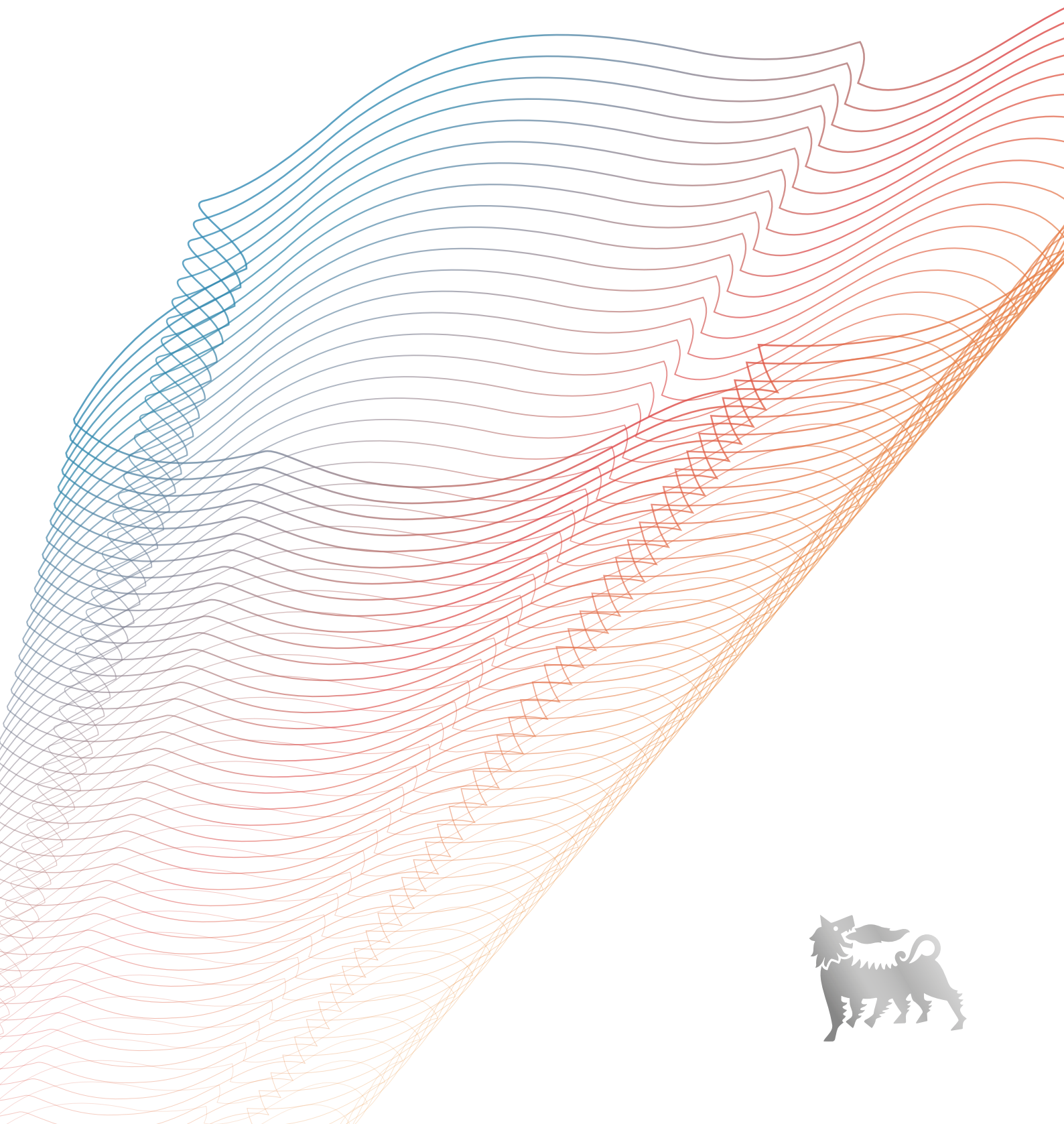


Eni

Methodology for the assessment of GHG emissions along the value chains of Eni products

2020 revision - abstract



Eni's delivery of a strategic GHG reduction roadmap along their value chains

Foreword by Professor Anna Korre, co-Director Energy Futures Lab, Imperial College London

Eni's delivery of a methodology for the assessment of GHG emissions along their product value chains is a key element of the company's vision to supply essential energy and materials for a sustainable society. It is in the company's best interest to be ambitious on climate change action and strategic GHG reduction objectives, given the wide recognition that successful energy companies can only be those that supply low-carbon energy to power future economies.

For most people, interaction with oil and gas sector companies is through using the energy and products they supply. So far, most companies have not done enough to communicate with their stakeholders the details of their emissions and the performance assessment methodologies used for their products. In many cases, it is not clear if these are based on company-specific facility characteristics and the product chains they cover. Recognising that the communication of these specifics is necessary to raise confidence and earn the trust of stakeholders, Eni has chosen to deploy a GHG accounting methodology that considers all of their traded products across business sectors. This is important and a step change. Moreover, a reasonably accurate and up-to-date record of the company's performance is evidence that can be used to track the company's performance over time and verify that its engagement in the energy transition is genuine.

The publication of this first edition of Eni's methodology for the assessment of GHG emissions along their product chains aims to tackle a difficult problem. The company profile is such that different energy raw materials and types of production chains are engaged in delivering a multitude of products. These products are then used in society to supply a wide range of energy services.

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Moreover, outside Eni's own activities, the company also trades third party products across the world, over which the company has less control and for which less evidence is available. These difficulties pose significant challenges in accurate emissions accounting, which to be reliable should have high assurance and low uncertainty. In addition to emissions accounting, the very nature of performance assessment requires robust and consistent GHG intensity calculations.

A coherent and reasonably accurate assessment framework for GHG emissions accounting has been implemented across Eni's product chains

The methodology presented in this report indicates that a coherent and reasonably accurate assessment framework for GHG emissions accounting has been implemented across Eni's product chains. As a first attempt, it is recognised that this contains elements that are covered in good detail, and many that are reasonably accurate and with low uncertainty. It also contains few that need to be improved upon. Noteworthy is that the boundary of systems studied for Eni's products is wider. This is an important advancement that improves upon similar life cycle net carbon intensity calculation metrics proposed by other companies in the oil and gas sector. Although this metric should be improved - such that the reference unit for energy is consistent across the different product chains - it is notable that the energy service provided through Eni's products is recognised as a necessary metric for life cycle carbon intensity calculations. This is appropriate and in line with the ISO 14040 series of standards. It is also noted that additional efforts are promised in the near term to improve the methodology and support the publication of progressively more reliable performance intensity metrics.

I therefore welcome this report from Eni, recognise the good efforts made so far and encourage the additional analysis required to address the shortcomings identified.

The reality of climate change is posing hard choices for companies and societies alike. I believe wholeheartedly that for those companies that embrace change, what is good for the planet can also be the best for them. I trust and commend Eni for choosing to be one of the visionaries.

Anna Korre

Professor of Environmental Engineering, Imperial College London
Co-Director, Energy Futures Lab
Working independently via Imperial Consultants

Methodology

Introduction

Reliable GHG emissions accounting is becoming a key topic in the framework of evaluating the effects of business strategies on emissions reductions, and quantifying the effectiveness of efforts towards a low carbon world and alignment with the Paris Agreement goals.

In order to overcome the current fragmentation in GHG reporting, a fully comprehensive approach covering all of our product value chains has been adopted. This methodology accounts for the GHG emissions from all energy products and hydrocarbons traded by Eni, namely total emissions (scope 1+2+3) including end-use:

- covering all hydrocarbons traded by businesses within Eni's portfolio, regardless of whether they are self-produced or bought in from third parties;
- calculated on an absolute basis and in terms of intensity per sale of energy product.

The methodology implemented has been inspired by a lifecycle approach, engaging with a major independent scientific advisor and verifying figures with a 3rd party assurance provider.

With the adoption of this methodology, Eni creates a full framework for tracking GHG emissions related with Company activities, extending the scope to encompass the whole carbon footprint of our business.

The results of the application of this methodology are not directly comparable with the data currently published in Eni institutional reports, which are based on the GHG Protocol, because the boundary is wider.

This summary report describes the fundamentals of the methodology. The methodology will be continuously updated in order to be as accurate as possible and to include new elements, in line with external context developments (technology, regulations, scenario drivers). Areas of planned improvements include:

- Increasing the granularity of the activity data (volume) and emissions factors in order to reflect an analysis of the asset basis also for third party operations.
- Developing an intensity indicator based on energy services which are associated with products in line with the ISO standard for LCA.
- Reflecting the evolutions of those external frameworks still under discussion (e.g. Science Based Target Initiative).

Output Metrics

Eni's methodology provides an output of three main metrics (see figure 1):

- Net GHG Lifecycle Emissions
- Net Carbon Footprint
- Net Carbon Intensity

The metrics described in the following sections allow Eni to have a baseline dataset to assess Company performance according to the decarbonisation targets and monitoring the effectiveness of the actions undertaken in the medium-long term.

The expected uses of these metrics include:

- Performance monitoring at Company and business unit level
- Benchmark analysis, both internal and external
- Medium and long-term scenario analysis (2030-2050)
- Information sharing with stakeholders regarding Company performance in terms of climate change mitigation

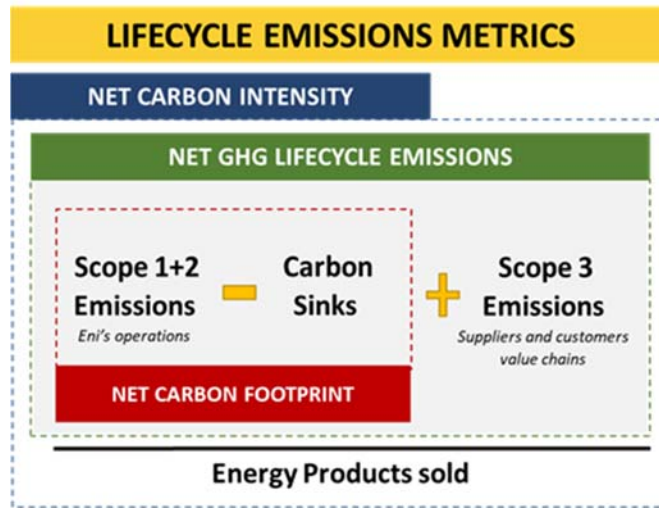


Figure 1 - Metrics and indicators

The net GHG lifecycle emissions are expressed in terms of million tons of CO₂ equivalent (MtCO₂e) and include direct (Scope 1) and indirect (Scope 2 and 3) contributions. Negative emissions associated with carbon sinks (e.g. forestry, CCUS) directly managed by Eni are considered credits and deducted from Scope 1 and 2 emissions to calculate the net carbon footprint.

The net carbon intensity is expressed in gCO₂eq/MJ and is calculated by dividing the Net GHG lifecycle emissions with the energy content of sold products, which represents the overall amount of energy delivered to final customers, considering all volumes managed by Eni.

Boundary of the Methodology (products and value chains)

Eni's Methodology for Lifecycle GHG Assessment covers all the energy products managed by Eni (figure 2), considering their impacts throughout the entire value chain. This approach comprises direct and indirect emissions of Eni's business, including those associated with the end use of energy products, which in the

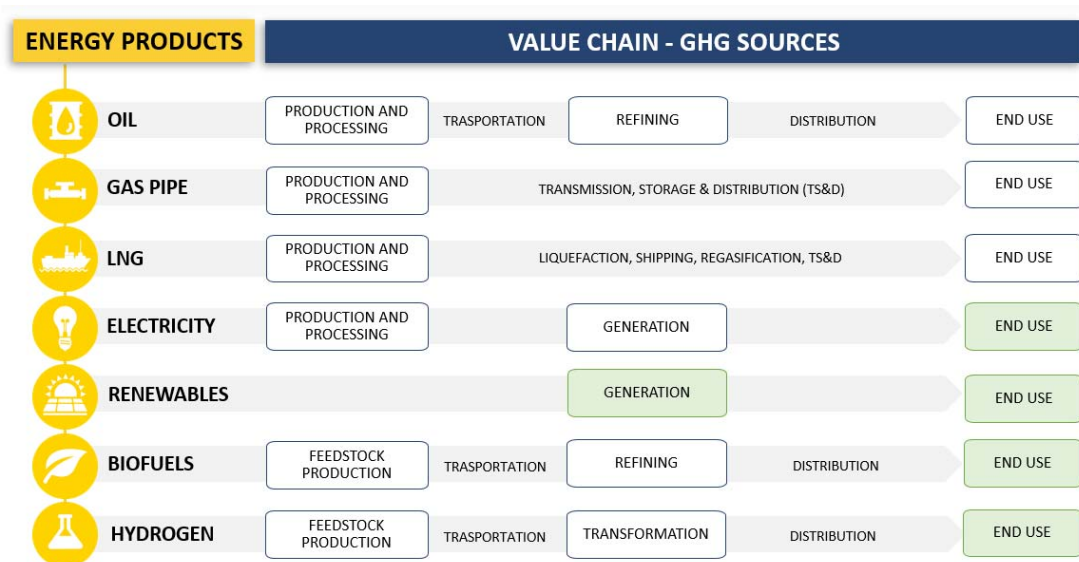


Figure 2- Products and associated value chains (green shaded elements are currently considered carbon free)

oil & gas sector represent around 85% of the overall emissions. For each energy product, the value chain accounts for all material sources of GHG emissions in accordance to a *well-to-wheel* LCA approach¹.

¹ Therefore, the emissions associated with construction and decommissioning of assets and facilities, purchased goods and services (including capital goods), business travel and employee commuting and waste management are not included, as they are assumed not to be material with respect to other contributions.

GHG Estimation Methodology

Data input for the GHG emission calculation include, for each value chain:

- Activity data (volumes): produced and sold volumes by single value chain, for each segment considered (*well-to-wheel*)
- Emission factors and other calculation parameters:
 - GHG emissions per unit of product (or representative of a set of products)
 - Calculation parameters: these are used to estimate the production/consumption volumes within the value chain segments managed by both Eni and third parties (e.g. self-consumption/extraction, transport, refining losses, etc.)

Activity data (volumes) definition

Eni is an integrated energy company trading energy products at multiple points of its value chains, namely production, transformation and marketing, managing equity production and exchanging volumes with the market.

The approach adopted by Eni considers the sum of all volumes managed by each Business Unit, netting internal exchanges of products (equity production) to avoid double counting.

As an example (see figure 3), crude oil produced by Eni, includes both volumes processed in our refineries and sold to 3rd parties. Similarly, we include all oil products sold by Eni, regardless if they are own-refined using 3rd party purchased crude oil or refined in 3rd party refineries and purchased by Eni as finished products. The same approach is used for natural gas (both pipeline and LNG).

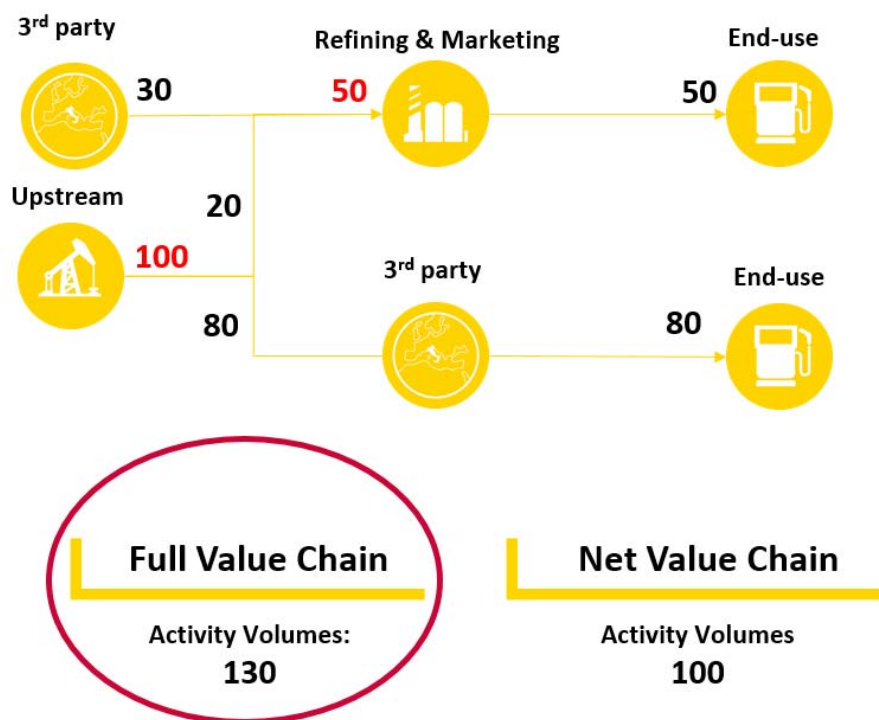


Figure 3- Volumes accounting along the value chain (crude oil example, numbers are indicative)

For the calculation of the energy sold, all energy products are converted and homogenised on an energy basis according to the respective net calorific values; electricity from the grid is converted according to the fuel mix representative of EU area and applying the average efficiency of thermoelectric production by fuel.

For renewable electricity, the reference unit for energy sold is the physical energy content of the electricity generated in the plant, as opposed to the use of the Partial Substitution Factor, where the reference unit is the amount of energy that would be necessary to generate an identical amount of electricity in conventional thermal power plants.

Emission Factors definition

A specific emission factor is defined for each segment of the value chains for each product, distinguishing between:

- Eni controlled operations (e.g. production of oil&gas, processing in own refineries, etc.);
- 3rd party operations (e.g. production of oil&gas purchased by 3rd parties, end use of products by customers, etc.)

For activities owned/controlled by Eni, emission factors used are directly derived from our operations and based on an annual GHG emissions inventory (Scope 1 and 2 on an operated basis). This approach ensures a representative estimation, given the accuracy of GHG accounting and the independent assurance review performed yearly by a 3rd party verifier.

All relevant emission sources are included (combustion, process, flaring, venting, fugitives) and all material gases are accounted (given the typology of business, CO₂ and CH₄ are the two main material gases, however, also N₂O is included in the inventory).

For activities managed by 3rd parties, we apply specific literature emission factors, taking into consideration geographical areas and destination use of our products.

Regarding Scope 3 GHG emissions from the end-use of sold products, emission factors from literature are applied (source API/IPCC); for crude oil an average composition of the final barrel is assumed (from IEA sources) to convert it into final products.

For products other than oil & gas, the following criteria are applied:

- Biofuels: emissions are estimated applying specific emission factors associated with feedstock production, as per feedstock sustainability certificates and with refining process. The biofuel's end use is assumed to have no significant GHG emissions.
- Electricity from the grid: emissions are estimated through emission factor based on the fuel mix representative of the EU area (location-based approach).
- Renewable energy is considered to have zero GHG emissions across all the segments of the value chain.



VERIFICATION OPINION N°. VER-0036

RINA SERVICES S.p.A., on the basis of the assessments carried out, declares that

**The calculation of
Net-GHG lifecycle emissions and Net-Carbon Intensity
of Eni's energy products**

Reference Year: 2018

prepared by the organization

**Eni S.p.A
Piazzale Enrico Mattei 1,
00144 Roma**

complies with the requirements of the following reference document

**Methodology for the assessment of Greenhouse Gas Emissions along the
value chains of Eni energy products– Rev 2020**

The methodology provides the rules for assessing net-GHG emissions and net-carbon intensity of Eni's products throughout their value chains, including the whole energy company portfolio. The methodology is inspired by the most important and authoritative guidance and standards on GHG accounting and life cycle assessment, i.e. GHG Protocol (WBCSD/WRI), ISO 14064-1, ISO 14067, ISO 14072, ISO 14040, ISO 14044. Moreover, the methodology provides rules for estimating Eni's net-GHG emissions along the value chain up to 2050.

Results for the baseline year 2018

Net Lifecycle GHG emissions: 537 MtCO₂eq

Net Carbon Intensity: 72 gCO₂eq/MJ

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