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Naturgy

Carbon Footprint Report 2017

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Letter from the chairman

It is my pleasure to present to you Naturgy's ninth Carbon Footprint Report, which contains the most relevant data on our company with regards to greenhouse gas emissions and climate change policies. With this exercise we intend to compile, in a comprehensive, transparent and reliable manner, our performance on climate change for 2017.

We are at a stage where the energy model is in the process of transformation, based on technologies that are playing a decisive role by promoting and making it feasible to offer solutions and business models oriented towards a low-carbon economy. In this area of technology, along with energy efficiency, we can highlight the evolution of the photovoltaic energy learning curve and the maturity reached by wind energy, with their investment and operating costs constantly reducing, which places them among the most competitive energies we currently have today. Despite this, the main challenge of these energies lies in their dependence on the weather. Therefore, they require the support of energy such as natural gas, which has a lower environmental impact and guarantees security of supply. Thus, the combination of renewable energies and natural gas constitute the right energy mix for the coming years. In addition, renewable gas is one of the keys to achieving these ambitious objectives and contributing to the development of the circular economy.

In this transition process, energy and climate change policies will affect the energy sector and especially electricity by acting as a catalyst for this transformation. As we move forward with the European Union's roadmap 2050, with significant reductions in emissions, other emission-intensive sectors such as transport, thermal uses of energy in industry or the residential sector will need to define their contribution targets for a low-carbon economy. The implications of mitigation measures in these sectors will need to be carefully analysed as they could have an even greater impact than those in the electricity sector.

As far as Naturgy's activity in 2017 is concerned, the weather conditions, characterised by a very dry year, led to a reduction in renewable energy production in Spain of over 70%. Under these conditions, in order to guarantee the stability of the electricity system, it was necessary to fill this gap with thermal generation, inevitably leading to an increase in CO2 emissions to 20.5 MtCO2e, 4.6% more than what was recorded in 2016. In spite of this, and considering larger historical series, a positive evolution of the main climate indicators can be clearly seen as a result of the environmental strategy that is being developed. Among the various lines and actions, it is worth noting the gradual increase in renewable power and low emissions, which provides us with a good balance in the generation mix, contributing to a sustainable energy system in terms of security of supply, with affordable costs and oriented towards the well-being of people and the protection of the environment.

Continue reading to find out more about our inventory of greenhouse gas emissions, along with our perspective on climate change and the work we have undertaken to reduce our carbon footprint.

Francisco Reynés
Executive Chairman

1. About this report

Organisation and person in charge: This Carbon Footprint Report has been drawn up by Naturgy's climate change department. As of 27 June 2018, Gas Natural Fenosa came to be known as Naturgy and, consequently, before publishing this report, the old name, Gas Natural Fenosa, was replaced by the new name, Naturgy, in all instances where the company is mentioned. The use of the new brand does not imply any organisational or operational changes. For any questions or clarifications, please contact Amado Gil Martínez (agilm@naturgy.com) or Eduardo Fernández Rodríguez (efernandezr@naturgy.com).

Period covered by the report: 1 January to 31 December 2017.

Limits of the organisation: For the purposes of emissions accounting, the organisational limits of the carbon footprint inventory are established according to the financial consolidation criteria, in accordance with the shareholding percentages defined by the Economic and Financial Management Division. The consolidation methods defined by the Economic and Financial Management Division are: full consolidation, where the % of consolidation is 100%, equity method and proportional consolidation method, where the % of consolidation matches the % of economic interest held. See organisational perimeter in Annex 8.1.

According to the internal procedure, which allows to exclude from the final inventory the direct GHG emissions that represent less than 0.05% of the total Scope 1, the direct emissions that affect the Almaraz and Trillo nuclear power plants have been excluded.

Although the information collected in this document is consistent with the Corporate Responsibility Report (CRI) and the Integrated Annual Report (IAI) of 2017, there could be differences because in these two reports:
- Some processes that operated in 2017 and were divested in 2018 receive a different treatment.
- Only those companies or activities in which the participation is equal to or greater than 50%, that have the capacity to influence environmental management and that have a significant impact capacity, are included.

Base year: 2012 is established as the base year for the definition and monitoring of Naturgy's GHG emission reduction targets. The 2017 financial year did not involve a recalculation of the base year.

Quantification methodology: This report, together with the GHG inventory it contains, was prepared in accordance with internal procedure P.E.02770-GN: “Quantification and Report on GHG Emissions and Removals” and a calculation tool, the methodology of which can be seen in chapter 7 of this Report: The 2017 inventory is the first in the 4-year series beginning in 2016 where, for simplicity of calculation, Scope 3 categories that do not add up to more than 1% of Scope 3 in the 2016 inventory can be excluded, provided that the total of the excluded categories does not represent more than 5% of the value of Scope 3.

Emission factors used: The emission factors used for the preparation of the inventory can be found in Annex 8.2.

Impact of uncertainties: The uncertainty associated with direct emissions, Scope 1, is calculated annually together with the inventory. For the aggregation of uncertainties, the recommendations in Chapter 3, Volume 1 of the 2006 IPCC Guidelines are followed. For the 2017 GHG Inventory, the uncertainty associated with Scope 1 is 6.75%

2. Transition indicators

Transition risks: Participation of fossil technologies in the mix

Installed capacity in 2017 (MW)

Total GNF(1)	**15,560 MW**
Emission-free	4,072 (26%)
With emissions	11,488 (74%)
Natural Gas	9,168 (59%)
Coal	2,010 (13%)
Fuel	310 (2%)

Officially communicated shutdowns or divestments:

Fuel	112
Coal	299

Note (1): The Carbon Footprint Report includes installed capacity in Kenya, unlike the Annual Management and Corporate Responsibility Report

Physical risks: water stress

Due to collecting water for cooling in thermal plants:

- 97% percent of installed capacity in thermal power plants is not impacted at all, whether due to the availability of the resource or thanks to measures taken to capture sea water or to use recycled water.

- The remaining 3% is in areas of water stress, although these plants use technology requiring a low amount of water for operation.

The Transition as an opportunity: Investment in renewable energies

Triple power in renewables in the period 2018-2022.

Renewable energies under construction (MW)	**1,466**
Spain:	962
Wind energy quota Canary Islands	45
Wind energy Mainland Spain	667
PV Solar energy Mainland Spain	250
International:	504
Wind energy Australia	91
PV Solar energy Brazil	83
Wind energy/PV Chile	330

The Transition as an opportunity: Electrification and Energy Efficiency

- Infrastructures as a key element in the transformation, reinforcing the weight of electrical infrastructures in the company's portfolio.

The Transition as an opportunity: Digitization, the catalyst of the transformation

- Reinforce the commitment with customers through services & solutions: technological innovations, smart apps, mobility, storage, distributed generation, remote control and smart meters
- Implementation of advanced analytical data-driven management models.
- Automation of processes and operations and asset sensorization.

Governance and Strategy

- In 2017, Naturgy closed an €800 million issuance of green bonds that mature in May 2025 for the construction of approximately 700 MW of wind energy and around 250 MW of solar energy.
- Emission reduction targets (absolute and specific) according to the Sectoral Decarbonization Approach SDA_Tool.v8 of the Science Based Targets Initiative
- Inclusion of climate risk in the company's overall risk assessment and reporting in accordance with the recommendations of the Task Force on Climate-related Financial Disclosures (TCFD)
- Performance targets for the management team regarding energy efficiency and, thus, emission reduction.

3. Governance

Here at Naturgy, we believe that climate change is a global environmental challenge and also an important vector of economic growth. We share the vision that advocates an **orderly and efficient transition of our economy towards a low-carbon paradigm**, while remaining aware of the opportunity created for our industry by means of the fulfilment of this premise.

Naturgy's position on climate change is based on the principle of our Corporate Responsibility Policy:

"**Help to mitigate and adapt to climate change by using renewable and low-carbon energies, promoting energy saving and efficiency and using new technologies**".

This positioning is materialized in the **Climate and Air Action Line** of the Environment Strategy, which in turn is integrated into the 2020 Sustainability Plan.

4. Climate Change Strategy

Naturgy's Climate Change Strategy, included in the climate and air axis of the Environmental Strategy, has the main objective of reducing emissions in our operations and promoting the use of sustainable energy. This strategy is structured into five lines of action, based on which specific objectives are determined and the actions to be carried out to meet them are defined. The different actions carried out in each of the lines of action are listed below.

1. Reduce emissions from our operations. The main actions under this line of action include:
   - Use of natural gas
   - Use of renewable energy
   - Reduction of fugitive emissions

2. Improve our energy efficiency. The main actions under this line of action include:
   - Energy efficiency in our operations
   - Energy efficiency for our customers

3. Develop sustainable products and services for our clients. The main actions under this line of action include:
   - Renewable gas
   - Sustainable mobility
   - Eco-tariffs

4. Integrate climate change into internal management. The main actions under this line of action include:
   - Implement tools for climate risk / opportunity management
   - Strengthen the integration of carbon pricing into the company's key decisions. Explore opportunities in relation to market mechanisms
   - Promote the offsetting of greenhouse gas emissions

5. Determine impact and performance. The main actions under this line of action include:
   - Carbon footprint. Inventory Calculation
   - Participation in international performance indices

5. Risk management

Naturgy's Corporate Risk Map includes the risks and opportunities associated with climate change. Once quantified, they can be integrated into the corporate strategy and goals can be established to minimise risks and maximise opportunities.

The company's Climate Change Risk Model is based on a tool developed in Ms Excel and @Risk, which allows the company's risk exposure to be estimated.

Using this model and the possibilities offered by the tool, the company analyses the impact of climate change variables on the following areas:

- Time: the impacts are analysed over the different periods (2018-2050) and these risks are classified according to their relevance in the short, medium and long term.
- Nature of the business: the impacts that could be caused to the different company businesses are analysed (generation, commercialisation and distribution of electricity, distribution and commercialisation of natural gas, liquefaction plants and operations in markets regarding CO2 emission allowances).
- Geography: the impacts are analysed in the different countries in which the company operates.

The Climate Change Risk Model also allows for the simulation of new products and services and the implementation of R&D&I actions, generating different scenarios to evaluate the impact through physical, business, economic and environmental indicators.

Types of risks and opportunities

The risks and opportunities identified are classified into four different categories to be addressed from each area.

Impact category

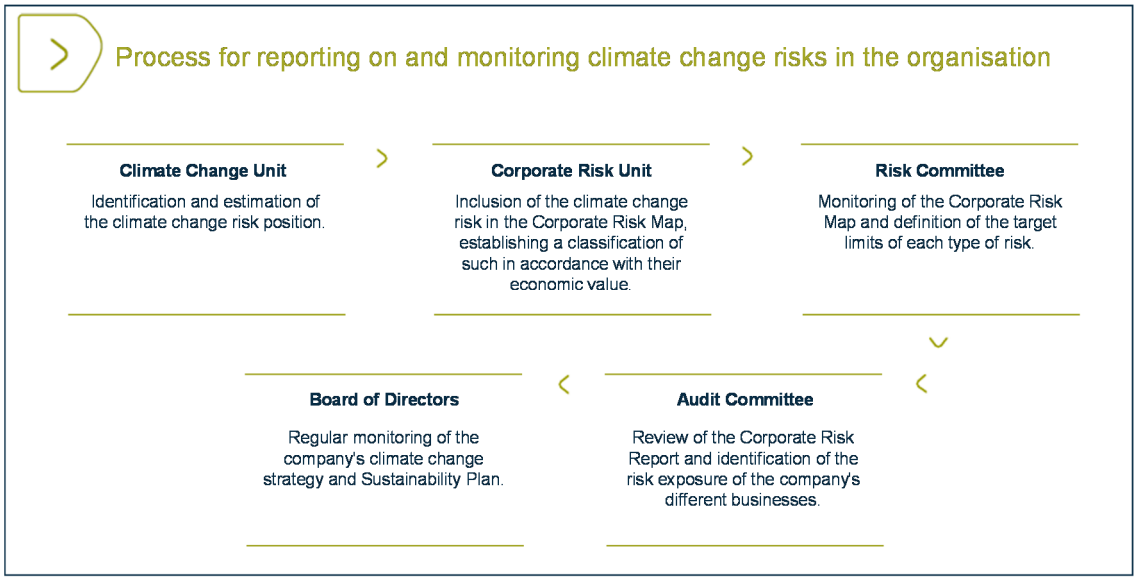
Impacts according to identified risk are grouped into impact categories.

Impact categories on Risk Map

Category	Factors
Ambient temperature.	Demand for natural gas.
	Demand for electricity.
	Performance of combined cycles.
Rainfall.	Generation dispatch.
	Wholesale electricity price.
Rising sea level.	Floods.
	Production loss.
Extreme weather phenomena.	Variation in frequency and intensity of extreme weather phenomena.
CO_2 Markets.	Commercial scheme of emissions rights 2013-2020.
	European Commission intervention.
	Introduction of CO_2 capturing technology.
	Wholesale electricity price.
	Thermal gap.
Renewable energies.	Impact on generation dispatch.
	Sensitivity of the wholesale electricity price market.
Energy efficiency.	Demand for natural gas and electricity.
	Penetration of the electric car: increased demand for electricity and greater use of installed power.
Company reputation.	Impact on the company's reputation.

Reporting and monitoring process in the organisation

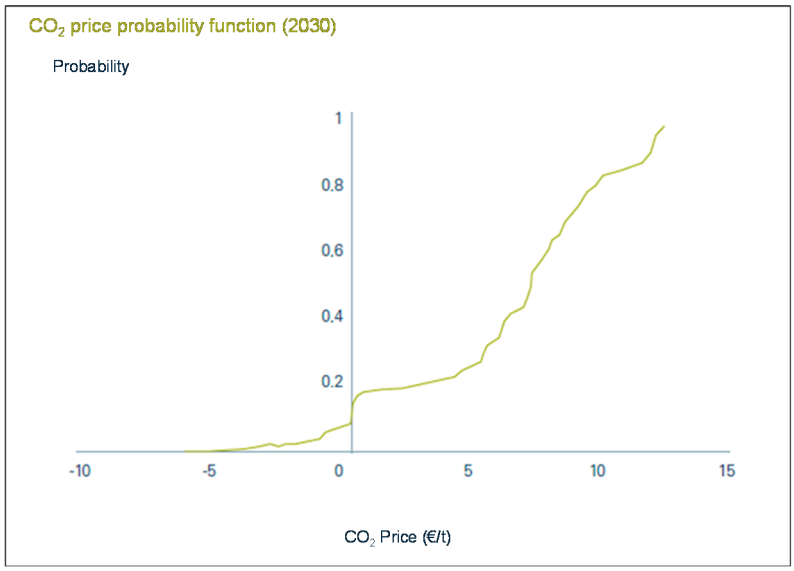
Once climate change risks have been identified, we carry out a reporting and monitoring process to address them and monitor their evolution.



CO_2 scenarios and optimal price

Naturgy has developed a Monte Carlo simulation model to determine the optimum abatement cost in the EU to meet the 2030 reduction targets and to obtain CO_2 price scenarios that reflect the evolution of RE penetration, fuel prices, electricity demand, electricity prices, the impact on the EBITDA, Value at Risk, etc.

In the last simulation carried out, work was carried out with 2ºC scenarios for physical risks and with 4 scenarios for covering demand by 2030. The result was that CO_2 prices were obtained which in the intermediate scenarios would range between €9-10/tCO2.



For the sensitivity analysis, we have taken two additional scenarios where the price of CO_2 and the penetration of renewable energies have been pushed to their upward limits (with regards to the previous scenario), which would correspond to ambitious scenarios of compliance with emission reduction policies in the event of potentially harsher climate policies being put in place.

6. Metrics and targets

Target 1: Reduce absolute emissions in scope 1 and 2 compared to 2012

Goal 1.1: reduce absolute emissions by 26% by 2025 (according to the SBTI tool v.8) compared to the 2012 base year

Follow-up 2017. Goal 1.1:

- 2017 Emissions: 21.848 MtCO2-eq
- Objective fulfilment progress: (26.123 - 21.848) MtCO2-eq / (26.123 - 19.376) MtCO2-eq = 63%
- Objective progress: 5 years / 13 years = 38.4%.

Assessment of compliance with Goal 1.1: The objective fulfilment progress is much greater than the objective progress.

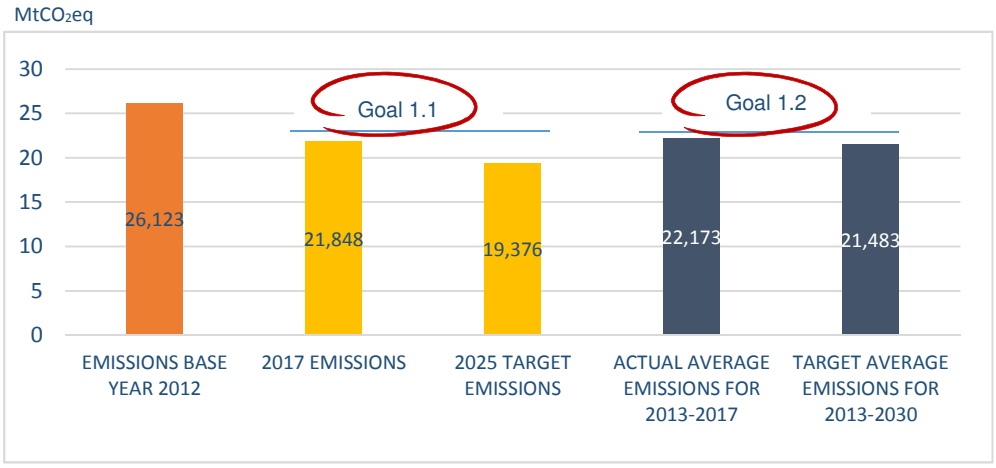
Goal 1.2: Reduce the average emissions in Scope 1 and 2 by 17.8 % for 2013-2030 compared to the base year 2012

Follow-up 2017. Goal 1.2:

- Total reductions to be achieved in the 2013-30 period: 83.526 MtCO2-eq
- Actual reductions achieved in the 2013-17 period: 26.123-22.17 MtCO2-eq/year x 5 years = 19.750 MtCO2-eq for 2013-17
- Objective fulfilment progress: 19.750 MtCO2-eq/83.526 MtCO2-eq = 23.7%
- Objective progress: 5 years have passed (2013-2017) out of a total of 18 years (2013-2030): 27.8% progress:

Assessment of compliance with Goal 1.2:

The actual fulfilment progress (23.7%) is slightly below the objective progress level (27.8%). However, this is considered in line with total fulfilment as most decreases will occur between 2020-2030.



Remarks and objective calculation bases:

- Applicable to Scopes 1 and 2
- Applicable to all GHG, not just CO2
- Applicable to all countries and sectors, (not just to EU guideline sectors).
- Target calculated using the SBTI tool v8

Target 2: Reduce the specific CO2/GWh emissions from electricity generation compared to 2012

Goal 2.1: reduce specific emissions by 33% by 2025 (according to the SBTI tool v.8) compared to the 2012 base year

Follow-up 2017:

- Specific emissions 2017: 388 tCO2/GWh
- Objective fulfilment progress: (413-388)tCO2/GWh/(413-278) MtCO2-eq = 18%
- Objective progress: 5 years / 13 years = 38.4%.

Fulfilment assessment:

The objective fulfilment progress is less than the objective progress, since 2017 was a year with very low availability of hydro power resources in Spain. Despite this, it is considered that the objective will be met, since most of the reductions will occur towards the end of the period.

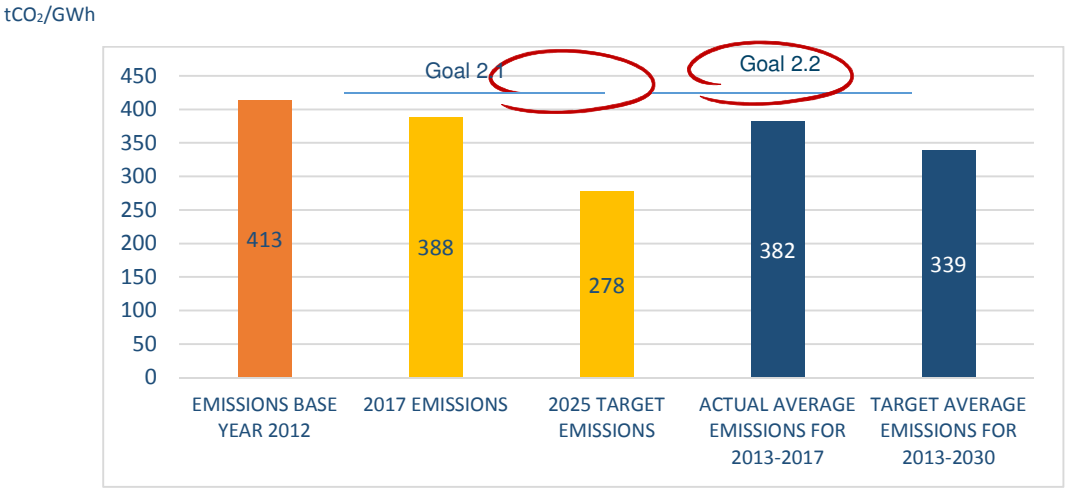
Goal 2.2: reduce average specific emissions by 17.8% for 2013-2030 compared to the 2012 base year

Follow-up 2017:

- Average specific emissions for 2013-2017: 382 tCO2/GWh
- Objective fulfilment progress: (413-382) tCO2/GWh / (413-339) MtCO2-eq = 42%
- Objective progress: 5 years / 18 years = 27.8%.

Fulfilment assessment:

The current objective fulfilment progress (42%) is greater than the objective progress: (27.8%). We are considered to be on track to meet the target, as the largest decline in the specific emission factor is expected from 2020 onwards.



Remarks and objective calculation bases:

- This relative objective is set only for CO2 from electricity generation which accounts for approximately 90% of GNF emissions.
- Target calculated using the SBTI tool v8

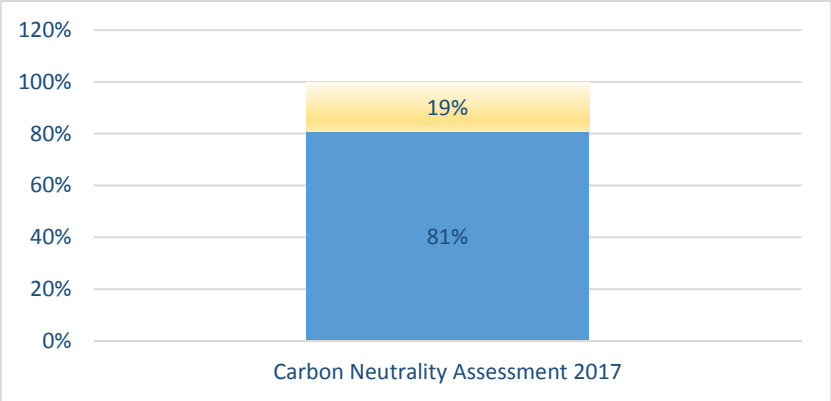
Target 3: Reaching carbon neutrality in 2050 (Scopes 1+2+3)

Follow-up 2017:

- Total GHG emissions (Scopes 1+2+3) 2017: 163.6 MtCO2-eq
- Total GHG emissions avoided (Scopes 1+2+3) 2017: 132.4 MtCO2-eq
- Objective fulfilment progress: 80.9%

Fulfilment assessment:

The current objective fulfilment progress (81%) has increased by about 15.7% with regards to the previous year (70%), indicating that the Company is on track to achieve climate neutrality by 2050. The increase in the degree of achievement recorded is a combined effect of several factors, although the main vector in the increase of these avoided emissions has been the commercialization of natural gas in countries intensive in carbon, either by its energy mix or by the climatic conditions, which has allowed displacing coal and fuel



Remarks and objective calculation bases:

- Applicable to Scopes 1, 2 and 3
- Applicable to all GHG, not just CO2
- Applicable to all countries and sectors.
- The decreases are calculated according to the UNFCCC CDM projects.

For more information regarding the calculation of the indicator, see chapter on Emission Neutrality Assessment.

Emission Neutrality Assessment

Presentation in the form of a balance sheet of the relationship between our emissions (direct and indirect) and the emissions avoided by our assets, products and services due to the displacement of sources with greater levels of emissions.

EMISSIONS	Emissions 2017 (tCO2eq)
1. Direct Emissions (Scope 1)	**20,531,127**
2. Indirect emissions due to electricity use (Scope 2)	**1,317,179**
3. Indirect Emissions (Scope 3) upstream	**31,643,661**
3.1. Goods and Services acquired	-
3.2. Capital goods	-
3.3. Activities linked to fuels and energy upstream	
3.3.a. Upstream emissions of acquired fuels (recovery, production and transportation)	
3.3.a.i. Coal	589,395
3.3.a.ii. Natural Gas	17,569,486
3.3.a.iii. Petroleum	582,655
3.3.b. Emissions of electricity acquired (recovery, production and transportation of fuels for electricity generation)	-
3.3.c. Emissions from losses in transportation and distribution of electricity consumed (electricity generation of losses)	-
3.3.d. Emissions of electricity acquired for sale to third parties (generation of electricity sold)	12,879,674
3.4. Goods transport and distribution	-
3.5. Wastes generated by operations	-
3.6. Business travel	6,215
3.7. Worker travel	16,236
3.8. Leased goods	-
3. Indirect Emissions (Scope 3) downstream	**110,157,601**
3.9. Goods transport and distribution	-
3.10. Treatment of products sold	-
3.11. Use of products sold	
3.11.a. End use of the natural gas distributed/marketed	105,643,954
3.11.b. End use of retrieved coal	3,705,294
3.12. End of life cycle treatment for sold products	-
3.13. Leased goods	-
3.14. Franchises	-
3.15. Investments	808,352
TOTAL	**163,649,568**

AVOIDED EMISSIONS	Avoided emissions 2017 (tCO2eq)	Energy saving 2017 (TJ)
1. GAS NATURAL	123,863,984	586,294
Natural gas, best fossil fuel because it displaces other fossil fuels:	-	-
1.1. Electricity Production	76,474,255	478,523
1.2. Tertiary	24,657,729	39,728
1.3. Residential/Commercial	11,733,509	44,328
1.4. Transport	2,809,704	10,122
1.5. Cogeneration	8,188,789	13,593
2. NATURAL RESOURCE MANAGEMENT	3,170,359	38,465
Renewable generation due to displacement of fossil fuels	-	-
2.1. Wind farms	1,810,365	21,292
2.2 Hydropower Production	1,336,842	16,740
2.3. Photovoltaic production	23,152	433
2.4. Voluntary offsets "CO2pensados Initiative"	-	-
3. ENERGY SAVINGS AND EFFICIENCY	1,824,028	27,148
Saving and energy efficiency actions in our installations or the end customer's installations	-	-
3.1. Own facilities: Energy Efficiency Operational Plan	-	-
3.1.1. Renewal of networks in Gas T&D	1,060,899	2,806
3.1.2. Electricity distribution actions	93,031	576
3.1.2. Electricity generation actions	-	-
3.1.2.a. Combined Cycle	313,786	5,561
3.1.2.b. Coal-fired power plants	31,273	313
3.1.2.c. Fuel-based power plants	2,791	36
3.2. End client	-	-
3.2.1. Energy services	322,248	17,855
4. OTHERS	3,577,125	- 11,581
4.1. Nuclear production	3,577,125	- 11,581
TOTAL	**132,435,496**	**640,326**

CLIMATE NEUTRALITY ASSESSMENT: 80.9%

Criteria for quantification:

1. During the reporting period, the projects must produce quantifiable GHG and/or fuel/energy reductions with regards to a reference baseline.
2. The reference baseline is defined on a case-by-case basis.
3. The emissions avoided are calculated as the difference between emissions from "with project" and "without project" scenarios.
4. The "with project" scenario represents the actual level of GHG emissions.
5. The "without project" baseline scenario represents the GHG emissions levels that would have been reached if the project had not been implemented.
6. The emission factors used for the "with project" and "without project" scenarios have been obtained based on the IPCC 2006 guidelines for national GHG inventories.
7. The calculations have been performed as per the UNFCCC methodologies and simplified tools for Clean Development Mechanisms (CDM).

The inventory at a glance

Emissions from all Naturgy activities and businesses are set out in the greenhouse gas emissions inventory. Below is the data obtained from the three scopes distributed by business segments, type of Greenhouse Gas (GHG) and countries.

Scope 1 emissions		**20,531,127 tCO2eq**			
Mainly due to CO2 emissions in countries with thermal electricity generation					
BY SEGMENTS		**BY TYPE OF GHG**		**BY COUNTRIES**	
Generation	88.4%	CO_2	92.6%	Spain	57.0%
Gas Distribution	6.9%	CH_4	7.1%	Mexico	30.6%
Gas	3.3%	N_2O	0.1%	Dominican Rep.	3.1%
Offices	0.1%	SF_6	0.1%	International Maritime Transport	2.2%
Mining	0.1%	HFC	0.0%	Chile	1.5%
Electricity Distribution	1.2%	PFC	0.0%	Other	5.5%

Scope 2 emissions		**1,317,179 tCO2eq**			
These are mainly due to CO2 emissions associated with electricity distribution losses					
BY SEGMENTS		**BY TYPE OF GHG**		**BY COUNTRIES**	
Electricity Distribution	94.1%	CO_2	99.6%	Chile	46.2%
Mining	3.3%	CH_4	0.3%	Spain	19.9%
Gas Distribution	0.9%	N_2O	0.0%	Panama	15.9%
Offices	1.6%	SF_6	0.0%	Moldova	9.1%
Gas	0.1%	HFC	0.0%	Argentina	4.5%
Generation	0.0%	PFC	0.0%	Other	4.3%

Scope 3 emissions		141801261.3 tCO2eq			
These are mainly due to CO2 emissions in the combustion of natural gas for the end use of distributed and marketed natural gas					
BY SEGMENTS		**BY TYPE OF GHG**		**BY COUNTRIES**	
Gas	50.5%	CO_2	95.5%	Spain	23.7%
Gas Distribution	35.9%	CH_4	4.4%	Brazil	12.9%
Electricity Distribution	9.1%	N_2O	0.1%	Chile	12.1%
Mining	2.6%	SF_6	0.0%	Argentina	10.8%
Generation	1.9%	HFC	0.0%	France	5.6%
Offices	0.0%	PFC	0.0%	Other	3.9%
SCOPE 3 BY CATEGORIES					
End use of the natural gas distributed/marketed		74.50%	Train travel:		0.00050%
Natural gas life cycle		12.39%	Leasing (upstream)		0
Life cycle electricity distributed		9.08%	Life cycle electricity distribution losses		0
Financial investments		2.61%	Capital goods		0
End use of extracted coal		0.57%	Goods and services		0
Coal life cycle		0.42%	Waste life cycle		0
Oil derivative life cycle		0.41%	Life cycle consumed electricity		0
Employee travel		0.01%	Leasing (downstream)		0
Flights		0.00%	Goods transport and distribution		0

Evaluation and reduction of Uncertainty

The uncertainty associated with the report on Scope 1 emissions for 2017 is 6.75%

For installations under the EU emissions trading scheme, according to the Decision 2007/589/EC of 18 July, uncertainties regarding GHG emissions values will be less than or equal to those corresponding to the levels approved by the competent authority. For other emission sources, the uncertainty associated to the calculation of GHG emissions is a combination of the uncertainty of the activity data and the emission factors used, using the references established in 2.38. 2006 IPCC GHG, Vol.2, table 2.12, page

To minimise the uncertainty of the activity data all the emission sources have environmental and quality management systems in accordance with the ISO 14001:2015 and ISO 9001:2015 standards. In order to minimise the uncertainty related to emission factors, official sources are always used, as are, by default, the core values recognised in the 2006 IPCC Guidelines for National Greenhouse Gas Inventories.

Greenhouse Gas Inventory

The **emissions generated by each type of GHG** are shown below:

GAS NATURAL FENOSA INVENTORY BY TYPE OF GHG (tCO2-eq)									
Data series 2015-2017									
GHG emissions	**Scope 1**			**Scope 2**			**Scope 3**		
tCO2-eq	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
CO2	21,270,018	18,173,252	19,018,367	1,326,089	1,453,156	1,312,491	128,043,026	131,141,913	135,464,116
CH4	1,445,627	1,397,140	1,455,449	584	641	608	6,757,325	6,825,472	6,205,257
N2O	30,081	24,694	25,634	3,635	4,324	4,081	126,750	127,697	131,888
SF6	26,238	24,910	29,655	0	0	0	0	0	0
PFC*	0	0	0	0	0	0	0	0	0
HFC	7,363	4,529	2,022	0	0	0	0	0	0
All	**22,779,327**	**19,624,525**	**20,531,127**	**1,330,308**	**1,458,120**	**1,317,179**	**134,927,101**	**138,095,082**	**141,801,261**

As there are no emissions of this gas, it will not appear in subsequent tables

*

Inventory by business

The GHG emissions generated by each **business segment** are shown below:

GAS NATURAL FENOSA INVENTORY BY BUSINESS SEGMENTS (tCO2-eq)									
Data series 2015-2017									
GHG emissions	**Scope 1**			**Scope 2**			**Scope 3**		
tCO2-eq	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
Generation	20,639,772	17,521,399	18,142,821	0	0	0	3,170,338	2,870,886	2,670,570
Electricity Distribution	26,029	24,667	245,830	1,269,650	1,392,825	1,238,947	11,725,139	12,195,641	12,955,979
Gas Distribution	1,484,985	1,370,458	1,424,143	13,856	12,718	12,239	50,880,201	48,540,149	50,877,085
Gas *	574,520	663,772	673,981	1,589	3,318	1,477	64,633,256	70,007,533	71,561,044
Mining	26,234	24,640	23,218	40,521	44,005	42,844	4,482,504	4,173,053	3,707,338
Offices	27,788	19,589	21,135	4,692	5,254	21,672	35,663	307,821	29,245
All	**22,779,327**	**19,624,525**	**20,531,127**	**1,330,308**	**1,458,120**	**1,317,179**	**134,927,101**	**138,095,082**	**141,801,261**

* relating to natural gas infrastructure, procurement and commercialisation.

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Inventory by country

Shown below are the **GHG emissions generated by the countries in which we operate:**

GAS NATURAL FENOSA INVENTORY BY COUNTRIES (tCO2-eq)									
Data series 2015-2017									
GHG emissions	**Scope 1**			**Scope 2**			**Scope 3**		
tCO2-eq	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**	**2015**	**2016**	**2017**
Germany	-	-	-	-	-	-	232,674	451,863	805,293
Algeria	-	-	-	-	-	-	126,098	137,043	121,344
Argentina	340,973	299,638	301,167	77,055	75,034	59,498	14,746,839	15,269,346	15,253,816
Belgium	-		-	-		-	669,120	1,001,425	1,511,665
Brazil	117,717	115,926	129,781	115	650	616	21,935,691	15,294,605	18,275,310
Canada			-			-			514,187
Chile	410,070	305,214	317,899	527,913	515,712	608,623	16,446,799	16,662,806	17,138,911
China			-			-			739,627
Colombia	158,394	163,661	164,732	413,091	391,923	2,819	7,627,997	7,634,980	5,454,041
Korea	-	-	-	-	-	-	2,016,442	-	456,350
Costa Rica	-		-	-		-	3	16	14
Egypt	-	-	-	-	-	-	29,877	2,815,209	859,896
United Arab Emirates	-	-	-	-	-	-	-	443,986	-
Spain	14,188,040	11,027,808	11,709,493	17,031	100,711	262,663	33,694,989	35,414,257	33,534,114
United States of	-	-	-	-	-	-	-	-	2,189,428
France	-	-	-	-	-	3	6,225,961	11,895,948	7,866,304
The Netherlands	-	-	-	-	-	-	932,143	1,074,901	1,431,751
India	-	-	-	-	-	-	2,385,968	2,705,378	4,214,490
Ireland	-	-	-	-	-	-	-	125,984	322,517
Italy	105,122	106,073	106,465	613	567	423	1,252,958	1,590,801	3,071,778
Japan	-	-	-	-	-	-	1,560,451	-	1,436,358
Jordan	-	-	-	-	-	-	-	494,826	1,243,857
Kenya	85,799	132,429	185,784	-	-	-	28,050	45,004	62,166
Kuwait	-	-	-	-	-	-	-	240,969	287,213
Morocco	237,237	233,572	204,025	185	1,693	1,568	3,210,798	3,853,729	3,722,768
Mexico	6,096,234	6,151,362	6,279,129	8,143	7,997	7,960	4,342,593	4,544,023	5,400,387
Moldova	935	963	1,949	123,036	110,691	120,368	1,204,557	1,228,116	1,345,340
Oman	-	-	-	-	-	-	56,243	59,595	23,103
Pakistan	-	-	-	-	-	-	-	452,195	293,250
Panama	5,368	5,064	8,355	122,607	209,137	209,794	1,175,564	1,639,915	1,578,173
Portugal	-	-	-	-	-	-	5,258,405	5,355,240	4,900,638
Puerto Rico	-	-	-	-	-	-	2,493,041	2,584,922	1,834,204
Dominican Republic	679,572	636,379	637,844	-	-	-	447,732	241,728	430,497
South Africa	26,215	24,584	23,208	40,521	44,005	42,844	4,482,412	4,173,029	3,707,334
Taiwan.	-	-	-	-	-	-	-	242,984	268,614
International Maritime Transport	327,651	421,851	461,297	-	-	-	508,019	420,259	121,134
Trinidad and Tobago	-	-	-	-	-	-	1,643,510	-	-
Turkey	-	-	-	-	-	-	192,165	-	521,523
Ukraine			-			-			265,834
All	**22,779,327**	**19,624,525**	**20,531,127**	**1,330,308**	**1,458,120**	**1,317,179**	**134,927,101**	**138,095,082**	**141,801,261**

Inventory by country, business and GHG.

Germany							
Carbon Inventory 2017							
Scope 3							
tCO_2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Germany		774,181	30,557	555	-	-	805,293
	Gas	774,181	30,557	555	-	-	805,293
% GNF		0.57%	0.49%	0.42%	0.00%	0.00%	0.57%
Algeria							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Algeria		66,277	54,973	95	-	-	121,344
	Gas	66,277	54,973	95	-	-	121,344
% GNF		0.05%	0.89%	0.07%	0.00%	0.00%	0.09%
Argentina							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Argentina		2,400	298,715	18	34	-	301,167
	Electricity Distribution	-	-	-	34	-	34
	Gas Distribution	1,480	298,706	1	-	-	300,187
% GNF		0.01%	20.52%	0.07%	0.11%	0.00%	1.47%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Argentina		59,379	34	85	-	-	59,498
	Electricity Distribution	56,650	33	81	-	-	56,764
	Gas Distribution	1,729	1	2	-	-	1,733
	Offices	1,000	1	1	-	-	1,002
% GNF		4.52%	5.63%	2.07%	0.00%	0.00%	4.52%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Argentina		14,622,813	620,336	10,667	-	-	15,253,816
	Electricity Distribution	749,184	431	1,068	-	-	750,683
	Gas Distribution	13,089,164	584,904	9,056	-	-	13,683,125
	Gas	783,038	34987.24934	541.757337	0	0	818566.6682
	Offices	1,427	13	1	-	-	1,441
% GNF		10.79%	10.00%	8.09%	0.00%	0.00%	10.76%

Belgium							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Belgium		1,454,530	56,096	1,038	-	-	1,511,665
	Gas	1,454,530	56,096	1,038	-	-	1,511,665
% GNF		1.07%	0.90%	0.79%	0.00%	0.00%	1.07%

Brazil							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Brazil		820	128,946	15	-	-	129,781
	Gas Distribution	-	128,924	-	-	-	128,924
	Offices	820	22	15	-	-	857
% GNF		0.00%	8.86%	0.06%	0.00%	0.00%	0.63%
By company							
Gas Natural Servicios		46.857	0.08	0			50
GSEP		619.904	3,962.49	0			99,694
CEG Río		74.121	532.88	0			13,397
DG Sao Paulo		78.766	124,450.93	15.047			16,640
Scope 2							
tCO2eq		CO2	CH4	N2O	SF6	HFC	CO2e
Global Brazil		613.977	0.318	1.494	-	-	616
	Offices	613.977	0.318	1.494	-	-	616
% GNF		0.000	0.001	0.000	-	-	0
By company							
Gas Natural Servicios							
GSEP		566.111	0.012	0.005			568
CEG Río		17.786	0.000	0.000			18
DG Sao Paulo		30.080	0.306	1.489			30
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Brazil		17,365,521	896,787	13,002	-	-	18,275,310
	Gas Distribution	15,322,101	791,265	11,357	-	-	16,124,723
	Gas	2,042,692	105,489	1,514	-	-	2,149,694
	Offices	729	33	130	-	-	892
% GNF		0	0	0	-	-	0
By company							
Gas Natural Servicios		33.614	0.112	0.0258			44.10
GSEP		8,973,660.825	18,522.864	22.8849			9,443,552.14
CEG Río		5,588,814.242	11,536.284	14.0373			5,881,404.46
DG Sao Paulo		2,803,012.618	866,727.300	12,964.9225			2,950,309.04

Canada							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Canada		493,373	20,493	321	-	-	514,187
	Gas	493,373	20,493	321	-	-	514,187
% GNF		0.36%	0.33%	0.24%	0.00%	0.00%	0.36%

Chile							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Chile		227,042	88,148	213	2,497	-	317,899
	Electricity Distribution	223,065	112	149	2,497	-	225,822
	Gas Distribution	991	88,031	17	-	-	89,039
	Offices	2,986	4	47	-	-	3,038
% GNF		1.19%	6.06%	0.83%	8.42%	0.00%	1.55%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Chile		606,144	223	2,256	-	-	608,623
	Electricity Distribution	588,382	216	2,190	-	-	590,789
	Gas Distribution	0	0	0	0	-	0
	Offices	16,309	6	61	-	-	16,376
% GNF		46.18%	36.65%	55.29%	0.00%	0.00%	46.21%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Chile		16,633,835	474,422	30,654	-	-	17,138,911
	Electricity Distribution	6,446,905	14,638	23,843	-	-	6,485,386
	Gas Distribution	9,344,137	421,900	6,253	-	-	9,772,289
	Gas	836,721	37,880	549	-	-	875,150
% GNF		12.28%	7.65%	23.24%	0.00%	0.00%	12.09%
China							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global China		714,805	24,195	627	-	-	739,627
	Gas	714,805	24,195	627	-	-	739,627
% GNF		0.53%	0.39%	0.48%	0.00%	0.00%	0.52%
Colombia							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Colombia		549	164,169	14	-	-	164,732
	Gas Distribution	-	164,158	-	-	-	164,158
	Offices	549	11	14	-	-	574
% GNF		0.00%	11.28%	0.06%	0.00%	0.00%	0.80%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Colombia		2,810	1	8	-	-	2,819
	Gas Distribution	2,406	1	7	-	-	2,414
	Offices	404	0	1	-	-	405
% GNF		0.21%	0.16%	0.20%	0.00%	0.00%	0.21%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Colombia		5,174,726	275,855	3,460	-	-	5,454,041
	Gas Distribution	5,172,886	275,843	3,458	-	-	5,452,187
	Offices	1,840	12	2	-	-	1,853
% GNF		3.82%	4.45%	2.62%	0.00%	0.00%	3.85%
Korea							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Korea		437,292	18,775	282	-	-	456,350
	Gas	437,292	18,775	282	-	-	456,350
% GNF		0.32%	0.30%	0.21%	0.00%	0.00%	0.32%

Costa Rica							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Costa Rica		14	-	-	-	-	14
	Generation	-	-	-	-	-	-
% GNF		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

Egypt							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Egypt		803,468	55,895	534	-	-	859,896
	Gas	803,468	55,895	534	-	-	859,896
% GNF		0.59%	0.90%	0.40%	0.00%	0.00%	0.61%

Spain							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Spain		11,215,216	456,370	17,393	19,690	824	11,709,493
	Electricity Distribution	-	-	-	19,198	-	19,198
	Gas Distribution	358	448,668	0	-	-	449,027
	Gas	8,799	122	5	-	-	8,926
	Generation	11,198,184	7,551	17,277	492	824	11,224,328
	Others	10	0	0	-	-	10
	Offices	7,864	29	111	-	-	8,004
% GNF		58.97%	31.36%	67.85%	66.40%	40.77%	57.03%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Spain		261,704	107	852	-	-	262,663
	Electricity Distribution	261,687	107	852	-	-	262,646
	Gas	17	0	0	-	-	17
% GNF		19.94%	17.53%	20.88%	0.00%	0.00%	19.94%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Spain		32,284,817	1,219,340	29,957	-	-	33,534,114
	Electricity Distribution	2,788,278	1,135	9,079	-	-	2,798,492
	Gas Distribution	1,468,762	55,656	937	-	-	1,525,356
	Gas	26,727,503	953,397	16,961	-	-	27,697,861
	Generation	1,286,876	209,068	2,942	-	-	1,498,886
	Mining	5	0	0	-	-	5
	Offices	13,392	84	38	-	-	13,514
% GNF		23.83%	19.65%	22.71%	0.00%	0.00%	23.65%

United States of America							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global United States		2,112,690	75,436	1,302	-	-	2,189,428
	Gas	2,112,690	75,436	1,302	-	-	2,189,428
% GNF		1.56%	1.22%	0.99%	0.00%	0.00%	1.54%

France							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global France		3	0	0	-	-	3
	Gas	2	0	0	-	-	2
	Offices	2	0	0	-	-	2
% GNF		0.00%	0.00%	0.00%	0.00%	0.00%	0.00%

The Netherlands							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Holland		1,380,594	50,383	774	-	-	1,431,751
	Gas	1,380,594	50,383	774	-	-	1,431,751
% GNF		1.02%	0.81%	0.59%	0.00%	0.00%	1.01%

India							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global India		3,982,414	229,681	2,395	-	-	4,214,490
	Gas	3,982,414	229,681	2,395	-	-	4,214,490
% GNF		2.94%	3.70%	1.82%	0.00%	0.00%	2.97%

Ireland							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Ireland		310,908	11,411	198	-	-	322,517
	Gas	310,908	11,411	198	-	-	322,517
% GNF		0.23%	0.18%	0.15%	0.00%	0.00%	0.23%

Italy							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Italy		2,616	103,831	17	-	-	106,465
	Gas Distribution	1,679	103,816	1	-	-	105,496
	Offices	937	15	16	-	-	968
% GNF		0.01%	7.13%	0.07%	0.00%	0.00%	0.52%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Italy		421	0	1	-	-	423
	Gas Distribution	231	0	1	-	-	231
	Offices	191	0	1	-	-	191
% GNF		0.03%	0.03%	0.03%	0.00%	0.00%	0.03%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Italy		2,940,126	129,416	2,236	-	-	3,071,778
	Gas Distribution	151	77	0	-	-	229
	Gas	2,939,467	129,321	2,235	-	-	3,071,022
	Offices	508	18	1	-	-	527
% GNF		2.17%	2.09%	1.70%	0.00%	0.00%	2.17%

Japan							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Japan		1,377,038	58,458	861	-	-	1,436,358
	Gas	1,377,038	58,458	861	-	-	1,436,358
% GNF		1.02%	0.94%	0.65%	0.00%	0.00%	1.01%

Kenya							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Kenya		185,177	180	428	-	-	185,784
	Generation	185,177	180	428	-	-	185,784
% GNF		0.97%	0.01%	1.67%	0.00%	0.00%	0.90%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Kenya		61,809	208	149	-	-	62,166
	Generation	61,809	208	149	-	-	62,166
% GNF		0.05%	0.00%	0.11%	0.00%	0.00%	0.04%
Kuwait							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Kuwait		277,355	9,708	150	-	-	287,213
	Gas	277,355	9,708	150	-	-	287,213
% GNF		0.20%	0.16%	0.11%	0.00%	0.00%	0.20%
Morocco							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Morocco		201,409	2,505	111	-	-	204,025
	Gas	201,147	2,504	107	-	-	203,759
	Offices	262	0	4	-	-	267
% GNF		1.06%	0.17%	0.43%	0.00%	0.00%	0.99%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Morocco		1,562	1	6	-	-	1,568
	Gas	1,452	1	6	-	-	1,458
	Offices	110	0	0	-	-	110
% GNF		0.12%	0.10%	0.15%	0.00%	0.00%	0.12%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Morocco		2,954,041	766,061	2,667	-	-	3,722,768
	Gas	2,953,860	766,060	2,666	-	-	3,722,586
	Offices	181	0	0	-	-	182
% GNF		2.18%	12.35%	2.02%	0.00%	0.00%	2.63%
Mexico							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Mexico		6,083,872	190,030	3,300	730	1,198	6,279,129
	Gas Distribution	-	187,311	-	-	-	187,311
	Generation	6,081,152	2,693	3,211	730	1,198	6,088,984
	Offices	2,720	26	89	-	-	2,835
% GNF		31.99%	13.06%	12.87%	2.46%	59.23%	30.58%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Mexico		7,941	4	16	-	-	7,960
	Gas Distribution	6,387	3	12	-	-	6,403
	Offices	1,553	1	3	-	-	1,557
% GNF		0.60%	0.65%	0.38%	0.00%	0.00%	0.60%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Mexico		4,923,067	473,303	4,018	-	-	5,400,387
	Gas Distribution	4,134,794	181,181	2,987	-	-	4,318,962
	Gas	507,484	22,866	298	-	-	530,648
	Generation	278,231	269,247	724	-	-	548,202
	Offices	2,557	9	8	-	-	2,575
% GNF		3.63%	7.63%	3.05%	0.00%	0.00%	3.81%

Moldova							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Moldova		1,761	10	39	139	-	1,949
	Electricity Distribution	-	-	-	139	-	139
	Offices	1,761	10	39	-	-	1,810
% GNF		0.01%	0.00%	0.15%	0.47%	0.00%	0.01%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Moldova		120,250	54	64	-	-	120,368
	Electricity Distribution	118,839	53	64	-	-	118,956
	Offices	1,411	1	1	-	-	1,412
% GNF		9.16%	8.84%	1.58%	0.00%	0.00%	9.14%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Moldova		1,344,005	614	721	-	-	1,345,340
	Electricity Distribution	1,342,894	600	719	-	-	1,344,213
	Offices	1,111	14	2	-	-	1,126
% GNF		0.99%	0.01%	0.55%	0.00%	0.00%	0.95%
Oman							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Oman		10,981	12,107	15	-	-	23,103
	Gas	10,981	12,107	15	-	-	23,103
% GNF		0.01%	0.20%	0.01%	0.00%	0.00%	0.02%
Pakistan							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Pakistan		283,313	9,734	203	-	-	293,250
	Gas	283,313	9,734	203	-	-	293,250
% GNF		0.21%	0.16%	0.15%	0.00%	0.00%	0.21%
Panama							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Panama		1,755	3	30	6,566	-	8,355
	Electricity Distribution	-	-	-	638	-	638
	Generation	-	-	-	5,928	-	5,928
	Offices	1,755	3	30	-	-	1,789
% GNF		0.01%	0.00%	0.12%	22.14%	0.00%	0.04%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Panama		209,025	174	595	-	-	209,794
	Electricity Distribution	209,025	174	595	-	-	209,794
% GNF		15.93%	28.55%	14.58%	0.00%	0.00%	15.93%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Panama		1,572,391	1,307	4,475	-	-	1,578,173
	Electricity Distribution	1,571,426	1,305	4,473	-	-	1,577,205
	Offices	964	2	2	-	-	968
% GNF		1.16%	0.02%	3.39%	0.00%	0.00%	1.11%

Portugal							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Portugal		4,828,523	69,062	3,053	-	-	4,900,638
	Gas	4,828,523	69,062	3,053	-	-	4,900,638
% GNF		3.56%	1.11%	2.31%	0.00%	0.00%	3.46%
Puerto Rico							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Puerto Rico		1,748,650	84,833	721	-	-	1,834,204
	Gas	1,434,127	76,499	605	-	-	1,511,231
	Generation	314,523	8,334	116	-	-	322,973
% GNF		0	0	0	-	-	0
Dominican Rep.							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Dominican Republic		635,741	621	1,482	-	-	637,844
	Generation	635,695	621	1,480	-	-	637,796
	Offices	46	0	1	-	-	47
% GNF		0	0	0	-	-	0
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Dominican Republic		422,414	7,420	664	-	-	430,497
	Gas	185,435	6,621	92	-	-	192,148
	Generation	236,957	799	572	-	-	238,327
	Offices	22	0	0	-	-	22
% GNF		0.31%	0.12%	0.50%	0.00%	0.00%	0.30%
South Africa							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global South Africa		2,118	21,085	5	-	-	23,208
	Others	2,118	21,085	5	-	-	23,208
% GNF		0.01%	1.45%	0.02%	0.00%	0.00%	0.11%
Scope 2							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global South Africa		42,638	11	196	-	-	42,844
	Others	42,638	11	196	-	-	42,844
% GNF		3.25%	1.80%	4.80%	0.00%	0.00%	3.25%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global South Africa		3,697,458	587	9,288	-	-	3,707,334
	Mining	3,697,458	587	9,288	-	-	3,707,334
% GNF		2.73%	0.01%	7.04%	0.00%	0.00%	2.61%
Taiwan.							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Taiwan		256,331	12,142	141	-	-	268,614
	Gas	256,331	12,142	141	-	-	268,614
% GNF		0.19%	0.20%	0.11%	0.00%	0.00%	0.19%

International Maritime Transport							
Carbon Inventory 2017							
Scope 1							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global International		457,892	836	2,569	-	-	461,297
	Gas	457,892	836	2,569	-	-	461,297
% GNF		2.41%	0.06%	10.02%	0.00%	0.00%	2.25%
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global International		106,906	14,093	136	-	-	121,134
	Gas	106,906	14,093	136	-	-	121,134
% GNF		0.08%	0.23%	0.10%	0.00%	0.00%	0.09%
Turkey							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Turkey Global		500,301	20,998	223	-	-	521,523
	Gas	500,301	20,998	223	-	-	521,523
% GNF		0.37%	0.34%	0.17%	0.00%	0.00%	0.37%
Ukraine							
Carbon Inventory 2017							
Scope 3							
tCO2eq		CO_2	CH_4	N_2O	SF_6	HFC	CO_2e
Global Germany		253,430	12,233	170	-	-	265,834
	Gas	253,430	12,233	170	-	-	265,834
% GNF		0.19%	0.20%	0.13%	0.00%	0.00%	0.19%

7. Methodology

7.1. Calculation of GHG emissions from the Naturgy Inventory

To quantify Naturgy's greenhouse gas (GHG) emissions, we have developed an application and calculation method, based on the following guidelines and methodologies:

- Includes scopes 1, 2 and 3 emissions according to "The Greenhouse Gas Protocol. A Corporate Accounting and reporting standard".
- Report of Scope 3 according to Corporate Value Chain (Scope 3).
- It includes the emissions of the 6 GHGs set out in the 2006 IPCC guidelines for national GHG inventories (hereinafter 2006 IPCC GHG).
- Standard UNE-ISO 14064-1. Greenhouse Gases Part 1: Specification with guidance at the organization level for quantification and reporting of greenhouse gas emissions and removals.
- Standard UNE-ISO 14064-2. Greenhouse Gases Part 2: Specification with guidance at the project level for quantification, monitoring and reporting of greenhouse gas emission reductions or removal enhancements.
- Standard UNE-ISO 14064-3. Greenhouse Gases Part 3: Specification with guidance for the validation and verification of greenhouse gas assertions.
- Definition of life cycles in accordance with the UNE-EN-ISO 14040 and ENE-EN-ISO 14044 standards on life cycle analyses.
- Example of specific emission factors pursuant to the 2006 IPCC guidelines on national GHG inventories (hereinafter GHG IPCC 2006) and use of other documentary sources and checkable bibliographies.

7.2. Operational Limits

Naturgy's Carbon Footprint inventory includes GHG emissions from the following activities of the group:

- Recovery, road transportation, liquefaction, maritime transportation, regasification, distribution and marketing of natural gas.
- Carbon-fired, fuel-fired and combined cycle thermal generation, combined generation, generation in wind farms and hydropower plants.
- Mining.
- Electricity distribution.
- Offices.

7.2.1. Systems included in the footprint

Different units of calculations have been included in all the aforementioned activities. In other words, all the facilities of each activity. The businesses and activities considered to determine the calculation units are treated according to the criteria of global consolidation, according to the shareholding percentages defined by the Economic-Financial Management Division.

The calculation units include energy consumption (fuels, electricity), waste production and consumption of other raw materials or chemical products. This energy consumption produces emissions throughout their life cycle:

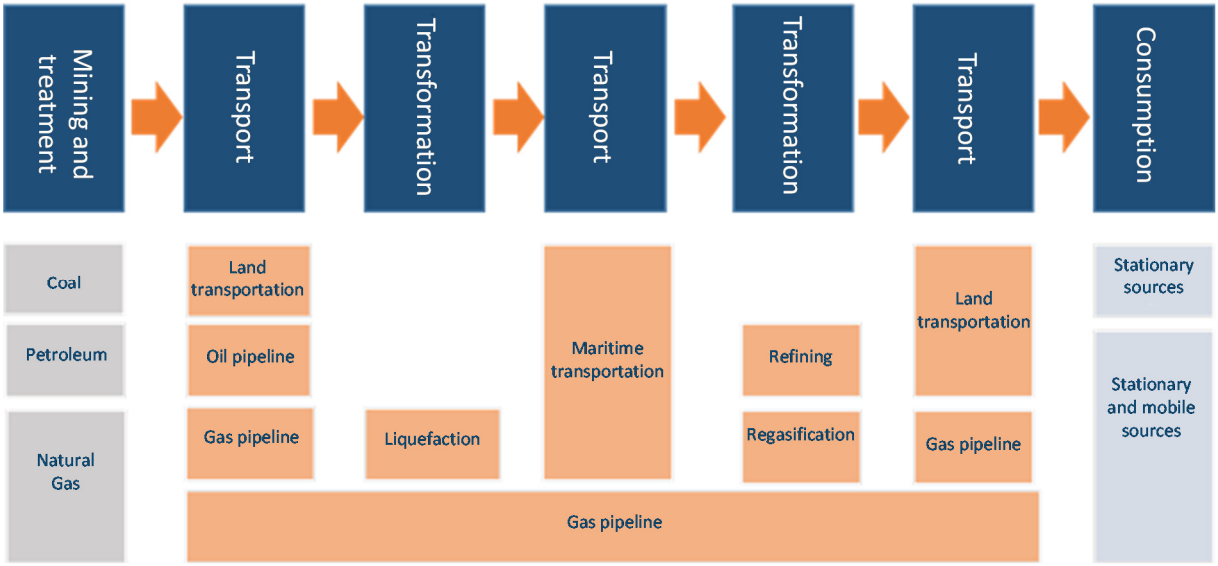

Diagram 1: Life cycle systems of the main fuels (ethanol is not included).

Life cycle of fuels used

The fuels used in both fixed sources (fuels for thermal power stations: coal, natural gas, fuel, propane, diesel and petroleum coke. Stationary combustion) and mobile sources (gasoline, gas oil, natural gas, propane and ethanol) have been considered.

In sea transportation, the fuel of methane carriers is boil-off: it comes from the same LNG they transport as well as fuel, diesel and low-sulphur diesel.

Energy

Emissions from electric power have only been considered when it is used as primary energy and it is not generated by any of the units of the calculation of the group:

- Electricity consumption purchased from external suppliers.
- Losses derived from transportation and distribution of the energy distributed and not generated by the company in each country.
- Emissions from the Life Cycle of the fuels used in the generation mix of each country.

Chemical products

Chemical products with a consumption over 85% of the total consumption have been considered. Two systems have been considered for each chemical product, the System called “Manufacturing” and the “Transportation” System.

Waste

Wastes with over 85% of total generation have been considered. The following common systems have been taken into account for each waste considered:

- Transportation system. The most common transportation system is by road, with trucks (10T and 27T diesel). However, ashes and dross generated in some of the coal-fired power plants are transported by conveyor belts.
- Individualised management of each type of waste: recycling or regeneration and energy recovery or incineration.
- Final destination. Usually land-fill site and/or tip (for dross and ashes from coal-fired power plants).

Geographical limits

Geographical limits have been defined taking into account the location by country of the activity performed and the source of the fuels, as well as management of generated waste and the manufacture and transportation of the chemical products consumed.

For the annual inventory, it is necessary to conduct a series of preliminary studies to define the structure of starting data, such as the update of gas, coal and crude oil supply routes. (There are over 500 routes that communicate 165 recovery points in 30 countries):

Thus, 3 types of data are updated each year:

- Characteristics of the recovery points (specific factors based on the country, technology, type of well or mine...).
- Definition of the routes themselves (distances for each country and specific factors).
- Assessment of fuels in destination countries.

Types of emissions

- Scope 1. Direct GHG emissions, meaning those from sources owned by the company itself.
- Scope 2. Indirect emissions due to the generation of electrical energy purchased by the company for its own consumption but not generated by the group.
- Scope 3. Indirect emissions, not included in scope 2, derived from the group's value chain, including upstream and downstream emissions, which are not directly controlled or managed by the group. The following categories defined by GHG Protocol have been calculated as part of the group's scope 3:

    - Acquired products and services: emissions derived from the "manufacture" of purchased products and services. This category includes chemical products used in each calculation unit of each activity of the group.
    - Equipment goods: emissions resulting from construction of equipment goods in the year analysed. There are four infrastructures included in capital goods: electricity lines, transformers associated with transformer stations, gas pipelines and wind power plants.
    - Life cycles of fuels: emissions from life cycle of fuels. This category includes the following sub-categories:

        - A.1: Emissions from recovery, treatment and transportation of coal.
        - A.2: Emissions from recovery, treatment (liquefaction and gasification) and transportation (via gas pipeline and/or LNG carrier not owned by the company) of natural gas.
        - A.3: Emissions from recovery, treatment (refining) and transportation (via oil pipeline and/or oil tanker) from oil derivatives.
        - B: Emissions from life cycles of the fuels used for electricity generation of the energy mix of each country.
        - C: Emissions due to electricity losses in transportation and distribution of electricity consumed but not generated.
        - D: Emissions from the energy that has been consumed by the group but it is unclear whether it was generated and/or distributed by the group.

    - Upstream Transportation: Emissions derived from the "transportation" system of purchased products and services. In this case, it is the transportation of chemical products consumed in each calculation unit of the group.
    - Waste: Emissions from transportation and management systems of generated waste (both hazardous and non-hazardous).

- Business trips: Emissions derived from movements of workers by plane, train or any means other than the vehicle fleet owned by the group. It is divided into two sub-categories:

  - ✓ A: Company staff train travel.
  - ✓ B: Company staff flights.

- Worker commutes: Emissions derived from worker commutes from their respective homes to work.
- Leasing (upstream): This category covers the methane emissions from leased concession dams.
- Use of sold products: This category includes emissions from combustion/burning of sold products. There are two sub-categories:

  - ✓ A: Emissions from burning natural gas sold by the group to the customer, minus the gas consumed.
  - ✓ B: Emissions from the coal extracted from Kangra. All the coal extracted in Kangra has been sold to third parties.

- Concessions: This category includes emissions from the concession of the Touro dam.
- Investments: This category includes emissions from handling coal at the Richards Bay coal terminal in South Africa, as well as direct and indirect emissions from activities not included in the consolidation perimeter (Ecoeléctrica, Unión Fenosa Gas, Nueva Generadora del Sur...).

7.3. Organisational Limits

The GHG inventory in the Carbon Footprint Report 2017 includes all the businesses and activities according to the criteria of financial consolidation, according to the shareholding percentages defined by the Economic-Financial Management Division, grouped by segments. Therefore, discrepancies may exist with regards to the climate information reported in the Corporate Responsibility Report, since the latter excludes office activities, vehicle fleets and nuclear activities (along with their electricity production).

Electricity Generation Segment

It includes the electricity generated in Spain, Costa Rica, Mexico, Panama, Puerto Rico, the Dominican Republic and Kenya by combined cycle, thermal, nuclear, hydroelectric, co-generation and wind power plants.

Companies:

- Naturgy Generación S.L.U. (Electricity generating power plants in the Ordinary Scheme in Spain)
- Naturgy Renovables, S.L.U. (Facilities in the Special Scheme in Spain)
- Global Power Generation S.A.U. (Electricity power plants in Panama, the Dominican Republic, Costa Rica, Kenya, Mexico and Puerto Rico)

Exclusions:

- C.N. Trillo, C.B. (34.5%)
- C.N. Almaraz, C.B. (11.29%)
- Sociedade Galega Do Medio Ambiente, S.A. (49%)

Gas Distribution Segment

It encompasses the regulated gas distribution business in Spain, Italy, Argentina, Brazil, Colombia and Mexico.

Companies:

- Nedgia S.A. (Gas transmission and distribution in Spain)
- Nedgia, S.P.A. (Gas distribution in Italy)
- Gas Natural Distribución Latinoamérica, S.A. (Gas distribution in Brazil, Argentina, Mexico and Colombia)

Gas segment.

Includes activity derived from the gas infrastructure, the supply and commercialisation activity and Unión Fenosa Gas. The infrastructures business includes gas exploration and production from extraction until the liquefaction process. It also includes the activities in the Liquefied Natural Gas (LNG) value chain, from the moment that it leaves exporting countries (liquefaction plants) to the points of entry in end markets, including maritime transport of the LNG and the regasification process. It also includes operation of the Maghreb-Europe gas pipe. The Supply and Commercialisation business includes supply and commercialisation of natural gas to wholesale and retail customers from the deregulated Spanish market, as well as supplies of products and services related to retail sales. Sales of natural gas to customers outside Spain are also included.

Companies:

- Metragaz, S.A.
- Medgaz, S.A.
- E.M.P.L.
- Petroleum Oil & Gas España, S.A.
- Gas Natural Almacenamientos de Andalucia, S.A.
- Gas Natural Aprovisionamiento SDG, S.A.
- Sagane, S.A.
- Gas Natural Comercializadora SDG, S.A.
- Gas Natural Servicios SDG, S.A.

- Gas Natural S.U.R., S.A.
- Naturgy LNG, S.L. (Commercialisation of liquefied natural gas worldwide)
- Naturgy Internacional, S.A. (Commercialisation of liquefied natural gas in Mexico, Colombia, Brazil, Argentina, Italy, France, Luxembourg, Belgium, Holland, Germany, Austria, Puerto Rico, India, Singapore, Turkey and Uruguay)
- Unión Fenosa Gas

Electricity Distribution

Encompasses the regulated electricity generation business in Spain, Moldova and Panama.

Companies:

- Unión Fenosa Distribución, S.A. (Spain)
- Naturgy Internacional, S.A. (Panama, Moldova)

Mining

Includes operation of a coal field owned by the company Kangra Coal (Proprietary), Ltd. in South Africa

Companies:

- Unión Fenosa Distribución, S.A. (Spain and South Africa)

Offices

Includes all the offices that are related to the previously described activities.

Companies:

- Gas Natural SDG, S.A. (Work centres in all the countries where we have presence)

8. Appendices

8.1. Organisation and shareholdings

NAME	PROFILES	INFORMATION PROVIDED (%)
Work centres (Argentina)	International Resources Corporation	100%
Work centres (Brazil)	International Resources Corporation	100%
Work centres (Colombia)	International Resources Corporation	100%
Damietta	Liquefaction (Unión Fenosa Gas)	41%
Cartagena Group I	Combined-Cycle Thermal Plants	100%
Cartagena Group II	Combined-Cycle Thermal Plants	100%
Cartagena Group III	Combined-Cycle Thermal Plants	100%
Cartagena Common	Combined-Cycle Thermal Plants	100%
CH Tambre I	Hydropower Plants	100%
CH Tambre II	Hydropower Plants	100%
CH Portodemouros	Hydropower Plants	100%
Toledo PV	Solar Generation	33%
Limeisa	Mining	100%
Work centres (France)	International Resources Corporation	100%
Work centres (Morocco)	International Resources Corporation	100%
Work centres (Panama)	International Resources Corporation	100%
Work centres (Dominican Republic)	International Resources Corporation	100%
Kangra	Mining	100%
North Region - Galicia	Electricity Distribution	100%
North Region - Castile and Leon	Electricity Distribution	100%
Centre Region - Castile-La Mancha	Electricity Distribution	100%
Centre Region - Madrid	Electricity Distribution	100%
Gómez Ulla	Cogeneration	100%
El Romeral Petroleum (Electricity generation)	Cogeneration	100%
Nuelgas	Cogeneration	50%
Sabón	Combined-Cycle Thermal Plants	100%
Campo de Gibraltar Group I	Combined-Cycle Thermal Plants	100%
Campo de Gibraltar Common	Combined-Cycle Thermal Plants	50%
Palos Group I	Combined-Cycle Thermal Plants	100%
Palos Group II	Combined-Cycle Thermal Plants	100%
Palos Group III	Combined-Cycle Thermal Plants	100%
Palos Common	Combined-Cycle Thermal Plants	100%
Sagunto Group I	Combined-Cycle Thermal Plants	100%
Sagunto Group II	Combined-Cycle Thermal Plants	100%
Sagunto Group III	Combined-Cycle Thermal Plants	100%
Sagunto Common	Combined-Cycle Thermal Plants	100%
Narcea Group I	Coal-Fired Thermal Power Plants	100%
Narcea Group II	Coal-Fired Thermal Power Plants	100%
Narcea Group III	Coal-Fired Thermal Power Plants	100%
Narcea Common	Coal-Fired Thermal Power Plants	100%
La Robla Group I	Coal-Fired Thermal Power Plants	100%
La Robla Group II	Coal-Fired Thermal Power Plants	100%
La Robla Common	Coal-Fired Thermal Power Plants	100%
Work centres (Moldova)	International Resources Corporation	100%
Gas Natural BAN, S.A.	Gas Distribution	100%
La Joya Plant	Hydropower Plants	100%
Energy Services (LNG plants)	Wholesale Energy | Retail Market	100%
Metragaz, S.A.	Gas transport	100%
Gas Natural México S.A. de CV	Gas Distribution	100%
Hermosillo	Combined-Cycle Thermal Plants	100%

NAME	PROFILES	INFORMATION PROVIDED (%)
Naco Nogales	Combined-Cycle Thermal Plants	100%
Red UF, S.A.	Electricity Distribution	100%
Ecoeléctrica LP	Combined-Cycle Thermal Plants	48%
Regasification (Puerto Rico)	Regasification	48%
Palamara	Fuel-based Thermal Plants	100%
La Vega	Fuel-based Thermal Plants	100%
Nairobi South Power	Fuel-based Thermal Plants	100%
Gas extraction and storage	Gas extraction and storage	100%
Work centre Madrid	Resources Corporation Spain	50%
Gas Natural Servicios, S.A	Retail Market (Energy Services)	100%
Malaga	Combined-Cycle Thermal Plants	100%
Port of Barcelona Group I	Combined-Cycle Thermal Plants	100%
Aceca	Combined-Cycle Thermal Plants	100%
Anllares	Coal-Fired Thermal Power Plants	67%
Meirama	Coal-Fired Thermal Power Plants	100%
José Cabrera	Nuclear Thermal Power Plants	100%
Purchasing	Purchasing/Procurement	100%
Work centres (Mexico)	International Resources Corporation	100%
Port of Barcelona Group II	Combined-Cycle Thermal Plants	100%
Port of Barcelona Common	Combined-Cycle Thermal Plants	100%
Resources (common)	Resources Corporation Spain	100%
Cogenerations (common)	Cogeneration	100%
Wind Farms (common)	Wind Generation	100%
Hydropower Plants (Common)	Hydropower Plants	100%
Centre Region (common)	Gas Distribution	100%
North Region (common)	Gas Distribution	100%
East Region (common)	Gas Distribution	100%
Levante Region	Gas Distribution	100%
South Region (common)	Gas Distribution	100%
St. Adriá de Besós	Combined-Cycle Thermal Plants	100%
San Roque	Combined-Cycle Thermal Plants	100%
Regions (common)	Electricity Distribution	100%
Small Hydropower plants (Common)	Hydropower Plants	100%
Unión Fenosa Gas Maritime Transport LNG	Maritime transport of LNG	50%
Stream Maritime Transport LNG (Scope 1 100%)	Maritime transport of LNG	100%
Qalhat	Liquefaction (Unión Fenosa Gas)	4%
Tuxpan TG 3-1	Combined-Cycle Thermal Plants	100%
Tuxpan TG 3-2	Combined-Cycle Thermal Plants	100%
Tuxpan TG 4-1	Combined-Cycle Thermal Plants	100%
Tuxpan TG 4-2	Combined-Cycle Thermal Plants	100%
Tuxpan Common	Combined-Cycle Thermal Plants	100%
Durango TG 1-1	Combined-Cycle Thermal Plants	100%
Durango TG 1 -2	Combined-Cycle Thermal Plants	100%
Durango Common	Combined-Cycle Thermal Plants	100%
García Carrión Daimiel	Cogeneration	100%
Gas Distribution (Brazil)	Gas Distribution	100%
Small Hydropower Plants (Panama)	Hydropower Plants	100%
Electricity distribution (Panama)	Electricity Distribution	100%
Centre Region - Castile-La Mancha	Gas Distribution	100%
Centre Region - Madrid	Gas Distribution	100%
East Region - Aragon	Gas Distribution	100%
East Region - Catalonia	Gas Distribution	100%
East Region - La Rioja	Gas Distribution	100%
East Region - Navarre	Gas Distribution	100%
East Region - Basque Country	Gas Distribution	100%

NAME	PROFILES	INFORMATION PROVIDED (%)
North Region - Cantabria	Gas Distribution	100%
North Region - Castile and Leon	Gas Distribution	100%
North Region - Galicia	Gas Distribution	100%
South Region - Andalusia	Gas Distribution	100%
South Region - Extremadura	Gas Distribution	100%
Hydropower Plants Duero Basin	Hydropower Plants	100%
Hydropower Plants Jucar Basin	Hydropower Plants	100%
Hydropower Plants Miño Basin	Hydropower Plants	100%
Hydropower Plants Tajo - Castile-La Mancha Basin	Hydropower Plants	100%
Hydropower Plants Tajo - Castile and Leon Basin	Hydropower Plants	100%
Hydropower Plants Aguas de Galicia Basin (Rest)	Hydropower Plants	100%
Centre Region - Castile-La Mancha	Resources Corporation Spain	100%
Centre Region - Madrid	Resources Corporation Spain	100%
East-South Region - Andalusia	Resources Corporation Spain	100%
East-South Region - Balearic Islands	Resources Corporation Spain	100%
East-South Region - Catalonia	Resources Corporation Spain	100%
East-South Region - Extremadura	Resources Corporation Spain	100%
East-South Region - Levante	Resources Corporation Spain	100%
East-South Region - Murcia	Resources Corporation Spain	100%
North Region - Aragon	Resources Corporation Spain	100%
North Region - Asturias	Resources Corporation Spain	100%
North Region - Castile and Leon	Resources Corporation Spain	100%
North Region - Galicia	Resources Corporation Spain	100%
North Region - Basque Country	Resources Corporation Spain	100%
North Region - Navarre	Resources Corporation Spain	100%
North Region - Rioja	Resources Corporation Spain	100%
North Region - Canary Islands	Resources Corporation Spain	100%
Wind farms Andalusia	Wind Generation	100%
Wind farms Aragon	Wind Generation	100%
Wind farms Castile-La Mancha	Wind Generation	100%
Wind farms Castile and Leon	Wind Generation	100%
Wind farms Catalonia	Wind Generation	100%
Wind farms Galicia	Wind Generation	100%
Small Hydropower plants Castile-La Mancha	Hydropower Plants	100%
Small Hydropower plants Galicia	Hydropower Plants	100%
Hydropower Plants Tajo - Madrid Basin	Hydropower Plants	100%
Inactiv -Energía Empresarial de la Costa (Work Centre)	International Resources Corporation	100%
Work centres (Chile)	International Resources Corporation	100%
CGE Argentina, S.A.	Electricity Distribution	100%
Metrogas	Gas Distribution	100%
Bii Hioxo	Wind Generation	100%
Edelmag (Generation)	Fuel-Gas Thermal Power Plants	100%
Zone I Arica-Iquique	Electricity Distribution	100%
Zone II Antofagasta	Electricity Distribution	100%
Zone III Copiapó	Electricity Distribution	100%
Zone IV Coquimbo-Viña	Electricity Distribution	100%
Zone V Metropolitan Region	Electricity Distribution	100%
Zone VI Ohiggins	Electricity Distribution	100%
Zone VII Maule	Electricity Distribution	100%
Zone VIII Araucanía-Biobio	Electricity Distribution	100%
La Dehesa PV	Solar Generation	100%
Torito	Hydropower Plants	100%
Viura Plant	Gas extraction and storage	29%
Gas Natural Fenosa Perú, S.A.	Gas Distribution	100%
Work centres (Peru)	International Resources Corporation	100%

NAME	PROFILES	INFORMATION PROVIDED (%)
Edelmag (Distribution)	Electricity Distribution	100%
Work Centre Marismas Base	Resources Corporation Spain	100%
Work Centre Romeral Base	Resources Corporation Spain	100%
Sertao I	Solar Generation	100%
Sobral I	Solar Generation	100%

8.2 Emission factors

LCV ng	MJ/kg	47.585	Internal data Gas Natural Fenosa
HCV ng	MJ/kg	52.873	Internal data Gas Natural Fenosa
LCV petrol	MJ/kg	44.3	OECC Carbon Footprint Calculation Guide
LCV Diesel/Gas oil A & C Spain	MJ/kg	43	OECC Carbon Footprint Calculation Guide
LCV ethanol	MJ/kg	27	Table 1.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
LCV biodiesel	MJ/kg	27	Table 1.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
LCV fuel oil	MJ/kg	40.4	OECC Carbon Footprint Calculation Guide
Density ng	kg/m3	0.8076	Internal data Gas Natural Fenosa
Density petrol	kg/l	0.7475	OECC Carbon Footprint Calculation Guide
Density diesel/gas oil A	kg/l	0.8325	OECC Carbon Footprint Calculation Guide
Density diesel/gas oil C	kg/l	0.9	OECC Carbon Footprint Calculation Guide
Density ethanol	kg/l	0.789	Internal data Gas Natural Fenosa
Density biodiesel	kg/l	0.845	Royal Decree 61/2006
Density methane	kg/m3	0.7175	Internal data Gas Natural Fenosa
Density propane	kg/l	0.5185	CEPSA product sheet
LCV propane	MJ/kg	46.2	OECC Carbon Footprint Calculation Guide
HCV propane	MJ/kg	49.98	CEPSA product sheet
EF CO2 petrol	kg CO2/GJ	69.3	OECC Carbon Footprint Calculation Guide
EF CH4 petrol	kg CH4/GJ	0.025	Table 3.2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O petrol	kg N2O/GJ	0.008	Table 3.2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CO2 diesel/gas oil A	kg CO2/GJ	74.1	OECC Carbon Footprint Calculation Guide
EF CO2 diesel/gas oil C	kg CO2/GJ	73	OECC Carbon Footprint Calculation Guide
EF CH4 diesel/gas oil stationary sources (hereinafter ss)	kg CH4/GJ	0.01	Table 2.4. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O diesel/gas oil ss	kg N2O/GJ	0.0006	Table 2.4. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CO2 MDO carriers	tCO2/tMDO	3.206	International Maritime Organization
EF CH4 diesel/gas oil mobile sources (hereinafter ms)	kg CH4/GJ	0.007	Table 3.5.3. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O diesel/gas oil ms	kg N2O/GJ	0.002	Table 3.5.3. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CH4 diesel/gas oil electricity generation	kg CH4/GJ	0.003	Table 2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O diesel/gas oil electricity generation	kg N2O/GJ	0.0006	Table 2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CO2 HFO carriers	tCO2/tHFO	3.1144	International Maritime Organization
EF CH4 fuel oil ms	kg CH4/GJ	0.007	Table 3.5.3. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O fuel oil ms	kg N2O/GJ	0.002	Table 3.5.3. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CH4 fuel oil electricity generation	kg CH4/GJ	0.003	Table 2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O fuel oil electricity generation	kg N2O/GJ	0.0006	Table 2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CH4 domestic coal	kg CH4/GJ	0.0006	Table. 1.4.2. (01.01.01) National Atmospheric Emission Inventories 1990-2012. Volume 2: Analysis by SNAP Activities.
EF N2O domestic coal	kg N2O/GJ	0.0008	Table. 1.4.2. (01.01.01) National Atmospheric Emission Inventories 1990-2012. Volume 2: Analysis by SNAP Activities.

EF CH4 imported coal	kg CH4/GJ	0.0006	Table. 1.4.2. (01.01.01) National Atmospheric Emission Inventories 1990-2012. Volume 2: Analysis by SNAP Activities.
EF N2O imported coal	kg N2O/GJ	0.0008	Table. 1.4.2. (01.01.01) National Atmospheric Emission Inventories 1990-2012. Volume 2: Analysis by SNAP Activities.
EF CH4 coke	kg CH4/GJ	0.0003	Table. 1.4.2. (01.01.01) National Atmospheric Emission Inventories 1990-2012. Volume 2: Analysis by SNAP Activities.
EF N2O coke	kg N2O/GJ	0.0025	Table. 1.4.2. (01.01.01) National Atmospheric Emission Inventories 1990-2012. Volume 2: Analysis by SNAP Activities.
EF CO2 natural gas	kg CO2/GJ	56.1	OECC Carbon Footprint Calculation Guide
EF CH4 natural gas ss	kg CH4/GJ	0.005	Table 2.4. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O natural gas ss and electricity generation	kg N2O/GJ	0.0001	Table 2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CH4 natural gas ms	kg CH4/GJ	0.092	Table 3.2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF N2O natural gas ms	kg N2O/GJ	0.003	Table 3.2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CH4 natural gas electricity generation	kg CH4/GJ	0.001	Table 2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF CO2 LNG carriers	tCO2/tLNG	2.75	International Maritime Organization
EF CH4 natural gas carriers	kg CH4/GJ	0.004	Table 2.7. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. By analogy with the type of turbine. Gas turbines >3MW
EF N2O natural gas carriers	kg N2O/GJ	0.001	Table 2.7. 2006 IPCC Guidelines for National Greenhouse Gas Inventories. By analogy with the type of turbine. Gas turbines >3MW
EF CO2 propane	kgCO2/GJ	63.6	OECC Carbon Footprint Calculation Guide
EF CH4 propane ms	kgCH4/GJ	0.062	Table 3.2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories LPG
EF N2O propane ms	kgCO2/GJ	0.0002	Table 3.2.2. 2006 IPCC Guidelines for National Greenhouse Gas Inventories LPG
EF CH4 propane ss	kgCO2/GJ	0.005	Table 2.4. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
EF NO2 propane ss	kgCO2/GJ	0.0001	Table 2.4. 2006 IPCC Guidelines for National Greenhouse Gas Inventories
GWP Methane	kgCO2/kgCH4	25	IPCC 4th Assessment Report
GWP SF6	kgCO2/tSF6	2.3E+07.	IPCC 4th Assessment Report
GWP N2O	kgCO2/tN2O	298000	IPCC 4th Assessment Report
GWP HFC	kgCO2/tHFC	1.5E+07	IPCC 4th Assessment Report
GWP PFC	kgCO2/kg PFC	1.2E+07	IPCC 4th Assessment Report

Indirect CO_2 Emissions (Scope 2)		
Country	$KgCO_2/kWh$	
Spain	0.36	
It corresponds to the CNMC electricity mix factor for 2016		
(published in April 2017)		
EN17 Administration		
Average distance short-haul plane journey	km	510
Average distance medium-haul plane journey	km	1643
Average distance long-haul plane journey	km	6096
Average distance train journeys	km	659
Emission factor short-haul plane journeys	kg CO_2/km	0.14
Emission factor medium-haul plane journeys	kg CO_2/km	0.10
Emission factor long-haul plane journeys	kg CO_2/km	0.08
Emission factor train journeys	kg CO_2/km	0.06

Bureau Veritas
Certification

Declaration of conformity
GHG emissions

UNE ISO 14064-1

NATURGY ENERGY GROUP, S.A

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28108 Alcobendas – MADRID

VERIFICATION REPORT
NATURGY ENERGY GROUP, S.A.

1. VALIDATED/VERIFICATE EMISSIONS

The activities included in this verification and therefore included in the carbon footprint inventory are:

- Extraction, land transport, liquefaction, maritime transportation, regasification, distribution and commercialization of natural gas.
- Thermal generation of coal, thermal fuel and combined cycle thermal, cogeneration, generation in wind farms and hydroelectric power plants.
- Mining.
- Electric power distribution.
- Offices

PERIOD 01-01-2017 to 12/31/2017

CONCEPTO	tCO2 e
Emissions GHG SCOPE 1	**20.531.127 t CO_2e**
Emissions GHG SCOPE 2	**1.317.179 t CO_2e**
Emissions GHG SCOPE 3	**141.801.261 t CO_2e**
Total GHG emissions of NATURGY GENERACIÓN, S.L.U. in 2017	**163.649.568 t CO_2e**

2. DECLARATION OF CONFORMITY

Opinion

The auditor team manifest the following opinion according to the requirement of the standards:

☒ EN- ISO 14064-1
☐ EN- ISO 14064-2
☒ EN- ISO 14064-3

Under an assurance level:

☐ **Limited**
☒ **Reasonable**

Based on the process and procedures performed, it is determined that the GHG declaration is substantially correct and is a faithful representation of the GHG information and data

José Manuel Sánchez
Lead Auditor

June 25, 2018