4.7 Climate Change and Energy Efficiency [GRI 103-1, GRI 103-2, GRI 103-3]

Improved energy efficiency and lower greenhouse gas emissions are major factors in reinforcing the vital role that natural gas will play in a low carbon economy as a key element for achieving sustainable, safe and efficient energy.

The most relevant aspects that we address in our climate change management model are public commitment and the setting of objectives, emissions reduction and compensation measures, as well as reporting on our performance and results.

Milestones 2017

- Production of analyses and studies to promote the use of natural gas instead of other more polluting fuels.
- Approval of Corporate Directives concerning Sustainable Mobility.
- Renewal of the maintenance and management fleet with vehicles using compressed natural gas (CNG).
- Involvement in the project for the promotion of the use of natural gas as a fuel on the railways through a pilot test of liquefied natural gas in a passenger train.
- Launch of the voluntary carbon offsetting programme.
- Signing of the commitment to adopt the recommendations of the report drafted by the *Task Force on Climate related Financial Disclosures* (TFCD).
- Registration with the 'Carbon Footprint, Compensation and Absorption Projects' of the MAPAMA, with 'calculation and reduction' seal achieved for 2016.

Targets 2018

- Energy management system establishment under ISO 50001.
- Evaluation of the most significant suppliers in terms of climate change.
- Setting short and long-term (science based targets) emissions reduction objectives.
- Review of economic quantifications of risks and opportunities arising from climate change (preparation of scenarios based on temperature increases - TCFD).
- Review of electricity supply contracts with the aim of increasing the percentage of electricity supplied with 40% guarantees of origin in practically all the infrastructures.

0.4%
of reduction of the 2017 carbon footprint reduction (Scopes 1 and 2) in the facilities in Spain compared to 2016

2,069 tCO_2e
avoided through energy efficiency measures

266,357 tCO_2e
Scope 1 emissions [GRI 305-1]

46,851 tCO_2e
Scope 2 emissions [GRI 305-2]

Commitment to action on climate change

Enagás has taken on a major commitment to the fight against climate change and for the improvement of air quality.

Accordingly, the company has adopted a public commitment by joining the 'WE MEAN BUSINESS' initiative, with an undertaking to promote policies towards a low carbon economy, to set a carbon price and report information on climate change in corporate publications. In relation to this last commitment, Enagás has been a pioneer in signing the commitment to adopt the report recommendations drafted by the *Task Force on Climate related Financial Disclosures* (TFCD). Likewise, it is part of the Spanish Green Growth Group and we are members of the Action for Climate initiative.

Climate change management model

Enagás' climate change management model is based on the evaluation and minimization of the environmental impact of our activity, plus reporting through the company's Annual Report and carbon footprint.

Since 2013, Enagás calculates and verifies its carbon footprint according to ISO 14064 before an independent third party to provide reliability and transparency to its calculations based on a realistic scenario for the definition of its strategy.

As part of this strategy, the setting of a carbon price for the period 2015-2020 has enabled environmental externalities to be included in the company's business and investment decision-making.

Likewise, the company sets itself improvement challenges by setting annual and medium-term emissions reduction targets, as well as through the definition of an emissions compensation strategy.

We extend our commitments and actions on climate change to our supply chain through the inclusion of criteria related to the management of climate change in procurement processes.

To achieve these objectives, for several years, there has been an Energy Efficiency and Emissions Reduction Plan which annually identifies, develops and quantifies different energy saving measures. They include a campaign to detect, quantify and reduce leak emissions (LDAR), which continued in 2017, ensuring the regular monitoring of the methane emissions of our facilities.

Moreover, Enagás participates in numerous international studies and lines of research related to the quantification and reduction of greenhouse gas emissions (mainly carbon dioxide and methane) in the natural gas value chain, which is currently a highly debated problem in the sector.

In innovation matters, Enagás has supported the creation of the Vira Gas Imaging start-up, a manufacturer of infra-red cameras (Optical Gas Imaging) for use in early detection of methane leaks into the atmosphere and their subsequent quantification.

Enagás has been a pioneer in signing the commitment to adopt the recommendations of the *Task Force on Climate related Financial Disclosures* (TCFD)

Management of the climate change-related risks

[GRI 102-29, GRI 102-31, GRI 201-2]

By applying the company's risk management model (see the chapter on 'Risk Management'), Enagás has identified the following risks related to climate change:

Type of risk	Description	Mitigation measures	Probability	Impact
Risk derived from regulatory changes	International agreements aimed at the development of zero-emission energy sources, particularly renewable ones, which may impact the demand for natural gas.	• Promotion of new services and uses of natural gas in transportation by road, rail and sea and in the industrial and household sectors. • Promotion of the development of gas from renewable sources and hydrogen and their integration in gas infrastructures. • Promotion of the development of new technologies and infrastructures for the capture, transmission and storage or use of CO_2 and small-scale liquefaction.	Medium	High
	Increased costs associated with compliance with laws governing CO_2 emissions.	• Setting the target of 30% reduction in emissions for 2016–2018, linked to variable employee remuneration. • Energy Efficiency and Emissions Reduction Plan. • Setting a carbon price for the 2015-2020 period, in order to fully incorporate environmental externalities into our business and investment decisions. • Carbon offsetting programme.	Medium	Low
Risk derived from physical parameters	Unpredictable weather patterns, with fluctuations in temperature extremes that could cause catastrophic natural disasters, such as flooding, and therefore impact natural gas demand.	• Environmental certification (ISO 14001 and EMAS) • Emergency response action plans. • Procedures for investigation and monitoring of incidents. • Development of natural gas demand and peak demand scenarios that determine the infrastructure to develop in order to guarantee secure supply. • Policies regarding catastrophic material damage, such as that caused by flooding, earthquakes, volcanic eruptions, cyclones, etc.). • Emergency response action plan for the Spanish Gas System. • Insurance policy covering catastrophic damage. • Review of plans for adaptation to climate change in infrastructures.	Low	Low

Energy efficiency and emissions reduction targets

Enagás annually sets energy consumption targets as well as targets for its own power generation from efficient, clean and renewable sources. These targets are linked to the variable remuneration paid to professionals.

In addition, the company has set long-term goals, such as cutting emissions by 30% over the 2016–2018 period compared to 2013–2015, which has been included in long-term variable remuneration.

During the first two years, emissions were reduced by 37% compared to the 2013-2015 annual average.

In 2017, the percentage of electricity with guarantees of origin out of total grid electricity consumption was 20%. From 2018, the percentage of electricity with guarantees of origin has increased by up to 40% in practically all facilities.

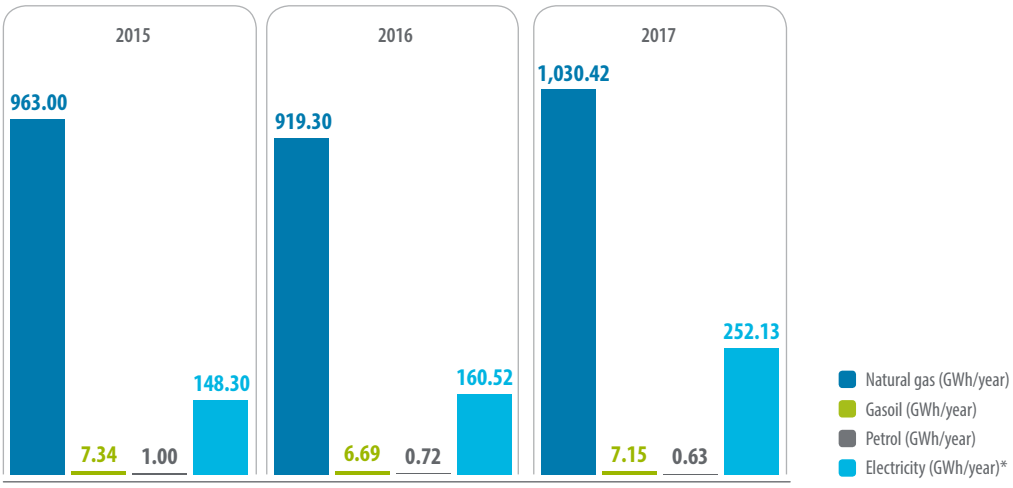
Self-generated electricity from renewable, clean or efficient sources in 2017 accounted for 11% (21.1 GWh) of total consumption, with part of this electricity delivered to the national grid and the other part used at Enagás facilities. [GRI-OG3]

Energy Efficiency and Emissions Reduction Plan

At Enagás, energy efficiency has a key role in emissions reduction and considerable efforts have been made in this regard. The energy efficiency measures implemented in 2017 were able to prevent the emission of 2,069 tCO_2into the atmosphere.

Savings of 1.22 GWh of natural gas and 4.91 GWh of electricity were achieved with an investment of more than 2 million euros. [GRI 201-2]

Energy consumption (GWh/año) [GRI 302-1]



(*) Power consumption in 2017 includes 60.13 GWh of the GNL Quintero regasification plant.

Energy intensity

[GRI 302-3]

	2015	2016	2017
Energy intensity per turnover (GWh energy consumed /M€)	2.71	2.61	2.63
Energy intensity per employee (MWh energy consumed /employee)	837	813	905
Energy intensity per gas output (MWh energy consumed/GWh total outputs)	2.994	2.973	3.034

Energy Efficiency Measures established in 2017 [GRI 302-4, GRI 302-5, GRI 305-5]

Energy Efficiency Measures	Type of energy saving	Energy savings achieved in 2017	Emission reductions achieved in 2017
Campaign to detect, quantify and reduce fugitive emissions in four compression stations, 72 regulation and measurement stations, 82 valve positions and in the Huelva Regasification Plant and Serrablo Underground Storage Facility (in injection)	Natural gas savings	0.75 GWh	1,162 tCO_2e
Upgrading of the TC4 compressor in the Almendralejo Compression Station		0.47 GWh	94 tCO_2e
Installation of frequency inverter on primary LNG pumps (115 J) at the Huelva Regasification Plant	Electric consumption savings	1.48 GWh	221 tCO_2e
Installation of a frequency inverter on a seawater collection pump (116 J) in the Huelva Regasification Plant		1.01 GWh	151 tCO_2e
Installation of a frequency inverter on a seawater collection pump (116 J) in the Barcelona Regasification Plant		0.89 GWh	134 tCO_2e
Installation of a frequency inverter on a seawater collection pump P-1440-D1 in the Barcelona Regasification Plant		0.33 GWh	49 tCO_2e
Installation of frequency inverter on secondary LNG pumps GA-223-E at the Cartagena Regasification Plant		0.79 GWh	119 tCO_2e
Installation of frequency inverter on a primary LNG pump GA-231-B at the Cartagena Regasification Plant		0.03 GWh	5 tCO_2e
Installation of 122 frequency inverters in regulation and measurement station pumps		0.36 GWh	131 tCO_2e
Detection and repair of compressed air leaks in the Barcelona Regasification Plant		0.02 GWh	3.1 tCO_2e
Detection and repair of nitrogen leaks at the Barcelona Regasification Plant		0.0000012 GWh	0.00018 tCO_2e
Replacement of light fixtures in the warehouse and workshop of the Huelva Regasification Plant		0.01 GWh	0.9 tCO_2e
Total			**2,069 tCO_2e**

Reduction of fugitive emissions [GRI 305-5]

Fugitive emissions account for 17% of the company's carbon footprint and are responsible for most of methane emissions.

After several campaigns for the detection, quantification and repair of natural gas leaks in its facilities, Enagás has internalized these actions in the maintenance ranges of its facilities in order to reduce losses from emissions leaks from its activity year after year.

Simultaneously, Enagás analysed other existing best practices to reduce methane emissions in its facilities, taking account of its cost / benefit analysis, by identifying a list of measures to be included in the Energy Efficiency and Emissions Reduction Plan 2018.

Furthermore, Enagás participates in a number of associations actively collaborating in the preparation of reports, studies and research related to methane emissions. Among the published studies, the following are of note:

- Climatic and methane metrics, developed by the *Sustainable Gas Institute of London Imperial College*. This study analyses the different existing climate metrics and more suitable periods for the conversion of emissions of different greenhouse gases into tons of CO_2 equivalent (GWP, GTP, etc.). It should be noted that currently the 100-year GWP is the most widely recognized metric, used by expert bodies.
- The *Thinkstep/NGVA* study, Greenhouse Gas Intensity of Natural Gas, shows that greenhouse gas emissions from the natural gas value chain are lower than those of other fossil fuels both for use in power generation and in road transport (light and heavy vehicles) and maritime transport.

Carbon offsetting

In 2017, Enagás defined its carbon offsetting strategy, through which the company undertakes to achieve carbon neutrality in key strategic areas:

- Carbon neutrality of regasification plants: this involves key infrastructures for the security and diversification of supply. Furthermore, they are one of the priorities at strategic level, insofar as the company wishes to position itself as a global specialist in LNG (see the chapter on 'Our future project').
- Carbon neutrality of the corporate fleet: one of the strategic priorities of Enagás is the promotion of new uses of natural gas in transport. The corporate fleet, certified as an ecological fleet, is one of the key areas of the company's Sustainable Mobility Plan.
- Carbon neutrality of the corporate headquarters: the corporate headquarters is the company's most representative building and has recently received LEED Gold certification.

For the first time, Enagás has offsetted part of its 2017 footprint emissions with credits generated by emissions reduction projects developed in the countries where it operates, Peru and Chile, which also involve an improvement of environmental and social impact on local communities .

Thus, 19,478 tCO_2 have been offsetted with carbon credits generated by the following projects:

- Project for the substitution of stoves made with stones or terracotta with kitchen stoves with a chimney that emit fewer polluting gases among Peruvian populations.
- Project for the protection of forest areas within the Cordillera Azul National Park of Peru.
- Project for the collection and use of gas from one of the most important landfills in the region, in Chile, for power generation. The project includes electrical substations and a transmission line.

Enagás has offsetted part of its emissions with carbon credits generated by projects with social and environmental impact in local communities in Peru and Chile

Sustainable mobility

One of the Enagás strategic priorities is to encourage the substitution of more polluting fossil fuels with natural gas, contributing to reduce emissions in the transport sector.

Maritime transport

Enagás participates in projects such as CORE LNGas Hive. In this case, it is the coordinator of the project that includes 42 partners with a budget of € 33.3Bn, with the objective of the development of an integrated, safe and efficient logistics chain for the supply of liquefied natural gas (LNG) for fuel in the transport sector, especially in maritime transport, in the Iberian Peninsula: Spain and Portugal. This will promote the use of this alternative fuel not only for supply to ships but also for industrial equipment in port areas.

In addition, from its position as Vice President of the Maritime section of Gasnam, Enagás is promoting all necessary measures for the promotion and development of the infrastructures required for the use of LNG as a maritime transport fuel.

Rail transport

Enagás is collaborating with Renfe and other companies, supported by the Ministry of Public Works and Transport, to develop a test for the use of LNG in a passenger car on the Spanish railway network, as part of the Driving Vehicles with Alternative Energies Strategy in Spain 2014-2020 and in line with the implementation of Directive 2014/94 on the implementation of an infrastructure for alternative fuels in Europe. This project seeks to analyse the technical, environmental, legal and economic feasibility of railway traction with LNG to assess the possibility of extending this new traction solution to the commercial area in Spain.

Also, a second project will be developed, in collaboration with Renfe, to convert the railway traction of a diesel freight locomotive to LNG (raiLNG project). Enagás is also involved with RENFE in the development of intermodal transport of LNG isocontainers for combined transportation by Road-Rail-Sea.

Road transport

The company is participating in the ECO-GATE project, a consortium of natural gas operators and technology and service providers, end users and experts in market knowledge and promotion in Spain, Portugal, France and Germany, whose aim is to construct 23 gas stations (21 L-CNG, 1 Biomethane, 1 H2CNG) in the Atlantic and Mediterranean corridors of the road network of Spain, France, Germany and Portugal.

Likewise, the company's Sustainable Mobility Plan includes a range of initiatives aimed at its professionals and its fleet of vehicles, which promote the use of vehicular natural gas and optimize travel, thus reducing environmental impact. These include the replacement of vehicles for operation and maintenance by vehicles powered by CNG, if there are equivalent vehicles; the delivery of CNG vehicles to managers and the promotion of the purchase of this type of vehicle by their employees in advantageous conditions.

Additionally, the company is promoting the use of natural gas as an alternative fuel to oil in vehicle fleets through the creation of start-ups (Gas2Move and ScaleGas).

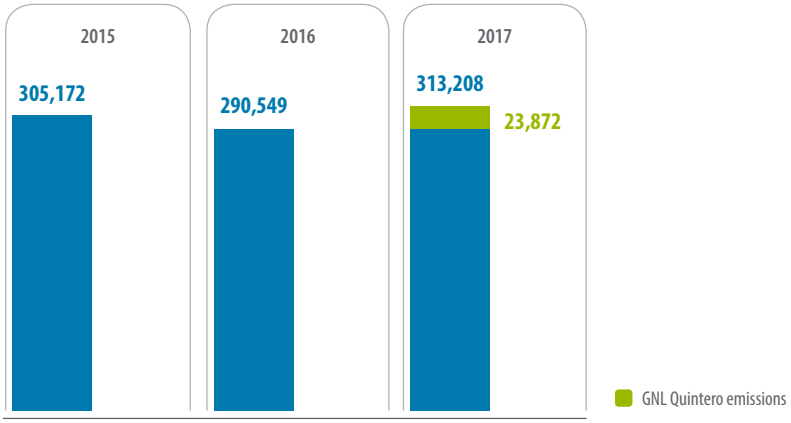
For the promotion and enhancement of CNG and LNG for use as land transport fuel, Enagás is also participating as a partner in Gasnam, NGVA and Sedigas, supporting the measures agreed in the sector.

Evolution of Scope 1 and 2 emissions

The Enagás carbon footprint (Scopes 1 and 2) has decreased by 0.4% compared to the previous year, excluding emissions from the LNG Quintero regasification plant.

Evolution of Scope 1 and 2 emissions (tCO_2e)

[GRI 305-1, GRI 305-2]



This slight decrease in emissions becomes relevant in a scenario of greater national demand and change of the balance sheet code that has caused an increase in the activity of facilities that have inevitably had to improve their efficiency.

Specifically, the emissions of regasification plants in Spain have been reduced by 29%, due to:

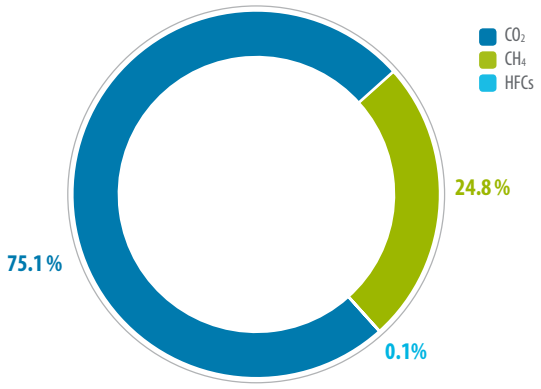
- The increase of in-house power generation (+ 14%) from the Barcelona turboexpander, a clean source of electricity generation that can be used to shift consumption from the grid.
- A significant reduction (-74%) in fugitive emissions due to the repair of detected leaks.
- The 81% reduction in venting compared to 2016 due to best practices in operations.

However, emissions at regasification plants have increased by 63.9% due to the inclusion of Scope 2 emissions from the GNL Quintero plant (Chile).

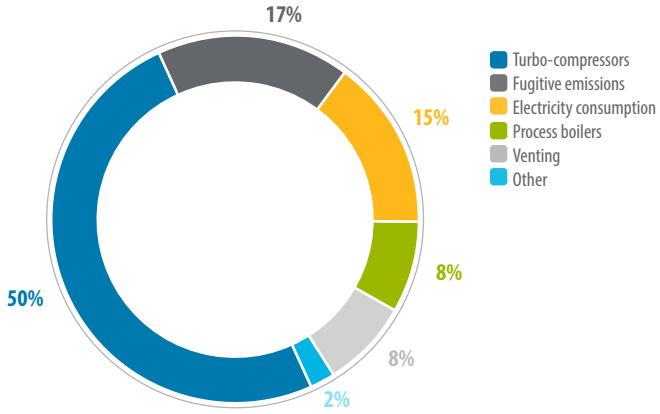
On the other hand, emissions generated in gas pipelines and in regulation and measurement stations have reduced by 5.9% and 4.6% respectively over the previous year. This is due to the reduction in power consumption and the repair of detected leaks.

Finally, emissions from compression stations have increased by 7.2% with respect to 2016, mainly due to the increase in natural gas consumption in turbocompressors (+ 11%) due to the entry into force in October 2016 of the new gas sector balancing code that eliminated the flexibility mechanisms that previously enabled optimization of the operation of the facilities.

Scope 1 and 2 emissions by gas type
[GRI 305-6]



Scope 1 and 2 emissions by source
[GRI 305-1, GRI 305-2]



75.1% of the Enagás carbon footprint corresponds to emissions of CO_2, mainly produced during the combustion of natural gas in stationary sources, i.e. turbocompressors, boilers, flares, etc.

Emissions of CH_4, which account for 24.8% of this footprint, are mainly due to fugitive emissions (17%) and natural gas venting (8%). Venting may occur as a result of operation and maintenance, operating safety, pneumatic valves and analysis equipment (for example, chromatographs, etc.).

50% of total footprint emissions are generated by the self-consumption of natural gas in turbocompressors in compression stations and underground storage facilities.

Emission intensity (scopes 1 and 2) [GRI 305-4]

	2015	2016	2017
Intensity of emissions by turnover (tCO_2e/M€)	739	697	638
Intensity of emissions by employee (tCO_2e/employee)	228	217	220
Intensity of emissions by gas outputs (tCO_2e/Gwh outputs)	0.82	0.79	0.74

Emission rights trading strategy

51% of emissions included in carbon footprint scopes 1 and 2 are included in the EU Emissions Trading System (EU ETS).

The Enagás emission rights trading strategy approved by the Board of Directors identified the need to purchase approximately 155,000 rights until 2020. [GRI 201-2]

Scope 3 emissions [GRI 305-3]

Scope 3 emissions

1. Acquisition of goods and services	Emissions derived from the extraction, fabrication and transport of acquired goods and services.	2,069 tCO_2e
	Emissions arising from the use of paper and office materials.	2 tCO_2e
2. Capital goods	Emissions derived from the extraction, fabrication and transport of equipment acquired for production.	7,896 tCO_2e
3. Activities related to energy production (not included in scopes 1 or 2)	Emissions due to the extraction, production and transport of fuel consumed directly by Enagás.	16 tCO_2e
4. Upstream transmission and distribution	Emissions generated by the consumption of fuels derived from helicopter and ship transport services (from the plant to the platform of the Gaviota underground storage facility).	2,010 tCO_2e
	Emissions generated by the consumption of fuels derived from the contracting of surveillance services and air, maritime and land maintenance.	
5. Waste generated during operation	Emissions derived from the transport, management and treatment of waste generated at Enagás facilities.	57 tCO_2e
6. Work-related journeys	Emissions derived from work-related journeys by Enagás employees (aeroplane, train and taxi).	3,156 tCO_2e
7. Journeys to and from work by employees	Emissions derived from journeys to and from work by Enagás employees.	1,209 tCO_2e
15. Investments	Emissions, excluded Scopes 1 and 2, from those companies in which Enagás has a stake but not operational control: Bahía de Bizkaia Gas, S.L, Compañía Operadora de Gas del Amazonas, S.A.C. (COGA), Sagunto S.A. Regasification Plant (Saggas), Terminal de LNG de Altamira, S. de R.L. de C.V.	160,941 tCO_2e
Scope 3 total		**177,356 tCO_2e**