This future has a future

Moeve Chemicals ISO 14064-1:2018
carbon
footprint
report **2024**

Contents

01

Strategy

01. Strategy

Moeve continues this year 2025 with its inventory verification plan at the organizational level of Greenhouse Gas (GHG) emissions under the framework of ISO 14064- 1:2018 in line with its Positive Motion. The verification includes the emissions of the following GHGs: carbon dioxide (CO_2), methane (CH_4) and nitrous oxide (N_2O), hydrofluorocarbons (HFC) and hydrochlorofluorocarbons (HCFC).
The process of inventory verification has been carried out in Sustainability & Energy Transition Area with the accreditation of AENOR with a limited level of assurance and a threshold of maximum relative importance of 5%.

With this report:

- Under our strategy and commitment to reduce our CO_2 emissions, we adopt rigorous monitoring and volunteer audit of these emissions to enhance our transparency and rigor in communication of emissions.
- Positive Motion Strategy is accompanied by Sustainability Plan in Moeve. Our Sustainability Plan is Moeve's roadmap to promote positive impact and sustainability through our actions linked to environmental, social, and good governance (ESG) criteria, which transversally involve all areas of the company.

Sustainability plan | Moeve

Moeve has updated its policy framework, and a new climate action policy is available in www.moeveglobal.com

This Policy aims to establish a framework to articulate the Company's strategy and business model in a manner consistent with its commitment to carry out the necessary climate actions, aligned with the energy transition and a low-carbon economy.

Strategy 2030, towards the energy transition - Moeve

Our Commitments:

- **Establish, monitor, and validate by a third-party CO_2 emissions and abatement plan targets.**
- **Integrate climate change in the company strategy and in all businesses decision-making processes.**
- **Design carbon mitigation and adaptation plan considering the entire value chain.**
- **Keep climate-related objectives as a monetary reward parameter.**

02

Reporting top-ics

02. Reporting topics

2.1. Boundaries

Following emissions are reported under this report

- This report groups **direct GHG emissions** (CO_2, CH_4, N_2O and refrigerant gases) from the facilities, including combustion, process, fugitive emissions, and emissions from mobile sources. Emissions from facilities's wastewater treatment plants have also been included (Category 1).

- **Indirect emissions** by purchased steam and electricity of the facilities included in the scope of this verification (Category 2).

- Likewise, this 2024 report includes the **indirect emissions** of the **value chain** corresponding to scope 3 under the GHG Protocol Methodology and under ISO 14.064-1:2018 (Categories 3-6).

Greenhouse gas emissions sources have been identified and grouped in accordance with the ISO 14064-1:2018 standard. This standard lists six categories of emissions and differs somewhat from earlier categorization in line with the Greenhouse Gas Protocol's Scopes 1 through 3.

- **Category 1**: Direct GHG emissions and removals
- **Category 2:** Indirect GHG emissions from imported energy
- **Category 3:** Indirect GHG emissions from transportation
- **Category 4:** Indirect GHG emissions from products used by the organization
- **Category 5:** Indirect GHG emissions associated with the use of products from the organization
- **Category 6:** Indirect GHG emissions from other sources

This report, although drawn up in parallel, is developed within the framework of the principles established by Moeve regarding the quantification of GHG and the establishment of objectives to reduce GHG emissions.

Significance and Materiality

It is necessary to define and explain our own pre-determined criteria for the significance of indirect emissions, considering the intended use of the inventory.

Factors for consideration in assessing significance and materiality include:

- Magnitude or Size of the emissions
- Level of Influence on the emission source
- Difficulty in obtaining data
- Poor validity in available estimation approaches

Whilst all of the above would be considered in materiality assessments, the criteria that would mandate disclosure of emissions sources as significant is:

a) Where there is a single source with estimated emissions likely to be at least 1% of its category. In this case, that emissions source must be included.
b) Where the total of 'insignificant' sources has estimated emissions likely to be at least 5% of total emissions. In this case, enough of the 'insignificant' emissions must be included until the estimate of excluded emissions is below 5%.

2.2. Scope

Chemicals

Moeve's petrochemical activity is developed in a dynamic of maximum integration with Refining. In this way, products of high added value are manufactured, which are converted into raw materials for other industries and with multiple final applications: detergents, resins, electrical components, synthetic fibers, pharmaceutical products, among others.

The production of basic petrochemical products is carried out at the Gibraltar-San Roque and La Rábida Energy Parks, operated by Moeve. These industrial complexes, located in the provinces of Cádiz and Huelva respectively, have a combined capacity of over one million tonnes per year of petrochemical derivatives. After the distillation of crude oil, the refining units extract raw materials such as benzene, toluene, and xylene, which are used in various chemical processes. They also produce intermediate and final products, including solvents, propylene, and sulfur. Moeve Química, after processing these products, distributes and commercializes the final products worldwide.

- Moeve Chemicals Puente Mayorga

Puente Mayorga Plant, which is located in San Roque (Cádiz), produces linear alkylbenzene (LAB), sulphonic acid (LABSA) for the production of detergents, n-paraffin, dearomatized solvents and heavy alkylates as rolling oils in various industries.

- Moeve Chemicals Palos de la Frontera

Palos de la Frontera Plant is located in Palos de la Frontera (Huelva) and processes benzene and propylene to produce cumene, phenol, acetone and alphamethylstyrene. Phenol and acetone are used in the manufacture of resins, high-tech plastics, synthetic fibers, pharmaceuticals, and a long list of final applications.

- Moeve Chemicals Shanghai

Shanghai Plant is located in Lot C4 of Shanghai Chemical Industry Park (SCIP). It processes benzene and propylene to produce phenol, acetone and cumene. Phenol and acetone are used in the manufacture of resins, high-tech plastics, synthetic fibers, pharmaceuticals, and a long list of final applications.

- Moeve Chimie Bécancour

Bécancour Plant is located in the Bécancour Industrial and Port Park in southern Quebec. Linear alkylbenzene (LAB) is produced there, compound used in the manufacture of biodegradable detergents as well as other secondary products of commercial and industrial utility. The alkylation of benzene with olefins for the production of LAB also implies the production of heavy alkylate bottoms made up mainly of dialkylbenzenes, mainly used as refrigerant additives and for the production of highly hydrophobic surfactants.

- Moeve Química Brasil

Deten Química Plant is located in Polo Petroquímico de Camaçari (Bahía). Linear alkylbenzene (LAB) is produced there, compound used in the manufacture of biodegradable detergents as well as other secondary products of commercial and industrial utility. The sulphonation of the LAB leads to the formation of the corresponding LABSA.

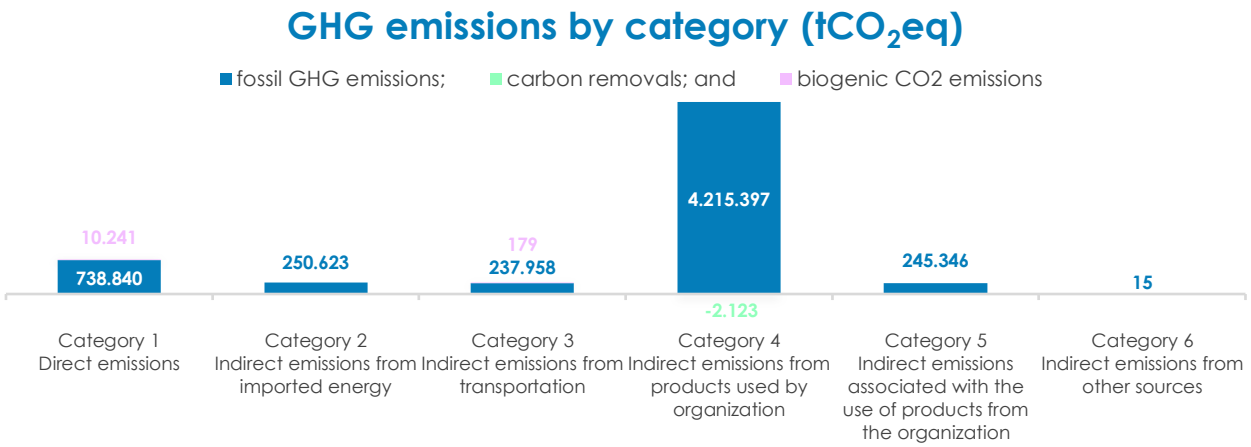
03

Data and methodology

03. Data and methodology

3.1. Emission data

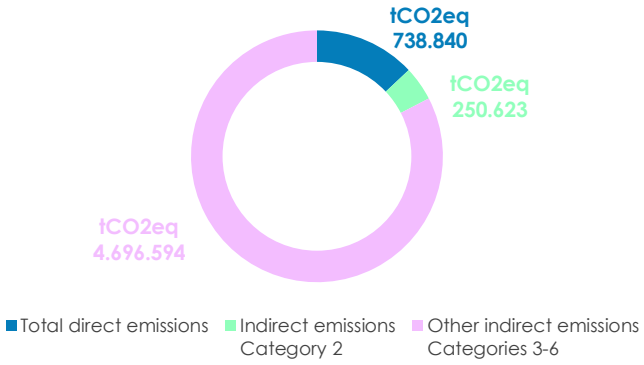
The general distribution of emissions among the above mentioned ISO 14064-1:2018 for the year 2024 categories is shown in the following graph, according to the materiality criteria.



Where,

- **Total fossil GHG emissions account to 5,686,057 tonnes of CO_{2eq}.** This sum of emissions includes 2,123 tonnes of CO_2 due to carbon removals and excludes the biogenic emissions which account to 10,420 tonnes of CO_{2eq}.
- It is seen that **Category 4 contributes to the most emissions**, specifically the emissions from purchased products. This is followed by Category 1 and 2.
- Indirect emissions corresponding to Category 2, emissions from purchased energy is shown in the graph as **market-approach calculation**. This category accounts for 315,754 tonnes of CO_{2eq} under location-approach calculation.

Now, the percentage distribution graphs for carbon footprint by scope show that **indirect emissions account for the largest percentage** of emissions calculated.



The breakdown of **direct emissions** is shown in the following table:

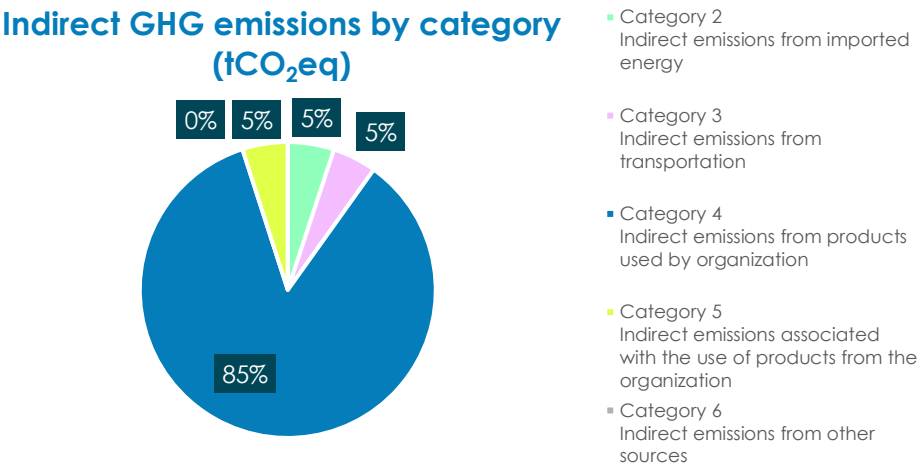
Direct emissions per source, GHG tonnes	Total CO_2e emissions	CO_2	CH_4 as CO_2e	N_2O as CO_2e	Refrigerant gases as CO_2e
Combustion stationary sources	689,842	685,904	379	3,559	
Flaring	5,130	5,129	1	1	
Process emissions	3,221	3,221	0	0	
Combustion mobile sources	42	42	0	0	
Wastewater treatment facilities	880	0	698	183	
Gas post-meter leakage	48,304	17	48,286	0	
Fugitive refrigerant	1,661				1,661
Where, total fossil GHG emissions; and	**738,840**	**684,073**	**49,363**	**3,743**	**1,661**
biogenic CO_2 emissions	**10,241**	**10,241**			

Indirect emissions associated with Categories 2-6 are summarized in the following table, differentiating between location- based and market-based methods

Category		GHG emissions (tCO_2eq) Market approach	Location approach
Category 2 Indirect emissions from imported energy	fossil GHG emissions;	250,623	315,754
	carbon removals; and		
	biogenic CO_2 emissions		
	Total	**250,623**	**315,754**
Category 3 Indirect emissions from transportation	fossil GHG emissions;	237,958	237,958
	carbon removals; and		
	biogenic CO_2 emissions	179	179
	Total	**237,958**	**237,958**
Category 4 Indirect emissions from products used by organization	fossil GHG emissions;	4,215,397	4,215,397
	carbon removals; and	-2,123	-2,123
	biogenic CO_2 emissions		
	Total	**4,213,274**	**4,213,274**
Category 5 Indirect emissions associated with the use of products from the organization	fossil GHG emissions;	245,346	245,346
	carbon removals; and		
	biogenic CO_2 emissions		
	Total	**245,346**	**245,346**
Category 6 Indirect emissions from other sources	fossil GHG emissions;	15	33
	carbon removals; and		
	biogenic CO_2 emissions		
	Total	**15**	**33**
Total	**fossil GHG emissions and carbon removals**	**4,947,217**	**5,012,365**
	biogenic CO_2 emissions	**179**	**179**

1. Total GHG emissions consider fossil GHG emissions and carbon removals

Within the section of **indirect emissions**, the following graph shows the distribution of indirect emissions from Category 2 to Category 6. As previously indicated, the results of emissions associated with electricity have been carried out according to the market-approach methodology



3.2. Methodology

Category 1. Direct emissions

- Combustion emissions in stationary sources; GHG emissions according to:
  For Spanish facilities, the reporting methodology is aligned with the EU ETS (European Emission Trading Scheme) and national inventory emission factors. The Shanghai Plant follows a Carbon Market through Shanghai's Emissions Trading Scheme for its reporting methodology.
  In Bécancour, the Cap-and-Trade emissions allowances system prescribes a Reporting Methodology that accounts for equivalent CO_2.
  The EU-PRTR Concawe Methodology is applied for the Deten Plant.

  Emissions of CH_4 and N_2O in stationary sources are also calculated in accordance with the EU-PRTR Concawe Methodology. GWP of CH_4 and N_2O GHG according to IPPC AR6 Global Warming Potentials.

- Flaring emissions in facilities; GHG emissions reported according to the same methodologies as those described for combustion emissions at stationary sources.

- Process emissions in facilities; CO_2 according to Methodology European Reporting under EU ETS. Activity data are reported following the EU Methodology regulation.

- Combustion emissions in mobile sources: activity data coming from internal registers or from supplier service, and national inventory emission factors for considered GHG.

- Wastewater treatment plant emissions. Methane produced in the anaerobic reactor and nitrous oxide as intermediate in the nitrification-denitrification process. The quantification methodology is based on own discharge parameters and IPCC Guidelines for wastewater treatment and discharge default factor.

- Gas post-meter leakage. Activity data reported according to the same methodologies as those described for combustion emissions at stationary sources and gas leakage at industrial plants emission factors from 2019 Refinement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

- Fugitive emissions of refrigerant gases. GHG according to IPPC AR6 GWPs (100-years). Activity data reported under refill and maintenance evidence.

Category 2. Indirect emissions from imported energy

Associated emissions to purchased electricity and steam in facilities under scope. Activity data are reported under carbon markets verified data or invoices. Emission factor of indirect emissions due to steam come from operational data.

Emission factors for power are chosen under market-based and location-based criteria.

Categories 3-6. Indirect emissions from value chain

Following subcategories as energy and purchased fuels, raw materials and services (category 4), upstream transportation of raw material and downstream transportation and distribution (category 3), use of sold products and waste management (category 5), upstream leased asset (category 6) have consistent activity data for their calculation as they are verified in other categories to carry out emission calculations.

Category 3. Indirect GHG emissions from transportation

3.1. Subcategory Indirect emissions by transport and distribution upstream

The quantification methodology used for calculating emissions is based on raw materials activity data and emission factors from Ecoinvent database.

It accounts for **34,996 tonnes of CO_{2eq}**.

3.2. Subcategory Indirect emissions by transport and distribution downstream

The quantification methodology used for calculating emissions is based on the sold products activity data and emission factors from Ecoinvent database.

Fossil GHG emissions in this subcategory accounts for **201,383 tonnes of CO_{2eq}**. Biogenic GHG emissions in this subcategory accounts for **126 tonnes of CO_{2eq}**.

3.3. Subcategory Indirect emissions caused by employees commuting to work

The quantification methodology used for calculating emissions is based on activity data from commuting survey (2022) and emission factors from DEFRA database.

Fossil GHG emissions in this subcategory accounts for **1,019 tonnes of CO_{2eq}**, but due to the materiality criteria it has been considered **non-significant**. Biogenic GHG emissions in this subcategory accounts for **53 tonnes of CO_{2eq}**.

3.4. Subcategory Indirect emissions caused by business travel

The quantification methodology used for calculating emissions is based on activity data from travel agencies reports and emission factors from DEFRA database.

It accounts for **687 tonnes of CO_{2eq}**, but due to the materiality criteria it has been considered **non-significant**.

Category 4. Indirect GHG emissions from products used

4.1. Subcategory Indirect emissions from purchased products

The quantification methodology is based on the same basis as the upstream transport subcategory, with chemical products and renewable raw materials being purchased products. Additionally, for intermediate products transferred from both Energy Parks to Spanish chemicals plants, we have used emission factors calculated and verified by ISO 14067.

It accounts for **3,972,441 tonnes of CO_{2eq}**.

4.2. Subcategory Indirect emissions from purchased consulting services

The quantification methodology used for calculating emissions is based on consulting services cost activity data and emission factors of business services.

It accounts for **1,656 tonnes of CO_{2eq}**.

4.3. Subcategory Indirect emissions from purchased energy

As upstream emissions of purchased fuels and electricity and transmissions and distribution losses

The quantification methodology used for calculating emissions is based on diesel, electricity and steam consumption activity data and emission factors from DEFRA database.

It accounts for **180,630 tonnes of CO_{2eq}**.

4.4. Subcategory Indirect emissions from third-party disposal and treatment of waste generated in operations

The quantification methodology used for calculating emissions is based on official declaration of managed wastes, internal register or/and water discharged to third party treatment plant as activity data and emission factors from DEFRA database.

It accounts for **58,547 tonnes of CO_{2eq}**.

Category 5. Indirect GHG emissions from use of products

5.1. Subcategory Indirect emissions from the processing of sold products

The quantification methodology used for calculating emissions is based on chemical sold products as activity data. For the processing of those chemicals, the emission factors used are the actual processing ratios provided by our clients.

Due to this limitation and to the lack of access to these data in databases, this subcategory only includes sales for which reliable emission factors are available. Consequently, it is estimated that only about 7% of chemical sales are covered in this report. Action plans are currently being developed to address this problem.

It accounts for **245,346 tonnes of CO_{2eq}**.

Category 6. Indirect GHG emissions from other sources

6.1. Subcategory Indirect emissions from the upstream leased assets.

Involving emissions in Moeve's headquarters in Madrid.

The quantification methodology used for calculating emissions is based on natural gas and electricity invoices as activity data and national emissions inventory and electricity labeling for emission factors.

It accounts for **15 tonnes of CO_{2eq}**, under market-based approach.

3.3. Exclusions and uncertainty

Exclusions

In the 2024 exercise there are no exclusions in emissions reporting.

Uncertainty

The uncertainty in emissions stems from inaccuracy in activity data, inconsistencies in the primary data used for different emission types, and variations in emission factors. The data for elementary flows is then qualitatively evaluated, considering criteria such as precision, integrity, representativeness, and coherence, among others. A scale from A to D is used for this evaluation, where A represents verified data and D corresponds to estimates.

Data for elementary flows	Data quality	Explanation
Category 1. Direct emissions		
Activity data	**A**	Most emissions under regulated system
Emission factors	**A**	Most emissions under regulated system
Category 2. Indirect emissions from imported energy		
Activity data	**A**	Invoices
Emission factors	**A**	Electricity labeling of electricity trading companies
Category 3. Indirect GHG emissions from transportation		
Activity data	**B**	Internal records and travel agencies report
Emission factors	**B**	Database
Category 4. Indirect GHG emissions from products used		
Activity data	**A**	Regulated systems and financial planning
Emission factors	**B**	Database and own Product Carbon Footprints (PCF)
Category 5. Indirect GHG emissions from use of products		
Activity data	**B**	Financial planning
Emission factors	**A**	Clients EFs
Category 6. Indirect GHG emissions from other sources		
Activity data	**A**	Invoices
Emission factors	**A**	National Inventory EFs and electricity labeling

3.4. Base year

Moeve included its international chemical facilities for the first time in the reporting year 2022.

As can be seen in ***section 3.2***, fossil emissions have increased significantly compared to the base year for category 4 of purchased products. The update from Ecoinvent 3.8 dataset version to 3.10 and the use of emission factors calculated and verified by ISO 14067 for intermediate products from Energy Parks to Spanish plants, forces us to recalculate the base year in this category and to establish 2024 as the new base year.

Please, check ecoinvent's Knowledge Base for Ecoinvent Version 3.10, where in the Fuels section the main changes are explained.

Regarding the recalculation of category 4 in the base year 2022, the variation is shown in the following table:

Category		GHG emissions (tCO_2eq)		variation compared to base year	2022 base year GHG emissions	variation compared to recalculated base year	2022 base year recalculated GHG emissions
		market approach	location approach				
Category 4 Indirect emissions from products used by organization	fossil GHG emissions;	4.215.397	4.215.397				
	carbon removals; and	-2.123	-2.123				
	biogenic CO_2 emissions						
	Total	**4.213.274**	**4.213.274**	**-88%**	**2.239.567**	**-31%**	**3.510.826**
Total	**fossil GHG emissions and carbon removals**	**5.686.057**	**5.756.969**	**-56%**	**3.652.991**	**-21%**	**4.924.250**
	biogenic CO_2 emissions	**10.420**	**10.420**	**-1041897%**	**1**		

In 2024 exercise, there are other improvements in calculations compared to the 2022 exercise like bulk-shipping downstream emissions considering ballast, sailing and port contributions.

04

Reduction and removal

04. Reduction and removal

4.1. Emissions reduction action

In 2024, we have made significant progress in reducing emissions, particularly through the consumption of biomethane at our facilities in Bécancour and Puente Mayorga. Additionally, the transition to energy transition has accelerated, with most of our Chemicals plant in Shanghai consuming 60% renewable electricity, along with our facilities in Spain.

Moeve Chemicals has also participated in decarbonization initiatives to reduce its scope 3 emissions by signing agreements so that the supply transportation of chemical products from Moeve will be carried out using 100% renewable diesel (HVO) for some clients.

The impacts of these actions can be observed both in terms of biogenic emissions and zero emissions (market approach) in ***Data and methodology*** section.

In addition, we have implemented a number of energy efficiency actions to further improve sustainability and emissions reduction. The emissions abatement potential of these projects is according to the documentation submitted for investment approval.

Moeve Chemicals Palos de la Frontera (Huelva)

	Action	Abatement potential (tCO_2/yr)	COD	Reduction 2024 (tCO_2/yr)
01	Achieving energy integration by utilizing heat from cumene product to pre-heat feed into oxidation	2698	March	2248*
02	Installing an advanced air preheater in line 3 furnace	1864	February	1709
03	Preheating raw phenol feed using energy from phenol product output	1005	September	335

**Value from post-expenditure analysis*

Moeve Chemicals Shanghai

	Action	Abatement potential (tCO_2/yr)	COD	Reduction 2024 (tCO_2/yr)
04	Optimizing reflux flow, bottom temperature, and condensate valves for stable tar column operation	5918	March	4932
05	Replacing medium pressure steam with low pressure steam in the flare torch to save MPS	2654	March	2212
06	Implementing APC technology to optimize the cumene plant, improve stability	1787	April	1340
07	Increasing CHP concentration to save energy in the phenol unit	1255	January	1255
08	Generating 800,000 kWh of green electricity annually from a photovoltaic project	336	July	168

4.2. Emissions removal actions

During 2024-year Moeve implemented some removal actions affecting indirect emissions in value chain.

4.2.1. Renewable raw material carbon absorption

The absorption of carbon by renewable materials during their growth phase is accounted for when these materials are utilized for chemical production without any associated combustion. During this year, renewable vegetable oils (CPKO and PKO) have been processed in Chemical facilities to produce sustainable linear alkylbenzenes (NextLab portfolio).

2,123 tonnes of CO_2 have been removed due to the renewable raw materials processed in 2024, helping our clients to achieve their challenging targets dedicated to reducing climate change impact. These emissions have been considered **carbon removals in Category 4** Indirect GHG from products used, and subcategory purchased products.