# The Risk of an L-Gas Supply Crisis in Germany

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# Mitigate or Litigate?
# A review and update

of the paper published in February 2018

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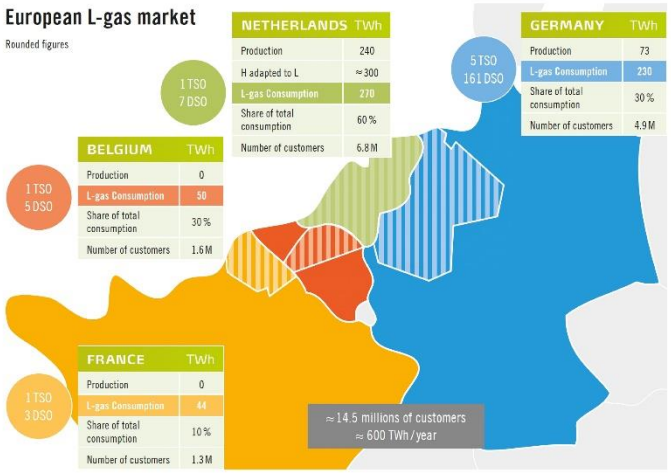
# Introduction

- Low calorific gas **(L-gas)** is an important and distinct **part of the natural gas market in North West Europe** (NWE)
- Since the 60's the bulk of L-gas is produced from the **giant Groningen field** in the Netherlands. This field is in decline and in Germany the conversion of supply areas from L-gas to H-gas is planned for the next decade
- Due to induced **earthquakes** Groningen production rates had been limited and are claimed to be further reduced as a consequence of a high court decision and recent relatively strong earthquakes in January 2018 as well as in May and June 2019
- There is a risk that a further earthquake triggers the State Supervision on the Mines to re-commend a further cut of Groningen production. This might have further implications in NWE
- As customers require **uninterrupted supply**, either conversion of H-gas to L-gas or the adjustment of end-users' installations are the options of choice
- Yet, the **speed of conversion** of L-gas to H-gas installations is organizationally limited
- The German regulator **has not (yet) adjusted guidelines** for network planning, i.e., still assumes that L-gas delivery obligations of Dutch suppliers will be fulfilled
- Which measures shall be taken to **avoid such emergency** case and how should **market participants prepare** for such case?

# Overview

## L-gas market in Europe

- in total, about 600 TWh/a L-gas is needed in a cold year
  - North-West of Germany (up to 230 TWh/a),
  - the Netherlands (up to 270 TWh/a),
  - parts of Belgium (up to 50 TWh/a) and
  - North of France (up to 44 TWh/a)
- L-gas market established in 1963
- restricted to L-gas production in the Netherlands and North-West Germany
- production in sharp decline
- need to convert L-gas distribution and supply areas to H-gas



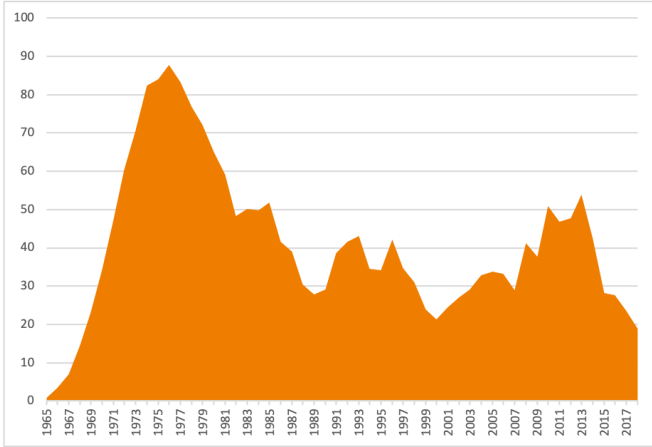

*Geographical distribution of L-gas consumption*
Source: ENTSOG (2017): Gas Regional Investment Plan 2017, North West GRIP, Main Report, p. 67.

**L-gas**

- high inert gas share
- i.e., lower calorific value and Wobbe index than H-gas
- particular technical specifications for L-gas distribution
- defined L-gas distribution and supply areas
- millions of L-gas burner appliances

# Background
## production from the Groningen field

- original natural gas reserves ~**2,800 bcm**
- ~2,200 bcm already produced by Nederlandse Aardolie Maatschappij (NAM), i.e., remaining reserves estimated at ~600 bcm
- throughout the years natural gas was produced with a very high degree of **flexibility***
- (man-made = induced) earthquakes observed since the 90´s
- production level and fluctuation considered causing these **earthquakes**




*Natural gas production of the Groningen field; annual values (in bcm/a) since 1965*
Data from www.nam.nl, Download Feb. 2019.

- allowed annual production volume and permitted variations in production were progressively restricted
- production volume declined from ~54 bcm/a in 2013 to ~18.8 bcm/a in 2018

→ **by 2030 exports of L-gas should be significantly reduced and then discontinued**

* i.e., buyers of natural gas have been granted options to purchase natural gas within pre-agreed limits at different times. As a result the production of natural gas from the Groningen field was subject to strong fluctuations.

# Background

## New Gasunie Transport Services Proposal, January 2019


**Figuur 1: Advies GTS januari 2019 met betrekking tot de benodigde Groningenproductie voor verschillende scenario's.**

From published letter of GTS to: „Zijne Excellentie de rninister van Econornische Zaken en Klirnaat, de heer ir. E.D. Wiebes MBA

- GTS does not exclude the option to reduce Groningen production to 0 m³/a already in 2022/2023 (in an average year)

# Background
# Recent Developments I

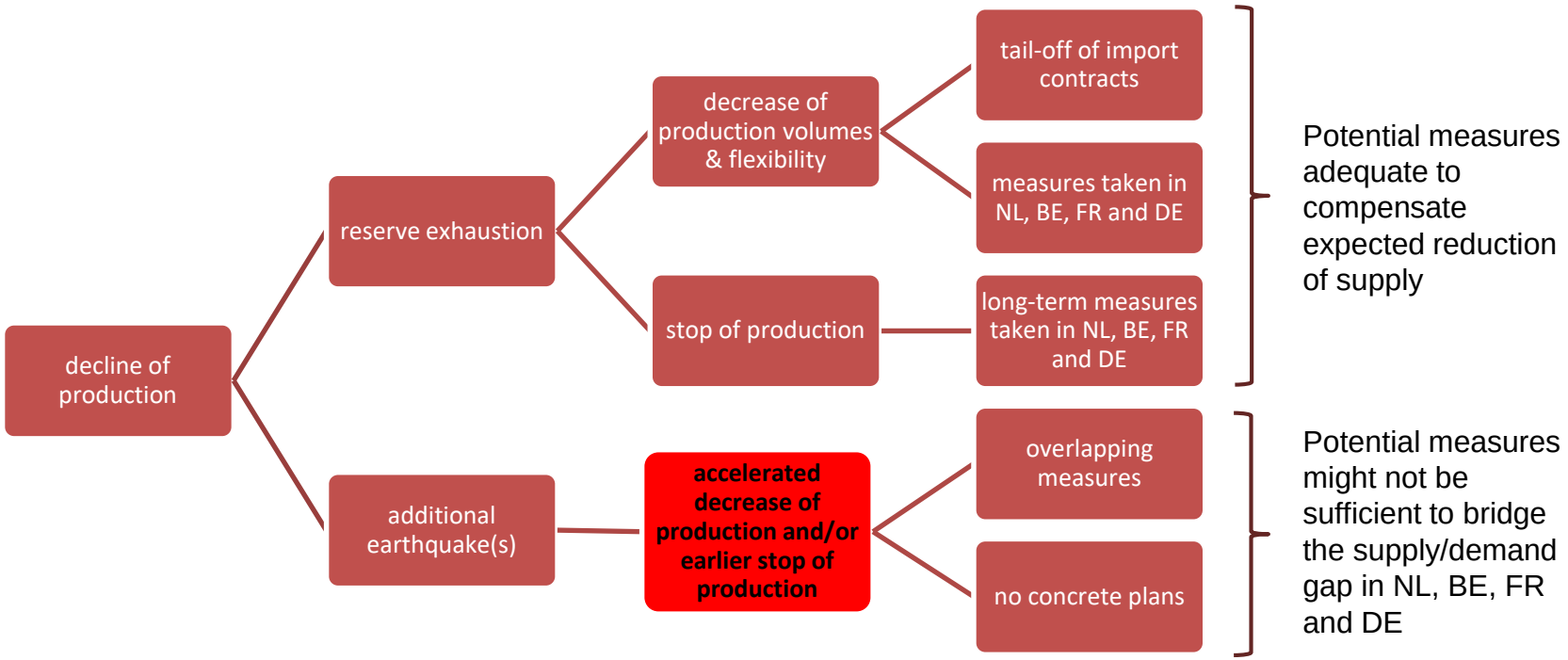
- Since January 1, 2019 Gasunie Transport Services (GTS) has a legal obligation to advice the Minister of Economic Affairs and Climate Policy regarding the Groningen production on a yearly basis
- GTS advised the Minister in January 2019 as the starting point for the process of the declaratory decision („vaststellingsbesluid“) a reduced Groningen production of 15.9 bcm in 2019/20, substituting Groningen gas to a large share by pseudo G-gas produced from $N_2$ injection to H-gas and enrichment and taken from storage
- Based on a draft concept and consultation the Minister will publish the final declaratory decision („vaststellingsbesluid“) by October 1st, 2019
- On May 22, 2019 an earthquake at Westerwijtwerd occured, strength of 3.4 Richter scale
- The State Supervision on the Mines (SODM) advised the Dutch Minister of Economics to reduce the Groningen production in gas year 2019/20 to 12 bcm (for an average year) and consequently, the Minister asked GTS to investigate the possibility to reduce the required Groningen production accordingly

# Background
# Recent Developments II

- GTS proposed on June 11 in a preliminary statement to the Minister a set of changed assumptions and additional measures to meet a 12 bcm/a Groningen production target
- This represents a 25% downward cut of the Januar 2019 GTS planning of the minimum required Groningen production within less then five months
- Nevertheless, GTS expects to meet the L-gas requirements of the Dutch and the export markets
- However, this time GTS consulted the market participants in June/July 2019 and asked for opinions and feedback on the planning assumptions and measures
- The advice of the SODM to reduce Groningen production to 12 bcm/a in 2019/20 is not consulted/discussed by/with market participants
- GTS proposed to increase the $N_2$ injection to 100% of the injection capacity, store pseudo G-gas in UGS Norg, supply Oude Statenzijl with pseudo G-gas and reduce Norg wintergas by 1 bcm in 2019/20 in order to meet the 12 bcm/a Groningen production target
- GTS will submit its final recommendations to the Minister by the end of July 2019

# Outline of challenge

## As forecasted 2018 the market faces the marked-up challenge



# Potential consequences in DE

- The **risk of supply shortages** has **increased** since last year, and consequently, a **supply emergency** in Germany caused by a **shortage** of the L-gas production in the Netherlands and deliveries to Germany is even more likely.
- Producers and sellers might request **force majeure** and ask for **termination or suspension** of the contracts (downstream companies often might have the greater economic disadvantages and risks due to shorter-term purchasing contracts).
  This might imply
  - **reduction** of natural gas **volumes** available on the market
  - **close down** of distribution grids
  - **price increase** (in particular for L-gas)
    - due to the expectation of scarcity of natural gas in general, or
    - due to the necessity to use conversion capacities
  - **increase** in **conversion fees** – far beyond the usual levels
  - an expected **loss of image** for natural gas as a source of energy in general

# Measures taken in DE
## due to planned tail-off of imports

- BNetzA expects and has approved measures to mitigate any consequences of the planned decline due to reserve exhaustion – **but not due to any other, earlier disruption**
- **L-gas conversion** plans reflect a 10% p.a. tail-off of Dutch L-gas deliveries only

→ However, a catalogue of **well-defined measures is missing**

→ The German transmission system operators have mentioned the fact of the repeated earthquakes in their recently published scenario for the network planning 2020-30. However, they did not indicate any measures to be taken

# Potential measures to be taken in DE
## (due to earthquakes)

- maximization of indigenous L-gas **conventional production**
- increase in German L-gas **unconventional production** (by fracing), *but unlikely for political opposition*
- temporary **conversion** of H-gas **storage** to L-gas storage

## TSOs and DSOs

- speed up the **conversion of appliances** from L-gas to H-gas
- construction of **conversion plants**, e.g., by admixture of nitrogen to decouple L-/H-gas conversion of distribution areas to H-gas from actual Dutch L-gas supplies
- alternatively, use of nitrogen from **nitrogen-rich natural gas reservoirs** – as a low-cost nitrogen source – for conditioning with H-gas
- **expansion** of transport **pipelines** in anticipated bottlenecks

## Trader and Supplier

- Renegotiation of service contracts for L-gas procurement and balancing
- Review of L-gas supply portfolio
- Conclude new (different) L-Gas supply contracts
- Renegotiation of L-gas supply contracts

# Open issues

- How can **market players** like importers, traders, TSOs, DSOs, sellers and suppliers like “Stadtwerke” (municipal utilities) **protect themselves** against an L-gas supply emergency for their customers and/or the economic consequences in case of such an event?
- What are the **necessary prompt changes** to gas supply contracts and trading?
- Which local technical measures should be taken?

→ It is advisable that market participants at all levels (importers, traders, TSOs, DSOs, sellers and suppliers)

  - **systematically identify and analyse their individual risk position** in relation to the challenges outlined here and
  - **derive and implement suitable measures** of a technical and contractual nature (inventory, default scenarios, network risk analysis and analysis of gas purchase, sales and trading contracts, identification and evaluation of options, action planning and implementation)

# Authors

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