

Les

Rendez-vous Clients

GRTgaz

VERS UN AVENIR
ÉNERGÉTIQUE DÉCARBONÉ



**Jeudi
4
avril**

9h00 - 17h00

Yacht de Paris
Salon Nework

Les

Rendez-vous Clients

GRTgaz

Introduction

Pierre Cotin

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Rendez-vous Clients

GRTgaz

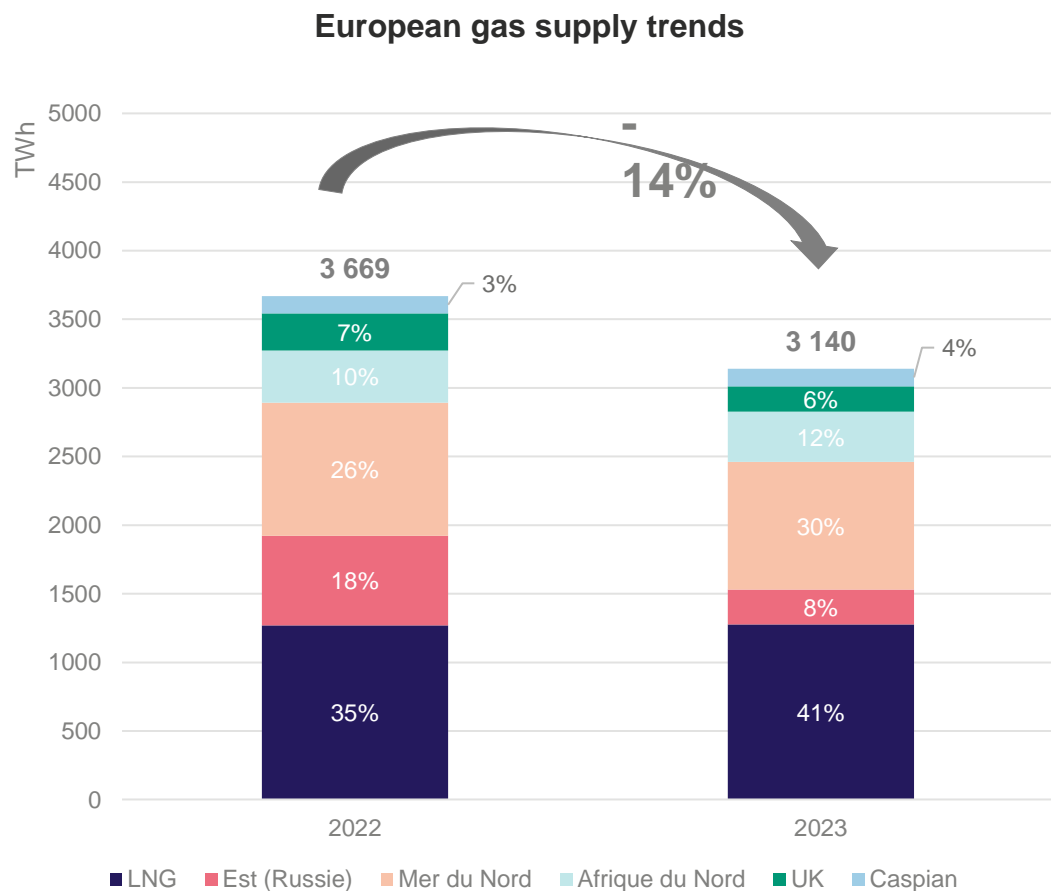
Gas overview 2023

Matthieu Morin

European context 2023



European gas system consolidates and adapts to declining flows from Russia

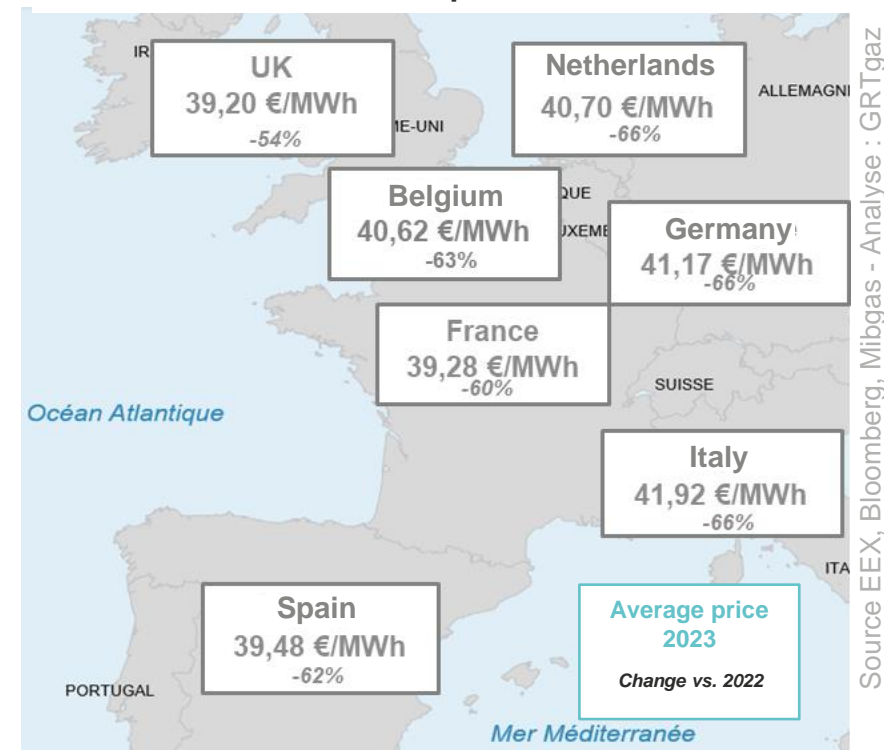
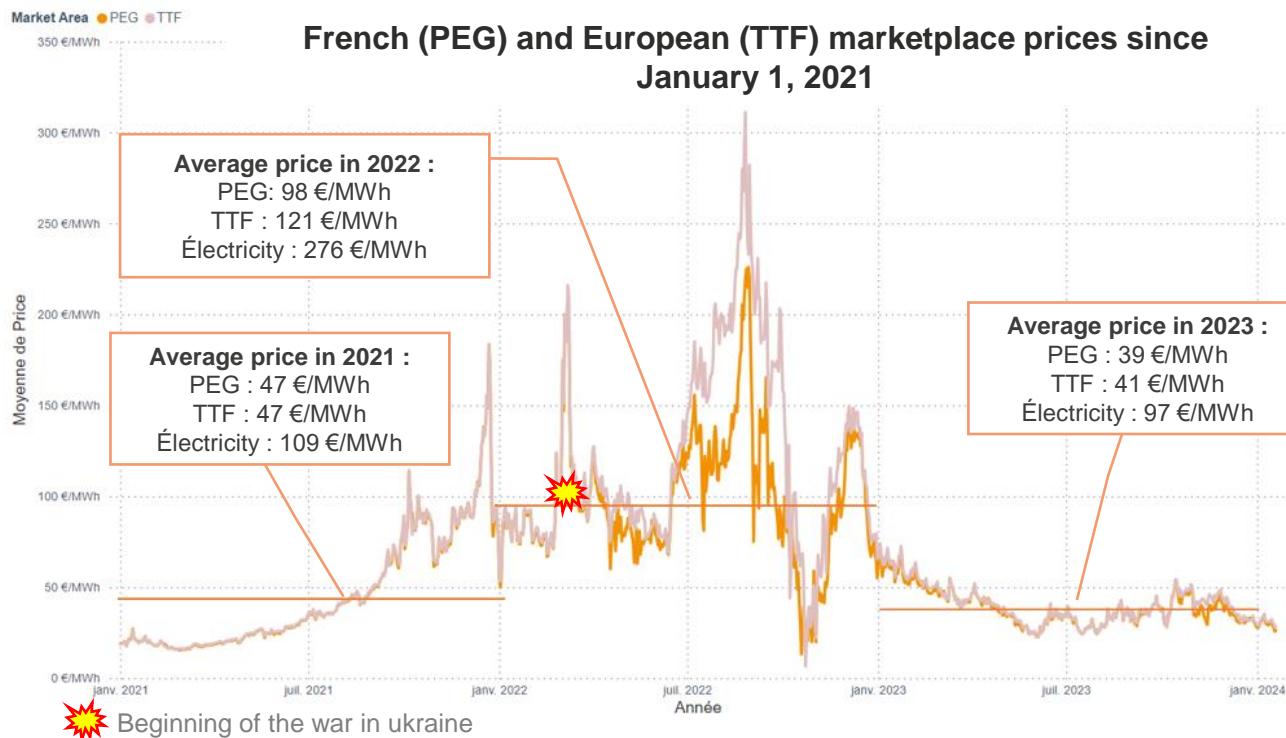


Sources : ENTSOG, Eurostat, GIE ALSI, S&P Global – Analyse : GRTgaz

- **European gas supplies down 14%**, reflecting :
 - the downward trend in **European demand** (-7.2% according to Eurostat)
 - **High storage injection requirements in 2022 and low in 2023**
- **LNG's** share of European gas supplies will rise from 35% in 2022 to **41% in 2023**, while **Russian gas supplies** via pipelines will fall from 18% to **8%**.
- **LNG is delivered to Western Europe**, notably France (22%), Spain (19%), the Netherlands (16%) and Italy (12%), with some **transiting to the East**.

Stabilization of European gas prices and return to competitive pre-war levels

Average spot prices for 2023 on the main European marketplaces



- **Falling prices** on all European marketplaces, returning to pre-war levels
- **Price volatility considerably reduced** but still higher than in early 2021 due to current events (balticconnector rupture, war in Israel, etc.).
- **France is Europe's cheapest marketplace** (on a par with the UK), thanks to a sound supply structure and appropriate infrastructure.
- Market prices expected to fall in the medium term to around **€27/MWh by 2027**



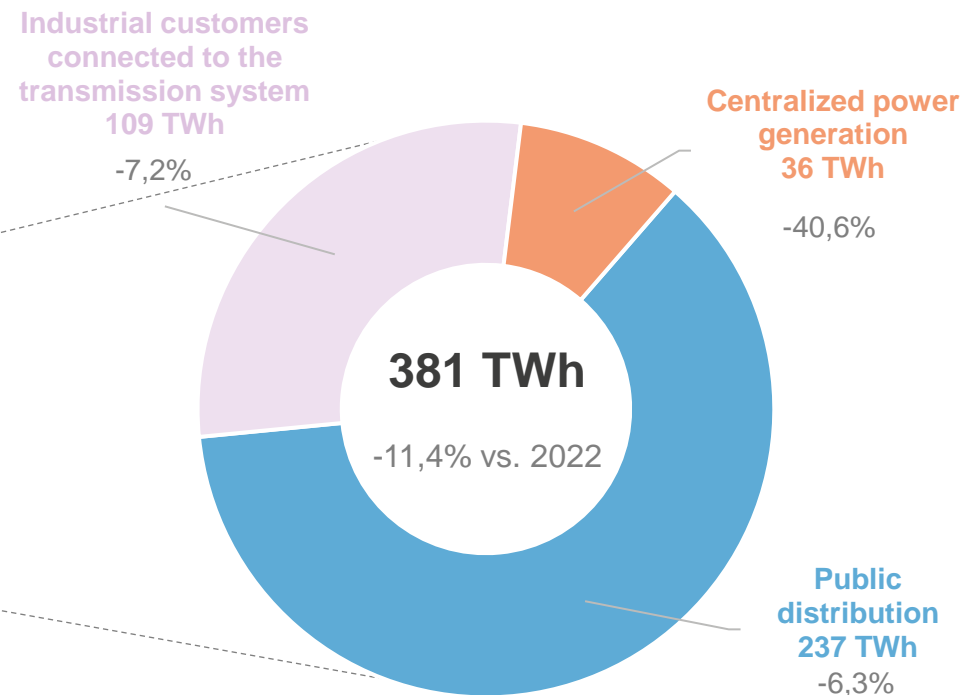
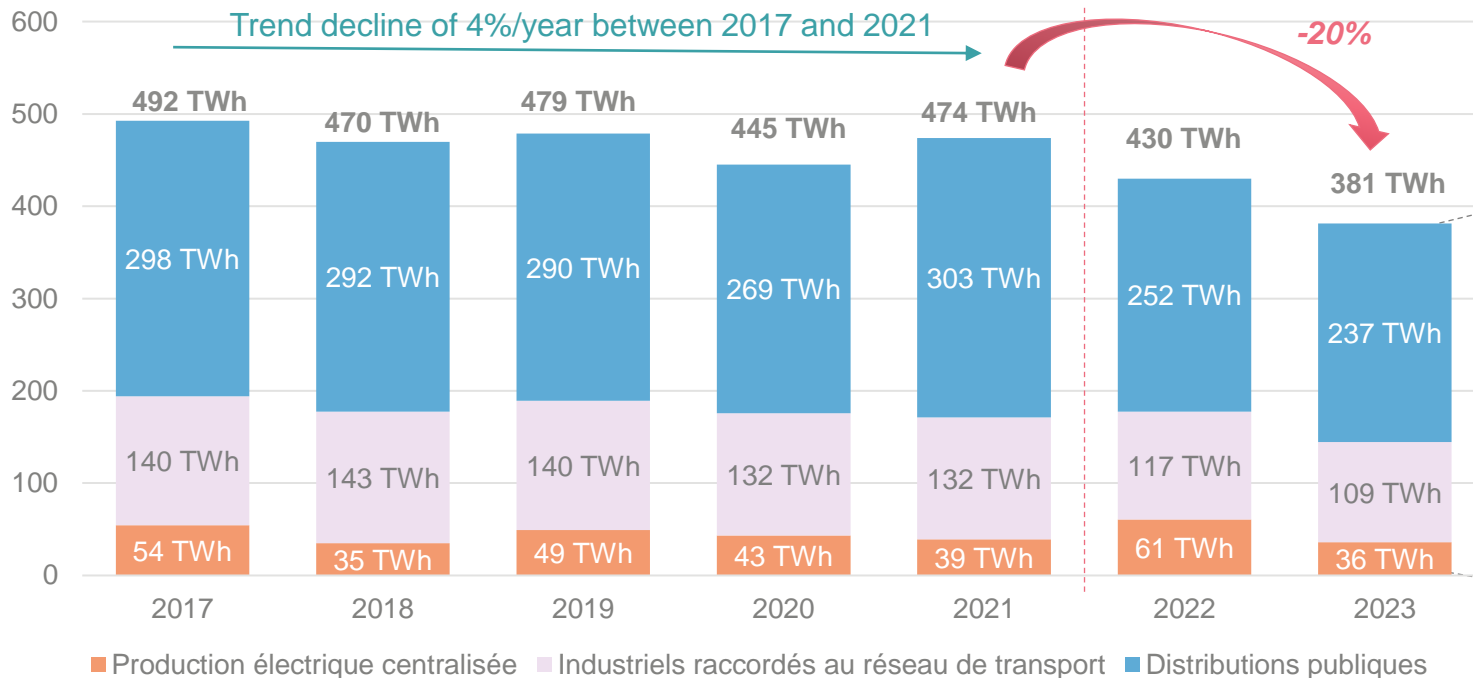
Gas overview 2023

flows and gas consumption



Gas consumption in France down by 11.4% compared to 2022

Gross gas consumption in France since 2017



Sources : GRTgaz, Teréga, GRDF, ELD - Analyse : GRTgaz

- **Break in consumption trend** from 2021, reflecting a change in consumer behavior and mild weather (2023 second warmest year after 2022 since 1900)
- **Decrease in final gas consumption** (-6.7%) of which public distribution (-6.3%) and industrial (-7.2%) vs. 2022
- **Lower demand for centralized gas-fired power generation** (-40%) after an exceptional year in 2022,

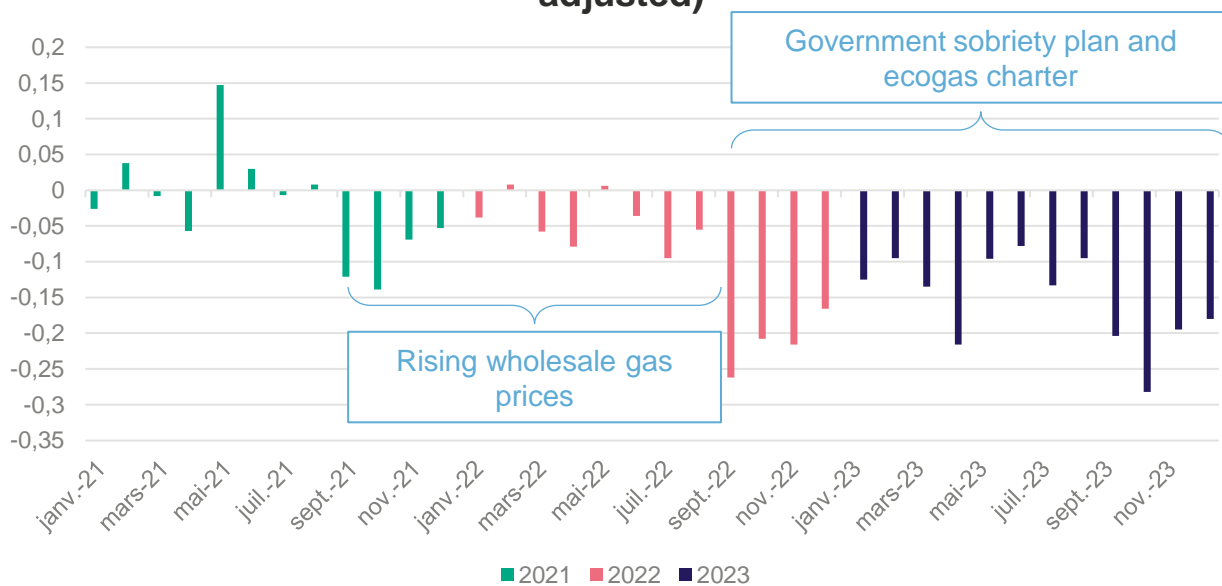
In 2023, gas consumption by power plants returns to 2021 levels

- An exceptional 2022 due to major outages at nuclear power plants and low hydroelectric output
- In 2023, gas-fired power plant consumption (excluding cogeneration) reaches 36 TWh in a **slack electricity context**
 - partial recovery in nuclear availability
 - record electricity production from renewable sources
 - falling electricity demand (sobriety, reaction to inflation)
- The **gas system plays its role in ensuring the** balance of the power system through the flexibility it offers.
- Gas accounts for around 6% of the electricity mix in 2023 (10% in 2022)

	2020	2021	2022	2023
Consumption by gas-fired power plants (excluding cogeneration) in TWh PCS	44	40 ↓	61 ↑	36 ↓
Nuclear production in TWh PCI	335	361 ↑	279 ↓	320 ↑

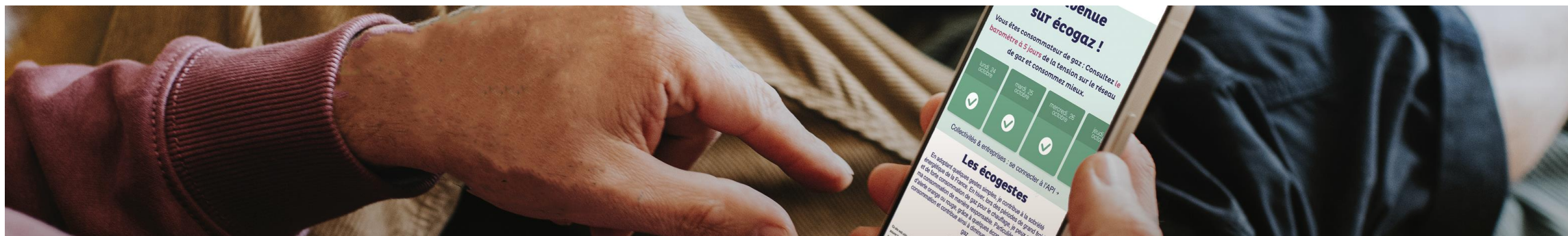
Climate-adjusted consumption by public utilities down 6.5 %

Difference between monthly consumption in 2021, 2022 and 2023 and monthly consumption in 2019 (climate-adjusted)



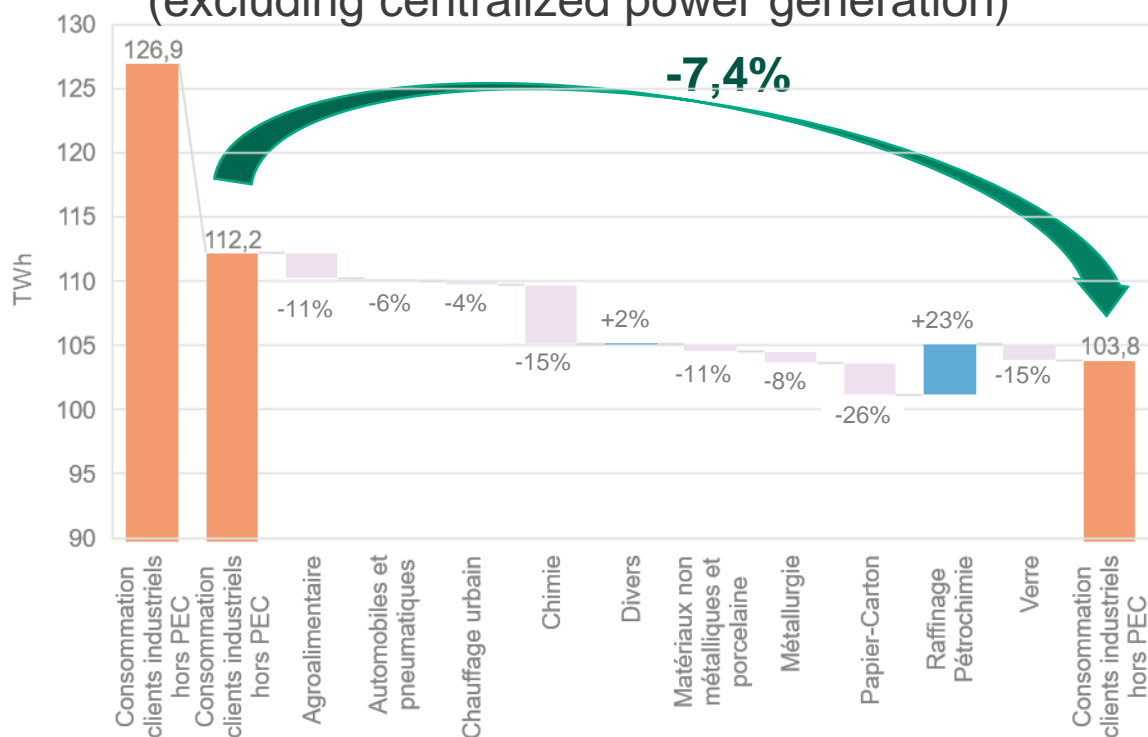
- No effect of climate on consumption **between 2022 and 2023**, these two years being respectively the 1st and 2nd hottest since 1900.
- Climate-adjusted consumption by public utilities down **6.5%** on 2022 to 253 TWh (-13.2% vs. 2021)
- **Sobriety efforts and responses to inflation** initiated in the 4th quarter of 2022, with the **sobriety plan** and the **ecogas charter**, and maintained throughout 2023.

Sources : GRTgaz, Teréga, GRDF - Analyse GRTgaz



Consumption by industrial customers connected to GRTgaz's system down 7.4%

Change in gross consumption by industrial customers connected to the GRTgaz network, broken down by sector (excluding centralized power generation)

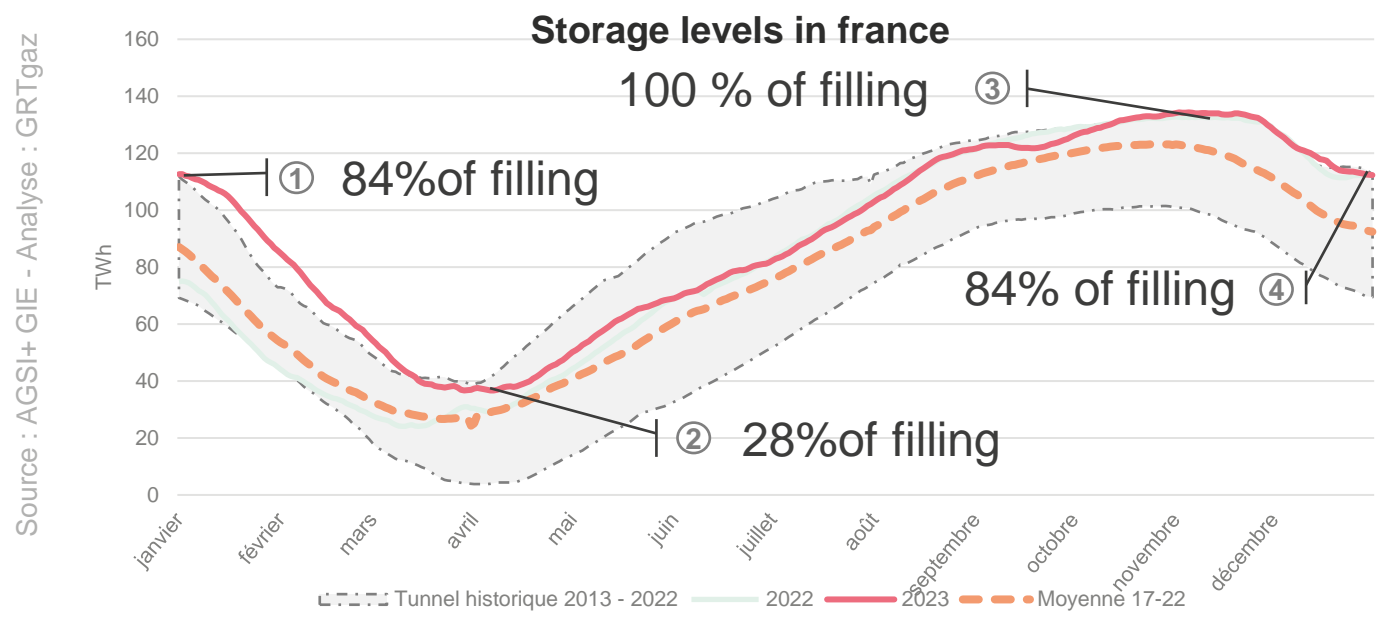


Source : GRTgaz - Analyse GRTgaz

- Reduction in gas consumption in most industrial sectors (-7.4% vs. 2022, and -18.2% vs. 2021)
- A differentiated reduction by sector
- In each sector, changes in industrial consumption are the result of **3 main effects**: changes in industrial activity, energy efficiency efforts and energy substitution.



ities that balance ndrawal and injection



- A very high level of storage at the beginning of 2023 ①
- Higher withdrawal in 2023 than in 2022 due to storage cycling requirements ②
- 100% filling on November 1, 2023 ③
- Zero net withdrawal in 2023, with 138 TWh withdrawn and 137 TWh injected ④



Biomethane: sustained momentum in 2023 despite a difficult context

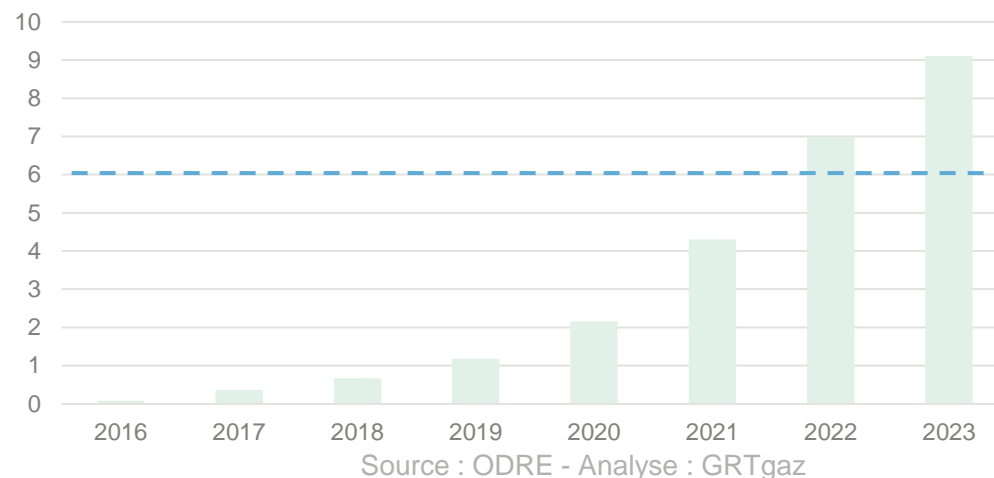
- **652 methanization sites** will be injecting into gas networks by the end of **2023 (+138)**, including **80** into the GRTgaz network (+17), representing almost 20% of national capacity.

- These include **560 agricultural methanization sites**, providing farmers with a stable source of additional income, mainly from farm waste, **as part of a circular economy**.

- **Annual production capacity of 11.8 TWh/year** (equivalent to 2 nuclear reactors or 7 offshore wind farms), **+2.8 TWh/year** vs. 2022. Connected sites produced over **9 TWh** of renewable gas in France, 50% more than the EPP objectives (target 6 TWh in 2023).

- **14.8 TWh** of anaerobic digestion projects currently under development, with new projects picking up momentum after 3 difficult years.

Biomethane production, TWh PCS at 0°C



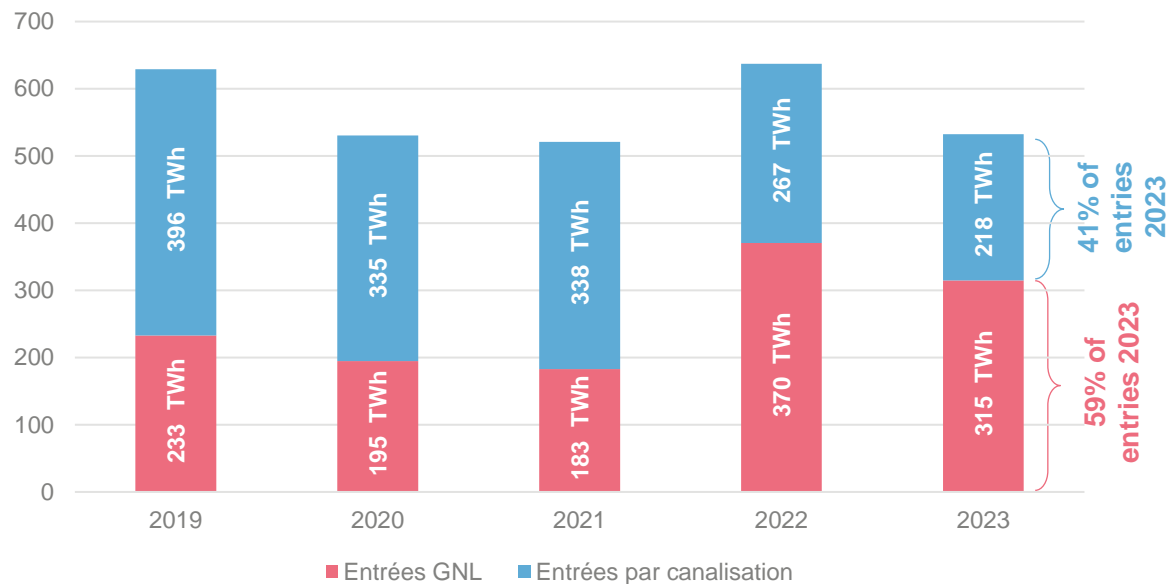
6 TWh: 2023 target (set in PPE 2020), already exceeded in 2022

20 reverse flow in operation at GRTgaz, 16 under construction and 7 under study

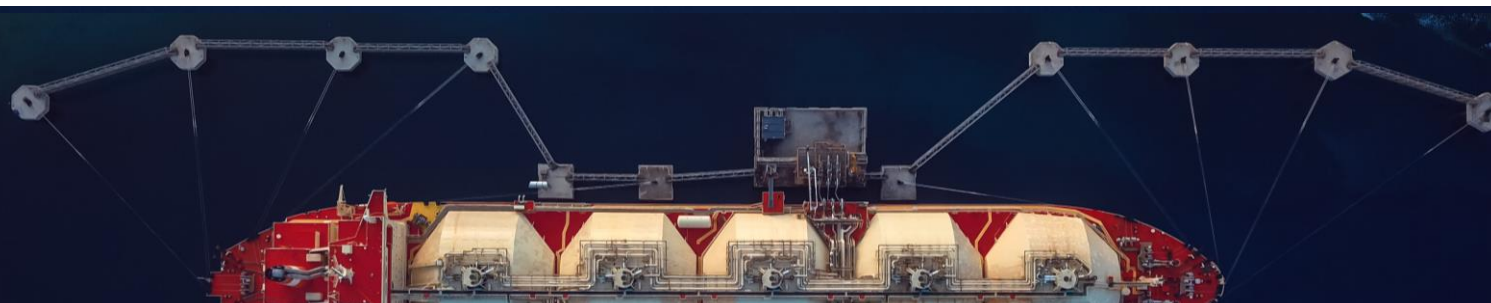


LNG accounts for the majority of French natural gas supplies

Trends in gas receipts from pipelines and LNG terminals in France

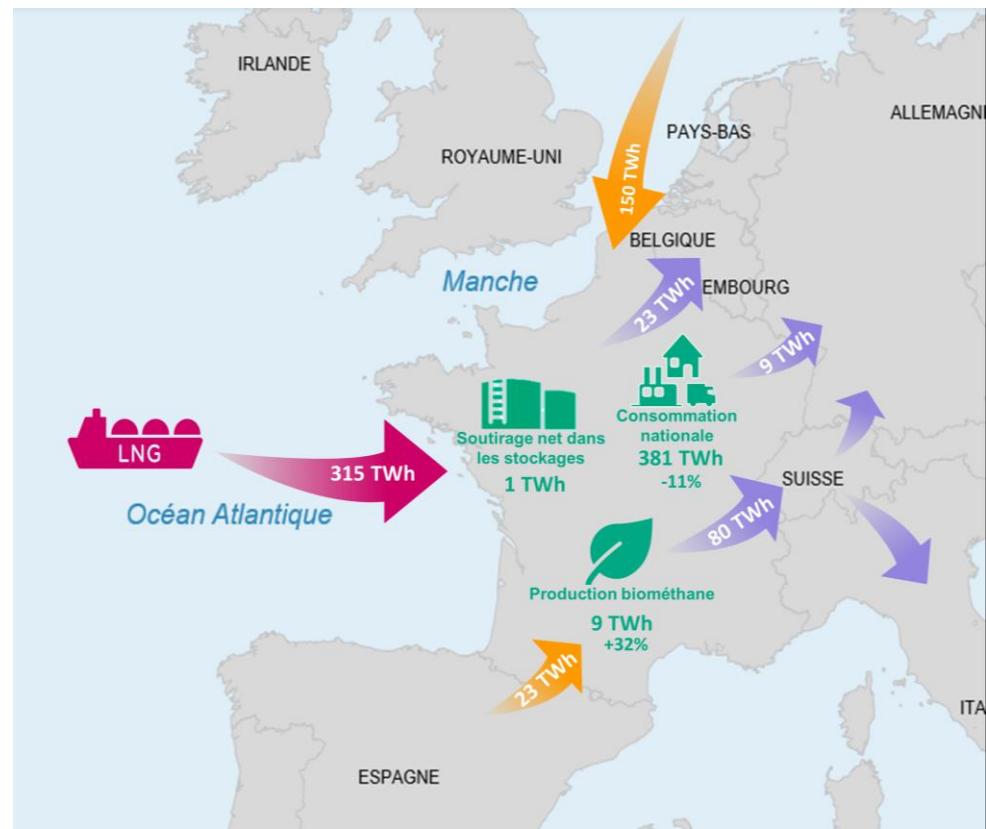


- Consolidated import pattern, with **59% LNG** (vs. 35% in 2021) and **41% by pipeline**
- **Lower LNG inflows (-15.1%)** compared with 2022, reflecting lower consumption, lower demand at borders and a reduced need to fill storage facilities.
- **Lower pipeline imports (-18.4% vs. 2022)** for the same reasons, combined with the end of supplies from Eastern Europe.
- **The floating terminal (FSRU)**, a project commissioned in almost a year and a half, offers power equivalent to 3 EPRs and has emitted almost 5 TWh in 3 months of service over 2023.

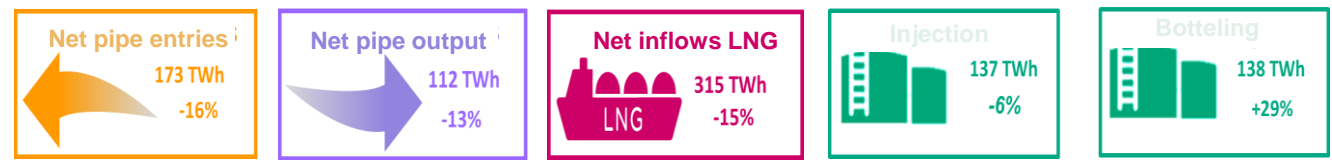


Gas transmission in France: 10% reduction compared with 2022

Source : GRTgaz, GIE, Teréga, ODRE - Analyse : GRTgaz



- In 2023, some **680 TWh** of gas were transported, all network operators combined, down nearly 10% on 2022.
- France confirms its position as a **major LNG entry point** in Europe. France's 5 terminals account for **22%** of European LNG imports.
- France maintains a high level of transit, with **112 TWh** of gas transported to neighboring countries, mainly Italy, Belgium and Germany.
- **Bi-directionality** maintained at certain interconnection points, notably with Belgium (37 TWh in and 60 TWh out) and Spain (30 TWh in and 7 TWh out)
- **Resilience and reliability** of our infrastructures despite a reversal in flow patterns





Thank you

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Rendez-vous Clients

GRTgaz

TRF : a robust,
optimized system

Barbara Pichayrou
Isabelle Pelloux-Prayer
Romane Chamailard
François Blanchard
Amélie Viaud

TRF: a robust optimized system

01

Winter overview

Le Havre FSRU: a new LNG import point

Improved short-term exit offers to Germany and Switzerland

TRF and congestion: satisfactory performance this winter

Ingrid: now GRTgaz's only customer portal



02

Outlook for summer 2024 and next winter

Work program: a constant search for optimization

Summer Outlook: the network enables storage to be refilled

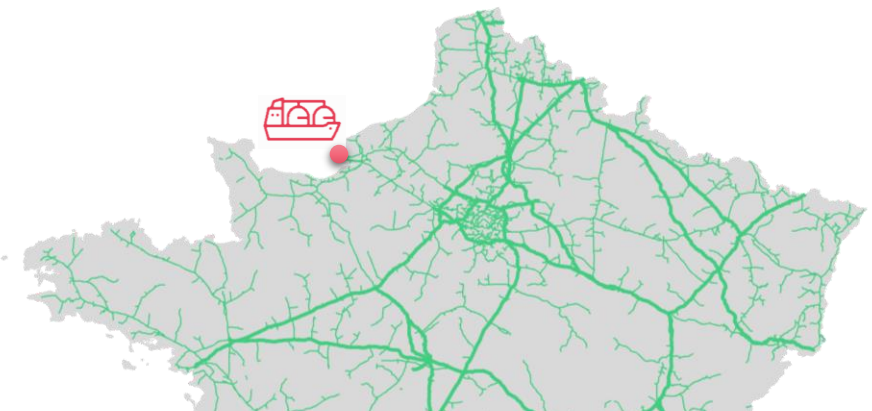
Load shedding survey in progress

Conclusion

Winter 23/24 overview



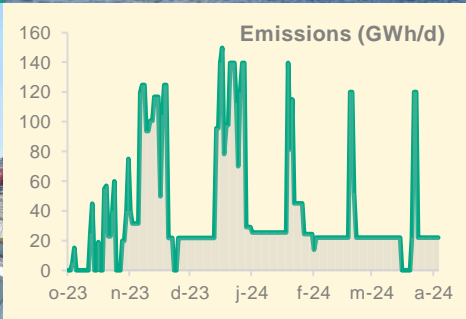
Le Havre: a new LNG import point since October 2023



A floating LNG terminal for 5 years in the port of Le Havre



New entry capacity to secure France's supply



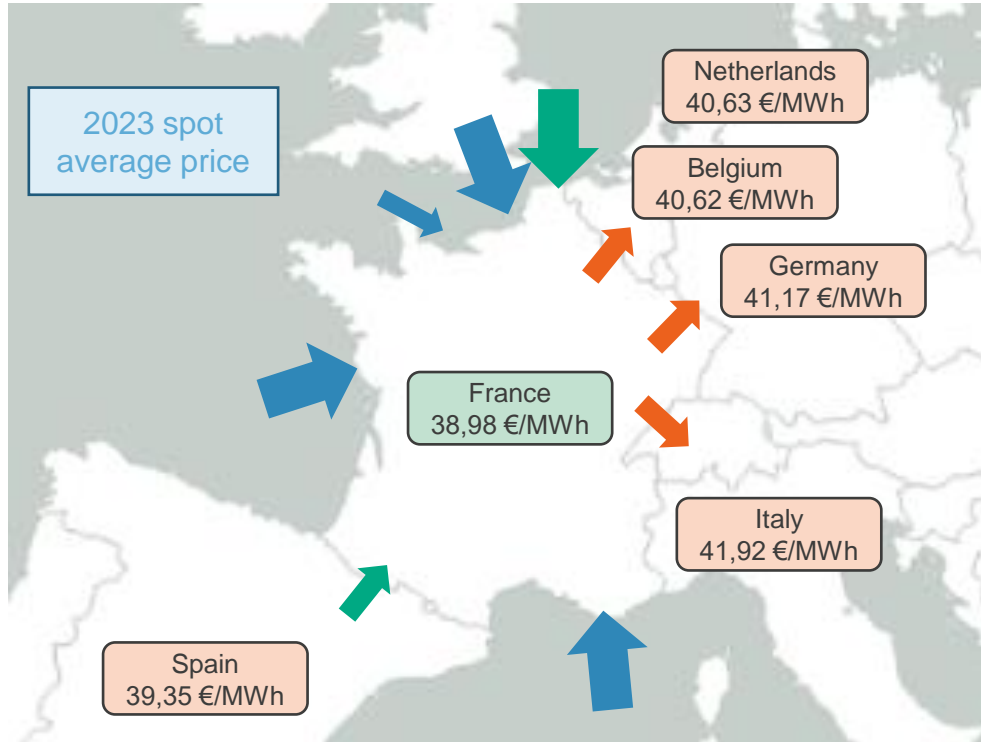
46 TWh/year

Connection to the network in record time



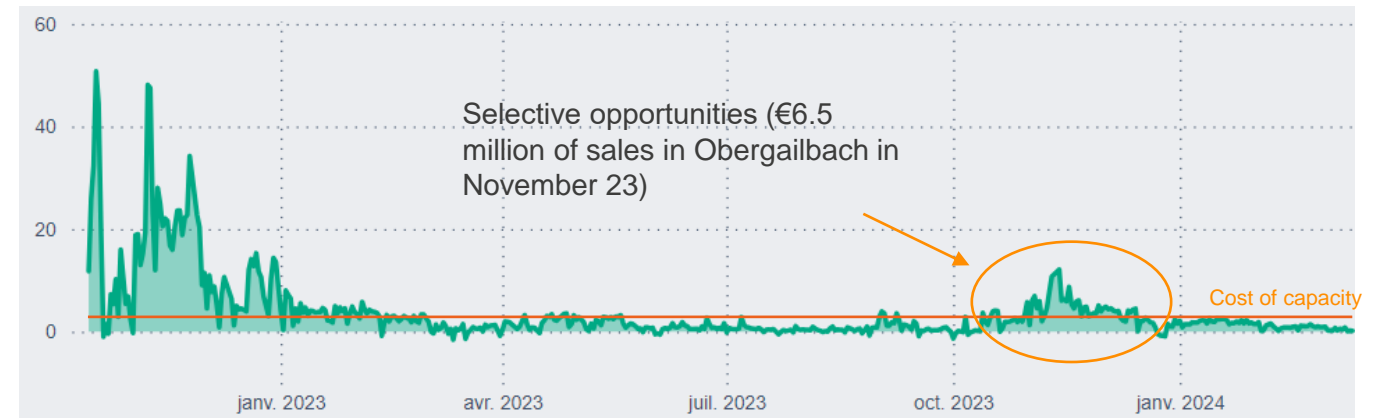
France at the crossroads of European flows

One of the lowest PEG prices in Europe, and still opportunities to develop outlets to neighboring countries



Source: EEX, Bloomberg, Mibgaz – Analyse: GRTgaz

Spread day-ahead THE-PEG (Allemagne - France) (€/MWh)



- Nevertheless, market interest in developing long-term outlets is waning.

Improved short-term exit offers to Germany and Switzerland

Meet market demand and reduce pricing pressure by generating additional revenue



Short-term offers

- Infra-day service at Obergailbach since april 2023
- Daily exit capacity increased since January 2, 2024:
 - Obergailbach: 100 -> 180 GWh/d max
 - Oltingue: 260 -> 273 GWh/d

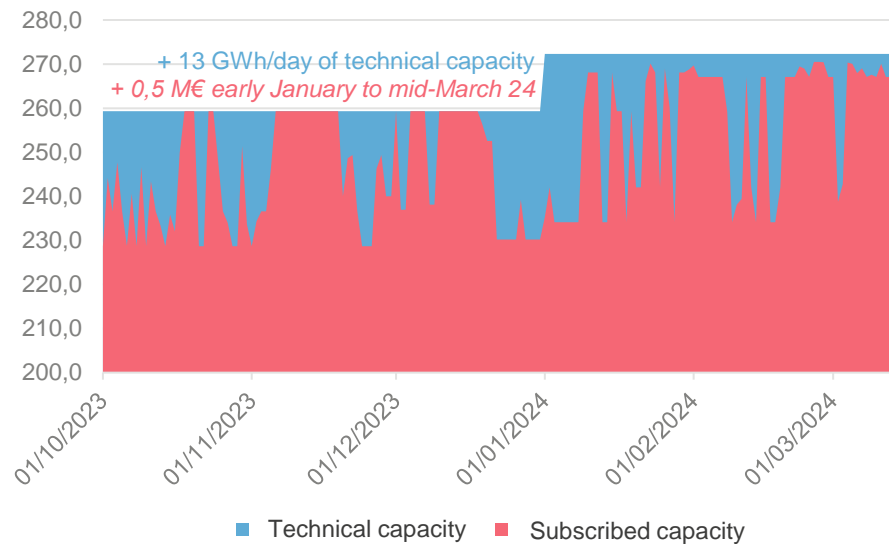


Medium-term offer, without investments



- Higher maturity capacities (monthly, quarterly...)
- Obstacles still to be overcome (notably south > north congestion)
- Subject on stand-by

Oltingue outlet subscribed capacities (GWh/d)



Long-term offer, with investments



- Annual capacities; not before 2028
- No market demand during the summer 2023 incremental capacity process
- -> no investment study launched

The TRF offer has been adapted to meet new flow configurations

- New supply and export patterns since 2022 have reconfigured flows within TRF
- Exposing the TRF to a new risk of congestion in **the South to North direction**, mainly in winter



Winter 2022-23: first winter with heavy South-North congestion

- Resilient TRF, but adjustments of the offer necessary
- Nearly €55M to manage congestion
- Restrictions on shippers' firm capacity as a last resort



How can we improve South-North congestion in coming winters?

- Studies to adapt the TRF offer in consultation with the market
- Resulting in a CRE decision on 12/10/2023

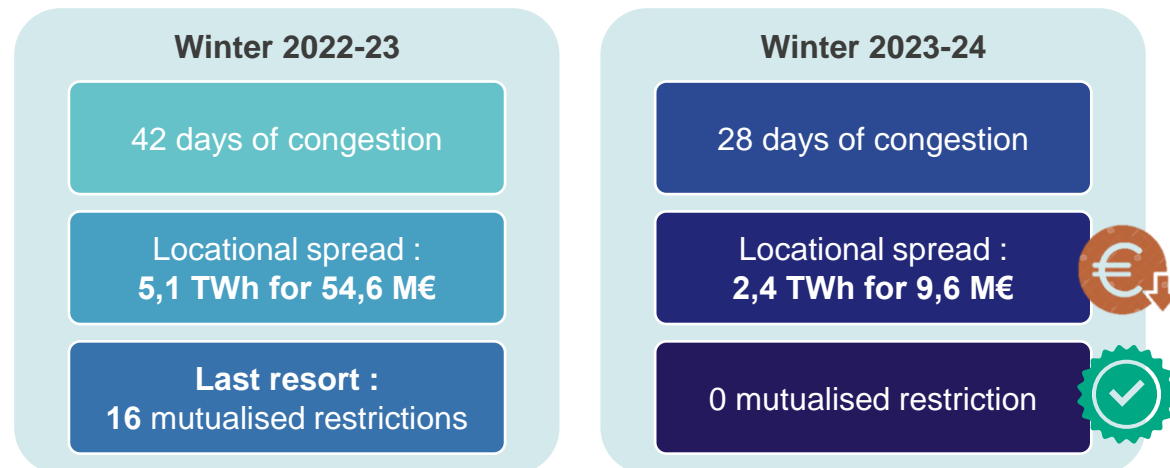


Winter 2023-24: implementation of new TRF operating procedures

TRF: satisfactory performance this winter, still under control

Winter 2023-24: a clear improvement in South-North congestion management

- A mild winter, quite like the previous one
- Efficient congestion management mechanisms
- Lower congestion management costs
- No impact on shippers' firm capacity
- Congestion is the counterpart of a PEG price lower than other marketplaces in North-West Europe



A continuous improvement process to be pursued in 2024

- Winter REX to be shared with the market in Q2 2024
- Adjustments under study to optimize TRF operation
- In preparation to a new CRE consultation in summer 2024
- Also to come: implementation for winter 2024-25 of the latest changes decided in 2023

Meet us at the
Concertation Gaz on
May 31st, 2024 to
discuss our proposals

Ingrid is now, the only customer portal GRTgaz



- The commissioning of the latest INGRID module completes the external part of the offering IS overhaul project (RIO) begun by GRTgaz in 2018.
- INGRID became **the only portal for all GRTgaz Customers**.
- This last commissioning implies **the closure** of the **TRANS@ctions** and **IngridLab** portals.

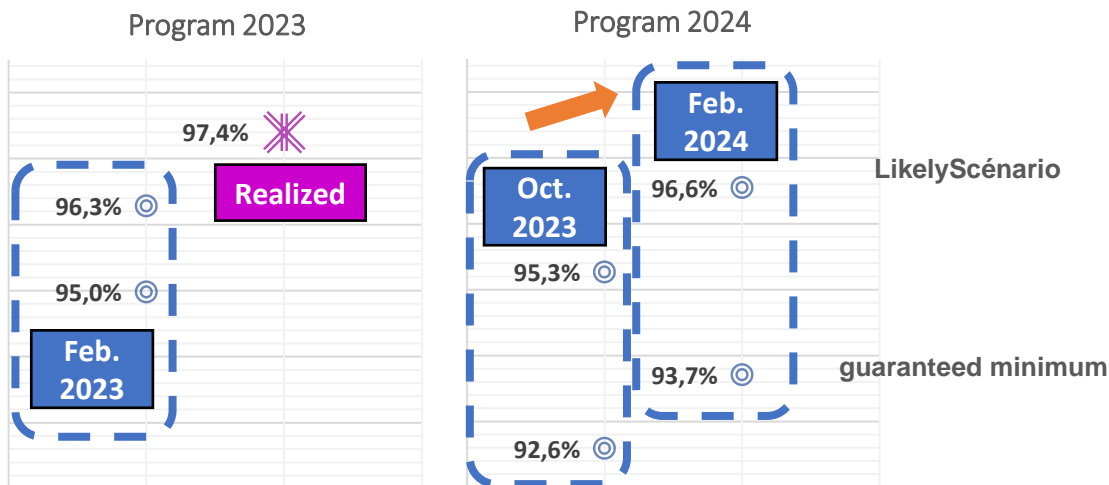


Outlook for summer 2024 and next winter



The 2024 works program for shipper customers

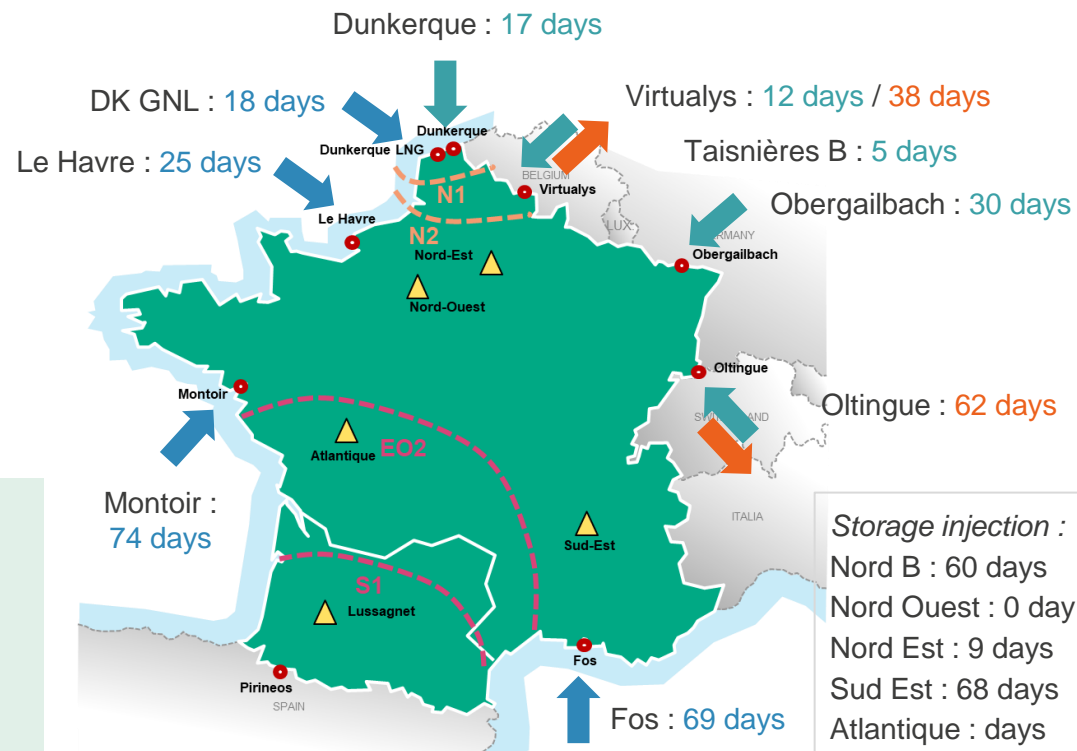
A constant quest to optimize commercial impact



Availability of firm capacity subscribed at all TRF entry/exit points (including Teréga points)

- **Improvement in capacity** availability since 1st publication and stability compared with 2023 in the probable scenario
- **A substantial works** program in line with changes in regulations (Multi-Fluids Decree), which intensifies the frequency of pipeline inspections and rehabilitation.
- **Better visibility** thanks to the adaptation of LNG assumptions on the probable capacity availability indicator
- **Maximization** of available capacity through coordination with adjacent operators

SPN2U : 16 days (impact on **inputs** DK GNL, Dunkerque, Virtualys)
 SPN1U : 1 day (impact on **inputs** DK GNL, Dunkerque)



SPEO2D : 172 days (impact on **output** Atlantique, Lussagnet, Pirineos)
 SPS1D : 144 days (impact on **output** Teréga : Lussagnet, Pirineos)

Number of days with a maximum restriction rate on subscriptions (TRf Max) greater than 0%.

The Summer Outlook: the tool for assessing summer storage levels



Seasonal assessment carried out in accordance with the regulatory framework (Energy code Art. L141-10)

Purpose: Verify storage filling capabilities across TRF from April to October, taking into account network limitations and maintenance schedules

Note: Infrastructure Opportunities Assessment Exercise

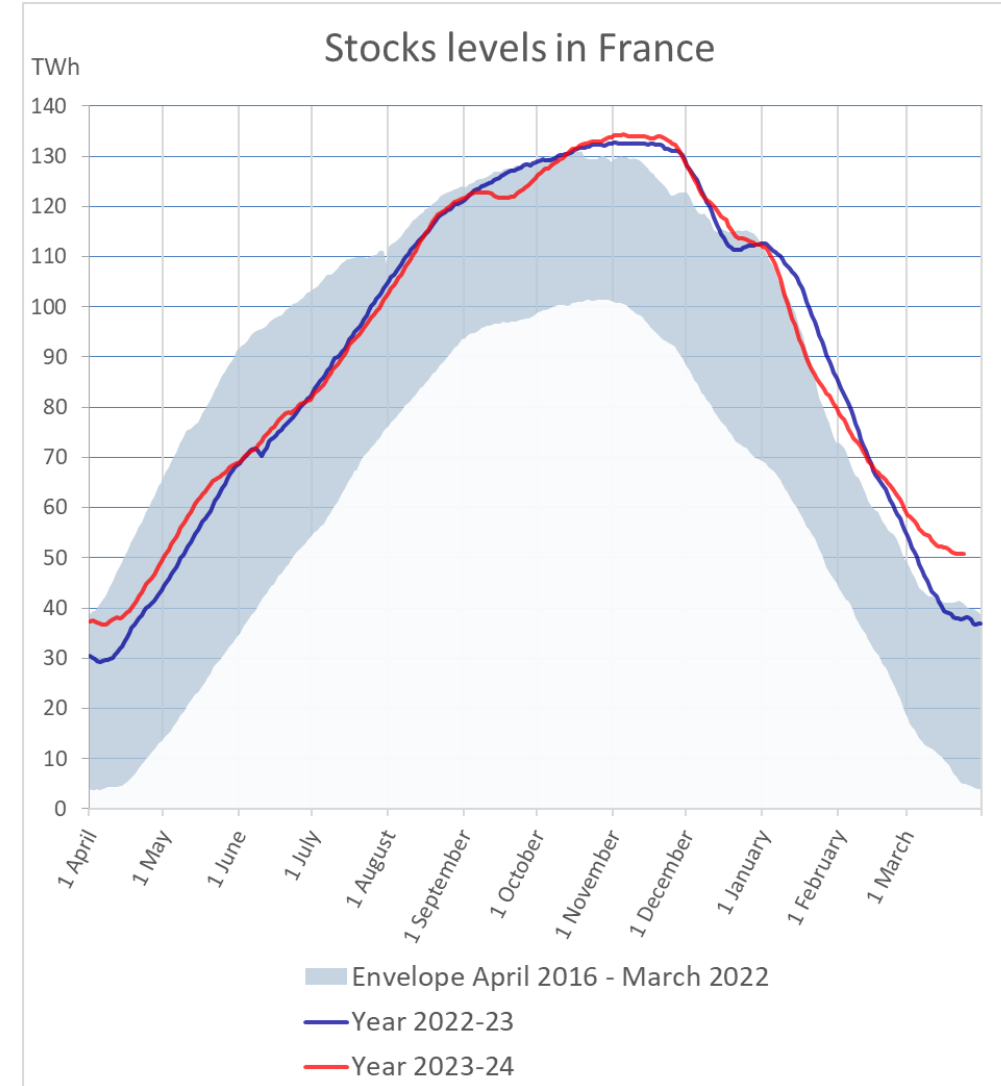
(not for forecasting or evaluating the availability of supply sources; simulations assume the availability (excluding maintenance) of LNG terminals and storage)

This presentation summarizes the main information and key messages of the Summer Outlook 2024, which can be consulted in greater detail on the GRTgaz website.

Summer storage capacity target: increase from 47.6 to 129.5 TWh

- Storage offer 2024-25: UV* = **129.55 TWh**
(of which unsubscribed to date: 3 TWh in zone L)
- H+B stock assumption on April 1: **50.4 TWh**, i.e. 38.9% of UV
- Security of supply challenge for winter 2024-25: **maximize stock levels at end-October**, particularly in the current Russian-Ukrainian context, to cover consumption in a cold winter with potentially high exports to Germany, Switzerland and Belgium.
- Regulatory requirements:
 - ⇒ French regulation: 85% of the volume subscribed on 01/11 (Mandatory for shippers)
 - ⇒ European regulations: **90% of the marketable volume on 01/11** (Mandatory for France)

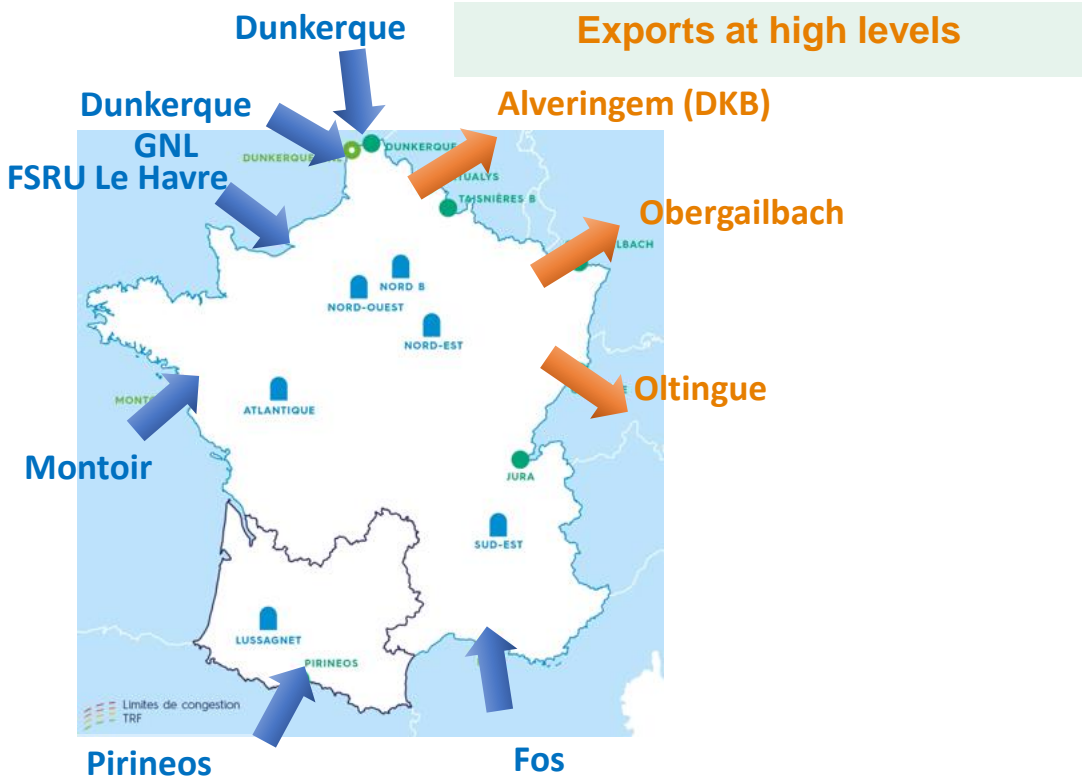
* : UV = utile volume



Results

Sustained use of the Dunkirk, Pirineos & LNG entry points is necessary to keep storage facilities at full capacity

Same % use for all import points
(see table opposite)



Stock H the 31/10 (% VU) (*)				
% capacity utilization Dunkirk, Pirineos & PITTM	100%	90%	80%	70%
High consumption scenario	100% 😊	100% 😊	95% 😊	72% 😞
Medium consumption scenario	100% 😊	100% 😊	100% 😊	100% 😊

Orders of magnitude: 1% filling H = 1.2 TWh ≈ 1 LNG carrier ≈ 4 days of export at Olingue

The network enables the filling of storages

- Taking into account the work of adjacent TSOs and operators
- Two consumption scenarios: high and medium

In summary: the network enables storage facilities to be filled, but large inflows are required.

Security of Supply: strong stakes on maximizing summer exit storage levels for next winter

The network allows the filling of the storage at the end of October

Due to the break in Russian supplies, the margin is small. The filling of the storage assumes:

- * use of Dunkirk, Pirineos and LNG inputs **at a level close to their maximum**
- * **throughout the season.**

The efforts of sobriety must continue to facilitate a maximum filling of storage, even in case of strong economic recovery, in anticipation of a winter 2024/25 potentially cold.

The concept of load shedding

● Decree 2022-495 on natural gas load shedding:

- ⇒ Specifies that load shedding is **the reduction or interruption of consumption within 2 hours**,
- ⇒ Defines the target and content of the "**load shedding survey**" to be organized annually by network operators,
- ⇒ Allows **two months** from receipt of survey to respond
- ⇒ Indicates that the prefectures will be responsible for classifying consumers into **3 categories** (or lists) based on responses to the load shedding survey
- ⇒ Defines the **order of priority** to be used by network operators in the event of load shedding.
 1. Consumers with electricity generation capacity more than 150 megawatts, up to the level of supply likely to jeopardize security of electricity supply,
 2. Consumers consuming more than 5 GWh per year, up to the level of supply mentioned in the load shedding survey
 3. Consumers consuming more than 5 GWh per year, for reductions going beyond the supply level mentioned in the load shedding survey,
 4. Consumers other than those mentioned in 1° to 3°.

Load shedding survey 2024

The 2024 survey on load shedding is open from **March 15 to May 15.**

- **The questionnaire** remains unchanged from 2022, with the exception of a question on purchase obligations for electricity producers.
- Answers to the 2023 questionnaire are **pre-filled** in. After final validation, an acknowledgement of **receipt and a summary of the answers** will be sent to the person who filled in the questionnaire.
- The new lists validated by the prefectures should be known by winter 2024/2025.



In summary: TRF, a robust and optimized system

A favorable market context

- PEG sustainably competitive, thanks to multiple French supply sources
- Storage facilities in France and Europe at good levels at the end of winter



Summer Outlook: towards full storage in summer 2024

- Our infrastructures enable storage facilities to be filled
- But we need large-scale gas deliveries to Dunkirk, Pirineos + LNG to maintain security of supply.

A mature offering, constantly being optimized

- TRF: a system under control, with the latest developments underway for next winter
- Work program: avenues for improvement
- A transmission offer compatible with the large-scale development of biomethane
- Later: no doubt further developments with the easing of capacity sales conditions on PIRs (pending European decisions).



Thanks

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GRTgaz

ATRT8 tarifs

Ophélie Micic-Polianski
Rémy Champavère

An extensive consultation process led by the regulator



Gas Infrastructure Tariffs Workshops

N°1 :
Distribution
Tariff
Structure
23 Feb

N°2 :
Transmission
Tariff
Structure
4 May

N°3 :
Renewable
Gas
10 May

N°4 :
Regulatory
Framework
20 Jun

N°5 :
Quality of
Service
13 Sep

**Round Tables
with consumers
associations,
local
authorities,
suppliers, etc.**

Final's
CRE
Decision
on ATRT8
30 Jan



**a transparent,
open process**

Transmission and storage
26 Jul – 9 Oct

Distribution
12 Oct – 20 Nov

Draft CRE
Decision
on ATRT8
14 Dec

Public consultations

A context of strong pressure on prices

Increasing expenses



Inflation : sharp rise in 2022-2023, affecting all expenses



Energy price and tensions : higher energy costs, B/H conversion and localized spread



New needs : renewable gases, reducing CH4 emissions, cybersecurity and safety



Productivity Gains: -15 FTE/year and -24 M€ cumulated on external expenses

*Level of expenses to be covered retained by the CRE :
+8% for average ATRT8 p/r actual 2022*

declining subscriptions



Long-term subscriptions not renewed : Taisnières, Obergailbach, Oltingue



Lower consumption : forecasts consistent with ADEME S3 scenario



Global warming : revision of GRTgaz's climate reference system (T2%)

*Subscription forecasts adopted by the CRE :
-5% / year on average for GRTgaz's main network
-2% / year on average for GRTgaz regional network*

authorized revenue = operating expenses + capital expenses = subscriptions x tariffs

⇒ **Increase in tariff terms**

ATRT8: changes in tariff terms in 2024

€/MWh/d/year	Current Terms	Terms at 1 April 2024	Terms at 1 October 2024	Change
IP Entries	105.70	105.70	130.63	+23.6%
IP entry Taisnières B	81.99	81.99	101.61	+23.9%
PITTM Entries	95.13	116.36	116.36	+22.3%
PITS Entries	9.22	10.88	10.88	+18.1%
Obergailbach IP exit	375.60	375.60	443.25	+18.0%
Oltingue IP Exit	386.85	386.85	440.47	+13.9%
Pirineos IP Exit	587.20	587.20	580.15	-1.2%
Virtualys IP Exit	42.05	42.05	52.17	+24.0%
PITS exits:	21.53	28.52	28.52	+32.5%
Exits from the main network to the regional network	95.20	124.42	124.42	+30.7%

The tariff structure :

- has been established in compliance with the Tariff Network Code (EU Regulation 2017/460)
- has been the subject of ACER analysis published on Dec. 8, 2023 ([link](#))

The methodology used to calculate tariff terms in ATRT7 has been renewed, but with revised flow scenarios (lower Russian gas prices).

	€/MWh/d/year	Current Terms	Terms at 1 April 2024	Change
GRTgaz	Terms of transmission capacity on the regional network (TCR)	84.29	96.38	+14.3%
Téréga	Terms of transmission capacity on the regional network (TCR)	84.79	102.60	+21.0%

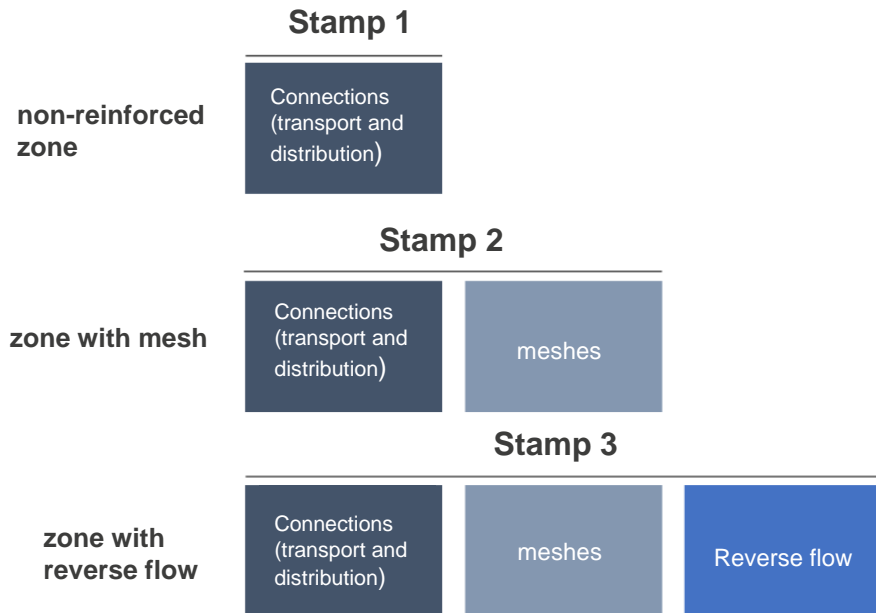
For the record, pricing terms have remained stable in current euros between 2020 and 2023, while inflation has been 12%.

Biomethane injection stamp

Changes planned as part of the ATRD7 deliberation

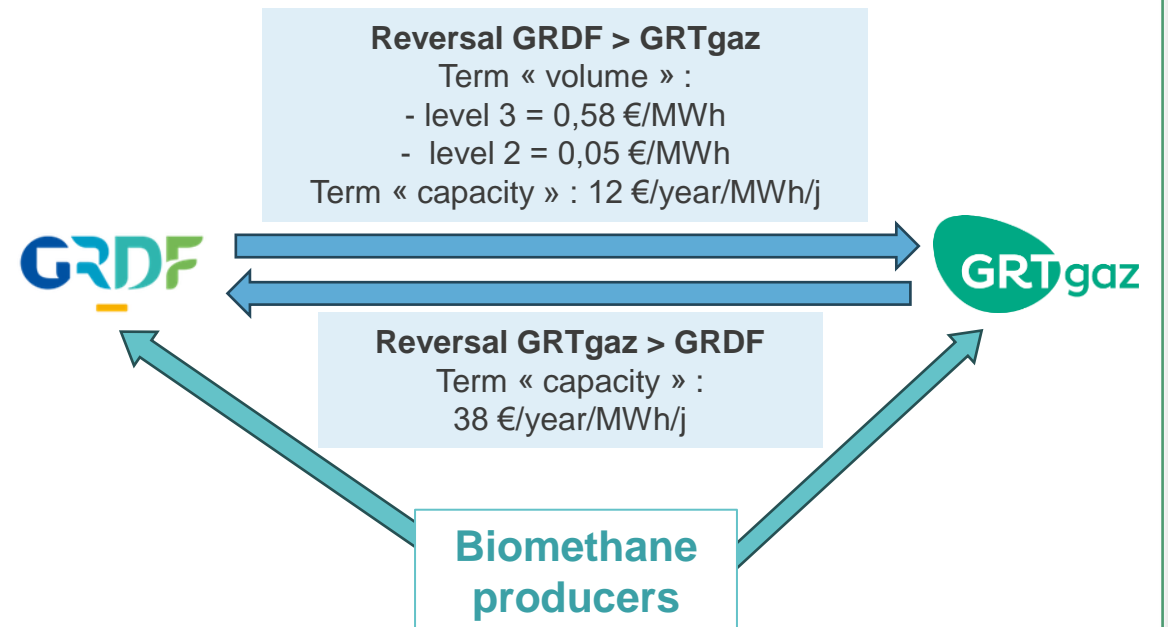
Maintaining the term "volume"

- differentiated by zone, with no change in amount
- level 3 = 0.7 €/MWh - level 2 = 0.4 €/MWh - level 1 = 0



Introduction of a "capacity" term

- applicable to all sites
- from €50/MWh/d/year



ATRT8: annual tariff updates and other changes

A marginally adapted offer

- Elimination of the "congested" tariff
- PITTM backhaul offer not retained in the end

Main changes in CRCP

- Energy costs: maintenance of the 2023 framework (90% CRCP coverage*) and continuation of the discussions initiated in 2023 with a view to overhauling the framework.
- Upstream subscriptions (PIR and PITTM): switch to 90% CRCP coverage instead of 80%.

(*) and 100% for the difference between actual and the CRE forecast exceeding 50% of the CRE forecast.

Annual change in pricing terms

- = inflation forecast for the coming year
 - + difference between actual inflation for the previous year and forecast inflation
 - + coefficient k, which takes into account each year's actual CRCP level
- ⇒ k now limited to +/- 3% instead of +/- 2%.

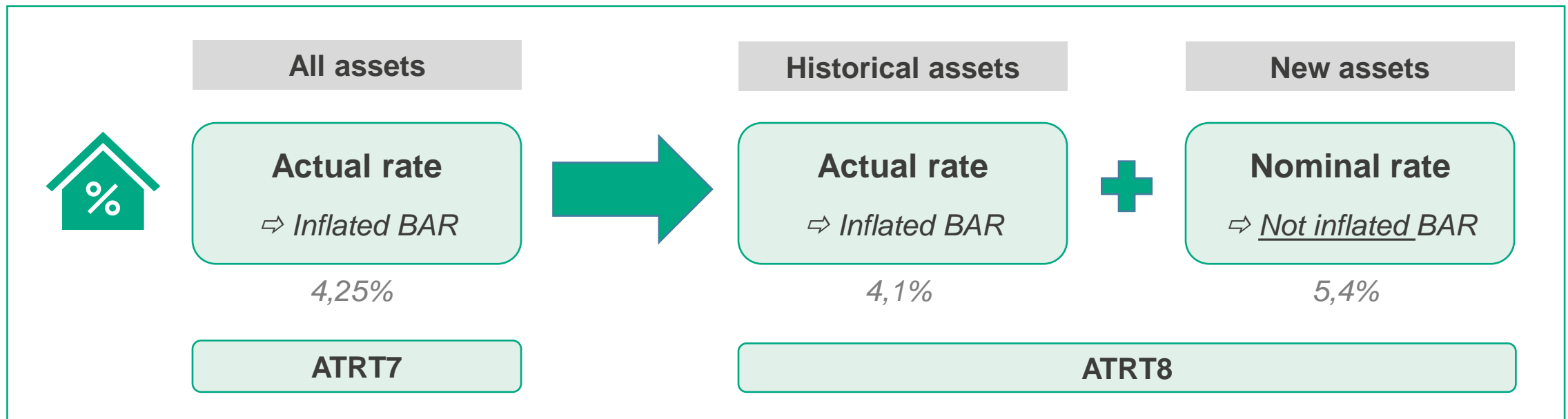
Service quality indicators

- Introduction of 5 (non-incentive) indicators on the injection of renewable gases
- Removal of indicators for monitoring TRF operation

A tariff that prepares for the future by modifying the framework applicable to new assets

Objective = To limit the risk of an excessive increase in unit transmission costs for future network users.

⇒ Leverage = adapt the distribution of capital costs over time: increase in the short term and reduction in the long term, in line with anticipated trends in gas consumption.



+ The depreciation period for pipes (new assets) is reduced from 50 to 30 years.

An indispensable network for today and tomorrow

The key role of the transmission grid in the Russian-Ukrainian crisis



Network flexibility: increase in LNG imports, cessation of Russian gas imports



PEG<THE: approx. 7 G€ gains for the French market*.



European supply security : Security of European supply



Electricity generation : +54% in 2022 vs. 2021, against a backdrop of unavailability of nuclear power plants

The importance of the transmission network for the energy transition



Connecting renewable gas producers and maximizing production **potential**



Connect consumption & production zones and provide access to storage



Provide the inter-seasonal flexibility essential for the significant development of **electric renewable energies**



Supporting hydrogen development

The transmission network plays its insurance role at a cost representing around 5% of the final price of gas. The ATRT8 should enable it to continue while guaranteeing its resilience to current and future challenges.**

* Daily differential between F and D prices x French consumption between Feb. 2022 and March 2023

** for an average public distribution customer



Thanks

Les

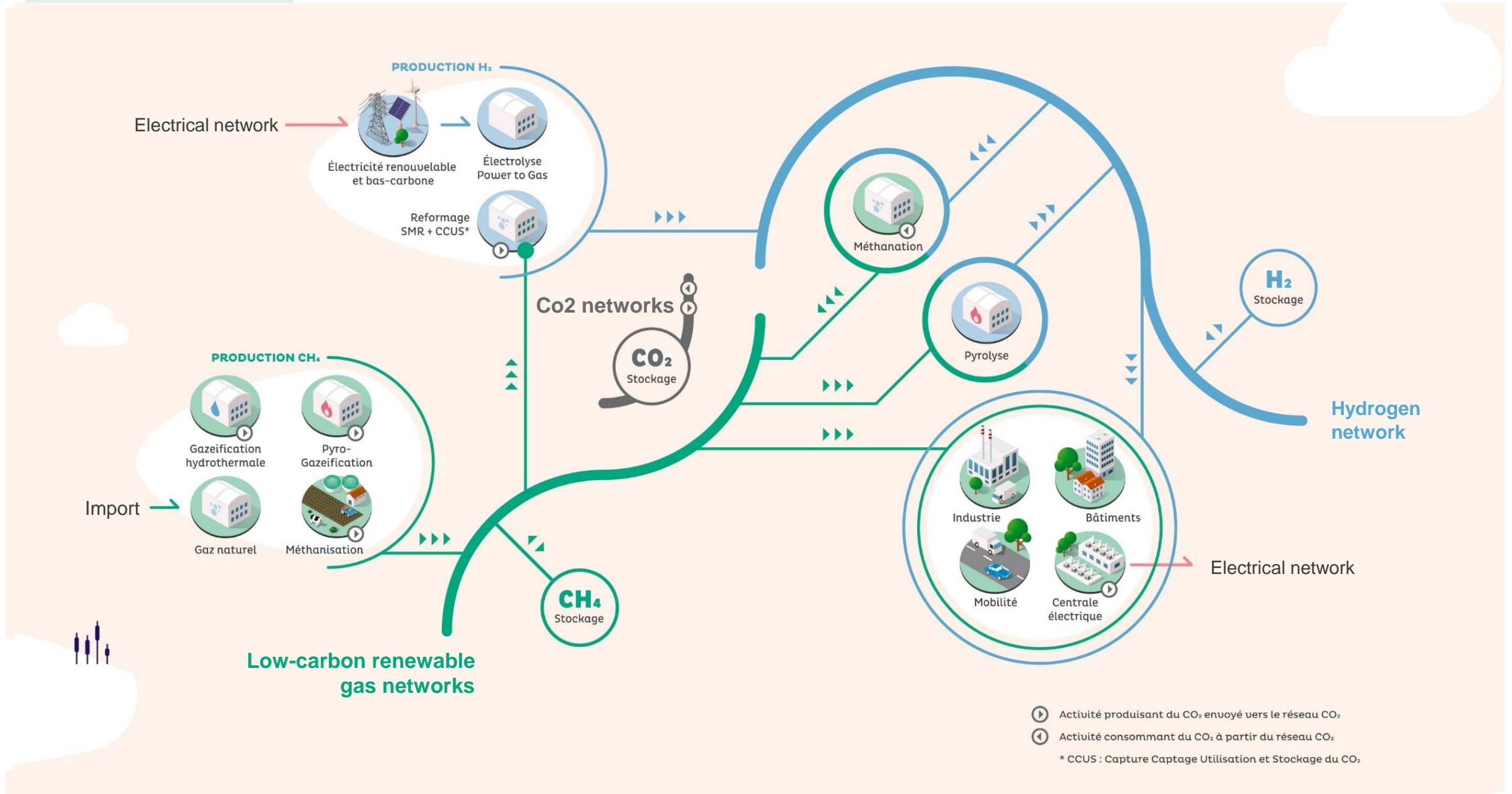
Rendez-vous Clients

GRTgaz

The gas transition in
motion

Jean-Marc Le Gall
Geoffroy Anger

Our vision of the network in 2050





La transition gazière en mouvement

**Renewable gases:
momentum and growth prospects**

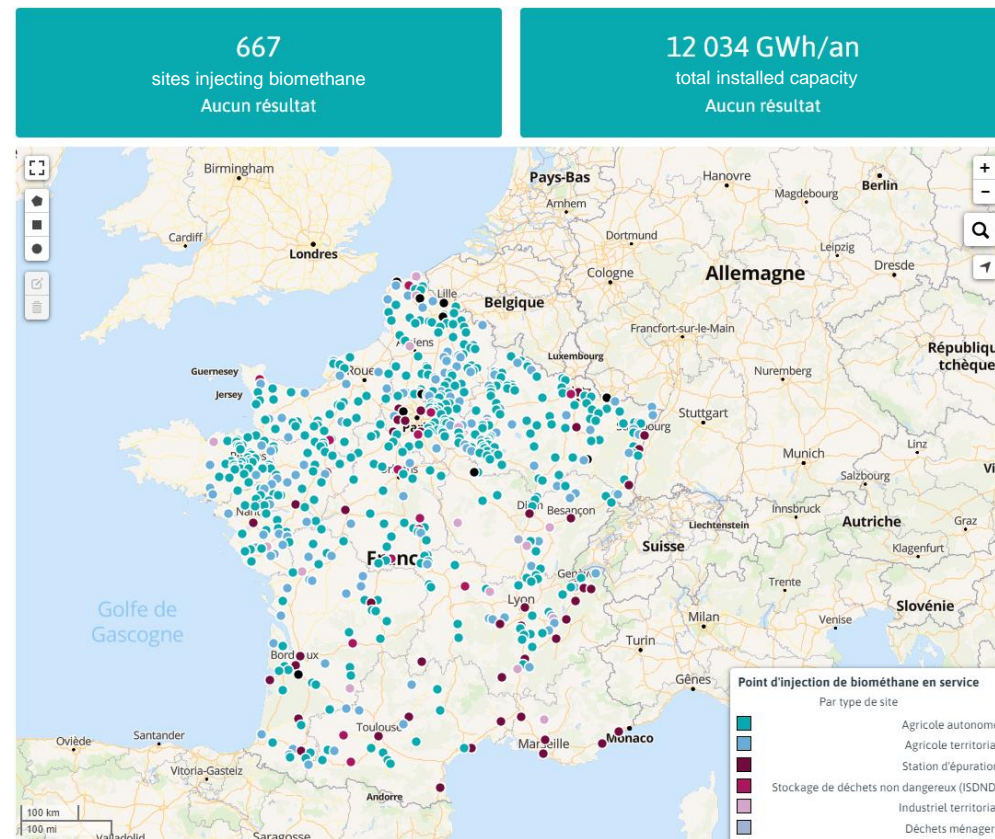
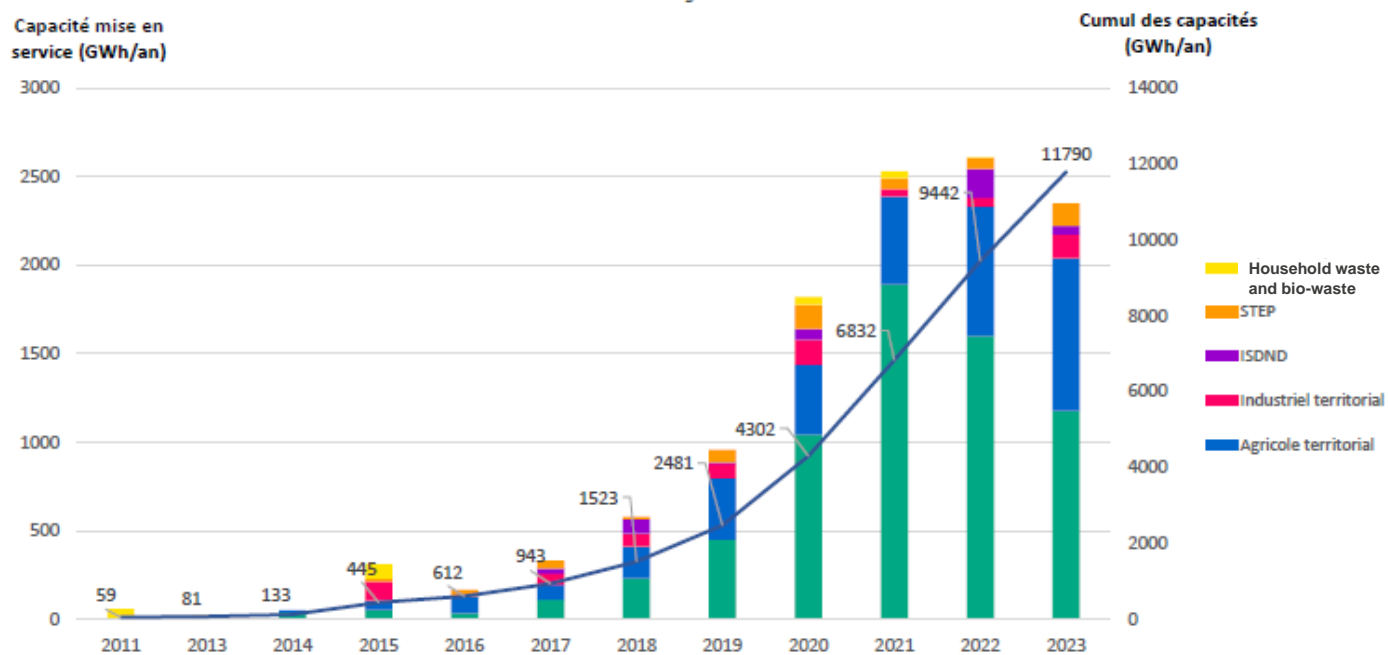


Renewable gases

Today, production driven by methanization

Connected capacity on 31/12/2023 : 11 790 GWh

Source : données des gestionnaires de réseaux



Prospects for renewed growth in methanization and diversification of production technologies

Methanization

Several signals:

- 2 calls for tender in 2024
- a new attractive tariff
- forthcoming implementation of the CPB system

Pyrogasification

- Annonce d'un appel à projet pour concrétiser les premiers projets industriels

Project GAYA in Saint Fons (69, France)

Hydrothermal gasification

- A sector already visible at European level and a French initiative planned for 2024.

Figure 14 : Vue aérienne du site d'Alkmaar de SCW Systems (source : invest-nl.nl).

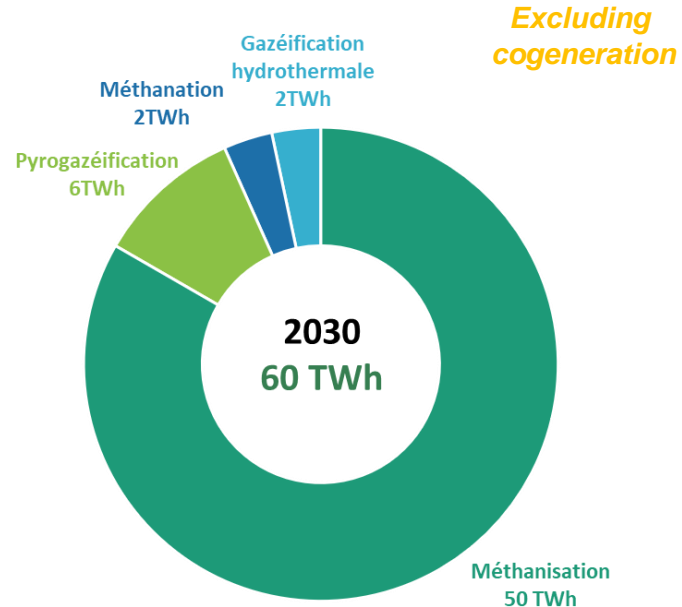
By 2050, 100% renewable, low-carbon gas

France-wide figures, all networks

2023 : 11 TWh



2030 : 60 TWh
15 à 20% of the gas cons

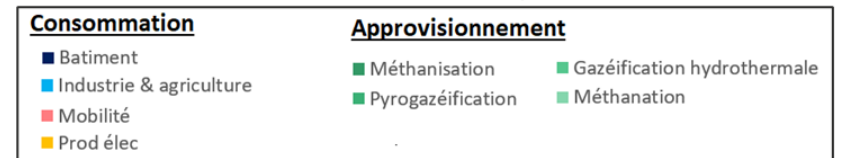
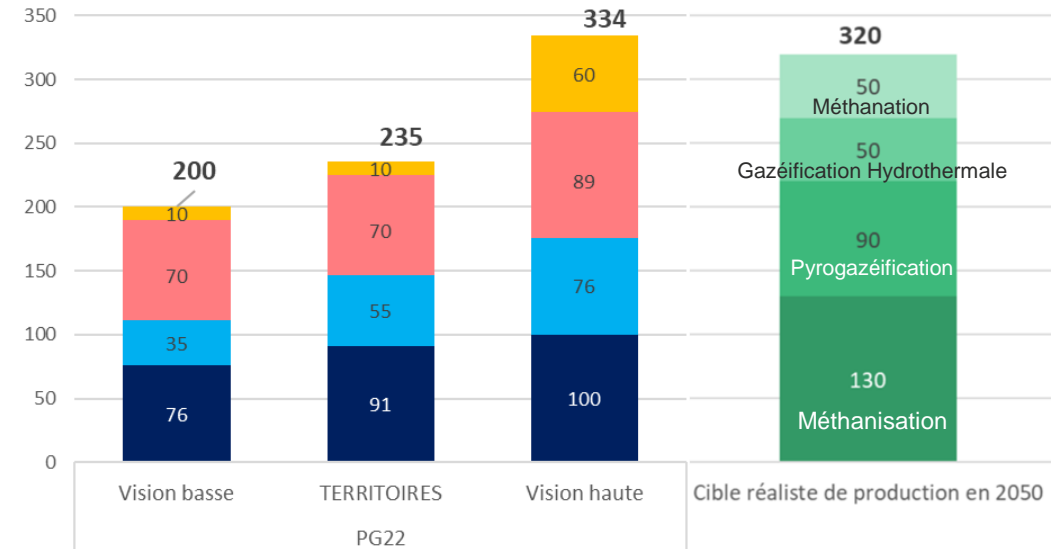


Analyse GRTgaz / GRDF / FGR / ATEE / GT Gazéification hydrothermale sur la base des études disponibles (ADEME, Solagro, France Stratégie, ENEA)

2050

100% renewable and low-carbon gases

Perspectives Gaz 2022 - Consommation de CH4 en 2050 - TWh PCS



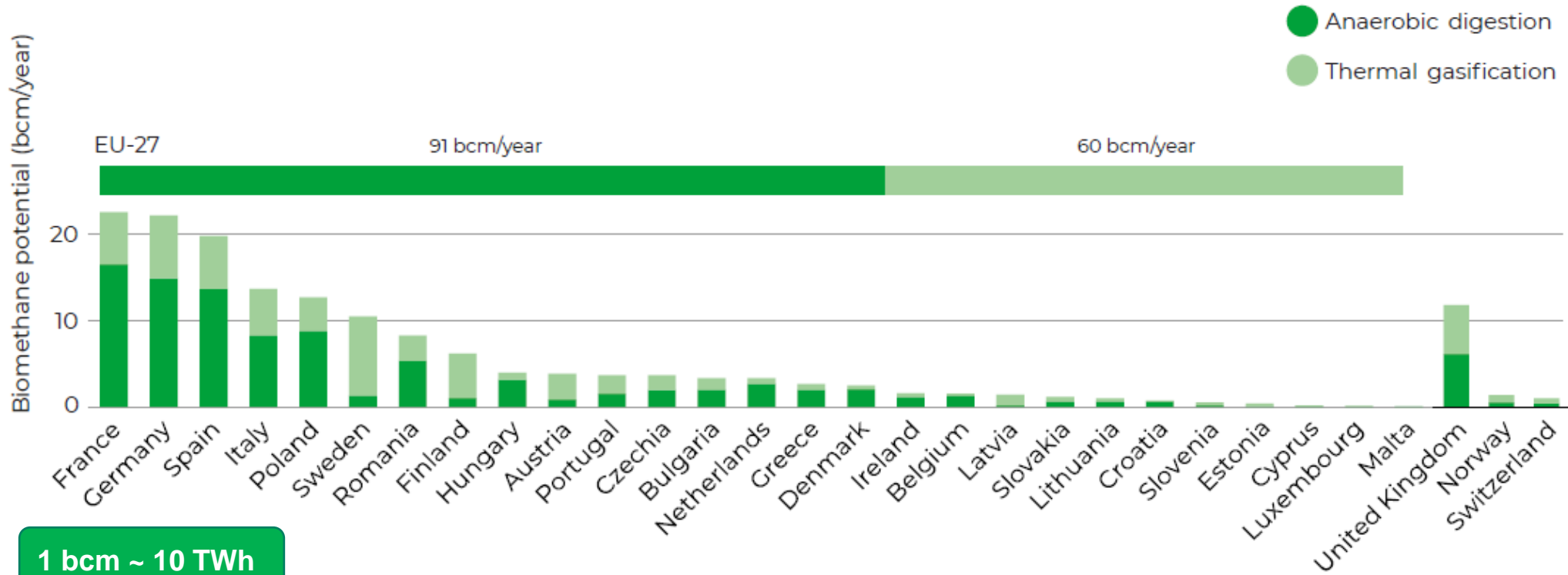
Beyond methanization, other technologies set to develop

Renewable gas production

France has the greatest potential in Europe

Etude Gas for Climate / European Biogas Association – juillet 2022

Figure 2.
Biomethane potential in 2050 per technology and country

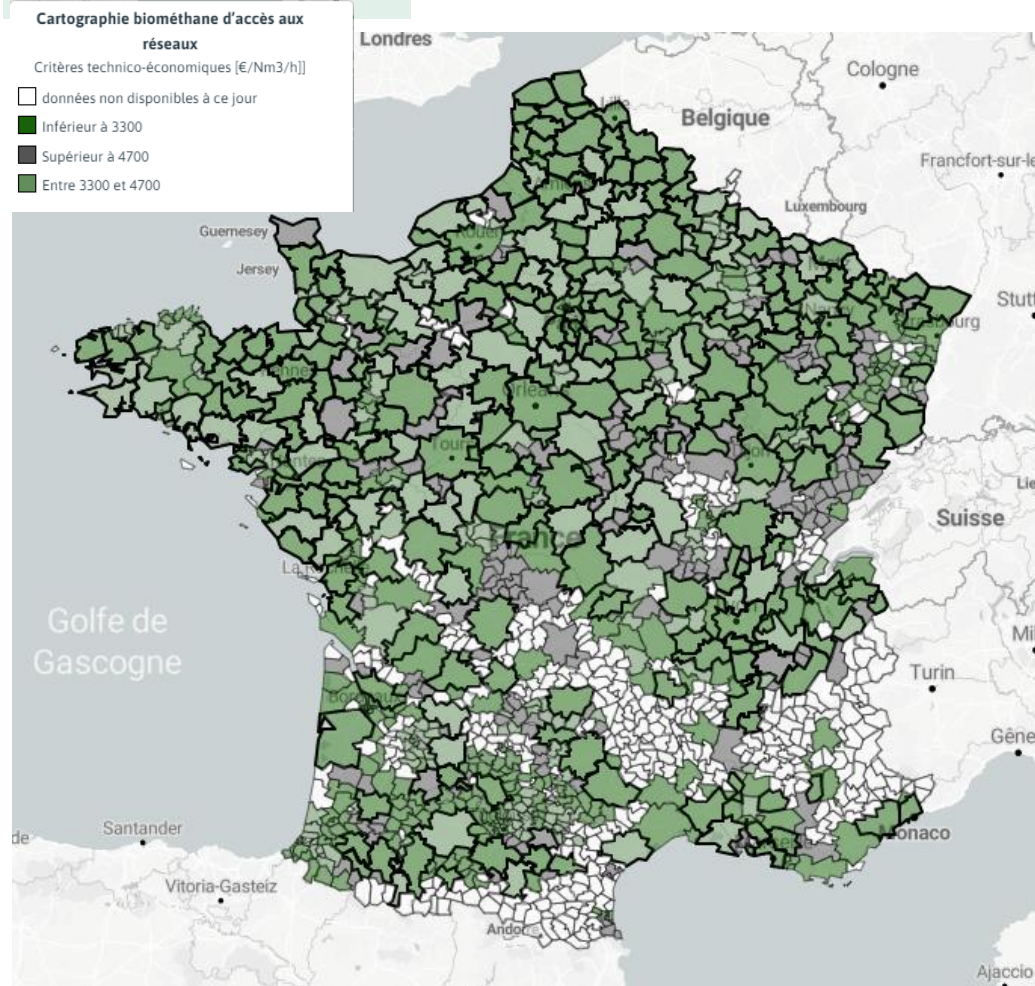


1 bcm ~ 10 TWh

The role of infrastructure

Hosting renewable gases at controlled cost

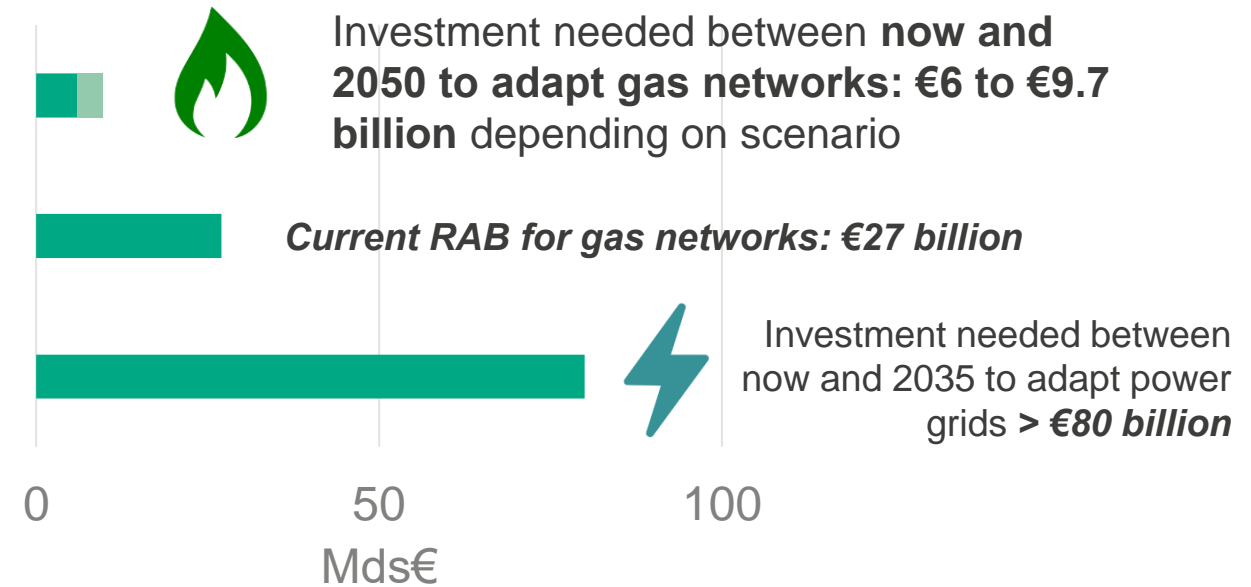
A large part of the territory suitable for injection



Source : [Droit à l'injection | grtgaz.com](https://droit-a-linjection.grtgaz.com)

Controlled investment costs

Report 2023
Future of gas infrastructures



GRTgaz graph based on CRE figures

La transition gazière en mouvement

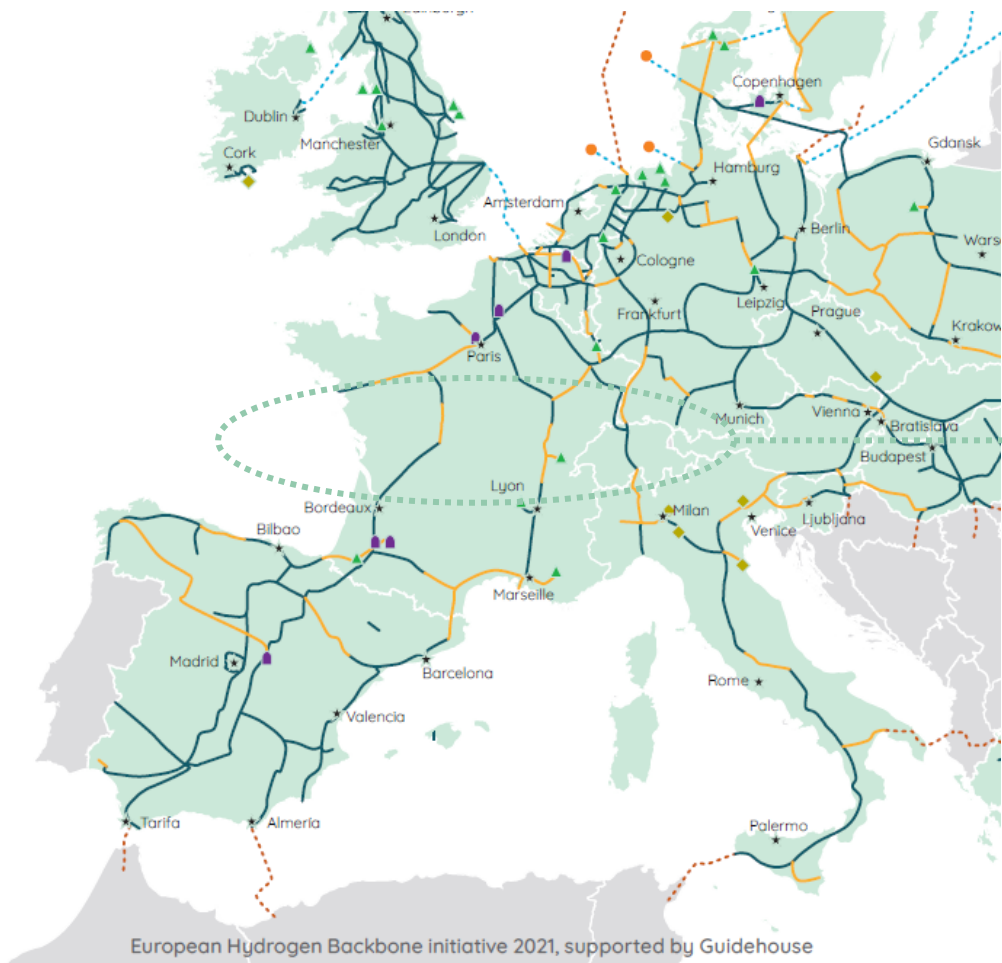
H2 & CO2 Transport



Vision: The French H2 network, an integral part of EHB

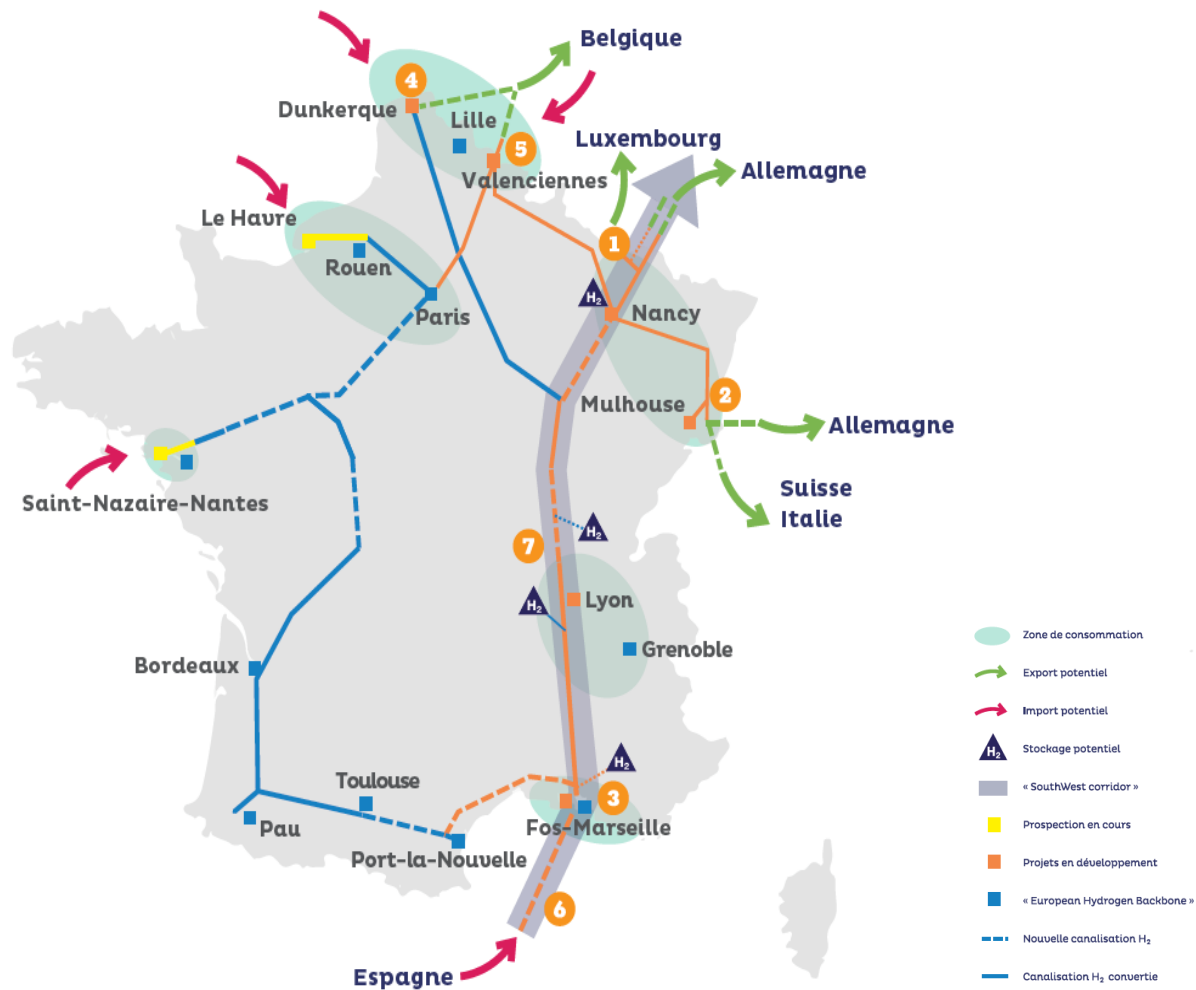
European hydrogen backbone by 2040

Transport costs: €0.11-0.21 per kg of hydrogen, for 1,000 km.



Focus on France

GRTgaz's active projects



National Hydrogen Strategy

Focus on infrastructure



Figure 3 : Carte des principaux hubs hydrogènes en France

1st phase :
Focus on intra-basin connections

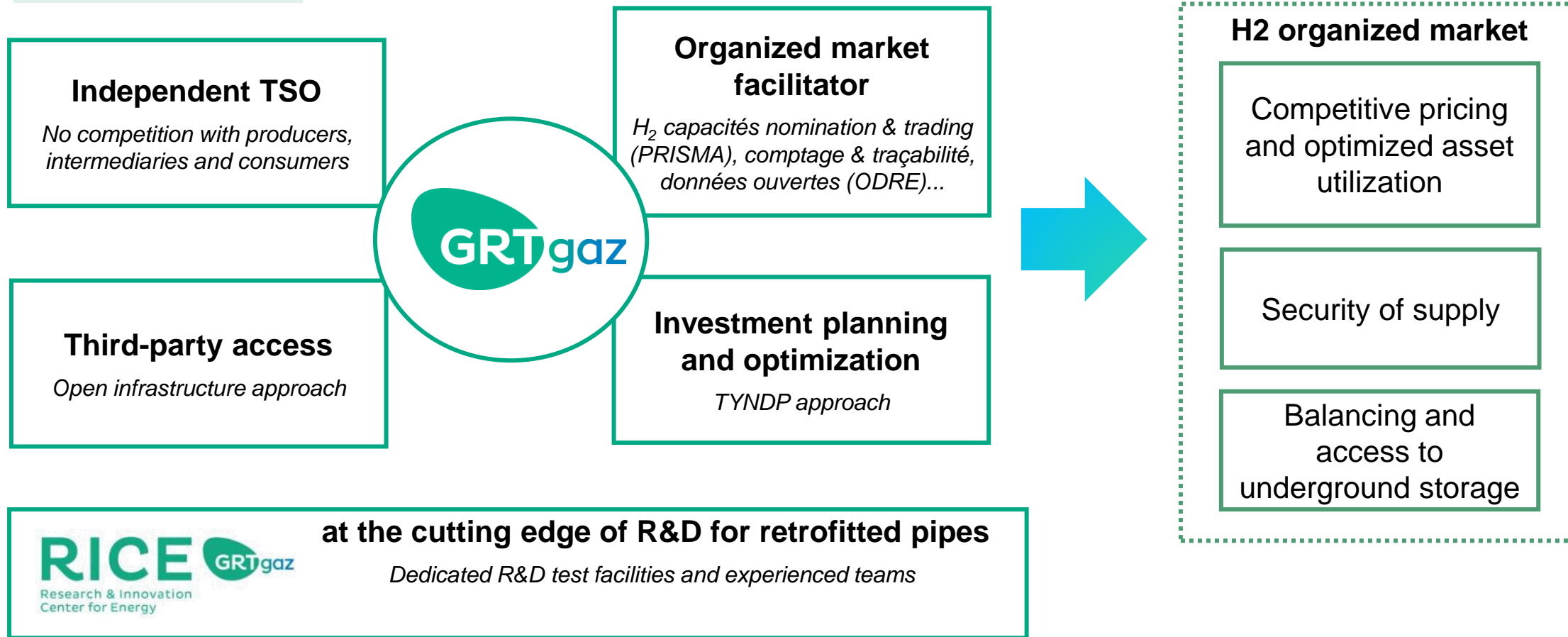
500 km by 2030

Planning and support mechanisms to be defined by
CRE by 2026

Study of imports of H2 and derivatives

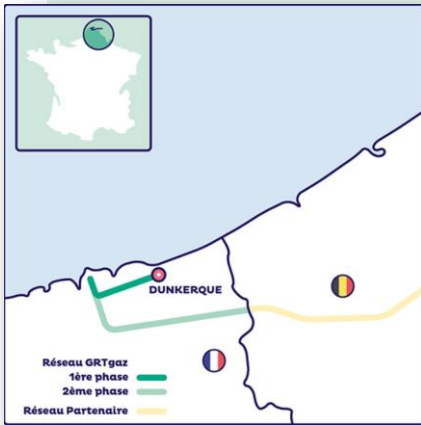
Connection to storage facilities supporting the power
system

Ambition: to become the trusted player in the H2 market in France and the EU



Focus on the basins

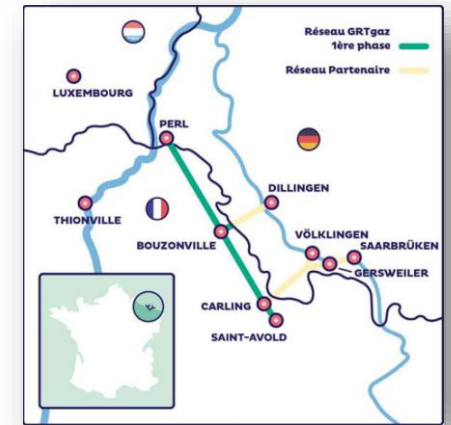
DHUNE



HYnframed



mosaHYc

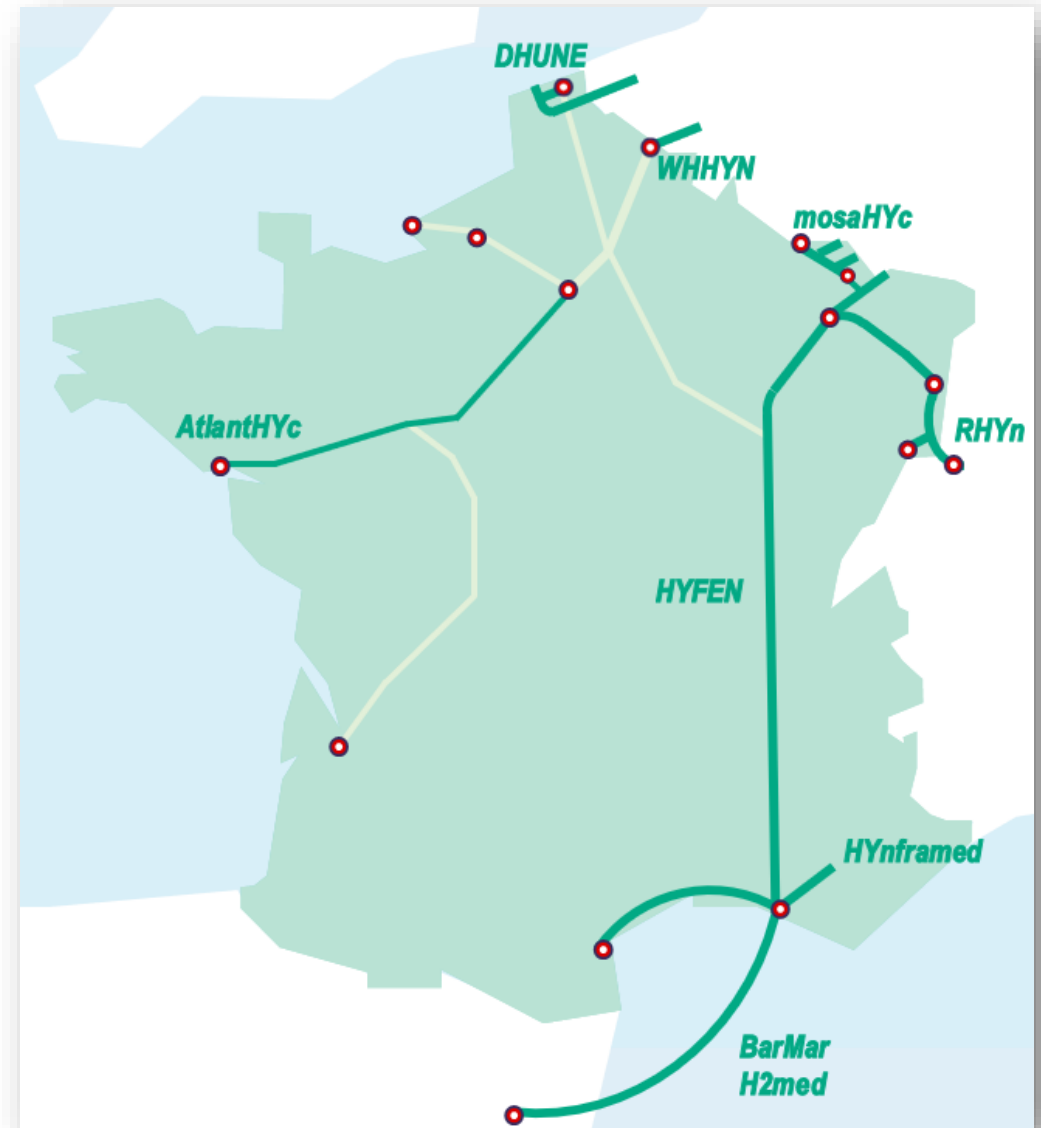


RHYn



H2Med/BarMar and Y-FEN

- H2Med project to be launched in December 2022
- Extension of the H2Med corridor to Germany via the HY-FEN project
- 2 Mt H2/year capacity



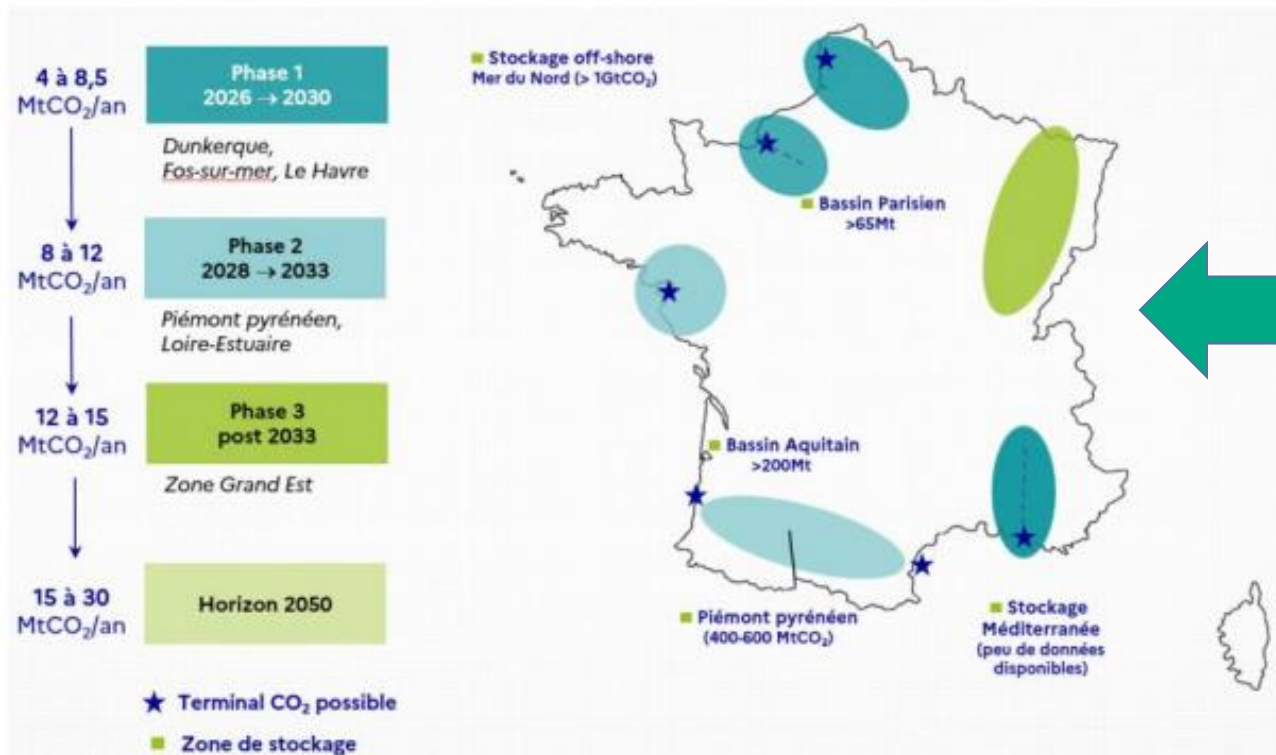
CO2 Strategy



Market outlook for CO₂ transport

Development in key industrial port areas, in line with government strategy

State CCUS strategy (June 2023) - 15 to 30 MtCO₂/year



- **CCFD** (Carbon Contract for Difference) tenders to support manufacturers
- **Infrastructure :**
 - **Infrastructure development in industrial basins and CO₂ export hubs** is a key short-term challenge.
 - **Regulation by the CRE**
 - Selection of monopoly operators in each basin
 - Minimum revenue guarantee: balanced risk-sharing not yet determined between State, issuers and infrastructures
 - Regulated framework necessary

A business model proposed by GRTgaz in line with the challenges and the CO2 infrastructure model proposed by the CCUS consultation

What GRTgaz promotes

ATR model, with nationally authorized operators, government guarantee and regulation.

+

Interest in all-gas synergy

+

Need for coordinated development by zone

analysis of a set of projects + infrastructures (average abatement cost within each cluster) for CCfD tenders in order to :

MMaximize volumes captured in each basin

- **Coordinate development** in each basin

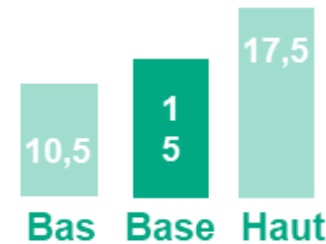
+

Any CC(U)S project with a positive cost/benefit analysis must be financed/assisted under the FR framework.

Targets identified by GRTgaz

GRTgaz study
Target clusters > 500 ktCO2 /year

Minimum" potential and a "no regrets" vision



↑
Aligned with
SNBC 2020

A cluster-based strategy, consistent with the minimum market level assessed by the French government: 15 to 20 Mt CO2/year for the industrial sector.

CO2 projects around the harbour of Dunkirk, Fos and Saint-Nazaire

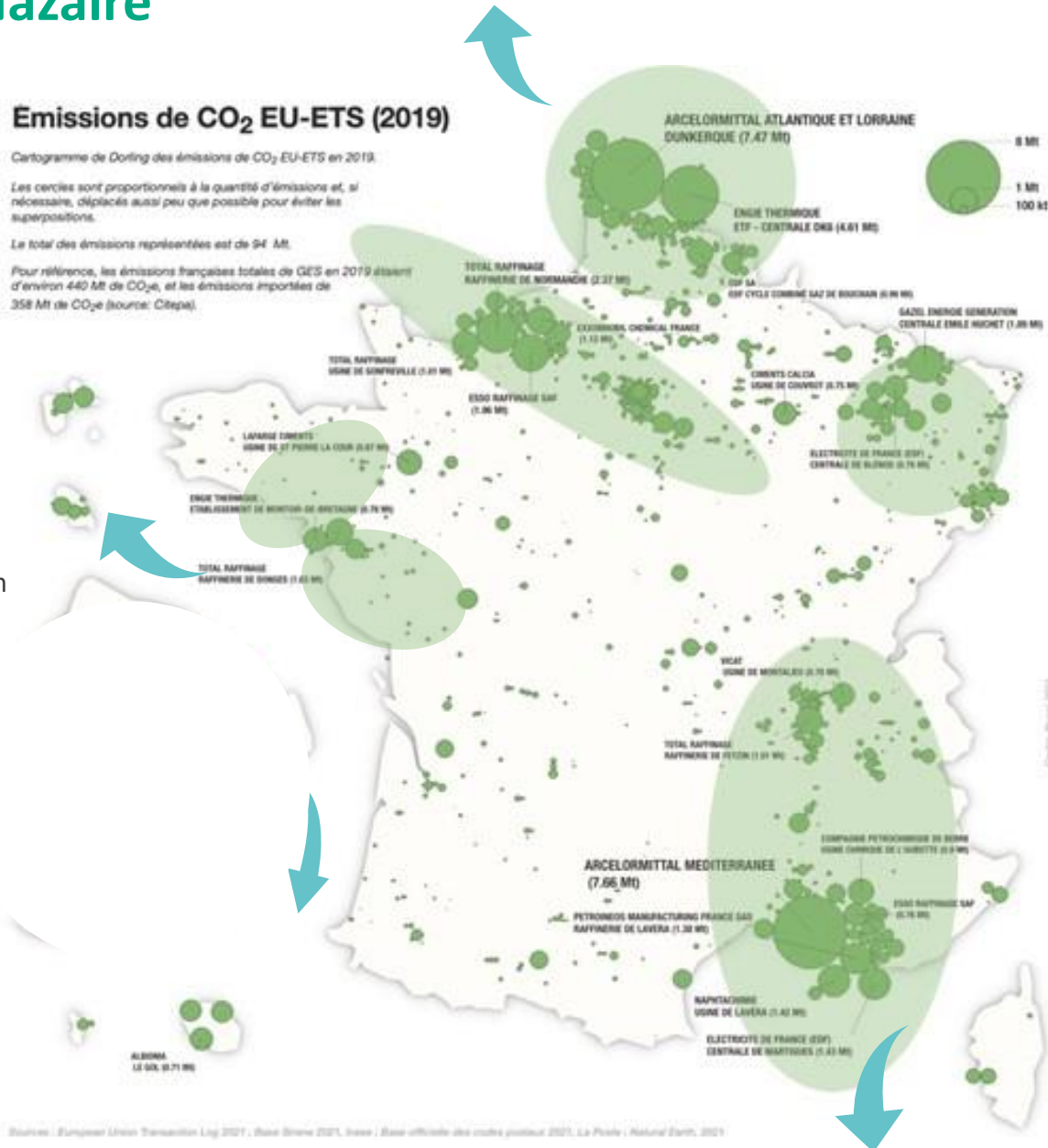
Emissions de CO₂ EU-ETS (2019)

Cartogramme de Dorling des émissions de CO₂ EU-ETS en 2019.

Les cercles sont proportionnels à la quantité d'émissions et, si nécessaire, déplacés aussi peu que possible pour éviter les superpositions.

Le total des émissions représentées est de 94 Mt.

Pour référence, les émissions françaises totales de GES en 2019 étaient d'environ 440 Mt de CO₂e, et les émissions importées de 358 Mt de CO₂e (source: Citepa).



DK CO2

Transport network to collect and valorize industrial CO2 emissions
CO2 export study

Feasibility studies done

GO CO2

~400km of pipeline on 35-53-79-85-44
To collect CO2 emissions and transport them to Montoir
Liquefaction for storage via ELENGY or local CO2 use

AMI in progress

CALLISTO

~ 300km of pipework to collect emissions in the RHONE Valley and FOS area for export to RAVENE (IT) via ELENGY

Structuring in progress



Thank you

Les

Rendez-vous Clients

GRTgaz

Les stratégies de
décarbonation :
témoignage
d'ArcelorMittal

Emmanuel Tillous-Borde
Jean-Victor Rotger

Interview



Emmanuel TILLOUS-BORDE

General Manager – Head of Energy Purchasing

ArcelorMittal



Thank you

Les

Rendez-vous Clients

GRTgaz

Decarbonizing
industry with
biomethane : levers
and tools

Aude Filippi
Sylvie Jadoul
Guillaume Vens

Summary



01

Introduction: dynamics of biomethane

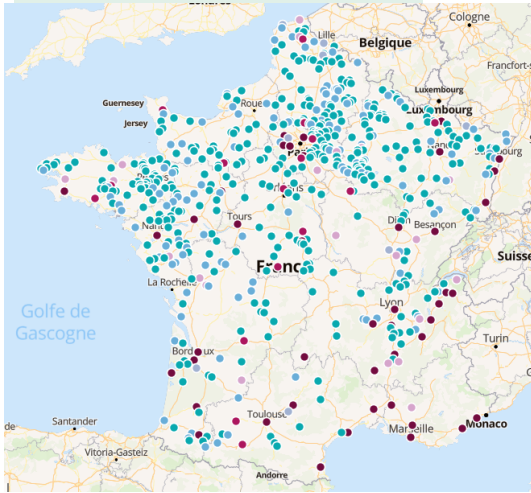
02

Buying Biomethane: how it works, the advantages of the new register, and sustainability

03

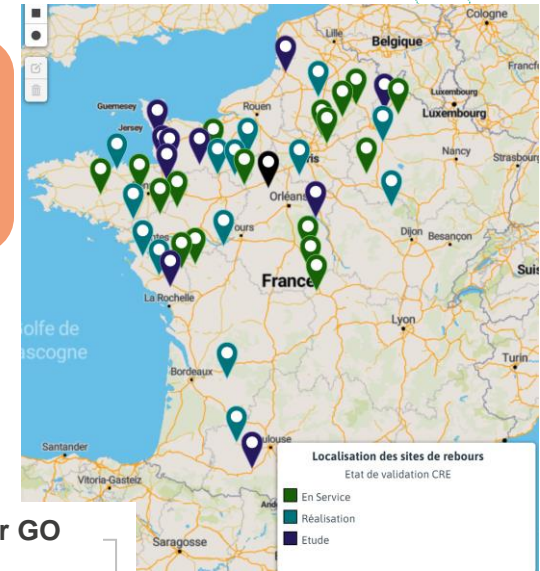
What about CPB?

Biomethane is a reality in the energy mix



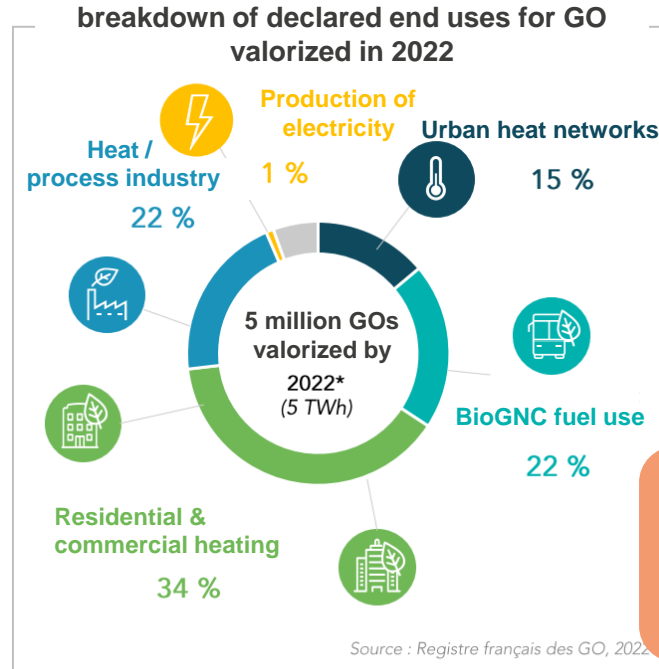
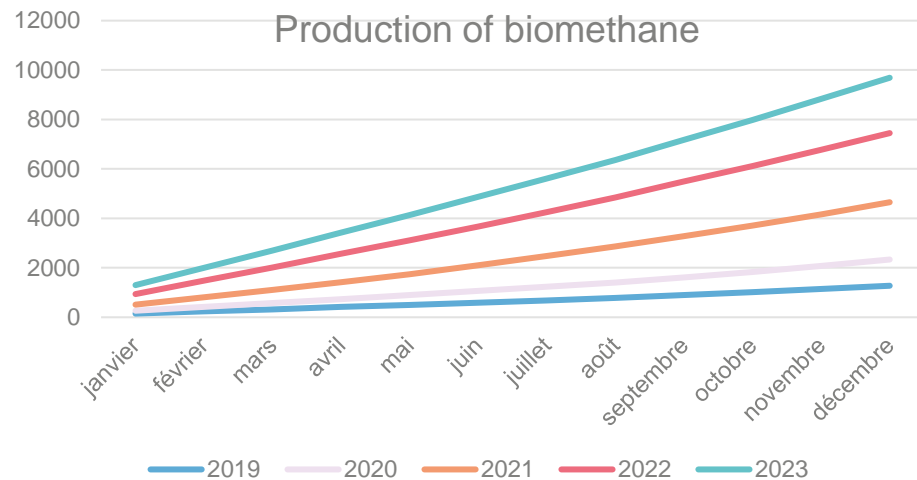
652 biomethane injection sites in France.
More than 800 by 2025 for 15TWh

Adapting network infrastructures :
20 revers flow in service
~40 by 2025



Mapping injection sites

9.7 TWh injected in 2023, i.e. 1.5% of annual French consumption



Reverse flow mapping
Data at 03/01/2024

22% of biomethane will be used by industry by 2022

Biomethane: European and French ambitions

RePowerEU: 380 TWh of biomethane in Europe by 2030, transposed into French law



RePowerEU

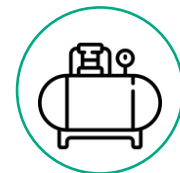
- Objective for the EU to be independent of Russian fossil fuel imports by 2030.
- A political commitment backed up by an industrial commitment: the Net Zero Industry Act, launched in March 2023, highlights biomethane as a strategic investment sector within the European Union.



X10
Current production

X2
Compare to the target
of Fit for 55

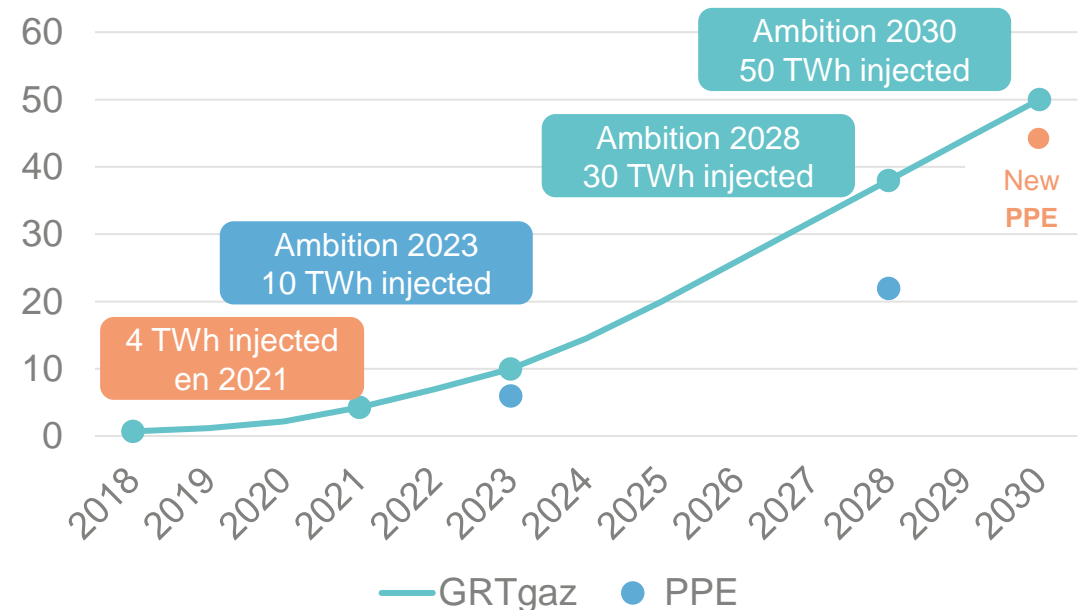
- Ambition confirmed in RED III: ENR target of up to **45% by 2030**



35 bcm
Of biométhane
production in 2030

Future PPE 2024 - 2032, Higher ambitions!

44 TWh of injected biomethane in 2030
→ 60 TWh of raccorded capacity for the new gas project in 2030



Summary



01

Introduction: dynamics of biomethane

02

Buying Biomethane: how it works, the advantages of the new register, and sustainability

03

What about CPB?

How can I be sure that I'm using green gas when I'm connected to a gas network?

1 MWh of biomethane injected = 1 guarantee of origin GO

A guarantee of **GO origin** is an electronic document that provides consumers with a guarantee of the **traceability of biomethane**, from its point of production to its point of **consumption**. It **is cancelled once used**.



1 MWh purchased + 1 GO = 1 MWh of green gas consumed

How to buy biomethane - GRTgaz

99.9% of current green gas purchasing contracts in France

Subsidized production



I buy

1 MWh of undetermined origin
+
1 "guarantee of origin" GO
from a subsidized producer

Price \approx market gas price + premium GO

2 cases of biomethane purchase agreements (BPA) in France

Unsubsidized production



I buy

1 MWh from partner producer
+
1 "guarantee of origin" from non-subsidized
partner producer

Price \approx production cost + expenses

Analysis of the Decree of 8/12/2022

Decree no. 2022-1540 of December 8, 2022 on guarantees of origin for biogas injected into natural gas networks



Biomethane with tariff

- A part that can be used in ETS (+ if RED2 sustainability criteria met)
- The other reserved for ESR
- Prorata ETS gas consumption/total gas consumption (France and N-2)



Biomethane unassisted

- Usable in ETS (if RED2 sustainability criteria met)



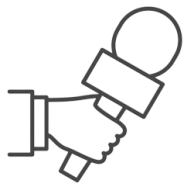
Biomethane by European GO

- Usable in ETS (if RED2 sustainability criteria met)
- Provided they have not already been booked in the state of origin

EEX - New assignee for the GO register



**New manager of the GO Registry
and CPB registers on 1/10/2023
(order of August 4, 2023)**



INTERVIEW



Interview with Aude FILIPPI

**Director Business
Development Gas &
Sustainability Markets**

European Energy Exchange AG

The advantages of biomethane



1- Biomethane's carbon content

- **6 times lower than natural gas!** If F.E ADEME base at 44g/kWh
- If positive externalities are considered =: 23g/kWh, i.e., a **10-fold reduction** in carbon emissions!

2- Circularity of the local economy

- Protection **centered in local areas**
- Within their local ecosystem (manufacturers, local authorities, farmers)
- **Local inputs!** No imports, unlike natural gas or uranium
- National or even local **energy autonomy!**



3- Preservation of industrial facilities

- Biomethane **properties identical** to natural gas!
- **No CAPEX**, no process or equipment changes
- **Gradual decarbonisation** according to YOUR roadmap



BPA – decoding for industrials

Results of joint GRTgaz - OSIRIS work



BIOMETHANE PURCHASE AGREEMENT



Un guide de décryptage
pour les industriels
consommateurs de gaz



The document is divided into four main sections

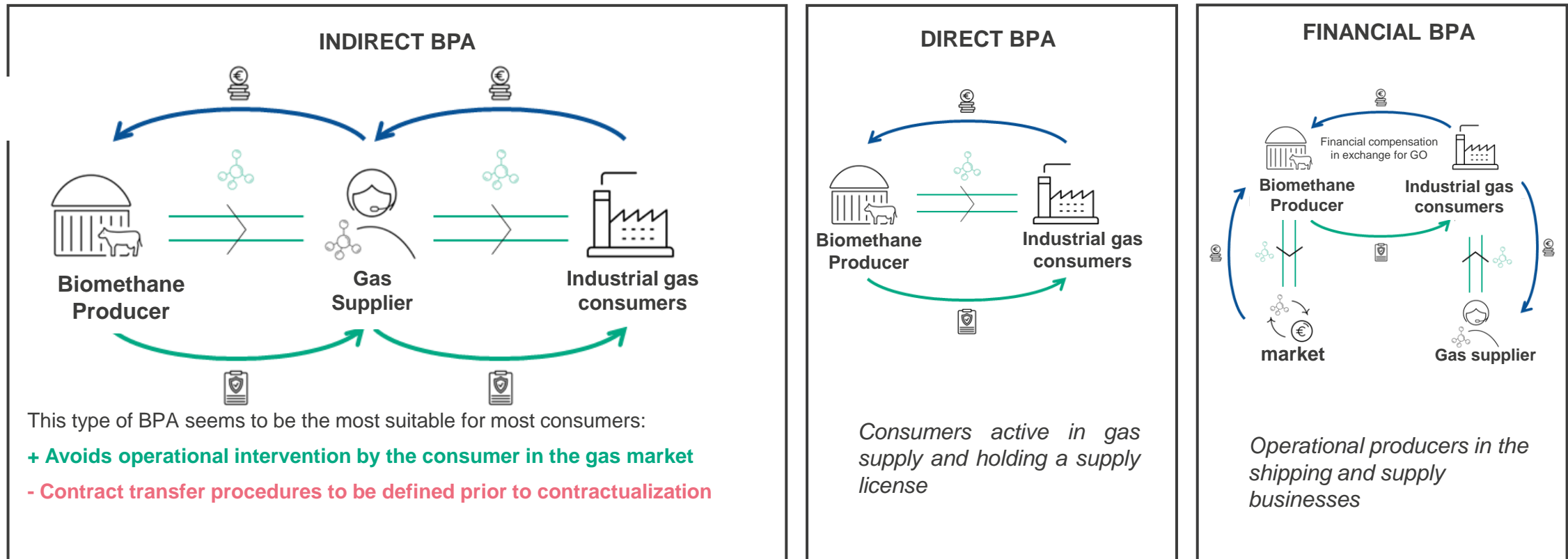
- *Biomethane presentation*
- *Definition of the different forms of BPA*
- *Frequently asked questions from industrial gas consumers*
- *Ten obstacles identified with suggested actions and examples from stakeholders*

OSIRIS and GRTgaz would like to thank E-CUBE and FINERGREEN for producing this guide, and AXPO FRANCE and WAGA ENERGY for their contributions.

BPA - Biomethane purchase agreement

Mechanism features

- A BPA is a simple extra-budgetary mechanism: it's a direct or indirect purchase contract between a producer and a consumer. The biomethane producer undertakes to sell the biomethane (energy, GO, sustainability certificate if applicable) at a price negotiated between the parties for a given period.
- GOs issued under a BPA are 100% eligible for the ETS, as they are not backed by the government.



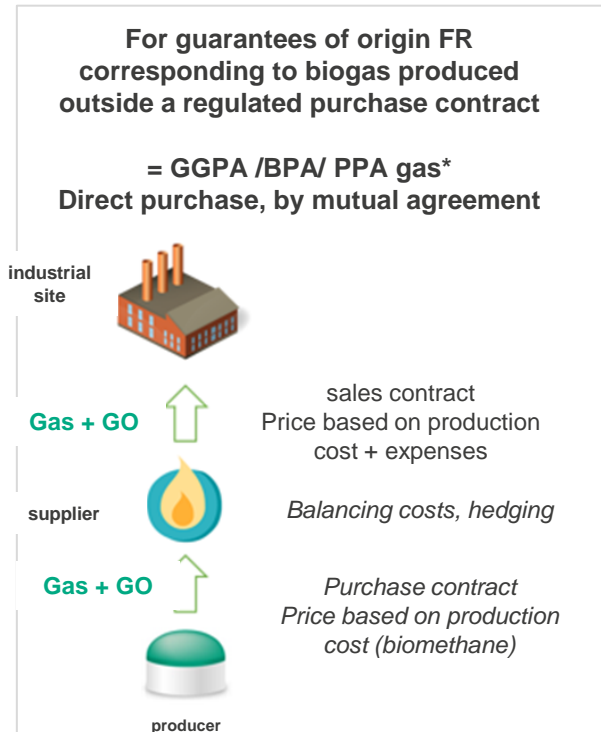
€ Cash flow

Energy

guarantee of origin (GO)

Biomethane and EU-ETS in France: growing interest in over-the-counter contracts between biomethane producers and an industrial

The complementary benefits of BPA:



Maximum decarbonisation

- GOs from non-subsidized purchases can be allocated 100% to the EU-ETS if they are sustainable.

Price stability

- Consumers are spared the volatility of market prices linked to security of supply.

Visibility of contractual terms

- Producer and consumer make a long-term commitment, over a period negotiated by mutual agreement

Additionality

- Generates new production capacity (greenfield)

A strong local presence

- Known identification of the producer site, and the direct contribution made by the consumer to the regional community (employment, waste management, digestates, etc.).

Effluent management

- The possibility of recycling waste from the industrial site

Summary



01

Introduction: dynamics of biomethane

02

Buying Biomethane: how it works, the advantages of the new register, and sustainability

03

What about CPB?

Biogas Production Certificates

Regulatory obligation for suppliers to incorporate renewable gas in their consumers

gas deliveries to



Part of the system is already in the regulatory framework *

Decree no. 2022-640 of April 25, 2022 on the biogas production certificate scheme

General principles



Operational procedures

* Articles L. 446-31 to L. 446-55 of the Energy Code introduced by the law n° 2021-1104 of August 22, 2021 on combating climate change and strengthening resilience to its effects.

Biogas Production Certificates view of producers

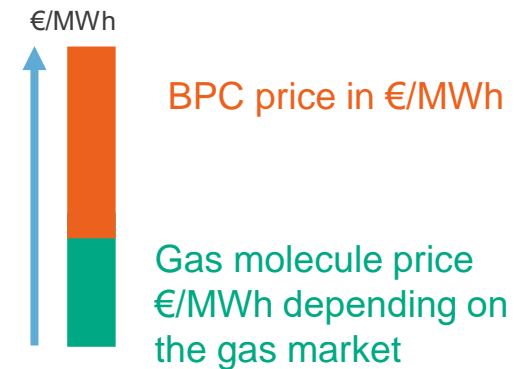


Typology of eligible projects

- Biomethane produced by capture on a and methanization in a digester.

Biogas producers in mainland France must comply with the following conditions :

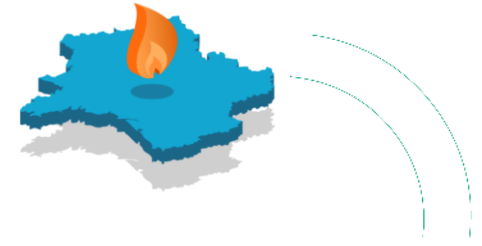
- No support **mechanism**,
- Meet **GHG and sustainability** criteria
- Respect the limit of supply by **food crops**
- The projected annual production of the PAP plant is defined at the outset, and only **1 change** in the plant's **PAP is authorized per 12-month period**.
- No BPC issued for biomethane injected into a natural gas network more than **the PAP**.
- Modulation defines the number of **BPC/MWh**



Producer remuneration

Negotiated remuneration with separate identification of energy and CPB shares

BPCs provide long-term financing for the industry without the need for direct government funding



Biogas Production Certificates

View of Suppliers

Operating principles

- **Obligation for gas suppliers to incorporate a proportion of biomethane**
- Every year, suppliers will have to return a volume of CPB proportional to the volume they market.
- **The obligation will initially apply to large suppliers** (annual deliveries or consumption in excess of 400 GWh HCV) and will gradually be extended to small suppliers (reduced threshold of 100 GWh HCV each calendar year).
- Visibility of the average price at which these certificates have been sold: **published monthly.**
- **Maximum penalty of €100/missing CBP** for non-compliance with obligation to return certificates to the State (could be revised to take account of inflation)



The volume of gas delivered for the calculation depends on the customers in the plate.



The amount of BPC required depends on the trajectory



The penalty effectively defines the BPC price ceiling

Biogas Production Certificates

Customer view



Operating principles

Customers in the plate :

- pay the additional cost of this obligation
- can benefit from a green offer up to the incorporation rate

Customers who are not in the plate are not eligible for BPC, except for :

- Buying surplus CPB from a supplier
- CPBs are ETS-eligible

Biogas Production Certificates

Current regulatory situation



Part of the system is already
in the regulatory framework *

Decree no. 2022-640 of April 25, 2022 on the biogas production certificate scheme

General
principles



Operational
procedures



... but some important practical details
should be clarified in 2024

Consumption
base

- **Gas consumers concerned**
- **The incorporation trajectories** and therefore the **volume of CPB** to be surrendered each year (for the 1st period)

Modulating
production
facilities

- **CPB/MWh** modulation ratios for generating units **by size and type**

The register

- Setting up the registry following the **August award to EEX**

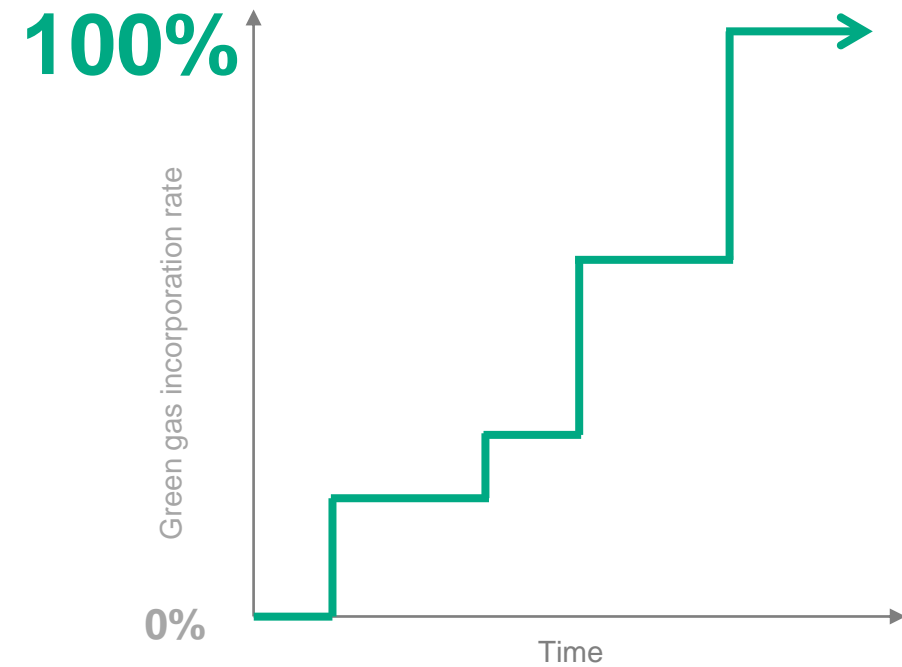
* Articles L. 446-31 to L. 446-55 of the Energy Code introduced by the law n° 2021-1104 of August 22, 2021 on combating climate change and strengthening resilience to its effects.

Do I need to invest in my production facilities to use green gas?

Decarbonization can be achieved without modifying industrial facilities, and with the same ease of operation as with natural gas.



Green gas enables gradual decarbonization





Thanks