



good new energy

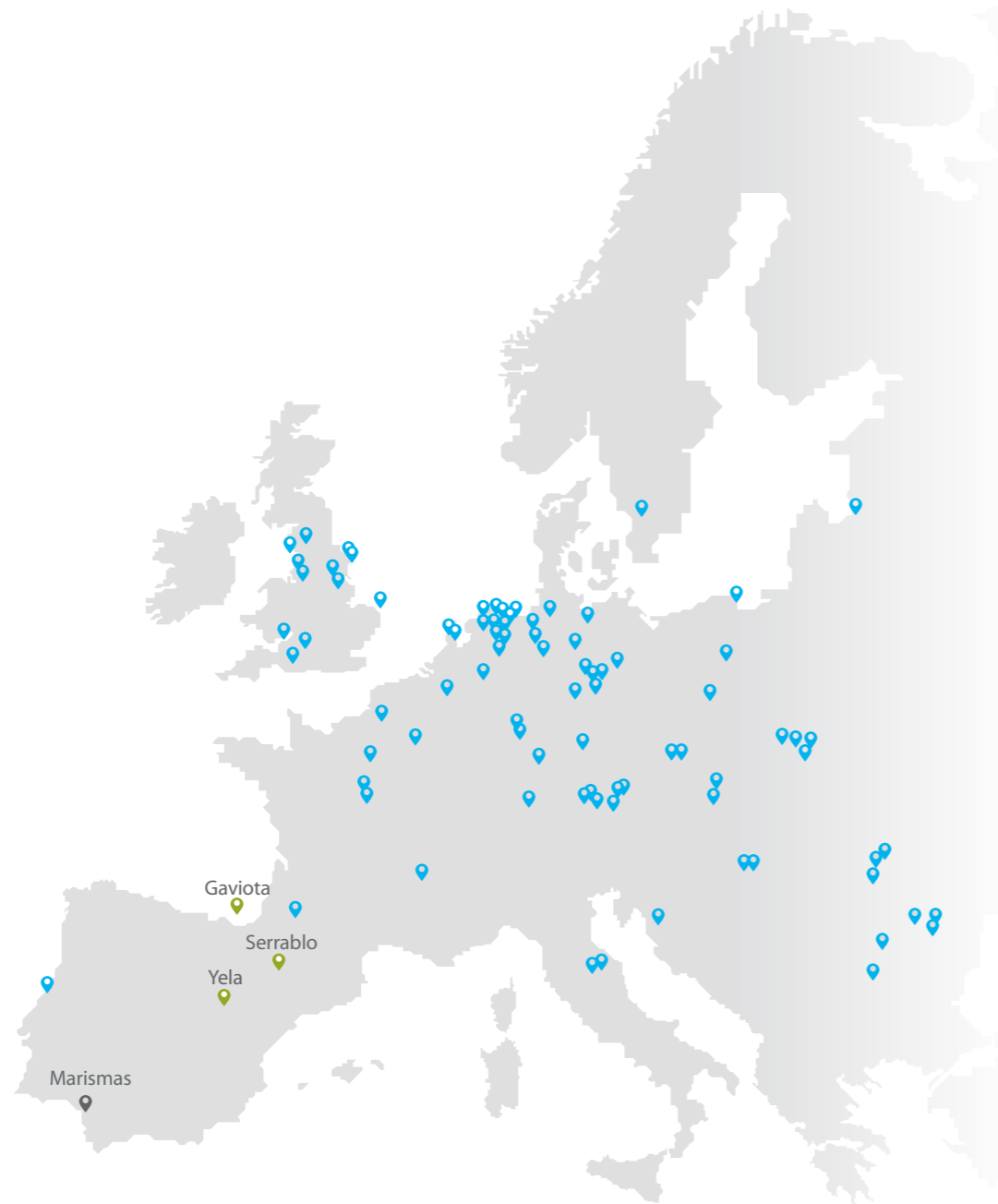
Underground storage facilities



A century of underground storage facilities

Natural gas underground storage is a key infrastructure in energy systems. The first dates back to 1915, and today there are more than 700 in the world, including one under the city of Berlin. In Spain, Enagás manages the three main operating storage facilities that play a strategic role in the Spanish Gas System, a reference model for other countries in safety and diversification of supply.

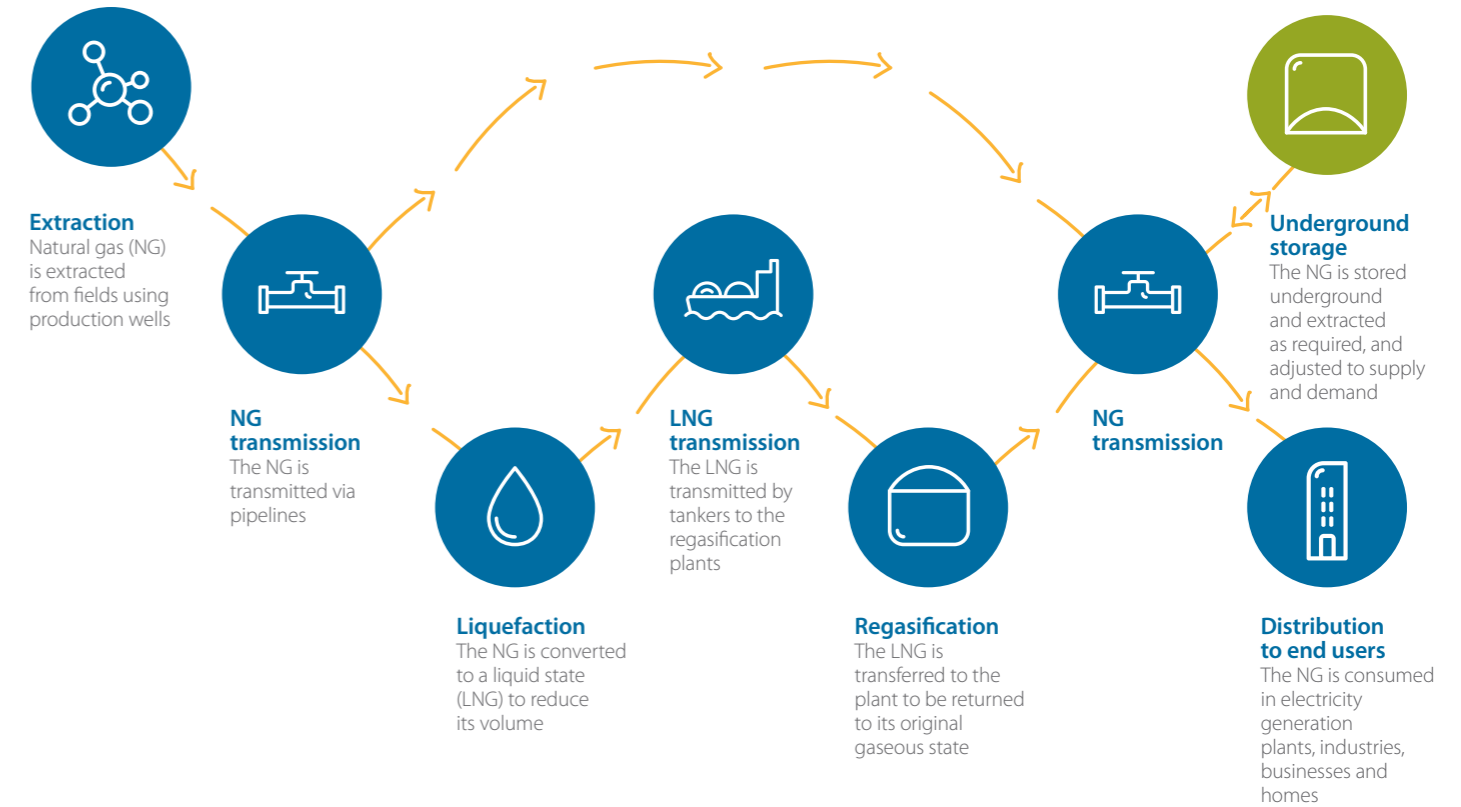
- They modulate the differences in consumption between winter and summer
- They maintain strategic stocks
- They contribute to guaranteeing supply



- 📍 Main storage facilities in operation in Europe
- 📍 Enagás storage facilities
- 📍 Other storage facilities

Enagás, with 50 years' experience and presence in Latin America and Europe, is an international benchmark in the development and maintenance of gas infrastructures and the operation and management of gas networks. It is a certified European Union TSO (Transmission System Operator), which accredits it as an independent operator in any European country. In Spain, it is also the Technical System Manager. Gas infrastructures are a core element in the energy transition towards decarbonisation. Our network in Spain is ready for the transmission and storage of gas produced from renewable sources.

A key player in the natural gas value chain

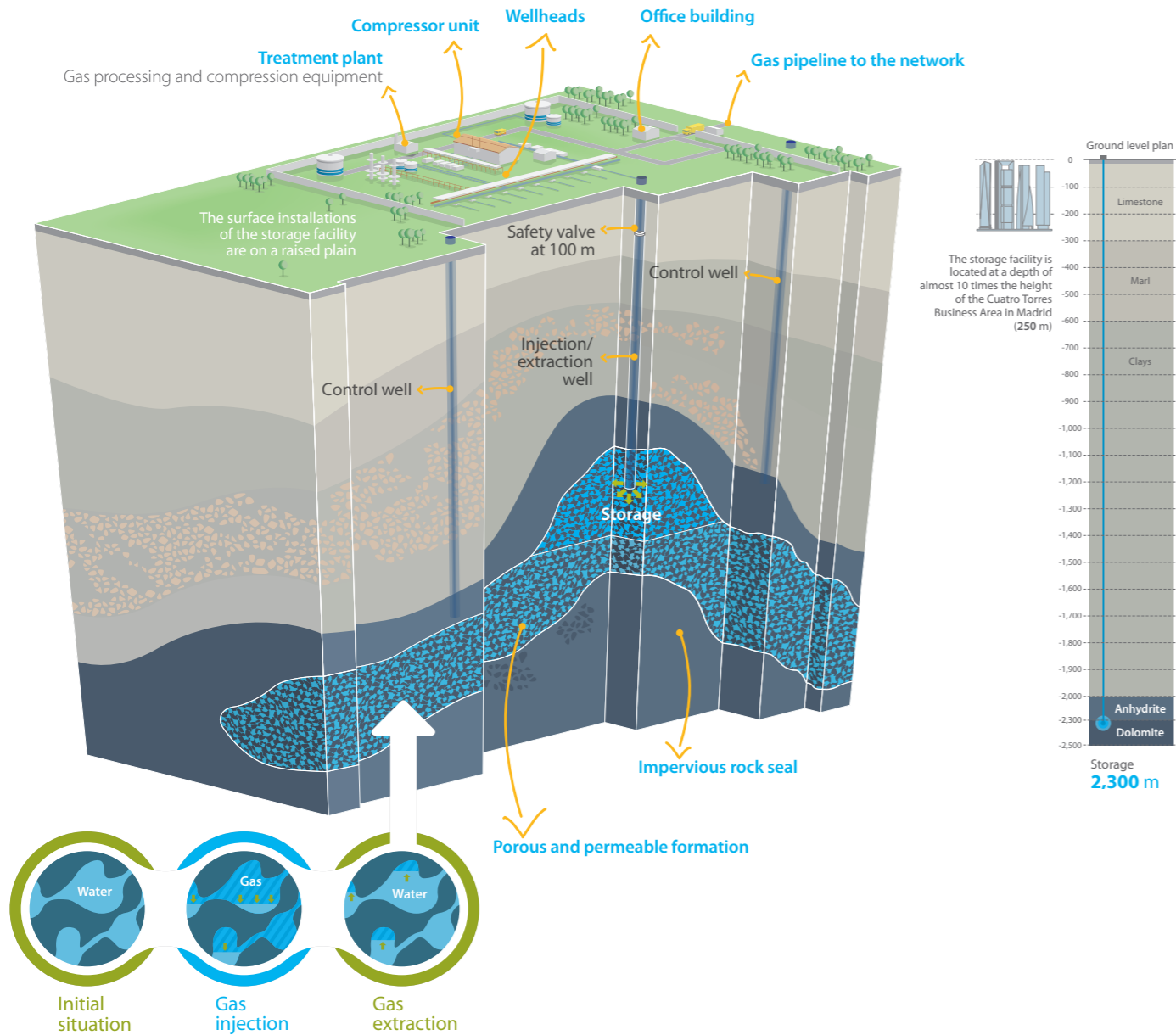


Underground storage facilities are key infrastructures in the natural gas value chain, since they **allow supply to be adjusted to demand, in order to cope with peaks in consumption.**

In Spain, with the implementation of the **European Network Code on Gas Balancing of Transmission Networks**, underground storage facilities also play an **important role as a tool available to shippers** to balance their portfolios in the transmission network.

Onshore storage facility model: Yela

We have designed and conceived this storage facility under strict efficiency criteria, ensuring maximum security and availability.

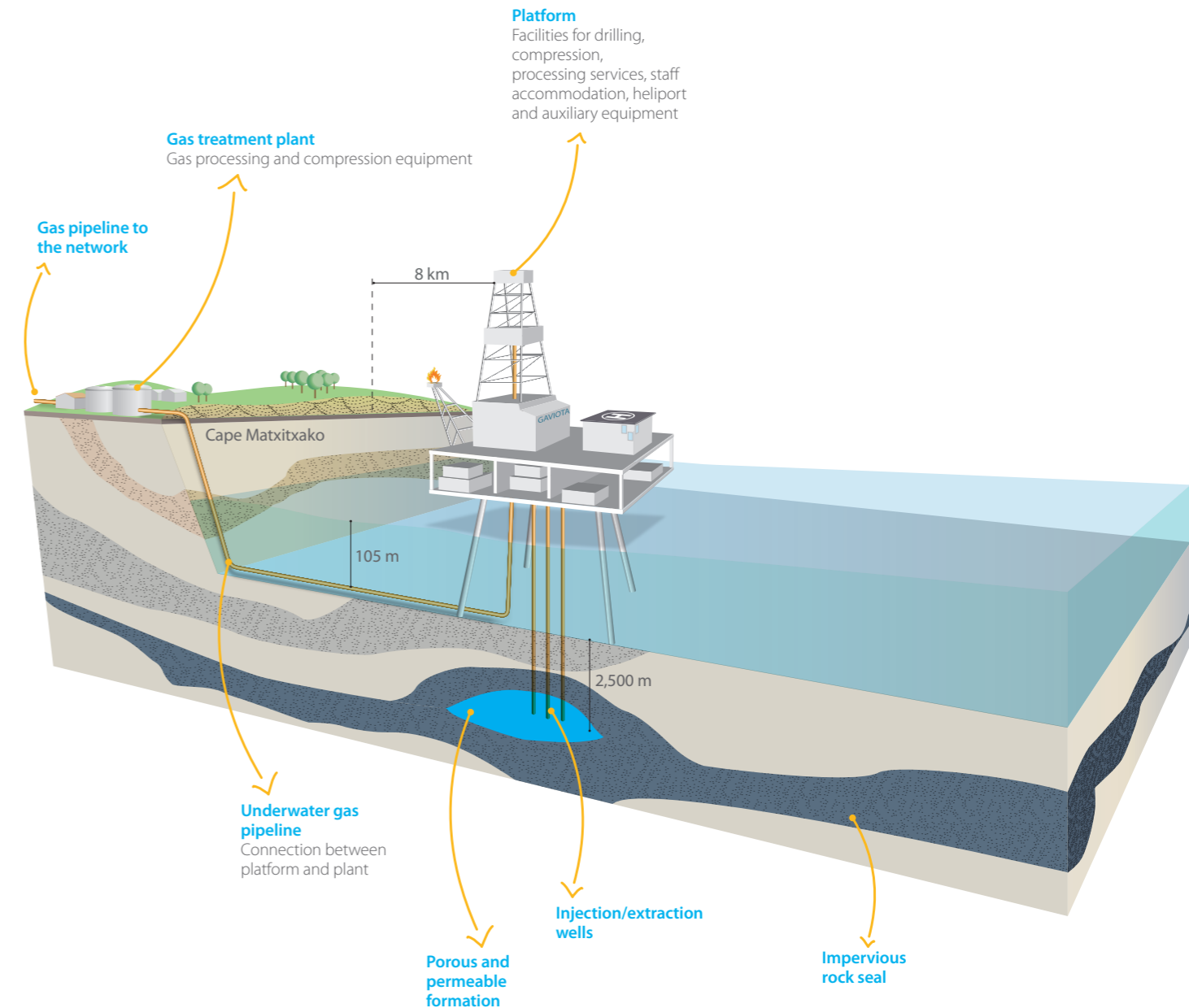


The Yela underground storage facility is operated remotely and is notable for its low environmental impact:

- All its facilities are in a single location.
- Minimal emissions.
- A large part of the process has been soundproofed.

Offshore storage facility model: Gaviota

Our management capacity and experience have allowed us to develop and operate complex infrastructures that are now a benchmark in this sector.



Gaviota is one of the few offshore storage facilities in the world. This type of infrastructure, which combines facilities on land and sea, requires specific logistics and maintenance.

Enagás underground storage facilities

Yela

Guadalajara

Working gas	1,050 mill. m ³ (n)
Cushion gas – Non-extractable	900 mill. m ³ (n)
Maximum injection	10 mill. m ³ (n)/d
Maximum withdrawal	15 mill. m ³ (n)/d

2,000
million m³ (n)
total capacity



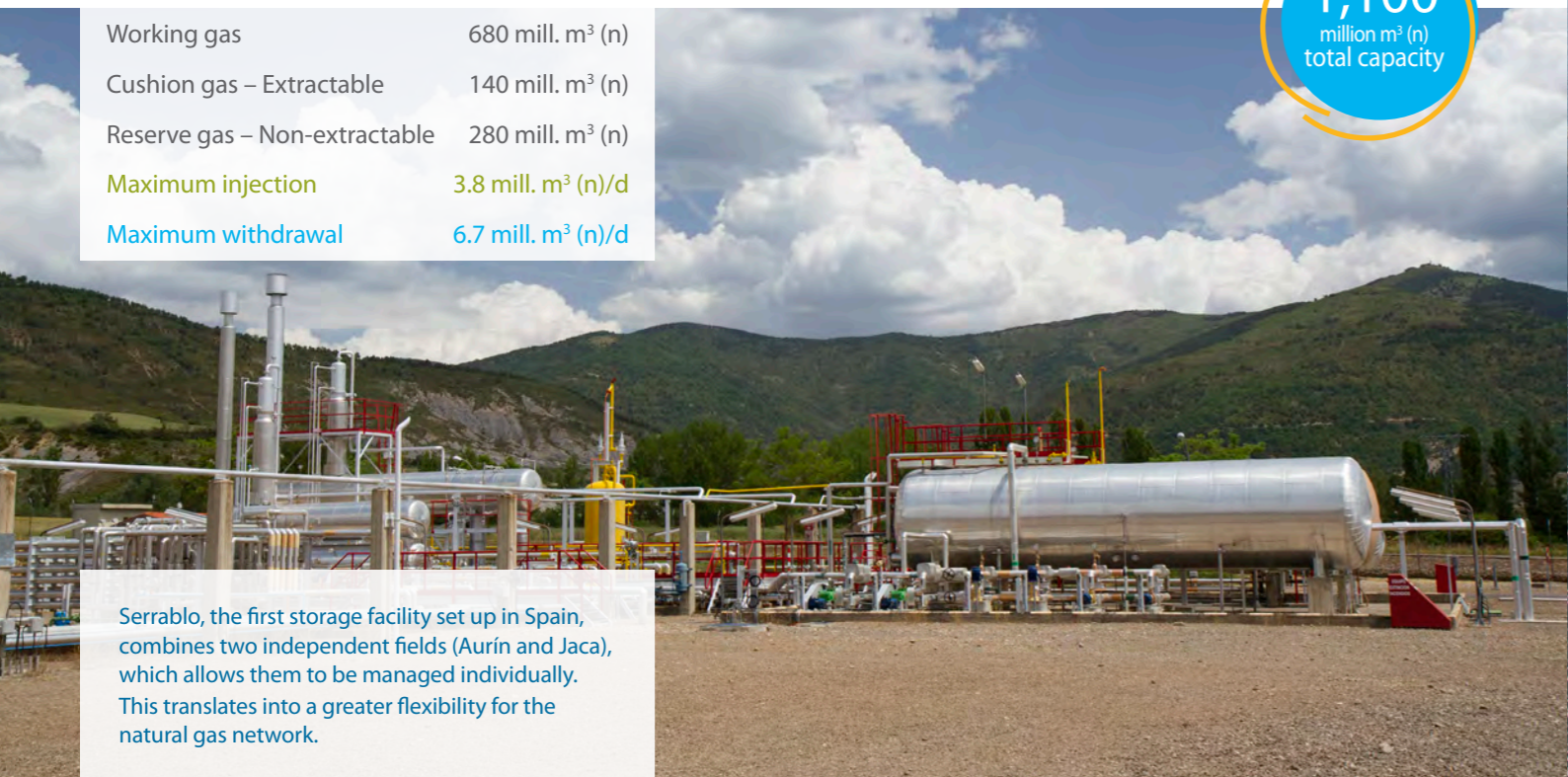
Its strategic location in the centre of Spain makes Yela a key piece infrastructure for guaranteeing supply. It provides great flexibility to the Gas System, allowing almost seamless switching from injection to extraction and vice versa.

Serrablo

Huesca

Working gas	680 mill. m ³ (n)
Cushion gas – Extractable	140 mill. m ³ (n)
Reserve gas – Non-extractable	280 mill. m ³ (n)
Maximum injection	3.8 mill. m ³ (n)/d
Maximum withdrawal	6.7 mill. m ³ (n)/d

1,100
million m³ (n)
total capacity



Serrablo, the first storage facility set up in Spain, combines two independent fields (Aurín and Jaca), which allows them to be managed individually. This translates into a greater flexibility for the natural gas network.

Gaviota

Bizkaia

Working gas	980 mill. m ³ (n)
Cushion gas – Extractable	567 mill. m ³ (n)
Reserve gas – Non-extractable	1,134 mill. m ³ (n)
Maximum injection	4.5 mill. m ³ (n)/d
Maximum withdrawal	5.7 mill. m ³ (n)/d

2,681
million m³ (n)
total capacity

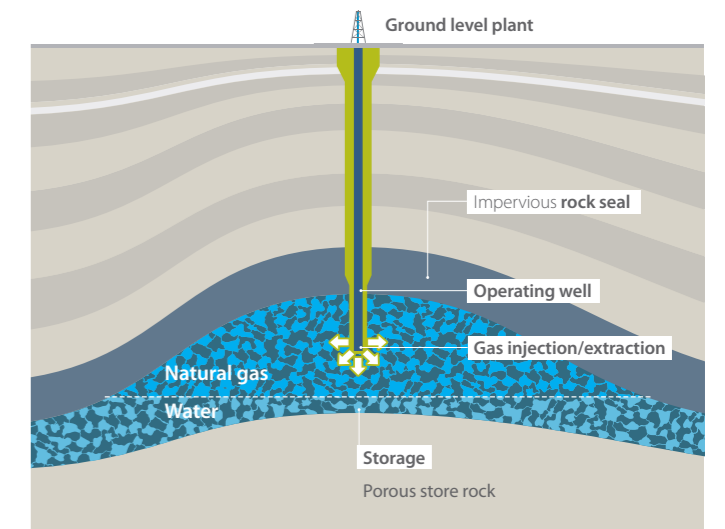


Located in the Bay of Biscay and connected by pipeline with a gas treatment plant onshore, Gaviota has the capacity to offer a stable flow of gas during most of the production season.

How a storage facility works

Two fundamental processes take place in an underground storage facility: the injection and the extraction of natural gas. During the **injection** process, natural gas from the basic gas pipeline network is compressed in order for it to be injected in deep formations. The injected gas that occupies a much smaller volume than it does at ground level displaces the water filling the pores of the storage rock, which is sealed by an upper layer of impervious rock.

During the **extraction** phase, the natural gas is removed from the storage facility and is treated to comply with the specifications required by the national regulation for transmission via the gas network (dew point of water, dew point of hydrocarbons, etc.). Finally, the natural gas is odorised before entering the network.



A system that imitates nature

Gas has been stored naturally for millions of years. Underground storage facilities mimic this process by making use of a natural formation, former depleted deposits or salt aquifers for the storage of natural gas underground.

The Serrablo, Gaviota and Yela facilities are managed in accordance with the highest standards of security and respect for the environment.



Underground storage facilities



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