



Shaking Dutch grounds won't shatter the European gas market



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ABSTRACT

The Netherlands have been a pivotal supplier in Western European natural gas markets in the last decades. Recent analyses show that the Netherlands would play an important role in replacing Russian supplies in Germany and France in case of a Russian export disruption. Lately, however, the Netherlands have suffered from a series of earthquakes that are related to the natural gas production in the major Groningen field. By consequence, natural gas production rates – that are politically mandated in the Netherlands – have been substantially reduced, by almost 45% in 2015 compared to 2013-levels. We implement this reduced production path for the next decades in the Global Gas Model and analyse the geopolitical impacts. We find that the diversification of European natural gas imports allows spreading the replacement of Dutch natural gas over many alternative sources, with diverse pipeline and LNG supplies. There will be hardly any price or demand reduction effect. Even if Russia fails to supply Europe, the additional impact of the lower Dutch production is moderate. Hence, the European consumers need not to worry about the declining Dutch natural gas production and their security of supplies.

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1. Introduction

Since winter 2013/2014, consumers in the European Union have worried about the security of their natural gas supplies. The difficult geopolitical situation with Russia – that was triggered by the conflict over Crimea and Ukraine – has cast doubts about the reliability of the Russian natural gas exports to Europe. However, several analyses show that European supplies are sufficiently diversified to sustain a short- and long-run disruption by Europe's major supplier (Richter and Holz, 2015; Hecking et al., 2014; ENTSO-G, 2014a). One important part of the European supply portfolio – that can also help to balance a sudden disruption of Russian natural gas supply – is the indigenous natural gas production in the Netherlands. In 2013, total Dutch natural gas production accounted for almost 20% of total EU consumption (IEA, 2015), reaching 86 billion cubic meters (bcm), of which 67 bcm were exported to other EU countries (IEA, 2014a).

More specifically, it is the Groningen field that is of pivotal importance for the Dutch natural gas production. This largest of all fields in the Netherlands accounts for around 60% of total Dutch natural gas production and is further used to balance seasonal fluctuations (IEA,

2014b). As much natural gas as possible has been extracted from the small fields to conserve the reserves in the Groningen field to, on the one hand, preserve the status as a swing supplier and, on the other hand, extend the number of years where the Netherlands remain a net-exporter (Schipperus and Mulder, 2015). Since 2013, however, an unprecedented series of earthquakes has rattled the country's Northeastern provinces. This has imposed costs on house owners and gas extraction companies while, additionally, raising concerns about soil subsidence and further earthquakes (cf. Koster and van Ommeren, 2015). As the seismic activity is related to the natural gas extraction in the Groningen field, there has been increasing public opposition to the resource extraction in the Netherlands. In consequence, the Dutch Minister of Economics lowered the production ceilings for Groningen natural gas such that no more than 70 bcm in 2014, and 60 bcm in 2015, respectively, were produced in the Netherlands in total (Gasunie, 2015; Ministry of Economic Affairs, 2015a). The expected pathway of even lower natural gas production in the coming decades constrains the Dutch capacity to deliver substantial amounts of natural gas to the European market.

The contribution of this paper is twofold. First, we provide a concise overview of the governance of natural gas production and trade in the Netherlands. We thereby explain what decision process has led to the altered production cap for the Groningen field. Second, we analyse the impact that reduced Dutch production capacities have on the European natural gas market. To this end, we use numerical modelling

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and conduct a scenario analysis with the Global Gas Model (GGM; Egging, 2013). This equilibrium model of the global natural gas market allows us to analyse production patterns, trade flows and infrastructure expansions. Relative to the GGM *Base Case*, we investigate the global natural gas market in reaction to reduced Dutch production where we focus on European consumers. Moreover, to take account of the geopolitical risk posed by Europe's main natural gas supplier Russia, we further model an accelerated decline in Dutch production levels jointly with a long-term disruption of Russian natural gas exports to Europe.

Our results show that Dutch natural gas can be replaced by a diversification of European natural gas imports, using many alternative suppliers, including diverse pipeline and LNG routes. There will be hardly any price or demand reduction effect – neither on average nor for neighbouring countries that currently strongly rely on Dutch natural gas. Similarly, even in the case of Russia failing to supply Europe, the additional impact of the lower Dutch production is moderate.

Dutch natural gas production was already scheduled to decline prior to the current earthquakes that shake the Dutch society.¹ The Groningen reserves are limited, as are the reserves of the remaining small fields. Moreover, the densely populated country is unlikely to pursue shale gas production. Nevertheless, the unexpected tightening of the production cap in the wake of current earthquakes reduces short-term production capacities pronouncedly, which could pose substantial supply pressure on the European natural gas market. Our analysis shows, however, that long-run results diverge less from the *Base Case* than the 2013 share of the Dutch natural gas production leads to presume.

The remainder of this paper is organised as follows. Section 2 describes in detail the Dutch natural gas market and the decision process that led to the production cap for the Groningen field. In Section 3, the GGM and its underlying data set are presented, and scenario definitions are laid out. Section 4 discusses our main results. Section 5 concludes.

2. The Dutch natural gas market: setup and recent developments

Natural gas production in the Netherlands started in the 1960s. The three main actors in the gas market are the Dutch central state, Royal Dutch Shell and ExxonMobil. Through a composition of organisations and institutions, these three actors have established a public-private partnership that develops and sells most of the Dutch natural gas (Correljé and Odell, 2000). The revenues from natural gas sales have been significant both for the state and the private parties. In 2013, 70,000 people were employed in the Dutch natural gas sector and the central government gained revenues of 13 billion euros. This corresponds to 4.5% of total government revenues (IEA, 2014b).

In the following, we focus on the organisation of the production from the Groningen field. The Groningen field is the largest deposit of natural gas in the Netherlands and the main source for uncertainty of the Dutch natural gas production in the years to come.

2.1. Dutch regulation and the Groningen cap

The Ministry of Economic Affairs is the most important player for the regulation of the Groningen field, as it exclusively grants licences to explore and extract raw minerals or geothermal heat in the Netherlands.² In addition, the state-owned company EBN (*Energie Beheer Nederland*—Energy Management Netherlands) takes a 40% share in all gas and oil projects and is an instrument for the Dutch state to ensure the public interest. Finally, the ministry has to approve production plans of operators and can exercise power by adjusting or rejecting these

plans. In the last decades, the Ministry approved a rather flexible production plan for the Groningen field with a cap for a multi-year period (425 bcm maximum production between 2006 and 2015, and 425 bcm maximum production between 2011 and 2020; IEA, 2014b).

Decisive for the natural gas extraction are, additionally, Shell and ExxonMobil, which together form the *Nederlandse Aardolie Maatschappij* (Netherlands Petroleum Partnership, NAM). Together, NAM and EBN form the *Maatschap Groningen* (Partnership Groningen), which manages the production of Groningen gas. While NAM holds 60% of the shares and EBN 40%, both decide with equal voting shares. The Groningen gas is extracted on account of the *Maatschap*, but NAM is the operator of the Groningen gas field and GasTerra is responsible for sales. GasTerra is owned by the state (10%), EBN (40%), Shell (25%), and ExxonMobil (25%). Long-term decisions concerning the strategy are taken by an assembly of the most important shareholders of GasTerra and the *Maatschap*. This assembly has a double role since it both sets the strategy for the *Maatschap* (regarding production), as well as the strategy for GasTerra (regarding sales). The Minister of Economic Affairs makes the final decision on whether to approve the production plan by NAM and is furthermore authorised to intervene in case of safety concerns.

Crucial for the final production permission is also the State Supervision of Mines (SSM), which assesses and advises on the effects of mining on the environment and on subsidence. In this role, it advises the Ministry of Economic Affairs on its decisions regarding licensing and approval of production plans. SSM's advice in 2013 to reduce gas production from the Groningen field as quickly and reasonably as possible has been the trigger for the Economic Minister to reduce the Groningen production plan in 2014 and further decrease it to 30 bcm in 2015.³ This represents a production rate that is 45% below 2013 levels (54 bcm; Ministry of Economic Affairs, 2015a).

The crucial influence that the central government has on the natural gas output of the Netherlands has become a key political issue. With all current opposition parties being very critical about natural gas production, the parliamentary elections in early 2017 will have an impact on the future natural gas extraction in the country.

Provinces and municipalities do not play an official role in the decision-making process, except that they can advise the minister on potential decisions. With the current public opinion in the Groningen province being strongly opposed to gas extraction and tensions rising (Onderzoeksraad voor Veiligheid, 2015), there are already first signs that the Ministry of Economic Affairs increases the involvement of local authorities in the debate. New dialogue fora between all stakeholders and the appointment of the national coordinator to improve liveability and safety have been the first steps in a changing policy by the government (Ministry of Economic Affairs, 2015b).

Giving municipalities a stronger say in natural gas production will also have a strong impact on potential shale gas extraction in the Netherlands. The discussion about shale gas is highly controversial: One camp sees the opportunity of shale gas as a compensation for the declining conventional production, while the other camp is referring to major risks related to the unconventional natural gas extraction for people and the environment. 226 out of 393 municipalities declared themselves as “shale gas free” and suspended formerly planned test drillings until further notice.⁴ The Ministry of Economic Affairs ruled out commercial shale gas production in the Netherlands until 2020. In this context, shale gas extraction also appears unlikely after 2020, due to strong public and municipal opposition.

³ In case of a cold winter, a total production from the Groningen field of 33 bcm is needed to guarantee the security of supply and meet domestic demand and long-term contracts with foreign parties. The buffer of 3 bcm will only be used in case of necessity for security of supply (Ministry of Economic Affairs, 2015a). To account for this option, the maximum capacity of the Groningen field is set to 33 instead of 30 bcm in the modeling exercise (see below).

⁴ Schaliegasvrij, Overweldigende meerderheid voor motie tegen schaliegas op VNG jaarcongres (2015), accessed July 1, 2015, <https://www.schaliegasvrij.nl/2015/06/03/overweldigende-meerderheid-voor-motie-tegen-schaliegas-opvng-jaarcongres/>.

¹ Dutch natural gas production is said to have peaked already in the 1970s (IEA, 2014b). New discoveries were small in scale.

² Article 6 of the Mining Act of the Netherlands (Mijnbouwwet). <http://www.nlog.nl/resources/Legislation/Engelse%20vertaling%20Mijnbouwwet1.pdf>, accessed March 15, 2016.

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