gasunie transport services

GTS Investment Plan 2022-2032

Addendum

8 August 2023

Introduction

On 1 April 2022, GTS adopted the Investment Plan (2022IP) in accordance with Article 7a of the Dutch Gas Act. The 2022IP provides an overview and substantiation of GTS' investments in the short and long term. This document is a addendum to the 2022IP. This addendum includes a number of proposed investments, which are not included in the 2022IP. In publishing this addendum, GTS is submitting these proposed investments to ACM and the Minister of Economic Affairs and Climate Policy (EZK) for approval.

Contents

The investments in this addendum are divided into three categories: (i) adjustment of compression due to changed gas flows; (ii) connection requests and investments for feed-in of Liquefied Natural Gas (LNG); and (iii) other investments that were already included in the 2022IP as a study and an acquisition of a NAM pipeline so the full send-out capacity of the Grijpskerk gas storage facility (which has been converted from H-gas to G-gas) can be used.

Results of the consultation

GTS received 7 responses in the wake of the consultation. Of these, 5 responses may be published and 2 responses are confidential. These responses, GTS' answers to these and the processing method can be found in Appendix 10.

Changes to the addendum compared to consultation version

- The 'no-action' alternatives in Appendix 1 and 2 have been clarified.
- The process associated with the Capacity Release has been updated.
- One of the LNG parties has withdrawn its connection request and another LNG party has amended its connection request.
- The lead time for the implementation of the measures relating to Midden-Zeeland has been adjusted.
- The difference analyses in Appendix 6 and 7 have been clarified.
- Avoided emissions have been added to Appendix 6.

Process

In the spring of 2023, GTS submitted an addendum to the Investment Plan 2022 to the market for consultation for four weeks. In this addendum, GTS has included a number of proposed investments that were not part of the Investment Plan 2022. GTS has processed the received responses and presented the (adjusted) draft addendum to the ACM and the Minister of Economic Affairs and Climate. They then reviewed the draft addendum within the statutory period of 12 weeks. GTS is now publishing the final addendum.

Mission

We deliver gas transport services in a customer-focused and transparent way. Safety, reliability, sustainability and cost-effectiveness are central in everything we do. We serve the public interest, and work as professionals to create value for our stakeholders.

Vision

We aim to be an organisation that best serves the market, responds flexibly to changes in its surroundings, enables new gas flows, facilitates the introduction of sustainable energy and thus plays a key role in the north-western European gas market.

To be able to continue to fulfil the above duties with the required level of quality, GTS needs to invest in the maintenance and (in some cases) expansion of the gas transmission network.

By carrying out the aforementioned investments, the gas transport network will continue to meet the basic principles in the field of safe and reliable gas transport.

Developments on the (Dutch) gas market

The Russian invasion of Ukraine has fundamentally changed the situation on the Dutch and European energy markets. Since the summer of 2022, the supply of Russian gas, which until recently accounted for a third of the H-gas supply in north-western Europe, has completely disappeared. Part of this lost H-gas supply has been replaced by additional LNG through existing terminals in the Netherlands, Belgium and Great Britain and through new terminals such as the EemsEnergy Terminal (EET) in the Dutch port of Eemshaven. In addition, the transit of H-gas to Germany has sharply increased and the supply of Norwegian gas has shifted to Germany, as a result of which the supply of Norwegian gas to the Netherlands has fallen significantly.

Additional LNG feed-in capacity realised in 2022

In 2022, the LNG feed-in capacity in the Netherlands was greatly expanded. The LNG initiatives realised will be briefly discussed in this section.

GATE terminal (GATE)

In September 2021, GATE had a send-out capacity of 17.5GW (approximately 130TWh per year). This was increased in a number of steps to 21GW (approximately 160TWh per year) by September 2022.

EemsEnergyTerminal (EET)

On 6 September 2022, GTS published a final addendum to the 2022 Investment Plan.[1] This addendum describes the measures required to connect EET's Floating Storage and Regasification Unit (FSRU) to the GTS network. By realising these measures in six months, approximately 10GW (approximately 80TWh per year) of additional LNG feed-in capacity has been created.

The realisation of both initiatives significantly expanded the Dutch LNG feed-in capacity during 2022, making it possible to almost double (from 130TWh to 240TWh per year) the potential LNG import volume.

1 *https://www.gasunietransportservices.nl/uploads/fckconnector/8c59b78f-c68b-5e44-b851-1f3359d318fb/3216641986/Final%20addendum%20to%20the%20IP2022.pdf?lang=en*

Restoring a healthy supply and demand balance is no sinecure

Since the summer of 2022, no Russian gas has been exported to north-western Europe. It is not expected that deliveries from Russia will be resumed in the foreseeable future, partly in view of the European aim to become completely independent of Russian gas as quickly as possible.

The loss of Russian gas flows was partly replaced by additional deliveries of LNG. In addition, there has been a significant reduction in gas demand, mainly as a result of high gas prices for households and businesses. As a result, a new but shaky market equilibrium now seems to have been reached. This is also reflected in the 'annual letter of estimates' for the required Groningen capacity and volume. GTS sent this letter[2] to the Ministry of Economic Affairs and Climate Policy on 31 January 2023. In that letter, GTS makes it clear that there is a lot of uncertainty in the energy markets and that recovery of supply will not be easy.

2 *https://www.gasunietransportservices.nl/en/news/advice-for-the-coming-gas-year-closing-the-groningen-field-in-2023-is-risky-in-the-current-geopolitical-situation*

(i) Compression modifications to accommodate changed gas flows

Developments in the gas market have reversed the direction of the dominant gas flows from east-west to west-east. This reversal has a significant impact on the way in which GTS' gas transport network is used and has led to bottlenecks at the Wijngaarden, Ravenstein and Scheemda compressor stations (CS). In order to solve these bottlenecks, GTS must invest. For the Ravenstein CS, this involves a limited functional modification to enable the transport of gas from the Betuwe pipeline to the north of the Netherlands. This does not require significant investments and has therefore not been included in this addendum. Significant investments are however required for the Wijngaarden and Scheemda CS, which have therefore been included in this addendum.

Due to the changed gas flows, the Wijngaarden, Ravenstein and Scheemda compressor stations have become crucial for the flow of LNG that is fed into the Maasvlakte and for the import of gas via Zelzate. These compressor stations must now be able to operate with different flow directions to what they were originally designed for. GTS must therefore take a number of measures to effectively utilise these compressor stations.

Wijngaarden CS

Wijngaarden CS is located at an intersection of pipelines and has been designed with great flexibility in possible incoming and outgoing gas flow combinations and associated compression and pressure-reducing facilities. The basic assumption here was, however, that one gas stream would always flow towards Zelzate. Due to the incoming gas flow from Zelzate, compression on the other gas flow is blocked and one of the two overflow reducing stations is also unusable. The proposed measures at Wijngaarden CS provide the required flexibility. The adjustment will also enable Wijngaarden CS to compress the gas from the Maasvlakte, as well as compressing the gas from Zelzate. This is necessary to be able to transport the gas efficiently from the west of the Netherlands to the north-east of the Netherlands (also see the next section). The adjustment will also make it easier to change the compressor station's operating mode and, in the event of a switch to another operating mode, will prevent the need for a complete shutdown of Wijngaarden CS. In addition, the proposed measures also mean that the transmission capacity can be maintained during high entry in the western Netherlands and simultaneous low exit in the western Netherlands.

The alternative evaluation for the adjustment of Wijngaarden CS can be found in appendix 1.

Scheemda CS

Scheemda CS was designed to transport Norwegian gas to the rest of the Netherlands. Due to the loss of supply of Russian gas, the import of Norwegian gas has also decreased (since demand for Norwegian gas to Germany has increased). At the same time, the need for H-gas in the north-eastern Netherlands is increasing as a result of H-gas market demand in Germany and the construction of the new nitrogen plant in Zuidbroek (Zuidbroek II) to accommodate the phase-out of the Groningen field. As a result, more gas will have to be transported from the west of the Netherlands to the north-east of the Netherlands. The configuration of Scheemda CS is not suitable for this and needs to be expanded. The necessary measure involves the construction of a reduction facility to transport gas from the south-west of the Netherlands - via compression at Scheemda CS - to Germany and the new nitrogen plant Zuidbroek II. The Norg and Grijpskerk L-gas storage facilities can then also be filled from Zuidbroek II.

The alternative evaluation for the adjustment of Scheemda CS can be found in appendix 2.

(ii) Connection requests for LNG feed-in

Prior to drawing up this addendum, GTS received four connection requests from parties wishing to feed LNG into GTS' gas transport network. One of the parties that submitted a connection request withdrew this request during the consultation period. Additionally, after the consultation one of the other parties submitted a new connection request in which they requested more entry capacity than in their original request. GTS has not yet made network calculations that takes into account the requested higher capacity; accordingly, the measures in this addendum do not take this into account either. The connection requests that the measures in this addendum take into account concern the following entry capacities (aggregated): 10.8GW in the Midden-Zeeland region and a rise (over time) from 9.5 to 12.5GW in the Maasvlakte region.

If the LNG projects underlying these connection requests are realised, GTS must, in accordance with its statutory duty, provide these parties with a connection to the national gas transport network. GTS currently has insufficient transport capacity available in its network to provide all these connections with the requested entry capacities. This requires significant additional investments . The three parties requesting a connection have stated that they wish to have a connection and associated entry capacity in the period 2024 to 2026. This can be partly accommodated by GTS, but large-scale investments would be required in order to meet the total sum of the requested entry capacities. These investments have a lead time of approximately five years. Given the current uncertainty about the actual realisation of one or more of these LNG projects, GTS chooses not to present the significant investments required for the full accommodation of these projects (in this case, for accommodating the total sum of the requested entry capacities) to the market and ACM and the Minister of Economic Affairs and Climate Policy for an assessment of usefulness and necessity. However, a preview is given below of what the actual realisation of the three LNG projects would mean for GTS in terms of measures (or investments) required.

Instead of simply accommodating the connection requests received (and thus investing on a large scale), GTS opts for the approach of making as much entry capacity available as possible and doing so as quickly as possible in the relevant regions, Maasvlakte and Midden-Zeeland, on the basis of relatively limited investments. This entry capacity will be offered to the market at both the existing GATE entry point and at a number of new entry points that correspond to the connection requests received. This enables all shippers recognised by GTS to contract this capacity for LNG projects that are under development, without a physical connection having to be realised for this. In this way, GTS guarantees non-discriminatory treatment of market parties.

In concrete terms, this means that an LNG project can be accommodated in both the Maasvlakte region and the Midden-Zeeland region with limited measures and in a relatively short period of time. In addition, there is the option of immediately connecting an LNG project to the existing NGT entry point in the north-eastern Netherlands.

In the event that multiple LNG projects are to be realised in the same region, the necessary measures will be presented by GTS to the market, ACM and the Ministry of EZK in a future Investment Plan (or addendum).

Offering available entry capacity

The capacity that GTS can make available will be offered – where possible on a first come first served (FCFS) basis[3] – on 3 July 2023 and can be requested for annual, quarterly and monthly products, First Served (FCFS)[4] basis. Capacity can be requested for annual, quarterly and monthly products. These capacity products can, if desired, be booked years in advance. Where allocation under FCFS is not the desired mechanism, because several parties have submitted a connection request in the same region, the capacity will be allocated by means of a Capacity Release.[5] A Capacity Release offers the possibility to make new capacity available in a non-discriminatory manner. Available capacity in the relevant region will also be included in this sort of Capacity Release.[6] GTS will publish the procedure for this Capacity Release on its website on 5 June 2023. In offering available capacity, GTS distinguishes the following entry points and associated capacities[7]:

(a) Maasvlakte region

The Maasvlakte region will initially consist of two network points, namely the existing GATE entry point (301345) and a new virtual entry point. The reversal of the direction of dominant gas flows has a significant impact on the way in which GTS' gas transport network is used, resulting in a change in network planning principles. As a result, the available capacity in the Maasvlakte region can be increased by 4GW from 1 October 2025 (without major investments). When the measures in the "Required measures for the Maasvlakte region" section have been realised, an additional 2GW will become available. The target completion date is 1 October 2026. The total additional capacity (6GW) in this region will be offered competitively (through a Capacity Release). Available (not booked) capacity at the GATE entry point will be included in the Capacity Release. This means that from 5 June 2023 to 3 July 2023, no FCFS capacity will be made available on the GATE network point for the period from 1 October 2025 and beyond.

If capacity is allocated to the virtual network point from the Capacity Release, it will be transferred to the relevant physical network point as soon as this point is ready.

(b) New virtual entry point in the Midden-Zeeland region

When the measures in the "Required measures for Midden-Zeeland" section have been realised, 7.2GW capacity will become available at this new entry point. The intended completion date depends on a final investment decision by the relevant LNG party (and when this FID is taken) in combination with the required lead time for implementing the necessary measures. The capacity that is available at that time will be offered on an FCFS basis. The capacity available at that time will be offered according to the FCFS principle.

(c) Existing NGT entry point (301094)

An alternative to feeding in LNG in the Maasvlakte and Midden-Zeeland regions could be for LNG to be fed in at the existing NGT entry point. Currently, 7GW is available at this network point. This capacity can therefore be booked immediately and is offered according to the FCFS principle.

3 *https://www.gasunietransportservices.nl/shippers/capaciteit-boeken/netwerkpunten-op-fcfs-basis*
4 *https://www.gasunietransportservices.nl/en/shippers/capacity-booking/fcfs-network-points*
5 *https://www.gasunietransportservices.nl/en/shippers/capacity-booking*
6 *See ENTSOG website for the current available capacity at entry point GATE (301345): link.*
7 *In response to an amended connection request, this date has been changed from 1 October 2024 to 1 October 2025*

Required measures for the Maasvlakte region

In order to be able to increase the available new entry capacity for the integration of LNG in the Maasvlakte region from 4 GW to 6 GW in the relatively short term, GTS must take a number of measures. These consist of the construction of a new high-pressure gas transport pipeline of 6.6km with a connection to two existing valve stations in the Maasvlakte region.

The alternative evaluation for the necessary measures in the Maasvlakte region can be found in appendix 3.

Required measures for Midden-Zeeland

In order to facilitate the connection request received in the Midden-Zeeland region, GTS must take a number of measures. The acquisition of the Zuid-Beveland ('ZBL') pipeline is part of the intended necessary measures for Midden-Zeeland. The acquisition of the ZBL pipeline as an investment has already been assessed in terms of its usefulness and necessity in the 2020 Investment Plan (2020IP) under the conversion task (G-H conversion). As soon as the ZBL pipeline is part of GTS' national gas transport network, the pipeline (with limited measures, see the section below) can also be made suitable for the injection of LNG from the Midden-Zeeland region.

In order to be able to transport LNG from Midden-Zeeland under high pressure in GTS' gas transport network to the north-east of the Netherlands, a new pipeline must be installed between Nieuw Hinkeloord and Westerschelde Oost, and the route needs to be reinforced further along the route to ensure sufficient H-gas capacity to the east.

The alternative evaluation for the necessary measures in Midden-Zeeland can be found in Appendix 4.

For both Midden-Zeeland and the Maasvlakte region, GTS will only realise all necessary measures and connections if there is sufficient certainty about the realisation of the relevant LNG projects.

Accommodating the total requested entry capacities

If the LNG projects underlying the connection requests received were all realised and fully accommodated (by GTS), the LNG feed-in capacity would increase by 23.3GW (approximately 175 TWh per year). In this scenario, GTS must take significant additional measures for its network with an investment volume of hundreds of millions of euros. Given the current uncertainty about the actual realisation of these LNG projects, the full package of the necessary measures in this addendum has not been presented for an assessment of usefulness and necessity. If and when it is deemed appropriate, GTS will present these measures in a future Investment Plan or addendum. The following section provides a description of the expected scope and costs of these measures.

At the beginning of this year, GTS started to take stock of the measures required to fully accommodate the LNG connection requests that had been submitted at that time. Three of the four connection requests had been received by this point. These three projects have a total input capacity of 23.3GW. With the measures presented by GTS in this addendum,

GTS can make more than half (6GW in the Maasvlakte region and 7.2GW in Midden-Zeeland) of the aforementioned (23.3GW) feed-in capacity available. If the requested LNG feed-in capacity has to be made fully available, significant additional measures will have to be taken to accommodate the remaining part of the LNG feed-in capacity. These measures are accompanied by substantial investments and a long lead time (approximately five years).

Possible routes to make the LNG import capacity available
There are two possible alternatives to realise the remaining 6.5GW in capacity requested from the Maasvlakte region and 3.6GW in additional capacity from Midden-Zeeland:

1. West-East connection: Delta Corridor
2. Maasvlakte and Betuwe route

In order to transport as much gas as possible from the Midden-Zeeland region, the existing natural gas pipelines in Brabant will be used, which can transport gas to Ravenstein CS via Westerschelde-Oost. That will mean this route is fully utilised. GTS is furthermore looking into whether adjustments to Beverwijk CS should be made in all alternatives.

Ad. 1. Delta Corridor (preferred alternative)

The Delta Corridor runs from the Maasvlakte region to Boxtel. This provides maximum support for west-east transport. The intended measures are:

- 101km 48" Maasvlakte-Boxtel pipeline
- AS Westerschelde-East reducing station

This alternative provides economies of scope. The project can be prepared and implemented in conjunction with the construction of pipelines for hydrogen (and potentially CO_2). As a result, project costs can be shared between the parties involved, thus lowering the project costs for GTS (and other parties). The route followed by the Delta Corridor is part of the government's vision on pipelines for 2012-2035 (*Structuurvisie Buisleidingen*).

After being used in the GTS transport network, the natural gas pipeline in the Delta Corridor can be used for hydrogen transport in the future, thereby increasing the transport capacity of hydrogen between the Maasvlakte region and the Ruhr area (Germany). Depending on whether low or high-pressure CO_2 transport is chosen, the natural gas pipeline could also be used for this modality. In addition, in the event of a possible transfer of the natural gas pipeline to a hydrogen network or CO_2 network, the proceeds of the transfer will normally be settled through GTS' natural gas transport tariffs.

The costs of this variant are currently estimated at 500-600 million euros, with a lead time of approximately five years, depending on possible bottlenecks on the route that need further investigation.

Ad. 2. Reinforcement of the Maasvlakte - Betuwe pipeline

West-east transport is also fully supported in this variant. Measures are needed on both the Maasvlakte pipeline and the entire Betuwe pipeline. The intended measures are:

- 18km 48" Maasvlakte pipeline
- 21km 48" Maasvlakte pipeline (pressure upgrade)
- 72km 48" Betuwe pipeline
- AS Westerschelde-East reducing station

The costs of this variant are currently estimated at 650-750 million euros, with a lead time of approximately five years, depending on possible bottlenecks on the route that require further investigation.

Like the Delta Corridor, the route followed by the Betuwe line is part of the government's vision on pipelines for 2012-2035 (Structuurvisie Buisleidingen).

Deviations from estimated lead time and costs
There are numerous factors, both external and internal, that could lead to deviations in the forecasted lead time and costs. This could result in differences between the planning and realisation of the intended measures. Examples are gas transport restrictions, soil mechanical and geohydrological aspects, permit procedures, the current nitrogen deposition problem, availability of personnel, available capacity at contractors and delivery times of materials.

(iii) Other investments

Through this addendum, GTS is furthermore submitting four investments that were already included as a study in the 2022IP. These investments concern:
i. a GZI green gas gathering pipeline
ii. a replacement programme at metering and regulating stations (M&R)
iii. a replacement programme for capacity registration systems (CARS) and telemetry systems (TMX) and
iv. a replacement programme for electronic volume conversion devices (EVHI).

In addition, GTS proposes the acquisition and integration of a NAM pipeline. With this acquisition, GTS is increasing the west-east G-gas transport capacity in its network, so that Grijpskerk UGS can be utilised at maximum capacity. This will contribute to the closure of the Groningen field.

The estimated costs of these measures are between € 10m and € 30m per investment. The alternative considerations for these investments are shown in the following appendices:

Appendix 5: GZI Green gas gathering pipeline
Appendix 6: CSR Making M&R emission-free
Appendix 7: Replacement of capacity registration systems (CARS) and telemetry systems (TMX)
Appendix 8: Electronic Volume Conversion Instruments (EVHI) replacement
Appendix 9: Acquisition of Eemskanaal – Tjuchem NAM pipeline

Appendices

Appendix 1: Adjustment of Wijngaarden CS

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014782
b. TYNDP identifier	N/A
c. Bottleneck	Capacity bottleneck
d. Investment classification (EP or RP)	Expansion investment project
e. Grid component name and location	Wijngaarden CS
f. Pressure level (HPGG or RDN)	HPGG
g. Project phase	Study
h. FID year	2023
i. Commissioning year	2025
j. Investments per year	2023: € 400k 2024: € 6,000k 2025: € 200k 2026: € 70k Total: € 6,670k
k. Explanation of why the investment solves the bottleneck	Due to the changed direction of the gas flows in the GTS network, it has become apparent that the current control and configuration is too limited to achieve sufficient compression on the Zelzate-Ravenstein and Maasvlakte-Beverwijk routes.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	The bottleneck at Wijngaarden CS concerned a problem that arose in practice when there was a full outage at the station in the summer of 2022, caused by the change in the dominant direction of gas flow through the GTS network. GTS considers it likely that, in the coming years, Wijngaarden CS will have to continue compressing larger volumes of gas coming in via Zelzate than it had done previously. The envisioned measures would make this possible. Doing nothing would mean that there will continue to be insufficient compression capacity available at Wijngaarden CS for the changed gas flows and that the station will inevitably experience more outages.
Alternatives	GTS has investigated the following alternatives: 1. Underground piping adjustments. 2. Overground and underground pipework modifications. In both alternatives, adjustments are required to the valves (operation and control) and piping configuration (piping, including 42" valves) of the station.
Difference analysis (technical, financial and social effects)	Alternative 1 means an expansion of the current station and possibly also an expansion of the site. Alternative 2 means maintaining the current site and finishing the overground pipework with local soil embankment. The TCO (Total Cost of Ownership) of alternative 2 is lower, because the site does not need to be expanded.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Substantiation of the assessment of the effects of the alternatives	With alternative 2, no impact on the environment is expected, because the work takes place at GTS' own site. However, it is expected that ground water extraction will have to take place. This is not the case with option 1.
Accountability for choice of proposed alternative	Alternative 2 is preferred because of the lower Total Cost of Ownership and the lower impact on the environment.
Explanation of missing information	The project is still in the study phase, where the basic design and the budget are being worked out. The assessment of the alternatives was made on the basis of the rough outline of the expected investments.

Appendix 2: Adjustment of Scheemda CS

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014788
b. TYNDP identifier	N/A
c. Bottleneck	Capacity bottleneck
d. Investment classification (EP or RP)	Expansion investment project
e. Grid component name and location	Scheemda CS
f. Pressure level (HPGG or RDN)	HPGG
g. Project phase	Study
h. FID year	2023
i. Commissioning year	2026
j. Investments per year	2023: € 2,000k 2024: € 5,360k 2025: € 7,300k 2026: € 340k Total: € 15,000k
k. Explanation of why the investment solves the bottleneck	Network calculations have identified a bottleneck at Scheemda CS. These calculations take into account the changed dominant gas flows. The calculations show that, in various scenarios, the current GTS network will not be able to facilitate full supply to the new Zuidbroek II nitrogen plant or full export to Germany. Implementation of the envisioned measures will make it possible to transmit the gas from the south, with Scheemda CS at the required pressure for transport to Germany and the new Zuidbroek II nitrogen plant. The Norg and Grijpskerk L-gas storage facilities can then also be filled from Zuidbroek II.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	Doing nothing would mean that, in some transmission situations with relatively higher transmission capacities, it will not be possible to facilitate full supply to the new Zuidbroek II nitrogen plant or full export to Germany.
Alternatives	GTS has investigated the following alternatives: 1. Installation of two separate regulators 2. Installation of a bi-directional regulator In both alternatives, adjustments to the switching options and the station's pipe configuration are also required.
Difference analysis (technical, financial and social effects)	Alternative 1 involves a larger scope of work and more investment costs. Alternative 2 involves less work and has lower investment costs.
Substantiation of the assessment of the effects of the alternatives	With both alternatives, no impact on the environment is expected because the work will take place at GTS' own site.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Accountability for choice of proposed alternative	Alternative 2 is preferred because of the lower TCO.
Explanation of missing information	The project is still in the study phase, where the basic design and the budget are being worked out. The assessment of the alternatives was made on the basis of the rough outline of the expected investments.

Appendix 3: Required measures for the Maasvlakte region

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014795
b. TYNDP identifier	N/A
c. Bottleneck	Capacity bottleneck
d. Investment classification (EP or RP)	Expansion investment project
e. Grid component name and location	West Netherlands HPGG
f. Pressure level (HPGG or RDN)	HPGG
g. Project phase	Study
h. FID year	2023
i. Commissioning year	2026
j. Investments per year	2023: € 2,000k 2024: € 6,000k 2025: € 20,000k 2026: € 5,000k 2027: € 2,000k Total: € 35,000k
k. Explanation of why the investment solves the bottleneck	In order to facilitate the injection of additional LNG into the Maasvlakte region, GTS must take a number of measures.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	Doing nothing means that there is insufficient additional capacity in the GTS network to accommodate additional capacity in the Maasvlakte region.
Alternatives	GTS has investigated the following alternatives: 1. Use of existing H-gas pipelines in the Maasvlakte region 2. Construction of a new 6.6km H-gas pipeline in the Maasvlakte region
Difference analysis (technical, financial and social effects)	Because using existing pipelines does not provide enough extra capacity, alternative 1 does not offer a solution. Alternative 2, which involves developing and constructing a new 6.6km pipeline route, is therefore the only viable option.
Substantiation of the assessment of the effects of the alternatives	Alternative 2 involves the construction of a new pipeline, which has a major impact on the spatial planning environment. The pipeline must be laid over a route where space is scarce.
Accountability for choice of proposed alternative	Based on gas transport considerations, alternative 2 is the proposed alternative.
Explanation of missing information	The project is in the study phase, in which the detailed design and the detailed budget are being worked out. This will not affect the choice of the preferred alternative. For this investment, GTS will only implement all the required measures if and when there is sufficient certainty on the realisation of the relevant LNG project(s).

Appendix 4: Required measures for Midden-Zeeland

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014744
b. TYNDP identifier	N/A
c. Bottleneck	Capacity bottleneck
d. Investment classification (EP or RP)	Expansion investment project
e. Grid component name and location	South-west Netherlands HPGG
f. Pressure level (HPGG or RDN)	HPGG
g. Project phase	Study
h. FID year	2023
i. Commissioning year	2025
j. Investments per year	2023: € 400k 2024: € 2,500k 2025: € 2,500k 2026: € 200k Total: € 5,600k
k. Explanation of why the investment solves the bottleneck	In order to be able to transport the LNG with a high gas pressure in the GTS network towards the north-east of the Netherlands, a new pipeline must be installed between Nieuw Hinkeloord and Westerschelde Oost, and the route needs to be reinforced further along the route to ensure sufficient H-gas capacity towards the east.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	Doing nothing means that there is insufficient capacity in the GTS network to accommodate additional capacity in Midden-Zeeland.
Alternatives	GTS has investigated the following alternatives: 1. Converting an existing G-gas pipeline to H-gas 2. Construction of a new H-gas pipeline In both alternatives, a new connection between Nieuw Hinkeloord and Westerschelde Oost must also be realised.
Difference analysis (technical, financial and social effects)	Because an existing pipeline is utilised, alternative 1 has the lowest TCO and the least impact on the environment compared to alternative 2, which requires the development and construction of a new pipeline route of 35km.
Substantiation of the assessment of the effects of the alternatives	Alternative 2 includes the adjustment at valve locations and the disconnection and transfer of existing G-gas connections on the parallel G-gas line.
Accountability for choice of proposed alternative	Based on costs and impact on the environment, alternative 1 is preferred.
Explanation of missing information	The project is in the study phase, in which the detailed design and the detailed budget are being worked out. This will not affect the choice of the preferred alternative. For this investment, GTS will only implement all the required measures if and when there is sufficient certainty on the realisation of the relevant LNG project(s).

Appendix 5: GZI Green gas gathering pipeline

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.013799 & I.014572 - Conversion A-605-00 GZI to green gas gathering pipeline
b. TYNDP identifier	N/A
c. Bottleneck	Capacity bottleneck
d. Investment classification (EP or RP)	Replacement investment project
e. Grid component name and location	GZI Green gas gathering pipeline Emmen - Ommen
f. Pressure level (HPGG or RDN)	RDN
g. Project phase	Study/Basic Design
h. FID year	2023
i. Commissioning year	2025
j. Investments per year	2022: € 569k 2023: € 3,399k 2024: € 14,350k 2027: € 4,000k 2029: € 4,000k Total: € 29,283k
k. Explanation of why the investment solves the bottleneck	There is a congestion bottleneck in the triangle of Hoogeveen, Emmen and Ommen in the Regional Network Operator (RNO) grids as a result of green gas injection. The transport restrictions are also arising in GTS' RDN in the region. This congestion is much more common in summer than in winter. The intended green gas gathering pipeline in the national gas transport network will resolve this bottleneck, because the RNO networks in the area can feed off any surplus of green gas to the gathering pipeline. Green gas producers can also feed directly into the gathering pipeline. The gathering pipeline ends at the Ommen compressor station, where the gas is compressed centrally and transferred to GTS' national high-pressure HPGG network. In this way, GTS ensures that these RDN and RNO networks do not fill up and that there is still room for more local green gas production.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	The Dutch Climate Agreement envisages at least 20 TWh of green gas per year in the Netherlands by 2030. A substantial part of this is expected to be fed into the relevant RNO grids in this region. The producers have an interest in continuous feed-in options for green gas. If the bottleneck is not solved, the production of green gas would have to be stopped (which is very difficult given the production process), the gas would have to be flared, especially in the summer (which is highly undesirable), or the production facility would not be built at all due to lack of transport capacity. Doing nothing is therefore undesirable.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Alternatives	GTS has considered the following alternatives: 1. Use of boosters on RNO-GTS grid links The construction of several boosters (at least one per RNO network area with congestion) at network connections between GTS and the RNOs, with which the gas can be transferred from the RNO network to GTS' RDN. If at any time the RDN also reaches full utilisation, further overflow to the HPGG will have to take place (using boosters that can compress to HPGG pressure) 2. Use of green gas gathering pipeline Repurposing the existing GZI pipeline into a green gas gathering pipeline to which RNOs can connect so that they can discharge a gas surplus. By operating the green gas gathering pipeline at a lower pressure, no compression (boosters) is required on these network connections. In Ommen, the gas will then be compressed by GTS to HPGG pressure and further transported in the HPGG. This removes congestion in the entire area near the GZI pipeline.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Difference analysis (technical, financial and social effects)	Because green gas production in the Hoogeveen, Emmen & Ommen area is expected to increase considerably, a green gas gathering pipeline is the most cost-efficient solution. The green gas gathering pipeline anticipates the future growth of green gas production and is robust for the future, both in terms of feed-in capacity and the required technical components. Both alternatives are based on the same realistic and conservative estimate of green gas production in the coming years in that area. This expected green gas production translates into six booster locations. The total costs for GTS for alternative 2, the repurposing of the GZI pipeline as a collector pipeline, are expected to be lower than those for alternative 1, the construction of six booster locations at the RNO grid connection points. Expected TCO: • Alternative 1: € 43.6m • Alternative 2: € 29.3m When considering the alternatives, the possibility of using mobile boosters was also considered. With the same assumptions for green gas production, alternative 2 would still have the lowest TCO. Also from a social point of view, alternative 2 is preferable for the following reasons: - The cost-efficiency of this alternative is robust in relation to expected policy choices, including in response to the Dutch Climate Agreement and the blending obligation for green gas, which will further boost the production of green gas. - No compressors close to or in the built environment. - Central compression at the Ommen site and, if necessary, also central gas treatment at the Ommen site, are more efficient than decentralised compression because of the scale and the ability to blend the gas. Alternative 2 is therefore, among other things, the preferred alternative for the relevant RNOs and possibly for direct importers of green gas into the GTS network.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Substantiation of the assessment of the effects of the alternatives	The cost structure of the two alternatives is significantly different. In alternative 1, investments in new boosters must be made again and again when the demand for green gas increases. In alternative 2, major investments only need to be made once to accommodate the expected future demand for green gas. Alternative 2 thus offers a clear outlook for all parties involved. Alternative 1 has a negative impact on the built environment. In alternative 1, the compressors must be placed in the built environment and also take up a lot of space. Alternative 2 does not require compressors to be placed in or near the built environment. The RNOs involved (Rendo, Cogas and Enexis) indicate that alternative 2 is the preferred alternative because the gathering pipeline offers more options for choosing the location of the connection line with the RNO in such a way that the capacity in their grid is optimised. This makes it easier to clear the network congestion. In alternative 1, due to the limited existing infrastructure, there are restrictions on the locations where the grid connections can be established.
Accountability for choice of proposed alternative	Based on various consultations between GTS and the RNOs about the plans and projects with regard to green gas production in the region, GTS considers it plausible that gas will have to be transferred between RNBs and GTS at a minimum of at least six locations in order to prevent feed-in restrictions from green gas producers. The gathering pipeline is the most cost-efficient alternative to solve this bottleneck. Additionally, it is expected that the production of green gas will continue to be incentivised in the coming years (consider aspects like the Dutch Climate Agreement, blending obligation, the proposed gas and hydrogen decarbonisation package), which can be expected to lead to even more initiatives for the production of green gas With the green gas gathering pipeline, the region is well prepared for this and any additional production in this region can be accommodated in a cost-efficient manner with the help of the gathering pipeline. The green gas gathering pipeline is beneficial to other parties. For example, future direct importers (producers) can save on compression on the green gas gathering pipeline, and the gathering pipeline is also preferred by the relevant RNOs, despite having to install connecting pipes. All things considered, the GTS green gas gathering pipeline offers the most cost-efficient way to accommodate the injection of the expected amount of green gas produced in the Hoogeveen, Emmen and Ommen region.
Explanation of missing information	N/A

Appendix 6: CSR Making M&R emission-free

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014513
b. TYNDP identifier	N/A
c. Bottleneck	Quality bottleneck (CH4 emissions footprint reduction)
d. Investment classification (EP or RP)	Replacement investment project
e. Grid component name and location	M&R: Metering and regulating stations throughout the Netherlands
f. Pressure level (HPGG or RDN)	HPGG
g. Project phase	Preparation
h. FID year	2023
i. Commissioning year	2024 to 2026
j. Investments per year	2021 € 12k 2022 € 82k 2023 € 156k 2024 € 6,333k 2025 € 6,333k 2026 € 6,333k Total € 19,258k Amounts per year are expected amounts, depending on the annual spread of the adjustments to be chosen.
k. Explanation of why the investment solves the bottleneck	Undesired methane emissions are reduced by converting the continuously emitting regulators on M&Rs to non-natural gas-emitting regulators. This investment would result in the avoidance of a total of 525.5 tonnes of methane emissions – equal to 44,184 tonnes of CO_2e – each year.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	Alternative 0: do nothing, the pneumatic control components continue to operate on natural gas. Doing nothing means that the carbon footprint resulting from methane emissions from metering and regulating stations will not be reduced.
Alternatives	The following alternatives were investigated during the study phase: 1. Replace natural gas control medium with N2 2. Replace pneumatic control components with electric control valves 3. Control components fitted with pilot control 4. Replace entire metering and regulating station
Difference analysis (technical, financial and social effects)	Alternative 1 has the lowest TCO and the highest risk efficiency. The TCO for alternatives 2 and 3 is four times higher and these alternatives are less risk-efficient. Though alternative 4, total replacement, provides the highest risk reduction, its TCO is nine times higher and it is the least risk-efficient alternative.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Substantiation of the assessment of the effects of the alternatives	Alternative 1 takes up the smallest amount of resources. The activities are simple and small-scale in nature with the shortest lead time and little risk of any delay in planning. The relatively short lead time is a major advantage for achieving the emission reduction targets. Alternatives 2 to 4 take up considerably more resources and have longer lead times. Because the M&Rs must be taken out of operation with these alternatives, temporary emergency facilities must also be deployed. So alternative 1 is also preferred on the basis of the qualitative effects.
Accountability for choice of proposed alternative	Based on the alternatives evaluation, GTS opts for alternative 1, with which methane emissions can be optimally reduced with the most cost-effective solution (lowest TCO and highest risk efficiency).
Explanation of missing information	The project is still in the preparatory phase, where the detailed design and detailed budget are being worked out. The assessment of the alternatives was made on the basis of the rough outline of the expected investments.

Appendix 7: Replacement of CARS and telemetry

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014442
b. TYNDP identifier	N/A
c. Bottleneck	Quality bottleneck (Obsolete Systems)
d. Investment classification (EP or RP)	Replacement investment project
e. Grid component name and location	GRS: Gas receiving stations throughout the Netherlands
f. Pressure level (HPGG or RDN)	RDN and HPGG
g. Project phase	Preparation
h. FID year	2023
i. Commissioning year	2033
j. Investments per year	2021 € 20k 2022 € 200k 2023 € 1,590k 2024 € 1,540k 2025 € 1,700k 2026 € 1,700k 2027 € 1,700k 2028 € 1,700k 2029 € 1,700k 2030 € 1,700k 2031 € 1,700k 2032 € 1,400k 2033 € 240k Total € 16,890k Amounts per year are expected amounts depending on the chosen annual spread of the replacements.
k. Explanation of why the investment solves the bottleneck	The GTS Capacity Registration Systems (CARS) and Telemetry Systems (TMX) are obsolete and can therefore no longer be maintained. In this project, the optimum replacement strategy was determined by combining both systems, whereby all obsolete systems are gradually replaced and sufficient parts remain available over the intended multi-year replacement period to allow the systems to function reliably.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	Doing nothing means that systems will exceed the end of their service life, with insufficient spare parts and service options available to guarantee the reliability of these systems and thus the transport security of the GTS network.
Alternatives	The following alternatives were investigated during the study phase: 1. Renew service contract 2. Exact replacement: two separate systems 3. Exact replacement: combined systems 4. Implement a standard RTU 5. Exact replacement: two separate systems with development to future situation standard TMX.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Difference analysis (technical, financial and social effects)	Alternative 4 has the lowest investment costs and the lowest management costs due to the elimination of systems and is therefore the alternative with the lowest TCO. Reducing the number of systems at stations means that savings can be made in merging network connections. Alternative 2, 3 and 5 all have a TCO that is at least 20% higher than the TCO of alternative 4. This is mainly due to the required investments in the central data processing systems and the larger number of systems to be maintained.
Substantiation of the assessment of the effects of the alternatives	Alternative 1 has been used in recent years, but appears to be no longer feasible in the short term, mainly due to a lack of parts and know-how in the market. Alternatives 2, 3 and 5 are not market standards, have relatively high maintenance costs and are also not future-proof. With alternative 4, there is just one system for interfacing with the central data processing systems. To this end, the interfaces with the systems of the Central Command Post and the systems at the stations will be adapted. The merger will also result in cost savings in management and maintenance by reducing the number of systems. Work takes place at GTS' own locations, so no special effects on the environment are anticipated.
Accountability for choice of proposed alternative	When assessing the different options, the quantitative and qualitative effects were compared in terms of: • costs; • technical possibilities; • impact on the availability of the systems When selecting the preferred alternative, alternative 4 was chosen, the most future-proof and technically feasible solution with the lowest TCO.
Explanation of missing information	The project is in the preparation phase, where the detailed design and the detailed budget are being worked out. The stated budgets and annual spread are based on expectations.

Appendix 8: EVHI replacement

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	PG-I.014510 - EVHI replacement
b. TYNDP identifier	N/A
c. Bottleneck	Quality bottleneck (Obsolete Systems)
d. Investment classification (EP or RP)	Replacement investment project
e. Grid component name and location	This concerns EVHI's at gas receiving stations, export stations and a limited number at compressor stations.
f. Pressure level (HPGG or RDN)	RDN and HPGG
g. Project phase	Preparation
h. FID year	2023
i. Commissioning year	2026
j. Investments per year	2022: € 38k 2023: € 262k 2024: € 2,164k 2025: € 4,329k 2026: € 4,329k 2027: € 735k Total: € 11,857k Amounts are expectations per year.
k. Explanation of why the investment solves the bottleneck	Some types of EVHI (Electronic Volume Conversion Instruments) used at GTS are obsolete and will no longer be maintainable in the near future. An EVHI is a legally required part of the gas metering installations that ensure accurate determination of the energy content of the gas flow. The optimum replacement strategy was determined during the study phase, whereby all obsolete systems are gradually replaced and sufficient parts remain available over the intended multi-year replacement period to allow the systems to function reliably.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	Doing nothing means that systems exceed the end of their service life, with insufficient spare parts and service options available to guarantee the reliability of these systems. As a result, GTS does not comply with the legal requirements for gas measurements.
Alternatives	The following alternatives were investigated during the study phase: 1. Replacement in one year 2. Replacement in several years
Difference analysis (technical, financial and social effects)	An exact replacement of all relevant EVHIs in one year means a greater demand on resources in the GTS organisation and at contractors and higher costs in that year. An exact replacement of all relevant EVHIs over several years results in a better spread of activities at GTS and contractors and a better spread of investment costs. The investment costs of both alternatives are comparable.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Substantiation of the assessment of the effects of the alternatives	With both alternatives, no impact on the environment is expected because the work will take place at GTS' own sites. The implementation will also be set up in such a way that there will be no influence on gas transport. In alternative 2, the impact on resources will be limited due to the spread of implementation over several years.
Accountability for choice of proposed alternative	Based on the consideration of alternatives, GTS opts for alternative 2, which limits the impact on GTS' and contractors' resources and ensures that sufficient spare parts remain available for proper phasing out of the obsolete components.
Explanation of missing information	This project is in the preparation phase. The stated budgets and annual spread are based on expectations.

Appendix 9: Acquisition of Eemskanaal – Tjuchem NAM pipeline

Information on major investments (outlook for 2022 to 2031)	
a. Identifier	I.014764
b. TYNDP identifier	N/A
c. Bottleneck	Capacity bottleneck
d. Investment classification (EP or RP)	EP
e. Grid component name and location	Acquisition of Eemskanaal – Tjuchem NAM pipeline
f. Pressure level (HPGG or RDN)	HPGG
g. Project phase	Study
h. FID year	2023
i. Commissioning year	2025
k. Explanation of why the investment solves the bottleneck	In 2022, the conversion of Grijpskerk UGS from H-gas to G-gas started, and the UGS can now act as a back-up in the G-gas/L-gas market. The switch is part of the efforts being made to terminate production from the Groningen field. GTS has adapted its network for Grijpskerk UGS G-gas through measures at Grijpskerk and Ten Boer. As a result, under the principles set at the time regarding the use of assets and supply and demand, GTS anticipated that it would be able to accommodate a send-out capacity of approximately 1.9 million m^3/h, which is sufficient for Grijpskerk UGS' back-up role. However, Grijpskerk UGS has a send-out capacity of 2.5 million m^3/h. The delta of 0.6 million m^3/h is not available due to the limited transport capacity to the east. NAM wants to be able to make full use of the disposal capacity and is asking GTS to take measures to make this possible.
l. Alternative assessment (if not in realisation phase by 1/1/2022)	
No-action alternative	If GTS does not realise NAM's capacity demand, it will not fulfil its statutory duty (Dutch Gas Act, Article 10, paragraph 6). GTS has established that the west-east capacity of its network in Groningen is insufficient to accommodate NAM's additional demand for capacity.
Alternatives	The following alternatives have been investigated: 1. Acquisition of the NAM pipeline route between Eemskanaal and Tjuchem. As a result of this measure, a second west-east connection will be realised in Groningen. 2. Construction of a new pipeline between Eemskanaal and Tjuchem.

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Information on major investments (outlook for 2022 to 2031) Continued previous page

Information on major investments (outlook for 2022 to 2031)	
Difference analysis (technical, financial and social effects)	Alternative 1 comprises the takeover of the NAM Eemskanaal and Tjuchem section (15km 36" pipeline) and its integration into GTS' HPGG network. The takeover of the pipeline has a high social purpose, i.e. the closure of the Groningen field as soon as possible. Acquisition can take place relatively quickly (lead time of approx. 2 years) compared to the lead time for the construction of a new pipeline, which is estimated at a minimum of 4 years. Acquisition also contributes to the reuse of resources (continuation of current use) and has an advantageous effect on the footprint. The costs of integrating EKL-TJM are lower than the construction of a new route. Alternative 1 is therefore preferable to alternative 2.
Substantiation of the assessment of the effects of the alternatives	The consideration of alternatives is based on costs, lead time and social impact. See above.
Accountability for choice of proposed alternative	Alternative 1 is financially the most advantageous, has the smallest impact on the environment and can be realised the fastest.
Explanation of missing information	The project is in the study phase. Based on information to be provided by NAM, GTS needs to determine whether takeover of all or parts of the pipeline is technically feasible. It should be noted here that the pipeline sections to be acquired are an integral part of the NAM systems, so the technical feasibility of separation (and integration into the GTS network) and legal unbundling are not self-evident. In addition, the parties must reach agreement on the conditions under which takeover can take place. The measures that GTS must take to integrate the route into its network will be studied for feasibility in 2023. After completion of these activities, GTS will determine whether there is sufficient basis to take the FID.

Appendix 10: Consultation matrix

Party	Number	Consultation response
Shipper 1	1.1	Ondersteunt de LNG investeringen die worden beschreven in het ontwerpaddendum IP2022
Shipper 2	2.2	Ondersteunt de LNG investeringen die worden beschreven in het ontwerpaddendum IP2022
Gate terminal (GATE)	3.1	Gate heeft met bijzondere aandacht gekeken naar de voorstellen naar aanleiding van de aansluitverzoeken voor de invoeding van extra LNG In de regio Maasvlakte, waaronder ons eigen aansluitverzoek. Wij steunen uw voorstel om hier vanaf 1 oktober 2024 4 GW aan additionele capaciteit beschikbaar te hebben en om te investeren in een additionele 2 GW per 1 oktober 2026. Wij begrijpen uw afweging om de gevraagde totale entry capaciteit gefaseerd ter beschikking te stellen naarmate de diverse LNG projecten meer concreet worden. Ook begrijpen wij uw keuze voor de introductie van het virtuele entrypunt Maasvlakte. Wij hebben geen bezwaar. Gate's vierde tank project kent een goed momentum. Indien het project doorgang vindt, stijgt Gate's doorvoercapaciteit met 4 BCM per jaar naar een totaal van 20BCM per jaar. De send-out capaciteit zal stijgen met 5400 MWh/h naar een totaal van 26.500MWh/h. Uw voorgenomen investering in een 6,6 kilometer lange H-gasleiding op de Maasvlakte maakt dit mogelijk. Dit heeft een positief effect op de leveringszekerheid in Nederland en NW-Europa. Wij verwachten daarnaast dat de omzet van de extra boekingen van GTS entry en exit capaciteit zullen leiden tot een langjarig significant positief materiaal effect op het tarief van alle entry en exit punten in uw netwerk. Indien de andere LNG projecten in de regio Maasvlakte ook een goed momentum kennen, is het mogelijk dat de vraag naar entry capaciteit groter is dan het aanbod. Gate-shippers kunnen buiten de boot vallen. Wij verzoeken u om in dit geval op korte termijn te starten met de voorbereidingen voor een volgend addendum op het Investeringsplan.

	GTS' response	Method of processing
	GTS thanks shipper 1 for their response.	The response did not result in a change to the final version of this addendum to the 2022IP.
	GTS thanks shipper 2 for their response.	The response did not result in a change to the final version of this addendum to the 2022IP.
	GTS thanks GATE for their response. If at any time the (sufficiently concrete) requested entry capacity in the Maasvlakte region exceeds the current supply (including the additional capacity GTS realises through the implementation of measures in this addendum), GTS will investigate at that time which measures are necessary to accommodate the entry capacity requested. If it emerges that additional investments are necessary, GTS will submit these proposed investments to the market parties, ACM and the Ministry of Economic Affairs and Climate Policy through a new investment plan/addendum to the investment plan.	The response did not result in a change to the final version of this addendum to the 2022IP.

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Consultation matrix continued previous page

Party	Number	Consultation response
Energie-Nederland	4.1	**Market Developments and GTS investments:** Energie-Nederland expects that the gas market will decline rapidly over the coming years. There are several reports that underline our expectations, amongst others: - "Scenario's investeringsplannen" by Netbeheer Nederland (Feb-23) - Breaking free from fossil gas: A new path to a climate-neutral Europe by Agora (May-23) - Bericht des Bundeswirtschafts- und Klimaschutzministeriums zu Planungen und Kapazitäten der schwimmenden und festen Fliissigerdgasterminals (Mar-23) All these reports point out that gas demand will be halved within the next 10 years and there will be a potential overcapacity of Regas capacity in North west Europe. In this declining gas market the capacity sales by GTS will also diminish leading to a high risk of increasing tariffs. Any additional investment by GTS should therefore either be necessary from a technical/replacement rationale or lead to additional capacity sales. The costs should be carefully weighed against the future income. preferably the investments costs should be recovered from additional bookings made in a process similar to the incremental capacity investments on interconnection points. In this process network users provide binding commitments for incremental capacity. This prevents the possibility of stranded assets in the future. Energie-Nederland urges GTS to discuss the process regarding investments with the ACM to ensure a process similar to incremental capacity is applied to all new connections and in case of increases of capacity for existing connections.
	4.2	**The changed gas flows:** Energie-Nederland acknowledges that the EU and NL gas flows have changed due to the Russian invasion of Ukraine. The key question is how long and how big the changed flows will last and whether or not this warrants the investments that GTS proposes. Energie-Nederland would like to see an estimate of the additional capacity sales GTS expects, once the investments in the compressor stations at Wijngaarden en Scheemda are made.
	4.3	**Connection requests for LNG:** Energie-Nedeland supports the pragmatic approach GTS has taken with regards to the connection requests for additional LNG terminals' Several articles índicate that there will be an overcapacity of LNG regas capacity build in Europe and that the utilisations rates are potentially low (- 5oo/o12. Energie-Nederland would like to see an estimate of the additional capacity sales GTS expects, once the investments in the Maasvlakte and Midden Zeeland area are made. Energie-Nederland prefers a process where there is certainty that these investments are recovered via committed capacity sale. In this case the expected sales should be substantiated by actual capacity bookings.
	4.4	**Other investments:** Energie-Nederland supports the investment in the GZI Green gas gathering pipeline (Appendix 5), as it supports the energy transition. We would like to have additional information regarding the CSR investment (Appendix 6). No data is available on how much emissions (e.g. MT of CO2) are saved to judge if this is an efficient investment.The proposed investments in replacements (Appendix 7 and 8) seem sensible but Energie-Nederland does not have the technical expertise to judge these investments. Energie-Nederland advises ACM to get a second opinion on the necessity of these investments. With regards to the Acquisition of the NAM pipeline (Appendix 9), Energie-Nederland questions whether the investment is an efficient investment and whether or not the additional 0.6 million m3/hour is required for security of supply or purely for commercial benefit of the NAM. The alternative for the NAM would probably be to decommission the pipeline, i.e. the market value of the pipeline is probably low. Also in this case, a firm capacity booking by the NAM should be preferred to ensure recovery of the investment costs.
Coteq	5.1	**GZI Groengas-verzamelleiding:** Goed om te vernemen dat GTS voornemens is de toekomstige congestie in de RNB gasnetten te voorkomen. Coteq heeft zoveel als mogelijk de diverse netten met elkaar verbonden om het afzetgebied voor groengas te optimaliseren. Zonder de voorgestelde oplossing met de groengas-verzamelleiding zou het gasnet van Coteq ondanks deze netkoppelingen vollopen kort na 2024. Dankzij deze netkoppelingen leeft de verwachting dat een booster tussen het Coteq gasnet en het RTL net van GTS niet meer nodig is.

	GTS' response	Method of processing
	GTS thanks Energie-Nederland for their response. GTS appreciates Energie-Nederland's desire for GTS' investment costs to be covered by additional capacity bookings. However, GTS is currently not allowed to set additional financial or other conditions for obtaining a connection or investing in additional transport capacity. GTS has asked ACM to investigate to what extent such a mechanism for covering investment costs can be introduced at a later time.	The response did not result in a change to the final version of this addendum to the 2022IP.
	The proposed investments in the compressor stations at Wijngaarden and Scheemda are in response to transmission bottlenecks that have arisen as a result of the changed dominant gas flows. GTS intends to address these bottlenecks in compliance with its statutory duty to maintain the gas transport network in a manner that ensures its safety and reliability (in accordance with Article 10[1] of the Dutch Gas Act).	The response did not result in a change to the final version of this addendum to the 2022IP.
	GTS submits the investments in the Maasvlakte and Midden-Zeeland region in compliance with its statutory connection duty (in accordance with Article 10[6] of the Dutch Gas Act). GTS does not provide an estimate of the additional capacity sales resulting from these investments. GTS refers further to its responses at 4.1 and 4.2.	The response did not result in a change to the final version of this addendum to the 2022IP.
	As a result of the consultation on the addendum, GTS has included an explanation of the estimated emission reduction that will be realised through the investment 'CSR Making M&R stations emission-free (see Appendix 6). The acquisition of the NAM pipeline (Appendix 9) is necessary with respect to security of supply and, more specifically, the H-gas shortage in the Netherlands.	The response resulted in a change to Appendix 6: additional information has been added.
	GTS thanks Coteq for their response.	The response did not result in a change to the final version of this addendum to the 2022IP.

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Consultation matrix continued previous page

Party	Number	Consultation response
	6.1	LNG project developer' has read the addendum to the GTS Investment Plan dated 19 April 2023 ("GTS Addendum") with interest, being the developer of a LNG and New Energy Import Terminal ("Terminal") to be located in the Vlissingen area of the Netherlands. With this letter LNG project developer would like to respond to the addendum as published by GTS. The development of the Terminal will be handled under the 'Rijkscoördinatieregeling' (RCR) procedure in cooperation with the Ministry of Economic Affairs and Climate (EZK). The Terminal would be an important addition to local infrastructure providing optionality in natural gas import as well as contributing to the security of supply of energy to the Netherlands. The Terminal will need to be commercially viable with a certain throughput capacity offered so that the Terminal's usage tariffs are acceptable and within reason for the market. As such, it is of vital importance that enough capacity is made available in a timely manner as required for the realization of the Terminal. The GTS Addendum lists 7.2 GWh/hour as additional capacity at a new virtual entry point in the Midden-Zeeland region, which would be available with limited required investments. This capacity is insufficient for the contemplated throughput of the Terminal. As a minimum, the capacity of 10.8 GWh/hour mentioned on page 8 of the GTS Addendum should be made available at the new virtual entry point in Midden-Zeeland. Furthermore, LNG project developer suggests that 14.3 GWh/hour, or the energy equivalent to 1 BCF/day of regasified LNG, should be made available to allow sufficient optionality in volume contribution to the security of energy supply. With the entire Netherlands considered when deciding on the location for the Terminal, Zeeland came out as the only viable region due to its geography and availability of required port and industrial infrastructure. The presence of a significant industrial cluster also ensures local demand for high calorific value natural gas which can be supplied directly from the Terminal. These are important evaluation criteria for selecting the location. LNG project developer requests GTS to make the requested capacity available in a timeline corresponding to the proposed timeline of the Terminal operational target date as indicated in the capacity request form. We would like to continue communications with GTS on the progress of the Terminal development and GTS's mirrored pipeline capacity requirements project and related bookings. This as to assure the timelines remain in sync with the investment decision processes required by both LNG project developer and GTS. Herein LNG project developer would welcome an open and informed discussion about improvements to the GTS network system, to eliminate potential capacity bottlenecks that may affect the availability of capacity to the Terminal in a timely manner. Furthermore, LNG project developer future ambitions are aligned with the transition to green energies and views this as an integral part of the development of the Terminal. Considerable efforts are being made to ensure that the Terminal will be able to offer capacity for the import of green energy commodities such as ammonia at the time when regulation-, technology- and market developments are ready. LNG project developer looks forward to being involved in the development of infrastructure related to this transition in the future.
LNG projectde-veloper		

GTS' response	Method of processing
On 23 December 2022, GTS received a connection request from a party in the Midden-Zeeland region with an accompanying entry capacity request for 7.2GW to 10.8GW from the GTS network. The network calculations made showed that 7.2GW can be made available with limited investments. The intended completion date depends on an FID by the relevant LNG party (and when this FID is taken) in combination with the required lead time for implementing the necessary measures. GTS has presented these investments in this addendum. If this entry capacity proves insufficient, 10.8GW could be made available within 5 years through additional investments. On 19 May 2023, GTS received a new connection request with an accompanying entry capacity request for 7.2GW to 14.3GW. GTS needs to investigate the consequences, in terms of lead time and investment costs, of making this 14.3GW available. GTS notes here that it will only carry out any further investments after the required investments has been assessed by ACM and the Ministry of Economic Affairs and Climate Policy and the 'LNG project developer' has taken a positive FID on the completion of the LNG project. GTS is more than willing to continue discussions on this matter with the relevant parties.	The response did not result in a change to the final version of this addendum to the 2022IP.

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Party	Number	Consultation response
Vereniging Gasopslag Nederland (VGN)	7.1	**Market Developments and GTS investments:** In general VGN expects that the gas market will decline rapidly over the coming years. There are several reports that underline this, amongst others: - "Scenario's investeringsplannen" by Netbeheer Nederland (Feb-23) - Breaking free from fossil gas: A new path to a climate-neutral Europe by Agora (May-23) - Bericht des Bundeswirtschafts- und Klimaschutzministeriums zu Planungen und Kapazitäten der schwimmenden und festen Flüssigerdgasterminals (Mar-23) All these reports point out that gas demand will be halved within the next 10 years and there will be a large overcapacity of Regas capacity in North West Europe. In this declining gas market the capacity sales by GTS could also decline leading to a high risk of increasing tariffs. Any additional investment by GTS should therefore either be necessary from a technical/replacement rationale or lead to additional capacity sales. For these investment the costs should be carefully weighed against the future income. Preferably the investments costs should be recovered from additional bookings made in a process similar to the incremental capacity investments on interconnection points (NC CAM). In this process network users provide binding commitments for incremental capacity. This prevents the possibility of stranded assets in the future. VGN urges GTS to discuss the process regarding investments with the ACM to ensure a process similar to incremental capacity is applied to all new connections and in case of increases of capacity for existing connections.
	7.2	**The changed gas flows:** VGN acknowledges that the EU and NL gas flows have changed due to the Russian invasion of Ukraine. The key question is how long and how big the changed flows will last and whether or not this warrants the investments that GTS proposes. VGN would like to see an estimate of the additional capacity sales GTS expects, once the investments in the compressor stations at Wijngaarden en Scheemda are made.
	7.3	**Connection requests for LNG:** VGN supports the pragmatic approach GTS has taken with regards to the connection requests for additional LNG terminals. Several articles indicate that there will be a glut of LNG regas capacity build in Europe and that the utilisations rates will be low (~ 50%)1, It does not make sense to expand the GTS network to facilitate additional LNG transit flows to Germany when Germany itself is also building LNG regas capacity. From a commercial point of view it would be more economical to transport the LNG directly to Germany to avoid paying the interconnection fees payable at the Dutch/German border. VGN would like to see an estimate of the additional capacity sales GTS expects, once the investments in the Maasvlakte and Midden Zeeland area are made. As stated before, VGN prefers a process where there is certainty that these investments are recovered via committed capacity sale.
	7.4	**Other investments:** VGN support the investment in the GZI Green gas gathering pipeline (Appendix 5), as it supports the energy transition. VGN would like to have additional information regarding the CSR investment (Appendix 6). No data is available on how much emissions (e.g. MT of CO2) are saved to judge if this is an efficient investment. The proposed investments in replacements (Appendix 7 and 8) seem sensible but VGN does not have the technical expertise to judge these investments. VGN advises ACM to get a second opinion on the necessity of these investments. With regards to the Acquisition of the NAM pipeline (Appendix 9), VGN questions whether the investment is an efficient investment and whether or not the additional 0.6 million m3/hour is required for security of supply or purely for commercial benefit of the NAM. The alternative for the NAM would probably be to decommission the pipeline, i.e. the market value of the pipeline is probably low. Also in this case, a firm capacity booking by the NAM should be preferred to ensure recovery of the investment costs.

GTS' response	Method of processing
See our response to 4.1.	The response did not result in a change to the final version of this addendum to the 2022IP.
See our response to 4.2.	The response did not result in a change to the final version of this addendum to the 2022IP.
See our response to 4.3.	The response did not result in a change to the final version of this addendum to the 2022IP.
See our response to 4.4.	The response resulted in a change to Appendix 6: additional information has been added.

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