

gasunie

crossing borders in energy



Market Consultation

Glycol drying unit for the benefit of N.V. Nederlandse Gasunie / HyStock

N.V. Nederlandse Gasunie
Groningen, 2023

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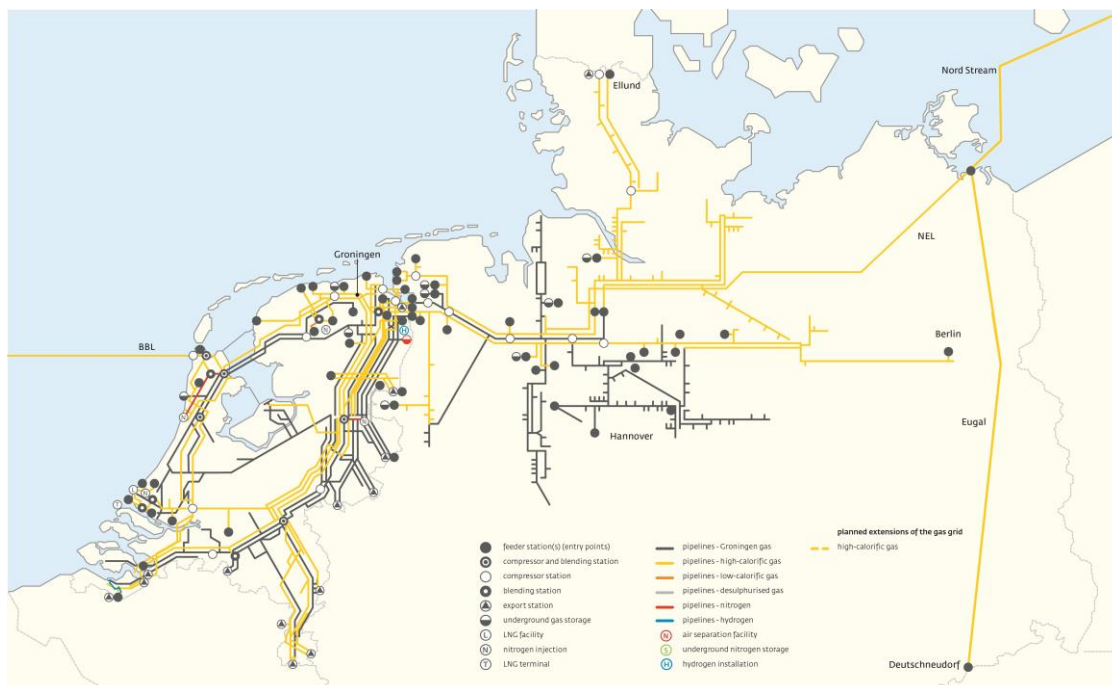
1 GENERAL INFORMATION

1.1 N.V. Nederlandse Gasunie

Gasunie is an energy infrastructure company. In the Netherlands and Northern Germany, we manage the infrastructure for large-scale transport, storage and conversion of gas, currently still mostly natural gas. With the energy transition, this is increasingly shifting towards green gas and hydrogen. We are also working on the construction and management of heat and CO₂ networks.

Our duty is to provide safe, reliable, affordable and sustainable energy infrastructure services, making energy available to everyone at all times. Safety, reliability, sustainability and cost awareness are paramount.

The Gasunie network is one of the largest high-pressure gas transport networks in Europe and consists of more than 15,000 km of pipelines, 1,000 gas receiving stations and dozens of installations in the Netherlands and Northern Germany. Gasunie's infrastructure is part of the 'gas roundabout' of Europe. This network allows the gas to be traded and transported easily. The annual throughput of gas is approximately 100 billion cubic meters.



Our mission

Gasunie is a leading company in the field of energy infrastructure in Europe. The transportation and storage of gas are our core business. We serve the public interest and facilitate the energy transition by offering integrated infrastructure services. We focus on value creation for our shareholder(s) and other stakeholders, and apply the highest industrial safety and business standards.

Our vision

We believe in a sustainable future with a balanced energy mix and a continuing role for gas from various sources. We believe that we offer our customers the best service by offering innovative solutions in the field of infrastructure, particularly gas infrastructure.

Our three pillars:

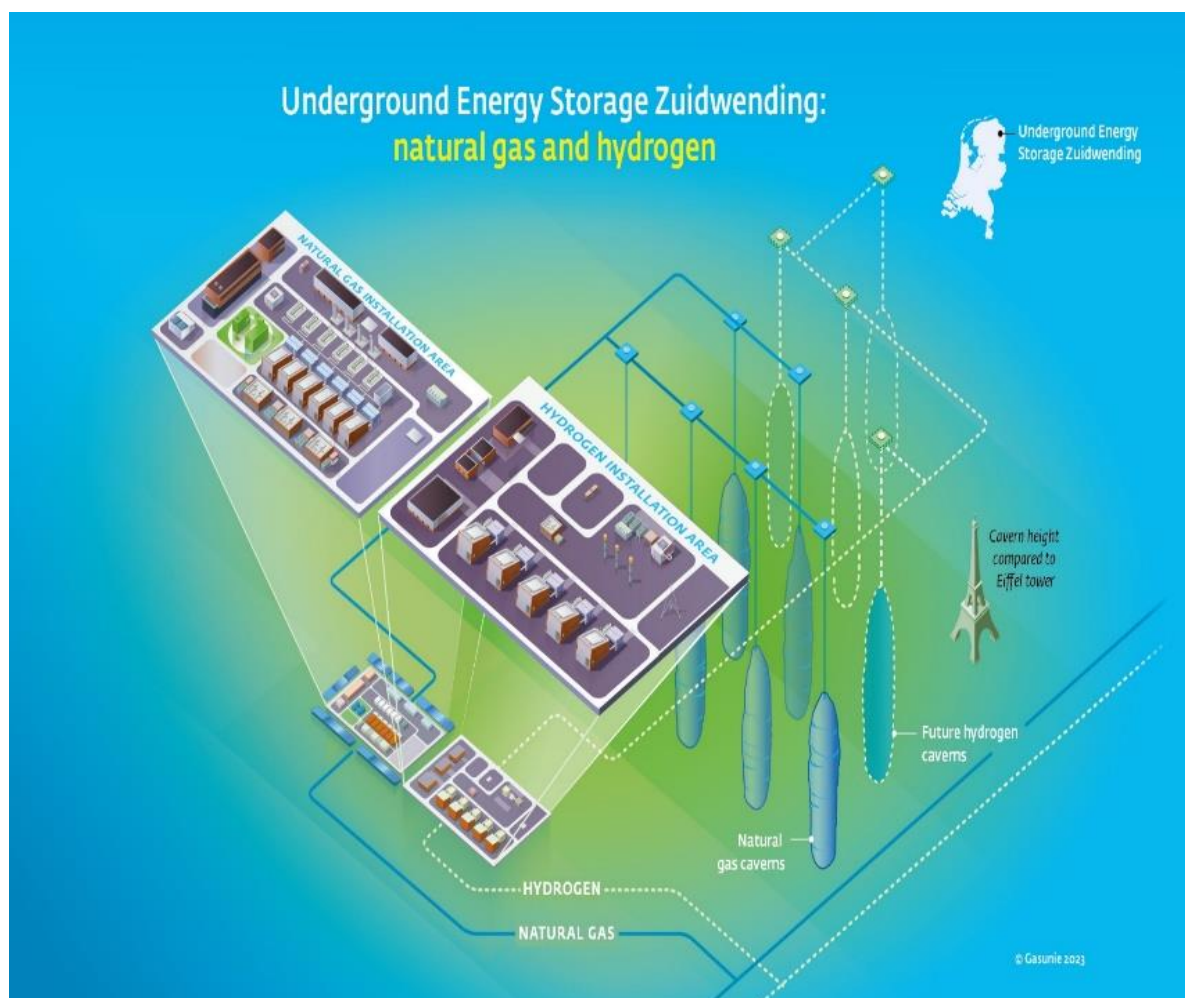
- Ensuring a safe, reliable, affordable and sustainable gas infrastructure in our key area.
- Contributing to efficient gas infrastructure and services for a well-functioning European natural gas and LNG market.
- Accelerating the transition to a CO₂-neutral energy supply.

More information about Gasunie can be found on <https://www.gasunie.nl/en>.

1.2 HyStock

Gasunie is working on the HyStock hydrogen storage project near Zuidwending in the Netherlands. Gasunie is planning to develop here the first large-scale hydrogen storage site in northwest Europe. The Zuidwending site is situated on top of a salt dome that is ideally suited to underground hydrogen storage. In this way energy can be stored. At the end of 2026, the first cavern and an above-ground installation will be put into operation. It is expected that four hydrogen caverns will be needed by 2030 to meet the demand. To this end, the current above-ground plant needs to be expanded. It is planned, that in the future the H2 caverns will connect to the H2 Back Bone project, which is still under development. With a connection to the national transport network for hydrogen (H2 Back Bone project), it will be possible for companies throughout Northwest Europe to supply and purchase hydrogen. In this way HyStock is facilitating the energytransition to a clean and sustainable society.

In addition to existing natural gas caverns owned by EnergyStock, 4 new caverns can be realised for hydrogen storage. The envisaged storage facility will be developed in steps, starting with a first cavern in 2026 and then expanding to at least four caverns in 2030.



The storage facility will be accessible to the entire market on an open-access basis. Via a connection to Gasunie's national hydrogen infrastructure, which is currently under development, the stored hydrogen can be offered by producers and supplied to customers throughout the country and to the industrial clusters in Germany and Belgium from 2026 onwards.

For more information about Gasunie's role in Hydrogen: see <https://www.hystock.nl/en> or <https://www.gasunie.nl/en/expertise/hydrogen>.

1.3 Glycol drying system

For the underground hydrogen storage project Hystock in Zuidwending, The Netherlands, we intend to remove water from the produced hydrogen by means of glycol drying.

Vendor is asked for the following services:

- Engineering of the whole system (battery limit at gas inlet and outlet nozzles of absorption columns)
- Delivery of equipment
- Assembly and delivery of skids (including skid mounted piping and wiring of instrumentation)

Gasunie's construction contractor will assemble interconnecting piping, wiring of instrumentation to DCS and power supply cabling under vendors supervision.

Gasunie intends to control the drying system from their own DCS, based on Vendor's control narrative.

This drying system should at least consist of the following elements:

- Glycol contactors (2 + 1 spare)
- Glycol Recovery Units (2 + 1 spare) (Electrically heated)
- Lean glycol vessel, rich glycol vessel and glycol storage vessel
- High pressure pumps
- Other necessary equipment for safe, reliable and efficient operation (pumps, heat exchangers, valves, pressure relief valves, HIPPS, check valves, instrumentation, etc.)

1.4 Scope

Below are listed the currently identified scope and requirements as a reference for answering the questions in annex 1.

Process conditions contactors		
Capacity (per contactor)	40.000 kg nett hydrogen per hour (note: volumetric flow can be higher due to possible contaminations of the hydrogen (see gas quality specification below))	
Total capacity:	80.000 kg/h (one contactor is spare)	
Water content:	Saturated at operational pressure and temperature	
Design pressure:	90 bar(g)	
Operational pressure:	70 bar(g)	
Operational temperature:	5 – 40°C	
Dewpoint requirement		
Water dewpoint:	-8°C @ 70 bar(g)	
Gas quality specification		
Components	Unit	Requirement
Hydrogyn (H ₂)	mol%	≥ 98
Inert (N ₂ , Ar, He)	mol%	≥ 2
Total hydrocarbon content (including CH ₄)	mol%	≤ 1,5
Hydrocarbon dew point	°C	≤ -2 at 1-70 bar(a)
Water dew point (H ₂ O) ¹	°C	≤ -8 at 1-70 bar(a)
Oxygen (O ₂)	μmol/mol (ppm)	≤ 10
Carbon dioxide (CO ₂)	μmol/mol (ppm)	≤ 20
Total sulfur (S) content (including H ₂ S)	μmol/mol (ppm)	≤ 3
Halogens	nmol/mol (ppb)	≤ 50
Carbon monoxide (CO)	μmol/mol (ppm)	≤ 20
Formic acid (CH ₃ OOH)	μmol/mol (ppm)	≤ 10
Ammonia (NH ₃)	μmol/mol (ppm)	≤ 10
Formaldehyde (CH ₂ O)	μmol/mol (ppm)	≤ 10
Dust particles		Disclaimer ²
Wobbe-index	MJ/m ³ (n)	44,85 – 48,35 ⁴

2 PROCEDURE

2.1 Schedule

Activity	Date / Period
Publication of the consultation via Tendered	26 July 2023
Deadline submission of response via Tendered	6 September 2023

2.2 Exchange of information

The exchange of information for this market consultation is carried out electronically via Tendered, www.tendered.nl. The use of Tendered is free of charge.

If you want to participate in this consultation, please answer the questions in Annex 1 via provided the Q&A Form (Word). You can send the Question Form to Thijs Albers via t.s.albers@gasunie.nl. For questions about this consultation please contact Mr. Albers.

2.3 Conditions

By taking part in this market consultation you agree with the following conditions:

1. Communication is in the English language;
2. All communication is exclusively with the contact person mentioned in paragraph 2.2;
3. Your answers are confidential and shall only be shared within Gasunie;
4. The provided information will only be used for further studies and advice;
5. The scope and requirements may change based on the provided information;
6. Gasunie is not bound by the results of the market consultation;
7. Participants cannot derive any rights based on this market consultation;
8. If needed, Gasunie reserves the right to change the planning.

ANNEX 1 QUESTION FORM

*Please note that underneath references may be the same

1. Do you have experience with engineering a glycol drying unit?
 - a. In which industry?
 - b. In which year was it engineered?
2. Do you have experience with manufacturing a glycol drying unit?
 - a. In which industry?
 - b. In which year was it constructed?
3. Do you have experience with building a glycol drying unit?
 - a. In which industry?
 - b. In which year was it delivered?
4. Would you be interested in Gasunie her project?
 - a. If yes, please explain in a few sentences why you're interested
 - b. If no, what's the reason? When are you interested?
5. Do you have the capacity to start in Q3 2024
 - a. If no, when do you have time? / what's is the best period for you?