this commitment, we are bringing forward £295 million of capital funding which will allow local authorities in England to prepare to implement this policy. We will also be mandating the separate collection of food waste from businesses and non-household municipal premises such as schools and hospitals.

Government is also committed to eliminating food waste to landfill and delivering the UN Sustainable Development Goal 12.3 to halve food waste by 2030. This will create carbon savings and support the shift to a circular economy, as food waste is instead turned into biogas and digestate (an organic fertiliser) through anaerobic digestion. In addition, government will continue to work with the Waste and Resources Action Programme (WRAP) and industry, and to support the Courtauld 2030 voluntary agreement with food and drink businesses, the Food Waste Reduction Roadmap, and the Target Measure Act approach, as well as campaigns in the public and private sector to reduce food waste, including the annual Food Waste Action Week.

4.1.3 AGRICULTURE

As part of the NZS, the government outlined an ambition for 75% of farmers in England to be engaged in low carbon practices by 2030, rising to 85% by 2035. Government is introducing farming schemes, including new environmental land management schemes, which will provide a powerful vehicle for achieving net zero, and the goals of the 25 Year Environment Plan.

Together with environmental land management schemes, our Animal Health and Welfare Pathway, and offers such as the Farm Investment Fund (FIF) and Farming Innovation Programme (FIP), will also support farmers to adopt low carbon farming practices and increase the carbon stored on their farms, helping to improve business productivity and profitability gains[35].

A range of opportunities exist to support a reduction in methane emissions from agriculture. The introduction of feed products with methane suppressing properties is one such way of supporting the livestock sector to decarbonise, allowing us to continue to produce healthy, nutritious food while meeting our greenhouse gas emissions targets.

Whilst methane suppressing feed products are an emerging technology, the government is actively investigating the promising role these products may have in delivering emissions savings in the mid-term, including by assessing whether regulation could ensure maximised take up of such products. The UK and Devolved Governments have launched a call for evidence to better understand the opportunities and challenges associated with these products and explore how we can work with farmers and agri-businesses to increase adoption of this technology to support more sustainable protein production[36].

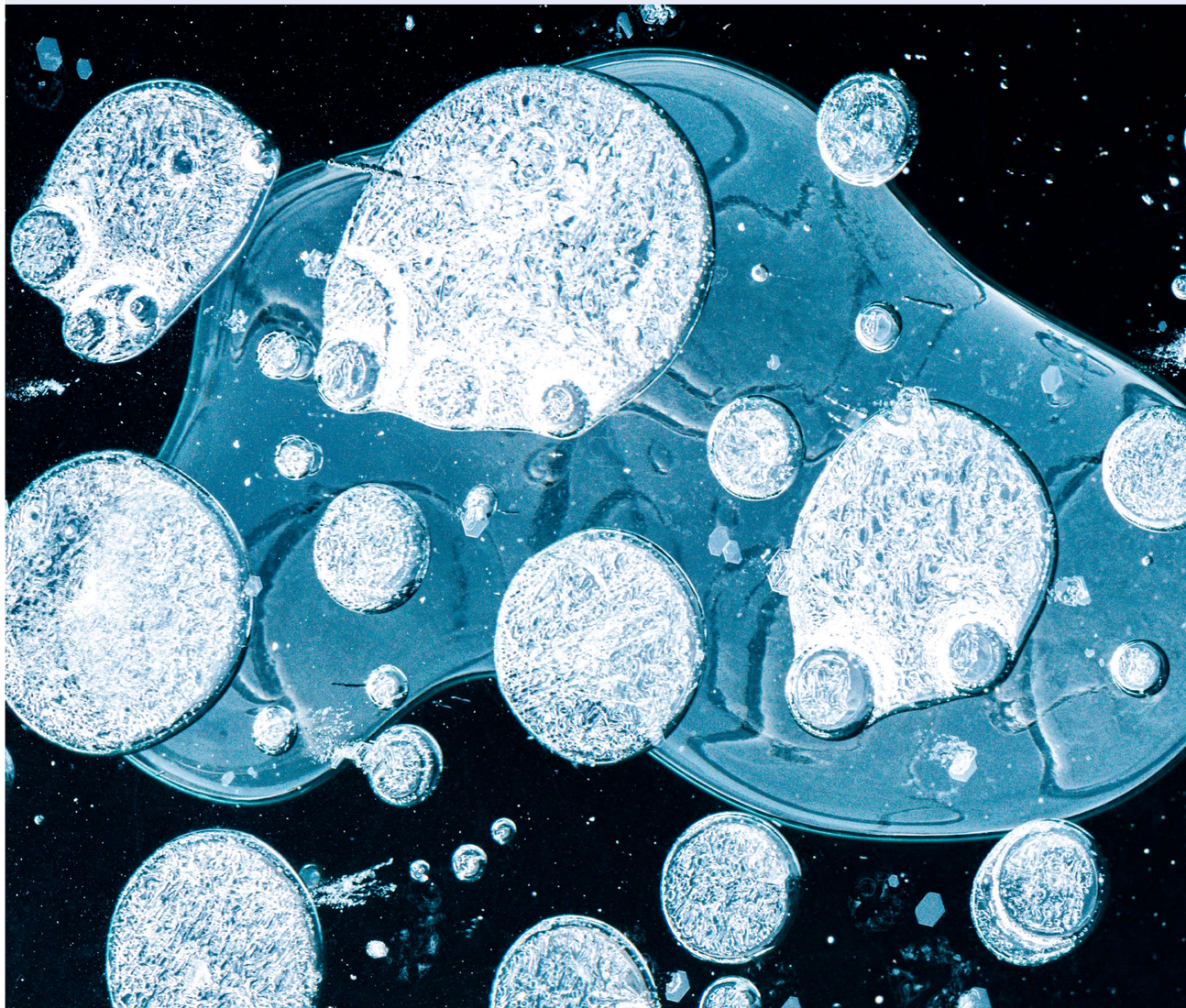
4.1.4 Case Study: Improving Regulation - Environment Agency

The Environment Agency is reviewing how they can enable methane emission reductions across regulated industries in England, by fully utilising their powers as an environmental regulator and sharing knowledge to reduce methane emissions in the UK and internationally.

The main areas of focus are to:

- Improve the data - by improving how methane is measured, monitored, and modelled, we will make better decisions and target action.
- Effective regulation - to enable and encourage operators to reduce methane emissions and maximise efficiency.
- Work with external partners and other countries – to share knowledge to help improve our collective understanding of how to enable methane reduction.

An Environment Agency Methane Action Plan will be created to drive this focused action on methane.



[1] Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions | UNEP - UN Environment Programme

[2] https://unfccc.int/sites/default/files/resource/cop26_auv_2f_cover_decision.pdf - [Paragraph 19 - Invites Parties to consider further actions to reduce by 2030 non-carbon dioxide greenhouse gas emissions, including methane]

[3] https://www.globalmethanepledge.org/

[4] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[5] https://www.gov.uk/government/publications/net-zero-strategy

[6] https://www.ipcc.ch/assessment-report/ar6/

[7] Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions | UNEP - UN Environment Programme

[8] https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf

[9] https://www.ipcc.ch/sr15/chapter/spm/

[10] https://www.unep.org/news-and-stories/story/methane-emissions-are-driving-climate-change-heres-how-reduce-them

[11] Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions | UNEP - UN Environment Programme

[12] Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions | UNEP - UN Environment Programme

[13] https://www.ipcc.ch/site/assets/uploads/sites/2/2019/06/SR15_Full_Report_High_Res.pdf

[14] Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions | UNEP - UN Environment Programme

[15] Global Methane Assessment: Benefits and Costs of Mitigating Methane Emissions | UNEP - UN Environment Programme

[16] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[17] UNFCCC, 2022 national inventory submissions: https://di.unfccc.int/time_series

[18] OECD, population data: https://data.oecd.org/pop/population.htm

[19] EIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[20] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1094025/UK_Energy_in_Brief_2022.pdf

[21] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[22] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[23] National Atmospheric Emissions Inventory - https://www.nstauthority.co.uk/data-centre/data-downloads-and-publications/

[24] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[25] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/ Methane emitted from landfills is included as an entry in the UK National GHG national inventory emissions (the short cycle/biogenic carbon dioxide is not). The national inventory uses a model to estimate the generation of methane from landfills, subtracts the figures measured for gas use, destruction (flaring), and potential microbial oxidation, to estimate the emissions to the atmosphere.

[26] BEIS, UK 1990-2020 greenhouse gas inventory: https://naei.beis.gov.uk/data/

[27] https://www.gov.uk/government/statistics/uk-milk-prices-and-composition-of-milk; https://www.gov.uk/government/statistics/cattle-sheep-and-pig-slaughter; https://www.gov.uk/government/statistical-data-sets/structure-of-the-livestock-industry-in-england-at-december

[28] https://www.gov.uk/government/publications/energy-white-paper-powering-our-net-zero-future

[29] https://www.gov.uk/government/publications/g7-climate-and-environment-ministers-meeting-may-2021-communique/g7-climate-and-environment-ministers-communique-london-21-may-2021

[30] https://www.bundesregierung.de/resource/blob/974430/2044350/84e380088170c69e6b6ad45dbd133ef8/2022-05-27-1-climate-ministers-communique-data.pdf?download=1

[31] https://www.gov.uk/government/publications/net-zero-strategy; https://www.gov.uk/government/publications/the-uks-nationally-determined-contribution-communication-to-the-unfccc

[32] https://www.nstauthority.co.uk/media/7184/se11_net-zero.pdf

[33] https://oeuk.org.uk/wp-content/uploads/2021/06/OGUK-Methane-Action-Plan-2021.pdf

[34] https://www.gov.uk/government/publications/resources-and-waste-strategy-for-england

[35] https://www.gov.uk/government/publications/animal-health-and-welfare-pathway

[36] https://consult.defra.gov.uk/agriclimate/methane-supressing-feed-products/