gasunie
transport services

Consultation of the planning assumptions to determine the required Groningen production

Schiphol, November 27th, 2019

Content

- Legal framework
- Recap methodology
- Evaluation gas year 2018/2019
- Planning assumptions for gas year 2020/2021
- Consultation process

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Legal framework

- Since January 1st 2019, GTS has the legal obligation to advice the Minister of Economic Affairs and Climate Policy regarding the Groningen production before February 1st of each year
- This advice concerns:
  - The required Groningen volume and capacity for the next gas year
    - A formula describing the relation between temperature and Groningen volume ("Groningen graaddagenvergelijking")
  - A formula comparable to the previous bullet describing the relation between temperature and the total L-gas demand
  - Outlook for the coming ten years regarding the
    - Required Groningen volume and capacity
    - Total L-gas demand and the demand of protected customers in the Netherlands
  - Consultation of the planning assumptions with market parties
- After the gas year GTS has to report before November 1st of each year:
  - Usage of the blending facilities
  - Usage of storages and LNG
  - Green gas production
- Finally, during the gas year, GTS has to report significant deviations in the availability of the relevant blending facilities and the gas market which could affect the required Groningen production

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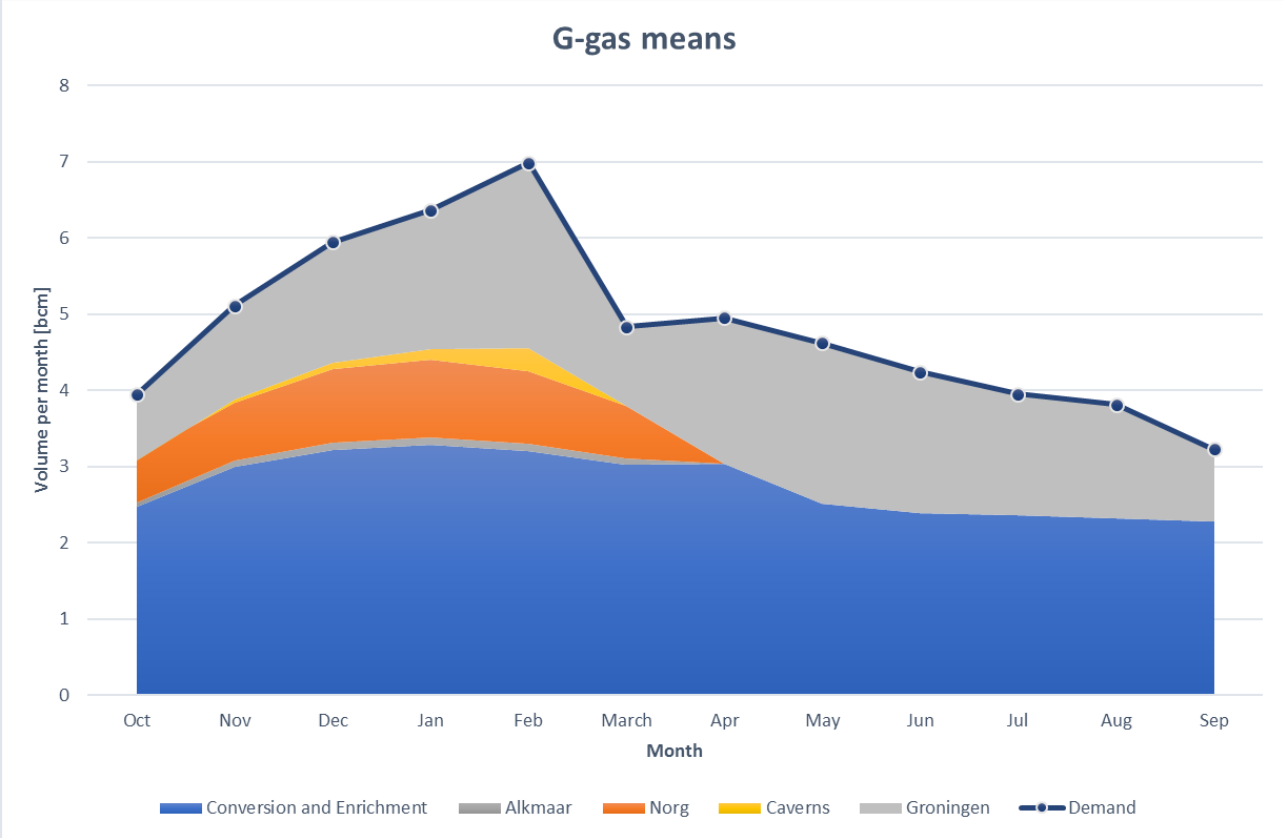
Recap methodology

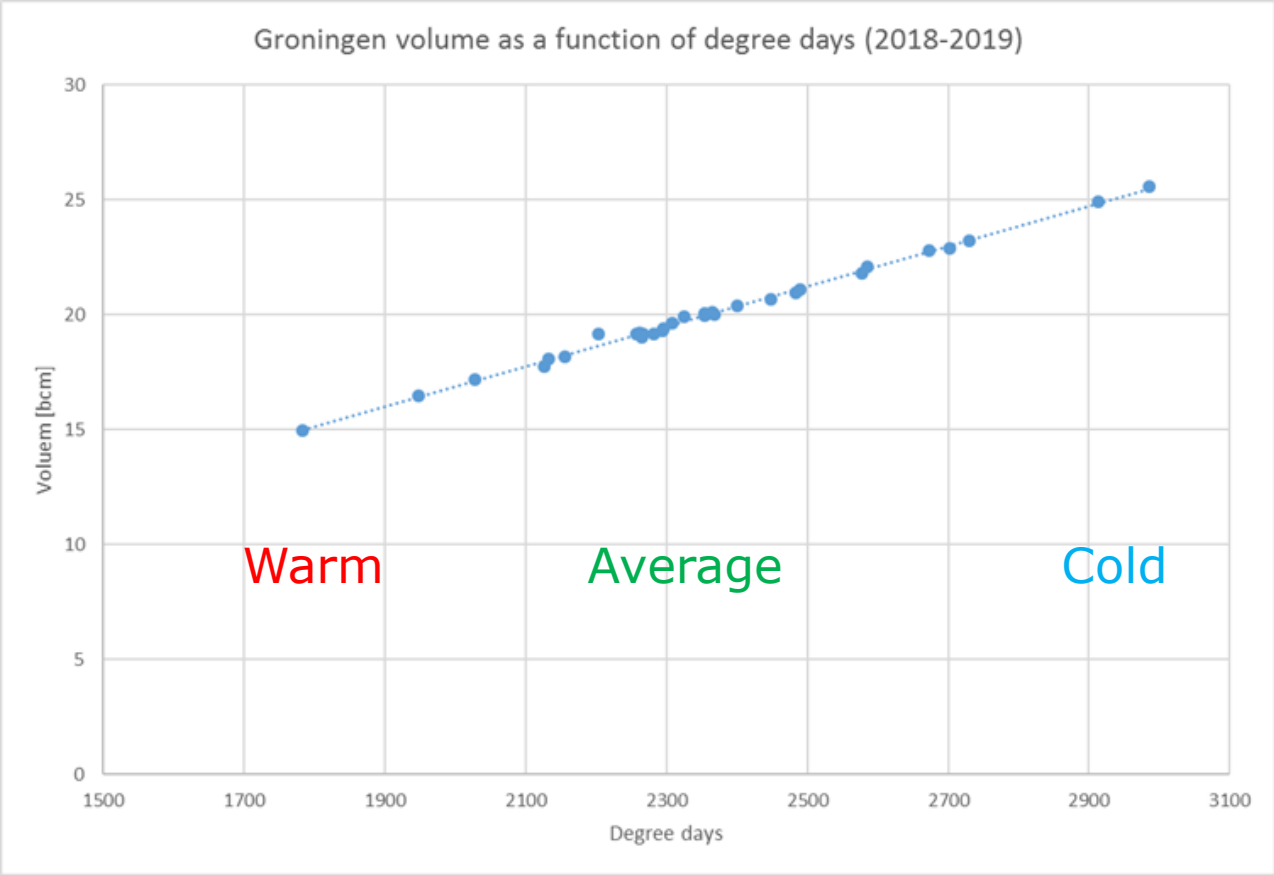
Modelling required Groningen volume (simplified)



Example: gas year 2018/2019, without additional nitrogen, 92.5% and Groningen gas via Norg and OSZ

Recap methodology

Temperature vs Groningen supply for gas year 2018/2019



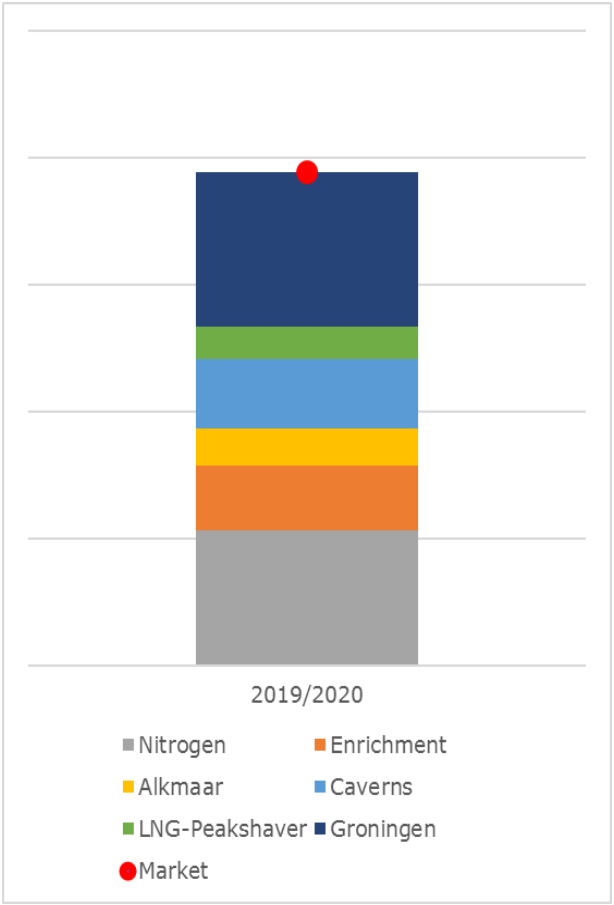
Groningen volume =0.0874*dd - 0.595

Recap methodology
Modelling required Groningen capacity

- Capacity Groningen
  - Required Groningen capacity based on European regulation, to safeguard the security of gas supply (25 Oct 2017, 2017/1938), article 5 Infrastructure standard, clause 1

- Assumption:
  - Single largest infrastructure (capacity) = UGS Norg
  - Once in 20 years is translated to a daily average temperature of -15.5°C

- Method:
  - Determine the market demand at a temperature of -15.5°C
  - Use all (including back-up) facilities at their technical capacity excluding UGS Norg and excluding Groningen
  - Use Groningen to close the gap between demand and supply
  - Deliberation between GTS and MEA on the definition of the market (the Netherlands or L-gas region)



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Evaluation gas year 2018/2019
Summary

- Realised number of degree days: 2075
  - Warmer than average (~2300 degree days)
- Calculated market 50.3 bcm, realised market 49.8 bcm
- Calculated and realized Groningen production 17.5 bcm
- Average nitrogen utilization 91%
  - Only using the correction for planned maintenance and not for the size of the market and transport limitations
  - NAM has to keep the Groningen production below the degree day formula, therefore all deviations in planning assumptions will directly have influence on the nitrogen utilization
- In total GTS has produced 32.4 bcm pseudo G-gas via enrichment and nitrogen blending
  - Nitrogen blending 22.9 bcm, enrichment 9.4 bcm
- Modelled Wobbe-index slightly lower than realised Wobbe-index
- Storages (seasonal and caverns) are almost volume neutral

Evaluation gas year 2018/2019
Estimation of the market (bcm)

	Regional gas companies	Industrial end users	Germany	Belgium and France	Total market
Realisation	18	5.8	17.0	9.1	49.8
Model	17.3	5.3	18.3	9.4	50.3

- The output of our model (using temperature data supplied by the KNMI) is compared with the realisations
- The results of the domestic market will be updated with the KEV2019
- GTS has contacted the German L-gas TSO's to investigate the difference between model en realisation

Evaluation gas year 2018/2019
Nitrogen utilization

Month	Nitrogen utilization [%]
October 2018	86
November 2018	94
December 2018	106
January 2019	109
February 2019	86
March 2019	89
April 2019	100
May 2019	109
June 2019	91
July 2019	71
Augustus 2019	62
September 2019	77
Total	*91*

- All quality conversion capacity is made available to market parties
- The nitrogen utilization is a result of the behaviour of market parties
- Utilization above 100% means that the back-up facilities (Pernis and Heiligerlee) have been used by the market parties
- Overall nitrogen utilization 91% (volume weighted)

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Planning assumptions gas year 2020/2021
Demand

- Realized hourly temperature profiles
  - Last 30 temperature profiles at weather station de Bilt (KNMI)
  - In order to calculate severe but realistic scenarios over the past 30 years
  - As required by the Dutch Gas Act
  - Gas year 1989/1990 until 2018/2019 *instead of 1988/1989 until 2017/2018*
- Demand
  - Domestic consumption
    - Klimaat- en Energieverkenning 2019 *instead of the Nationale Energieverkenning 2017*
    - Conversion of largest L-gas industries/power plants to H-gas
  - L-gas export
    - Belgium and France: reduction based upon information of concerned MEA *instead of on an estimate of GTS*
    - Germany: reduction based upon NEP2020 *instead of USB2019*

Planning assumptions gas year 2020/2021
Supply

- Planned nitrogen utilization set at 100% of Ommen, Wieringermeer and Zuidbroek (when available, for the 10 year outlook)
- Base load nitrogen facilities (100%)
  - Ommen (cap. 146,000 m^3/h N_2)
  - Wieringermeer (cap. 295,000 m^3/h N_2)
  - For the 10 year outlook, new nitrogen plant Zuidbroek per April 1st 2022 (cap. 180,000 m^3/h N_2)
- Pernis (cap. 60,000 m^3/h N_2) and Heiligerlee (cap. 190,000 m^3/h N_2) are back-up facilities to guarantee the base load capacity
- Norg and Alkmaar are available in all years and volume neutral by definition
  - *Norg is filled with pseudo G-gas and Groningen gas, working gas volume in every year 4 bcm*
- Caverns are volume neutral by definition
  - 3 caverns available from gas year 2020/2021
  - For the 10 year outlook, 2 caverns available from gas year 2021/2022 onward
- LNG-PS available for all scenarios and years[1)]
- Groningen is the balancing source in the merit order
- Wobbe-index based on data provided by small field producers

1) *GTS is investigating the possibility to increase the back-up capacity by using nitrogen which is now allocated to other than quality conversion tasks*

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Consultation process

- Consultation question: we would like to ask your opinion/feedback on all planning assumptions
- Start consultation on November 20th 2019, GTS published the letter of our latest evaluation and the slide pack discussed today
- Workshop on November 27th 2019, where GTS presents the planning assumptions to market parties
- Consultation ends on December 6th 2019, last day for market parties to give their written view
- Written views will be taken into account in the advice GTS sends towards the Minister (before February 1st)