EUROPEAN ENERGY SECURITY
GAS INFRASTRUCTURE CONTRIBUTION
FRENCH ILLUSTRATION

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Infrastructure Strategy – GDF SUEZ
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A leading Group in three buoyant businesses

Electricity

- **No.1** Independent Power Producer (IPP) in the world.
- **No.1** producer of non-nuclear electricity in the world.
- **118.2 GW** of installed power-production capacity.*
- **11.8 GW** of power capacity under construction.*

Natural gas

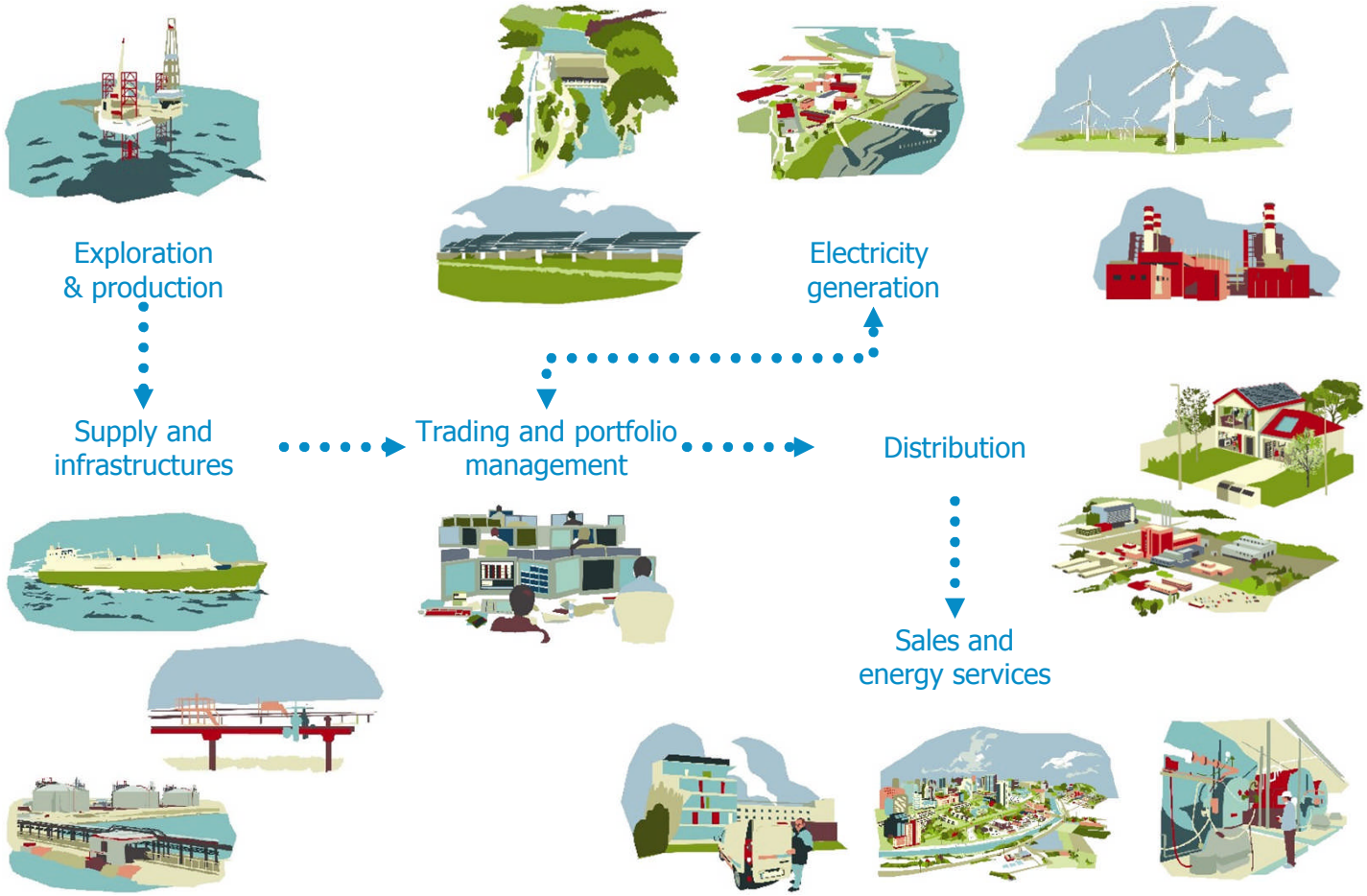
- **No.2** purchaser of natural gas in Europe.
- **No.3** importer of LNG in the world.
- **No.1** natural-gas transmission and distribution networks in Europe.
- A supply portfolio of **1,260 TWh** (115 bcm).

Services

- **No.1** supplier of energy and environmental efficiency services in Europe.
- **No.2** supplier of water and waste services in the world.
- **180** district heating and cooling networks operated worldwide.

* Including 100% of the capacity of GDF SUEZ assets at June 30, 2012 regardless of the actual holding rate.

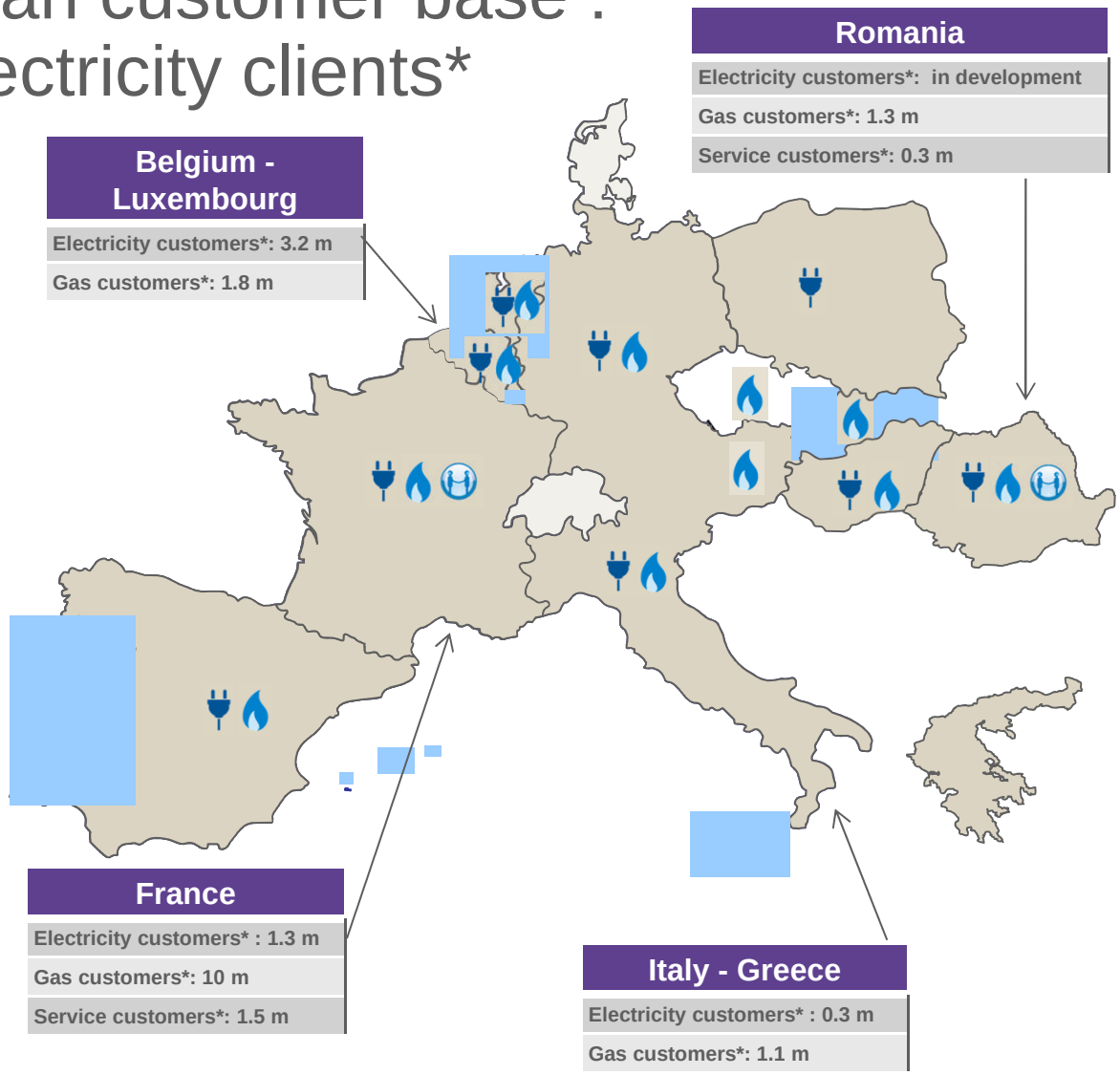
A presence across the energy value chain



A wide european customer base : 22 m gas & electricity clients*

- **> 80%** of sales in **Central Western Europe (CWE)**
- Strong position in **Belgium** (dual fuel) and in **France** (Gas)
- Significant sales in **Italy** and **Romania** (Gas)

		2011
	Power sales (TWh)	202 (**)
	Gas sales (TWh)	647 (**)
	Electricity customers*	5.4m
	Gas customers*	16.6m
	Service customers*	1.8m



2011 year-end figures
* Number of customer contracts

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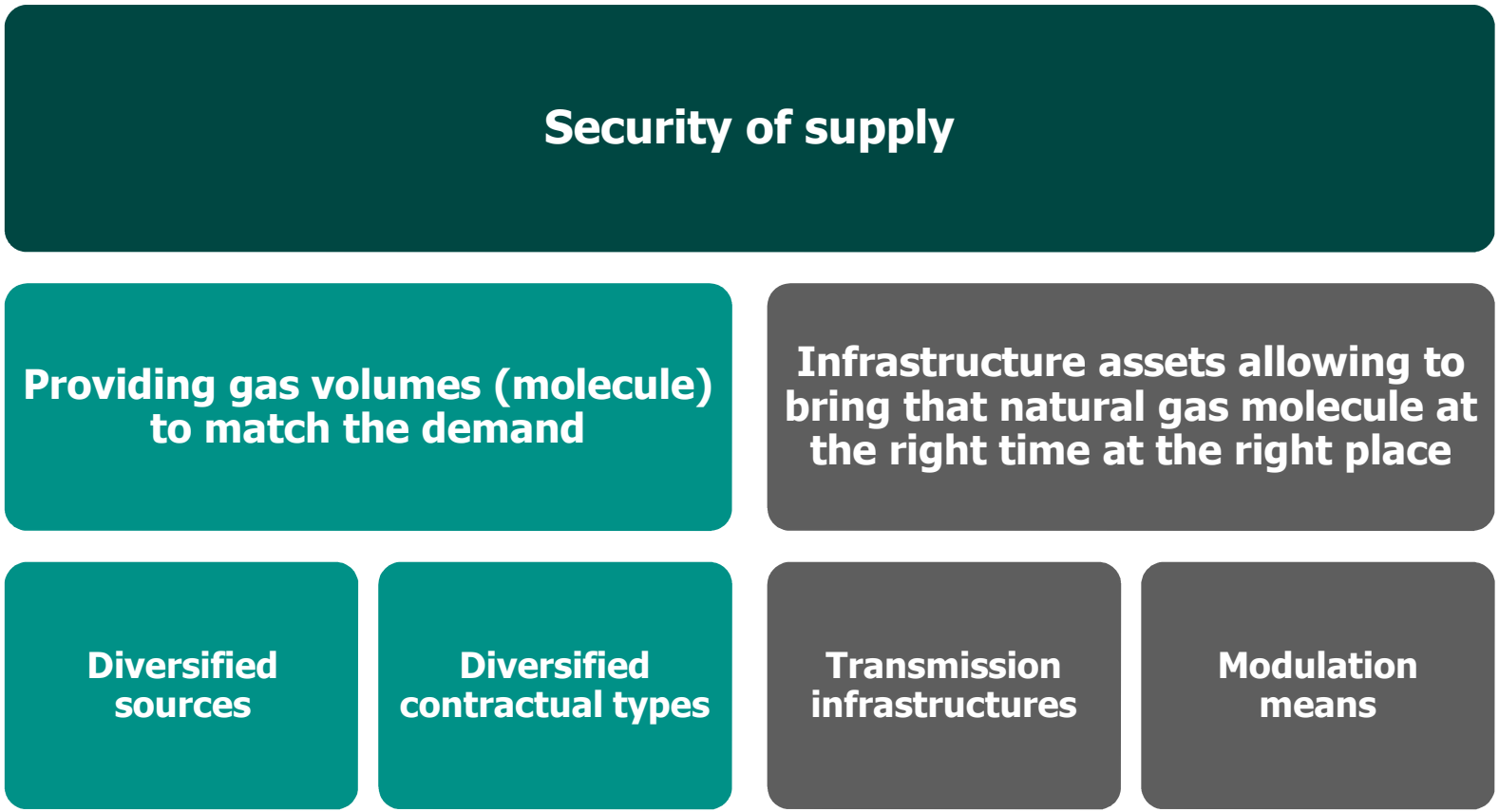
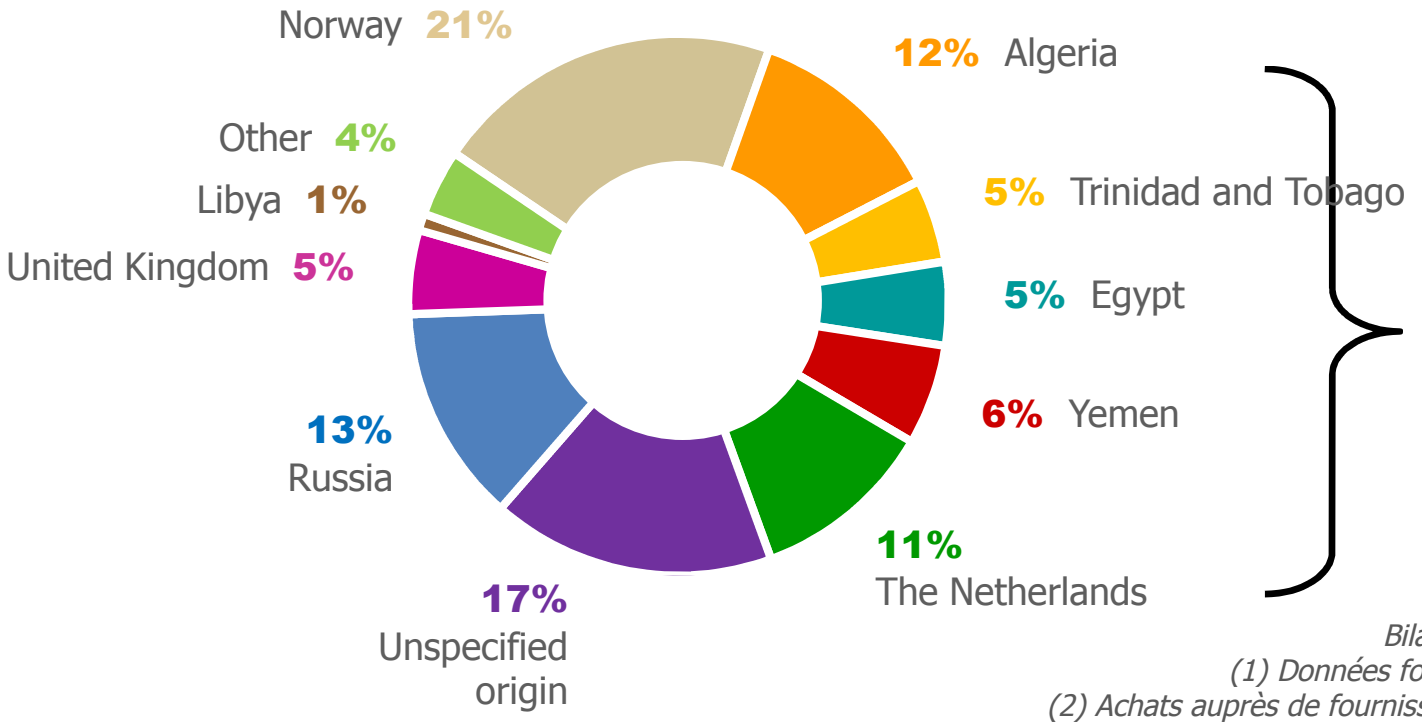
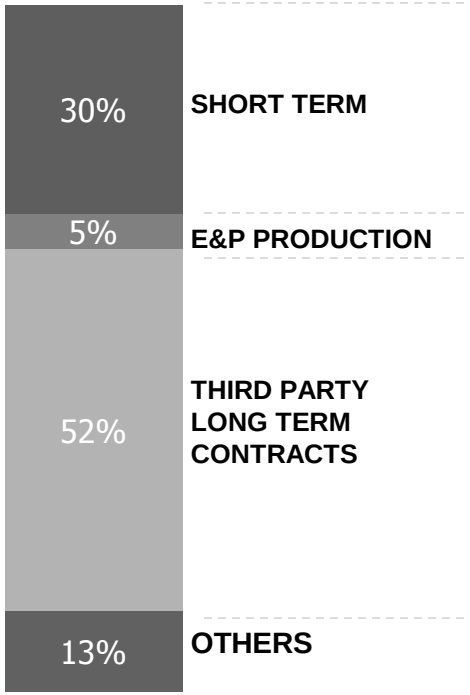
Security of supply is based on four components



A diversified and balanced natural-gas supply portfolio of 1260 TWh (115 bcm)

Breakdown of GDF SUEZ long-term natural-gas supply by source region et December 31, 2011





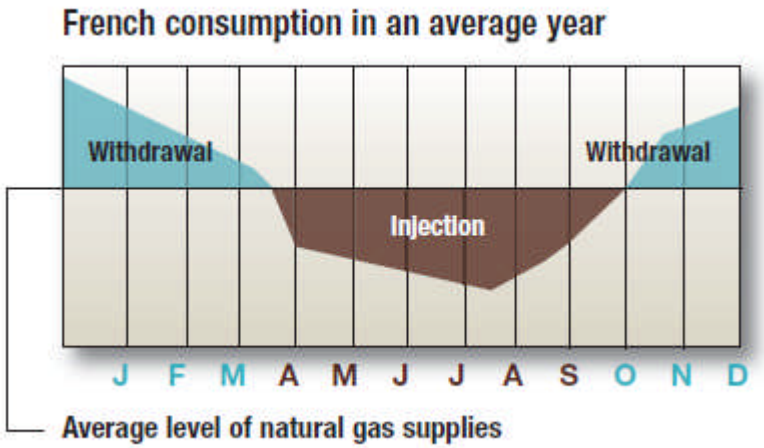
Bilan gaz GDF SUEZ en TWh, fin 2011
(1) Données fondées sur une méthode du Groupe
(2) Achats auprès de fournisseurs de gaz ; origine non spécifiée

Bringing the gas where and when needed

•Natural gas fields are often located far from the consumption areas which calls for transmission, whether by pipe or LNG boats

•Since the consumption pattern is not flat, modulation is needed to match the demand curve:

- Gas storages
- Contract flexibility
- Market spot sourcing



•Storages, being physical assets located inside consumption areas are also convenient back up resources when geology is favorable

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French gas system

- **Transmission network**
  37 500 km
  (32 200 km: GRTgaz, 3 300 km: TIGF),
  3 market areas

- **7 interconnexion points**
  2000 GWh/d import capacity
  (330 GWh/d export capacity)

- **3 LNG regas terminals**
  800 GWh/d import capacity
  (2 operators: Elengy et STMFC)

- **15 storage cavities**
  (2 operators : Storengy et TIGF)
  - 9 aquifer storages
  - 2 salt caverns
  - 1 depleted field
  - Available Capacity: 146 TWh
  - Withdrawal capacity: 3000 GWh/j

In France, law specifies means to ensure end customer's security of supply

- French regulation specifies the obligations of the natural gas provider and of the infrastructure operator :

- All providers should be able to ensure continuity of service for protected customers in the following circumstances:
  - A cold winter
  - A cold peak during three consecutive days
  - The unavailability, for a given provider, of its main supply source during six months

- If the provider's market share is above 5%, it should diversify its supplies' points of entry on national territory

- Providers with domestic clients are entitled to storage rights based on their customer portfolio. They also have the obligation to put in physical gas storages, 85% of their rights' volume by the beginning of each winter

The february 2012 european cold snap
A stress test

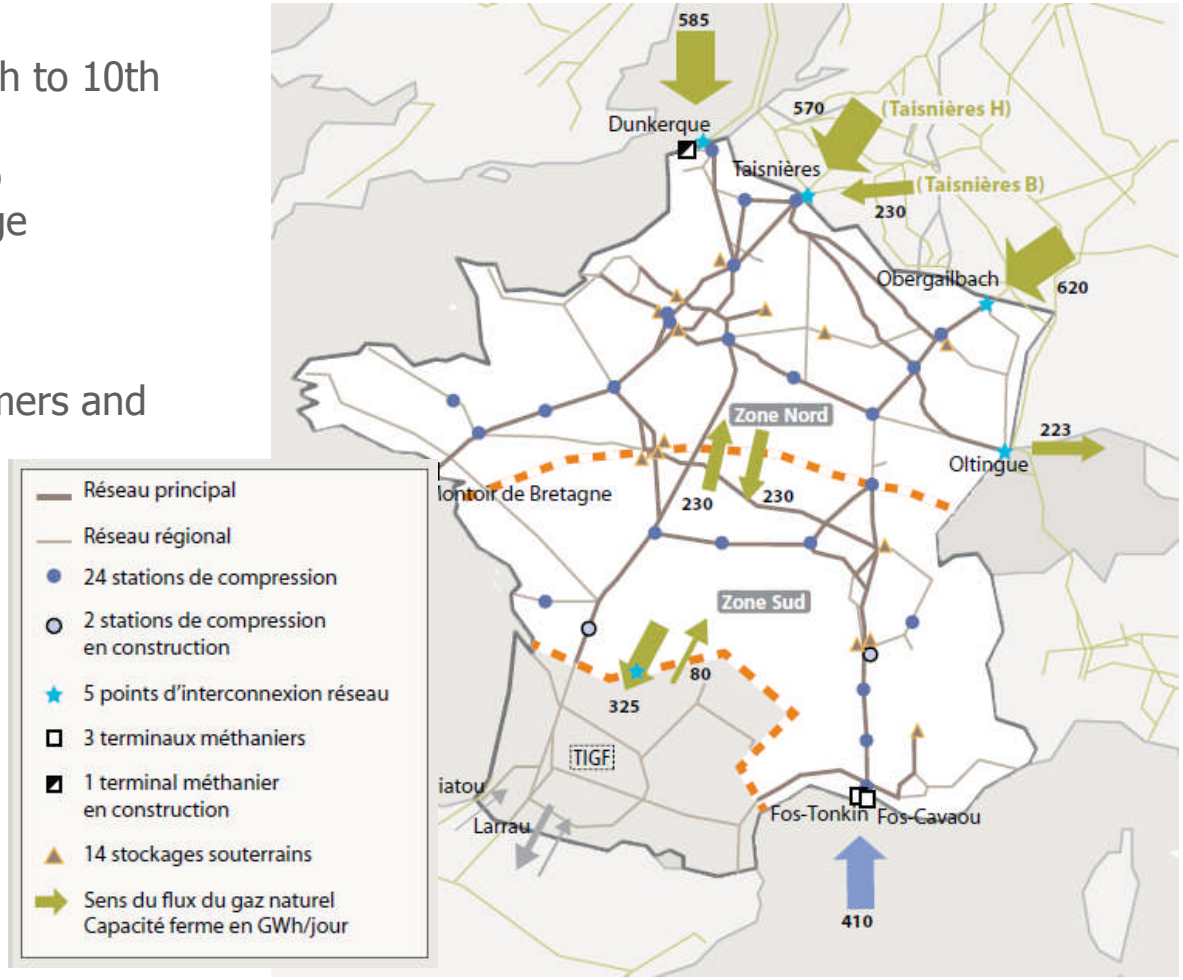
- February 1st to 13th colder from 6th to 10th

- Daily cold : 14% - period cold ~1%
- Consumption: 3 360 GWh in average
  - Peak: 3 700 GWh the 8th
  - 2 200 GWh/d the previous year

- Consumption for distribution customers and electricity gas based production
  - Electricity and gas system integration

- Storages: 1 900 GWh/d – 54%
- Exports
  - To Spain and Italy through Switzerld
- Lower Russian import levels
- Lower LNG regas emissions
- High market based transactions

All numbers source is CRE web site



➔Test passed
➔When tension occurs, the system provides resiliency by mutual back up… up to a point
➔How to define the optimum point, in terms of security, in terms of price for a service?

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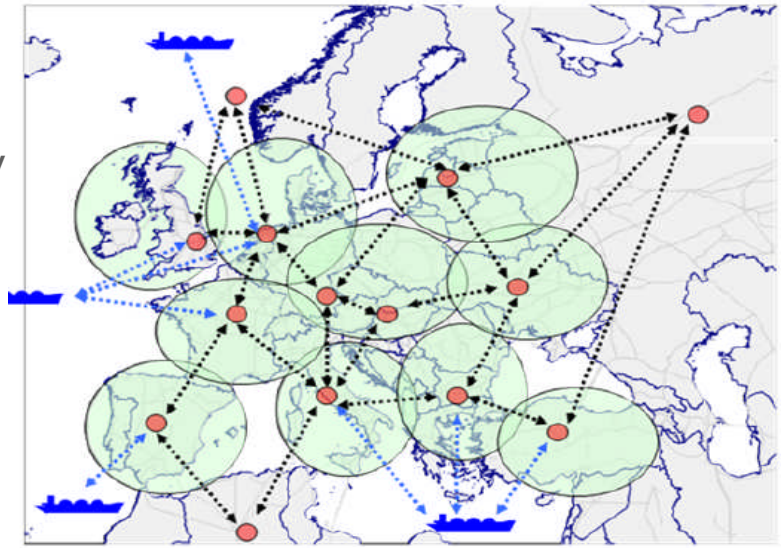
European regulatory challenges

• Security of supply is one of the three pillars of the EU energy policy

• More imports will be needed to ensure security of supply in Europe
➔ This calls for additional gas infrastructures

• Need for an adequate regulatory and legal framework providing:
  • Long term visibility
  • Stability

• Recognition of the significant role of gas in the long term



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In conclusion

• Security of supply is a key issue for customers, for energy actors and for the political world, both national and European

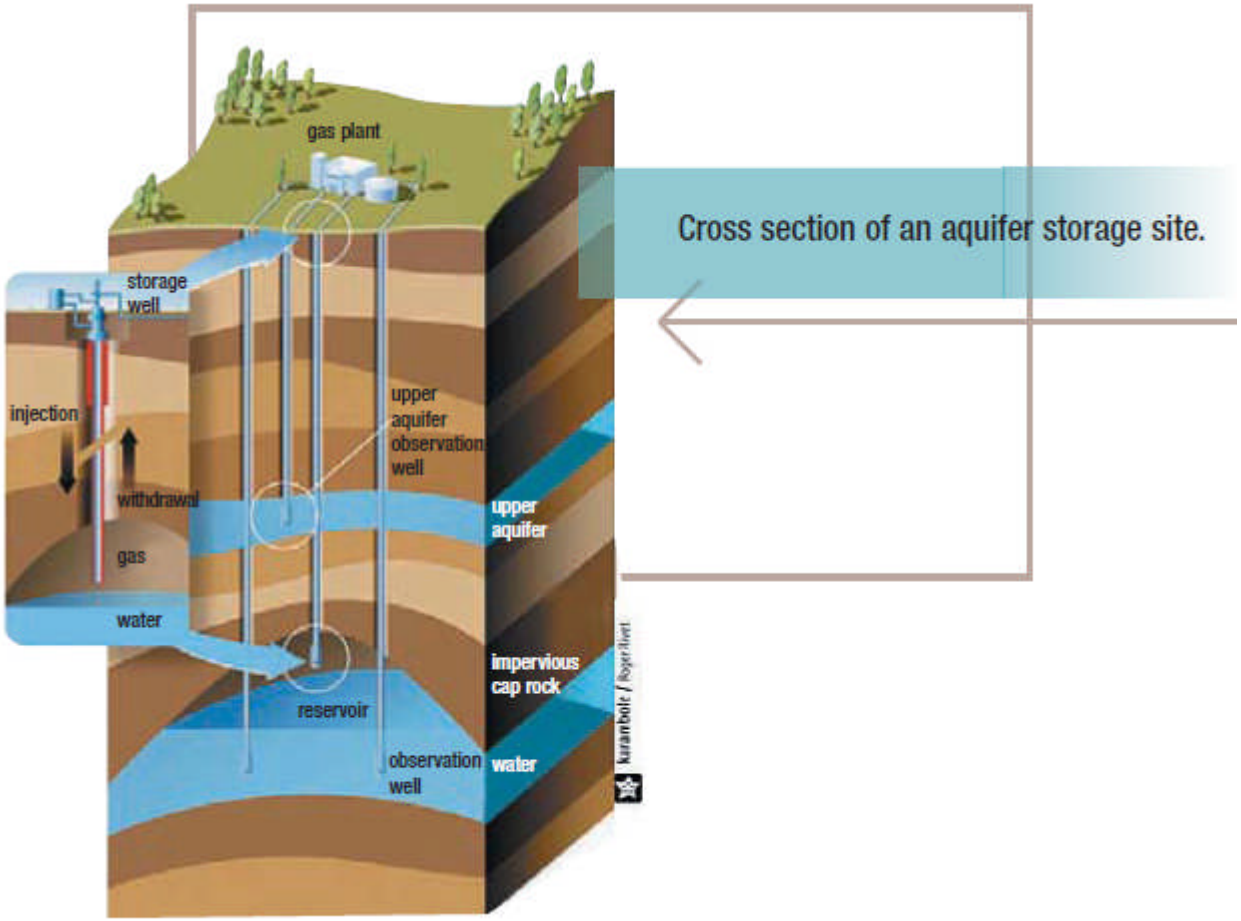
• Security of supply relies on having both natural gas and adequate infrastructures

• Investment in infrastructure needed to cope with the increasing imports can be decided if
  - the regulatory framework reflects a long term vision on natural gas and its place in the energy mix
  - and if this framework is stable

➔ Security of supply is reached by a delicate balance between estimated need, calculated cost and perceived benefit

gdfsuez.com

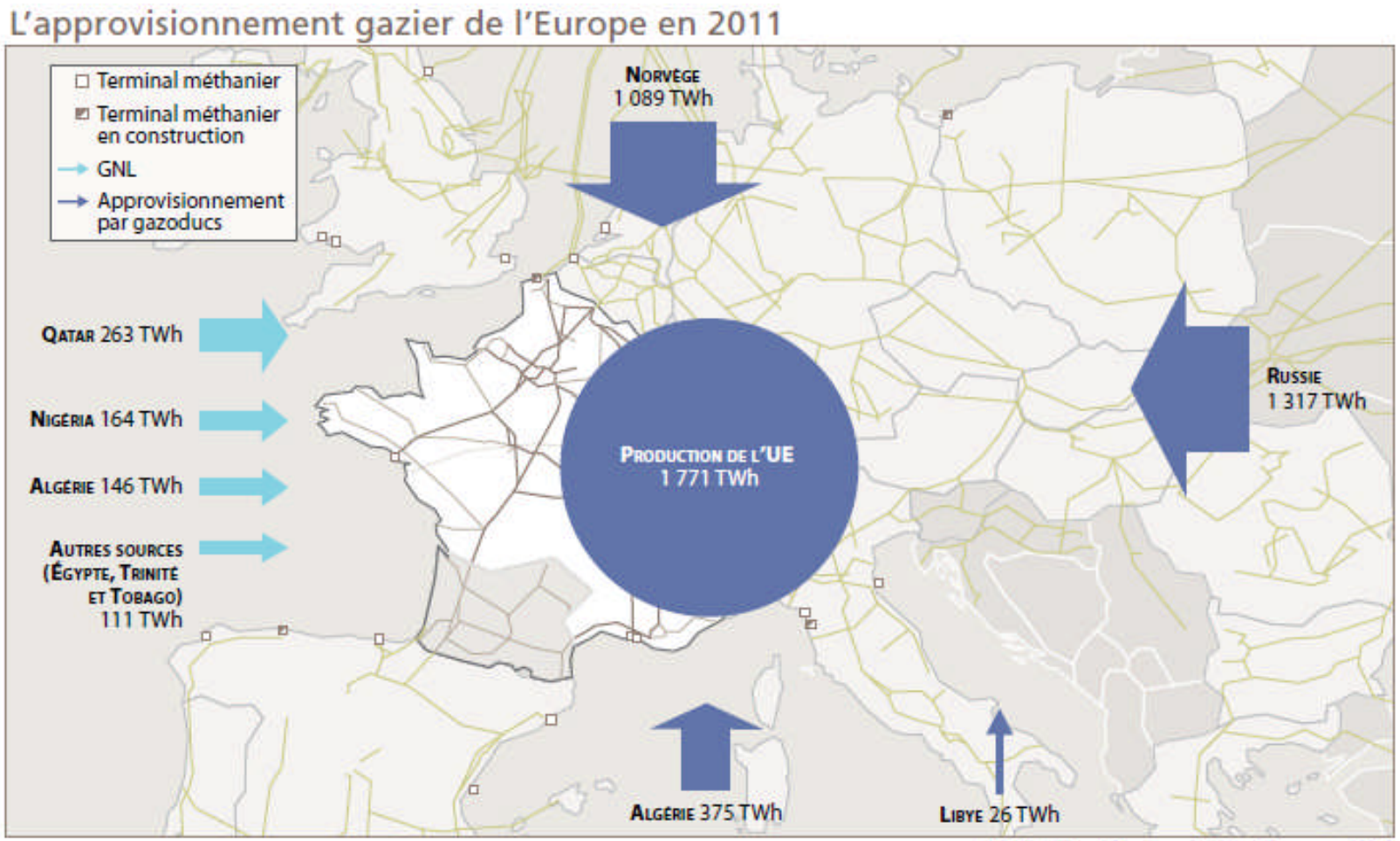
Aquifer storage



Cross section of an aquifer storage site.

Storage in aquifers:
Aquifer storage sites occupy geological structures similar to those of natural fields. They are used by injecting gas under pressure at great depth into the rock. The gas progressively displaces the water without changing the underground architecture. A true natural reservoir, the dome shaped structure is crowned with a tight cap rock which ensures the gas is kept underground.

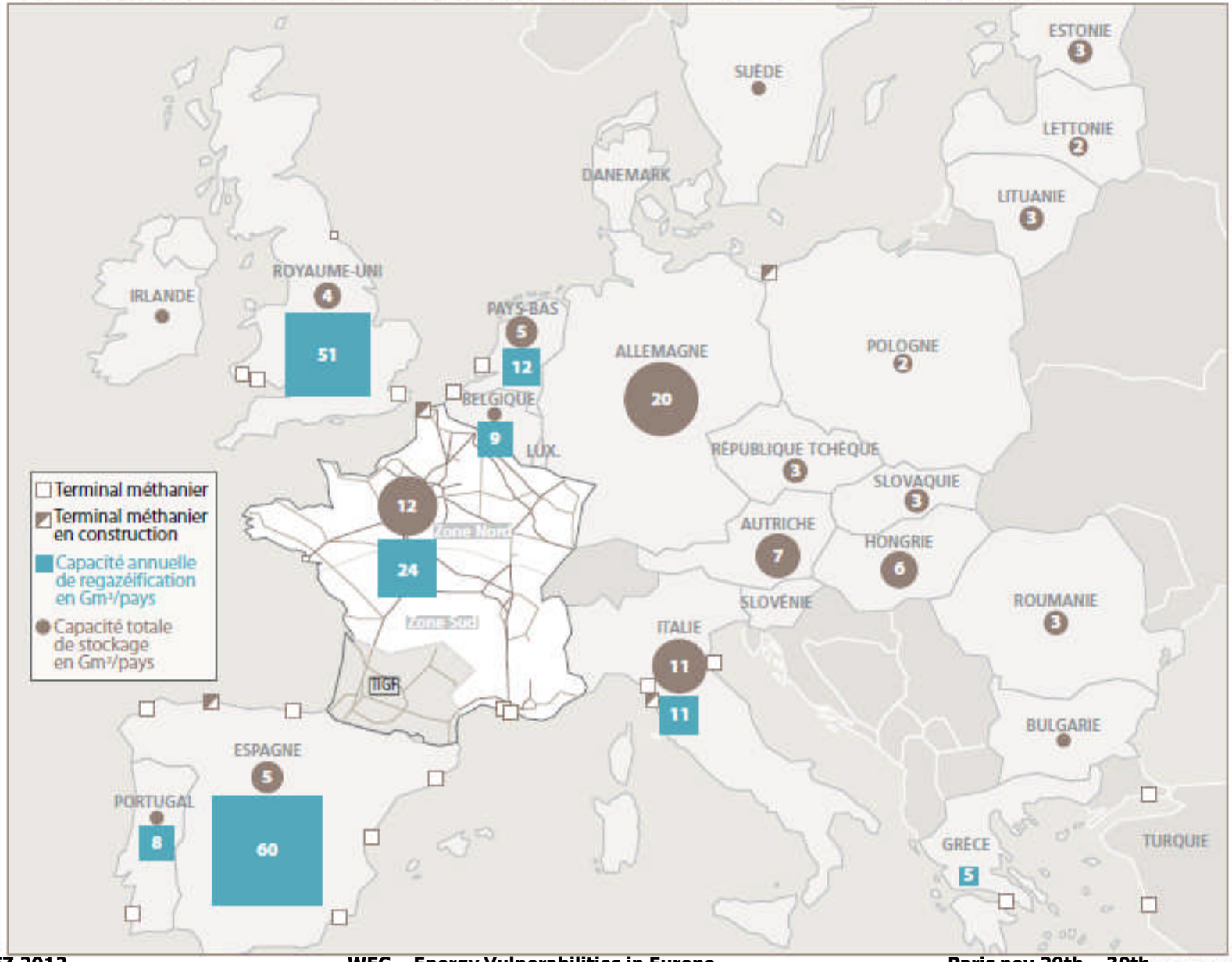
European natural gas supply in 2011



BP Statistical Review of World Energy 2012

European gas storage and regas. capacities

Les capacités de stockage et de regazéification dans l'Union européenne



GIE 2012