



GHG emissions calculation methodology

Vitol GHG footprint



Guiding principles for Vitol's GHG inventory and calculation approach

Vitol's GHG inventory is prepared using methodologies consistent with the *GHG Protocol*,¹ the IPIECA guidelines,² as well as additional guidance from the IPCC, the IMO, the GLEC, the ISO and the SASB standards.³

Organisational boundary

We have set an organisational boundary according to the operational control approach for consolidation, which most closely reflects GHG emissions from assets that Vitol can directly influence and reduce, and aligns to our financial consolidation approach.

Base year and recalculation policy

To allow for meaningful comparisons of "like with like" GHG emissions data over time, we use a rolling base year approach of current year minus two (Y-2). We believe this provides a reasonable three-year time frame (Y-2, Y-1, CY) over which to assess changes in our GHG footprint, whilst ensuring reliable and consistent data can be collected.

We therefore recalculate our emissions across all three scopes every year, based on Vitol's operational control boundary as of 31 December of the current reporting year applied consistently across the last three years.

This leads to GHG baseline changes across various ESG reports, in keeping with our acquisitions and divestments, yet allowing for year-over-year comparisons within any given ESG report.

Greenhouse gases in scope

Our GHG inventory includes the following greenhouse gases covered by the Kyoto Protocol: carbon dioxide (CO₂), methane (CH₄), nitrous oxide (N₂O) and sulphur hexafluoride (SF₆).

To the extent of our current knowledge, our activities do not result in any material emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and nitrogen trifluoride (NF₃), which are therefore not included.

Calculation approach

We combine direct measurements and estimations of activity data based on materiality, accuracy, availability, and consistency criteria.⁴

We then apply emission factors from a range of reliable sources: IMO, UK Government, IEA, U.S. EPA,⁵ Quantis and others as applicable.

All emissions are then converted into metric tonnes of carbon dioxide equivalent (tCO₂e) based on 100-year global warming potential (GWP) rates from the IPCC *Fifth Assessment Report* (AR5) and the IMO *Fourth Greenhouse Gas Study*.⁶

Scope 1 emissions

Scope 1 refers to direct GHG emissions from assets controlled by Vitol, from stationary (e.g., boilers, furnaces, heaters, stationary turbines and engines, waste incinerators and flares) and mobile combustion (e.g., ship and truck internal combustion engines) sources, as well as vented (or process) and fugitive emissions.

We use emission factors from the IMO for CO₂ emissions from shipping activities, and from the UK Government for all others (including CH₄ and N₂O emissions from shipping activities).

Scope 2 emissions

Scope 2 refers to indirect GHG emissions from assets controlled by Vitol, arising from the generation of purchased or acquired electricity, steam, heat, and cooling, notably at processing plants and retail stations, and in Vitol offices.

We use emission factors from the IEA for location-based carbon intensity of power consumption, and use specific factors from selected power providers for market-based carbon intensity when applicable.

Scope 3 emissions

Scope 3 refers to other indirect GHG emissions arising across Vitol's value chain as a consequence of our activities, but occurring at sources controlled by other companies.

It is subdivided into 15 categories, covering both upstream emissions (categories 1 to 8, related to purchased or acquired goods and services) and downstream emissions (categories 9 to 15, related to sold goods and services) relative to Vitol's position in the value chain (not to be confused with upstream and downstream business segments as per oil & gas industry terminology).

For additional transparency, we have detailed our approach to calculating each of these categories on the following page.

1. GHG Protocol: A Corporate Accounting and Reporting Standard published in 2004 by the World Resource Institute (WRI) and the World Business Council for Sustainable Development (WBCSD), and additional technical guidance on recalculation methodologies for structural change (2005), leased assets (2006), scope 2 (2015) and scope 3 calculations (2011 and 2013).

2. International Petroleum Industry Environmental Conservation Association guidelines for reporting greenhouse gas emissions (2011) and supplementary methodologies on value chain (scope 3) GHG emissions (2016).

3. Respectively the Intergovernmental Panel on Climate Change, the International Maritime Organization, the Global Logistics Emissions Council, the International Organization for Standardization, and the Sustainability Accounting Standards Board.

4. E.g., fuel and power consumptions for the most material sources of emissions such as shipping activities, distance-based for flights, time-based for hotel nights, spend-based for service purchases.

5. Respectively the International Maritime Organization, the UK government GHG conversion factors, the International Energy Agency, the United States Environmental Protection Agency.

6. Respectively 25 for CH₄, 298 for N₂O, and 23,500 for SF₆.



Calculation approach for Scope 3 categories and Black carbon emissions

Scope 3 categories of GHG emissions

Categories 1 (purchased goods and services) and 2 (capital goods) are calculated by applying Quantis spend-based emission factors to operational and capital expenditures respectively, as per our consolidated financial statements.

Category 3 (fuel and energy-related activities) is calculated by applying UK Government well-to-tank emission factors to actual fuel consumption from our controlled fleet.

Categories 4 (upstream transportation and distribution) and 8 (upstream leased assets) are calculated together for practical purposes, as specific contractual arrangements to charter ships (on a time charter or a spot charter basis) may vary and influence the categorisation of a given vessel as a contracted transportation service or as a leased asset, yet without affecting the overall GHG footprint.

For chartered vessels, we collect actual fuel consumption, then apply IMO CO₂ emission factors and UK Government CH₄ and N₂O emission factors for fuel combustion, then add UK Government well-to-tank emission factors.

For transportation via pipeline, small river and costal barges, railcars, and trucks, we apply Quantis spend-based emission factors to our freight contracts.

Category 5 (waste generated in operations) is calculated by applying UK Government emission factors to waste metrics.

Category 6 (business travel) is calculated by applying UK Government emission factors to flying distances, and Greenview Hotel Footprint Tool factors to hotel nights.

Category 7 (employee commuting) is calculated by applying UK Government emission factors to estimated distances travelled.

Categories 9 to 12 are calculated for products sold in our upstream business segment, as they relate to hydrocarbons, i.e. crude oil, (dry) natural gas and natural gas liquids (NGLs), that are effectively extracted from assets we control then transported, processed and largely used as combustible fuel or incinerated as waste at end-of-life.

These products downstream emissions are therefore not counted a second and third time over in the midstream and downstream segments.

Categories 9 (downstream transportation and distribution) and 10 (processing of sold products) are calculated by applying measured or estimated carbon intensity factors for each segment of the value chain to hydrocarbon net sales volumes (equity production) from our controlled upstream assets.

Categories 11 (use of sold products) and 12 (end-of-life treatment of sold products) are calculated together by applying U.S. EPA combustion emission factors to hydrocarbon net sales volume (equity production) from our controlled upstream assets.

Approximately 8% of crude oil and NGL volumes and 1.9% of (dry) natural gas volumes have been excluded to account for non-energy uses and net carbon storage.¹

Categories 13 (downstream leased assets) and 14 (franchises) are not applicable as Vitol does not lease non-controlled assets in which it holds equity nor operate franchises in the course of its normal activities, whilst emissions from leased controlled assets are already captured in scope 1.

Category 15 (investments) has been split into two subcategories for transparency, and calculated consistently with our methodology used for scopes 1, 2, and 3:

- **3.15a** includes scope 1 and 2 emissions reported by all of Vitol's non-controlled investments across business segments, adjusted for our equity share
- **3.15b** includes scope 3 categories 9, 10, 11 and 12 applied to hydrocarbon net sales volumes (equity production) from our non-controlled upstream assets.

In line with IPECA guidance, we acknowledge potential double counting of oil- and gas-related emissions across scope 3 categories, especially as fuel and industrial feedstock combustion emissions captured in categories 11 and 12 may overlap with categories 3, 4, 6, 7, 8, 9, 10 and 15.

Black carbon emissions

Black carbon (BC) is generally classified as particulate matter, making it an aerosol instead of a gas. As such, BC emissions are not covered by the Kyoto Protocol on GHG, yet due to science-based evidence of its global warming potential, and in line with GLEC methodology, Vitol reports an estimate of these emissions for transparency, next to its GHG inventory.

We acknowledge the limitations of this exercise, as the extent of BC's greenhouse effect is still being studied by scientists measuring the extent of albedo feedback on radiative forcing, and use a 100-year GWP of 900 (i.e. 1 tBC = 900 tCO₂e) from Bond et al 2013, in line with GLEC and IMO guidance.

We then apply emission factors from IMO's *Fourth GHG study* to actual fuel consumptions from both controlled and chartered vessels, which constitute the most material sources of emissions arising from Vitol transportation activities.

1. Reflecting carbon not returned or only partially returned to atmosphere, e.g. bitumen, lubricants, plastics, etc. Based on Transition Pathway Initiative, *Carbon Performance assessment of oil & gas produces: note on methodology* (2021), and R. Heede (Climate Accountability Institute), *Carbon Majors: Updating activity data, adding entities, & calculating emissions: A Training Manual* (2019).

