

Emissions Monitoring Report 2026 Methodology

This document provides technical detail and references to support the analysis presented in the NSTA's 2026 Emissions Monitoring Report.

Intergovernmental Panel on Climate Change (IPCC) upstream oil and gas categories

Direct production-related greenhouse gas (GHG) emissions from the activities of the UK upstream oil and gas sector have been identified within the [National Atmospheric Emissions Inventory \(NAEI\) dataset](#) using relevant categories defined by the IPCC, which the NSTA uses in its assessments. We include data for the following Common Reporting Table [\(CRT\) categories](#):

CRT category	CRT category description
1A1cii	Oil and gas extraction fuel use
1B2ai	Oil exploration fugitive emissions
1B2aii	Oil production and upgrading fugitive emissions
1B2aiii	Oil transport fugitive emissions
1B2aiv	Oil refining/storage fugitive emissions
1B2avi1	Oil production fugitive emissions
1B2bi	Gas exploration fugitive emissions
1B2bii	Gas production and gathering fugitive emissions
1B2biii	Gas processing fugitive emissions
1B2ci1	Oil industry venting
1B2ci2	Gas industry venting
1B2cii1	Oil industry flaring
1B2cii2	Gas industry flaring

As in previous Emission Monitoring Reports, estimated GHG emissions from the Sullom Voe CHP facility, a power generation plant which supplies electricity to the Sullom Voe oil terminal, have been deducted from the relevant totals for oil terminals reported by DESNZ.

Global warming potential factors

The NSTA includes three greenhouse gases in the analysis: carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (N₂O). These are combined based on their respective global warming potential equivalent to carbon dioxide, termed 'CO₂e'. The NSTA follows the UK government which uses 100-year global warming potential (GWP100) values from the Intergovernmental Panel on Climate Change's Fifth Assessment Report (IPCC AR5), specifically those in Table 8.A.1 (100-year time horizon, without climate-carbon feedback) of [Working Group 1 of the IPCC Fifth](#)

[Assessment Report: Climate Change 2013](#). The AR5 GWP100 values are 1 for CO₂, 28 for CH₄ and 265 for N₂O.

Estimated 2025 emissions

NAEI data for 2025 are not yet available so the NSTA estimates emissions using Environmental and Emissions Monitoring System (EEMS) data for offshore installations, broken down by GHG component and grouped into eight categories (gas consumption, diesel consumption, fuel oil consumption, direct process, oil loading, gas flaring, gas venting and fugitives), and UK Emissions Trading Scheme Registry (UK ETS) data on CO₂ emissions in scope of the UK ETS for onshore terminals. The NSTA applies the growth in offshore and onshore emissions from these sources to the equivalent 2024 NAEI totals to estimate total GHG emissions in 2025. Where the NSTA show EEMS totals for offshore installations for earlier years, they have been scaled to match the corresponding NAEI totals.

UK upstream oil and gas emissions business as usual (BAU) projection

The NSTA's BAU projection of production-related GHG emissions by the UK upstream oil and gas sector uses a bottom-up approach, based on recent EEMS data provided by the Offshore Petroleum Regulator for Environment and Decommissioning (OPRED), and from the [UK ETS](#). Expected cessation of production (CoP) dates for individual installations and cessation of operation dates for onshore terminals are informed by, and generally based on, operator submissions to the NSTA's latest annual UK Stewardship Survey (UKSS).

Projected emissions for a limited number of potential future developments with major infrastructure are based on operator estimates from the latest UKSS or published environmental statements. Inclusion of future developments does not imply that consent for development will be granted by OPRED or the NSTA.

For existing offshore installations which are expected to be in use after 2025, the BAU projection is guided by EEMS data for the last two years (i.e. 2024 and 2025). Emissions are assumed to remain flat at the maximum of the 2024 and 2025 levels and are subsequently scaled to ensure that aggregate emissions from installations expected to operate beyond 2025 are aligned with their aggregate emissions in 2025.

The analysis is undertaken separately for each GHG (CO₂, CH₄ and N₂O) across eight emissions categories.

A similar approach is adopted for oil terminals (including Wytch Farm) and gas terminals (including Humbly Grove) but using total verified CO₂ emissions for 2024 and 2025 from the UK ETS Registry (since onshore terminals' emissions are no longer collected through EEMS). Terminal GHG emissions are projected to move in

line with the corresponding projections for aggregate CO₂ emissions in scope of the UK ETS; for 2026, oil and gas terminals have been treated independently as they are separately reported in the NAEI data.

Emissions from exploration flaring are assumed to decline at 5% a year starting from 2025 levels as reported in the NAEI.

Total emissions for offshore installations reported in the NAEI are a few percent greater than the total of emissions reported by EEMS. A scaling factor is therefore applied to the aggregate EEMS-based projections to give a more accurate estimate of total offshore emissions in 2025 and later years. The scaling factor is based on the percentage difference between the EEMS total and the NAEI total for offshore GHGs in 2024.

UK upstream oil and gas electrification

The NSTA models low, mid, and high electrification abatement scenarios. The modelling approach depends on whether power would be from onshore grid or offshore wind:

Electrification status	Assumed abatement of power generation emissions (%)	Emissions description
Grid-based	100% abatement is assumed via UK grid-sourced power, eliminating all emissions from power generation (except when grid electricity replaces only part of the power supply).	Scope 2 emissions are estimated by multiplying projected grid power demand by DESNZ's industrial electricity factors. Net abatement equals Scope 1 abatement minus Scope 2 emissions.
Offshore wind	35% reduction in baseline emissions through partial offshore wind power supply (except when offshore wind electricity replaces only part of the power supply).	Offshore wind produces no Scope 2 emissions, so Scope 1 abatement is reported gross.

Abatement scenarios

Compared with the projects included in EMR 2025, following assessments of the reasonableness of electrification projects for offshore installations, modelling now shows abatement from a much-reduced set of potential electrification projects. For each project the NSTA is modelling, informed estimates of implementation timescales and associated emissions savings have been used.] The total emissions savings if all of these projects were to proceed forms a full (100%) deployment scenario from which high, mid and low ranges have been calculated as follows:

Scenario range	Description
High	Represents deployment equivalent to up to 80% of each planned electrification project included in the 100% scenario, maintaining best-estimate first power dates. Confirmed projects are included at 100%.
Mid	Represents deployment of up to 50% of each planned electrification project included in the 100% scenario, with first power dates deferred by one year in each case. Confirmed projects are included at 100% with best-estimate first power dates.
Low	Represents deployment of up to 10% of each planned electrification project included in the 100% scenario, with first power dates deferred by two years in each case. Confirmed projects are included at 100% with best-estimate first power dates.

The assumptions underlying the abatement projections reflect the best current data available to the NSTA on technically feasible electrification projects. As with the BAU projection analysis, the abatement potential estimated in the electrification scenarios is not a forecast and should not be used as such. Scenarios are based on the NSTA's best understanding of the scope of projects that could be electrified and makes assumptions intended to capture a range of potential future deployments and are, therefore, subject to uncertainty.



Implementation of zero routine flaring and venting (ZRFV)

The NSTA provides projections illustrating abatement from implementation of ZRFV by the end of 2030, applying the following methodology to estimate emissions abatement attributable to ZRFV. The analysis treats offshore and onshore installations separately.

Offshore installations

Consents data on outturn quantities emitted by flaring and venting split between (i) Category A (routine), (ii) Category B and (iii) Category C have been mapped to fields/installations. The average share is applied to each installation in a field where there are multiple installations. Shares for routine flaring and venting are calculated for each installation for January to December 2024 (i.e. the last full calendar year for which outturn data are available).

For installations expected to be in use after 2030, the BAU emissions projections of GHG emissions from flaring and venting at installation level are used as a starting point. Projected BAU emissions for CO₂, CH₄ and N₂O are summed to give a total in CO₂e terms for each installation separately for flaring and venting. Average routine shares for each installation are then applied to the BAU emissions projection to estimate the abatement from 'phasing out' routine flaring and venting. The abatement profiles for the period 2026 to 2030 assume zero abatement in 2026, 20% in 2027, 40% in 2028, 60% in 2029 and 80% in 2030, with full abatement from 2031 onwards.

Onshore terminals (including Wytch Farm)

Consents data as described above is used for onshore installations. Flare and vent quantities are separately projected at installation level until the year of cessation of operation used in the BAU projection. Category A flaring and venting is assumed to be phased out progressively by 2031 as described above for offshore installations. That allows non-abated flaring and venting for all onshore terminals (including Wytch Farm) to be estimated for each year. Abated and unabated flare and vent totals are then calculated separately for oil terminals (including Wytch Farm) and gas terminals. The NAEI data published by DESNZ provides total 2024 GHG emissions from flaring and venting, reported separately for oil terminals and gas terminals.

These totals are scaled by the change between 2024 and 2025 in total oil or gas terminal CO₂ emissions as reported by the UK ETS authority. The 2025 total is then scaled for each future year by the relevant abated and unabated totals. The difference is estimated abated flaring and venting.

Abatement projects

Operators submit data to the UKSS on the status of their emissions abatement projects. Abatement project data is provided for emissions reduction plans that exceed 5,000 tonnes CO₂e per annum. The criteria for submission of probability of proceeding are as follows:

Abatement project status	Probability of proceeding (%)
Completed, under execution or planned	100
Under evaluation	50–99
Under scoping	1–49
Assumed cancelled	0

Emissions intensity

Emissions intensity is defined as the total volume of GHGs (carbon dioxide, methane and nitrous oxide) emitted per barrel of oil equivalent (boe) produced. Two levels of emissions intensity are calculated, as follows:

Emissions intensity level	Description
UKCS average emissions intensity	Total UK GHG emissions from offshore fields and terminals are divided by the total volume of UK oil and net gas production. The UK-level data come from the NAEI (up to 2024) or NSTA estimates (for 2025) while total UK production is as estimated by the NSTA based on production data published by DESNZ.
Facility average emissions intensity	Facility GHG emissions are divided by the total volume of sales production exported from each facility. Emissions from terminals are excluded. Emissions and sales production data for offshore facilities are sourced, respectively, from the latest EEMS and Petroleum Production Reporting System (PPRS) datasets.

For the UK and UKCS as a whole, the NSTA publishes several emissions intensity (EI) metrics, each of which serves a distinct purpose and captures a different aspect of emissions performance.

Emissions intensity estimate	kgCO ₂ e/boe (2025)	Includes production-related emissions	Includes transportation and onshore processing emissions
NSTA UK oil and gas EI	29	Yes	Yes
NSTA offshore fields EI	23	Yes	No
Rystad UK oil and gas upstream EI	22	Yes	No
Rystad EI of UK gas production, processing and transport	27	Yes	Yes

- Rows 1 and 2 are calculated using NSTA estimates of GHG emissions and production in 2025.
- Row 3 shows the EI for the UK from the Rystad Energy dataset used for international benchmarking (see below).
- Row 4 shows the EI for UK gas production from the Rystad Energy dataset used to compare the EI of UK gas imports.

International benchmarking

UK upstream emissions performance is assessed using Rystad Energy data to compare carbon and methane intensities from upstream production only to other hydrocarbon-producing countries. Benchmarking covers 109 countries, providing a representative global comparison of emissions intensity across the sector and considers the following points:

- Non-CO₂ GHGs are converted to CO₂-equivalent (CO₂e) using AR5 GWP100 factors (excluding climate-carbon feedback).
- International emissions intensity figures exclude onshore terminals and midstream/downstream activities, reflecting emissions solely from oil and gas field operations.
- Rystad Energy's upstream methane emissions data are derived from a proprietary field-level inventory that integrates asset-level reported data (where available), aggregated company and regional data, methane satellite observations and satellite flaring data (via VIIRS Nightfire, Colorado School of Mines). Due to limited availability and quality of public data, these bottom-up



estimates do not represent total industry emissions, but rather emissions that can be attributed to individual fields based on reported information, facility profiles and satellite measurements.

- Emissions intensities at country level obscure the extent of in-country variation in emissions intensity at field level. Some of this variation is related to the phase in the lifecycle of each field, with late-life emissions intensity rising as production rates decline and CoP approaches.

Methane intensity

NSTA are using a methane density of 0.680 kg/m³ rather than 0.657 kg/m³ for the methane intensity chart (Figure 9).