A Study on Consumer Protection during Gas Phase-Out

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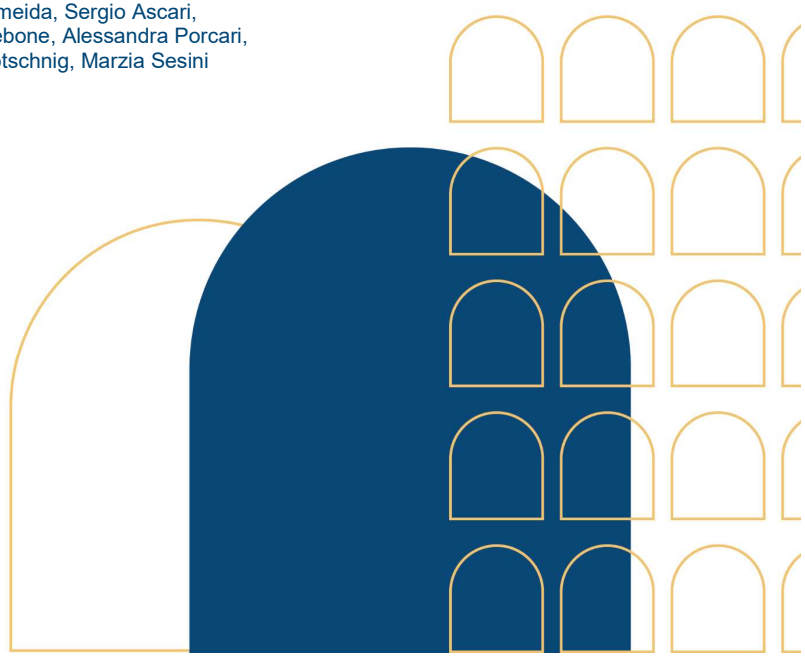

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Executive Summary

The EU aims to reach climate neutrality by 2050, which means phasing out almost all fossil fuels and shifting to renewable energy. As a result, gas consumption is already falling and will continue to decline over the next few decades as more households switch to cleaner, ultimately cheaper heating and cooling systems. As gas consumption declines, parts of today's gas grid will become redundant. Some sections may be repurposed for hydrogen, but future hydrogen demand is uncertain, and repurposing is unlikely to apply to most distribution networks.

This transition brings significant challenges for consumers. As fewer households remain connected to the gas grid, the fixed costs of maintaining the infrastructure will be spread across a shrinking user base. This means higher network charges per customer, particularly in areas where the grid cannot be fully depreciated or repurposed. These rising costs will hit low-income and vulnerable households hardest, especially those unable to afford a quick switch to cleaner heating.

This Study examines how the gas phase-out will affect households, focusing on the financial pressures faced by consumers still connected to the gas grid in France and Spain. It quantifies the expected cost impacts on households and assesses the risks they may face during the transition. In addition, the Study reviews possible consumer safeguards and provides practical recommendations for a regulatory framework—both at the national level (in France and Spain) and at the EU level—to ensure strong consumer protection throughout the gas transition.

Consumption reduction, disconnection trends and cost reallocation

Since 2021, gas demand has fallen sharply in both France and Spain, but for different reasons. In France, demand is dropping because both the number of connected customers and their average consumption are declining. Between 2021 and 2027, customer numbers are expected to fall by about 8%, while average use per customer is expected to decline by 10–12%, leading to sustained reductions in total volumes and users. In Spain, customer numbers have stayed almost unchanged (–1.5% from 2019 to 2024), but total household demand has fallen by roughly 17%. This shows that Spain's reduction comes mainly from lower consumption per connected customer, not disconnections.

These trends may be explained by different tariff choices across countries. France recovers more network costs through fixed and capacity-based charges, making revenues less sensitive to falling consumption. But this also weakens the link between usage and bills, potentially encouraging households able to switch to disconnect entirely, while shifting more fixed costs onto those who remain (often renters or customers with limited ability to change heating systems). Recent ATRD7 adjustments better target large backup users, but do not eliminate the long-term pressure created by a shrinking customer base. Spain has moved in the opposite direction by reducing fixed charges and relying more on volumetric charges. This protects low-consumption and vulnerable households but increases revenue risk for distributors as falling consumption makes revenues more dependent on delivered volumes. Over time, this may lead to higher per-kWh charges as demand continues to decline.

Economically, declining gas demand creates a classic cost-recovery challenge for networks with high fixed costs. Fixed or capacity-based charges can help secure revenues, but when used extensively—as in France—they raise fairness concerns because they increase regressivity: low-income households spend more of their income on energy despite using less. In contrast, Spain's more volumetric system is more equitable today but may face sustainability issues in the long run.

Impact of gas consumption reduction on gas network unit costs

Our future scenarios (2030–2050) suggest that the expected "death spiral"—falling gas consumption leading to higher network costs, further reinforced by ETS2 carbon pricing—may indeed occur and significantly affect consumers' welfare and energy choices. The strong price sensitivity already seen during the 2021–22 energy crisis is likely to persist, as many households now view natural gas as risky, politically exposed, and increasingly expensive. As a result, consumers continue to cut their gas use, improve efficiency (sobriété in France), or switch to alternative energy sources such as electricity or, in rural areas, wood-based fuels.

In France, rising transmission and distribution costs, spread across a shrinking consumption base, result in sharp price increases for all users. Small customers (households, commerce, public services) are most affected because distribution charges account for about 70% of their network costs. As consumption falls faster for households than for industry, household gas becomes increasingly unaffordable, accelerating the move away from gas. The FSR model projects a 53% price increase and a 61% decline in consumption by 2030, implying that household gas use would nearly vanish by 2032. Industry faces similar dynamics, with FSR projecting a 78% price increase and a 34% drop in consumption by 2030. Even estimates based on the French gas transportation industry's gas consumption scenarios show price increases for households between 44 and 52% by 2030, strengthening to almost 80% by 2040 and 100-140% by 2050, provided that biomethane could be competitive with current natural gas prices plus carbon-related (ETS) taxes. Gas use for power and heat is expected to vanish around 2030, pushing network utilisation down and unit costs up. Overall, most distribution networks in France are expected to face very low usage by 2032, paving the way for large-scale decommissioning.

In Spain, network costs stay roughly stable, but declining gas demand after 2030 raises unit network charges, reinforced by ETS2 after 2028. The resulting price increases trigger further declines in consumption, creating a slower but still significant downward spiral. Because many Spanish industrial users are connected to distribution networks, both households and industry share price impacts more evenly than in France. Growing renewable power generation reduces the operating hours of gas transmission networks, further raising unit costs. The FSR scenario shows consumption rising slightly until 2030 due to recent network expansion, before declining. Household price increases in 2030 range from 55–62%, while industry faces 37–57% increases. Gas expenditure for the average household/commercial user rises by €237–€283 in 2030, increasing further in later years.

Spain's gas system appears more resilient than France's. Besides the difference in network tariff structure, Spain has lower expectations for biomethane investment, a larger share of

industrial users, and lower average consumption per customer, which reduces the impact on bills and price sensitivity. Finally, the social impact differs between the two countries. In Spain, low-income households generally do not rely on gas and are therefore less exposed to these price increases. In France—and in colder European countries where household gas use is widespread—the burden on vulnerable consumers is likely to be more significant.

Mapping the regulatory and policy framework for consumer rights and protection

Assessing consumer rights and protections during the natural gas phase-out requires understanding how both average and vulnerable households will react to the transition. To structure this analysis, we define five consumer profiles (Consumer Types), each capturing different behaviours and capacities—such as how quickly consumers respond to price changes and whether they can afford to switch to cleaner energy alternatives. Type 0 are passive stayers; Type 1 are consumers who reduce consumption; Type 2 switches to biomethane/hydrogen while using the network; Type 3 are fully electrify or shift to District Heating and Cooling system but remain physically connected; Type 4 are disconnected due to decommissioning. Each type faces different consumer protection gaps.

Beyond the Consumer Types, we also developed a broader analytical framework to structure the legal assessment. This framework is built around three interrelated pillars. The first focuses on consumer rights and protections. The second addresses network regulation, covering both tariff-setting rules and the planning and management of gas network phase-out or decommissioning. The third pillar examines support schemes, analysing the financial and practical assistance available to help consumers transition to alternative energy sources.

The 2024 Gas Directive acknowledges that gas network decommissioning may increase tariffs and widen inequalities, and it therefore calls for measures to protect vulnerable consumers. However, significant gaps remain open. Regarding the first pillar of consumer rights and protection, there is no explicit obligation on suppliers to inform customers how the phase-out and shrinking consumer base will affect their prices, whether in contracts or on bills. Also, existing termination and switching rights with no fee are geared toward changing natural gas suppliers rather than changing energy vectors, meaning that shifts such as moving from gas to biomethane or fully electrifying do not generally trigger enhanced rights. As for the second pillar on network regulation, the gas network decommissioning plan is procedurally robust – comprising planning, approval, operation, and monitoring – but it leaves a large margin of discretion to DSOs to determine the timing and spatial scope of their rolling out of these decommissioning plans. For the last pillar on support schemes, despite references to support schemes in various sector-specific legislation, their effectiveness depends on Member States' transposition and implementation.

Neither France nor Spain has transposed the 2024 Gas Directive, with the transposition deadline of 5 August 2026. Nevertheless, most of the consumer rights gaps identified at the EU level would not be addressed by these national laws. In France, suppliers could continue to charge consumers for termination related-fee, but limited to the costs actually incurred through the network operator. In Spain, meanwhile, consumers under the *Tarifa de Ultimo Recurso*, which includes a large number of individuals not limited to those in energy poverty, are entitled to switch suppliers without a termination fee, but it's uncertain whether fees could be applied for termination without switching. In both countries, there is no network decommissioning plan yet. As for the support schemes, there is a wide variety of aids for consumers to improve household energy efficiency, but reported administrative bureaucracy in accessing them undermines their effectiveness.

Legal and Policy Recommendations to ensure consumer protections

The proposed legal and policy recommendations are based on insights from stakeholders and evidence collected throughout the study. As a result, the Study proposes 12 legal and policy recommendations to ensure consumer rights and protections throughout the gas phased out. These recommendations are organised according to the “Pillars” and “Consumer Types” of the abovementioned analytical framework.

Consumer rights and protection		1. Provide clear and transparent contractual and billing information on how final customers' price is affected by gas network decommissioning or repurposing	Either the EU legislator must amend the 2024 Gas Directive, or the transposition of this Directive into Member States must include an obligation for suppliers to inform consumers of the calculation method used to determine the final gas price, including the exposed risk of increases in network tariff costs.
		2. Enlarge comparison tools to include price comparison between cross-reference of different energy vectors	EU legislator must amend 2024 Gas Directive to ensure the expansion of the comparison tool platform to incorporate offers beyond the supply of natural gas, including RLCG and, in particular, biomethane. Second, Member States must also ensure that consumers have access to comparison tools that can estimate the costs and benefits to consumers in the event of household electrification.
		3. Regulate termination-related fees without switching suppliers and potentially disconnection fees	EU and Member States must ensure that consumers are not charged termination-related fees when they terminate the gas supply contract without switching to or shifting to renewable gases, nor are they charged decommissioning costs by DSOs.
		4. Ensure coordinated action is in place to prevent consumers from falling into payment arrears	Member States must ensure that gas suppliers carry out early-warning monitoring and cooperate with competent public authorities in a structured manner, which could be operationalised through a set of rules.
		5. Strength the role of energy ombudsmen	Member States must ensure that energy ombudsmen's that could dedicate part of their monitoring activities to consumers impacted by gas network decommissioning
-Network Regulation	**Tariff regulation**	6. Avoid tariff designs that shift gas phase-out costs onto remaining households	Member States must partially socialise network costs through the public budget. Moreover, the EU must issue guidance encouraging tariff frameworks that support an orderly and socially balanced phase-out

			of gas, while avoiding excessive reliance on either fixed charges or rising volumetric recovery that could lead to uneven outcomes across user groups.
		7. Improve transparency and impact assessment of gas tariff reforms	Member States must publish standardised, time-series information on gas distribution tariffs and customer segmentation. Moreover, EU regulatory guidance should require national regulators to conduct and publish clear and detailed distributional impact assessments when modifying gas network tariff structures, particularly in contexts of declining demand and rising disconnections.
	Gas network phase-out planning	8. Ensure minimum standards for rolling-out the gas network decommissioning	The EU must set a minimum, common standard for all Member States to roll out the network decommissioning, for instance, by establishing a cost-benefit analysis criterion that would require DSOs to set and initiate a decommissioning plan.
		9. Launch information campaigns to enhance consumer awareness and empowerment, with roadmaps detailing the timeline and milestones of the decommissioning or repurposing process	Member States must improve consumers' access to clear, timely, and accessible information on gas network decommissioning and repurposing, thereby directly addressing consumer energy illiteracy and lack of awareness.
Support schemes		10. Facilitate access to available support schemes	Member States must issue support schemes with simpler procedures to access public funds, specifically for the electrification of residential buildings rather than for overall building energy efficiency.
		11. Facilitate access to fair loans for the purchase and installation of energy-efficient equipment	Member States must facilitate average consumers' access to fair loans to finance the purchase and installation of energy-efficient equipment, such as electric boilers and heating systems, thereby scaling EaaS for consumers and accelerating the phasing-out of gas. A credit-worthiness assessment must be mandatory.
		12. Address the landlord-tenant dilemma with a transparent cost allocation.	Member States must ensure that landlords may not oppose tenants' investments in the property with the purpose of reducing or terminating the natural gas consumption without duly justified reasons. It is important to ensure that the landlord and tenants can fairly share the costs for these investments proportional to the benefits in the short and long-term to the property.

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Acronyms

Acronym	Description
ATRD	*Accès des Tiers aux Réseaux de Distribution* (Access for Third Parties to Distribution Networks)
CNMC	*Comisión Nacional de Los Mercados y La Competencia*
CRE	*Commission de régulation de l'énergie* (Energy Regulation Commission)
EU	European Union
GRDF	*Gaz Réseau Distribution France* (French gas DSO)
GRTgaz	French gas TSO
GO	Guarantee of Origin
HH	Householder
NEPC	National Energy and Climate Plan
PNACC	*Plan national d'adaptation au changement climatique* (National Plan for Adaptation to Climate Change)
PPE	*Programmation pluriannuelle de l'énergie* (Multiannual Energy Programme)
RLCG	Renewable and Low-Carbon Gases
SNBC	*Stratégie Nationale Bas-Carbone* (National Low-Carbon Strategy)
TUR	*Tarifa de Último Recurso* (Last Resource Tariff)

INTRODUCTION

The European Union (EU) aims to achieve climate neutrality by 2050, which requires phasing out fossil fuels almost completely and transitioning to renewable energy sources. As a result, we expect gas consumption gradually to shrink over the next 25 years. Gas consumption is already decreasing, and an increasing number of consumers are switching to cleaner heating and cooling systems, which are also more cost-effective in the long run. Even considering the expectations of increasing biomethane injection, a reduction in gas consumption is making an expanding part of the current gas grid no longer used or needed (for example, for security of supply purposes). A portion of the gas grid becoming redundant might be repurposed to flow hydrogen. However, (i) the future demand for hydrogen transport infrastructure is still highly uncertain at transmission grids; and (ii) it is unlikely that this repurposing of gas infrastructure will be relevant for distribution grids.

The phase-out of gas is expected to present considerable transitional challenges, particularly for consumers. Consumers are here meant to refer to any natural person (individuals) acting for purposes outside their trade, business, craft or profession, as defined in the Consumer Rights Directive[1]. Consumers are then those referred to in sector-specific regulation as household customers or only householders.[2] As the number of users connected to the gas network diminishes, the fixed costs of maintaining and operating the infrastructure will be distributed among a shrinking customer base, which could be summed with dismantling costs. This could lead to higher per-user charges, at least to the extent that the gas infrastructure no longer needed to flow gas is not yet fully depreciated or cannot be repurposed. This escalation in network charges is likely to disproportionately affect vulnerable and low-income households, who may not have the financial capability to make the upfront investment required to transition promptly to cleaner heating alternatives.

Ensuring a fair and socially equitable transition necessitates the development and implementation of robust regulatory measures aimed at minimising the financial burden and preventing disproportionate impacts on consumers. However, despite the urgency of the issue, the challenges associated with gas grid decommissioning remain largely overlooked in the political discourse of many countries. The current lack of concrete regulatory action and comprehensive long-term planning to protect consumers poses a significant risk to the EU's commitment to a just transition, potentially leaving vulnerable groups exposed and undermining the principle of leaving no one behind.

This Study aims to analyse the implications for households of the gas phase-out, with a particular focus on the potential financial burden faced by consumers connected to the gas grid in France and Spain. This economic analysis will seek to quantify these implications in

[1] Article 2(1) of Directive 2011/83/EU of the European Parliament and of the Council of 25 October 2011 on consumer rights, amending Council Directive 93/13/EEC and Directive 1999/44/EC of the European Parliament and of the Council and repealing Council Directive 85/577/EEC and Directive 97/7/EC of the European Parliament and of the Council.

[2] Article 2(48) of Directive (EU) 2024/1788 of the European Parliament and of the Council of 13 June 2024 on common rules for the internal markets for renewable gas, natural gas and hydrogen, amending Directive (EU) 2023/1791 and repealing Directive 2009/73/EC (recast).

terms of costs and impact on households. Additionally, the Study will evaluate potential safeguards and formulate practical recommendations for a regulatory framework at both the national (in France and Spain) and EU levels, aimed at ensuring strong consumer protection throughout the gas transition process.

The overarching objectives of this Study are divided into four task objectives, which are developed in the following chapters:

- Chapter 1 provides evidence (per year) on how many consumers have been disconnected from the gas network since 2020 and how the costs of the gas infrastructure have been distributed among fewer consumers;
- Chapter 2 analyses the economic implications (including in terms of higher network charges) for consumers who remain connected to the gas grid, both under current conditions (2025) and in a future decarbonisation scenario (2030, 2040, 2050);
- Chapter 3 analyses the existing regulatory framework to protect consumers from a disproportionate financial burden as a consequence of the gas phase-out in Spain, in France and at the EU level; and
- Chapter 4 proposes legal and policy recommendations that could be introduced to protect consumers from a real and potential disproportionate financial burden caused by the gas phase-out.

1. CHAPTER 1 - DISCONNECTION TRENDS AND COST REALLOCATION (FRANCE & SPAIN)

This chapter examines how the use of gas distribution networks in France and Spain has evolved since 2019/2020, focusing on changes in the number of connected customers, total gas volumes delivered, and average consumption per customer. Drawing on regulators' and operators' data, it documents recent trends and short-term projections and uses them to assess how household gas use patterns are changing in practice. The chapter then interprets these trends in the light of current tariff structures, exploring how declining demand and a shrinking customer base interact with the regulatory-allowed revenue framework, and how this affects the structural allocation of network costs among remaining users. A comparative perspective highlights both common dynamics and important differences between France and Spain, reflecting contrasting regulatory choices and tariff design responses to similar underlying pressures.

Methodology

The data used in this chapter is based almost exclusively on official documents and datasets published by the French national energy regulator (CRE), the main French gas distribution network operator (GRDF, *Gaz Réseau Distribution France*), and the Spanish energy regulator (CNMC). The specific source documents used are referenced in the corresponding section and listed in the Annex. With one clearly identified exception, no external datasets are used.

For France, the analysis relies on CRE tariff decisions and scenarios, as well as on GRDF reporting. These sources provide annual, climate-normalised data on total gas volumes distributed across the GRDF network and the total number of connected customers, as well as information on residential disconnections *("abandon du gaz")*. However, neither CRE nor GRDF publishes a disaggregated breakdown of gas consumption by customer type[3]. GRDF reports only aggregate consumption (in climate-normalised GWh across all customer categories) and total customer numbers, without distinguishing household (HH) customers from other end-users. CRE filings similarly do not include HH-specific energy volumes, and no tariff-class segmentation of consumption is available. As a result, HH-only annual gas consumption in France cannot be directly derived from official sources.

Given the focus of this report on residential consumers, a limited number of external, consumer-focusing sources were therefore used to obtain estimates of French HH gas consumption. These sources provide indicative benchmarks for typical HH gas use per dwelling and are used solely to construct transparent, bounded estimates of HH consumption (presented in Table 2 below). These estimates are not presented as official statistics and are explicitly treated as indicative, with their assumptions and limitations clearly stated.

In addition, the chapter compares the non-smoothed allowed revenue (*"revenu autorisé non lissé"*) across the ATRD6 (2020–2023) and ATRD7 (2024–2027) tariff periods, as defined in CRE tariff decisions. The average allowed revenue is combined with average customer

[3] I.e. small and medium sized enterprises (SME's), households (HH), industrial customers, etc.

numbers and distributed volumes to construct illustrative indicators of revenue per connected customer and per MWh. These indicators are intended to show the evolution of structural cost rather than actual tariffs paid by individual consumers.

For Spain, the analysis is based on CNMC provincial-level monthly datasets covering gas consumption and client numbers by tariff group. HH consumers are identified using tariff classifications: *Grupos 3.1 and 3.2* under the pre-2021 tariff system and *RL01–RL03* following the introduction of the new tariff structure in 2021. Monthly data are aggregated to calendar-year totals. Although these are not explicitly HH-only datasets, they represent a much narrower band of customers that is more representative of HH than the CRE data.

For both countries, the analysis prioritises internal consistency and transparency over precision where official sources do not provide HH-level data. All assumptions and limitations are explicitly documented, and no adjustments are made that are not directly supported by the underlying regulatory datasets.

France – Disconnections, Demand, and Tariff Design (2020–2024)

Table 1.1 presents data referring to the entire GRDF distribution network. GRDF operates roughly 96% of the French gas distribution grid[4], so these indicators are a good proxy for the evolution of the connected customer base in France. We present 'actual' data from 2020 to 2023, followed by 'projection' data from 2024 to 2027, based on GRDF and CRE reports.

Table 1.1 – GRDF customers and gas distributed in France, 2020–2027

Year	Total gas (TWh)	Customers (millions)	Average demand (MWh/customer)	Type
2020	276.248	11.16	24.8	Actual
2021	276.753	11.17	24.8	Actual
2022	258.201	11.11	23.2	Actual
2023	241.380	11.01	21.9	Actual
2024	247.168	10.83	22.8	Projection
2025	241.044	10.66	22.6	Projection
2026	236.032	10.47	22.6	Projection
2027	229.925	10.25	22.4	Projection

Note: "Customers" includes all customers connected to GRDF's distribution network (households, small businesses, public and industrial sites). Gas distributed is climate-normalised, which removes year-to-year weather effects. 2023 is still marked as an estimate in the CRE documents, and 2024–2027 are GRDF projections validated by CRE.

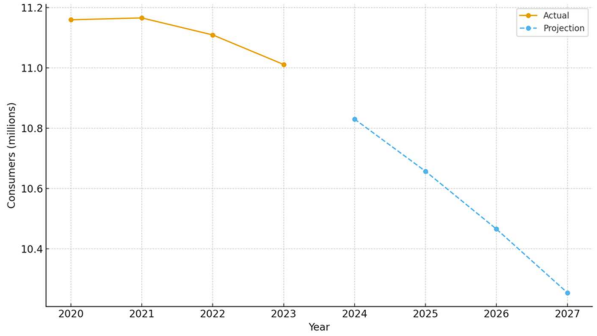
The total number of GRDF customers on the gas distribution network was broadly stable between 2020 and 2021 (around 11.16 million), then declined from 2022 onwards. CRE's

[4] IEA, 'France Natural Gas Security Policy' (2022) <https://www.iea.org/articles/france-natural-gas-security-policy>.

scenario for the 7th distribution network tariff period (ATRD7[5]) anticipates an acceleration of this decline, with the customer base shrinking to around 10.25 million by 2027. Average gas use per connected customer fell from about 24–25 MWh in 2020–2021 to around 22 MWh by 2023 and is expected to continue to contract slightly through to 2027. This suggests that reductions in gas demand are driven both by energy efficiency measures taken by consumers (e.g. insulation of homes, efficient appliances) and a shrinking connected base. In percentage terms, the total customer base declined by roughly 1.4% between 2021 and 2023, with projections indicating a cumulative reduction of around 8% by 2027 relative to 2021 levels.

Figure 1.1 shows the evolution of the total number of customers connected to GRDF's distribution network under CRE's ATRD7 scenario. These are total customers, rather than HH specifically, although we estimate that HH represent 70-90% of these customers (see Table 2).

Figure 1.1 – Number of GRDF customers on the gas distribution network

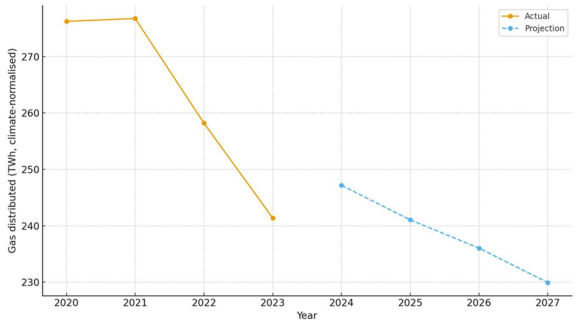


Sources: CRE – Délibération N°2024-40

Figure 1.2 presents the total climate-normalised gas demand on the distribution network under CRE's ATRD7 scenario.

Figure 1.2 – Gas distributed on GRDF distribution network (TWh, climate-normalised)

[5] ATRD7 is the current regulatory tariff framework for French gas distribution networks (2024–2027), through which CRE sets allowed revenues and adjusts tariff structures to reflect declining demand and changes in network usage.

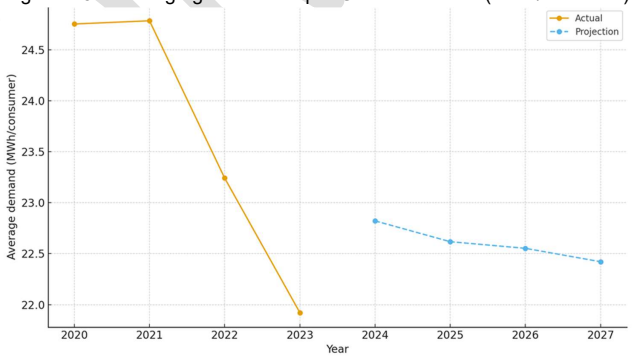


Sources: CRE – Délibération N°2024-40

Consumption has fallen steadily since 2021, with projections indicating a continued decline in the coming years. Again, this reflects both lower consumption per connected customer – likely due to improving energy efficiency and gradual fuel-switching – as well as increasing customer disconnections (*"abandon du gaz"* – see Table 3). Climate-normalised gas volumes distributed through the GRDF network fell from roughly 276 TWh in 2020–2021 to around 241 TWh by 2023. Projections show demand remaining on a downward trajectory, despite a short-term rebound in consumption between 2023 and 2024 in the climate-corrected series – likely a partial rebalancing following the energy crisis of 2022 - 2023. In percentage terms, climate-normalised gas volumes distributed through the GRDF network fell by approximately 13% between 2021 and 2023, with a projected decline of around 17% between 2021 and 2027.

Figure 1.3 shows average gas demand per connected customer, which follows broadly similar patterns to the total consumption data.

Figure 1.3 – Average gas demand per GRDF customer (MWh/customer)



Sources: CRE – Délibération N°2024-40

As previously mentioned, GRDF and CRE data do not include a disaggregated breakdown of gas consumption by customer class. Therefore, HH gas demand cannot be directly observed. The figures presented in Table 1.2, therefore, rely on a set of transparent and conservative assumptions to build a picture of potential HH consumption trends.

Table 1.2 - Estimated GRDF household (HH) consumption in France

	Lower bound	Upper bound
HH consumers as a % of total	70%	90%
Assumed # HH clients (11.1 M total in 2022)	7.8 M	10.0 M
Assumed per HH consumption	10 MWh	12 MWh
Estimated total HH consumption	78 TWh / year	120 TWh / year

Household consumption per dwelling is assumed at 10–12 MWh/year, based on publicly available consumer-information resources that summarise typical household gas usage in France. Sources: Selectra (2024). ~11,800 kWh/year; Meilleurtaux Énergie, (2025). 9,000–12,000 kWh/year; Vattenfall (date N.A). 9,865-20,361 kWh/year.

First, we assume that between 70% and 90% of all GRDF network customers are HH customers, consistent with the qualitative statements in CRE documents indicating that residential users form the majority of connections[6]. Second, the range of HH consumption per dwelling (10–12 MWh per year) is taken from publicly available consumer-focusing guidance summarising typical annual gas use for a gas-heated French home, based on information from market-facing actors[7]. Applying these benchmark intensities to the assumed share of HH clients produces a bounded estimate of total HH consumption.

These figures should not be interpreted as official CRE or GRDF HH demand estimates; they are indicative estimates designed to contextualise the scale of HH consumption within total distribution-network usage. They remain subject to uncertainty regarding dwelling type, regional heating needs, partial electrification, and the proportion of HH connected to gas but using little or no gas for heating. Table 1.3 below, however, presents HH-specific data on residential disconnections *("abandon du gaz")*.

Table 1.3 – Residential "*abandon du gaz*" (household disconnections from gas) in France

Year	Residential "*abandon du gaz*" (number of customers)	Type (actual/projection)
2020	113,000	Actual
2022	212,000	Actual
2027	241,000	Projection

Sources: CRE – Délibération N°2024-40

[6] CRE, 'Délibération de La Commission de Régulation de l'énergie Du 10 Mars 2016 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (2016) <https://www.cre.fr/fileadmin/Documents/Deliberations/import/160310ATRD5-GRDF.pdf>; CRE, 'Délibération de La Commission de Régulation de l'énergie Du 15 Février 2024 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (2024) <https://www.cre.fr/fileadmin/Documents/Deliberations/import/240215_2024-40_ATRD7_Post_CSE.pdf>.

[7] Selectra, 'Gas Price in France: How Much Does Gas Cost in 2021?' (2024) <https://en.selectra.info/energy-france/guides/gas/cost>; Meilleurtaux Energie, 'Consommation Moyenne de Gaz Naturel En France - Comment La Calculer?' (2025) <https://energie.meilleurtaux.com/gaz/simulateur-gaz/consommation-moyenne-gaz.html>; Vattenfall, 'Maison: consommation moyenne de gaz selon sa surface' (na) <https://www.vattenfall.fr/electricite-et-gaz/consommation-maison-gaz>.

CRE documents for the ATRD7 scenario report that around 113,000 residential customers abandoned gas in 2020, rising to around 212,000 in 2022, with a projected level of about 241,000 by 2027. These figures capture HH that formally disconnect from the gas distribution network, but understate the broader reduction in gas use, as many HH remain physically connected to the network while significantly reducing their gas consumption. Residential *"abandon du gaz"* numbers remain modest compared with the total customer base, but are clearly non-negligible and increasing.

CRE data allow residential disconnections to be identified explicitly, but do not provide a disaggregated breakdown of gas consumption or network tariffs by customer class. As a result, while HH exits from the gas network can be quantified, the tariffs for households that remain connected can only be analysed indirectly through the ATRD tariff groups defined by consumption bands. HH are not identified as a distinct category within the ATRD framework.

Instead, the tariff structure for gas distribution under ATRD7 segments customers into four tariff options (T1-T4), defined by annual consumption thresholds, as shown in Table 1.4. These tariff groups, therefore, combine different end-user categories, including HHs, tertiary users, and small industrial customers, depending on their annual gas use.

Table 1.4 – ATRD tariff options by annual consumption (ATRD7)

Tariff	Consumption band	Tariff structure	Approx. no. of consumers	Share of allowed revenues	Indicative customer profile
T1	0 – 4 MWh/year	Binomial (fixed and volumetric)	~3.2 million	11.8%	Typically, cooking and/or domestic hot water
T2	4 – 300 MWh/year	Binomial (fixed and volumetric)	~7.8 million	65.6%	Space heating small tertiary uses
T3	300 – 5,000 MWh/year	Binomial (fixed and volumetric)	~98,000	17.6%	Large non-industrial users; collective heating, large tertiary, small industry
T4	> 5,000 MWh/year	Trinomial (fixed, capacity and volumetric)	~2,700	~5.0%	Industrial or large collective uses

Sources: CRE – Délibération N°2024-40

As expected, the table shows a mismatch between the distribution of customers and the distribution of allowed revenues across tariff options. T1 and T2 together account for the vast majority of customers (over 95% of connections), but, given their low consumption levels, a smaller share of allowed revenues (~77%). In particular, T2 alone represents nearly two-thirds

of total revenues, reflecting the higher average consumption of gas-heated dwellings and small tertiary users, while T1 customers contribute relatively little despite their large numbers.

Conversely, T3 and T4 comprise less than 1% of sites, but together account for more than 20% of allowed revenues, highlighting the concentration of network cost recovery among larger customers. However, the absence of time-series data by tariff option or of a breakdown of revenues by tariff component (i.e., fixed vs variable components) means it does not allow an assessment of how tariff design has evolved over time or precisely how costs are shared across customer groups.

While the preceding sections document the decline in customer numbers and gas volumes, they do not by themselves show how these structural shifts interact with the regulatory framework governing network cost recovery. To assess this dimension, Table 1.5 compares the average *"revenu autorisé non lissé"* for the ATRD6 (2020–2023) and ATRD7 (2024–2027) tariff periods with the corresponding average number of connected customers and distributed volumes. This provides an indicative measure of how the overall network cost base evolves relative to the shrinking scale of the distribution system.

Table 1.5 – Network costs borne by French consumers: ATRD6 vs ATRD7[8]

	ATRD6 (2020–2023 avg.)	ATRD7 (2024–2027 avg.)	Change
Avg. allowed revenue (€m/year)	3,208.5[1]	3,898.8[2]	+21.5%
Avg. customers (millions)	11.11[3]	10.55[4]	–5.0%
Avg. gas delivered (TWh)	263.15[3]	238.54[4]	–9.3%
Avg. allowed revenue per connected customer (€/year)	289	370	+28%
Network cost per MWh (€/MWh)	12.19	16.35	+34%

Notes

[1] Average allowed revenue 2020–2023 (non-lissé): CRE – Délibération N°2020-010, p.59

[2] Average allowed revenue 2024–2027 (non-lissé): CRE – Délibération N°2024-40, p.65

[3] 2020–2023 consumption and customer figures: observed data (CRE – Délibération N°2024-40, p.63)

[4] 2024–2027 consumption and customer figures: CRE projections retained for ATRD7 (CRE – Délibération N°2024-40, p.65)

Sources: CRE – Délibération N°2020-010, CRE – Délibération N°2024-40

The comparison shows that the average allowed revenue has significantly increased between ATRD6 and ATRD7, while both the number of connected customers and distributed volumes have declined. It should be noted that the ATRD6 period includes exceptional shocks — notably the COVID-19 crisis and the 2022–2023 energy price spike — which contributed to temporary volatility in consumption. However, the ATRD7 scenario reflects CRE's assessment of a structurally declining demand trajectory. As a result, average allowed revenue per connected customer and per MWh distributed have risen significantly between the two regulatory periods. While these indicators should be interpreted as structural averages rather than literal charges paid by individual users, they illustrate how a largely fixed network cost base is recovered over a progressively smaller customer and demand base.

[8] The per-customer and per-MWh indicators are calculated as average allowed revenue divided by the average number of customers or total distributed volumes over each period. These metrics are illustrative indicators of structural cost evolution and do not represent actual network charges paid by individual consumers, which depend on tariff structure and consumption profile.

Spain – Disconnections, Demand, and Tariff Design (2019–2024)

This section documents annual gas connection trends and consumption in Spain between 2019 and 2024 using CNMC provincial-level datasets. For the 2019–September 2021 period, HH consumers correspond to the tariff groups *('Grupos')* 3.1 and 3.2, as per the old tariff classification system. In October 2021 the tariff system was updated to the new *'peaje'* structure, with HH consumers corresponding to tariff groups RL01–RL03 *(RL[9])* under Circular 6/2020. Both customer groups represent domestic and small non-household users (<50 MWh/year).

For 2019, household consumption data are only available from June to December. Therefore, full-year household consumption is estimated by extrapolating June–December 2019 consumption using the seasonal distribution of household gas demand observed in subsequent years. Specifically, the January–May share of annual consumption is inferred from the monthly consumption profile in 2020, with consistency checked against winter consumption levels observed in late 2021. This approach accounts for the strong seasonality of gas use and avoids linear scaling of partial-year data. Estimated 2019 values should nevertheless be interpreted with caution. For 2021, consumption combines Grupos 3.1 & 3.2 data (Jan–Sep) and RL01 - RL03 data (Oct–Dec), reflecting the transition to the new *'peaje'* structure.

Table 1.6 presents HH gas demand, the number of HH gas clients, and average consumption per client in Spain using CNMC tariff-group data.

Table 1.6 – Household (HH) gas demand, clients and average consumption per client in Spain

Year	Total household demand (TWh)	HH clients (millions)	Consumption per client (MWh)
2019	37.1	7.86	4.7
2020	38	7.90	4.8
2021	42.4	7.73	5.5
2022	36	7.74	4.7
2023	31.1	7.74	4.0
2024	30.8	7.74	4.0

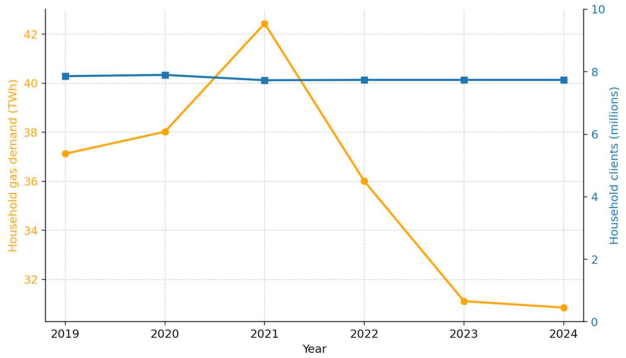
[9] 'RL' denotes local grids ('*redes locales*' in Spanish) and the different RL-codes denote consumer groups connected to the distribution grids charaterised by different consumption levels.

Sources: CNMC – Estadísticas del mercado de gas natural
2019 full-year values estimated from June–December data using seasonal profiles from subsequent years.

HH gas demand declines markedly, from 42.4 TWh in 2021 to just over 30 TWh in 2024. In percentage terms, both total HH demand and average consumption per household fell by approximately 27% between 2021 and 2024, while the number of HH gas clients remained essentially unchanged over the same period. This indicates that the reduction in gas use is driven by lower average consumption per HH rather than by household disconnections.

Figure 1.4 illustrates this decoupling of demand from the total number of consumers by presenting both HH gas demand (left axis) and the total number of HH gas clients (right axis) together.

Figure 1.4 – Household gas demand from 2019–2024 (in **orange**) and number of household gas clients from 2019–2024 (in **blue**), Spain



Sources: CNMC – Estadísticas del mercado de gas natural

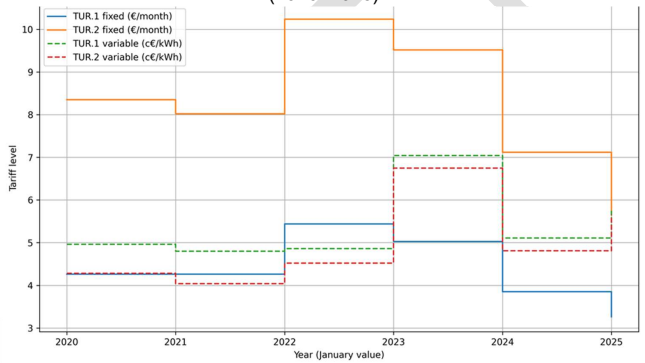
Key drivers for this trend likely include energy-saving behaviour following the 2021-22 energy crisis, growing efficiency measures, substitution toward electric heating, and climate variation – although these are only assumptions. What is certain, though, is that, as customer numbers remained flat, declining throughput increased the share of fixed distribution costs borne per delivered MWh, reinforcing upward pressure on per-unit network tariffs[10].

[10] CNMC, 'Memoria Justificativa de La Circular 4/2020, de 31 de Marzo, de La Comisión Nacional de Los Mercados y La Competencia, Por La Que Se Establece La Metodología Para Determinar La Retribución de La Distribución de Gas Natural' (2020) <https://www.cnmc.es/sites/default/files/2903966_1.pdf>; CNMC, 'Circular 4/2020, de 31 de Marzo, de La Comisión Nacional de Los Mercados y La Competencia, Por La Que Se Establece La Metodología de Retribución de La Distribución de Gas Natural' (2020) <https://www.boe.es/boe/dias/2020/04/03/pdfs/BOE-A-2020-4266.pdf>; CNMC, 'Estadísticas de gas natural' (2025) <https://www.cnmc.es/facil-para-ti/que-hace-la-cnmc-para-consumidores/estadisticas-de-gas-natural>.

In Spain, customers are connected to the distribution network under access tariff groups (RL01–RL03) defined by annual consumption, as described above. In parallel, a subset of these customers—primarily HH and small users—are supplied under the *Tarifa de Último Recurso* (TUR), a regulated retail gas tariff set by the CNMC and updated periodically. Although TUR is a supply tariff rather than a network access tariff, it applies to the same consumption bands as the RL access groups and incorporates both fixed and variable components that reflect, in part, underlying network and system costs. For this reason, the evolution of TUR tariff components provides a useful proxy for illustrating how cost recovery for small gas customers has been rebalanced over time, particularly in the context of declining household gas consumption.

As illustrated in Figure 1.5, from 2020 onwards, the TUR in Spain has exhibited a marked rebalancing between fixed and variable components for small gas customers.

Figure 1.5 – Evolution of regulated gas tariff components for small customers in Spain (2020–2025)



Sources: CNMC – Estadísticas del mercado de gas natural

Fixed monthly charges for both TUR.1 and TUR.2 increased slightly between 2020 and 2022, before falling sharply from 2023 onwards. By January 2025, fixed charges were around 25–35% lower than their 2020–2022 levels. Over the same period, variable charges per kWh rose strongly during 2022–2023, reflecting the energy crisis, and remained more volatile thereafter, even as wholesale prices eased.

This evolution indicates a deliberate shift in Spanish tariff design away from fixed charges and towards greater reliance on volumetric charges to recover network costs. In the context of broadly stable numbers of connected HH clients but declining gas use per customer, this approach limits the bill impact of fixed charges on low-consumption HH and reduces the risk that fixed charges accelerate disconnections. However, it also increases the sensitivity of network cost recovery to falling demand, as a larger share of costs is recovered per unit of energy delivered. As a result, while short-term affordability for remaining customers is preserved, the tariff structure may amplify longer-term revenue instability for gas distribution networks as consumption continues to decline.

Prior to 2020, Spanish gas regulation classified customers primarily by pressure level and broad consumption bands, with limited transparency on how fixed and variable charges were specifically allocated to small consumers. While tariffs already included both fixed and volumetric components, these were not designed or communicated as explicit, consumption-band-specific signals for HH customers. The post-2020 evolution of the '*TUR*' therefore represents a significant shift toward a more explicit rebalancing of fixed and variable charges for small consumers, with clearer implications for how network and supply costs are recovered as household gas use declines

France vs. Spain Tariff Design Comparison

In both France and Spain, gas distribution demand has declined markedly from 2021 onward, but the underlying drivers differ. In France, falling throughput reflects both a gradual contraction of the connected customer base and a reduction in average consumption per connected customer. Based on the available series, the number of connected customers is projected to decline by around 8% between 2021 and 2027, while average demand per customer is projected to fall by roughly 10–12%, resulting in a sustained decline in both total gas volumes and the number of users. In Spain, by contrast, the number of customers is virtually unchanged between 2021 and 2024, while total customer gas demand declined by around 27% over the same period. This indicates that the Spanish demand reduction is driven overwhelmingly by declining use per connected customer rather than by widespread network disconnections. These differing trends can be better understood when comparing tariff design choices in the two countries.

In France, under CRE's ATRD7 framework, a larger share of gas distribution costs is recovered through fixed and capacity-related charges, rather than through per-kWh charges linked to delivered volumes[11]. In the short term, this reduces distributors' exposure to declining consumption by making revenues less dependent on throughput. However, because customer bills become less responsive to reductions in gas use, HH with the financial and technical ability to switch away from gas may be implicitly encouraged to disconnect entirely. Over time, this approach risks concentrating a growing share of fixed network costs on less-flexible customers (e.g., renters or micro-SME's facing high upfront switching costs). CRE and GRDF have responded by adapting tariff structures, for example, under ATRD7, by introducing new terms from 2024 that better target large back-up and peak-capacity users[12]. These choices tend to limit the extent to which declining throughput automatically translates into much higher per-customer bills for typical HH, but they do not remove the underlying structural pressure from a shrinking, less-gas-intensive customer base.

[11] CRE, 'Délibération de La Commission de Régulation de l'énergie Du 15 Février 2024 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (n 6).

[12] ibid; CRE, 'Délibération de La Commission de Régulation de l'énergie Du 10 Mars 2016 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (n 6); CRE, 'Tarifs Reseaux Sommaire (Internal Document)' (na).

In Spain, tariff design for small customers has moved in the opposite direction. Fixed charges have been reduced, while a greater share of cost recovery relies on volumetric charges[13]. This structure cushions low-consumption and vulnerable HH from rising fixed charges and maintains a closer relationship between bills and actual gas use. This design choice is consistent with the observed stability in customer numbers despite a sharp decline in consumption. However, it also shifts risk toward distributors by increasing reliance on delivered volumes: as average consumption falls across a largely unchanged customer base, network revenues become more sensitive to further demand reductions, raising the likelihood of higher per-kWh charges in the future and renewed affordability pressures over time.

From an efficiency perspective, declining gas demand creates a classic cost-recovery problem for networks with high fixed costs. Volumetric tariffs, charged purely on consumption (€/kWh), provide efficient short-run usage signals, but, if set at cost-reflective levels, typically fail to recover total network costs that reflect marginal costs, even more so as volumes fall. In such circumstances, economic theory points to a second-best solution in which these residual fixed costs are recovered through charges which minimise distortions in consumers' behaviour (Ramsey pricing), such as standing charges for being connected to the network or capacity charges[14], up to the point where they begin to induce inefficient outcomes such as premature disconnection[15]. Seen through this lens, the French approach under ATRD7, which shifts a larger share of cost recovery to fixed and capacity-related charges, can be interpreted as conveying more efficient marginal-consumption signals while aiming to secure revenue adequacy.

However, reconciling efficiency with fairness is more complicated. HH energy consumption is typically regressive, with lower-income HH spending a higher share of income on energy despite lower absolute consumption. Increasing the share of costs recovered through fixed or capacity-related charges weakens the link between bills and actual usage, thereby amplifying regressivity. As a result, tariff structures with a high fixed component (e.g., the French model) may be considered less equitable, particularly for low-consumption and vulnerable HH who cannot easily disconnect from the gas network but face rising unavoidable charges as demand declines.

An important caveat is that the Spanish analysis isolates household and micro-SME customers (Grupos 3.1/3.2 and RL01–RL03), whereas the French analysis covers the entire GRDF distribution network across all customer categories (T1–T4). This difference in coverage likely explains part of the divergence observed between the two countries. Nevertheless, the comparison highlights a shared challenge: as gas use declines, the remaining customers are

[13] CNMC, 'Memoria Justificativa de La Circular 4/2020, de 31 de Marzo, de La Comisión Nacional de Los Mercados y La Competencia, Por La Que Se Establece La Metodología Para Determinar La Retribución de La Distribución de Gas Natural' (n 9); CNMC, 'Circular 4/2020, de 31 de Marzo, de La Comisión Nacional de Los Mercados y La Competencia, Por La Que Se Establece La Metodología de Retribución de La Distribución de Gas Natural' (n 9).

[14] Paul L Joskow, 'Regulation of Natural Monopoly' *Handbook of Law and Economics*, vol 2 (2007) <https://linkinghub.elsevier.com/retrieve/pii/S1574073007020166>.

[15] FP Ramsey, 'A Contribution to the Theory of Taxation' (1927) 37 The Economic Journal 47.

increasingly those with the least capacity to adapt, making tariff design a central determinant of whether the transition away from gas exacerbates or mitigates affordability risks.

Finally, these contrasting outcomes reflect regulatory choices rather than operator discretion. In both countries, distribution and access tariffs are set by independent national regulators—CRE in France and CNMC in Spain. The divergent tariff responses therefore represent different strategies for managing the social and financial consequences of declining gas demand on networks with largely fixed costs, rather than differences in institutional responsibility or technical constraints.

2. CHAPTER 2 - IMPACT OF GAS CONSUMPTION REDUCTION ON GAS NETWORK UNIT COSTS (2025-2050)

Introduction

The European Union set the goal of being climate-neutral by 2050. This can only be achieved by phasing out fossil fuels almost completely and transitioning to a renewable energy system. In turn, this could make gas grids redundant. However, whereas a significant reduction of the role of gas is generally foreseen, there are different views about the extent of such a reduction, and even more about the need to dismantle gas grids.

As we will see in the country analysis below, several scenarios envisage a significant but not dramatic reduction of gas consumption and the substitution of fossil by renewable gas, notably biomethane, as a way to comply with net-zero requirements. These scenarios entail limited reductions of both gas transmission and distribution networks. They acknowledge that gas consumption is already declining, aligned with the results in Chapter 1,[16] due to consumers switching to different energy vectors, with the gas price crisis of 2021-22 dealing a major blow to the perception of gas as a reliable and affordable source.

This Chapter assesses the economic implications for consumers who remain connected to the gas grid in a future decarbonisation scenario (2030, 2035, 2040, 2050). It introduces this scenario, named the FSR scenario, and compare to other publicly available scenarios. Where possible, specific care is devoted to understanding the economic implications for different consumer groups (e.g., distinguished by income level, geographic location etc.) and in relation to energy poverty.

Methodology

Gas prices for end customers can be broadly defined as consisting of four components:

- The wholesale price of natural gas, whether domestically produced or imported;
- The cost of infrastructure (transmission, distribution and storage[17]) used to transport gas to the end customers and deliver it with the required chemical, pressure and safety properties;
- The supplier's margin;
- Taxes and levies.

It is beyond the scope of this Report to pursue the development of any forecasting exercise about wholesale prices, considering how extremely difficult it is. Whereas price volatility is widely expected to remain higher than before 2020, complex economic and political factors may drive wholesale prices either up or down. Cyclical fluctuations are a common feature of

[16] See also Bruegel, 'European Natural Gas Demand Tracker' <https://www.bruegel.org/dataset/european-natural-gas-demand-tracker>.

[17] In this Report, we include the cost of LNG regasification into the wholesale price of gas, as it is not always part of the gas value chain and is often subject to a different regulatory regime (exemptions from third party access) in the EU.

fossil energy sources and other commodities such as minerals and agricultural products. Natural gas is no exception. Suppliers' margin may also change over time and typically depends on the degree of competition in the gas supply business, which may differ across regions and over time.

For the present analysis, we assume that both the component of the gas prices for end customers, reflecting wholesale gas prices and the suppliers' margins, remain constant over the forecasting horizon. Instead, we focus on the impact of changes in network costs and taxes. In the short term, changes in wholesale prices may affect mainly suppliers' margins, as many retail contracts offer fixed prices. However, when such contracts expire (usually after 1-2 years), such changes are typically (at least partly) transferred to end customers.

Network costs can be conveniently expressed as the total costs of transmission, storage, and distribution, divided by the volumes (expressed in energy) used by each of them.[18] Network costs are covered by network tariffs, which, being cost-reflective almost everywhere in Europe (at least on average), are updated and typically follow the evolution of costs, albeit with some delay - usually at the end of the regulatory period, e.g. the ATRD7 for France, or Circular 4-2020 (both mentioned in Chapter 1).

In addition, anticipated developments in carbon pricing applied to the final gas consumption - notably the EU Emission Trading System 2 (ETS2)[19] - will be factored in to gain a better understanding of how consumers' total gas bills may evolve in the future. Whereas several forecasts exist of ETS2 prices, as well as a policy framework to keep them within the range that is regarded as necessary to achieve decarbonisation objectives, other taxes depend on (mostly national) economic policy factors that cannot be foreseen, hence they will be kept constant in our analysis, with any excise tax change assumed to amount to the ETS carbon price and VAT-type taxes to vary proportionally.

Thus, the forecasting exercise is based on the following simple formula:

- Consumer Price = Wholesale Price + Cost of Transmission & Storage / Transmission Volume + Cost of Distribution / Distribution Volume + Supplier's margin + Carbon Price (ETS2) + VAT

Each component of this formula is assessed separately, except for the wholesale price, the supplier's margin, and VAT rates, which are assumed to be constant, as stated above. VAT is not considered for prices to the industry as it is not normally borne by manufacturers.

The analysis is conducted for France and Spain. No aggregate EU-level analysis is meaningful for such components, but a specific country-by-country analysis is required.

[18] In fact, for the purposes of the present analysis, storage can be conveniently regarded as an ancillary service of transmission and pooled with it, whereas distribution follows a potentially different pattern

[19] See e.g. Yehor Melakh, 'The State of the EU ETS 2: Europe's New Carbon Market' (*Clear Blue Markets,* 2025) <https://www.clearbluemarkets.com/knowledge-base/the-state-of-the-eu-ets-2-europes-new-carbon-market>.

For each component, estimation is based on:

- official forecasts as published in Documents issues by Governments, Governamental Agencies and network operators;
- our own elaboration of official forecasts, with a view to reconstructing the values of the above-listed components and assesings them critically, also by considering the impact of regulatory regimes. Elaborations benefited from interviews with national regulatory authorities and network operators, but any responsibility remains with the authors of this Report.

Values of gas consumption, related transmission (and storage) and distribution volumes are:

- taken from official forecasts, as stated above;
- for our own analysis, these are estimated by our own recursive model, based on the feedback of unit costs on prices, of prices on consumption, and of consumption on unit costs, with a view to model the feared downward spiral of costs and consumption. The model is outlined in more detail in the Annex

More specifically, stable or increasing network costs and the impact of the ETS2 implementation after 2028, combined with a shrinking consumption base, lead to significant unit cost increases, which in turn may trigger a further reduction of gas consumption, thereby reinforcing the unit cost increases.

Adequately to assess the impact on costs and prices, consumption is separately modelled for three main consuming sectors:

- Households (HH), commercial, transportation, agriculture and public services (usually supplied by distribution grids)
- Industry (supplied in part directly by transmission networks but partly by distribution grids)
- Power generation (usually supplied directly by the transmission grid).

For the impact of the ETS2, several forecasts are publicly available. We have chosen the Enerdata forecasts[20], which are intermediate among several others[21] and depend on scenarios. The values we have selected are for two scenarios (low and high), related to a less or more aggressive decarbonisation. For our own forecasting scenario, we have taken the mean of these scenarios. The ETS2 allowance prices in the Enerdata scenarios are presented in Table 2.1, and the ones used in our analysis are their mean values.

Table 2.1 – ETS2 allowance prices reference values (€/tCO2)

[20] Enerdata, 'Carbon Price Forecast 2030-2050: Assessing Market Stability & Future Challenges' (2025) <https://www.enerdata.net/publications/executive-briefing/carbon-price-projections-eu-ets.html>.

[21] BloombergNEF, 'Europe's New Emissions Trading System Expected to Have World's Highest Carbon Price in 2030 at €149, BloombergNEF Forecast Reveals' (2025) <https://about.bnef.com/insights/commodities/europes-new-emissions-trading-system-expected-to-have-worlds-highest-carbon-price-in-2030-at-e149-bloombergnef-forecast-reveals/>; AFS Energy, 'EU ETS Carbon Allowance Price Forecasts (2025–2030): What European Businesses Must Know for Effective Hedging and Compliance' (2025) <https://www.afsenergy.nl/blog-post/eu-ets-carbon-allowance-price-forecasts-2025-2030-what-european-businesses-must-know-for-effective-hedging-and-compliance>.

Year	Low	High
2027	45	55
2030	80	120
2040	120	160
2050	150	200

In any case, forecasts should be taken cautiously as several changes could occur in current regulatory practices, investment plans, and costs of renewable and low-carbon gases (RLCG), in response to unpredictable technological, economic, and policy evolution. This is, of course, truer the farther away from the present time. We suggest the reader focus on forecasts to 2030-35, even though later forecasted values are also provided as requested.

Further methodological details are provided in the Annex.

France

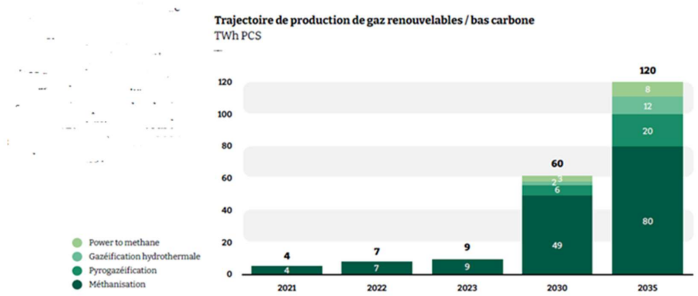
Overall gas outlook

In France, several official studies and position papers have been issued, dealing with climate and energy strategies that are deemed consistent with the country's 2050 net-zero commitment, as well as with the intermediate objective of cutting emissions by 50% by 2030 compared to 1990 levels. In particular, the National Energy and Climate Plan 2024 envisages a fall of natural gas-based primary energy consumption by 40 % by 2030 and 60 % by 2035, with respect to 2012. levels

On the other hand, a peculiar feature of the French approach to the gas role in the future energy system is the very high reliance on RLCG, notably those produced by pyrogasification and methanation. The related study by the main network operator, "*Perspectives Gaz 2024*" (henceforth: PG24)[22] expects that the role of such gases will reach 20% of national gas consumption by 2030 and over 40% by 2035, with a view to retaining a significant role of gas in the 2050 horizon, which would be by then 100% renewable or low carbon, as shown in (Figures 2.1 and 2.2.).

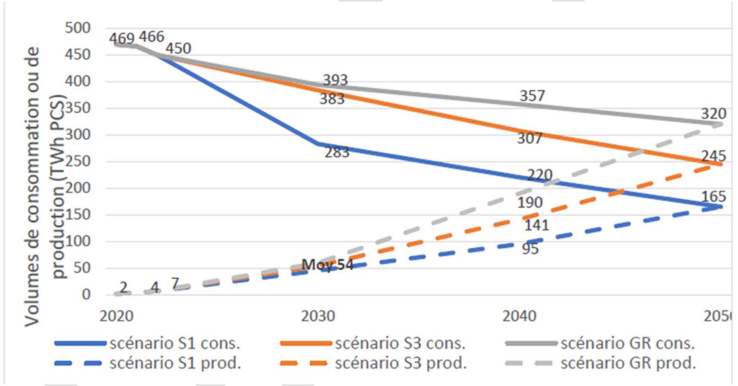
Figure 2.1 – Production trajectory of renewable and low-carbon gases to 2035 in France

[22]GRDF, GRTgaz and Térega, 'Perspectives Gaz 2024' (2024) <https://www.francegaz.fr/wp-content/uploads/perspectives_gaz_2024_final_web.pdf>.



Source: Perspectives Gaz 2024

Figure 2.2 – Gas Consumption and renewable/low carbon gas production until 2050 (TWh)[23]



Source: PG24

This very high reliance on RLCG raises several questions.

It is worth noting that the present Study does not focus on issues related to biomethane resources, technologies, costs and environmental impact. However, several published studies

[23] Scenarios S1 and S3 are two of several scenarios developed by ADEME, the official French Agency for Ecological Transition, which have been chosen by the PG24 Study for gas consumption forecasting, The GR scenario is taken from the Study published by the French Regulatory Commission of Energy: Commission de Regulation de l'Energie (CRE), 'Avenir Des Infrastructures Gazières Aux Horizons 2030 et 2050, Dans Un Context d'atteinte de La Neutralité Carbone' (2023) <https://www.cre.fr/fileadmin/Documents/Rapports_et_etudes/import/Rapport_avenir_des_infras_gazieres.pdf>.

have already addressed these issues, notably the studies published by DNV in 2023,[24] the IEA in 2025,[25] and the Cour de Comptes in 2025.[26] The reader is referred to them for further details. Key points of these studies are the following. First, the potential competition between the demand for biomass, mostly originating from agriculture, forestry and waste management, for the production of biomethane and for other uses, could raise the price of feedstocks. Second, the relative maturity of biomethane technology is expected to achieve only limited cost reductions in the future. Third, the impact on biodiversity in affected areas is a concern, as are some doubts about the products' actual carbon neutrality.

Moreover, in France, public subsidies may have been too large (addressing both investments and prices) and biased toward smaller producers, so that inefficient plants may have earned revenues that are not sustainable in the long run.[27]

The IEA reports estimates of their production costs between 20 and 70 €/MWh, with most European potential in the area of 40-50 €/MWh. Earlier DNV estimates are even higher at above 60 €/MWh by around 2030. These costs exceed current natural gas prices and would require adequate incentives and tax policies to be competitive, but are expected to become competitive with natural gas once the latter is charged with the carbon-related price after the implementation of ETS2. On the other hand, biomethane costs are expected to remain well below those of hydrogen.

Yet, the problem for biomethane is not only (and for the purpose of this Study, not so much) whether it can be competitive with traditional (natural) gas (even though it is not subject to ETS / ETS2 carbon price), but rather that the absolute level of gas prices would entail and could trigger a shift from gas consumption towards other energy carriers. For instance, the DNV study expects heat pumps to be more competitive than biomethane in the long run, notably in the residential and commercial market where low-temperature heat is needed. The success of such technology may however be slowed down by the high capital costs it entails, both for consumer appliances and for related home insulation interventions.

On the other hand, the substantial switch of the gas system to RLCG requires significant investment at both the transmission and distribution levels, whereas the persistence of nearly half of the current gas consumption to 2050 (turned to RLCG) could limit the decommissioning of networks to rather marginal sections, according to the PG24 Study. Such investments typically consist of:

- connections of RLCG producers, mostly to distribution grids, as RLCG are typically produced by relatively small plants that are scattered in the countryside;
- reinforcements and pressure upgrade of connections between distribution and transmission grids, as RLCG production is typically constant across seasons but consumption is not, hence gas must be transferred to storage sites to be available in peak (winter) months;
- adaptation of the transmission network to different supply patterns, as gas would originate mainly in rural areas, whereas a substantial part of consumption occurs in urban areas. Gas transmission logistics could be significantly affected and differ from the current pattern due to a limited number of production and import points.

[24] DNV, ' Project Olive. Biomethane Price Projection 2030', Report for the European Climate Foundation, 2023.
[25] ——, 'Outlook for Biogas and Biomethane. A Global Geospatial Assessment' (2025) <https://iea.blob.core.windows.net/assets/5b757571-c8d0-464f-baad-bc30ec5ff46e/OutlookforBiogasandBiomethane.pdf>
[26] Cour des comptes, 'Le soutien au développment du biogaz. Rapport public thematique, March 2025, www.ccomptes.fr/sites/default/files/2025-03/20250306-Soutien-au-developpement-du-biogaz.pdf
[27] Op. cit.

Therefore, total infrastructure costs are expected to slightly rise rather than decline. Estimations of such investments, as published by the PG24 Study, are included in our forecasting model.

It is worth noting that hydrogen plays a relatively minor role in these scenarios, which would mostly be limited to selected consumption areas and be transported by a separate network, some of which consisting of repurposed natural gas transmission lines. Almost all RLCG that would supply distribution grids (and hence small customers like households) would be biomethane.

Main components of the expected gas price evolution

As outlined in the general methodology section (section 2.2 above) we do not consider any change of the wholesale gas price. Any penetration of RLCG is assumed to be competitive with the current gas wholesale price, including any carbon price added to the latter, even though this is far from obvious. The carbon price entailed by ETS2 may facilitate the achievement of price parity between RLCG and traditional gas, but this is far from granted and beyond the scope of the present report.

Total costs of the transmission and distribution networks are projected starting from the current levels of allowed revenues set by CRE in 2024 for transmission (ATRT8), underground storage (ATS3) and distribution (ATRD7) (Tarifs d'accès | CRE). The latest levels of these allowed revenues already led to some increase in average network tariffs, due to the combined impact of growing costs and consumption reductions.

The evolution of tariffs in the longer term depends on future regulatory decisions. If the current regulatory model, enshrined in French law[28], is confirmed, we can expect relatively minor changes from the current level of *total* costs, but this would be borne by a shrinking consumption base. In particular, some savings may emerge from regulatory policies aimed at enhancing network management efficiency. On the other hand, the main factor that may lead to cost increases is the return of interest rates to normal levels from the ultra-low ones that have prevailed after the 2007-09 financial crisis and until the post-pandemic recovery: the current regulatory framework for gas networks in France used a 10-year government bond rate of return of 1.8%, but this rate is now around 3.5%[29]. We assume these factors offset each

[28] French Energy Code, articles from L. 452-1 to L. 452-3.
[29] CEER, 'Regulatory Frameworks for European Energy Networks 2024' (2025) <https://www.ceer.eu/wp-content/uploads/2025/02/GA191_05_2_IRB-Regulatory-Frameworks-Report-2024-Main-report-1-1.pdf>; 'France Government Bonds - Yields Curve' <https://www.worldgovernmentbonds.com/country/france/>.

other and keep the total allowed revenue for transmission and distribution constant in real terms, except for the additional costs of RLCG injection and logistics.

In fact, the main expected increase in network costs in France over the next decades is the above mentioned adaptation of the system to RLCG, which is thoroughly analysed in the GP24 Study. The related estimated capital costs are added to the regulated asset base and other (operational) costs are assumed to increase proportionally.

Whereas total transmission and distribution costs increase due to the above mentioned additional costs of RLCG injection and logistics, this is partly offset by significantly lower (-70% to -20%) storage requirements, as less storage is necessary when almost all gas is sourced domestically. Other, more limited savings come from some distribution network decommissioning that may occur in case of general customer disconnections from entire areas. However, the available results for very specific areas that are reported by the PG24 Study point to very limited network decommissioning: according to these studies, on average, a 15% reduction of customer connections would only entail a 1% reduction of the active distribution grid. Hence the related costs savings would be almost negligible. Thus, the increasing factors (additional costs) clearly dominate the limited offsetting ones.

Overall, considering all these factors and including costs for connection of new biomethane sites and the related transmission reinforcements, we expect:

- distribution costs to increase between 0.3% and 1.2% each year until 2050,
- total transmission and storage costs would decline between -0.2% and -2.2% each year, depending on scenarios.

CRE, the French energy regulatory agency, is fully aware of this evolution, which has already begun.[30] In fact, the 7th regulatory period (2024-27) has started with a 27% average tariff increase, of which 20% represents the recovery of missing revenues of the previous 4 years – due in turn to the lower than expected consumption in that period; 1.6% depends on increasing costs, which are expected to grow further during the period in relation to inflation; and 6% is related to spreading total costs on a lower customer and consumption base. CRE expects that the number of connected customers will decline by 1.5%/year during the 7th regulatory period, and consumption by 2%/year.

In turn, PG24 forecasts point to a reduction in the number of customers that proceeds at a lower rate (-1%/year) than that of consumption, as many customers retain their connection - e.g. to cope with “cold peaks” when other sources of energy, like heat pumps, may not be adequate. However, consumption levels – rather than the number of customers are what

[30] “Au cours des périodes tarifaires suivantes, la baisse de la consommation de gaz devrait se poursuivre. L’étude sur l’avenir des infrastructures gazières aux horizons 2030 et 2050 publiée par la CRE le 4 avril 2023 montre que le dimensionnement des infrastructures nécessaires ne devrait en revanche que faiblement décroître, et que seules des parties limitées du réseau pourront être abandonnées. Des coûts fixes stables ou ne décroissant que légèrement seront donc supportés par une plus faible base d’utilisateurs qu’aujourd’hui, ce qui entraînera de nouvelles hausses des termes tarifaires. Le cadre de régulation tarifaire du tarif ATRD7 évolue pour garantir à long terme la soutenabilité économique du système gazier”, CRE, ATRD7 (2024), p. 2.

matters to understand the impact on gas network unit costs, i.e. the average network charge per unit of consumption.

Our model includes two consumption forecasts to 2050, outlined in the “low” and “high” scenarios of the PG24 Study, which are deemed consistent with net-zero scenarios. Moreover, a third scenario represents our own forecasts and is based on the recursive model described in detail in the Annex.

Results

The combined impact of increased transmission and distribution costs (only partly offset by reducted storage costs),and the fact that such costs must be borne by a falling consumption base, will leads to dramatic price increases for both HH and industry (including commerce and public services). However, prices for HH and other small customers are expected to increase proportionally more, as distribution costs increase,whereas transmission and storage costs will tend slightly to decline. Moreover, consumption falls faster for HH and other small custommeers than for larger industry, which is mostly directly connected to the transmission networks and suffers therefore from relatively lower increases. In France, distribution costs typically represent 70% of the network costs for small customers, while transmission and storage costs account for 30%. Total network costs ccounted for 42% of the total cost of gas (excluding taxes) for HH and commercial users in 2024.

The increase in prices due the spreading of network costs on a shrinking consumption base accelerates the transition away from gas across all type of customers, including consumers. Gas-fired power generation is expected to be the first to almost disappear, as growing generation from renewables and nuclear crowds it out, except for a limited back-up role. The gas industry estimates that the fall of gas consumption for power generation may be offset by some growth in the transportation sector; an assessment of such forecast is beyond the scope of the present Study. Small customers (HH, commerce and public services) will follow, finding gas too expensive and switching to other energy sources. Industry consumption will be slightly more resilient, but it will also suffers from hard price hikes as network costs are borne by a shrinking total consumption, affecting all consumption sectors.

Starting from 2028, the impact of rising network costs is further enhanced by the addition of the ETS2 costs, falling on smaller customers, including HH, and increasing in line with most forecasts.

Tables 2.2 and 2.3 show the expected price variations (with respect to 2024) and the related consumption evolution, as averages for small customers (HH, commerce and public services) and large industry, for the “low” and “high” scenarios of the PG24 Study (see below). For comparison purposes, we add our one FSR scenario for 2030.

Table 2.2 – Expected average % gas price and consumption percentage changes with respect to 2024 levels for HH, commerce and public services

Year	Average price incl. all taxes			Average price excl. all taxes			Consumption		
Scenario	PG24 low	PG24 high	FSR	PG24 low	PG24 high	FSR	PG24 low	PG24 high	FSR
2030	43.7%	52.5%	53.1%	23.9%	17.2%	27.3%	-29.8%	-19.2%	-60.7%
2035	59.8%	68.1%	N.A.	37.1%	29.6%	N.A.	-45.9%	-33.1%	N.A.
2040	77.7%	78.7%	N.A.	52.6%	34.9%	N.A.	-57.7%	-37.6%	N.A.
2045	100.3%	89.7%	N.A.	77.2%	40.9%	N.A.	-69.5%	-42.0%	N.A.
2050	137.3%	101.2%	N.A.	121.5%	47.6%	N.A.	-81.3%	-46.5%	N.A.

The table and chart below show the evolution of the key factors that affect retail gas prices: network costs and carbon-related taxes. The evolution of the wholesale gas price is not shown as it has been assumed to remain constant[31]. The tax component is the same under all scenarios.

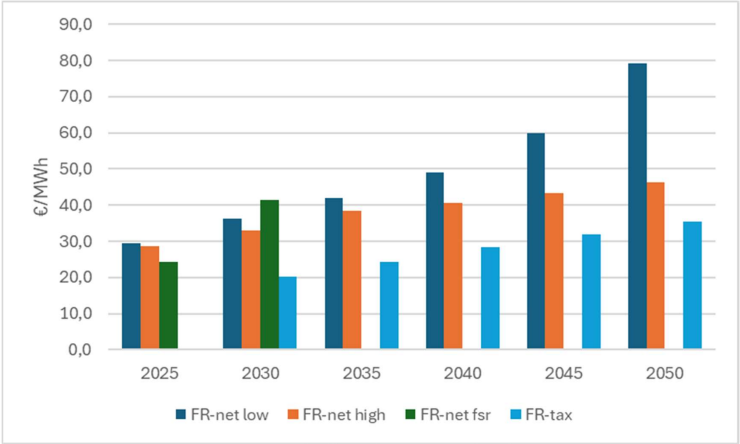
Table 2.3 – Key components of expected average HH gas price under different forecasting scenarios (€/MWh)

	FR-net low	FR-net high	FR-net fsr	FR-tax
2025	29,5	28,6	24,4	0,0
2030	36,3	32,9	41,3	20,2
2035	42,1	38,4	N.A.	24,3
2040	48,9	40,7	N.A.	28,3
2045	59,8	43,3	N.A.	31,9
2050	79,3	46,3	N.A.	35,4

The increase in the network cost component depends partly on a slight increase in total costs, mostly driven by investments for the collection and transportation of biomethane. However, the main reason for the increase is the fact that such costs are spread over fewer customers and borne by a shrinking consumption basis. Considering an average of the low and high scenarios, the annual network cost was about 608 EUR per customer as of 2024, but would increase to 730 by 2030.

[31] The estimation starts from 2024 data, hence 2025 is an estimate and not actual data, which were not yet available at the time of estimation.

Figure 2.3 – Key components of expected average HH gas price under different forecasting scenarios



We calculated our own estimates based on the recursive model described in section 2.2 above and in the Annex. Our estimation leads to steeper price increases of 53% as of 2030, with an associated consumption fall of - 61%. Such dramatic price escalation and the related shift from gas would imply the substantial disappearance of gas for HH around 2032, when the retail price (incl. taxes) would more than double (+109.5%) with respect to 2024. Hence, there are no FSR estimates beyond that date. On the other hand, it is not likely that all gas customers would disconnect by that date, but it is also unlikely that the few remaining customers would bear the cost of the whole network. As gas consumption shrinks to very low levels, some public intervention would probably occur to subsidise them until a full phaseout is carried out.

Whereas our model is certainly simpler than those underpinning the PG24 estimations, it could be considered to highlight that the “death spiral” of gas consumption might indeed become worse than what the gas industry forecasts.

Table 2.4 – Expected average gas price and consumption percentage changes with respect to 2024 levels for industry

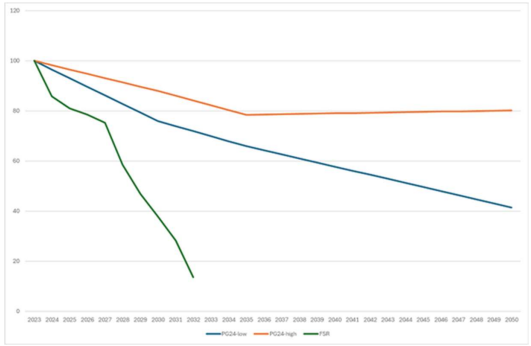
Year	Average price incl. taxes. ex. VAT			Consumption		
Scenario	PG24 low	PG24 high	FSR	PG24 low	PG24 high	FSR
2030	37.5%	54.0%	78.0%	-16.7%	-7.1%	-34.0%
2035	47.0%	64.8%	N.A.	-26.2%	-14.3%	N.A.
2040	56.0%	73.1%	N.A.	-32.8%	-21.2%	N.A.
2045	63.1%	81.4%	N.A.	-39.4%	-28.0%	N.A.

Our own estimates point to higher price increases of 78% by 2030, with a related consumption decline of -34%. Industry would also face a doubling of prices and leave gas around 2033.

We do not include estimations of other sectors – notably power and heat generation – as it is beyond the scope of the current Study. However, gas consumption for power and heat generation is expected to virtually disappear in France around 2030 due to high prices and the expected development of renewables,[32] thereby reducing the load factors of the transmission network and increasing their unit costs. This may be offset only if gas consumption for transportation grows significantly.

Figure 2.4 shows the evolution of total consumption in the PG24 scenarios and in our own forecasts, which forecast negligible consumption levels after 2032, paving the way for the mothballing or decommissioning of most networks and the disconnection of their end customers.

Figure 2.4 - Evolution of gas consumption in France until 2050 under several scenarios (2023=100)



Finally, Table 2.5 shows the expected expenditure (gas bill) increase for the average French residential and commercial consumer under the various forecasting scenarios. In France, the average residential and commercial consumer used 16.5 MWh/year of gas as of 2024.

Table 2.5 – Expected increase of gas expenditure of the average French residential/commercial consumer with respect to 2024 (EUR/year)

[32] RTE, 'Energy Pathways to 2050' (2021) <https://assets.rte-france.com/prod/public/2022-01/Energy%20pathways%202050_Key%20results.pdf>.

	PG24-low (incl. taxes)	PG24-low (excl. taxes)	PG24-high (incl. taxes)	PG24-high (excl. taxes)	FSR (incl. taxes)	FSR (excl. taxes)
2030	729.5	277.6	876.0	199.8	886.3	317.1
2035	998.7	431.0	1137.1	343.8		
2040	1296.9	611.0	1312.9	405.4		
2045	1675.1	896.8	1496.7	475.1		
2050	2291.6	1411.4	1689.7	552.9		

To understand the expenditure evolution with vs. without taxes, consider that taxes (excise and VAT) currently represent about 30% of the total price. Simulations assume that excise and VAT rates do not change, but ETS2 carbon pricing is added to excise taxes from 2028.

Spain

Overall gas outlook

Spain is committed to achieving Net Zero by 2050, and general plans have been outlined.[33] However, for Spain, we found few studies that explicitly forecast gas consumption in the country up to 2050. We focused on two sets of forecasts:

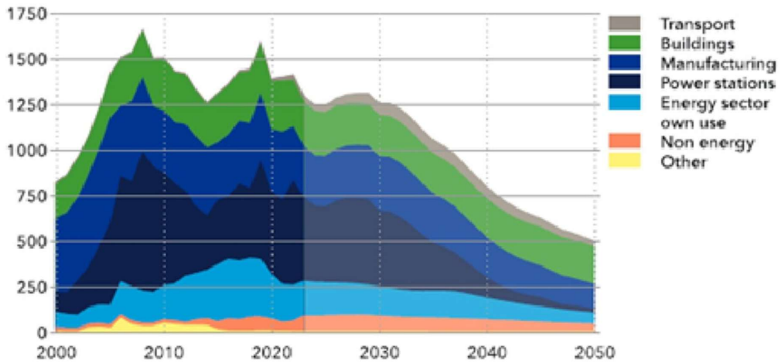
- The official National Integrated Energy and Climate Plan (*Plano Nacional Integrado de Energía y Clima* or *PNIEC*), issued by the Ministry for the Green Transition and the Demographic Challenge in September 2024 and updated to cover the period 2023-30. Hence, the PNIEC scenario in this Report has been used to cover only the 2030 horizon.
- A Study by a major consultancy (DNV),[34] prepared as a celebration of the company's 25 years of involvement in the Spanish energy industry and outlining single forecasts for gas consumption by sector in the 2030-40-50 horizon.

The following Figure 2.4 is taken from the DNV Study and shows such forecasts by sector. After a relative resilience for the rest of the current decade, DNV expects consumption to fall, driven by the collapse of gas-fired power generation (as renewables increasingly dominate), whereas buildings and industry are expected to diminish less dramatically.

Figure 2.4 – Gas consumption forecasts until 2050 in the DNV (2024) Study

[33] Government of Spain, 'Spain 2050. Fundamentals and Proposals for a Long-Term National Strategy' (2024) <https://futuros.gob.es/sites/default/files/esp2050/pdf/en/Spain_2050.pdf>.

[34] DNV, 'Energy Transition Outlook Spain 2024' (2024) <https://www.dnv.com/energy-transition-outlook/spain-2024/>.



Evolution of the main components of the expected gas price evolution

The estimation of costs follows a similar criteria approach as for France. The wholesale gas price is assumed constant in real terms at the average gas procurement price estimated by Naturgy[35], the main Spanish gas company, in its publication on key numbers of the Spanish gas sector. The same publication assesses the values of the main regulated price components (transmission and distribution regulated revenues). Considering the lack of expectations for significant customers disconnection – let alone the disconnection of entire regions or cities –, total transmission and distribution regulated revenues have been assumed to remain constant in the future, except for some increase in relation to the costs of connecting renewable gas facilities.

As in France, the gas industry highlights the remarkable role that renewable gases may have in the future. A Report by the main transmission company, Enagas[36], underlines recent regulatory improvements on this issue and mentions the main achievements to date, mainly in the area of Guarantees of Origin (GOs). A 2024 Sustainability Report by the largest distribution company, NEDGIA (serving about 70% of Spanish gas connections), highlights the progress in its capacity connection of renewable gases and lists the first biomethane injection cases.[37] A more technical, detailed Report by the Association of the Spanish gas industry[38] estimates the Spanish biomethane production potential into 2050 at 163 TWh/year, with details provided by source, technology and region, and expects related investments at about 40.5 billion EUR,

[35] Fundación Naturgy, 'El Sector Español Del Gas En Números. Informe 2024' (2025) <https://www.fundacionnaturgy.org/publicacion/el-sector-espanol-del-gas-en-numeros-informe-2024/>.

[36] Enagas, 'Annual Report 2024' (2025) <https://www.enagas.es/content/dam/enagas/en/files/enagas-communication-room/publications/informe-anual/Annual-Report-2024-Enagas.pdf>.

[37] Nedgia Grupo Naturgy, 'Memoria de Sostenibilidad 2024' (2024) <https://www.nedgia.es/wp-content/uploads/2025/12/Nedgia-memoria-sostenibilidad.pdf>.

[38] Sedigas, 'A Study of the Capacity for Biomethane Production in Spain, 2023' (2023) <https://biometano.sedigas.es/wp-content/uploads/2023/03/sedigas-report-potential-biomethane-2023.pdf>.

of which 8.3% in network developments. EBA[39] reports that Spain is the current leader of biomethane development in Europe, with planned investments of 4.8 billion EUR in the sector, delivering a capacity of 17.3 TWh/year or 6% of current national consumption.

For our analysis, we kept the EBA[40] assumption of a 4.8 billion EUR investment in the Spanish biomethane value chain, to be spread over the 2025-2035 period, and in particular the assumption that 8.3% of such investments would occur in gas networks. These investments would generate an annual incremental cost of about 8% relative to typical rates of return, depreciation and limited operational cost increases. These costs are split between transmission and distribution (in the same proportion as outlined by the more detailed French PG24 Study) and added to current costs, triggering a limited cost increase of 4% for transmission and 6% for distribution as of 2035.

The transmission and distribution costs are split across a shrinking consumption base, though in different ways for various consuming sectors. HH, commercial sector, public services and most of manufacturing in Spain are served by distribution companies, whereas only a few tens of large customers – mostly energy-intensive industrial plants such as oil refineries – are directly connected to transmission grids.

Our simulation is based on the impact of consumption reduction on unit costs, as total transmission and distribution costs are assumed as broadly constant, with the above mentioned limited increases in relation to the connection of biogas and biomethane plants. Moreover, the carbon price entailed by the implementation of ETS2 from 2028 on (see Table 2.1 above) is added.

For simulations, we use:

- the PNIEC scenario until 2030;
- the DNV forecasts until 2050;
- our own FSR forecasts, based on the recursive model described in section 2.2 above, and in more detail in the Annex.

Results

Stable (or slightly increasing) network costs, recovered from a shrinking consumption base after 2030, lead to increasing unit network costs for both transmission and distribution. This trend, together with the impact of ETS2 implementation after 2028, triggers a significant reduction of gas consumption, thereby reinforcing unit cost increases and putting in motion a downward spiral. The impact, however, is slower than in France, but it is more evenly distributed between HH (and other smaller customers) and industry, probably because most

[39] European Biogas Association, 'Biomethane Investment Outlook. Third Edition.' (2025) <https://www.europeanbiogas.eu/wp-content/uploads/2025/10/EBA-Biomethane-Investment-Outlook_2025.pdf>.

[40] ibid.

industrial customers in the country are connected to distribution grids and hence are subject to unit cost increases in both transmission and distribution.

The expected continuous strong growth of renewable-based power generation – where Spain is already one of the most advanced countries in Europe – further strengthens the impact, as gas transmission networks are used for fewer hours while their costs remain basically stable. Our model estimates that gas-fired power generation in Spain would almost disappear as a structural feature around 2035, with little and volatile use as back-up generation for renewables.

Although this main result holds across all considered scenarios, their timing differs, with our own estimations showing a delayed start of gas consumption decline. This may result from a temporary decline in wholesale gas prices in 2024 relative to their historical average, as well as from the recent gasification of some areas, where gas use is still spreading. Yet, the downward spiral occurs also in Spain, and across all considered forecasting scenarios.

Estimated impacts on prices and consumption in the three considered scenarios are provided in the following Tables 2.6 and 2.7. Figure 2.6 and Table 2.8 show the evolution of the key components of the household retail gas price under different scenarios; the tax components would be the same in all scenarios.

Table 2.6 – Expected average gas price and consumption % changes with respect to 2024 levels for households, commerce and public services

Year	Average price incl. all taxes			Average price excl. all taxes			Consumption		
Scenario	PNIEC	DNV	FSR	PNIEC	DNV	FSR	PNIEC	DNV	FSR
2030	61.7%	61.2%	55.3%	14.8%	2.0%	5.7%	+4.2%	-31.8%	+11.3%
2035	N.A.	67.2%	82.9%	N.A.	8.1%	29.5%	N.A.	-35.8%	-14.6%
2040	N.A.	74.1%	101.6%	N.A.	17.3%	39.6%	N.A.	-39.8%	-21.3%
2045	N.A.	81.4%	114.5%	N.A.	29.2%	45.0%	N.A.	-45.0%	-30.6%
2050	N.A.	91.1%	127.2%	N.A.	49.0%	50.1%	N.A.	-50.3%	-48.6%

Figure 2.6 – Key components of expected average household gas price under different forecasting scenarios

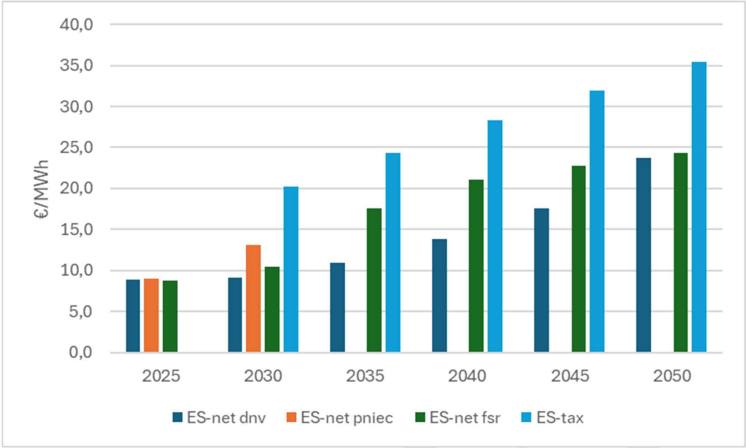


Table 2.7 – Expected average gas price and consumption percentage changes with respect to 2024 levels for industry

Year	Average price incl. taxes. ex. VAT			Consumption		
Scenario	PNIEC	DNV	FSR	PNIEC	DNV	FSR
2030	37.5%	54.2%	57.2%	-16.7%	-6.7%	-18.4%
2035	N.A.	68.7%	80.4%	N.A.	-17.4%	-21.8%
2040	N.A.	85.3%	97.7%	N.A.	-28.2%	-24.1%
2045	N.A.	101.8%	110.4%	N.A.	-42.3%	-26.4%
2050	N.A.	123.3%	122.8%	N.A.	-56.4%	-28.7%

Table 2.8 - Key components of expected average household gas price under different forecasting scenarios

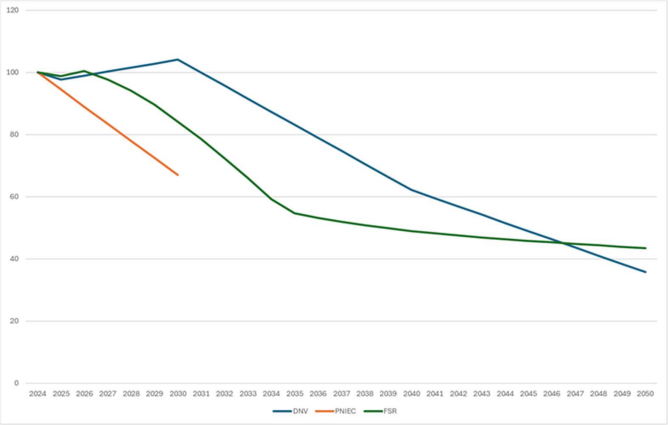
	ES-net dnv	ES-net pniec	ES-net fsr	ES-tax
2025	8,8	9,0	8,7	0,0
2030	9,1	13,1	10,5	20,2
2035	11,0		17,6	24,3
2040	13,8		21,1	28,3
2045	17,6		22,8	31,9
2050	23,8		24,3	35,4

In both PNIEC and our own forecasts, consumption tends to increase until 2030, then decline. This is probably due to the relatively recent gasification of several areas of Spain, where networks have not yet saturated their potential customers: given the long time that is necessary for an economic substitution of boilers and other consuming appliances, the whole impact of gasification of an area may take up to 20 years to be fully displayed. In fact, the relatively limited average consumption level per capita of Spanish households (and other small consumers), at around 6 MWh/year, suggests that the potential of gas penetration is not yet fully exploited. To understand this point, consider that France's comparable average consumption is 16.5 MWh, whereas Italy's (with a more similar climate to Spain's) is about 14. Hence, it should not be surprising that Spanish household consumption may still increase in the short term despite price growth, as shown by both official (PNIEC) forecasts and by our own estimates. Yet this is a short term development, as price increases start dogging consumption in Spain as well, though slightly later than in more mature gas systems.

In turn, price increases are mostly due to a decline in industry consumption, as this sector is by far the largest in Spain, accounting for 61% of the market in 2024 (versus 15% for residential and commercial users and 24% of power and heat generation). The decline in industrial consumption affects network costs and, hence, drives prices up alongside the impact of the ETS2 from 2028 onwards.

Figure 2.5 shows the evolution of total consumption in the three scenarios. The PNIEC scenario is only available until 2030, whereas the DNV forecasts show resilient consumption levels after 2038, as price growth eases and the downward spiral becomes smoother. Our estimates indicate a continuous decline following the short-term increase at the completion of the gasification process.

Figure 2.7 – Evolution of gas consumption in Spain until 2050 under several scenarios (2024=100)



Finally, Table 2.9 shows the expected expenditure (gas bill) increase for the average Spanish residential and commercial consumer under the various forecasting scenarios.

Table 2.9 – Expected increase in gas expenditure of the average Spanish residential/commercial consumer with respect to 2024 (EUR/year)

	DNV incl. taxes	DNV ex. taxes	PNIEC incl. taxes	PNIEC ex. taxes	FSR incl. taxes	FSR ex. taxes
2030	236.7	7.1	282.1	52.4	252.8	20.2
2035	304.2	28.7	N.A.	N.A.	379.2	104.5
2040	382.5	61.3	N.A.	N.A.	464.5	140.3
2045	465.1	103.4	N.A.	N.A.	523.8	159.4
2050	575.3	173.6	N.A.	N.A.	582.0	177.5

To understand the expenditure evolution with vs. without taxes, consider that taxes (excise and VAT) currently represent about 22.6% of the total price. Simulations assume that excise and VAT rates do not change, but ETS2 carbon pricing is added to excise taxes from 2028.

The relatively stronger resilience of the Spanish gas industry with respect to France's is probably related to several factors. First, investment into the biomethane value chain is not neglected in Spain but is expected to be slower than in France, hereby limiting cost increases for biomethane connection (and related network upgrades) that are a source of price hikes. The second – and more relevant - factor refers to the larger role of industry (notably refining and petrochemicals) within the country's gas demand, which seems to be less price-responsive than HH, according to our estimated demand functions (see the Annex for details). The third factor is the relatively lower levels of average HH customer consumption. Spanish households consume about 6 MWh/ /year versus 16.5 of French ones. This is partly due to climatic reasons and partly to the development of the Spanish gas industry being more recent and not fully mature. In fact, a significantly lower average consumption results in lower total bills and reduces consumers' price sensitivity.

On the other hand, the greater share of costs recovered through volumetric tariffs (see Chapther 1) may play in the opposite direction.

Available data do not allow for a specific analysis of the impact on vulnerable and other poorer consumers. However, studies by IDAE, the Spanish Government's Institute for the Diversification and Saving of Energy[41], show that natural gas is hardly used by these categories, which tend to rely on other energy vectors (Electricity, LPG, fuelwood) for their needs. Hence, the impact of gas price increase, while it is remarkable on the average consumer – notably in colder regions – does not particularly affect the poor.

[41] IDAE, 'Diagnóstico de La Pobreza Energética En España: Principales Resultados a Partir de Un Panel de Hogares' (2025) <https://www.idae.es/sites/default/files/estudios_informes_y_estadisticas/Monografico_Pobreza-energetica_VRMaqueta_Final_090925.pdf>.

France vs. Spain remarks on the impacts of consumption reduction

Our analysis shows that the feared spiral of reduced consumption triggering higher network costs, together with the impact of carbon prices entailed by the implementation of ETS2, could indeed materialise and have serious impacts on customers' welfare and energy use patterns. The sensitivity of consumption towards prices, already highlighted by the significant reduction during the 2021-22 energy crisis, is likely to continue as consumers are increasingly wary of natural gas, which is now widely regarded as an energy vector beyond the control of domestic policy and market forces, but potentially subject to political use. Hence, they tend to improve their energy efficiency and cut consumption – a development known in France as *sobriété,* as well as to move towards other energy vectors like electricity and, to some extent, notably in rural areas, traditional ones like fuelwood and wood pellets.

Gas consumption reduction affects not only HH and other smaller customers like commercial and public services, but also industry, which suffers from similar price increases as overall gas flows decline – and even almost disappear within a few years in the power generation sector, increasingly taken over by renewable energy sources.

The impact appears more serious and faster in France, notably if ambitious plans to switch gas supply towards biomethane and other renewable gases are carried out. Even if renewable gases could be produced at a cost that is competitive with that of traditional natural gas plus the carbon price, which is far from granted[42], the significant investments that are necessary to adapt the gas system to injection, transmission and distribution of biomethane further increase gas costs and prices, driving down demand.

Hence, the proposed plan of a general switch towards biomethane while essentially retaining the current gas network – as proposed notably in France - does not look consistent with market demand that could not bear the related price increases. More centralised policy measures seem necessary, for instance by selecting geographical areas where unit costs are reasonably low – like more densely populated areas – where gas supply (consisting mainly of biomethane, if reasonably priced) could be kept. In other regions, the gas network should be essentially abandoned, and consumers should be provided with other energy vectors, including electricity, modern versions of traditional fuels (like wood pellets) and possibly district heating, with appropriate subsidies[43]. On the other hand, such dismissal of networks should be carefully

[42] IEA, 'Outlook for Biogas and Biomethane. A Global Geospatial Assessment' (2025) <https://iea.blob.core.windows.net/assets/5b757571-c8d0-464f-baad-bc30ec5ff46e/OutlookforBiogasandBiomethane.pdf>.

[43] Some studies have already pointed at the potential savings from such optimisation of the gas network, even allowing for some significant decommissioning cost: AMORCE, 'Étude de l'optimisation Du Réseau Public de Distribution de Gaz Dans Un Contexte de Transition Énergétique' (2025) <https://amorce.asso.fr/publications/optimisation-du-reseau-de-distribution-de-gaz-synthese-de-l-etude-naldeo-amorce-enp92>.

planned in advance and in relation to their full depreciation, with a view to avoid the emergence of "stranded costs" that may eventually be borne by consumers.

The spiral of higher costs and prices and falling consumption would occur in Spain as well, though it is likely to be less dramatic there, where natural gas plays a smaller role in HH and other smaller customers' energy supply. Since industry is by far the largest gas-consuming sector in Spain and is more resilient to higher prices (according to our estimates), the impact could be smoother even if gas-fired power generation almost disappears in Spain as well, replaced by renewable energy and probably reduced to the occasional back-up role.

Finally, the impact on poorer and vulnerable consumers seems to less significant in Spain, where gas is hardly used by such customer groups, while it may be more serious in countries where gas is more widespread and higher consumption levels are necessary to face colder climates, like in France, and probably even more in other European countries where gas use among households is even more common and relevant.

3. CHAPTER 3 - MAPPING THE LEGAL AND POLICY FRAMEWORK FOR CONSUMER RIGHTS AND PROTECTION DURING GAS PHASE-OUT

Methodology

As mentioned in prior chapters, consumers are gradually changing their consumption patterns of natural gas. They are reducing gas consumption, switching to RLCG, or getting disconnected from the gas network. As a consequence, the fixed costs of maintaining and operating the infrastructure will be distributed among a shrinking customer base. This could lead to higher per-user charges, at least to the extent that the gas infrastructure no longer needed to flow gas is not yet fully depreciated or cannot be repurposed.

We have not identified any study offering a comprehensive legal assessment of consumer rights and protections during the gas phase-out under applicable EU legislation. This chapter addresses this gap and then focuses on two Member States, France and Spain.

The assessment of consumers' rights and protection during the natural gas phase-out process requires an understanding of how average and vulnerable consumers are likely to respond to such a process. To structure this analysis, we have identified five Types of consumer profiles, each reflecting a combination of consumers' actions across different stages of the natural gas phase-out, such as their proactiveness in responding to price changes, and their economic capacity to shift to sustainable energy alternatives. These Consumer Types have been derived from preliminary desk research and further refined through inputs from survey respondents and semi-structured interviews with relevant stakeholders, including national consumer associations, energy utilities, transmission and distribution system operators.

For each Consumer Type, it is possible to identify different implications for existing natural gas supply contracts (i.e. switching, contract amendment, and termination), as well as for the gas network (i.e. consumers remaining connected, or being disconnected, or being connected to a repurposed network). To identify the law applicable for each of these implications, it is worth clarifying the concepts of key legal terms applied throughout this chapter, which depart from the definitions and terminology application used by the Gas Directive and general contract law:

- **Switching supplier:** when consumers decide to change a gas supplier for another one offering either the same energy vector (i.e., natural gas) or RLCG, where the latter is relevant for this report.[44]

[44] As it will be later discussed in this chapter, the concept of switching suppliers adopted in this Study is aligned with the meaning adopted in the 2024 Gas Directive. Article 12 on "right to switch and switching related-fees" expanded the customer´s right to switch suppliers to include circumstances in which consumers switch natural gas suppliers to RLCG. This is reinforced by Recital 36, which states that strengthening contractual rights is a means of customer empowerment, including the right to switch from fossil gas to a more sustainable energy source. Therefore, the 2024 Gas Directive changed the meaning of switching rights adopted in prior Gas Directives, which limited them to circumstances where customers would switch gas suppliers offering the same energy vector, namely, natural gas.

- **Contract amendment**: when consumers decide to change the energy vector but remain with the same supplier. In the gas sector, this may include transitioning from natural gas to biomethane via GO.
- **Contract termination**: when consumers terminate a contract with the natural gas supplier by either switching to another supplier or stopping consuming gas.[45] For the purposes of this Study, the term "contract termination" refers to circumstances in which consumers can terminate their gas supply contract after the full electrification of their energy demand without switching to another supplier but remain connected to the grid. In such cases, the DSO may decide to seal the connection even if a consumer is not physically disconnected.
- **Gas network disconnection**: when consumers are physically separated from the public grid, for example, because of network decommissioning. Disconnection generally requires that no supply contract is in place, either because it has been voluntarily terminated by the consumer or imposed by the DSO.

The five Consumer Types and their respective implications for gas contracts and network connections are illustrated in the table 3.1 below and described in the following subsections.

Table 3.1 **– Consumer Types in different stages of the gas phase-out**

Consumer Type (average and vulnerable)	Consumer Type 0	Consumer Type 1	Consumer Type 2	Consumer Type 3	Consumer Type 4
	Consumers remain connected to the gas network and no changes in the consumption path	Consumers remain connected to the gas network but reduce gas consumption	Consumers remain connected to the gas network but shift to RLCG	Consumers remain connected to the gas network but without gas consumption (e.g, due to full electrification or DHC)	Consumers are disconnected from the gas network (e.g. due to network decommissioning)
Switching Suppliers	No	No, But decrease in	Yes (If the provider	No	No

[45] The concept of contractual termination adopted in the 2024 Gas Directive is aligned with the meaning of contractual termination in general contract law, which refers to the end of the parties' obligations. For instance, Article 2(66) of the Gas Directive defines a contract termination fee as a charge of penalty imposed on customers by suppliers or market participates for terminating a gas supply or service contract. For the purposes of this Study, it is important to map the legal framework applicable to circumstances in which consumers terminate a gas supply contract without switching to a new supplier and stopping gas consumption. Although a contractual termination also happens when consumers are switching suppliers, the Study applies the term "contractual termination" mostly to indicate circumstances in which consumers neither switch to new natural gas nor RLCG suppliers, but leads to a suspension of gas consumption.

		natural gas consumption	does not offer RLCG)		
Gas Supply Contract Amendment	No	No	Yes if the current supplier offers RLCG	No	No
Gas Supply Contract Termination	No	No	Yes if the current supplier does not offer RLCG	Yes	Yes (imposed by the DSO due of gas network decommissioning plans)
Gas Network Disconnection	No	No	No	No	Yes

Consumer Type 0

Consumers remain connected to the natural gas network and do not change their consumption pattern. In other words, their consumption patterns remain the same over the years. They neither amend their contract to shift from natural gas to biomethane or hydrogen, nor do they terminate it fully to electrify their energy demand.

The inertia characterising Consumer Type 0 may stem from a lack of awareness, understanding or information (commonly referred to by the scholarship as "energy illiteracy")[46], as well as from technical constraints related to the existing building infrastructure or appliance compatibility. Economic barriers also play a key role, including high upfront investment costs, limited access to financing and insufficient public incentives or support schemes. As a result, these consumers continue to rely on the gas system despite broader decarbonisation efforts.

Their natural gas contract remains in force, but the price will increase due to rising costs, carbon pricing or network tariffs during the gas phase-out process.

Consumer Type 1

[46] On this topic, see Karlijn L Van Den Broek, 'Household Energy Literacy: A Critical Review and a Conceptual Typology' (2019) 57 Energy Research & Social Science 101256. The lack of energy-related financial literacy has been identified as an important determinant of the energy-efficiency gap: see Julia Blasch and others, 'Empower the Consumer! Energy-Related Financial Literacy and Its Implications for Economic Decision Making' (2021) 10 Economics of Energy & Environmental Policy <http://www.iaee.org/en/publications/eeeparticle.aspx?id=384>.

Consumers remain connected to the natural gas network, similarly to Consumer Type 0. However, unlike in Consumer Type 0, where consumers are passive and consumption patterns do not change, consumers under Type 1 actively react to increasing gas prices. They may modify their consumption patterns by increasing consumption of other energy vectors (e.g., electricity or biomass) and/or by relying on natural gas only during peak heating periods.

Consumer Type 2

Consumers remain connected to the natural gas network, but stop consuming natural gas and shift entirely to biomethane or hydrogen. From a technical perspective, it is important to note that natural gas suppliers might also offer biomethane or hydrogen. However, it is unlikely that hydrogen will be offered to residential customers[47]; supplying hydrogen would also require repurposing the distribution network. Instead, biomethane can be transported through the existing gas network, without the need for network repurposing; however, the use of GOs is required under applicable legislation. If shifting to biomethane, consumers remain connected to the network and are charged for the network tariff.

From a contractual perspective, the shift to biomethane can occur either through a contractual amendment, if the current natural gas supplier also offers RLCG, or by terminating the contract with the current supplier and entering into a new contract for the supply of biomethane with a new supplier. However, it may also be possible that the consumer remains with the current gas supplier even if the latter does not offer biomethane, and procures GOs from a different entity, this combination being effectively equivalent to a shift to biomethane.

Consumer Type 3

Consumers remain connected to the gas network, but stop consuming gas due to the full electrification of their household energy demand or because they have connected to a district heating and cooling system.

From a contractual perspective, consumers exercise their right to terminate the contract with their natural gas supplier without switching to another gas supplier. Unlike Type 2 consumers, consumers of Type 3 no longer pay for the network tariffs as they cease consumption. Therefore, DSO may decide to seal the connection by removing the consumer´s meter, albeit not physically disconnecting them from the distribution grid.

Consumer Type 4

Consumers are disconnected from the natural gas network as a result of the implementation of gas network decommissioning plans developed by system operators.

[47] According to the data reported by the International Energy Agency, the contribution of hydrogen to meet energy demand in residential buildings remains negligible in Europe and worldwide. Advances in the use of pure hydrogen in buildings (boilers) are still limited to small-scale pilots and demonstration projects, and a significant number of these projects face low social acceptance or have proved not financially viable. See IEA, 'Global Hydrogen Review 2025' (2025) <https://www.iea.org/reports/global-hydrogen-review-2025>. Note that Chapter 2 of this Report also acknowledges that almost all RLCG that would supply distribution grids (and hence residential consumers) would be biomethane.

Natural gas suppliers are required to terminate contracts. Depending on the contents of the plans, consumers may shift to a broad range of alternative energy options.

Analytical framework to assess consumer protection in the gas phase-out process

Besides the Consumer Types, we have developed an analytical framework to conduct the legal analysis, consisting of three interlocking pillars:

- **Pillar A** on consumers' rights and protection,
- **Pillar B** on network regulation, being subdivided into gas network tariff regulation (**B.1**) and gas network phase-out planning (**B.2**), and
- **Pillar C** on support schemes.

Each pillar encompasses specific topics that are considered throughout the legal analysis conducted to assess consumer protection in the European Union, as well as in the French and Spanish legal systems. The legal analysis will have different implications for the Consumer Types described under Section 1.1.

Pillar A – Consumer rights and protection

Pillar A refers to consumer protection within the contractual relationship between consumers and natural gas suppliers. The topic includes contractual information on price and billing; the right to terminate the gas contract and to switch supplier; measures addressing adverse effects, inequalities, or disproportionate financial burdens on average and vulnerable consumers.

Pillar B – Network tariff regulation and gas network phase-out planning

Pillar B refers to the regulation of gas network and is divided into two categories.

Pillar B.1 refers to the regulation concerning gas network tariffs and takes into consideration the duties of national regulatory authorities in ensuring consumer protection during the gas phase-out. The legal provisions considered under Pillar B.1 have an impact on the price exposure of consumers remaining connected to the gas network, and especially consumers who are unwilling or cannot technically or economically afford the shift to options such as RLCG, electrification, or connection to a DHC system.

Pillar B.2 refers to the regulation of gas network phase-out planning, assessing whether and how consumers' rights and protections are taken into account by the plans and strategies adopted at the EU level, and in France and Spain. The legal provisions considered under this Pillar are crucial for consumers remaining connected to the gas network, but shift to RLCG (Type 3), and for those who get disconnected due to the implementation of decommissioning plans (Type 4).

Pillar C – Support schemes

Pillar C refers to the existing support schemes aimed at facilitating the gas phase-out process. They include support schemes for electrification, heating and cooling and energy efficiency at the EU level, and in France and Spain.

European Union

Pillar A – Consumer rights and protection

Gas network decommissioning has been introduced into the EU legal system through the "Hydrogen and Decarbonised Gas Market Package"[48], comprising Directive (EU) 2024/1788 (hereafter, "Gas Directive") and Regulation (EU) 2024/1789 (hereafter, "Gas Regulation"). The package has updated the rules on the EU gas market set out in Directive 2009/73/EC and Regulation (EC) 715/2009.

From the perspective of consumers' protection, the Gas Directive recognises that consumers should be enabled fully to benefit from affordable prices, good standards of services, and to make effective choices of offers mirroring technological developments[49].

Regarding specifiically to gas phase-out, Recital (33) of the Gas Directive acknowledges that the natural gas phase-out process and the related network decommissioning may determine some adverse effects on energy consumers:

> "[…] *Where natural gas infrastructure is decommissioned, it should be accompanied by measures that address the adverse effects on final customers, in particular vulnerable customers and household customers affected by energy poverty, as well as measures that address inequalities resulting from the energy transition. Natural gas consumers should be protected from rising tariffs when natural gas assets have to be depreciated, from cross subsidisation between gas and hydrogen users and from rising natural gas tariffs resulting from a shrinking customer base*".

Contractual information on price and billing

Contractual information is a cornerstone of consumer protection during the gas phase-out process. According to the analysis developed in Chapters 1 and 2, gas prices for consumers are expected to increase[50] due to high infrastructure costs being borne by fewer consumers, as well as the implementation of the ETS2. It is therefore necessary to verify whether

[48] For an overview, see James Kneebone, 'The EU Hydrogen and Decarbonised Gas Market Package' (*Florence School of Regulation*, 27 May 2024) <https://fsr.eui.eu/the-eu-hydrogen-and-decarbonised-gas-market-package/>.

[49] See Recitals (29)-(36) of the Gas Directive.

[50] We have provided evidence (per year) on how many consumers have been disconnected from the network since 2020 and how the costs of gas infrastructure have been distributed among fewer consumers and we have analysed the economic implications for consumers who remain connected to the grid. These results are respectively presented in Chapers 1 and 2 of this Study.

consumers are provided with clear and transparent information – both in their gas supply contract and in the bill – concerning the economic implications of the gas network decommissioning on the consumers remaining connected to the gas network.

Our assessment addresses contractual and billing information provided to consumers remaining connected to the gas network who are in the conditions to shift to alternative energy options such as RLCG (Type 2), electrification, or DHC (Type 3), as well as information provided to consumers who are not willing or able to undertake such a shift (Consumer Type 0 and 1) and are those who suffer the most the increasing costs associated with the gas phase-out.

Pursuant to Article 4(1) on market-based supply prices, "*suppliers shall be free to determine the price at which they supply natural gas and hydrogen to customers. Member States shall take appropriate actions to ensure effective competition between suppliers and to ensure reasonable prices for final customers*". This is complemented by Article 11(3) on basic contractual rights, which lists the elements that must be included in a natural gas or hydrogen supply contract[51].

An examination of the information required to be included in supply contracts shows that the Gas Directive obliges suppliers to provide information on "the main features of the services provided" (Article 11(3)(b)) and on "the means by which up-to-date information on all applicable tariffs" can be obtained (Article 11(3)(d)). However, the Gas and Decarbonised Gas Market Package did not introduce specific obligations for suppliers to inform consumers – within the contract – that remaining connected to the network may entail potential adverse implications on the price deriving from the gas phase-out process. Similarly, suppliers are not required to provide such information in the bill, as Annex I to the Directive only requires them to provide consumers, at their request, with complementary information on historical consumption[52], but not with information on potential price increases due to the gas phase-out.

Provisions addressing economic barriers faced by average and vulnerable consumers

[51] "(a) the identity and contact details of the supplier, including address, email address and a consumer support hotline; (b) the services provided (including the product and tariff name), the main features of the services provided, the service quality levels offered, and the time for the initial connection; (c) the types of maintenance service offered; (d) the means by which up-to-date information on all applicable tariffs, maintenance charges and bundled products or services can be obtained; (e) the duration of the contract, the conditions for renewal and termination of the contract and services, including products or services that are bundled with those services, and whether terminating the contract without charge is permitted; (f) any compensation and the refund arrangements which apply if contracted service quality levels are not met, including inaccurate or delayed billing; (g) where the environmental performance, including where relevant carbon dioxide emissions, is promoted as an essential feature, clear, objective, publicly available and verifiable commitments provided by the supplier and, in the case of supply of renewable gas and low-carbon gas, certification of the renewable gas and low-carbon gas supplied in accordance with Article 9; (h) the method of initiating an out-of-court dispute settlement procedure in accordance with Article 25; (i) information relating to consumer rights, including clear and understandable information on complaint handling and how and where a complaint can be submitted and all the information referred to in this paragraph, that is clearly communicated on the bill or the hydrogen or natural gas undertaking's website; (j) where relevant, information on the provider and the price of products or services that are tied to, or bundled with, natural gas or hydrogen supply".

[52] Gas Directive, Annex I, point 4.

The economic difficulties faced by consumers during the gas phase-out are addressed by the Gas Directive primarily with regard to poor and vulnerable consumers, who are entitled to a higher level of protection. Articles 26, 27 and 28 are particularly relevant in contexts where the decommissioning of gas networks accelerates and consumers are not realistically able to switch to alternative energy sources without targeted financial support.

- Article 26 focuses on vulnerable customers and customers affected by energy poverty (Article 26(1)), as well as on consumers living in remote areas (Article 26(2)). Given the particularly difficult conditions faced by these groups, Member States are required to ensure transparency regarding contractual terms and conditions, competitive, transparent and non-discriminatory prices, access to general information, and effective dispute-settlement mechanism
- Article 27 requires the Commission to provide guidance on the protection of vulnerable customers and customers affected by energy poverty during the planning and implementation of the natural gas phase-out, including situations in which gas distribution networks are decommissioned. To date (February 2026), the Commission has not yet issued such guidance.
- Article 28 contains provisions aimed at protecting poor and vulnerable consumers from disconnection. Suppliers shall not terminate contracts with, or disconnect, customers on grounds that are the subject of a complaint being handled by the supplier or of an out-of-court dispute-settlement procedure, without prejudice to the parties' contractual rights and obligations. In addition, Article 28 lists several measures that Member States may adopt to prevent arrears, including flexible payment plans, debt-advice services, improved communication with customers and support agencies, measures to promote customer education and awareness of rights and debt management, and access to finance, vouchers or subsidies to support the payment of energy bills.

Overall, these provisions establish quite a strong framework for the protection of poor and vulnerable consumers in their contractual relationship with gas suppliers. Nevertheless, three critical observations can be made.

First, under Article 26, the Gas Directive requires Member States to adopt appropriate measures to protect final customers and to ensure adequate safeguards for vulnerable consumers and those affected by energy poverty[53]. However, the EU legislator leaves it to Member States to define the notion of a "vulnerable gas consumer", subject only to two conditions: (i) Member States may refer to energy poverty when defining vulnerability; and (ii)

[53] As per the definition of energy poverty, the Gas Directive refers back to Article 2(52) of the Energy Efficiency Directive, which defines it as "a household's lack of access to essential energy services, where such services provide basic levels and decent standards of living and health, including adequate heating, hot water, cooling, lighting, and energy to power appliances, in the relevant national context, existing national social policy and other relevant national policies, caused by a combination of factors, including at least non-affordability, insufficient disposable income, high energy expenditure and poor energy efficiency of homes".

the definition of vulnerable gas consumers must be consistent with the definition applied to vulnerable electricity consumers at national level. Given the significant discretion afforded to Member States, the level of protection is likely to vary across the EU, potentially jeopardising and undermining common standards of consumer rights and protection.

Second, as noted by CEER[54], the protection of vulnerable and energy-poor consumers does not fall exclusively within the competence of energy national regulatory authorities. Other public bodies, operating in different policy areas, are often responsible for providing assistance to individuals and households in situations of hardship. Effective cooperation among these actors may prove challenging in practice.

Nevertheless, it is noteworthy that, among the duties and powers of the regulatory authority listed by Article 78(1), there is included the responsibility for "*monitoring the level and effectiveness of market opening and competition at wholesale and retail levels, including on natural gas and hydrogen exchanges, prices for household customers including prepayment systems, transparency of offers, price spikes and their impact on wholesale and consumer prices, the relationship between household prices and wholesale prices, switching rates, disconnection rates, charges for and the execution of maintenance services, complaints by household customers, and any distortion or restriction of competition, including providing any relevant information, and bringing any relevant cases to the attention of the relevant competition authorities, in particular with regard to vulnerable customers and customers who are affected by energy poverty*"[55].

Third, the guidance that the Commission is expected to provide under Article 27 is intended to target poor and vulnerable consumers, whereas the adverse effects of gas network decommissioning are likely to affect a broader group of consumers who do not necessarily fall within these categories.

Right to terminate a contract with natural gas suppliers

Consumer Types 2, 3 and 4 revolve around the shift from natural gas supply to RLCG, full electrification or connection to a DHC system, and might imply – depending on the type of the existing contract – a contractual termination, the switch to a different supplier, or a gas supply contract amendment. These Consumer Types, therefore, require consideration of legal provisions on the "right to terminate" and the "right to switch", governed by Article 11 and 12 of the Gas Directive.

The right to terminate a contract and the right to switch supplier are classified as "basic contractual rights" under Article 11. In particular, Article 11(3)(e) requires supply contracts to specify "*the duration of the contract, the conditions for renewal and termination of the contract*

[54] CEER, 'Beyond the Crisis: Consumer Protection and Market Measures for Better Functioning Markets' (2024) <https://www.ceer.eu/wp-content/uploads/2024/09/Beyond-the-Crisis_Consumer-Protection-and-Market-Measures-for-Better-Functioning-Markets-.pdf>.

[55] Article 78(1)(q)

and services, including products or services that are bundled with those services, and whether terminating the contract without charge is permitted".

The Gas Directive envisages two cases in which consumers might exercise the right to terminate a contract: (i) when they do not accept the new contractual conditions or (ii) when they do not accept adjustments in the supply price. In particular, suppliers must notify their final customers "*in a transparent and comprehensible manner of any adjustment in the supply price and of the reasons and preconditions for the adjustment and its scope*", no later than two weeks or, for household customers, no later than one month before the adjustment takes effect (Article 11(4)).

It is important to note that, unless the existing natural gas contract is a fixed-price one, an increase in natural gas prices or network tariffs for consumers remaining connected to the gas network cannot be considered as a change in contractual conditions. Therefore, the increase in the gas supply price due to the gas phase-out process – e.g., higher network tariffs resulting from a shrinking consumption base, as predicted in Chapter 2 – would not be considered a contractual adjustment in supply prices. Therefore, suppliers have neither an obligation to notify consumers, nor consumer could claim the right to terminate the supply contract. This consideration is relevant to all Consumer Types.

Right to switch gas suppliers

Switching is primarily and essentially a basic consumer right. The Directive refers to switching as an "indicator of consumer engagement" and an "important tool to boost competition"[56], and it emphasises that consumers "need to be informed about sustainable alternatives they can switch to"[57]. The protection measures applicable to consumers exercising their right to switch are set out by Article 12, which establishes that "*customers shall have the right to switch suppliers for natural gas and hydrogen or to switch natural gas and hydrogen market participants*" (Article 12(1)). Moreover, in relation to switching-related fees, "*Member States shall ensure that at least household customers, microenterprises and small enterprises are not charged any switching-related fees for natural gas and hydrogen, included where gas supply is tied to or bundled with other services, equipment or products*". Nevertheless, the EU legislator granted Member States the possibility of allowing "*suppliers or market participants to charge their customers contract termination fees where those customers voluntarily terminate fixed-term, fixed-price supply contracts before their maturity*"(Article 12(2)).

Considering the Gas Directive explicity refer that consumer rights are applicable to switch natural gas and hydrogen market participants, It is arguable whether the provisions on the right to switch – as well as the provisions on termination-related fees and switching-related fees – could be applied to Consumer Types 2, 3 and 4, where consumers terminate the gas supply contract without switching to a different natural gas supplier or become disconnected from the gas network, either voluntarily or due to the decommissioning plans under Article 57.

[56] Recital (39).

[57] Recital (22).

A notable gap emerges from this distinction: the Gas Directive does not establish a right to terminate gas supply contracts free of charge due to voluntary electrification (i.e., termination without properly switching to a different gas supplier), switching to RLCG suppliers, or decommission plans, extending the consumer rights of Article 12 to Consumers Types 3, 4 and 5. For this Study, this is certainly a consumer rights gap and a misalignment with the policy purposes of phasing-out natural gas. The Gas Directive should have granted consumers the right to terminate free of termination-related fees also for these consumer types, while respecting the exception for fixed-price, fixed-term contracts before their maturity.

Regarding Consumer Type 4, specifically, it is also worth noticing that the Gas Directive does not include provisions on the contractual implications of gas network decommissioning plans under Article 57 for existing natural gas supply contracts, nor on the eventual termination fee. It is not clear whether these contracts will be terminated as an automatic effect of the implementation of these plans at the regional and municipality level, or, most crucially, if DSOs are allowed to pass the related costs on to consumers, such as the costs for sealing the connection points and removing the gas meter. This gap could therefore result in a variety of approaches to be adopted by system operators with regard to such fees – both before and after the implementation of the directive – impacting both consumers who early abandon the gas system (Consumer Type 3) and Consumers who are subjected to the decommissioning plans (Consumer Type 4).

Pillar B – Network tariff regulation and gas network phase-out planning

Pillar B.1 – Gas network Tariff regulations

Network tariff regulation is a highly sensitive aspect of the gas phase-out process, as tariff structures may amplify the effects of consumers' disconnection from the network, i.e., the distribution of infrastructure costs across the shrinking customer base. According to Article 57(6) of the Gas Directive, "*where parts of the natural gas distribution network may require decommissioning before their originally projected life cycle, the regulatory authority shall establish guidelines for a structural approach to the depreciation of such assets and tariff setting*". Regulatory authorities shall consult the relevant stakeholders, notably distribution system operators and consumer bodies. They shall provide criteria and methodologies taking into account costs of network decommissioning, as per Article 78(1)(gg).

Pillar B.2 – Gas network phase-out planning

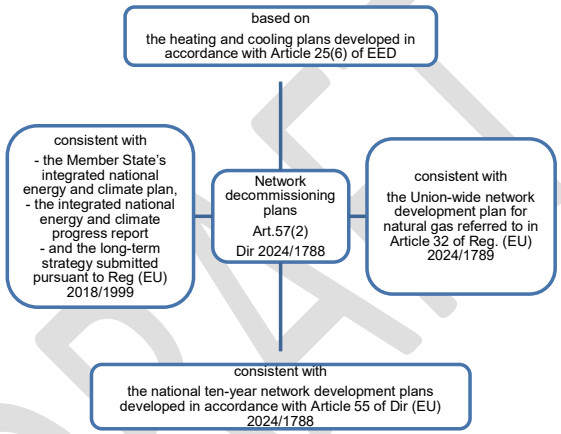
Gas network decommissioning is governed by the Gas Directive, and unfolds through a structured process comprising planning, approval, operation and monitoring, illustrated by the figures 3.1 and 3.2 below. It is closely interconnected with other EU-level and national planning instruments concerning the European decarbonisation policies.

The legal provisions assessed in Pillar B.2 are crucial for Consumer Type 2 (where consumers remain connected to the gas network but shift to RLCG), and Consumer Type 4 (where consumers get disconnected due to the implementation of decommissioning plans). Legal

provisions under Pillar B.2 also affect consumers who voluntarily reduce their natural gas consumption (Consumer Type 1) and who stop consuming gas (Consumer Type 3).

Figure 3.1 – Gas network decommissioning process

Figure 3.2 – Gas network decommissioning plans in relation to other plans



Planning

The initial stage of the natural gas decommissioning process is planning. As per Article 57(1) of the Gas Directive, Member States shall ensure that distribution system operators develop network decommissioning plans where a reduction in natural gas demand is expected. These plans are to be developed in synergy with operators in adjacent sectors (electricity, hydrogen, DHC), with a view to promoting effective system integration and prioritising energy and cost-efficient alternatives. Article 57(2) established detailed minimum requirements for these plans[58], including their consistency with other planning instruments, the use of reasonable

[58] "(a) the plans are based on the heating and cooling plans developed in accordance with Article 25(6) of Directive (EU) 2023/1791 and duly take into account the demand of sectors that are not covered by the heating and cooling plans; (b) the plans are based on reasonable assumptions about the evolution of production, injection and supply of natural gas, including biomethane, on the one hand, and the consumption of natural gas in all sectors at distribution level, on the other hand; (c) distribution system operators identify required infrastructure adaptations, while demand-side solutions not requiring new infrastructure investments are prioritised, and the plans list infrastructure that is to be decommissioned, also in view of creating transparency with regard to the possible repurposing of such infrastructure for the transport of hydrogen; (d) distribution system operators

demand and supply assumptions, the prioritisation of demand-side solutions, and transparency regarding infrastructure to be decommissioned or potentially repurposed.

While the planning framework is procedurally robust at the energy system level, consumers' rights and protection remain at risk of being compromised when Member States transpose and implement this provision. Notably, Article 57 does not include a legal obligation to ensure that consumers meaningfully influence planning outcomes, nor does it specify minimum standards for the quality, accessibility or representativeness of consumer participation in the consultation process. As a result, consultation risks becoming a formal procedural exercise rather than a mechanism for substantive consumer empowerment across all Consumer Types considered in this Study.

Approval

The second step concerns the assessment and approval of decommissioning plans. According to Article 57(3), national authorities are responsible for verifying compliance and then approving, rejecting or requesting amendments to the plans. Article 78(1)(dd) further requires national authorities to ensure "*an open, transparent, efficient and inclusive process for the setting up of the national ten-year network development plan in line with the requirements set out in Article 55, of the hydrogen distribution network development plan in line with the requirements set out in Article 56, and, where relevant, the network decommissioning plan in line with the requirements set out in Article 57*".

As anticipated in the analysis carried out under Pillar A, it is noteworthy that the development of such plans shall facilitate the protection of final customers, in accordance with the provisions of Article 13, and in cases of refusal of access or disconnection governed by Article 38.

Operation

At the operational level, two main effects arise from the approval of the gas network decommissioning plan.

First, according to Article 8(14), Member States shall refuse to grant authorisation for the construction and operation of transmission or distribution infrastructure for natural gas in the areas referred to in the decommissioning plan.

conduct a consultation process open to the relevant stakeholders when developing the plan in order to enable their early and effective participation in the planning process, including the provision and exchange of all relevant information; the results of the consultation and the network decommissioning plan are submitted to the relevant national authority; (e) the plans and the outcome of the stakeholder consultation are published on the distribution system operators' websites and those websites are updated regularly to ensure that the relevant stakeholders are informed sufficiently to allow them to participate in the consultation effectively; (f) the plans are updated at least every four years, based on the latest projections for natural gas demand and supply in the relevant region, and shall cover a ten-year period; (g) distribution system operators that are active in the same regional area may opt to develop one single joint network decommissioning plan; (h) the plans are consistent with the Union-wide network development plan for natural gas referred to in Article 32 of Regulation (EU) 2024/1789 and the national ten-year network development plans developed in accordance with Article 55 of this Directive; (i) the plans are consistent with the Member State's integrated national energy and climate plan, the integrated national energy and climate progress report and the long-term strategy submitted pursuant to Regulation (EU) 2018/1999 and support the climate-neutrality objective set out in Article 2(1) of Regulation (EU) 2021/1119".

The second effect, and more sensitive to consumers' rights, is that transmission system operators and distribution system operators "*are allowed to refuse access or connection, or to disconnect, natural gas network users"*. This can occur, in particular, *"to ensure compliance with the implementation of the climate-neutrality objective set out in Article 2(1) of Regulation (EU) 2021/1119*", subject to the conditions established by Article 38(4) of the Gas Directive[59].

When conditions are met, and Member States allow for the refusal of access or connection, or for the disconnection of network users, they shall establish a regulatory framework "*that is based on objective, transparent, and non-discriminatory criteria established by the regulatory authority, taking into account the interests affected, the existing requirements to reduce or switch from natural gas consumption, and the relevant local heating and cooling plans established pursuant to Article 25(6) of Directive (EU) 2023/1791*". Article 38 also stipulates that any refusal of access or connection, and any disconnection, must be properly justified.

Furthermore, when Member States allow disconnection, they shall implement adequate measures to protect network users, in accordance with Article 13 on "*consumer rights and protection in relation to the phasing-out of natural gas*". This provision is particularly relevant for the planning phase, since it requires Member States to ensure that the network users concerned and other relevant stakeholders, in particular consumer bodies, have been consulted (Art. 13 (a)), that network users, final customers and relevant stakeholders have been informed, sufficiently in advance of the planned date, of the procedure for disconnection, the steps planned and the relevant timeline (Art. 13(b); and that specific needs of vulnerable customers as referred to in Article 26 and customers affected by energy poverty are duly taken into account and, where applicable, appropriate measures are taken with the aim of removing adverse effects of the natural gas phase-out, taking into account the guidance referred to in Article 27 (Art. 13 (c)).

Monitoring

According to Article 57(2)(g) of the Gas Directive, the plans are updated at least every four years, based on the latest projections for natural gas demand and supply in the relevant region, and shall cover a ten-year period. It follows that any adverse effect on average and vulnerable consumers determined by the implementation of the decommissioning plan falls under the monitoring powers and duties of the national authorities.

Pillar C – Support schemes

[59] The conditions are the following:"(a) the network development plan established pursuant to Article 55 provides for the decommissioning of the transmission system or relevant parts thereof;(b) the relevant national authority has approved the network decommissioning plan pursuant to Article 57(3);(c) the relevant distribution network operator, exempted to submit a network decommissioning plan pursuant to Article 57(5), has informed the relevant national authority of the decommissioning of the distribution network or relevant parts thereof".

Pillar C refers to the existing support schemes available to consumers to facilitate the gas phase-out process. They include support schemes for electrification, heating and cooling and energy efficiency. This Pillar primarily draws on the relevant provisions of the Renewable Energy Directive, the Energy Efficiency Directive and the Energy Performance of Buildings Directive, as well as their implementation in the French and Spanish legal systems[60].

The Renewable Energy Directive provides a legal basis for Member States to adopt support schemes to mainstream renewable energy in buildings (Article 15a(3)) and in the heating and cooling sector (Article 23).

The Energy Efficiency Directive includes provisions aimed not only at protecting consumers involved in improving energy efficiency in the European Union, but also at empowering them. Notably, Article 22 on "*Information and awareness raising*" requires Member States to provide transparent and accessible information on available energy efficiency improvement measures. Behavioural change shall be promoted – for instance – through fiscal incentives, access to finance, vouchers, grants or subsidies, targeted advisory services for consumers, prioritising vulnerable and poor consumers and buildings with poor energy performance. As stressed by the Commission's guidelines on the transposition of the Energy Efficiency Directive, Member States are required to ensure the creation of one-stop shops or similar mechanisms to provide technical, administrative and financial advice on and assistance with energy efficiency improvements to final customers and final users[61]. The contribution of one-stop shops can be very important for vulnerable customers, as they can provide reliable, accessible information on energy efficiency improvements.

Finally, under the Energy Performance of Buildings Directive, Member States are required to provide appropriate financing, support measures and other instruments to address market barriers and deliver the necessary investments identified in their national building renovation plans (Article 17). They shall ensure that applications and procedures for public financing are simple and streamlined in order to facilitate access to financing, especially for households.

Despite this framework, constraints may arise at the transposition and implementation stages that, in practice, hinder average and vulnerable consumers' access to these measures. In particular, the availability, design and accessibility of support schemes may vary significantly across Member States, as the relevant administrative procedures fall within national competence.

[60] A definition for "support schemes" is provided by the Renewable Energy Directive, Article 2(5): "any instrument, scheme or mechanism applied by a Member State, or a group of Member States, that promotes the use of energy from renewable sources by reducing the cost of that energy, increasing the price at which it can be sold, or increasing, by means of a renewable energy obligation or otherwise, the volume of such energy purchased, including but not restricted to, investment aid, tax exemptions or reductions, tax refunds, renewable energy obligation support schemes including those using green certificates, and direct price support schemes including feed-in tariffs and sliding or fixed premium payments".

[61] COMMISSION RECOMMENDATION (EU) 2024/2481 of 13 September 2024 setting out guidelines for the interpretation of Articles 21, 22 and 24 of Directive (EU) 2023/1791 of the European Parliament and of the Council as regards the consumer related provisions, recital (4).

France

Legal analysis

The assessment of consumer rights and protection in France – conducted according to Pillars A, B, and C – has required an examination of the relevant legal provisions contained in the "*Code de l'énergie*" (hereafter, "Energy Code")[62] and the "*Code de la Consommation*" (hereafter, "Consumer Code")[63]. Each code consists of a "*Partie legislative*" and a "*Partie réglementaire*".

With regard to the Energy Code, the following provisions were examined:

- Book I, Title II on "*Les obligations de service public et la protection des consommateurs"* (Articles L121-1 to L124-5) ;
- Book IV on "*les dispositions relatives au gaz"* (Articles L400-1 to L461-3).

With regard to the Consumer Code, the analysis focused on the following provisions:

- Book II, Title II, Chapter IV, Section I on "*Contrats de fourniture d'électricité ou de gaz naturel*" (Articles L224-1 to L224-16).

The two Codes shall be read jointly, as Article L442-1 of the Energy Code states that "*The provisions of Articles L.224-1 to L.224-16 of the Consumer Code apply to contracts concluded between natural gas suppliers and consumers or non-professional users for natural gas consumption below 30,000 kilowatt-hours per year, as well as to the corresponding offers*".

Additionally, the analysis of the French legal and regulatory framework necessitates consideration of France's integrated National Energy and Climate Plan (NECP) and other related planning and strategic documents. It is worth noting that France has not transposed the 2024 Gas Directive; thus, national legislation reflects the implementation of prior packages.

Pillar A – Consumer rights and protection

Selected provisions concerning contractual and pre-contractual information on price, billing, and contract termination are included in Book II of the French Consumer Code, which deals with the formation and performance of contracts for natural gas supply. These provisions are aligned with the corresponding EU legislation and primarily concern Consumer Types 2, 3 and 4. The French legislator specifies that they constitute provisions "*d'ordre public*", meaning they cannot be waived through contractual arrangements. Failure to provide this information at the

[62] Accessible at https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000023983208?init=true&page=1&query=Code+de+l%E2%80%99%C3%A9nergie&searchField=ALL&tab_selection=all

[63] Accessible at https://www.legifrance.gouv.fr/codes/texte_lc/LEGITEXT000006069565?init=true&page=1&query=Code+de+la+Consommation&searchField=ALL&tab_selection=all

pre-contractual stage and during the contract's performance is punishable by the fine provided for "fifth-class contraventions"[64].

This Pillar also examines provisions addressing economic barriers faced by consumers during the gas phase-out, related to Consumer Types 0 and 1. These are governed by the Energy Code and the Family and Social Action Code.

Contractual information on price and billing

French legislation sets out detailed transparency obligations for natural gas supply contracts under the Consumer Code, to which the Energy Code expressly refers.

Article L224-3 of the Consumer Code outlines the information that must be provided "*in clear and understandable terms*" at the pre-contractual stage, before consumers enter into an agreement with a natural gas supplier. This information must be provided to the consumer in writing or on a durable medium prior to the contract being finalised, along with a summary of the main contractual terms, as specified in Article L224-4 of the same Code.

In line with EU law, natural gas supply prices in France are market-based, and suppliers remain free to determine their pricing structures under competitive conditions. Regarding pricing information, Article L224-3, no. 4 of the Consumer Code states that consumers must be informed about the prices of products and services at the date of the offer, and, where applicable, the conditions under which these prices may change, including how updated information on all applicable tariffs will be made available. Consumers shall also be informed about the billing procedures and payment methods (L224-3, no. 9, of the same Code).

Transparent billing information is further addressed in Articles L224-11 and L224-12 of the Consumer Code, which impose specific information obligations on gas suppliers. Consumers must be billed at least once a year based on their actual energy consumption. Specifically, bills shall be provided on a durable medium, with the supplier verifying annually that non-paper formats are suitable and accessible to the consumer. Bills delivered electronically must include key payment information and allow easy access to detailed breakdowns, with notifications when bills are posted online. Estimates must be realistic and based on past consumption, when available, and customers must be able to submit their own readings by convenient means.

French legislation does not require suppliers, at the pre-contractual, contractual or billing stages, to inform consumers of potential future price increases resulting from structural changes in the gas system. In particular, suppliers are not required to inform consumers about the possible adverse price implications associated with gas network decommissioning and the related redistribution of infrastructure costs among a shrinking number of consumers. Under

[64] In the French legal system, contraventions are divided into five classes, from the least serious to the most serious (the fifth-class contraventions). From first to fourth class, contraventions are punished by a fixed penalty, the amount of which increases according to the seriousness of the offence. For the fifth-class, the sufficiently serious nature of the offence committed justifies the transfer of the police report to a magistrate's court, which decides on the action to be taken according to whether it is a repeat offence or not.

EU law, French transparency obligations remain focused on current prices, tariff structures, and past consumption, rather than on forward-looking information concerning the expected cost drivers linked to the energy transition. As noted in the following section devoted to the termination of a gas supply contract, French legislation provides consumer protection measures, including the right to terminate a gas contract without a termination fee and the right to switch suppliers. However, these rights do not, *per se*, address the information asymmetry faced by consumers who remain connected to the gas network and are exposed to increasing costs during the gas phase-out.

Provisions addressing economic barriers faced by average and vulnerable consumers

France has not yet transposed the Gas Directive, which includes provisions specifically designed to protect average and vulnerable consumers under Consumer Types 0 and 1. However, the French legal framework provides measures to protect consumers from disproportionate financial burdens, which could be applicable in the current transitional phase.

First, under Article L122-6 of the Energy Code, any person or family experiencing difficulties is entitled to receive assistance from local public authorities to ensure access to energy supply, which is part of the French policy against poverty and social exclusion, and in particular, the "right to housing". Article L115-3 of the Social Action and Families Code provides that from 1 November each year to 31 March of the following year, electricity, heat and gas suppliers may not, in a primary residence, interrupt - including by terminating the contract - the supply of electricity, heat or gas to persons or families for non-payment of bills.

Energy suppliers may, however, reduce power, except for vulnerable energy consumers. For the rest of the year, suppliers may interrupt in a primary residence - including by terminating the contract - for non-payment of bills only after a period of reduced power lasting at least one month, allowing the household to meet its basic daily and hygiene needs. When a consumer has not paid their energy bill, the supplier shall notify them by letter of the time limit and the conditions - defined by decree - within which the supply may be reduced or suspended, or the contract terminated if payment is not made. Energy suppliers must transmit to the Energy Regulatory Commission, the minister responsible for energy, and to the national energy ombudsman, under conditions defined by regulation, information on supply interruptions or power reductions they implement.

Another measure available to energy consumers facing economic difficulties is the "energy voucher" ("*chèque énergie*"), as stipulated in Article L124-1 of the Energy Code. This is a special payment instrument which can be used by households whose reference income for tax purposes, taking into account the composition of the household of the holder of the electricity supply contract for the dwelling, is below a certain threshold, to pay all or part of the energy expenses related to their dwelling. Energy suppliers and distributors must accept this payment method.

Despite the robustness of French consumer protection measures enshrined in the Energy Code and the Social Action and Families Code, in view of the upcoming structural challenges posed by the gas phase-out, one aspect may require attention, pending the transposition of

the Gas Directive. The existing safeguards are primarily designed to address short-term affordability issues and may not be sufficient to address the structural consequences of gas network decommissioning, notably rising costs for remaining users.

Right to terminate a contract with natural gas suppliers

The right to terminate a contract with natural gas suppliers shall be included in the pre-contractual information, as per Article L224-3, nos. 13 to 15, of the Consumer Code. Consumers shall be informed not only about the conditions and procedures to exercise such a right, but also on the possibility of referring disputes to the National Energy Ombudsman provided for in Article L. 122-1 of the Energy Code, as well as the methods of judicial or extrajudicial dispute resolution available.

Article L224-10 of the Consumer Code states that any proposed modification to the contractual terms and conditions envisaged by the supplier shall be communicated to the consumer by post or, at the consumer's request, electronically, at least one month before the proposed date of application. Therefore, modifications relating to the method of determining the price of supply, as well as the reasons, preconditions, and scope of such modifications, shall be communicated in a transparent and comprehensible manner. This communication must include information on the consumer's right to terminate the contract without incurring termination fees within a maximum period of three months from the date of receipt of the notice. Article L224-10 of the Consumer Code, however, is not applicable to contractual changes required by law or regulation (i.e. not at the unilateral discretion of the supplier).

From these provisions, one could argue that an increase in network tariffs for consumers who remain connected to the network during the gas phase-out cannot be considered as a change in contractual conditions. Thus, it does not enable consumers to exercise their right to terminate the natural gas contract. This is because network tariff increases are generally regulatory or third-party cost adjustments set by the Energy Regulation Commission (CRE), and are not unilateral contractual changes imposed by the supplier. On the other hand, an increase in natural gas prices may entitle consumers to exercise such a right only if it is not properly communicated to consumers.

Right to switch gas suppliers

Regarding the right to switch, among the provisions applicable to the performance of the gas supply contract, Article L224-14 of the Consumer Code allows the customer to change supplier within the shortest possible timeframe, which may not exceed twenty-one days from the date of their request. In such cases, the contract is automatically terminated on the effective date of the new energy supply contract.

If the termination does not involve a change of supplier, it takes effect on the date requested by the consumer, and no later than thirty days from the date on which the supplier is notified of the termination.

Article L224-15 of the Consumer Code provides that the consumer shall receive the final bill within four weeks of the contract termination. The supplier may charge the consumer only for the costs actually incurred through the network operator in connection with the termination, provided that such costs are expressly stipulated in the offer. These costs must be duly justified. No fees may be charged to the consumer solely on the grounds that they are changing suppliers. Any overpayment shall be refunded within a maximum period of two weeks following the issuance of the final bill.

Pillar B – Network tariff regulation and gas network phase-out planning

Pillar B.1 – Gas network Tariff regulation

The legislative framework for gas network tariff regulation revolves around Book IV, Title V, Chapter II, of the Energy Code, entitled "*Tariffs for the use of natural gas transmission and distribution networks and for the use of liquefied natural gas facilities*" (Articles L452-1 to L452-6). The Energy Regulation Commission (CRE) is responsible for determining the methods used to establish tariffs for gas transmission and distribution networks, tariffs for LNG facilities, and tariffs for ancillary services provided by those operators (Article L452-2). Under Article L. 452-3, the CRE may make "*modifications to the level and structure of tariffs as it deems justified, particularly in light of its analysis of operators' accounts and the anticipated evolution of operating and investment costs*".

Based on the above-mentioned provisions, the CRE adopted Decision no. 40 of 15 February 2024 concerning the equalised tariff for the use of public natural gas distribution networks operated by GRDF, the largest French DSO[65]. This Decision was adopted after an extensive process of consultation with relevant stakeholders and relies on the results of a Report entitled "*Avenir des infrastructures gazières aux horizons 2030 et 2050, dans un context d'atteinte de la neutralité carbone*"[66] prepared by the CRE itself, following an initial request from the Directorate General for Energy and Climate (*Direction générale de l'énergie et du climat* - DGEC*)* of the French government.

The ATRD7 tariff entered into force on 1 July 2024 for a period of four years. Consistent with the preceding tariff framework, it encourages GRDF to improve its efficiency, especially in the context of decreasing gas consumption, while ensuring the highest safety standards[67].

The details of the French gas network tariffs have been addressed in Chapter 1.

Pillar B.2 – Gas network phase-out planning

[65] CRE, 'Délibération de La Commission de Régulation de l'énergie Du 15 Février 2024 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (n 6). Around 11 million consumers are connected to the natural gas distribution networks. They are supplied by 26 natural gas DSOs of varying sizes. GRDF distributes 96% of the natural gas distributed and transports natural gas across most of France.

[66] Commission de Regulation de l'Energie (CRE) (n 23).

[67] CEER (n 25).

As the Gas Directive has not yet been transposed into the French legal system, and network system operators have not yet been mandated to develop the "gas network decommissioning plans" provided for under Article 57 of that Directive, it is not currently possible to evaluate the impact on consumers under Type 4, in which consumers are disconnected from the gas network as a direct result of the implementation of those plans.

While the transposition process is still pending (the deadline is 5 August 2026), it is nevertheless possible to examine the existing planning and strategic documents approved by the French Government in order to verify (i) whether they envisage gas network decommissioning and/or repurposing, and (ii) whether and how they address potential adverse effects on consumers. This assessment is relevant for Consumer Type 2, where consumers remain connected to the gas network but shift to RLCG, and for Consumer Type 3, where consumers remain connected to the gas network but stop consuming natural gas (due to full electrification of their energy demand or to the connection to a DHC system).

As described under Pillar B.2 at the EU level, gas network decommissioning plans shall be consistent with:

- the Integrated National Energy and Climate Plans (NECP);
- the heating and cooling plans developed in accordance with Article 25(6) of the Energy Efficiency Directive;
- the national Ten-Year Network Development Plans (TYNDP).

Consequently, pending the implementation of the Gas Directive, the analysis for Pillar B.2 will be based on the first two documents. Ten-Year Network Development Plans are out of scope of this Study.

French Integrated National Energy and Climate Plan (NECP)

France has outlined its actions and policies to achieve the 2030 climate and energy targets and meet the objectives of the Energy Union through its National Energy and Climate Plan[68], as required under Regulation (EU) 2018/1999 ("Governance Regulation") and last updated it in 2024. The Plan is structured around three national planning and governance documents on energy and climate:

- the Multiannual Energy Programme (EPP), which sets out the priorities for public action in the energy sector,
- the National Low-Carbon Strategy (SNBC), which constitutes France's roadmap for climate change mitigation policy, and
- the National Plan for Adaptation to Climate Change (PNACC), which aims to protect citizens and prepare local and regional areas, the economy and the environment for the impacts of climate change.

[68] Accessible at https://commission.europa.eu/document/download/ab4e488b-2ae9-477f-b509-bbc194154a30_en?filename=FRANCE%20%E2%80%93%20FINAL%20UPDATED%20NECP%202021-2030%20%28English%29.pdf#page=8

The French NECP specifically addresses the impacts of the gas phase-out process on the energy infrastructures in Section 3.4.1, and it proposes the following measures:

> "(i) *a widening of the equalisation between natural gas distribution networks, which will make it possible to smooth the impacts associated with reducing methane gas consumption, (ii) ban on new natural gas distribution concessions and a framework for the extension of existing networks, which will limit stranded costs; (iii) local consumption reduction planning will have to be carried out over the coming years in order to identify areas where natural gas will no longer be used except at prohibitive costs for consumers, in the light of changes in consumption and the possibilities for substitution by other energy sources".*

The National Low-Carbon Strategy (SNBC) was first adopted in 2015 and subsequently revised in 2020. In 2023, the French government began preparing SNBC 3 to align it with the Fit-for-55 framework. A public consultation was launched at the end of 2024 with the goal of finalising the document in 2025, but it has not yet been published. The adoption of the PPE 3 (Multiannual Energy Programming), which shall inform the SNBC 3, is currently still subject to political negotiations.

The SNBC and the PPE are based on a shared "reference scenario". Their development is therefore closely interlinked, as each document affects the other. Indeed, while the SNBC is intended to define the mitigation roadmap for all sectors (including energy production and transformation), the PPE describes in detail the energy policy directions for the next ten years, particularly translating France's ambitions to reduce energy consumption and develop low-carbon energy production capacities into operational guidance for State action. The SNBC and the PPE must ensure, across all sectors (transport, agriculture, buildings, industry, energy, waste), a match between needs and resources (energy quantities, sectorial industrial capacity and availability of skills, financial resources) over the entire time horizon.

For this Study, it is noteworthy that the section on the decarbonisation of the residential sector in the draft SNBC 3[69] foresees some ambitious goals by 2030, mostly related to a strengthened public support for progressive replacement of gas boilers, mass deployment of low-carbon heating systems (heat pumps, district heating systems and biomass boilers), and building energy efficiency renovation. These measures will inevitably impact the design of the French gas network. Therefore, the draft PPE 3[70]highlights the need to adapt the gas network to the development of renewable and low-carbon gas production, as well as to the drop in methane gas consumption. Relying on the results of the Study conducted by the CRE for DGEC (already mentioned under Pillar B.1), in the draft PPE, it is acknowledged that "*in the absence of specific measures, the allocation of fixed costs to a declining methane gas consumption base could lead to an increase in the unit costs associated with gas infrastructures*"[71]. Consequently, the

[69] Accessible at https://concertation-strategie-energie-climat.gouv.fr/sites/default/files/2024-11/20241031%20Projet%20de%20SNBC%203%20-%20concertation%20prealable-vF.pdf

[70] Accessible at https://www.consultations-publiques.developpement-durable.gouv.fr/IMG/pdf/02__projet_de_ppe_3_en.pdf. See also the "Fiche thématique" no. 16 on the future of oil and gas infrastructure in the gas phase-out context, accessible at https://concertation-strategie-energie-climat.gouv.fr/sites/default/files/2024-11/Fiches%20th%C3%A9matiques%20%C3%A9nergie_VFF.pdf

[71] Section 4.6.3.

expected decline in gas consumption must be taken into account when setting tariffs for the use of gas infrastructure.

French heating and cooling plans

The Gas Directive requires that gas network decommissioning plans governed by its Article 57 shall be "*based on the heating and cooling plans developed in accordance with Article 25(6) of the* [Energy Efficiency Directive]". Such plans shall be prepared by regional and local authorities in municipalities with a total population exceeding 45,000.

In France, the EED was transposed in May 2025 through the "Loi DDADUE". According to the EU Tracker on local heating and cooling plans developed by "*EnergyCities*"[72], the plans developed at the regional and local levels sometimes lack sufficient detail about supply and demand scenarios.

Pillar C – Support schemes

France has established a comprehensive set of financial support schemes to promote energy-efficiency renovation in the residential sector[73]. They combine subsidies, loans, and tax incentives and are designed to benefit homeowners, tenants, landlords, and condominium associations. In addition to national schemes, regional and local authorities may provide complementary financial support[74].

MaPrimeRénov' constitutes the principal national subsidy scheme for residential energy renovation. It is available to all property owners for dwellings used as a primary residence, whether owner-occupied or rented. It is structured into three main pathways.

- The Single-Action Renovation Pathway (*MaPrimeRénov parcours par geste*) supports targeted energy renovation measures, such as thermal insulation (walls, roofs, floors) and the installation of low-carbon heating or domestic hot water systems. The amount of the subsidy depends on the household income and the type of work undertaken.
- The Assisted Renovation Pathway (*MaPrimeRénov' Parcours accompagné*) is designed for large-scale renovations and requires the involvement of an accredited "*Accompagnateur Rénov*", who supports households throughout the process. Eligibility criteria include an improvement of at least two energy performance classes and implementation of at least two insulation measures. The level of financial support is calculated as a percentage of total eligible costs, based on both energy performance gains and household income.
- The Condominium Renovation Pathway (*MaPrimeRénov' Copropriété*) finances energy renovation works in condominium buildings, including common areas and private areas designated as being of collective interest. Eligible works include façade insulation, roof waterproofing and replacement of collective heating systems. The aid is applicable to all co-owners, regardless of their income. The subsidy covers 30% to 45% of eligible costs, up to €25,000 per dwelling. An additional bonus of up to 20% is available for financially fragile condominiums. Applications are submitted collectively by the condominium manager, and funds are distributed in proportion to the ownership shares.

[72] Accessible at https://energy-cities.eu/countries/france/

[73] This section is based on the information available on the institutional websites: https://www.economie.gouv.fr/particuliers/faire-des-economies-denergie/renovation-energetique-les-aides-auxquelles-vous-pouvez#les-aides-locales-pour-financer-_3; https://www.service-public.gouv.fr/particuliers/vosdroits/N321.

[74] The National Agency for Housing Information (ANIL) maintains a centralized database of regional and municipal aid schemes.

Under the Energy Saving Certificates (*Certificats d'économies d'énergie*, CEE), energy suppliers offer financial incentives to households that undertake energy efficiency improvements. These incentives may take the form of grants, reduced-rate loans, or discounts. The scheme applies to dwellings completed more than two years ago, whether used as a primary or secondary residence. Eligible works include insulation and heating system upgrades. Financial support varies depending on the supplier, the nature of the works, expected energy savings and household income. The CEE framework also includes targeted incentive programmes known as "boost" ("*Coup de pouce*") bonuses. The "heating boost" ("*Coup de pouce chauffage*") bonus supports the replacement of fossil fuel-based heating systems (gas, coal, oil) with low-emission alternatives, including biomass boilers, heat pumps[75], solar thermal systems, and connection to renewable district heating networks.

The zero-interest eco-loan (*Éco-prêt à taux zero*, Éco-PTZ) enables households to finance energy renovation works without any income conditions. Eligible beneficiaries include homeowners and tenants, certain non-commercial companies, and condominium associations. The dwelling must be used as a primary residence and be more than two years old. The loan can finance individual energy efficiency measures, comprehensive renovations that achieve at least a 35% reduction in energy consumption, and the rehabilitation of non-collective sanitation systems that do not consume energy. Loan amounts correspond to eligible costs, subject to regulatory caps. The loan is available without income conditions, although higher support is provided to lower-income households, and is administered by energy suppliers participating in the CEE scheme.

Renovation Advance Loan (*Prêt avance mutation*) is a loan secured by a mortgage on the real estate property that allows homeowners to finance energy renovation works, such as roof and wall insulation, glazed surfaces or doors opening to the outside, modernisation of heating or hot water systems, and other works that achieve a minimum overall energy performance improvement, as well as insulation of the lowest floors of a building. The loan is offered by banks or financing institutions, which set the amount and interest rate. Repayment is made in a single payment upon sale of the property or upon inheritance.

A range of tax incentives, in the form of reductions and exemptions, further supports residential energy renovation.

- Energy renovation works may be eligible for reduced VAT rates of 10% or 5.5%, depending on the nature of the works and compliance with specific eligibility conditions.

[75] The bonus includes the installation of an air/water heat pump, a water-to-water heat pump, and a glycol-to-water heat pump. Detailed information is available at https://www.service-public.gouv.fr/particuliers/vosdroits/F34421

- The "Denormandie Tax Reduction" offers an income tax reduction for individuals who purchase and renovate older housing in designated municipalities for rental purposes. Renovation works must represent at least 25% of the total investment cost. The tax benefit varies according to the rental period and applies to investments completed before 31 December 2027.
- Landlords may deduct renovation-related deficits (*Déficit Foncier*) from their overall taxable income for unfurnished rental properties under the standard tax regime, based on actual expenses. For energy renovation works, the deductible ceiling was temporarily increased to €21,400 until 31 December 2025, provided the renovation improves the dwelling's energy class from E, F, or G to at least class D.
- Local authorities may grant a temporary property tax exemption for energy-saving renovations. The exemption applies for up to three years and may be partial or total. Eligible dwellings must be more than 10 years old, and minimum expenditure thresholds apply. Property owners must submit a declaration, along with supporting documentation, to the relevant tax authority.

A recent report published by the French consumer protection association UFC-Que Choisir[76] shed light on the main critical aspects of the above-described support schemes, claiming that access to such schemes remains highly complex from an administrative perspective, with negative implications particularly on condominiums, where decision-making and execution of works usually take a long time. The assessment carried out by Que Choisir, which is highly relevant to this Study, has identified several barriers. Regarding the *MaPrimeRénov*'s schemes, the principal national subsidy scheme for residential energy renovation, access to financial aid is often obstructed by IT issues and administrative delays. Additionally, although the introduction of "*Mon Accompagnateur Rénov*" is evaluated as a step forward because it would reduce the risk of fraud and scams, Que Choisir considers that this scheme would require greater financial support to avoid appearing to households as a new barrier to large-scale renovation.

Spain

Legal analysis

The assessment of consumer rights and protection in Spain – conducted according to Pillars A, B, and C – has required the examination of the relevant legal provisions contained in the *Ley 34/1998 del sector de hidrocarburos* (hereafter, Hydrocarbons Law)[77]. This law, which generally concerns the hydrocarbons sector in Spain, has been amended numerous times, primarily to align it with the EU Gas Directive of 2003 and 2009, as well as to address evolving energy policies, such as the promotion of renewable gases. The key amendments for this Study are the following:

[76] UFC-Que Choisir, 'Aides à La Rénovation Énergétique Des Dispositifs Encore Trop Complexes et Peu Efficaces ("Aids for Energy-Efficient Renovation Schemes Still Too Complex and Ineffective")' (2025) <https://www.quechoisir.org/action-ufc-que-choisir-renovation-energetique-des-aides-toujours-inefficaces-face-a-l-urgence-sociale-et-climatique-n166344/?dl=147064>.

[77] Accessible at https://www.boe.es/buscar/act.php?id=BOE-A-1998-23284

- Royal Decree-Law 984/2015 led to the creation of an organised gas market (Spanish Gas Hub, known as MIBGAS) to facilitate transparent, market-based pricing;
- Royal Decree-Law 6/2022 introduced measures from the framework of the National Response Plan to the economic and social consequences of the war in Ukraine. It contains a number of climate-related clauses, including dispositions to reduce gas flaring and a promotion of technologies reducing GHG emissions, notably with regard to fuels;
- Royal Decree-Law 18/2022 approved measures to strengthen the protection of energy consumers and contribute to the reduction of natural gas consumption in application of the 'Plan + seguridad para tu energía (+SE)' (Plan + security for your energy).

As usual, general consumer law is also relevant, since it applies to gas supply contracts with consumers. In Spain, this is the Royal Decree-Law 1/2007, *Ley General para la Defensa de los Consumidores y Usuarios* (hereafter, General Law for the Defence of Consumers and Users). In additional to general consumer law, Spanish legislation has transposed several sector-specific measures for consumer protection, such as in Royal Decree-law 17/2021 on urgent measures to mitigate the impact of rising natural gas prices on vulnerable consumers in the retail gas and electricity markets, which introduced the *Tarifa de Último Recurso* (TUR), translated as Last Resource Tariff.

Additionally, aligned with the analysis of French´s legal framework, Spain's integrated NECP and other related planning and strategic documents have been taken into consideration. Spain's Royal Decree-Law 7/2021 (hereinafter, the Climate Change and Energy Transition Law) reinforced the push for decarbonisation and introduced measures related to renewable energy facilities, affecting the long-term scope of the Hydrocarbons Law.

Pillar A – Consumer rights and protection

A number of provisions concerning contractual and pre-contractual information on price, billing, and contract termination are set out in Title IV, Chapter I, of the Spanish Hydrocarbons Law. Article 57*bis* deals with consumer rights and protections in relation to their natural gas supply contracts. These provisions align with the corresponding EU legislation and primarily concern Consumer Types 0, 1, 2, and 3.

Contractual information on price and billing

As with the EU Gas Directive, Article 57bis(e) of the Spanish Hydrocarbons Law outlines the information that must be included in gas supply contracts with consumers, as well as the obligation to disclose pre-contractual information in advance. A gas supply contract must include, inter alia, information about "*how to obtain up-to-date information on all applicable tariffs and maintenance costs", "the conditions for renewal and termination of services and the contract and, where permitted, withdrawal from the contract without cost"*. Moreover, the same provision states that the *"terms and conditions shall be fair and disclosed in advance"*.

Regarding the changes in the contractual terms and conditions, Article 57*bis*(f) establishes that consumers shall "*be duly notified in a transparent and comprehensible manner of any intention*

to modify the terms of the contract and informed of their right to terminate the contract at no cost upon receipt of the notification". The same provision that sets the consumer rights to be informed about contractual changes also addresses the issue of changes in the gas price. Consumer shall "*be notified directly by their supplier of any price revisions resulting from the terms and conditions, at least one month prior to their entry into force, in a transparent and comprehensible manner".* Moreover, "*communications regarding price revisions must include a comparison of the prices applied before and after the revision, as well as an estimate of the annual cost of supply for that consumer and a comparison with the previous annual cost".*

It is worth noting that the Spanish Hydrocarbons Law dedicated a separate paragraph to consumer information on network tariffs. According to Article 57*bis*(g), consumers must *"receive transparent information on prices, tariffs and general conditions applicable to access and use of gas services".* Nevertheless, like French law, the provisions could not be interpreted as requiring suppliers to notify consumers of the increase in network tariff costs shared among consumers, leading to a rise in overall gas supply prices.

On billing information, Article 57*bis*(m) establishes that consumers must "*be adequately informed of actual gas consumption and the corresponding costs at the frequency established by regulation, so that they can regulate their own gas consumption. The information shall be provided in good time, taking into account the capacity of the customer's metering equipment. No additional costs may be charged to the consumer for this service."* In addition to this provision, Royal Decree-Law 18/2022 amended Article 53 (m). In the case of consumers entitled to the TUR, the average consumption during the billing period of those consumers who share the same postcode and local network toll bracket will be included.

Provisions addressing economic barriers faced by average and vulnerable consumers

Like France, Spain has not yet transposed the 2024 Gas Directive, which includes provisions specifically designed to protect average and vulnerable consumers under Consumer Types 0 and 1. However, the Spanish legal framework provides measures to protect consumers from disproportionate financial burdens, which may be applicable in the current transitional phase.

According to Article 93 of the Spanish Hydrocarbons Law, *"the TUR shall be the maximum price that may be charged by suppliers that have been designated as last resort suppliers to the following consumers"*:

a) individual consumers with a supply pressure equal to or less than 4 bar and annual consumption of less than 50,000 kWh, and

b) communities of owners of residential properties and groups thereof, constituted in accordance with Articles 5 and 24 of Law 49/1960, of 21 July, on horizontal property, as well as the energy service companies that provide services to them, and

c) Publicly owned buildings intended for residential use and buildings owned by trusts or non-profit organisations intended for the same use, as well as energy service companies that provide services to them.

The scope of consumers eligible for the TUR is significantly large. They are not limited to vulnerable consumers or those in conditions of energy poverty, as observed in France.

Moreover, the TUR is uniform throughout Spain, without prejudice to any special provisions based on pressure levels and consumption volume (Article 93(4)).

The necessary provisions for establishing the TUR must be approved by the Head of the Ministry for Ecological Transition and Demographic Challenge, subject to the Government's Delegate Commission for Economic Affairs' agreements (Article 93(5)). According to Article 3(c) of the Hydrocarbons Law, CNMC is competent to determine the TUR following the general guidelines issued by the government, which shall include, on an additive basis, the cost of raw materials, tolls and access fees, charges, marketing costs and costs arising from security of supply (Article 93(6)). According to Article 3(c) of the Hydrocarbons Law, CNMC is competent to determine the TUR.

In addition to the TUR provided to a large group of consumers, Article 57 of the Hydrocarbons Law adds that the Minister of Industry, Energy and Tourism may establish specific supply conditions for certain consumers who, due to their economic, social or supply characteristics, are considered vulnerable consumers.

Right to terminate a contract with natural gas suppliers

As mentioned above, the right to terminate a contract with natural gas suppliers shall be included in the contractual information, as per Article 57*bis*(e), *5.° ("the conditions for renewal and termination of services and the contract and, where permitted, withdrawal from the contract without cost").*

The Spanish Hydrocarbons Law also establishes that consumers may terminate the supply contract at no cost if the supplier modifies the contractual terms and conditions. According to Article 57bis(f), consumers shall *"be duly notified in a transparent and comprehensible manner of any intention to modify the terms of the contract and informed of their right to terminate the contract at no cost upon receipt of the notification".* Since the increase in network tariffs resulting from gas phasing-out does not constitute a change in contractual terms and conditions, it does not constitute a justification for terminating gas supply contracts at no cost, according to the Spanish Hydrocarbons Law.

It is worth noting that the Royal Decree-Law 18/2022 introduced, in its Article 40, specific measures for terminating supply contracts under liberalised gas markets and TUR. For consumers under liberalised contracts, the terms and conditions for the terminations must be agreed between the parties (Article 40(1)(a)). Nevertheless, contracts on the free market are generally for one year and, after that, consumers can terminate without penalty. For termination before, the penalty for early termination cannot exceed 5% of the price of the energy that is still pending supply. Instead, for consumers under TUR, the contract with the current supplier shall be terminated on the date on which the supply contract with the new supplier is activated, with no penalty for termination, completing the switching process (Article 40(2)(a)). Therefore, consumers under the TUR may have the right to terminate contracts with no termination fees when they are switching suppliers, but it is arguable whether they are also entitled to no-termination fees if they switch to an RLCG supplier or if their termination does not lead to switching suppliers (Consumer Types 2 and 3)

Right to switch gas supply

Article 57bis(i) of the Spanish Hydrocarbons Law enshrines the consumers´ rights to "*switch supplier at no cost*" for the act of switching in itself. As abovementioned, all consumers have the right to switch suppliers, but only consumers under TUR are entitled to do so without penalty. Moreover, consumers must "*receive a settlement of the account after any change of natural gas supplier, within a maximum period of six weeks from the date of switching supplier*".

Pillar B – Network tariff regulation and gas network phase-out planning

Pillar B.1 – Gas network Tariff regulation

Spain's gas network tariff framework is governed by numerous key pieces of legislation and regulatory instruments. These include the Spanish Hydrocarbons Law and various decrees and circulars, such as Royal Decree-Law 1/2019, which grants the CNMC authority over methodologies and remuneration for gas infrastructure. The CNMC also issued Circular 6/2020, detailing the methodology for calculating tolls, and Circular 2/2019, which addresses financial remuneration for transmission and distribution. Additionally, Royal Decree 1184/2020 regulates Gas System charges and facility remuneration.

The details of the Spanish network tariff regulation have been addressed in Chapter 1.

Pillar B.2 – Gas network phase-out planning

The 2024 Gas Directive has not yet been transposed into Spanish law. Therefore, it is currently not possible to assess Spanish "gas network decommissioning plans" governed by Article 57 of such a Directive, nor to evaluate the impact on Consumer Type 4, where consumers are disconnected from the gas network precisely because of the implementation of those plans.

While the transposition process is still pending (the deadline is 5 August 2026), it is nevertheless possible to examine the existing planning and strategic documents approved by the Spanish Government in order to verify (i) whether they envisage gas network decommissioning and/or repurposing, and (ii) whether and how they address potential adverse effects on consumers.

As described under Pillar B.2 at the EU level, gas network decommissioning plans shall be consistent with:

- the Integrated National Energy and Climate Plans (NECP);
- the heating and cooling plans developed in accordance with Article 25(6) of the Energy Efficiency Directive;
- the national Ten-Year Network Development Plans (TYNDP).

Consequently, pending the implementation of the Gas Directive, the analysis for Pillar B.2 has been based on the first document, which is the latest Spanish NECP submitted in 2024 to the European Commission.[78]

The 2024 Spanish NECP acknowledges the need for a new planning for natural gas transport infrastructure, but it postpones any plan until after the update to the EU Regulation and Directive on hydrogen and natural gas.[79] Until 2025, Spanish authorities have not yet updated their NECPs. The current national plans make reference to the 2008-2016 Electricity and Gas Sector Plan, approved on 30 May 2008 by the Agreement of the Council of Ministers. This current plan analyses and identifies the need for new transport, storage and regasification infrastructure capacity, outlining the main axes in such a way as to create a secure and flexible system in which all gas areas are interconnected.

Despite the absence of holistic decommissioning or repurposing planning for the gas network, it is important to highlight an amendment to the Spanish Hydrocarbon Law introduced by Royal Decree-Law 18/2022, which defined direct lines and regulated their operation. Article 18 establishes that direct lines are gas pipelines "intended for the exclusive supply of a consumer through a direct connection to the transmission network or for connecting a renewable gas production plant to the gas system for the purpose of injecting gas into it". At the ownership and operational level, the Royal Decree-Law 18/2022 establishes that:

> *2. Direct lines intended for the exclusive supply of a consumer through a direct connection to the transport network shall be excluded from hydrocarbon planning and from the application of the provisions on expropriation and easements established in this law, and shall be subject to the general legal system. Direct lines connecting a renewable gas production plant to the gas system for the purpose of injecting gas into it shall be excluded from hydrocarbon planning and shall be declared to be in the public interest for the purposes of compulsory expropriation and the exercise of rights of way, with the provisions of Title V of this law applying.*
>
> *3. Consumers and producers of renewable gases may construct direct lines by their own means or request their construction from a transport company or distribution company with administrative authorisation in the area. Ownership of the direct line shall belong to the consumer or producer of renewable gas. Direct lines shall be excluded from the remuneration regime for transport and distribution activities.*
>
> *4. The owner of the direct line must allow access to third parties in accordance with the regulations. The National Markets and Competition Commission shall resolve any connection and access disputes that may arise.*

Pillar C – Support schemes

[78] Available here: https://commission.europa.eu/document/download/211d83b7-b6d9-4bb8-b084-4a3bfb4cad3e_es?filename=ES%20-%20FINAL%20UPDATED%20NECP%202021-2030%20%28Spanish%29.pdf

79 Idem, p. 61.

Spain has some support schemes aimed at alleviating energy poverty caused by the impact of heating costs on vulnerable consumers, as well as grants for energy efficiency, primarily delivered through direct subsidies.

Similar to France, Spain has a program that provides a social bonus to vulnerable consumers in both the electricity and gas sectors. For the latter, there is the *Bono Social Térmico* (Thermal Social Bonus), which provides an annual direct payment to support vulnerable consumers with heating expenses, including natural gas.

Concerning the support schemes for electrification and efficiency addressed to HH, Spain has the PREE 5000 Program (Program for Energy Rehabilitation of Buildings). This program provides subsidies for energy efficiency improvements in existing buildings throughout Spain, with a special focus on vulnerable households. This includes measures such as improved insulation and the installation of high-efficiency heating/cooling systems (e.g., heat pumps). The subsidy amount can vary, covering between 20% and 50% of costs for residential buildings and up to 80% for projects achieving significant energy savings or in cases of economic vulnerability.

In addition to the national energy efficiency programme, HH in Spain could also benefit from EU and regional programmes. At the EU level, in the Next Generation EU Program, individuals can finance 40 to 80% of their energy renovation project. Also, some autonomous communities have also offered aid for the energy rehabilitation of residential buildings and co-owned properties throughout the years, such as aid programmes in Catalonia[80] and Andalusia (Andalucía A+).[81]

In addition to support schemes that provide direct payments or reimbursements, Spanish HH can benefit from income tax (IRPF) deductions for energy-efficiency improvements in their primary residence. There are three degrees of benefits. Consumers are entitled to (i) 20% deduction of IRP for actions reducing heating and cooling demand by at least 7%, up to a maximum deduction of €1,000 annually; (ii) 40% of IRPF deduction for actions achieving a reduction of at least 30% in non-renewable energy consumption or improving the property's energy rating to class A or B, with a maximum annual deduction of €3,000; and (iii) 60% IRPF deduction for building-wide renovation works in residential buildings that achieve a minimum 30% reduction in non-renewable energy use or an A or B energy rating, up to a cumulative limit of €15,000 over four years.

[80] Available here: https://www.habitatge.barcelona/es/servicios-ayudas/rehabilitacion/ayudas-la-rehabilitacion-de-la-vivienda

[81] Available here: https://ec.europa.eu/regional_policy/projects/projects-database/renewable-energy-powers-ahead-in-andalusia_en#:~:text=The%20Andaluc%C3%ADa%20A+%20programme%20has,and%20municipalities%20in%20the%20region.&text=The%20reactivation%20of%20the%20Andalusian,1.3%20%25%20of%20the%20Andalusia's%20GDP.

4. CHAPTER 4 – POLICY AND LEGAL RECOMMENDATIONS TO ENSURE CONSUMER PROTECTION

The analysis in Chapter 3 demonstrates that the 2024 Gas Directive includes several provisions designed to protect both average and vulnerable consumers during the gas phase-out, particularly in contexts involving the decommissioning or repurposing of gas networks. However, Member States enjoy some elements of discretion in transposing the Gas Directive into their national legislation. Moreover, the number of actors involved in the process, including energy suppliers, network operators, national regulatory authorities and other competent bodies, makes the implementation of the provisions in the Gas Directive not straightforward.

Therefore, the legal and regulatory recommendations provided in this Study are formulated against a somewhat uncertain background, given that France and Spain have not yet transposed and implemented the 2024 Gas Directive. Also, there is limited evidence available regarding the actual decommissioning and repurposing of gas networks more broadly in these Membr Sates. Nevertheless, potential adverse impacts on average and vulnerable households are predicted, as illustrated in the scenarios in Chapter 2.

It is, therefore, essential that the applicable legal and regulatory framework ensures protection of average and vulnerable consumers from potential adverse impacts associated with the gas phase-out, including during the transitional period preceding the transposition and implementation of the Gas Directive.

To complement the legal analysis, we gathered input from a diverse range of stakeholders in the energy sector, not only in France and Spain. This broader approach enabled the gathering of evidence from other Member States and the identification of good practices that could potentially enhance consumer protection in the two case-study Member States and elsewhere. The survey used to collect the input from experts was structured around the following questions:

1. Which consumer protection issues do you foresee in the context of the gas phase-out? Please describe the main challenges and provide concrete examples.
2. Based on your knowledge and expertise, what measures or initiatives have been (or are currently being) implemented at the national level to mitigate potential costs faced by consumers during the gas phase-out?
3. Are you aware of any measures or initiatives from other network industries (e.g., telecommunications or others) that could serve as useful analogies for protecting consumers in the context of the gas phase-out?
4. Do you know of any relevant legal disputes regarding consumer protection during the gas phase-out currently before courts or Alternative Dispute Resolution Bodies?
5. Do you have any additional comments or inputs that you consider relevant to the objectives of this study?

A total of 17 responses were received, mostly from consumer protection associations, as well as distribution system operators, transmission system operators, energy suppliers and other

stakeholder associations. Respondents were based in Austria, the Czech Republic, Denmark, France, Germany, Italy, the Netherlands, Poland, Portugal, and Spain.

This chapters propose legal and policy recommendations building from the insights of stakeholders and on the evidence collected in prior chapters, namely:

- The number of consumers disconnected from the gas network since 2020 and the resulting redistribution of gas infrastructure costs among fewer consumers (Chapter 1);
- The economic implications for consumers remaining connected to the gas grid under current conditions and future decarbonisation scenarios (Chapter 2); and
- The assessment of consumer protection frameworks in the EU, France and Spain (Chapter 3).

As a result, this Chapter proposes 12 legal and policy recommendations, listed in Table 4.1 below, to ensure consumer rights and protections throughout the gas phased out. These recommendations are organised according to the "Pillars" and "Consumer Types" of the analytical framework outlined in Chapter 3, facilitating references to the consumer rights and protection gaps identified in this Study and to the respective policy recommendations to mitigate them.

Table 4.1 – Legal nd Policy Recommendations to Ensure Consumer Rights and Protections throughout the Gas Phase-out

Pillar A – Consumer rights and protection	1. Provide clear and transparent contractual and billing information on how final customers' price is affected by gas network decommissioning or repurposing; 2. Enlarge comparison tools to include price comparison between cross-reference of different energy vectors; 3. Regulate termination-related fees without switching suppliers and potentially disconnection fees; 4. Ensure coordinated action is in place to prevent consumers from falling into payment arrears; 5. Strength the role of energy ombudsmen;
Pillar B.1 – Gas network tariff regulation	6. Avoid tariff designs that shift gas phase-out costs onto remaining households; 7. Improve transparency and impact assessment of gas tariff reforms;
Pillar B.2 – Gas network phase-out planning	8. Ensure minimum standards for rolling-out the gas network decommissioning; 9. Launch information campaigns to enhance consumer awareness and empowerment, with roadmaps detailing the timeline and milestones of the decommissioning or repurposing process;
Pillar C – Support schemes	10. Facilitate access to available support schemes; 11. Facilitate access to fair loans for the purchase and installation of energy-efficient equipment; 12. Address the landlord-tenant dilemma with a transparent cost allocation.

Pillar A: Policy and legal recommendations concerning consumer rights

1. Provide clear and transparent contractual and billing information on how final customers' price is affected by gas network decommissioning or repurposing

The 2024 Gas Directive acknowledges that natural gas consumers should be protected from rising tariffs when natural gas assets are depreciated, from cross-subsidisation between gas and hydrogen users, and from rising natural gas tariffs resulting from a shrinking customer base[82]. Chapter 2 has confirmed that the decommissioning and repurposing of gas networks will affect the final price paid by average and vulnerable consumers, due to the need for high infrastructure investment, associated with decreasing volume of gas consumption (Consumer Types 1, 2 and 3) and an increasing number of disconnections (Consumer Type 4).

While the rising of network tariffs on consumers is uncontested, the EU legislation has not reflected or translated these concerns into specific legal requirements regarding the information to be included in the gas supply contract (Article 11(3)) or in the minimum information to be contained in the gas bill (Annex I). Furthermore, under EU horizontal consumer law, neither the Unfair Commercial Practices Directive nor the Consumer Rights Directive, which concern the provision about information on "*price or the manner price is calculated*," would create an obligation on the gas supplier to inform how network tariffs have increased over the years. The lack of a duty to disclose information about the burden of phasing out on consumers has also been confirmed in France and Spain.

If gas suppliers were required to provide this type of information and awareness to consumers, such as the increasing in costs with network tariffs, the latter would not only be placed in a better position to make informed choices (thus possibly switching to alternative energy vectors), but also to avoid bearing the consequences of an increase in gas prices associated with the gas phase-out process.

Therefore, this Study recommends a legal amendment to the 2024 Gas Directive, or the transposition of this Directive into Member States, including the obligation for suppliers to inform consumers of the calculation method used to determine the final gas price[83], including stat. This information should be displayed clearly and transparently, both at the pre-contractual stage and on the bill, to enable consumers to better estimate their expenses.

2. Enlarge comparison tools to include price comparison between cross-reference of different energy vectors

[82] Recital 33 of Gas Directive.

[83] A similar recommendation is provided with regard to the electricity prices in Lucila De Almeida and others, 'A Study on the Relevance of Consumer Rights and Protections in the Context of Innovative Energy-Related Services' (European Commission (DG ENER) 2025).

As acknowledged in Recital 48 of the Gas Directive, independent comparison tools are an effective means for consumers to assess the merits of the different energy offers that are available on the market. The 2024 Gas Directive introduced Article 14 imposing on Member States the obligation to ensure that consumers have access to at least one independent comparison tool and that the information provided on such tools is trustworthy, impartial, transparent and easy to understand. On the other hand, these comparison tools are only required to compare different natural gas supply offers and not offers across different energy vectors, such as supply contracts of RLCG or even an estimation of the impact on electricity bills in a scenario of HH electrification (Consumer Type 4). This could be perceived as a missed opportunity to accelerate the natural gas phase-out, as the lack of information could also help explain why so many consumers remain passive (Consumer Type 0).

Providing tools that enable consumers to compare natural gas supply offers with biometane is not as complex as long as consumers remain connected to the gas network. Nevertheless, these comparisons become more complex when consumers pursue electrification or switch to District Heating Systems. Building these platforms might be possible because the 2024 Gas Directive introduced provisions on data access, management, portability, and interoperability of consumption data (Articles 22 and 23). Thus, consumers could consent to comparison tools to access metering data across both the electricity and gas systems.

Therefore, this Study formulates two recommendations. First, Article 14 of the Gas Directive should be reviewed to ensure the expansion of the comparison tool platform to incorporate offers beyond the supply of natural gas, including RLCG and, in particular, biomethane. Second, Member States must also ensure that consumers have access to comparison tools that can estimate the costs and benefits to consumers in the event of HH electrification.

3. Regulate termination-related fees without switching suppliers and potentially disconnection fees

Switching suppliers is a customer's right that has been fundamentally important in boosting competition in natural gas markets throughout their liberalisation. Notwithstanding, the 2024 Gas Directive is emblematic for expanding and enhancing the already existing switching customer rights in the gas market. Firstly, Article 12 expanded switching rights for hydrogen supply contracts, in addition to natural gas. "*Customers shall have the right to switch suppliers for natural gas and hydrogen or to switch natural gas and hydrogen market participants*". Secondly, the same article also regulates switching-related fees, entitling consumers and SMEs not to be charged for them, except in circumstances where consumers voluntarily terminate a fixed-term, fixed-price supply contract before their maturity (Article 12(2)).

While Article 12 of the Gas Directive represents an advancement in consumer switching rights, these measures are limited to switching to a different supplier but for the same energy vector. In other words, it applies when the customer is switching from one natural gas supplier to another, or from one hydrogen supplier to another.

The measures on switching rights in the Gas Directive are, instead, not aligned with the ambitious natural gas phasing-out plan, as they do not apply to consumers switching away

from natural gas to another energy vector, as in the case of Consumer Types 2, 3 and 4. The Gas Directive also makes no reference to risks of consumers facing charges for decommissioning fees by DSOs.

This Study proposes three legal recommendations related to termination fees and switching-related fees.

First, consumers should not be charged termination-related fees when they terminate the gas supply contract without switching, i.e. when they stop consuming gas (Consumer Type 3). Considering that Consumer Type 3 is aligned with the natural gas phasing-out plans, it is hard to justify excluding this type of consumer from the right to terminate their contracts at no cost, except for fixed-price, fixed-term contracts.

Second, consumers who have been disconnected from the gas network due to the national decommissioning plan (Consumer Type 4) should not be charged any termination fee or any other fee related to decommissioning costs. Although Article 13 of the Gas Directive includes consumer rights and protections in relation to the phasing-out of natural gas, there is no provision addressing the risk that gas suppliers could charge fees when consumers terminate contracts due to decommissioning plans. Nor are there provisions precluding DSOs from charging decommissioning fees to consumers. The Gas Directive leaves it to Member States to decide whether and how to socialise the costs for decommissioning gas networks, as well as how to protect consumers throughout the gas phase-out.

It is worth noting that, at the national level, there is already evidence of adverse effects arising from the lack of clarity in the Gas Directive regarding the contractual effects of decommissioning under Article 57 of the Gas Directive, particularly on the decommissioning-related fees. In Germany, a legal dispute arose from a network operator charging a gas consumer 965 euros to dismantle the gas pipeline. Even if the Higher Regional Court of Oldenburg decided that the charge to consumers had no legal grounds, aligned to the arguments given by the plaintiff, the competent consumer protection association (and the case is now pending before the Federal Court)[84], it could be argued that similar disputes could arise not only elsewhere in Germany (for instance, a study by the North Rhine-Westphalia consumer centre reveals a significant variety of practices among gas network operators in the region[85]), but also in other Member States' jurisdictions.

Third and last, considering that EU legislator limited the rights to switch with no costs to when consumers are switching suppliers of the same energy vector (Article 12(1)), this Study claims that the consumers´ rights to face no switching-related fees (Article 12(3)) should be extended to switching from one natural gas supplier to another supplier of either biomethane or

[84] The judgement is accessible at https://www.verbraucherzentrale.de/sites/default/files/2025-12/bavonurschrifturteilleer_39d6309e-7baa-40b3-8c65-c7938f742f22_geschwarzt.pdf

[85] Verbraucherzentrale NRW, 'Was Kostet Die Stilllegung Oder Der Rückbau Des Gasanschlusses? ("How Much Does It Cost to Decommission or Dismantle the Gas Connection?")' (2025) <https://www.verbraucherzentrale.nrw/sites/default/files/2025-03/20250319_umfrage_gasanschluss_stilllegen_vznrw.pdf>.

hydrogen, respecting the exception for fixed-term, fixed-price supply contracts (Consumer Type 2).

4. Ensure coordination action is in place to prevent consumers from falling into payment arrears

Gas suppliers should be subject to a legal obligation proactively to identify and engage with consumers at risk of payment arrears during the gas phase-out process. This engagement should occur at the earliest indications of financial distress, such as initial missed payments, repeated late payments or atypical consumption patterns that may be symptomatic of affordability problems. In cases where a consumer's situation becomes financially critical, gas suppliers should be required promptly to notify the competent national authorities or designated social support bodies. Such a notification would enable the timely activation of existing support mechanisms – such as social tariffs, payment plans and targeted financial assistance – thereby reducing the risk of gas supply suspension, and ensuring service continuity.

This recommendation aims to address (and prevent) the situations faced by consumers described under Consumer Types 0 and 1, who have limited or no ability to switch to alternative heating and cooling solutions and are therefore exposed to rising gas supply contract prices and increasing tariffs. These consumers are disproportionately exposed to rising gas prices and increasing network tariffs, and therefore face a major risk of energy poverty and involuntary arrears during the gas phase-out process.

This recommendation could be enacted during the transposition and implementation of the Gas Directive. Two complementary approaches could be considered.

First, Member States could establish a legal obligation requiring gas suppliers to carry out early-warning monitoring and cooperate in a structured manner with competent public authorities.

Second, this requirement could be operationalised through a set of rules that establish minimum standards for suppliers' behaviour towards consumers experiencing economic difficulties during the gas phase-out. Such rules could include commitments on early contact, transparency of billing, flexible repayment arrangements, and referral to support services, and be subject to regulatory oversight and enforcement.[86]

Evidence suggests that this latter approach could also enhance consumer trust during the gas phase-out process. According to the 2025 Eurobarometer Report on Consumer Behaviour in

[86] There is a specific example of this in Catalonia. Catalan Law 24/2015 establishes a mandatory protocol for communicating with social services when a utility company must cut off service due to non-payment. In cases of non-payment due to financial hardship, public authorities must reach agreements with drinking water, gas and electricity supply companies to provide non-repayable aid or significant discounts on minimum consumption costs to individuals and families at risk of residential exclusion. <https://www.boe.es/buscar/act.php?id=BOE-A-2015-9725>

the Energy Transition, 82% of total respondents agree that they would trust an energy provider more if it committed to an officially certified code of practice on consumer rights[87].

5. Strength the role of energy ombudsmen

Following the collection of evidence with stakeholders, some respondents pointed out issues arising from the proper implementation of existing consumer rights throughout gas phasing-out, as well as those recommended in this Study. Ensuring compliance with consumer rights and, occasionally, enforcement for non-compliance would require cooperation among several actors, including national and local social welfare services, and accredited non-profit organisations working on energy poverty.

Notably, Energy Ombudsmen could play a significant role, as their functions include not only recommending solutions to disputes between consumers and energy suppliers, but also informing consumers about their rights. As such, the Energy Ombudsman serves as a key interlocutor for public authorities, maintaining ongoing relations with the relevant government departments and national regulatory authorities.

Specifically, Energy Ombudsmen could dedicate part of their monitoring activities to consumers impacted by gas network decommissioning. This would ensure better protection for consumers who are unable to switch to alternative energy sources – either due to insufficient support schemes or because they live in rural, isolated areas[88] – and who face rising energy prices and tariffs during the gas phase-out.

Pillar B.1 Policy and legal recommendations concerning network tariff regulation

6. Avoid tariff designs that shift gas phase-out costs onto remaining households

The comparative assessment of gas tariff design in France and Spain, considered alongside the consumption and disconnection dynamics analysed in Chapter 1, indicates that tariff structures play a significant role in shaping how different categories of users exit the gas system as demand declines. Residential and non-residential disconnections are an expected and necessary component of decarbonisation. The policy challenge lies not in preventing exits, but in ensuring that the sequencing and cost allocation of the transition do not place disproportionate burdens on users that remain connected due to financial, technical or contractual constraints.

[87] European Commission, 'Flash Eurobarometer 566. Consumer Behaviour in the Energy Transition' (2025) <https://europa.eu/eurobarometer/surveys/detail/3354>.

[88] Rural and idolated areas often lack access to electricity networks with sufficient capacity to support full electrification of their energy demand (e.g. heat pumps); district heating networks (as they are usually viable only in dense urban areas); and RLCG, which are unlikely to be deployed first in isolated rural areas due to high connection costs. As a result, household may remain dependent on existing natural gas infrastructure for longer that consumers libving in urban areas.

In France, an increased reliance on fixed and capacity-based charges reduces the extent to which lower consumption translates into lower bills. This may encourage earlier exit among users who can switch away from gas, while users who remain connected but with low-usage or residual consumption patterns face unavoidable rising network charges. In this context, tariff design may contribute to a regressive concentration of network cost recovery on a narrowing base of remaining users, irrespective of their capacity to adapt.

Spain applies the opposite approach, with an increasing share of revenues recovered on a volumetric basis. This maintains a closer link between consumption reduction and bill reduction and may support gradual adjustment for users who reduce gas use without disconnecting. However, in a context of declining volumes, increasing reliance on volumetric charges also raises longer-term questions about revenue stability and affordability for remaining users.

One possible policy response in such circumstances is for Member States to partially socialise network costs through public funds. For example, the national budget could be used directly to support amortisation and/or repurposing of the gas network, or cover a share of the network-related component of vulnerable gas consumers' bills. Partial costs socialisation would help to spread transition costs across society as a whole rather than concentrating them solely on residual gas consumers. Since gas-phasing out is a general policy benefitting all citizens, not just gas consumers, it might be fairer if the costs of early retirement of assets before the end of their economic lives were borne by all citizens.

It is nevertheless worth noticing that any cost socialisation mechanism should be carefully designed to avoid perverse incentives that might slow the transition to a more financially and environmentally sustainable energy system. The French and Spanish cases, therefore, illustrate that different tariff designs entail different distributional risks, none of which can be addressed by tariff design alone.

This Study also recommends that an EU-level guidance could be introduced in the 2024 Gas Regulation 2024/1789 (Article 17(1)), encouraging tariff frameworks that support an orderly and socially balanced phase-out of gas, while avoiding excessive reliance on either fixed charges or rising volumetric recovery that could lead to uneven outcomes across user groups. So far, only Article 57(6) of the Gas Directive refers to tariff settings in the gas decommissioning plans, imposing on national authoriites to establish guidelines for a structural approach to the dismantling of assets before the originally projected life cycle.

7. Improve transparency and impact assessment of gas tariff reforms

The analysis also highlights the importance of improved transparency and reporting to support effective oversight of gas tariff reforms during the transition. In both France and Spain, tariff structures are defined by consumption bands rather than customer categories, and published information does not allow systematic tracking of how different user types are affected by gas phasing-out over time. In addition, neither system provides consistent time-series data on the evolution of customer numbers by tariff group, or on the allocation of network revenues among fixed, capacity-based, and volumetric components as demand declines.

EU-level policy should therefore require Member States to publish standardised, time-series information on gas distribution tariffs and customer segmentation. This should include, at a minimum, the evolution of customer numbers by consumption band, the composition of allowed revenues by tariff component and the interaction between tariff design, declining consumption and disconnections. Improved data availability would enhance transparency, enable more consistent cross-country comparison, and support evidence-based policy-making at both national and EU levels.

In addition, EU regulatory guidance should require national regulators to conduct and publish clear and detailed distributional impact assessments when modifying gas network tariff structures, particularly in contexts of declining demand and rising disconnections. Such assessments should consider how tariff changes affect different user profiles and behavioural pathways identified in Chapter 3, with a view to ensuring that the costs of the gas transition are allocated in a transparent, proportionate and socially equitable manner.

8. Ensure minimum standards for rolling-out the gas decommissioning

The process of gas network decommissioning is governed by the Gas Directive, with planning logic aligned with the broader climate-neutrality objectives.

The process governed by Article 57 – as analysed under Pillar B.2 – is procedurally robust at the system level, yet it leaves a large margin of discretion to DSOs to develop network decommissioning plans and determine their evolution in time and space. Article 57(1) merely states that DSO shall develop the decommissioning plan "*where a reduction in natural gas demand*" requires "*the decommissioning of natural gas distribution networks or parts of such networks is expected*". There is no objective criterion that would make developing a decommissioning plan mandatory for DSOs, such as a threshold for reducing natural gas demand.

Although national authorities shall assess whether the distribution network decommissioning plans comply with the principles laid down in the paragraphs of Article 57(2), approving, rejecting or requiring amendments, it is arguable whether they would have granted powers to impose on DSOs to issue a decommissioning plan. Since neither France nor Spain has transposed the 2024 Gas Directive, we lack a reference on how Member States would transpose the provisions of Article 57.

This Study recommends that the EU legislator set a minimum, common standard for all Member States to roll out the network decommissioning, for instance, establishing a cost-benefit analysis criterion that would require DSOs to set and initiate a decommissioning plan. This sort of criterion has already been seen in the electricity markets, when the Electricity Directive 2019/944 mandates the rollout of smart meters where the cost-benefit analysis is positive. In the absence of EU common standards, Member States shall transpose a set of standards to be applied at the national level to DSOs.

9. Launch information campaigns to enhance consumer awareness and empowerment, with roadmaps detailing the timeline and milestones of the decommissioning or repurposing process

While the Directive acknowledges the importance of informing consumers about the forthcoming phase-out of natural gas, the availability of economic incentives for switching to alternative energy options and the rights applicable during the transition period, it does not impose specific and enforceable obligations on national authorities to ensure that such information effectively reaches consumers. In particular, there is no explicit obligation to proactively inform consumers about the concrete implications of network decommissioning or repurposing, including its potential impact on network tariffs and gas prices. This regulatory gap creates a risk that consumers remain formally protected, but uninformed in practice. Introducing mandatory, structured information campaigns could significantly mitigate this risk. Enhancing consumer awareness and empowerment during gas phase-out planning is essential for the different Consumer Types assessed in this Study.

First, improving consumers' access to clear, timely and accessible information on gas network decommissioning and repurposing would directly address one of the structural drivers underlying Consumer Types 0 and 1, namely consumer energy illiteracy and the lack of awareness. By enabling consumers to better understand forthcoming changes and available alternatives, information campaigns can support more informed and autonomous decision-making.

Second, this recommendation would also have a positive impact on Consumer Type 2, who remain connected to the gas network and shift to renewable and low-carbon gases, as well as Consumer Type 3, who cease gas consumption voluntarily and fully electrify their energy demand. According to the 2025 Eurobarometer Report on Consumer Behaviour in the Energy Transition, in the case of consumers who have recently switched supplier, energy providers' websites and price comparison websites are each cited as the preferred information sources[89]. Therefore, ensuring that these channels provide reliable, transparent and easily accessible information on decommissioning timelines, switching options and cost implications is essential to avoid information asymmetries or misinformed consumer choices.

Finally, for Consumer Type 4, who are disconnected from the network due to the implementation of plans required under Article 57 of the Gas Directive, information campaigns could be organised and developed at the national, regional and local level to ensure compliance with Article 13(c) of the same Directive, which requires Member States to provide consumers affected by decommissioning plans with information and advice on alternative

[89] European Commission (n 35), p 51. The interviewed consumers were asked to reply to the following questions (multiple answers allowed): "How did you inform yourself when choosing your current energy provider? Houw would you inform yourself if you were choosing an energy provider?". For respondents who switched within the last three years, the most voted options were "directly on the website of energy providers" (34%) and "price comparison websites" (34%). For respondents who did not switch in the last three years, the most voted options were "in-person recommendations from friends, family, or colleagues" (46%) and "price comparison websites" (34%).

heating options, as well as information on financial support, and one-stop shops established pursuant to Articles 21 and 22 of the EED and Article 18 of the EPBD.

Pillar C - Policy and legal recommendations concerning support schemes

10. Facilitate access to available support schemes

Both in France and Spain, two types of support schemes prevail. The first type supports vulnerable consumers in paying their natural gas bills (e.g., thermal bonus), providing support through direct payments or bill discounts and targeting those meeting the conditions of energy poverty. The second type of support scheme addresses the costs of building renovations to increase their energy efficiency. It is designed as a direct payment scheme, where consumers receive partial reimbursement of renovation expenses or receive them as income tax refunds.

This Study focuses its recommendations on the second type of support schemes, given their impact on the phasing-out of natural gas. The support schemes in Spain and France have primarily aimed to improve the energy efficiency of buildings. In other words, their main purpose is to increase the number of buildings with energy-efficiency ratings of A or B. However, the natural gas phase-out is not prioritised, as it is a secondary outcome achieved when the renovation also includes electrifying the heating system and boilers. Moreover, experts responding to the survey also reported an overly burdensome administrative bureaucracy for consumers seeking to access these funds, supporting efforts to improve buildings' energy efficiency.

This Study, therefore, highlights the need for more simplified support schemes, specifically for the electrification of residential buildings rather than overall building energy efficiency. The most recent and prominent example is the support scheme launched by the Portuguese government called *Programa E-Lar*. The *Programa E-Lar* offers financial support (up to €1,683 for vulnerable people, €1,100 for others) to replace gas appliances (cookers, ovens, water heaters) with efficient electric models, through a digital voucher issued by the Environmental Fund, with applications open until June 2026 or until funds are exhausted, with a view to decarbonisation and energy efficiency.

11. Facilitate access to fair loans for the purchase and installation of energy-efficient equipment

In addition to support schemes, which are usually addressed to vulnerable consumers, one effective channel to accelerate this transition for average consumers is to facilitate access to loans at concessionary rates for the purchase and installation of energy-efficient equipment.

The FSR Study on consumer protection in emerging energy-related services[90], commissioned by the European Commission, sheds light on emerging market players offering Energy as a Service (EaaS). EaaS are service contracts that encompass the installation and operation of

[90] De Almeida, Pototschnig, Porcari and Rossetto (2025).

equipment, such as solar panels, boilers, and electrical heating, by utility companies or Energy Service Companies (ESCOs). In this Study, we collected evidence to argue that, unlike large customers, the majority of these market players usually do not offer consumers upfront financing for this equipment (cookers, ovens, or water heaters), and consumers would need to finance them through their own savings or loans. The BEUC Study adds that some of these loans could be in the format of on-bill schemes.[91]

By mapping support schemes in Spain and France in Chapter 3, we notice the absence of programmes that facilitate these loans to consumers, which could be effective, given that EaaS is an emerging service.

This Study recommends that Member States must facilitate average consumers' access to fair loans to finance the purchase and installation of energy-efficient equipment, such as electric boilers and heating systems, thereby scaling EaaS for consumers and accelerating the phasing-out of gas. A credit-worthiness assessment must be mandatory.

12. Address the landlord-tenant dilemma with a transparent cost allocation

The design and allocation of support schemes might exacerbate the long-standing landlord-tenant dilemma, where tenants bear the brunt of energy costs while landlords control investment decisions on energy efficiency improvement measures[92]. Tenants lack the rights or the financial means to make long-term improvements to the property. Conversely, landlords have little motivation to invest in renewable energy or improve the building's energy efficiency, as the tenant typically pays the energy bills and therefore would benefit from the investment. To ensure effective consumer protection, Member States should establish clear rules on cost sharing that create balanced incentives for both landlords and tenants.

Support schemes should enable landlords to recover part of the costs for low-carbon heating systems, provided that energy savings or cost reductions are demonstrably passed on to tenants, that tenants are safeguarded from rent increases that outweigh the benefits of lower energy bills, and that financial support for buildings housing vulnerable consumers is prioritised.

This Study recommends that Member States must ensure that landlords may not oppose tenants' investments in the property with the purpose of reducing or terminating the natural gas consumption without duly justified reasons. It is important to ensure that the landlord and tenants can fairly share the costs for these investments proportional to the benefits in the short and long-term to the property.

This recommendation is primarily relevant for Consumer Type 4, who are required to switch to alternative heating solutions as part of decommissioning plans. Transparent cost-sharing mechanisms would reduce the risk that tenants are unfairly burdened by transition costs and

[91] BEUC, How to make energy markets work for consumers and deliver affordable bills: consumer energy policy into the 2030's (2026).

[92] https://www.beuc.eu/past-projects/clear-x/focus-barriers-split-incentive-between-landlords-and-tenants

would promote social acceptance of gas network decommissioning. In addition, this recommendation could impact Consumer Types 0 and 1, who do not have the financial means to switch to RLCG, fully electrify their energy demand, or connect to a DHC system.

REFERENCES

AFS Energy, 'EU ETS Carbon Allowance Price Forecasts (2025–2030): What European Businesses Must Know for Effective Hedging and Compliance' (2025) <https://www.afsenergy.nl/blog-post/eu-ets-carbon-allowance-price-forecasts-2025-2030-what-european-businesses-must-know-for-effective-hedging-and-compliance>

AMORCE, 'Étude de l'optimisation Du Réseau Public de Distribution de Gaz Dans Un Contexte de Transition Énergétique' (2025) <https://amorce.asso.fr/publications/optimisation-du-reseau-de-distribution-de-gaz-synthese-de-l-etude-naldeo-amorce-enp92>

BEUC, How to make energy markets work for consumers and deliver affordable bills: consumer energy policy into the 2030's (2026)

Blasch J and others, 'Empower the Consumer! Energy-Related Financial Literacy and Its Implications for Economic Decision Making' (2021) 10 Economics of Energy & Environmental Policy <http://www.iaee.org/en/publications/eeeparticle.aspx?id=384>

BloombergNEF, 'Europe's New Emissions Trading System Expected to Have World's Highest Carbon Price in 2030 at €149, BloombergNEF Forecast Reveals' (2025) <https://about.bnef.com/insights/commodities/europes-new-emissions-trading-system-expected-to-have-worlds-highest-carbon-price-in-2030-at-e149-bloombergnef-forecast-reveals/>

Bruegel, 'European Natural Gas Demand Tracker' <https://www.bruegel.org/dataset/european-natural-gas-demand-tracker>

CEER, 'Beyond the Crisis: Consumer Protection and Market Measures for Better Functioning Markets' (2024) <https://www.ceer.eu/wp-content/uploads/2024/09/Beyond-the-Crisis_Consumer-Protection-and-Market-Measures-for-Better-Functioning-Markets-.pdf>

——, 'Regulatory Frameworks for European Energy Networks 2024' (2025) <https://www.ceer.eu/wp-content/uploads/2025/02/GA191_05_2_IRB-Regulatory-Frameworks-Report-2024-Main-report-1-1.pdf>

CNMC, 'Circular 4/2020, de 31 de Marzo, de La Comisión Nacional de Los Mercados y La Competencia, Por La Que Se Establece La Metodología de Retribución de La Distribución de Gas Natural' (2020) <https://www.boe.es/boe/dias/2020/04/03/pdfs/BOE-A-2020-4266.pdf>

——, 'Memoria Justificativa de La Circular 4/2020, de 31 de Marzo, de La Comisión Nacional de Los Mercados y La Competencia, Por La Que Se Establece La Metodología Para Determinar La Retribución de La Distribución de Gas Natural' (2020) <https://www.cnmc.es/sites/default/files/2903966_1.pdf>

——, 'Estadísticas de gas natural' (2025) <https://www.cnmc.es/facil-para-ti/que-hace-la-cnmc-para-consumidores/estadisticas-de-gas-natural>

Commission de Regulation de l'Energie (CRE), 'Avenir Des Infrastructures Gazières Aux Horizons 2030 et 2050, Dans Un Context d'atteinte de La Neutralité Carbone' (2023) <https://www.cre.fr/fileadmin/Documents/Rapports_et_etudes/import/Rapport_avenir_des_infras_gazieres.pdf>

CRE, 'Délibération de La Commission de Régulation de l'énergie Du 10 Mars 2016 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (2016) <https://www.cre.fr/fileadmin/Documents/Deliberations/import/160310ATRD5-GRDF.pdf>

——, 'Délibération de La Commission de Régulation de l'énergie Du 15 Février 2024 Portant Décision Sur Le Tarif Péréqué d'utilisation Des Réseaux Publics de Distribution de Gaz Naturel de GRDF' (2024) <https://www.cre.fr/fileadmin/Documents/Deliberations/import/240215_2024-40_ATRD7_Post_CSE.pdf>

——, 'Tarifs Reseaux Sommaire (Internal Document)' (na)

Cour des comptes, 'Le soutien au développment du biogaz. Rapport public thematique, March 2025, www.ccomptes.fr/sites/default/files/2025-03/20250306-Soutien-au-developpement-du-biogaz.pdf

De Almeida L and others, 'A Study on the Relevance of Consumer Rights and Protections in the Context of Innovative Energy-Related Services' (European Commission (DG ENER) 2025)

DNV, ' Project Olive. Biomethane Price Projection 2030', Report for the European Climate Foundation, 2023.

DNV, 'Energy Transition Outlook Spain 2024' (2024) <https://www.dnv.com/energy-transition-outlook/spain-2024/>

Enagas, 'Annual Report 2024' (2025) <https://www.enagas.es/content/dam/enagas/en/files/enagas-communication-room/publications/informe-anual/Annual-Report-2024-Enagas.pdf>

Enerdata, 'Carbon Price Forecast 2030-2050: Assessing Market Stability & Future Challenges' (2025) <https://www.enerdata.net/publications/executive-briefing/carbon-price-projections-eu-ets.html>

European Biogas Association, 'Biomethane Investment Outlook. Third Edition.' (2025) <https://www.europeanbiogas.eu/wp-content/uploads/2025/10/EBA-Biomethane-Investment-Outlook_2025.pdf>

European Commission, 'Flash Eurobarometer 566. Consumer Behaviour in the Energy Transition' (2025) <https://europa.eu/eurobarometer/surveys/detail/3354>

Farren-Price B and Henderson J, 'Geopolitics of Gas – The Limits of Leverage' [2025] The Oxford Institute for Energy Studies <https://www.oxfordenergy.org/wpcms/wp-content/uploads/2025/11/Insight-173-Geopolitics-of-Gas-The-Limits-of-Leverage.pdf>

'France Government Bonds - Yields Curve' <https://www.worldgovernmentbonds.com/country/france/>

Fundación Naturgy, 'El Sector Español Del Gas En Números. Informe 2024' (2025) <https://www.fundacionnaturgy.org/publicacion/el-sector-espanol-del-gas-en-numeros-informe-2024/>

Government of Spain, 'Spain 2050. Fundamentals and Proposals for a Long-Term National Strategy' (2024) <https://futuros.gob.es/sites/default/files/esp2050/pdf/en/Spain_2050.pdf>

GRDF, GRTgaz and Térega, 'Perspectives Gaz 2024' (2024) <https://www.francegaz.fr/wp-content/uploads/perspectives_gaz_2024_final_web.pdf>

Grote D and others, 'Future Regulatory Decisions on Natural Gas Networks: Repurposing, Decommissioning and Reinvestments' (DNV 2022) <https://www.acer.europa.eu/sites/default/files/documents/Media/News/Documents/Future%20Regulation%20of%20Natural%20Gas%20Networks%20-%20Final%20Report%20DNV.pdf>

IDAE, 'Diagnóstico de La Pobreza Energética En España: Principales Resultados a Partir de Un Panel de Hogares' (2025) <https://www.idae.es/sites/default/files/estudios_informes_y_estadisticas/Monografico_Pobreza-energetica_VRMaqueta_Final_090925.pdf>

IEA, 'France Natural Gas Security Policy' (2022) <https://www.iea.org/articles/france-natural-gas-security-policy>

——, 'Global Hydrogen Review 2025' (2025) <https://www.iea.org/reports/global-hydrogen-review-2025>

——, 'Outlook for Biogas and Biomethane. A Global Geospatial Assessment' (2025) <https://iea.blob.core.windows.net/assets/5b757571-c8d0-464f-baad-bc30ec5ff46e/OutlookforBiogasandBiomethane.pdf>

Joskow PL, 'Regulation of Natural Monopoly' *Handbook of Law and Economics*, vol 2 (2007) <https://linkinghub.elsevier.com/retrieve/pii/S1574073007020166>

Kneebone J, 'The EU Hydrogen and Decarbonised Gas Market Package' (*Florence School of Regulation*, 27 May 2024) <https://fsr.eui.eu/the-eu-hydrogen-and-decarbonised-gas-market-package/>

Loar Halleröd, 'Changing Regulatory Frameworks and Conditions for a Rapid and Just Phase out of Natural Gas. Which Issues and Solutions for Local Authorities?' (Energy Cities 2023) <https://energy-cities.eu/wp-content/uploads/2024/04/VF_EnergyCities_2024_PolicyPaper_Phase-out-of-natural-gas_A4_EN_Web.pdf>

Meilleurtaux Energie, 'Consommation Moyenne de Gaz Naturel En France - Comment La Calculer?' (2025) <https://energie.meilleurtaux.com/gaz/simulateur-gaz/consommation-moyenne-gaz.html>

Melakh Y, 'The State of the EU ETS 2: Europe's New Carbon Market' (*Clear Blue Markets*, 2025) <https://www.clearbluemarkets.com/knowledge-base/the-state-of-the-eu-ets-2-europes-new-carbon-market>

Nedgia Grupo Naturgy, 'Memoria de Sostenibilidad 2024' (2024) <https://www.nedgia.es/wp-content/uploads/2025/12/Nedgia-memoria-sostenibilidad.pdf>

Ramsey FP, 'A Contribution to the Theory of Taxation' (1927) 37 The Economic Journal 47

RTE, 'Energy Pathways to 2050' (2021) <https://assets.rte-france.com/prod/public/2022-01/Energy%20pathways%202050_Key%20results.pdf>

Sedigas, 'A Study of the Capacity for Biomethane Production in Spain, 2023' (2023) <https://biometano.sedigas.es/wp-content/uploads/2023/03/sedigas-report-potential-biomethane-2023.pdf>

Selectra, 'Gas Price in France: How Much Does Gas Cost in 2021?' (2024) <https://en.selectra.info/energy-france/guides/gas/cost>

Stobbe M and others, 'Planning and Regulating Europe's Gas Networks: Breaking up with Fossil Gas. Regulatory Assistance Project' (Oeko-Institut 2024) <https://www.raponline.org/wp-content/uploads/2024/10/RAP-Oeko-Gas-planning-2024-Oct-30-FINAL.pdf>

UFC-Que Choisir, 'Aides à La Rénovation Énergétique Des Dispositifs Encore Trop Complexes et Peu Efficaces ("Aids for Energy-Efficient Renovation Schemes Still Too Complex and Ineffective")' (2025) <https://www.quechoisir.org/action-ufc-que-choisir-renovation-energetique-des-aides-toujours-inefficaces-face-a-l-urgence-sociale-et-climatique-n166344/?dl=147064>

Van Den Broek KL, 'Household Energy Literacy: A Critical Review and a Conceptual Typology' (2019) 57 Energy Research & Social Science 101256

Vattenfall, 'Maison: consommation moyenne de gaz selon sa surface' (na) <https://www.vattenfall.fr/electricite-et-gaz/consommation-maison-gaz>

Verbraucherzentrale NRW, 'Was Kostet Die Stilllegung Oder Der Rückbau Des Gasanschlusses? ("How Much Does It Cost to Decommission or Dismantle the Gas Connection?")' (2025) <https://www.verbraucherzentrale.nrw/sites/default/files/2025-03/20250319_umfrage_gasanschluss_stilllegen_vznrw.pdf>