



ARTICLE

Small-scale natural gas in France

Analysis of a growing market – 2019 review

In 2019, the small-scale gas market in France, combining all natural gas consumed remotely from the network, totalled approximately 3.3 TWh. The market has evolved considerably over the past decade with new demand segments and supply infrastructure. This paper provides an analysis of the segmentation, volumes, prices and competitive landscape in France from 2019 and looks at the potential for future development.

Key findings of the study

Demand & Segmentation

The small-scale gas market in France captures all the uses of natural gas outside the interconnected national gas network. It relies on **two products** (Liquefied Natural Gas [LNG] and Compressed Natural Gas [CNG]) and **two distribution chains** (LNG trucks or pipeline and then trucks) to supply **three main energy end-uses**: (1) road fuel for light-duty vehicles, buses and small trucks, (2) road fuel for heavy-duty trucks (road tractors), and (3) fuel in industrial processes for sites where connection to the gas grid is not possible. We estimate that the small-scale gas market size was around 3.3 TWh in 2019 (+18% vs. 2018; 2.8 TWh), which represents around 0.7% of the total natural gas consumption in France.

Supply & Infrastructure

The development of the small-scale natural gas market is supported by new supply infrastructure, notably LNG

terminals equipped with truck loading bays and the development of LNG & CNG fuelling stations.

Prices & Competitiveness

In 2019, small-scale natural gas was mostly priced in reference to the substitute oil products. Indications from competitive tenders point to a weighted average end price of small-scale gas of 42.39 EUR/MWhGCV in 2019, at a discount compared to 89.31 EUR/MWhGCV for oil products, (weighted average of diesel and gasoil).

Competitive landscape

Natural Gas for Vehicles (CNG for light-duty vehicles and LNG for trucks) and LNG retail to industry are two separate markets, with different competitive environments. Former French gas monopoly marketer ENGIE dominates the retail market for road fuel while competition on the industrial segment appears to be more fragmented.

Small-scale is defined by its specific logistics chain

The small-scale gas market can be defined as the end-uses of natural gas (methane) for which the burner tip is not directly connected to the natural gas network. It thus involves a specific, small-scale, logistics chain to bring natural gas to the point of combustion, contrasting with the dominant large-scale network-based delivery of natural gas.

This specific logistics chain, in France, relies on two different distribution chains and two different end-products, serving three main end-uses.

Two distribution chains, to bring gas from import facility to end-user through:

- LNG trucks
- Pipeline networks, and then trucks

Two end-products, which are consumed by end-users:

- Liquefied Natural Gas (LNG)
- Compressed Natural Gas (CNG)

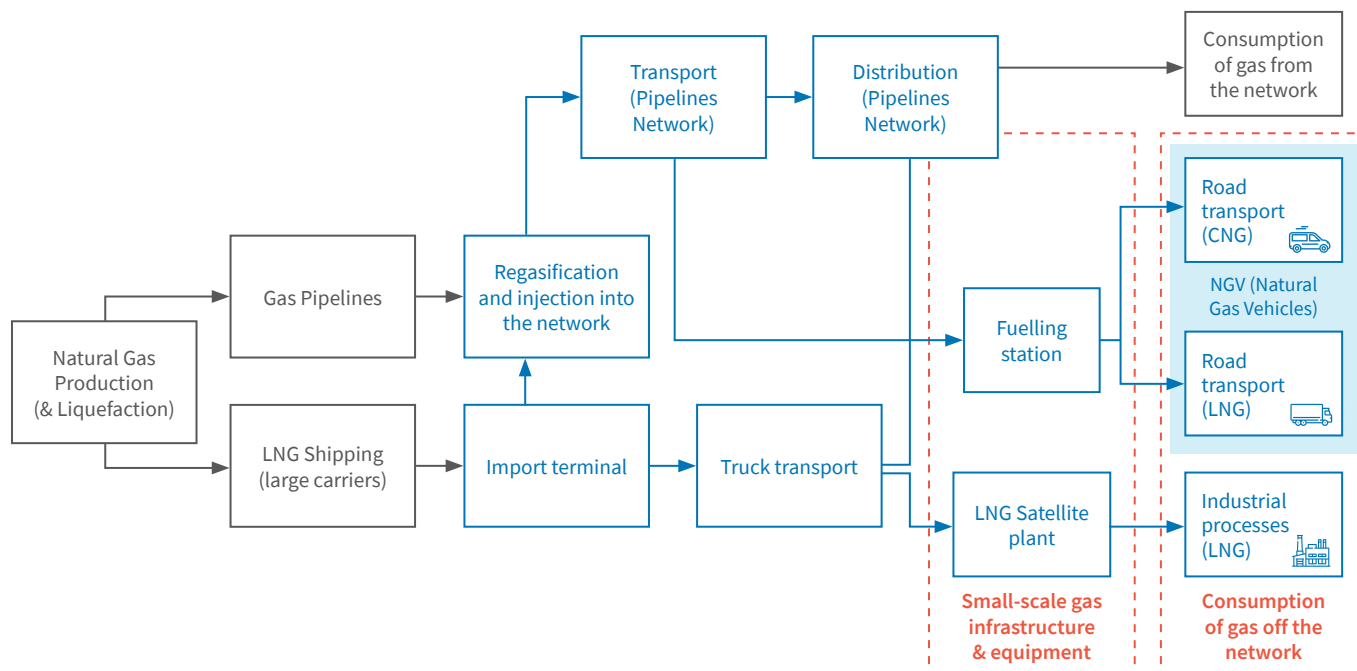
Three main end-uses¹:

1. **Road fuel for light-duty vehicles, buses and trucks (CNG)**, distributed in CNG fuelling stations and transported either through the network of pipelines (Networked CNG) or supplied to the station by trucks as LNG and then converted into CNG at the station (L-CNG).
2. **Road fuel for heavy-duty trucks (LNG)**, mainly road tractors > 40 Tons, distributed at LNG fuelling stations.
3. **Fuel for industrial processes (LNG)** for industrial consumers not connected to the natural gas network (off-grid). Usually, LNG is used as a substitute to oil products (gasoil, liquified petroleum gas, heavy fuel oil) in industrial processes. It is supplied directly by trucks from LNG terminals equipped with truck loading bays and stored on site and re-gasified by a LNG satellite plant.

The first two segments are usually referred to as Natural Gas Vehicles (NGV).

¹ In Europe, other end-uses are already developed, namely LNG for power generation, LNG for isolated gas networks and LNG for ships (marine fuel)

FIGURE 1 – NATURAL GAS LOGISTICS CHAIN AND MAIN USES



Small-scale gas is a collection of niche markets

Small-scale gas is a relatively new form of energy consumption which started taking off in the past decade. We estimate that the total demand for small-scale gas in France in 2019 amounted to 3.3 TWh, representing only about 0.7% of the total natural gas consumption in the country.

The development of the small-scale gas market started in the off-grid industry segment, with imports from Spain, Belgium and the Netherlands, and then a local supply with the opening of truck loading bays at Montoir LNG terminal in 2013 and Fos in 2014.

Since 2014, the NGV segments (CNG for light duty vehicles and buses and LNG for heavy-duty trucks) have significantly developed, supported by investments in refuelling infrastructure (notably LNG stations).

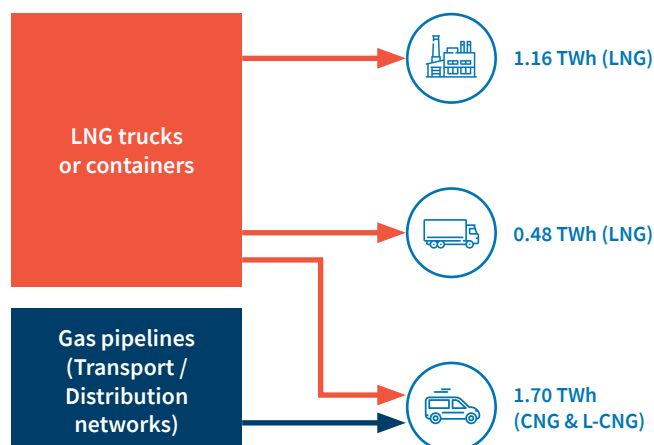
A. Demand

In 2019, we estimate that the NGV (Natural Gas for Vehicles) market size was 2.3 TWh, with 1.5 TWh of CNG from the gas grid, and 0.7 TWh of LNG transported from terminals to the fuelling stations by trucks. Based on interviews with market players, we can assume that 30% of LNG supplied to refuelling stations is transformed and ultimately used as CNG (L-CNG), breaking down the 0.7 TWh of LNG supplied into 0.5 TWh of LNG for heavy-duty trucks and 0.2 TWh for L-CNG. The total NGV consumption grew by 21% compared to 2018 figures (1.9 TWh).

The off-grid industry LNG consumption accounted for 36% of small-scale LNG supply to France and amounted to 1.2 TWh in 2019, compared to 0.9 TWh in 2018, an increase of 33%.

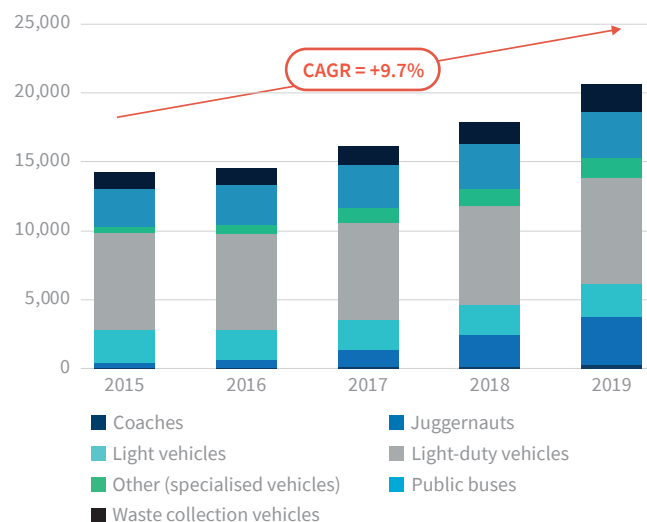
When compared to the total natural gas market size in France, we estimate that the small-scale segments only accounted for 0.7% of the 500 TWh total French natural gas consumption in 2019²³.

FIGURE 2 – BREAKDOWN OF VOLUMES IN 2019



Sources: FTI analysis based on Open Data Réseaux Energies and interviews

FIGURE 3 – EVOLUTION OF THE NATURAL GAS VEHICLE FLEET



Sources: AFGNV, FTI analysis

B. Primary Supply

Unlike CNG supplied through the gas network, the development of new infrastructure is particularly critical for segments relying on Liquefied Natural Gas. These segments represented 51% of the total small-scale natural gas consumption in 2019.

In 2019, 3 out of the 4 French LNG terminals offered truck loading services (Montoir-de-Bretagne, Fos Tonkin, Fos Cavaou).⁴

On top of that, French demand is also supplied with imports from Zeebrugge (Belgium), Barcelona (Spain) and Gate (Netherlands). In 2019, we estimated that imports accounted for 34% of the total supply of LNG trucks to France⁵.

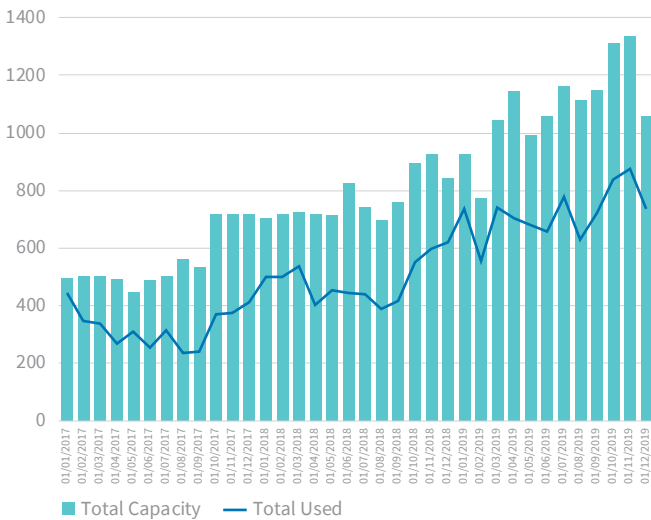
2 For our calculations, we have made the following assumptions: 1 LNG truck = 40 m³; LNG density = 450 kg/m³; GCV factor = 15.18 MWh/t

3 Based on an estimated consumption of 500 TWh (Bilan énergétique de la France en 2019 - Données provisoires – SDES)

4 The fourth one, Dunkerque LNG, opened its truck loading in June 2020

5 Estimate made based on interviews with terminal operators (Barcelona = 15% of total supply to France; Zeebrugge = 12%; Gate = 8%)

FIGURE 4 – EVOLUTION OF TRUCK LOADING CAPACITY AND VOLUMES IN FRANCE – NUMBER OF TRUCKS / SLOTS



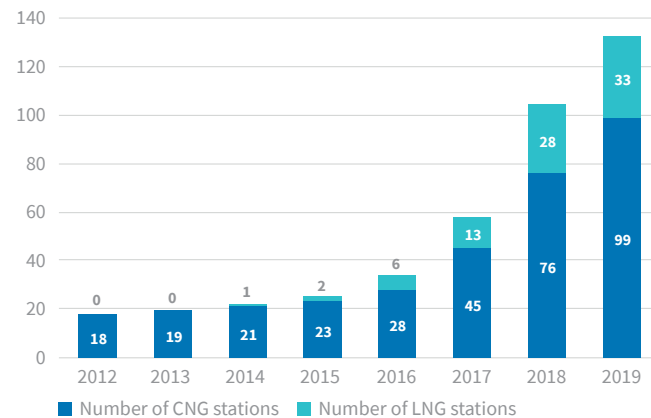
Sources: Elengy, FTI analysis

C. Secondary Supply

Access to refuelling infrastructure is a major factor for the development of Natural Gas for Vehicles (NGV). Similar to what can be observed in the electric vehicle market, consumers (either individual or fleet operators) must be reassured that the infrastructure will be sufficient to match their needs across their destination areas.

The number of public stations has increased significantly in the last 5 years reaching a total of 132 stations at the end of 2019 (99 CNG stations and 33 LNG stations)⁶, covering major routes. In addition to public stations, fleet operators (municipalities, road transport companies, etc.) can install private stations to refuel their own vehicles where infrastructure is lacking and if the size of the fleet makes it economically viable.

FIGURE 5 – EVOLUTION OF NUMBER OF PUBLIC CNG AND LNG STATIONS



Sources: AFGNV, FTI analysis

Gas is competitive against oil products, which could boost the development of small-scale gas end-uses

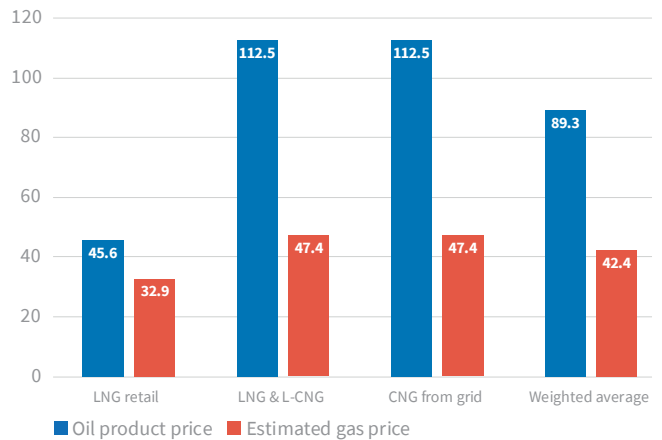
According to our interviews with market players, the value of gas in the small scale segment is determined by the closest substitute oil product. Such oil price references remain the basis for a large share of the small-scale gas market pricing. For LNG in the off-grid industry segment, Gasoil was the most relevant substitute while LNG and CNG for vehicles prices were compared to Diesel.

Attempting to go further than these general price references to oil-products, we conducted a review of pricing for small-scale gas in 2019 based on confidential brokers' information, and one refuelling station operator (V-Gas) price list. By relying on data from selected brokers (who generally optimize fuel costs for their clients) in our analysis, we acknowledge that price information may only be representative of the part of the market that is competitively sourced.

On this basis, we can observe significant price advantages for competitively sourced small-scale gas:

- In the off-grid industry segment, we observed a discount for the gas price vs. gasoil of 25% (in EUR/MWhNCV).
- In the NGV segments (LNG, L-CNG and CNG from grid), we observed a discount for the gas price in EUR/kg vs. diesel in EUR/l of 40%⁷.

FIGURE 6 – 2019 END-USER PRICES – CNG / LNG VS. EQUIVALENT OIL PRODUCT (DIESEL OR GASOIL) – EUR/MWH GCV (EXCL. VAT)



Sources: FTI analysis; based on V-Gas public price for natural gas and brokers' information

⁶ Source: AFGNV

⁷ Estimate made based on interviews with terminal operators (Barcelona = 15% of total supply to France; Zeebrugge = 12%; Gate = 8%)

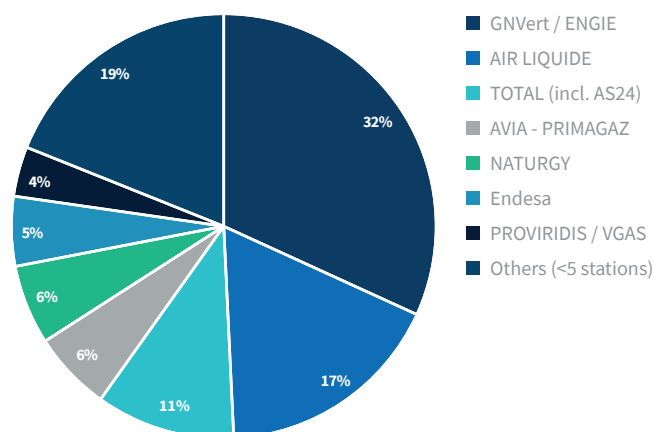
Competition could be another driver for growth, driving end-user prices down

The strong growth history and prospects of the small-scale gas market have attracted many players from adjacent sectors as well as standalone pure players. The diversity of players has helped market small-scale gas as a substitute fuel, and could drive prices down in the future, further supporting growth.

A. Competition on the NGV segment

At the end of 2019, more than 20 players were active in the natural gas for vehicles segments (fuelling stations operators). Only 7 operated more than 5 stations with GNVert (ENGIE) being the market leader, operating more than 1/3 of the opened public stations.

FIGURE 8 – ESTIMATED MARKET SHARES IN THE NGV FUELLING STATIONS SEGMENT (BASED ON A NUMBER OF PUBLIC STATIONS) – 2019



Sources: AFGNV, FTI analysis – 115 public stations identified
 Note: GNVert is the NGV retail brand of ENGIE

Market players can be divided into 4 main profiles:

- Integrated gas players, already involved in the retail of natural gas through networks (ENGIE – GNVert, Naturgy, Endesa)
- Pure players of the small-scale gas sector (Proviridis, Gazup, Molgas, etc.)
- LPG specialists that have diversified (Primagaz)
- Petroleum fuels retailers that have diversified (Total, Avia)

In addition to public stations, some of these companies operate private NGV stations for large consumers (municipalities, public entities, trucks fleets operators). GNVert reports operating more than 50 private NGV stations.

B. Competition on the off-grid industry segment

The off-grid market being more mature, competition there is more intense than in the NGV segment, with several major players active.

Market players can be divided into 3 main profiles:

- Integrated gas players, already involved in the retail of natural gas through networks (ENGIE - LNGeneration, Naturgy, Endesa): they benefit from their integration and clients portfolios in the natural gas retail segment
- New pure players for which small-scale natural gas is core business (Molgas, HAM): they tend to be more price aggressive and benefit from their expertise in LNG logistics
- LPG specialists that have diversified (Primagaz, Butagaz): they build on their current LPG clients portfolio and expertise in gas retail and logistics

Conclusion

While expected to remain limited compared to the total natural gas consumption in France, the small-scale natural gas market is forecasted to grow strongly in the upcoming decades.

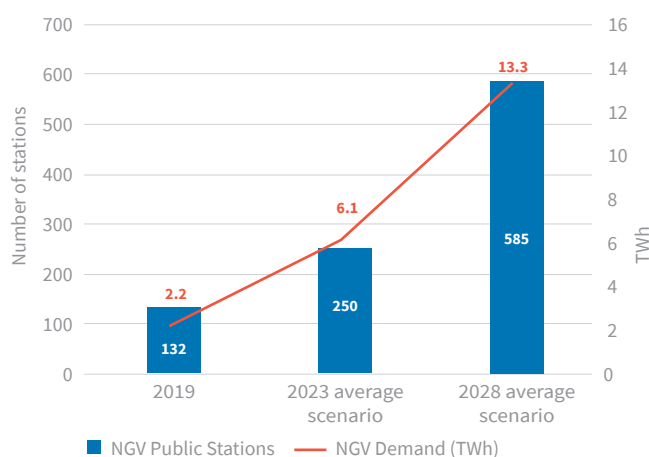
Our analysis suggested that in 2019 CNG and LNG were less expensive than oil alternatives, based on competitive sourcing. Small-scale gas competitiveness is largely dependent on commodity prices spread (Brent vs. TTF), and can be expected to be sustained in the near future. Besides, the regulatory context is favourable to the development of small-scale uses, as natural gas is considered a cleaner alternative to oil products, resulting in lower taxes and incentives.

In addition to NGV and off-grid segments, a new segment related to supply of LNG for ships (bunkering) is expected to take off in France with new ferries and large ships ordered and expected to be delivered over the next few years.

However, to attain the ambitious targets set in the French Government’s Scenario (PPE 2019-2028⁸), the main challenge will be overcoming the resistance to change (or stickiness) of most consumers not yet willing to switch, despite a potential price discount to oil and relatively low switching CAPEX. Significant marketing efforts will continue to be required to promote and reassure consumers, while maintaining the fast pace of infrastructure development (both truck loading for LNG and fuelling stations).

Furthermore, competition with other cleaner fuels is likely to intensify in the next decade, with the development of other alternatives to oil products in small-scale gas target markets, such as electricity (for vehicles) or liquified biomethane (direct substitute to natural gas).

FIGURE 9 – FRENCH GOVERNMENT’S SCENARIO (PPE)



Sources: Programmation Pluriannuelle de l’Energie 2019-2028, FTI analysis

The views expressed in this article are those of the author(s) and not necessarily the views of FTI Consulting, its management, its subsidiaries, its affiliates, or its other professionals.

8 PPE : Programmation Pluriannuelle de l’Energie 2019-2028 (Final version published in January 2020; p.232 & p.373

EMMANUEL GRAND

Managing Director
 +33 1 40 08 12 43
 emmanuel.grand@fticonsulting.com