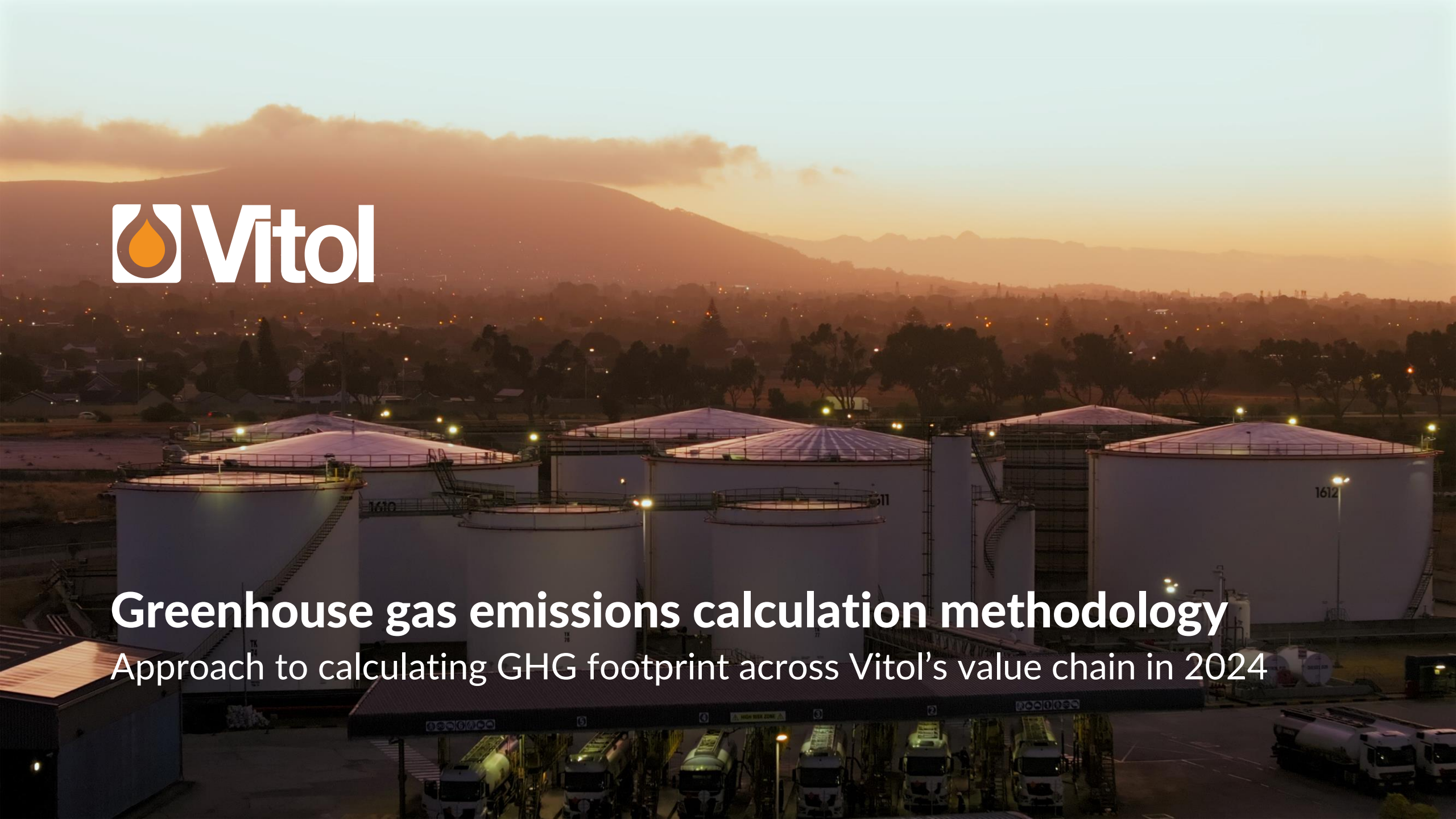

Greenhouse gas emissions calculation methodology

Approach to calculating GHG footprint across Vitol's value chain in 2024

Vitol's GHG inventory

Guiding principles and calculation approach

Vitol's greenhouse gas (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 with our financial consolidation approach.

Base year and recalculation policy

To allow for meaningful like-for-like comparisons of 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, current year) over which to assess changes in our GHG footprint, whilst ensuring that 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 which is applied consistently across the last three years.

This leads to GHG baseline changes across various ESG reports, in keeping with our acquisitions and divestments, whilst still 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 (CO_2), methane (CH_4), nitrous oxide (N_2O) and sulphur hexafluoride (SF_6).

To our current knowledge, our activities do not result in material emissions of hydrofluorocarbons (HFCs), perfluorocarbons (PFCs) and nitrogen trifluoride (NF_3), 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: the IMO, the UK Government, the IEA, Quantis and others where applicable.

All emissions are converted to metric tonnes of carbon dioxide equivalent (tCO_2e) using 100-year global warming potential (GWP) rates from the IPCC Fifth Assessment Report (AR5).[5]

Scope 1 emissions

Scope 1 refers to direct GHG emissions from assets controlled by Vitol, including 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 CO_2 emissions from shipping activities, and from the UK Government for all others (including CH_4 and N_2O 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 country-average emission factors from the IEA for location-based carbon intensity of power consumption, and contract-specific emission factors from 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 and gas industry terminology).

In line with Ipieca guidance, we acknowledge potential double counting of oil- and gas-related emissions across scopes and categories, especially since fuel and industrial feedstock combustion emissions captured in scope 3 categories 11 and 12 may overlap with emissions in other categories at various points in the value chain.

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

1. World Resources Institute (WRI) and World Business Council for Sustainable Development (WBCSD), *The Greenhouse Gas Protocol: A Corporate Accounting and Reporting Standard* (2004); with additional technical guidance on recalculation methodologies for organisational structural changes (2005), leased assets (2006), scope 2 (2015) and scope 3 calculations (2011 and 2013).
2. International Petroleum Industry Environmental Conservation Association (Ipieca), *Guidance on Greenhouse Gas Emissions Reporting* (2011); and Ipieca, *Estimating Petroleum Industry Value Chain (Scope 3) Greenhouse Gas 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 28 for CH_4, 265 for N_2O, and 23,500 for SF_6.

Scope 3 emissions

Detailed calculation approach by category

Due to Vitol's involvement at multiple points in the life cycle of the commodities we produce and consume, scope 3 reporting entails a degree of overlap in reporting boundaries, as energy extracted, processed, and marketed may either be transferred internally across our controlled assets or traded to third parties at any point in the value chain.

To limit or avoid double and triple counting of GHG emissions (e.g. from the same barrel extracted, processed, then marketed), and following Ipieca guidance, we determined that in 2024 Vitol holds the most direct influence in the processing segment (at refineries and power plants).

We then calculated scope 3 emissions related to sold products (see categories 1, 9, 10, 11, 12, 15b below) based on net product sales at the point of processing, rather than at the point of extraction, as was done in previous years of reporting. We also recalculated historical totals to allow for meaningful like-for-like comparisons.

Category 1 (purchased goods and services) is calculated by applying Quantis spend-based emission factors to operational expenditures as per our consolidated financial statements, as well as upstream and transport carbon intensity factors to volumes of crude oil and other feedstocks purchased at our controlled refining and processing assets.

Category 2 (capital goods) is calculated by applying Quantis spend-based emission factors to capital expenditures 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 charter party agreements 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 (both on a time and spot basis), we collect actual fuel consumption, then apply IMO CO_2 emission factors and UK Government CH_4 and N_2O emission factors for fuel combustion, then add UK Government well-to-tank emission factors.

For transportation via pipeline, river and coastal 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 the volumes of waste generated in our controlled operations.

Category 6 (business travel) is calculated by applying UK Government emission factors to flight 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 by employees.

Category 9 (downstream transportation and distribution) is calculated by applying downstream product transport carbon intensity factors to the net product sales (equity production volumes) from our controlled refining and processing assets.

Category 10 (processing of sold products) overlaps with scope 1 (refining at own operations), and scope 3 categories 11-12 (downstream use) and 15a (refining at investments), and is therefore excluded.

Categories 11 (use of sold products) and 12 (end-of-life treatment of sold products) are calculated together by applying UK Government combustion emission factors to the net product sales (equity production volumes) from our controlled refining and processing assets.

To remain conservative with a top-end GHG estimate, all sold products are currently assumed to be combusted at end-of-life, although a share of naphtha and other petrochemical products (e.g. lubricants, plastics) may not actually be returned to the atmosphere (e.g. landfilled or recycled).

Category 13 (downstream leased assets) is calculated by applying appropriate carbon intensity factors to activity estimates for leased-out assets in which Vitol holds equity but does not retain operational control Leased-out assets where Vitol retains operational control are otherwise captured in scope 1.

Category 14 (franchises) is not applicable as Vitol does not operate franchises in the course of its business activities.

Category 15 (investments) has been split into two subcategories for transparency and is calculated consistently with the methodology used for scopes 1, 2, and 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
- **15b** includes scope 3 categories 1, 9, 11, 12 applied to the net product sales (equity production volumes) from our non-controlled refining and processing assets.

Black carbon emissions

Calculation approach for marine vessels

Black carbon (BC) is classified as particulate matter, meaning it is considered an aerosol rather than a gas. Because of this, black carbon emissions are not included under the Kyoto Protocol on greenhouse gases. However, scientific evidence suggests black carbon has global warming potential. In line with GLEC methodology, Vitol therefore estimates and reports these emissions for transparency, alongside its GHG inventory.

We acknowledge the limitations of this exercise, as the greenhouse effect of black carbon is still being studied by scientists, who are measuring the extent of albedo feedback on radiative forcing, and we use a 100-year GWP of 900 (i.e. 1 tBC = 900 tCO_2e) from Bond et al 2013,[1] in line with GLEC and IMO guidance.

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

1. Bond, T. C., S. J. Doherty, D. W. Fahey, P. M. Forster, T. Berntsen, B. J. DeAngelo, M. G. Flanner, et al. "Bounding the Role of Black Carbon in the Climate System: A Scientific Assessment." *Journal of Geophysical Research: Atmospheres* 118, no. 11 (2013): 5380–5552.