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Gas in Spain: *Still* Oversupplied and Overcompensated

Regulation Continues to Guarantee a Secure Return on Gas Infrastructure Investment

Executive Summary

The profits of Spanish gas Transmission System Operator (TSO) Enagás (Empresa Nacional de Gas) have been driven in recent years not by consumer gas demand, but by a regulatory system that guarantees a fixed rate of return on the company's gas infrastructure investments—regardless of whether the country needs the investments.[1]

Over the years, Enagás has used "security and diversity of supply" as an excuse for building out or expanding liquefied natural gas (LNG) regasification terminals, natural gas pipelines, and gas storage facilities. However, these investments resulted in very low utilisation rates for gas assets, as well as some of the highest gas bills in Europe. Gas demand in Spain has declined since 2008, but Spanish consumers are still burdened with incredibly high rates for unused infrastructure.

In 2019, new regulations were introduced for the first time by an independent Spanish regulator (Comisión Nacional de los Mercados y la Competencia, or CNMC). However, the latest financial information shows the regulations have not resulted in any material reduction to Enagás' remuneration. This means the company can continue to overinvest at the expense of consumers and to the benefit of its shareholders for the next four years, until the regulations are reviewed.

The regulatory system guarantees rate of returns on gas infrastructure investments—regardless of their need.

In July 2022, Enagás presented its 2022-30 strategic plan, which aims to address "security of supply and decarbonisation" in Spain and Europe and to reflect the most pressing challenges in the European and global energy market. The company plans to invest €2.8 billion by 2030. The investment would increase to €4.8 billion euros with the inclusion of interconnection projects set out under the REPowerEU plan.

All of the investments will have a guaranteed regulated return. Spain has a stable regulatory framework covering the years 2022-26. After 2026, a new regulatory framework for hydrogen is expected, and Enagás is actively working to promote the integration of electricity, gas, and hydrogen networks. If the framework is approved

[1] Institute for Energy Economics and Financial Analysis. Gas in Spain: Oversupplied and Overcompensated. September 2021.

by the regulatory body, the company and its shareholders will receive guaranteed regulated revenues for investing in infrastructure that has huge technical and economic uncertainty, while consumers will be forced to carry the risk.[2]

[2] Enagás. Enagás will invest 2,775 million euros in security of supply and decarbonisation up to 2030. 12 July 2022.

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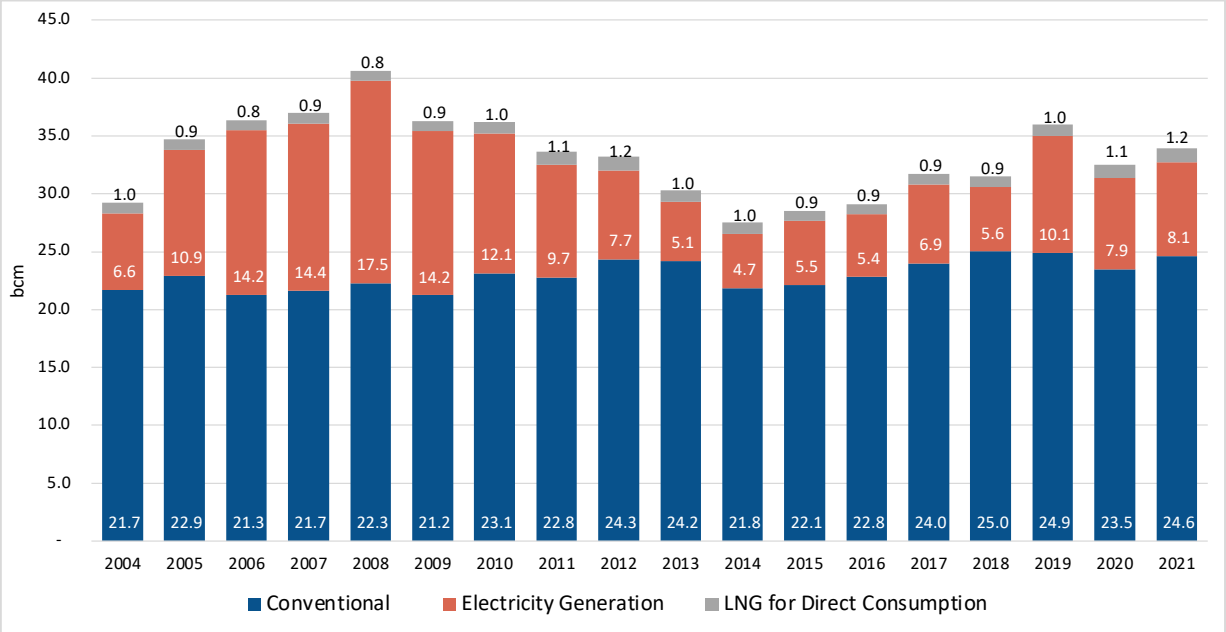
Spain's Gas Demand Has Been Declining

But Gas Prices Have Stayed High for Spanish Households

Spanish gas demand peaked at 40.6 billion cubic meters (bcm) in 2008, and has since declined annually. The majority of the demand is for conventional use (including commercial, households, and industry sectors), while power generation accounts for 25% to 30% of total consumption.

Figure 1: Evolution of Annual Natural Gas Demand in Spain (bcm)

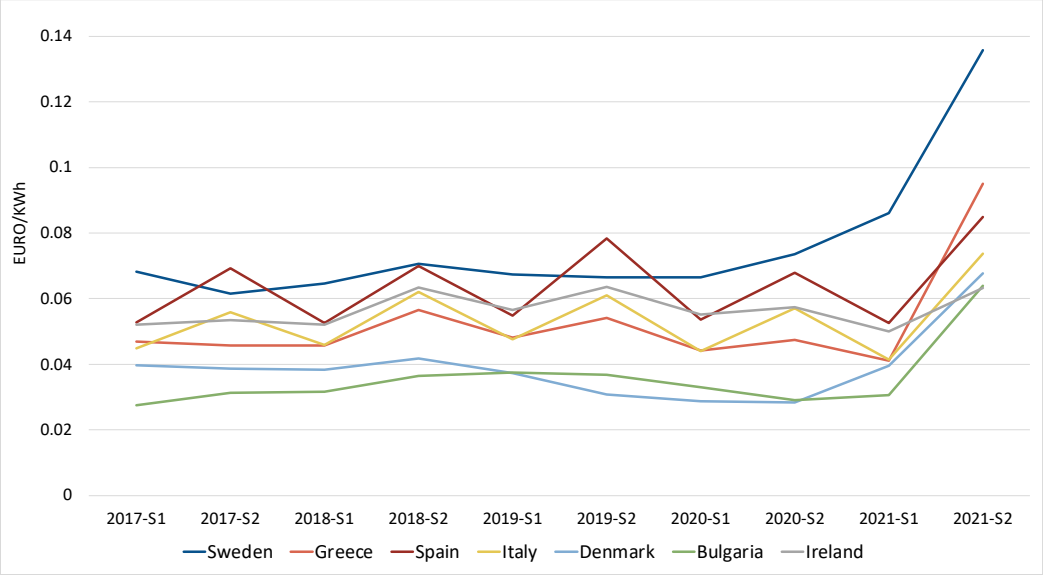


Source: BP, CORES, IEEFA.

Spain has among the highest gas prices for household consumers in Europe.[3] During the second semester of 2019, Spain had the highest gas price in Europe with 0.0783 euros per kilowatt-hour (€/kWh), rising to 0.0849 €/kWh in the second semester of 2021.

[3] Household consumers are medium-sized consumers with an annual consumption between 20 gigajoules (GJ) and 200 GJ.

Figure 2: Gas Prices for Household Consumers in Europe (€/kWh)



Source: Eurostat.

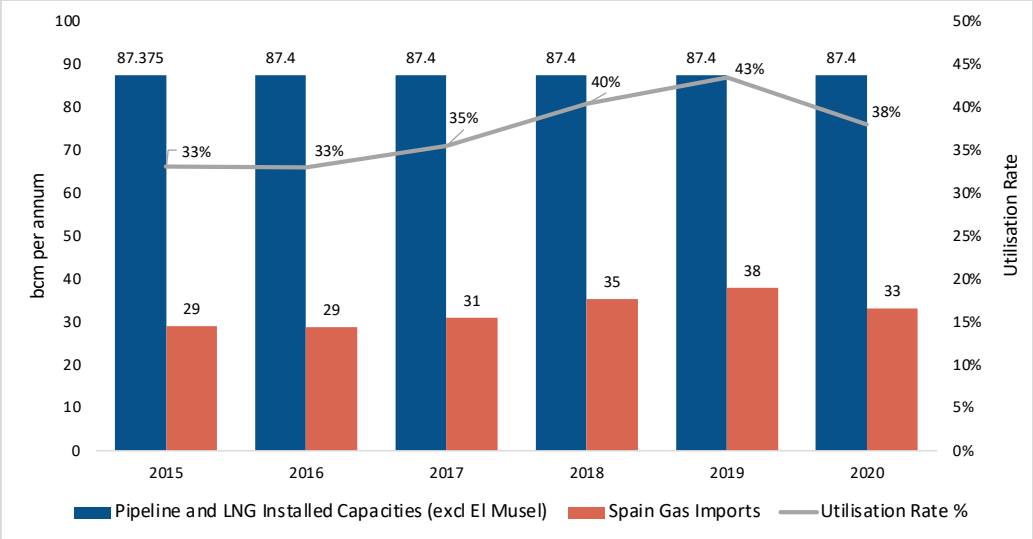
Spain's LNG Terminals and Gas Interconnections

LNG Terminals Have Been Consistently Overbuilt and Underutilised

The Spanish market's gas consumption relies mainly on imports from its international pipeline connection with Africa, as well as its own LNG terminals. Interconnections with France and Portugal are gas pipelines that allow bidirectional flows.

Taking into consideration Spanish gas demand and exports to neighbouring countries, the utilisation rate of the import gas pipelines and LNG terminals between 2015 and 2020 averaged 37%.

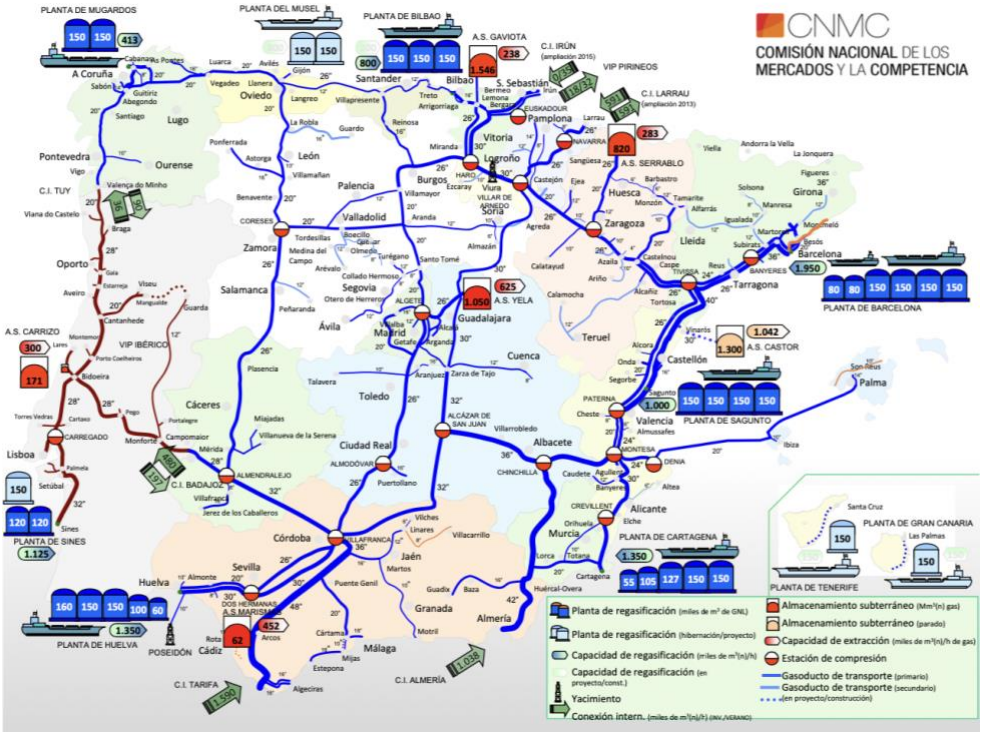
Figure 3: Spanish Gas and LNG Capacities



Source: BP Statistical Reviews, CORES, IEEFA calculations.

Spain has seven LNG import terminals; six are operational and one is mothballed (Planta Del Musel).

Figure 4: Spanish Gas/LNG System



Source: The Spanish National Markets and Competition Commission. General Overview of Spanish LNG Sector. November 27, 2018.

Enagás S.A., a Spanish gas transmission system operator (TSO), is among the biggest owners of LNG terminals in the world.[4] Enagás owns the LNG import terminals of Barcelona, Huelva, and Cartagena, 70% of Bilbao, and 72.5% of Sagunto. The company operates all five terminals.

The mothballed El Musel LNG Terminal, located in Gijon (Asturias), was completed in 2013 and was immediately mothballed because of lack of demand. However, Enagás has been receiving an income to maintain the plant so that it is ready to be brought into service if required.[5] During the 2015-20 regulatory period, Enagás Transporte, S.A.U. received €23.6 million annually. In the current regulatory period (2021-26), the revenue allowed was increased to €24.9 million per year. On June 28, 2022, Enagás obtained the administrative authorization resolution for the startup of the terminal.[6]

Table 1: LNG Regasification Terminals in Spain

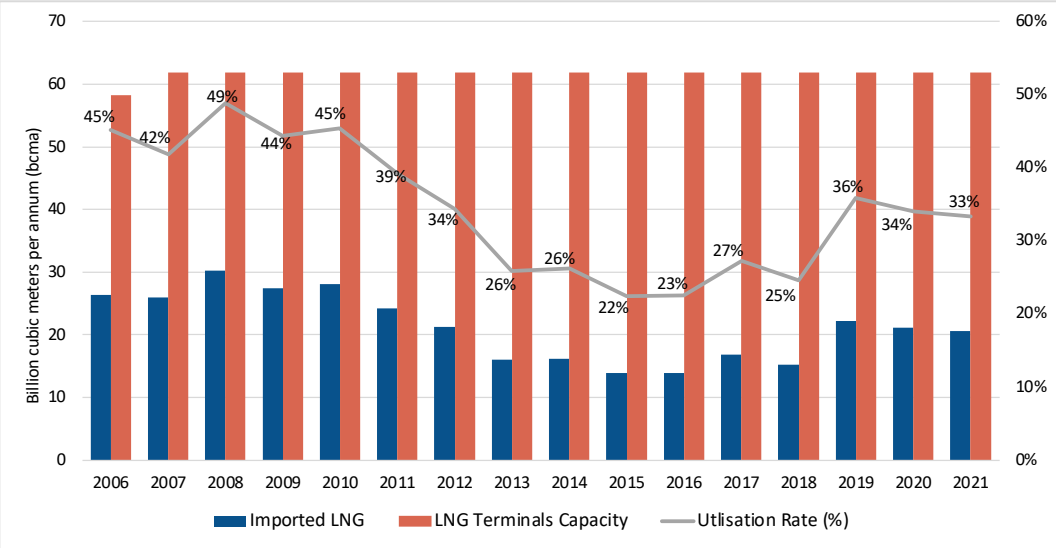
Terminal	Start Year	Operator	Owners	LNG Storage	Send-out Capacity	
				m3 LNG	BCM/yr	GWh/d
Barcelona	1969	Enagás	Enagás 100%	760,000	17.1	544
Huelva	1988	Enagás	Enagás 100%	619,000	11.8	377
Cartagena	1989	Enagás	Enagás 100%	587,000	11.8	377
Bilbao	2003	Enagás	Enagás 70%, EVE 30%	450,000	8.8	223
Sagunto	2006	Enagás	Enagás 72.5%, Osaka Gas 20%, Oman Oil 7.5%	600,000	8.8	279
Mugardos (El Ferrol)	2007	Reganosa	Grupo Tojeiro 50.36%, Gobierno Galicia 24.64%, First State Regasificador 15%, Sonatrach 10%	300,000	3.6	115
			Total	**3,316,000**	**61.9**	**1,915**
El Musel (mothballed)	2013		Enagás 100%		7.0	
				Total with El Musel (BCM)	68.9	
				Of which owned by Enagás	60.24	
					87.4%	

Source: BP Statistical Reviews, CORES, IEEFA calculations.

The operating LNG terminals in Spain account for almost one-third of Europe's LNG import capacity,[7] but they have some of the lowest utilisation rates on the continent. The utilisation rate of installed LNG capacity has averaged just 34% over the last 15 years; it dropped as low as 22% in 2015 and 23% in 2016.

[4] Enagás. Our regasification terminals.
[5] Enagás Financiaciones, S.A.U. Guaranteed Euro Medium Term Note Programme Guaranteed by Enagás S.A. May 28, 2021.
[6] Enagás. Our regasification terminals.
[7] Global LNG Hub. LNG in Europe 2020. December 2020.

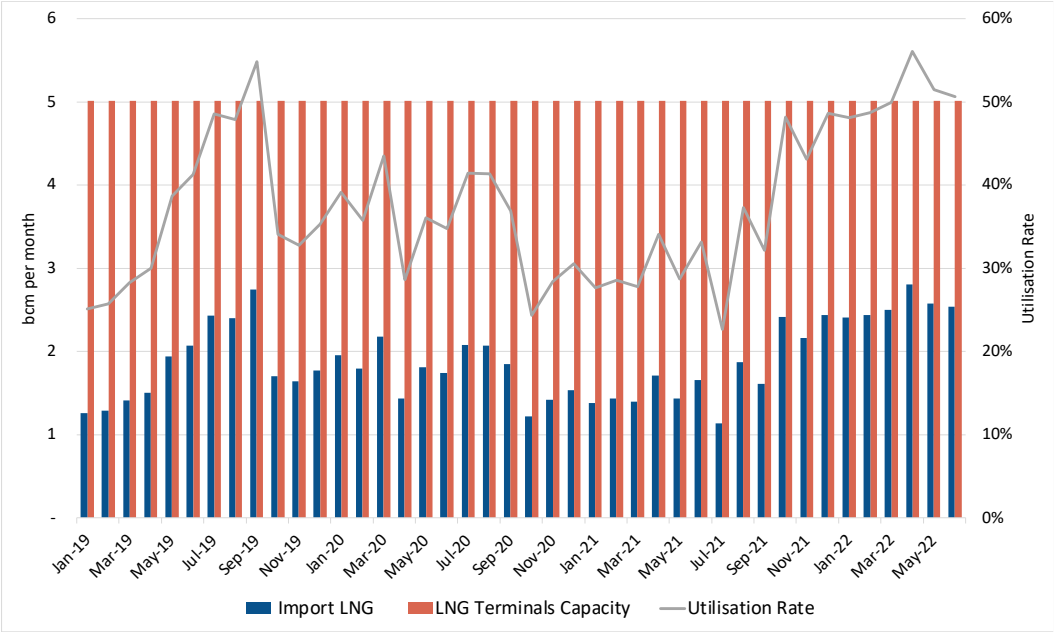
Figure 5: Spanish Annual LNG Imports, Installed Capacity and Utilisation Rate



Sources: CORES, BP, IEEFA, IH.
Note: Installed capacity does not include the mothballed El Musel terminal (7 bcm annual capacity).

Between January 2019 and June 2022, the utilisation rate of the LNG terminals never exceeded 56%, despite the increase in imported volumes.

Figure 6: Spanish Monthly LNG Imports and Installed Capacity



Source: IHS Markit, IEEFA calculations.
Note: Installed capacity does not include the mothballed El Musel terminal.

LNG imports increased in 2022, but the LNG terminals still have plenty of available capacity. The Barcelona LNG Terminal, the biggest regasification plant in Spain, reached a 41% utilisation rate in January 2022 and only 34% in June 2022. The other two major terminals, Cartagena and Huelva, have between 40% and 60% of spare capacity.

Table 2: Utilisation Rate of LNG Regasification Terminals in Spain, 2022

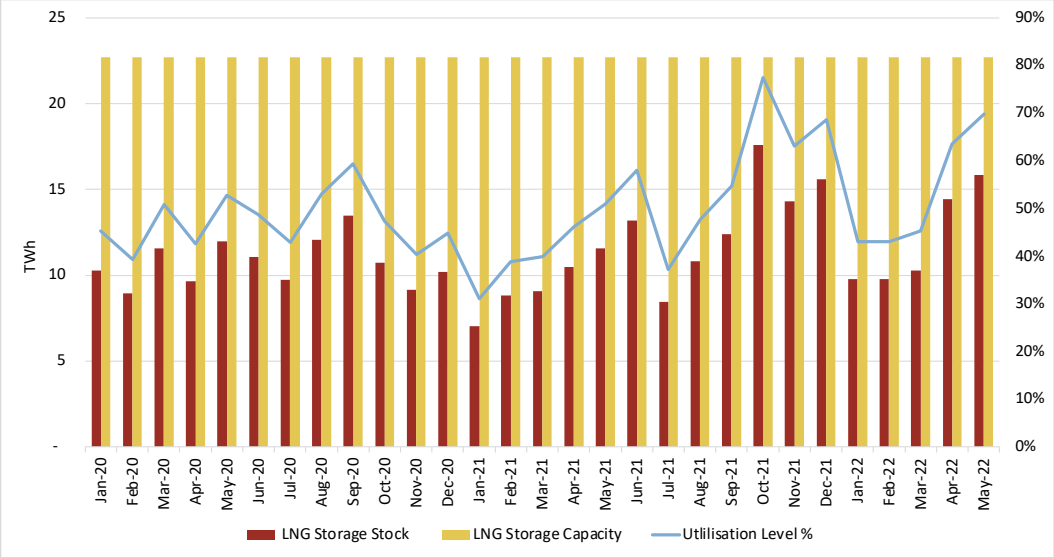
	Regas. Monthly Capacity (bcm)	Utilisation Rate (%)					
		Jan-22	Feb-22	Mar-22	Apr-22	May-22	Jun-22
Bahia de Bizkaia Gas	0.58	63%	64%	117%	102%	85%	85%
Barcelona	1.43	41%	34%	20%	28%	35%	34%
Cartagena (Spain)	0.99	50%	42%	39%	66%	69%	57%
Huelva	0.99	40%	60%	46%	40%	41%	43%
Mugardos	0.30	64%	63%	33%	98%	54%	104%
Sagunto	0.73	53%	54%	81%	65%	47%	35%

Source: IHS, IEEFA.

The LNG storage tanks in the six operational LNG terminals in Spain have a capacity of 22.7 terawatt-hours (TWh) for 23 days.[8] The average utilisation rates have been historically been between 40% and 45%, peaking at 77% in October 2021.

Despite the current gas crisis, which prompted an increased use of Spain's LNG storage tanks, the utilisation rate is still at 70%.

Figure 7: Spanish LNG Storage



Spain has international interconnections via pipeline with Algeria, Morocco, France and Portugal. Two gas pipelines from North Africa bring Algerian gas to Spain: The Medgaz Pipeline and the Maghreb-Europe Gas Pipeline (MEG). Medgaz is an undersea pipeline with an annual capacity of 8 billion cubic meters (bcm)

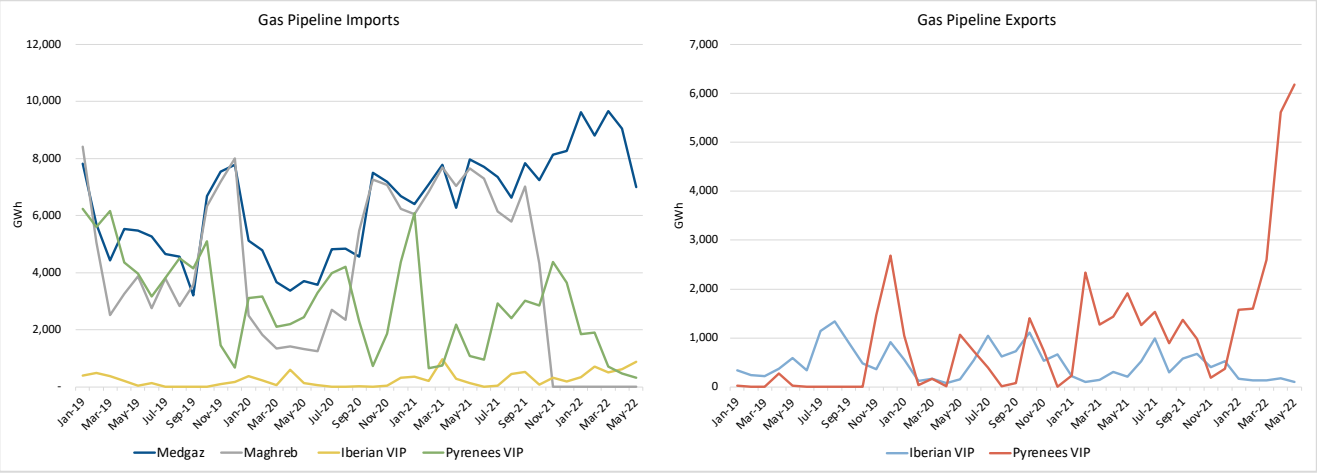
[8] European Commission. LNG Spain. 27 November, 2018.

transporting gas from Algeria to Spain. MEG has an annual capacity of 13.5 bcm. It was used to import gas from the Hassi R'Mel field in northern Algeria via Morocco to Tarifa in southwestern Spain until November 1, 2021, when Algeria cut diplomatic ties with Morocco and stopped supplying natural gas via the route.[9]

Spain has a virtual interconnection point with France called "VIP Pirineos," which gathers the two physical interconnection points "Larrau" and "Biriatou (FR) / Irun (ES)," and a virtual interconnection point between Portugal and Spain called "VIP Ibérico," which gathers the two physical interconnection points "Valença do Minho (PT) / Tuy (ES)" and "Badajoz (ES) / Campo Maior (PT)".[10] The annual capacity of the VIP Ibérico is 4.6 bcm from Spain to Portugal and 2.6 bcm in the opposite direction. The capacity of the VIP Pirineos is 7.5 bcm in the flow from Spain to France and 5.5 bcm from France to Spain.

To date in 2022, gas exports to France have increased, and gas imports via Medgaz have been steady.

Figure 8: Monthly Gas Pipelines Imports and Exports (GWh)



Source: CORES, IEEFA.

Spain has four operating underground gas storages (UGS) sites. Three are depleted gas fields: Gaviota, Serrablo, and Marismas. Yela is a saline aquifer (storage in porous media). Marismas is owned by a subsidiary of Gas Natural Fenosa, and the other three are owned by Enagás Transporte.[11] Their working gas capacities are: Gaviota, 2.7 bcm; Serrablo, 1.1 bcm; Marismas, 0.6 bcm and Yela, 2 bcm.[12]

[9] Reuters. Algeria end gas supplies to Morocco, October 25 2021.
[10] Acer. Gas Infraestructura. October 2017.
[11] International Energy Agency. Energy Policies of IEA Countries: Spain. 2015.
[12] S&P Global Platts. Hydrogen: Beyond the Hype. 2021.

Regulatory Frameworks

Enagás' Regulated Activities

Spain's gas network consists of Enagás, a regulated monopoly and the nation's only large TSO, as well as one small TSO and 12 transport companies.[13]

Enagás' main activities are:

I. Infrastructure:

   a) Gas transport: Offers gas transmission through its pipeline network;

   b) Regasification: Transforms liquefied natural gas (LNG) into gas form and stores it in cryogenic tanks;

   c) Storage: Operates underground natural gas storage facilities.

II. Technical Management: Coordination of the access, storage, transportation, and distribution process, maintaining gas infrastructure, and ensuring the continuity and security of gas supply.

III. Unregulated Activities: Includes deregulated operations and transactions.

Enagás' annual income comes from regulated and non-regulated activities. The company's income from regulated activities is granted on the basis of the use of its assets and on state payments for these activities, and for Enagás' role as the technical manager of the gas transmission system.

In the regulated market, gas tariffs are determined by the Ministry of Energy and the CNMC (Comisión Nacional de los Mercados y la Competencia). The main regulated components of gas prices are the tolls and charges (*peajes*) payable for the use of the gas system (pipelines, LNG plants, and underground storage facilities).

The company's regulated returns are calculated by adding the costs of investment, operation and maintenance (O&M), and management of the gas network. The values can be found in the Official State Bulletin (Boletín Oficial del Estado).

The regulatory frameworks consist of six-year regulatory periods that are established for both electricity and gas activities. As of July 2014, the annual remuneration of the regulated activities (transmission, regasification, and underground storage) was established according to Royal Decree-Law 8/2014 (see Table 3).[14]

[13] S&P Global Platts. Spain's Enagas announces work schedule for LNG terminals, storage, pipelines. September 2020.
[14] Agencia Tributaria España. Royal Decree-Law 8/2014.

The remuneration for the 2015-20 period consists of:

- Remuneration to Availability or Return on Investment Costs (RD or RDA)
    - RD is the sum of investment costs and the maintenance and operational costs of each facility
    - Remuneration for investment costs includes:
        I. Guaranteed financial returns for investment, at 5.09% per year of total net investment for 2015 through 2020;
        II. Amortization;
        III. Remuneration for extension of useful life (Costes de extensión de la vida útil, COEV, or Retribución por extensión de vida útil, REVU). COEVs are determined as a percentage of the remuneration for O&M costs that vary according to the age of the asset;
        IV. Costs of Exploitation (COPEX, Gastos de Explotación Activados) are expenses incurred from updating facility equipment due to obsolescence or the need to improve operating conditions, availability, safety and maintenance;[15] and
        V. Payback for gas heel, where applicable.[16]
- Remuneration to Continuity of Supply (RCS)
    - RCS is a remuneration assigned to each activity—transmission, regasification, and underground storage—that is then distributed to all installations of each activity while they are in operation, according to their standard investment value.
    - The remuneration is updated annually for each activity, according to the evolution of the established demand, the regasified volumes in the regasification plants, and the gas stored in the underground storages, corrected by an efficiency factor.

[15] Global-Regulation, Royal Decree-Law 8/2014. 4 July, 2014.
[16] It is normal practice to keep onboard 5% to 10% of an LNG cargo after discharge. This is referred to as the heel, and is used to cool down the remaining tanks that have no heel before loading.

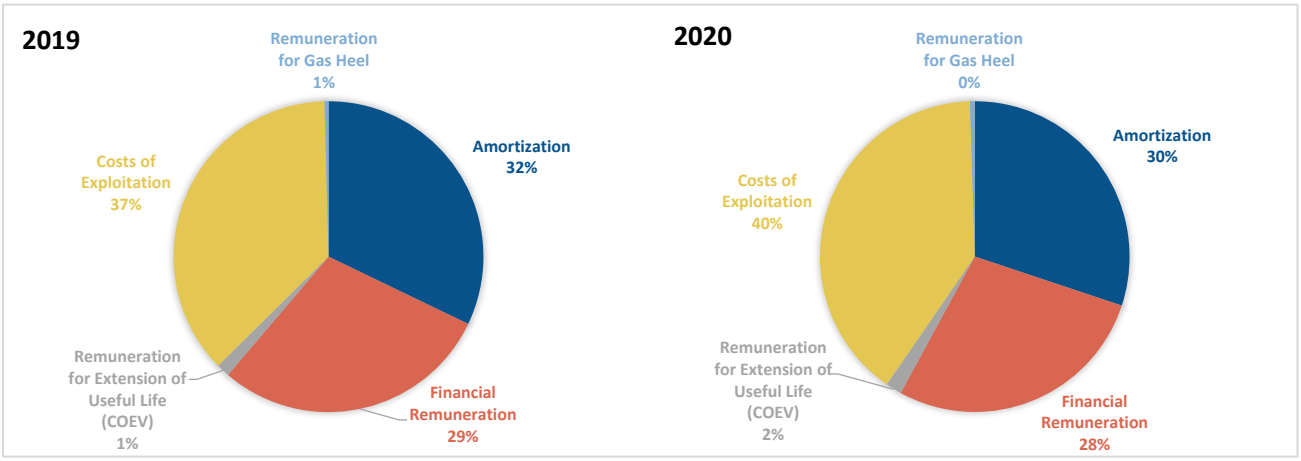
Table 3: Regulatory Framework 2015-2020

Regulatory Framework 2015-2020	
Total Remuneration	RD + RCS + OPEX
Return on investment Costs (RD or RDA)	Remuneration linked to net assets during their regulatory lives
	Extension of regulatory life pre 2008 transport assets
	Financial remuneration rate: 5.09%
RD=	Amortization + Remuneration for extension of useful life COEV or REVU + Costs of Exploitation COPEX + Payback for gas heel
Remuneration for Continuity of Supply (RCS)	Remuneration linked to the long-term availability of Gas System assets with adequate maintenance
	RCS is not affected by assets' amortization
	Limited impact of changes in demand in the formula
RCS=	Previous year RCS x 0.97 x (1 + delta gas demand)
Operation and Maintenance (OPEX)	Remuneration based on opex availability
	Once the useful life ends, the extension of useful life will be remunerated in addition to O&M remuneration
	TSO remuneration updated from €11M to €24M from 2016 onwards

Source: Enagás.

In the 2015-20 regulatory framework, costs of exploitation (COPEX) were a very significant part of Enagás' remuneration on investment. Because COPEX largely consists of costs incurred for updating the equipment for facilities in service, more infrastructure in service results in a higher COPEX.

Figure 9: Enagás Returns for Investment (Transport and Regasification)



Source: BOEs, Official State Bulletins and IEEFA calculations.

In 2019, COPEX accounted for 37% of all Enagás remuneration for investment—more than both financial remuneration (27% of total remuneration for investment) and amortization (32%). In 2020, COPEX accounted for 40% of all Enagás' remuneration for investment, while the financial remuneration accounted for 28% and amortization 30%.

In 2019, the Royal Decree Law 1/2019 gave the CNMC powers to set revenues and tariffs, which was previously done by the energy ministry. Consequently, CNMC

published a new regulation to set revenues for gas and electricity TSOs and distribution system operators for 2020-25 for electricity and 2021-26 for gas.[17]

The CNMC proposes a reduction in the remuneration of all electricity and gas infrastructure activities.[18]

The current regulatory framework for gas covers a six-year period from 2021 to 2026. The first gas year under this framework started on January 1, 2021, and ended September 30, 2021, approving remuneration for nine months. Successive gas years (12 months) will run from October 1 until September 30.[19]

In the current regulatory period (2021-26), COPEX is audited and has a maximum cap. CNMC approves the maximum amount of investment that can be made annually by companies entitled to remuneration and the provisional remuneration for the concept.[20]

Return on investment includes amortization plus financial remuneration and gas heel compensation. The compensation for operation and maintenance costs is calculated separately and includes costs for useful life, other costs, and COPEX.

RCS includes the payback for continuity of supply related to the demand, plus the remuneration for extension of useful life and payback for improvement of productivity.

Table 4: Regulatory Framework 2021-26

	Regulatory Framework 2021-2026
Total Reumuneration	ROI + RCS + REVU
Return on Investment Costs (ROI)	Remuneration linked to net assets during their regulatory lives
	Change to a stable and predictable WACC methodology
	Financial remuneration rate: 5.44%
RD=	Amortization + Financial Remuneration + Compensation for gas heel
Compensation for Operation and Maintenance costs=	Costs for useful life + Single and other costs + COPEX
	COPEX will be audited and will have a maximum cap
ROI = RD+O&M	Amortization + Financial Remuneration + Compensation for gas heel + Costs for useful life + Single and other costs + COPEX
Remuneration for Continuity of Supply (RCS)	Remuneration linked to the long-term availability of Gas System assets with adequate maintenance
	RCS revenues established for 2020 will progressively decrease to 20% at the end of the 2026 regulatory period
RCS=	Payback for continuity of supply related to the demand + Remuneration for extension of useful life + Payback for improvement of productivity
Incentives for Extending Life of Assets (REVU or COEV in Spanish)	Compensation based on Opex standards, with room for efficiency
	The company could maintain 50% of the efficiencies
	REVU component: once the useful life ends, the extension of the useful life will be remunerated with the O&M remuneration, with a progressive long-term formula
Investments in the System (not RAB)	Financial rate: 5.44% and two years of amortisation
	Investments greater than 250,000 euros
Principles	Incentives to keep the gas system's transmission infrastructure available
	Use of existing gas infrastructure is essential to move forward with the energy transition at the lowest cost
	Predictable WACC methodology, similar to main European frameworks
	Strengthens incentives to extend the useful life of assets
	Regulatory period of 6 years without reviews
	First time the regulation is implemented by an Independent Regulator, CNMC

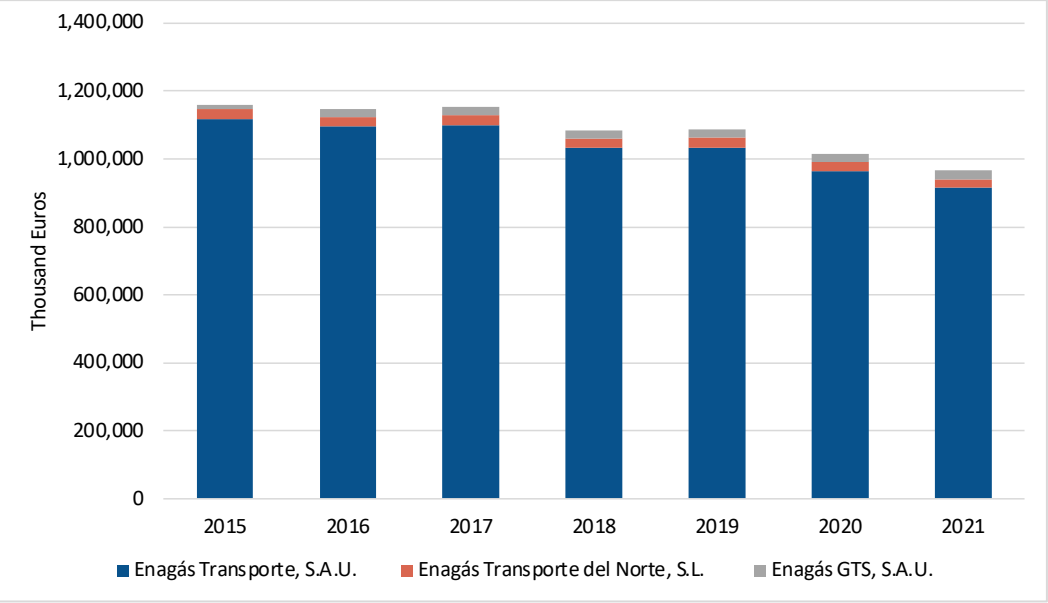
Source: Enagás.

[17] CNMC. Proposal for regulation of the national markets and competition commission. Undated.
[18] The Oxford Institute for Energy Studies. The future of gas infrastructure remuneration in Spain. October 2019.
[19] Lexology. The CNMC approves a Circular to establish a new remuneration structure for natural gas distribution. April 8, 2020.
[20] Boletín Oficial del Estado. Otras Disposiciones. February 23, 2021.

As technical manager of the system (*Gestor Técnico del Sistema*, GTS), Enagás received €2.4 billion annually in the previous regulatory framework period and has been allowed to receive between €26.3 million and €26.7 million annually from 2021 to 2023, reaching up to €27.2 million considering the maximum incentives allowed.[21]

Enagás' financial statements show that the company's main source of income has been slowly declining, falling 4.8% from 2020 to 2021, when the current regulatory framework came into force.

Figure 10: Enagás Income From Regulated Activities



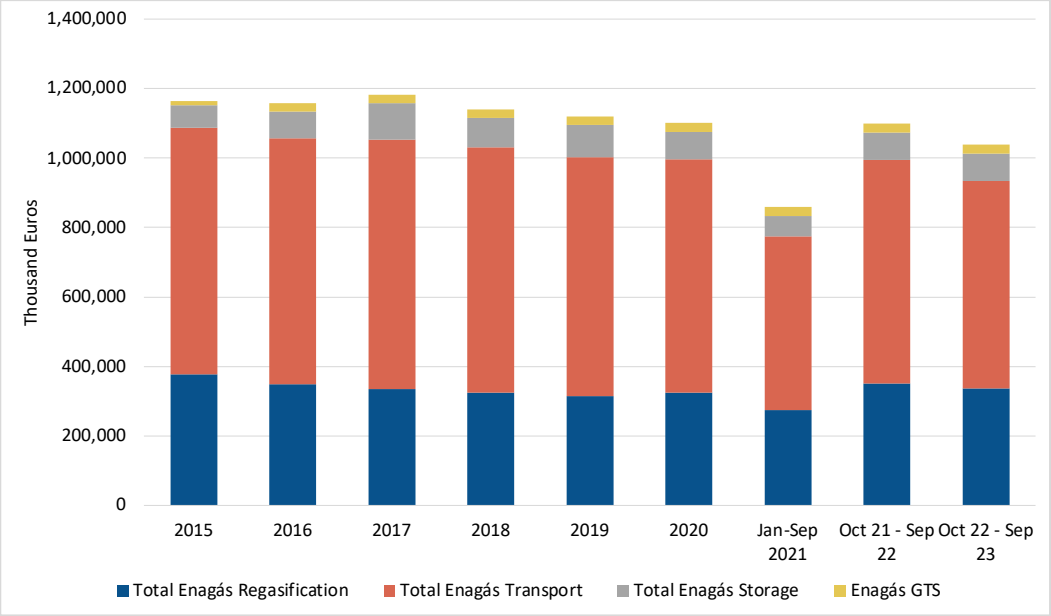
Source: Enagás Annual Financial Reports.

An analysis of the allowed annual revenues shows that for 2021, only the values for nine months (January to September) are included. It is unclear whether the figure on the financial statement reflects the company's income for the 12 months of 2021, or nine months only.

From 2022 onwards, the annual remuneration is calculated from October to September.

[21] CNMC. Retribucion de Enagas. January 16, 2020.

Figure 11: Enagás Regulated Returns



Source: BOEs, Official State Bulletins.

Throughout the six years of the previous regulatory period, the return on investment costs (RD) was Enagás' largest source of revenue, contributing 71% of total regulated revenue, followed by renumeration to continuity of supply (RCS) at 25%, and return for operation and maintenance at 4%. RD has made up 67% of Enagás total revenue (regulated and non-regulated).

Table 5 shows that the regulatory revenues in 2022 (October 2021 to September 2022) are forecasted to see only a small reduction (-2%) compared to 2020 values, which illustrates that the CNMC regulations are not reducing system costs significantly. Remuneration for regasification activities should increase by 8% from 2020 to 2022; renumeration for transport activities should decrease by 4%, where the maximum value of COPEX allowed has been used.

The values for 2023 (covering the period from October 2022 to September 2023) are not definite yet because of potential adjustments that could increase the revenues allowed for the year.

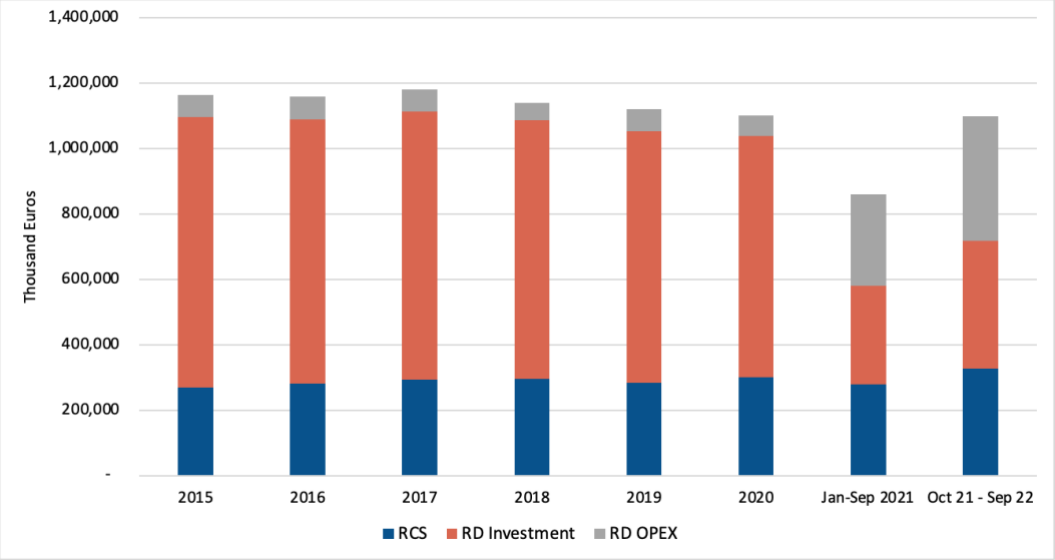
Table 5: Enagás Regulatory Returns per Activity (€'000s)[22]

Regasification	2015	2016	2017	2018	2019	2020	Jan-Sep 2021	Oct 21 - Sep 22	Oct 22 - Sep 23
RCS	46,911.10	49,576.59	51,817.97	57,251.02	53,481.79	71,478.18	83,898.60	102,240.52	93,178.24
RD Investment	307,007.10	275,092.01	259,607.94	244,462.29	237,184.68	228,423.42	79,985.02	102,572.59	97,445.75
RD Opex						1,941.91	90,907.50	121,329.71	120,714.81
El Musel	23,605.52	23,605.52	23,605.52	23,605.52	23,605.52	23,605.50	18,655.50	24,942.33	24,942.33
Total Enagás	**377,523.73**	**348,274.13**	**335,031.43**	**325,318.83**	**314,272.00**	**325,449.00**	**273,446.62**	**351,085.15**	**336,281.13**
COPEX Maximo							54,567.71	54,567.71	54,567.71
COPEX Enagás Used						-	10,516.93	14,022.57	14,022.57
Transport	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Jan-Sep 2021**	**Oct 21 - Sep 22**	**Oct 22 - Sep 23**
RCS	205,914.69	203,086.91	212,508.14	210,759.66	200,702.48	198,609.84	165,857.92	191,562.05	161,829.65
RD Investment	503,257.12	505,726.61	505,905.92	495,167.12	487,196.50	470,600.65	191,152.57	250,048.67	242,410.61
RD Opex						1,988.33	143,767.08	201,692.81	193,572.25
Total Enagás	**709,171.81**	**708,813.52**	**718,414.06**	**705,926.79**	**687,898.98**	**671,198.82**	**500,777.57**	**643,303.54**	**597,812.51**
COPEX Maximo							24,879.38	24,879.38	24,879.38
COPEX Enagás Used							18,406.16	24,541.55	24,541.55
Underground Storage	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Jan-Sep 2021**	**Oct 21 - Sep 22**	**Oct 22 - Sep 23**
RCS	4,733.48	4,422.81	4,754.49	4,360.92	4,693.00	4,462.52	3,148.36	5,954.72	
RD Investment	17,837.93	28,091.12	54,837.20	50,852.16	47,557.16	41,362.65	30,841.02	40,208.10	
RD Opex	42,782.18	45,193.25	45,193.25	29,475.03	42,239.17	33,836.72	24,836.94	33,236.19	
TOTAL Enagás	**65,353.60**	**77,001.85**	**104,079.62**	**83,982.78**	**93,784.00**	**78,956.56**	**58,826.33**	**79,399.01**	**-**
COPEX Maximo									
COPEX Enagás Used									
Total Enagás	**2015**	**2016**	**2017**	**2018**	**2019**	**2020**	**Jan-Sep 2021**	**Oct 21 - Sep 22**	**Oct 22 - Sep 23**
Total Enagás Regasification	**377,524**	**348,274**	**335,031**	**325,319**	**314,272**	**325,449**	**273,447**	**351,085**	**336,281**
Total Enagás Transport	**709,172**	**708,814**	**718,414**	**705,927**	**687,899**	**671,199**	**500,778**	**643,304**	**597,813**
Total Enagás Storage	**65,354**	**77,002**	**104,080**	**83,983**	**93,784**	**78,957**	**58,826**	**79,399**	**79,399***
Enagás GTS	**11,561**	**23,966**	**23,966**	**23,966**	**23,893**	**25,007**	**26,532**	**26,532***	**26,532***
Grand Total Enagás	**1,163,610**	**1,158,056**	**1,181,491**	**1,139,195**	**1,119,848**	**1,100,611**	**859,583**	**1,073,788**	**934,094**

Source: BOEs, Official State Bulletins, IEEFA calculations.
Note: Asterisk (*) indicates estimated values.

[22] Includes reported retrospective amendments in remuneration for preceding years.

Figure 12: Enagás Regulated Returns Composition



Source: BOEs, Official State Bulletins, IEEFA calculations.

Decarbonisation and Security of Supply Are the New Investment Rationale

Slogan Change From "Security of Supply" to "Decarbonisation"

Rate-of-return regulation is a form of price-setting regulation in which government regulators determine the fair price that a monopoly, such as a gas utility, is allowed to charge its customers.[23] Its critics argue it provides little incentive to reduce costs and increase efficiency. Rate-of-return regulation can contribute to the so-called *Averch-Johnson effect*,[24] which is named after two economists who developed a stylized model of the rate-of-return regulated firm. They found that firms which are subject to rate-of-return regulation will overinvest in capacity if the allowed return is greater than the required return on capital.[25] Is this the rationale behind the decarbonisation investments proposed and planned by Enagás?

Enagás has created a significant oversupply of underutilized gas infrastructure, which the company has justified as part of a strategy to achieve security and diversification of supply, passing down the cost of unnecessary infrastructure to its customers. A large number of LNG regasification terminals were built in the past 10 years, but their construction is difficult to justify, given the lack of demand for additional infrastructure projects.

In July 2022, Enagás presented its 2022-2030 Strategic Plan, which aims to address "security of supply and decarbonisation" in Spain and Europe to reflect the most pressing challenges in the European and global energy market. The strategic plan

[23] Investopedia. Rate of Return Regulation. November 18, 2020.
[24] Body of Knowledge on Infrastructure Regulation. Averch-Johnson Effect. 2021.
[25] *Ibid.*

foresees investments in gas and hydrogen infrastructure and adjacent businesses, innovation, technology and digitalization, international development with a main focus on Europe, and green hydrogen and biomethane generation activity and projects.

With this plan, Enagás aims to become a hydrogen network operator (HNO) by 2030, in line with the current proposal for European Union regulation. The investments will guarantee that Enagás will continue receiving regulated revenues that will reflect on an increase in gas consumer bills, as has been the case in recent years.

There is a real risk that decisions made within such a framework may be driven by remunerative motivations, not by technical system needs. From the technological, safety, and environmental perspective, there is still great uncertainty over whether hydrogen could or should be blended in the natural gas stream. The University of California at Riverside's Hydrogen Blending Impacts Study, an independent study commissioned pursuant to Senate Bill 1369, concluded that hydrogen blends above 5% could require modifications of appliances such as stoves and water heaters to avoid leaks and equipment malfunctions. If this is the case, consumers will need to invest in adapting or replacing their appliances, an additional cost to high gas bills.

Conclusion

Evidence analyzed by IEEFA suggests that rate-of-return regulation has encouraged Enagás to overinvest in gas infrastructure, boosting costs for Spain's gas consumers and returns for Enagás shareholders.

Under the premise of security and diversification of supply, Enagás has created a significant oversupply of underutilized gas infrastructure. The cost of the unnecessary investments falls on consumers, who continue to face high bills.

A high number of LNG regasification terminals were built in more than 10 years, but their construction cannot be justified because of the lack of demand for such projects, as shown by this analysis.

Enagás continues to use the same narrative—that is, seeking to address "security of supply and decarbonisation" in Spain and Europe to reflect the most pressing challenges in the European and global energy market—to justify continued investment in new and potentially unnecessary gas and hydrogen infrastructure. As this report shows, the company's aim is to guarantee a regulated revenue, regardless of whether this comes at the expense of gas consumers.

About IEEFA

The Institute for Energy Economics and Financial Analysis (IEEFA) examines issues related to energy markets, trends and policies. The Institute's mission is to accelerate the transition to a diverse, sustainable and profitable energy economy. www.ieefa.org

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Ana Maria Jaller-Makarewicz, energy analyst for IEEFA, is an energy consultant and training facilitator with a BSc and MSc in electrical engineering. Ana worked in Colombia at Electric Utilities, gas distribution company and Universidad de Norte. In the UK, she has worked as an energy consultant analysing the global natural gas market and industry. She advised electricity regulators in BiH and the Ministry of Power in Nigeria and worked as individual contractor for UNFCCC. She has delivered energy training programmes in Africa, Asia, Middle East, Latin America and Europe.