

The Risk of an L-Gas Supply Crisis in Germany — Mitigate or Litigate?

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Introduction

- Low calorific gas (**L-gas**) forms an important and distinct **part of the natural gas market in 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 a recent earthquake in Jan. 2018
- Dependent on the size (and speed) of potential additional production reductions a veritable **supply emergency** might occur in NWE
- As customers require **uninterrupted supply**, either conversion of H-gas to L-gas or the end-users' installations are the options of choice
- Yet, **the speed of conversion** of L-gas to H-gas installations is limited
- The German regulator **has not (yet) adjusted guidelines** for network planning, i.e., still assumes that L-gas delivery obligations of Dutch exporters 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

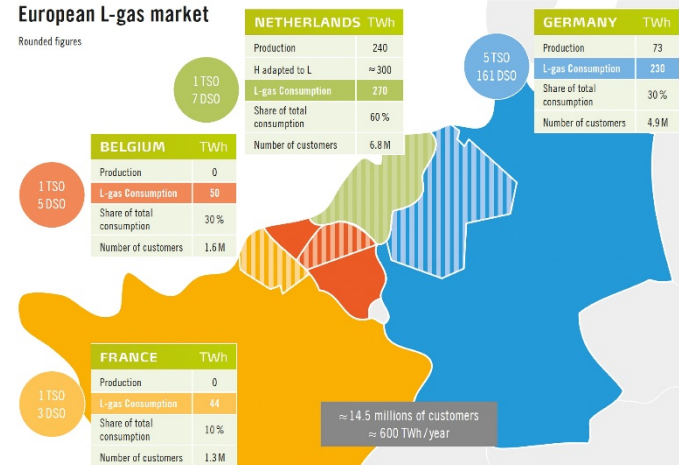
- high inert gas share
- i.e., lower calorific value and Wobbe index than H-gas
- particular technical specifications for L-gas distribution
- defined L-gas distribution and supply areas
- millions of L-gas burner appliances

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
- finally, need to convert L-gas distribution and supply areas to H-gas

European L-gas market

Rounded figures



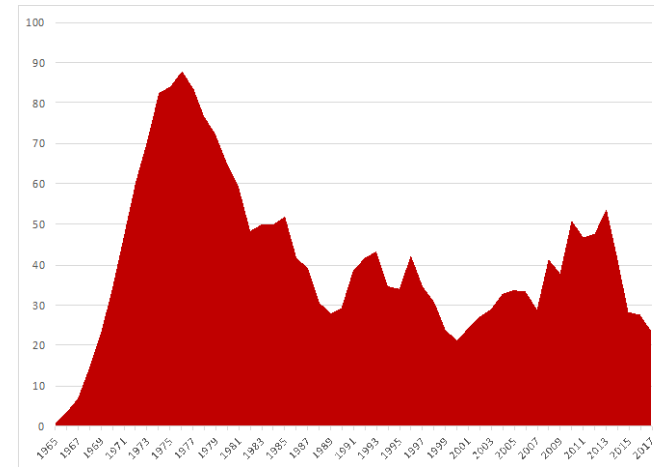
Geographical distribution of L-gas consumption

Source: ENTSOG (2017): Gas Regional Investment Plan 2017, North West GRIP, Main Report, p. 67.

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**
- allowed annual production volume and permitted variations in production were progressively restricted
- production volume declined from ~54 bcm/a in 2013 to ~23.5 bcm/a in 2017
- **production limited** in May 2017 to 21.6 bcm/a by 2020/21 (average year)
- **by 2030 exports of L-gas should be significantly reduced and then discontinued**



Natural gas production of the Groningen field; annual values (in bcm/a) since 1965
Data from www.nam.nl, Download Jan 18, 2018.

* 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

Decision of the Dutch High Administration Court

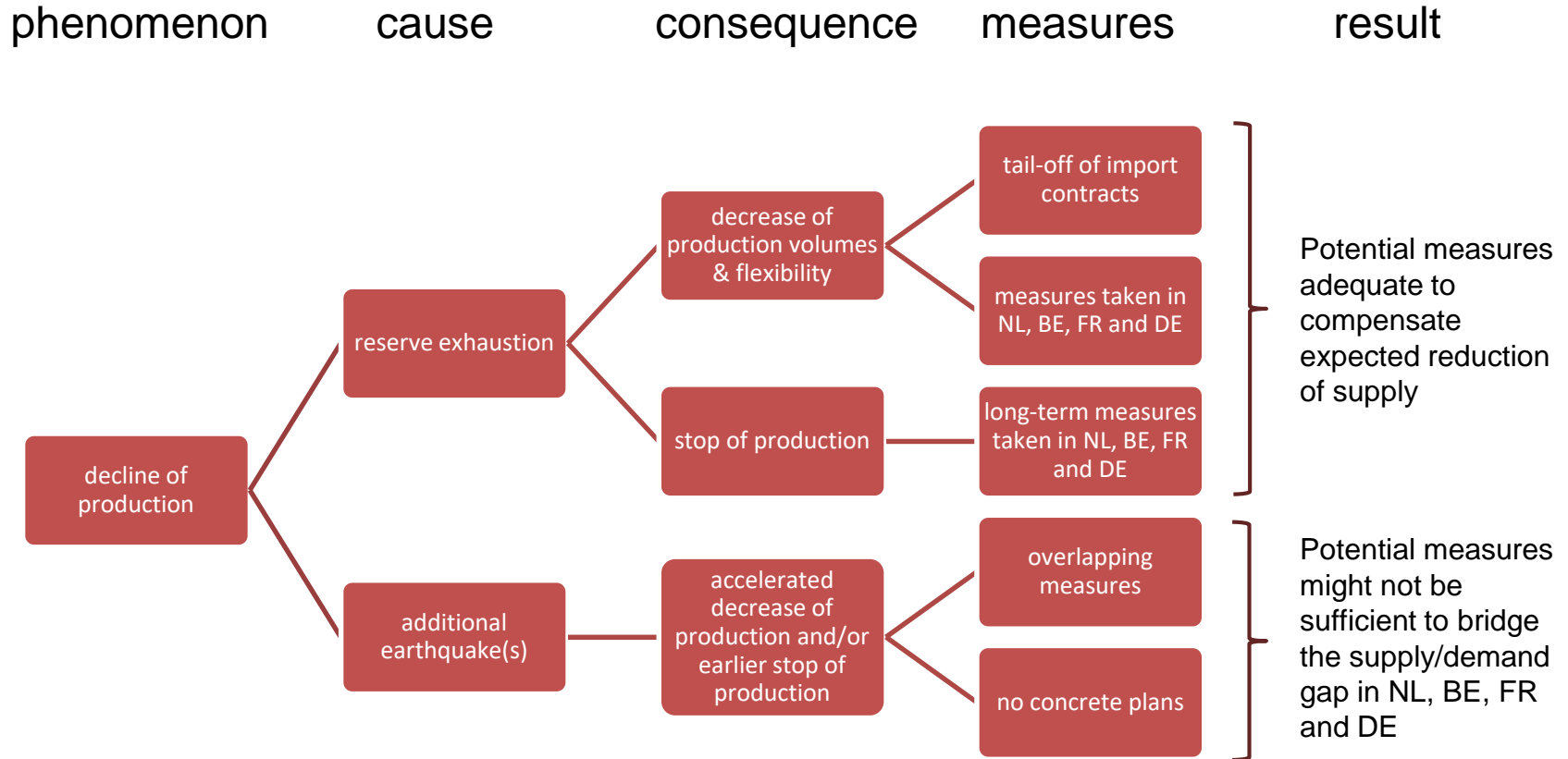
- on Nov. 15, 2017 the Dutch High Administration Court set aside the decision of the Dutch Minister of Economic Affairs and Climate Policy of Sept. 2016 and the amendment decision of May 2017 on gas extraction from the Groningen field
- the current gas extraction limit was only implemented as an interim provision
- the ministry has to issue a **new decision on gas extraction** in Groningen within one year based on a sound assessment of geological risks in the earthquake zone taking into consideration aspects like security of supply and export obligations

Background

Earthquake on Jan. 8, 2018

- despite a significant reduction of L-gas production from the Groningen field, an **earthquake** (with a Richter magnitude of 3.4) on Jan. 8, 2018 damaged buildings in the Groningen area
- the “geological” earthquake led to a “**political**” **earthquake**. Discussions of further Groningen production curtailments started immediately thereafter. Dutch Minister of Economic Affairs and Climate Policy, Eric Wiebes told parliament that Groningen production “needs to be lowered as much as possible”
- intensive discussions with proposals from, e.g., Gasunie Transport Services (GTS) and Dutch State Supervision of Mines (SSM) dated Jan. 31/ Feb. 1, 2018, respectively
- “Arbeitsgemeinschaft Erdgasumstellung” (ARGE EGU) (*Working Group for Gas Quality Conversion*) in Germany requires German regulator BNetzA
 - to clarify with the Dutch authorities the L-gas volumes available for export to Germany
 - to accept investments in conversion plants and
 - to implement risk scenarios in the 10 years network planning
- **BNetzA has not (yet) adjusted guidelines** for network planning and the German Federal Ministry for Economic Affairs and Energy still assumes that L-gas delivery obligations of Dutch exporters will be fulfilled

Outline of challenge



Potential consequences in DE

- L-gas for the German market is likely secured for gas year 2017/18
- albeit regionally limited, a veritable **supply emergency** in Germany caused by a disruption of the L-gas production in the Netherlands and deliveries to Germany cannot be ruled out. In such an event, industrial and commercial companies would have to cease operations, thousands of homes would remain cold
- 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
- plenty of H-gas is available, however, more than 100 L-gas distribution grids and more than 5.5 million L-gas burner appliances cannot be replaced or adjusted to H-gas in a short period of time

Measures taken in NL (before additional curtailments due to earthquakes)

- current delivery obligations (incl. flexibility) of Dutch suppliers in the Netherlands and for export are deemed to be safeguarded – even in a cold year
- **investments** in the Netherlands
 - Gasunie Transport Services BV (GTS) created additional **blending capacity** of ~10 bcm/a (50% of Groningen production)
 - GTS created ~20 bcm/a **admix capacity** to produce L-gas by adding nitrogen to H-gas
 - new natural gas storages (like Norg) for maintaining provision of flexibility
 - decision to invest in more nitrogen conditioning equipment was postponed by GTS
- L-/H-gas conversion of downstream appliances in the Netherlands planned only in the long-term future

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** is planned based on the quantities agreed upon in import contracts
 - L-gas conversion was already discussed in the early 2000s, however, such conversion was postponed to the period after 2020 due to the prolongation of the long-term contracts with GasTerra B.V. in about 2008
 - TSOs face(d) regulatory problems to charge customers for grid conversion
 - transmission grid operators (TSOs) faced as of approx. 2012 only conversions of L-gas supply areas to H-gas due to decreasing German L-gas production
 - in 2013 TSOs addressed for the first time the need to convert L-gas supply regions starting in 2021 due to the decline of Dutch L-gas supplies
 - German plans reflect the tail-off of delivery contracts only. However, German TSOs proposed additional investments in the draft of the ten year network development plan 2018.
- However, a catalogue of **well-defined measures is missing** in the event of a reduction or cessation of the Groningen production (caused by a change in political opinion or a court decision) should occur sooner or stronger than expected and affects the long-term contractual Dutch L-gas deliveries to Germany

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

- speed up the **conversion of appliances** from L-gas to H-gas
 - maximization of indigenous L-gas **conventional production**
 - increase in German L-gas **unconventional production** (by fracking), *but unlikely for political opposition*
 - 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 deposits** – as a low-cost nitrogen source – for conditioning with H-gas
 - **expansion** of transport **pipelines** in anticipated bottlenecks
 - temporary **conversion** of H-gas **storage** to L-gas storage
- yet, most of these measures require **long implementation times**,
the **political acceptance** is indispensable and **financing** has to be settled

Open issues in DE, FR and BE

- How can market players like importers, traders, TSOs, DSOs, sellers and suppliers like “Stadtwerke” protect themselves against a L-gas supply emergency for their customers and/or the economic consequences in case of an event?
 - Can they take the attitude of ‘wait and see’?
 - What are the necessary prompt changes to gas supply arrangements, contracts and trading?
 - Which local technical measures should be taken?
- It is advisable that market participants at all levels
- **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



With more than 25 years' hands-on experience in the European energy industry Michael Karasz's commercial expertise covers the whole value chain of the natural gas business from upstream to end user delivery.



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