

## Natural resources and geothermal energy in the Netherlands



# **NATURAL RESOURCES AND GEOTHERMAL ENERGY IN THE NETHERLANDS**

**2016 Annual review**

An overview of exploration, production and underground storage



## Preface

As well as reporting on the exploration and production of hydrocarbons, rock salt and geothermal energy in the Netherlands, this annual review entitled 'Natural Resources and Geothermal Energy in the Netherlands' also reports on the underground storage of natural gas, nitrogen, diesel and saline water. In so doing it covers all the exploration, production and storage activities in onshore Netherlands and in the Dutch part of the continental shelf that fall under the Mining Act.

The first section of this annual review deals with developments during the year 2016. The second part of this report comprises annexes giving an overview of the situation as at 1 January 2017, and the developments during preceding decades.

The first nine chapters deal with the exploration, production and underground storage of hydrocarbons. **Chapters 1 and 2 review** the changes in the estimates of natural gas and oil resources in 2016 and the resulting situation as of 1 January 2017. These chapters also present a prognosis for the gas (small fields) and oil production for the next 25 years. The remaining volumes of natural gas and oil are reported in accordance with the Petroleum Resource Management System (PRMS). Due to ongoing research on induced earthquakes in Groningen, there is no long-term production prognosis for the Groningen gas field. For this reason, only the smaller gas fields will be covered in this report.

**Chapters 3 to 8** contain information on developments relating to licensing, exploration and related matters (seismic surveys, drilling activities, the placing of new platforms and the laying of pipelines). **Chapter 9** summarises the produced volumes of natural gas, condensate and oil. **Chapters 10 to 13** report on the underground storage of substances and on the exploration and production of coal, rock salt and geothermal energy.

This report has been compiled by TNO, at the request of the Directorate General of Energy, Telecommunications and Competition of the Dutch Ministry of Economic Affairs. It includes data that the Minister of Economic Affairs is required to supply to both Chambers of the Dutch Parliament in accordance with article 125 of the Mining Act. The digital version of this review can be found on: [www.nlog.nl](http://www.nlog.nl)

The volumes of gas and oil have been expressed in accordance with article 11.3.1. of the Mining Regulations: gas in normal cubic metres and oil (a liquid) in standard cubic metres.

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The Hague, July 2017.



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## **Note:**

**In this annual report, the natural gas volumes are given in normal cubic metres (Nm<sup>3</sup>).**

'Normal' relates to the reference conditions 0°C and 101.325 kPa. 1 Nm<sup>3</sup>. = 0,9475 Sm<sup>3</sup>.

In a few instances, the volumes of natural gas are given in Groningen gas equivalents (m<sup>3</sup>Geq) of 35.17 mega joules gross calorific value per m<sup>3</sup> at 0°C and 101.325 kPa.

This is explicitly indicated in the text.

Volumes of oil and condensate are given in standard cubic metres (Sm<sup>3</sup>). 'Standard' relates to the reference conditions 15°C and 101.325 kPa.



## KEY FIGURES FOR 2016

### Natural gas and oil resources

The natural gas resources as at 1 January 2017 are estimated at 801 billion Nm<sup>3</sup>, of which 586 billion Nm<sup>3</sup> are in the Groningen gas field. The small fields in Netherlands Territory (i.e. onshore) contain 103 billion Nm<sup>3</sup> natural gas; those in the Dutch sector of the continental shelf contain 107 billion Nm<sup>3</sup> natural gas.

Oil resources at 1 January 2017 were 31.3 million Sm<sup>3</sup>, of which 18.3 million Nm<sup>3</sup> are in onshore oilfields and 13.0 million Sm<sup>3</sup> in fields on the continental shelf.

### Hydrocarbon licences

Five exploration licences and 2 production licences are pending for the Dutch Territory. In 2016, four exploration licences were granted for a duration of 1.5 to 2 years.

On the continental shelf, four exploration licences were granted in 2016 and seven exploration licences were extended. Exploration licences F6b and F18a-diep were reduced in total area. Oranje Nassau, Engie and Petrogas have returned one exploration licence each in 2016. As of the 1<sup>st</sup> of January 2017, eleven licences are still under application.

Two production licences were also granted in 2016 on the Dutch continental shelf. This includes the F17a-diep licence by Wintershall and the L11c licence for Oranje Nassau. Three production licences were granted in the L-blocks of the continental shelf. Two production licences by Centrica were reduced in total area. DANA has abandoned its production licence for P14a. For details, see chapters 3 and 4 and annexes 2, 3, 9 and 10.

### Wells

In total, 27 wells were drilled for oil and gas, 8 less than in 2015. Four exploration wells were drilled in 2016. Of these, 3 found gas, thus the technical success rate was 75%. In addition, one appraisal well, 17 production wells and 5 wells for gas storage and underground observation were drilled (territory plus continental shelf). Details can be found in chapter 7 and summary table 2.

### Natural gas production

In 2016 the volume of natural gas produced from Dutch fields was 47.9 billion Nm<sup>3</sup>. Onshore gas fields accounted for 34.6 billion Nm<sup>3</sup>. Of the total of 34.6 billion Nm<sup>3</sup>, 7 billion Nm<sup>3</sup> came from small fields and 27.6 billion Nm<sup>3</sup> from the Groningen gas field. The gas fields on the continental shelf produced 13.3 billion Nm<sup>3</sup>. As a result, total production in 2017 was 3.6% less than in 2015. For details, see chapter 9.

### Oil production

In 2016 a total of 1.136 million Sm<sup>3</sup> oil was produced. This is 31.4% less than in 2015. Territory (i.e. onshore) fields accounted for 0.18 million Sm<sup>3</sup>, which is 48.8% less than in 2015. Production on the continental shelf was 0.96 million Sm<sup>3</sup>, a decrease of 29.8%. Average daily oil production in 2017 was 3111 Sm<sup>3</sup>. For details, see chapter 9.

### Underground storage

In 2016 no new applications for storage licences were submitted. Two licences applications submitted previously are still in the procedure. These licenses are for storage of a filler to stabilize a salt cavern and the storage of brine. For details, see chapter 10.

## **Coal**

There are no developments to report for 2016. There are still five coal production licences in force. See chapter 11.

## **Rock salt**

In 2016 one exploration licence application which was applied for before 2016 was still in the application procedure. In total, 16 production licences and no exploration licences were in force at 1 January 2017. Production of rock salt in 2016 was 6.6 million tonnes. For details, see chapter 12 and annexes 5 and 6.

## **Geothermal energy**

In 2016 there were five new applications for exploration licences for geothermal energy. No exploration licences were granted in 2016. Five exploration licences were extended, one has been split into two new licences and another one was limited in total extent. Three exploration licences were either expired or withdrawn.

In 2016, three new applications for production licences were submitted, making six total running applications. No new production licences were granted in 2016. For details, see chapter 13 and annexes 7 and 8.

# 1. NATURAL GAS RESOURCES AND FUTURE DOMESTIC PRODUCTION

## INTRODUCTION

This chapter reports on the natural gas resources in the Netherlands and in the Dutch part of the continental shelf. First, it presents estimates of the natural gas resources as at 1 January 2017 and the changes compared with the resources as at 1 January 2016. The procedure for estimating the natural gas resources is explained briefly below. Prognoses are then given for the annual production of Dutch natural gas in the next 25 years (2016–2041).

## Figures

In accordance with the Mining Act (article 13, Mining Decree), every year operators of production licences report their estimates of remaining resources, per accumulation, and their expected annual production. These data are used to estimate the domestic resources of natural gas and the future production of natural gas from domestic reserves. The data on the natural gas resources are required to be reported in accordance with the Petroleum Resource Management System (PRMS)<sup>1</sup>, enabling a uniform classification of the resources.

## Petroleum Resource Management System (PRMS)

The development of a gas accumulation is normally phased in a number of projects. After the initial development, further projects may be planned, such as extra wells (infill or acceleration), the installation of compression and finally the placing of velocity strings, or the injection of soap. Each of these projects represents an incremental volume of gas that is expected to be produced

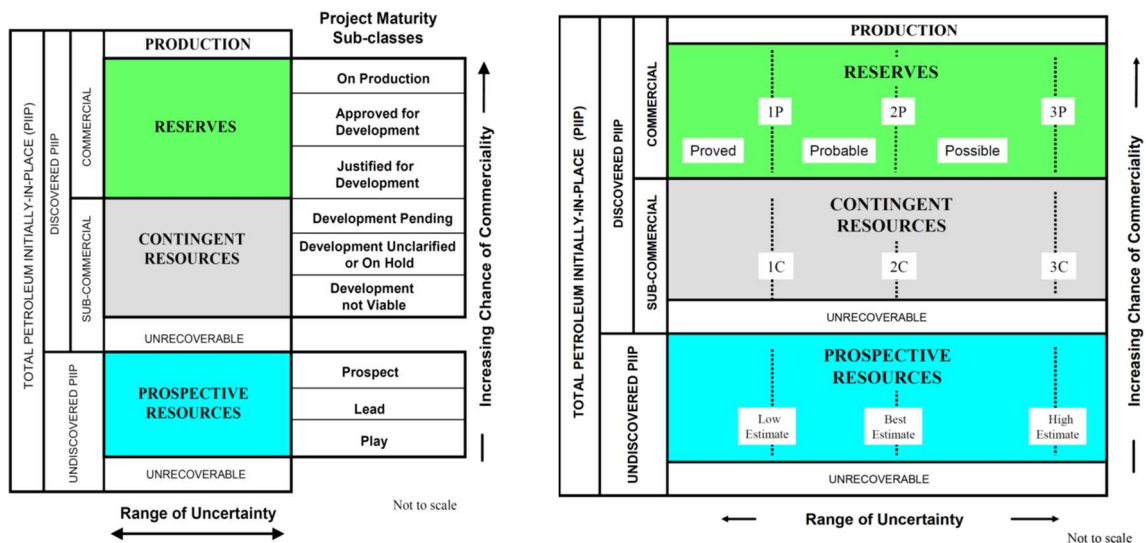


Figure 1. Schematic representation of the PRMS classification<sup>1</sup>

The gas reserves that are linked to projects are split into three classes. Reserves, the gas volume in proven plays that is regarded to be economically viable by well-defined projects. The contingent resources, the gas volume in proven plays that is recoverable in (incremental) projects, but only considered economically viable when one or more (technical, economic or legal) conditions are met. The prospective resources are defined as the part of the gas

<sup>1</sup> [Guidelines for application of the PRMS](#), Society of Petroleum Engineers, 2012.

considered recoverable in accumulations which have not been demonstrated yet. The subdivision of these three classes is shown in figure 1.

Since oil and natural gas are physically located underground at great depths, hydrocarbon resources are estimated by evaluating the data on the amounts present. All resource estimates have an intrinsic uncertainty. The PRMS resource classification takes account of this uncertainty in its central framework by classifying the gas resources for each project according to the likelihood of recovery. This is depicted along the horizontal axis in figure 1. The expectation is expressed in 1P (proved), 2P (probable) and 3P (possible). Similar categories exist for contingent resources: these are expressed as 1C, 2C and 3C. In turn, these volumes classified in the vertical axis, based on the probability that the project will be realised (probability of commercial viability).

The reported resources are a snapshot. This annual review gives an impression of the situation on the 1<sup>st</sup> of January 2017. The Dutch gas resources reported here comprise the total volume of expected reserves (2P) and the contingent resources (2C), insofar that these belong to the subclass 'development pending'. In this review, the contingent resource subclasses 'unclarified' or 'on hold' and 'development not viable' have not been included in the recoverable gas resources, considering the uncertainty whether these projects will be realized. The paragraph on exploration potential describes how the third class, undiscovered resources (or prospective resources), is determined.

This annual review shows the situation at the 1<sup>st</sup> of January 2017.

Further information on the PRMS is available at [www.spe.org](http://www.spe.org).

## **RESOURCES**

The natural gas resource is the volume of recoverable natural gas in proven underground accumulations of natural gas in the Netherlands. A part of the resources initially in place has been produced over the last decades. The volume of natural gas remaining in the proven accumulations that is economically viable to produce is called the remaining reserve. The term 'contingent resource' is applied to the proven resources whose commercially viable exploitation currently depends on one or more criteria.

As of 1 January 2017, there were 481 proven accumulations of natural gas in the Netherlands (see table 1) and over half (251) were in production. A further four gas fields were being used to store gas (in addition to the one gas storage facility in a salt cavern). The remaining 107 accumulations were not being exploited, but it is expected that 32 of them will be brought into production in the next five years (2017–2020). It is uncertain whether the remaining 75 will be developed. 118 of the accumulations that were not producing at the time, had been producing previously but their exploitation had been (temporarily) abandoned. The total number of fields increased by 4 compared to 1 January 2016. This includes two new discoveries (see table 4), one play that up to last year was considered not economically viable and the underground gas storage in the Zuidwending salt cavern. This gas storage is added to the total amount of fields so that all gas storages are included under one denominator.

Table 1. Proven natural gas accumulations as at 1 January 2017, classified according to their status

Status of gas accumulation	Territory	Continental shelf	Total
<b>I. Developed</b>			
a. Producing	104	147	251
b. Natural gas storage	5*	0	5
<b>II. Undeveloped</b>			
a. Production to start 2017-2019	11	21	32
b. Other	31	44	75
<b>III. Production</b>			
a. Temporarily abandoned	20	8	28
b. Abandoned	34	56	90
<b>Total</b>	<b>205</b>	<b>276</b>	<b>481</b>

\*Including gas storage in caverns.

During 2016, a total of 13 fields were taken into production. One of the 13 fields that came on stream during 2016 had previously been closed in. A complete list of all fields, grouped according to status and with information on operators and licences, is presented in appendix 1 (part two of this review).

## RESOURCE ESTIMATES

### Gas resources as at 1 January 2017

On 1 January 2017 the total gas resource in developed and undeveloped accumulations was 801.4 billion Nm<sup>3</sup> (table 2a).

### Restriction to conventional accumulations of gas

The estimates of resources in this review relate solely to resources that are proven plays, and thus this year to the review is limited to conventional natural gas accumulations and excludes shale gas. As of July 10<sup>th</sup>, 2015, the government has indicated that commercial exploration and production of shale gas will not be allowed during the following 5 years.

### Reserves and contingent resources

Figures for the gas resources are given in tables 2a (in billion Nm<sup>3</sup>) and 3b (in billion m<sup>3</sup> Groningen gas equivalents, m<sup>3</sup>Geq). According to the PRMS, a volume of gas qualifies as a reserve if it has been discovered and the gas is assumed to be commercially recoverable by means of well-defined projects. Contingent resources are those resources from proven accumulations that are potentially recoverable by means of development projects but which are deemed to be commercially viable only if they meet one or more preconditions. Here, only the contingent resources that are likely to be produced ('Development pending') are presented.

On 1 January 2017 the remaining reserves totalled 739.8 billion Nm<sup>3</sup>: 586.3 billion Nm<sup>3</sup> reserves in the Groningen field and 153.5 billion Nm<sup>3</sup> in the remaining (small) fields.

Some of the contingent resources are in the developed accumulations, but most are in undeveloped accumulations. According to the PRMS, 5.3 billion Nm<sup>3</sup> in the Groningen field belong to the contingent resources (table 2a). The small fields contain contingent resources

of 35.7 billion Nm<sup>3</sup> on the Territory (onshore) and 20.6 billion Nm<sup>3</sup> on the Continental Shelf (offshore).

Table 2a. Netherlands natural gas resources as at 1 January 2017, in billion Nm<sup>3</sup>

<b>Accumulations</b>	<b>Reserves</b>	<b>Contingent resources</b> (development pending)	<b>Total</b>
<b>Groningen</b>	586.3	5.3	591.6
<b>Overig Territoir</b>	67.0	35.7	102.7
<b>Continentaal plat</b>	86.5	20.6	107.1
<b>Total</b>	<b>739.8</b>	<b>61.6</b>	<b>801.4</b>

In order to be able to incorporate volumes of natural gas of different qualities in calculations, they have been converted to Groningen gas equivalents (Geq) on the basis of their calorific value (table 2b). The Groningen gas equivalent used to be calculated relative to a calorific value of 35.17 MJ/Nm<sup>3</sup>, the calorific value of the original content of the Groningen field. Since 2010, however, a calorific value of 35.08 MJ/Nm<sup>3</sup> has been assigned to the volume of gas still to be produced from the Groningen field, to reflect a slight change in the composition of the gas produced from this field.

Table 2b. Netherlands natural gas resources as at 1 January 2017, in billion m<sup>3</sup>Geq

<b>Accumulations</b>	<b>Reserves</b>	<b>Contingent resources</b> (development pending)	<b>Total</b>
<b>Groningen</b>	584.8	5.3	590.1
<b>Other Territory</b>	74.3	37.4	111.7
<b>Continental shelf</b>	98.1	22.8	120.9
<b>Total</b>	<b>757.2</b>	<b>65.5</b>	<b>822.7</b>



## Revised estimates compared to 1 January 2016

Table 3 shows the estimates for the Dutch natural gas resources after revision to account for

- New discoveries
- Re-evaluations of previously proven accumulations
- Production during 2016.

Table 3. Revised estimates of expected natural gas resources compared with 1 January 2017, in billion Nm<sup>3</sup>

Area	New discoveries	Re-evaluation,	Production	Total
Groningen field	0.0	-45.7	-27.6	-73.3
Other Territory	0.0	-2.9	-6.8	-9.7
Continental shelf	1.0	2.6	-13.5	-9.9
Total	1.0	-46.0	-47.9	-92.9

The net result is a decrease of the resource by 92.9 billion Nm<sup>3</sup> compared with 1 January 2017. A brief explanation of the figures follows below.

### New discoveries

3 exploration wells that struck gas seem to have found commercially recoverable volumes; two of those are new fields (table 4). The locations of the new discoveries are indicated by asterisks in figure 2.

Table 4. Natural gas accumulations discovered in 2016

Name of accumulation	Discovery well	Licence [Type]	Operator
J09 Alpha North	K07-13	K07 [pl]	NAM
P11-E	P11-12	P11a [pl]	Oranje-Nassau

Licence types: pl: Production License

### Re-evaluation

Operators periodically evaluate the gas fields in technical and economic terms. New developments and insights may lead to revised estimates of the resources. As a result of such re-evaluations of producing and non-producing fields, the estimates of resources were adjusted downward by 46 billion Nm<sup>3</sup> in 2016. The revision mostly focuses on the Groningen field (45.7 billion Nm<sup>3</sup> in 2016, almost 8% of the remaining reserves), due to re-evaluation of the reserves based on newly acquired data from the production and the new situation which has arisen as a consequence of the seismicity in the Groningen Field.

The resources have been adjusted on the basis of production performance and the implementation of technical modifications. The latter include the drilling of new wells and the application of techniques to prolong production, such as compression and the deliquification of production wells. Only these proven techniques have been included. At the moment experiments are being performed with Enhanced Gas Recovery (EGS) in the De Wijk field. Currently this technique is assumed non-proven and the associated resources are therefore not included in the overviews.

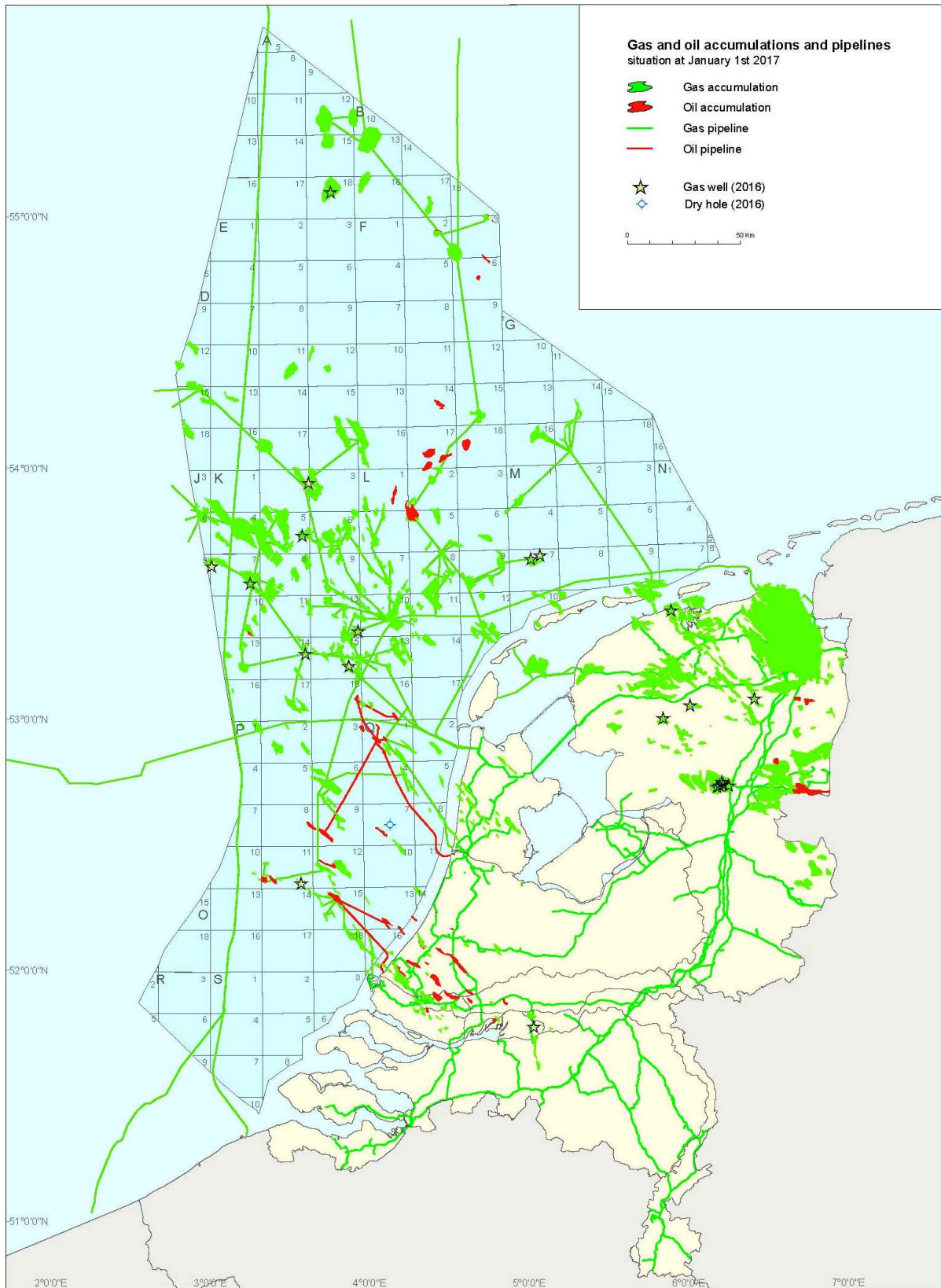


Figure 2. Map showing oil and gas accumulations in the Netherlands (as at 1 January 2017).

## **EXPLORATION POTENTIAL**

TNO updates the Dutch prospect portfolio for natural gas annually and evaluates the potential for recoverable volume it contains. It does so partly on the basis of figures that operators present in their annual reports for their licensed areas in accordance with article 113 of the Mining Decree. For other areas TNO uses figures from its own database. In this evaluation information provided by the licensees is preferred. However, both TNO and EBN (Focus on Dutch Oil and Gas, 2016) have noticed that in the majority of prospect developments the predrill volume of gas in place are overestimated. On average, only half of the expected volume was found. This implies that any volumes presented as a result of the exploration potential in this annual report may be deemed optimistic.

TNO assumes a fixed number of prospect developments (i.e. exploration wells) per year in the evaluation. The number of exploration wells occurring each year is based on the long-term moving average (5 years) of historical exploration drilling intensity, which corresponds to 7 offshore and 3 onshore wells. The choice to base the drilling intensity in the evaluation on historical figures does mean that the current low oil and gas price does not result in a decreased drilling intensity.

### **Geological units and prospects**

TNO focuses on the evaluation of the so-called 'proven plays'. These are geological units for which the data and discoveries justify the assumption that the necessary geological conditions for the accumulation of natural gas are met. Together, all prospective structures ('prospects') that have been mapped and evaluated on the basis of existing data form the prospect portfolio. Hypothetical plays and prospects are ignored, due to their speculative character.

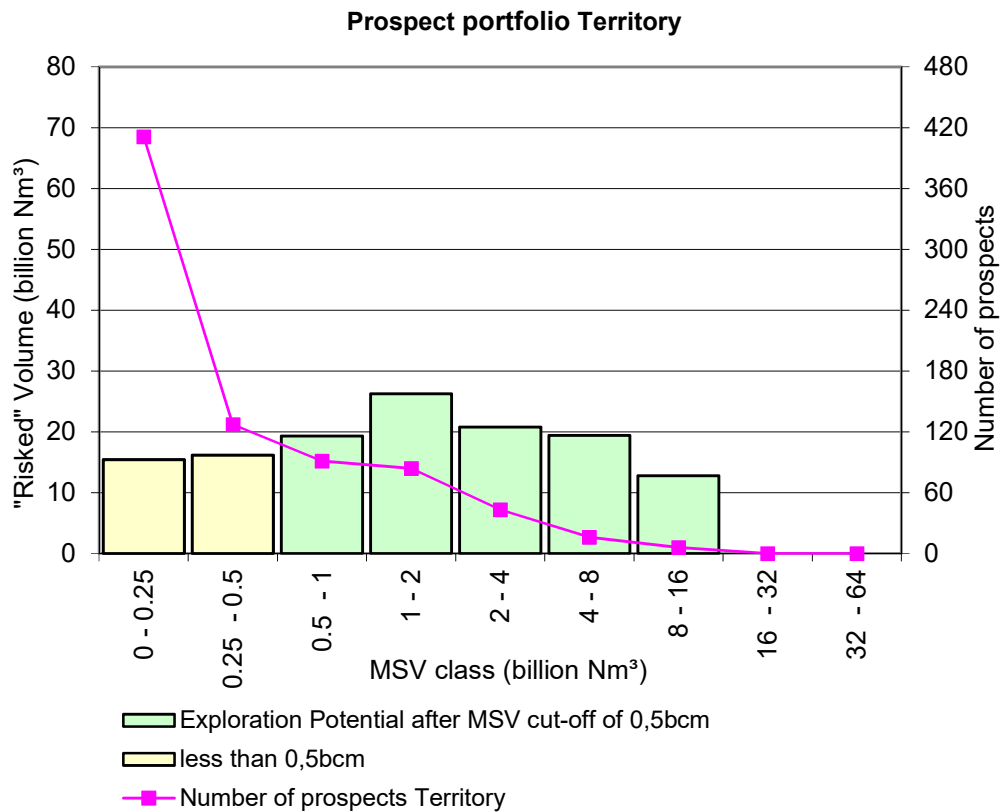
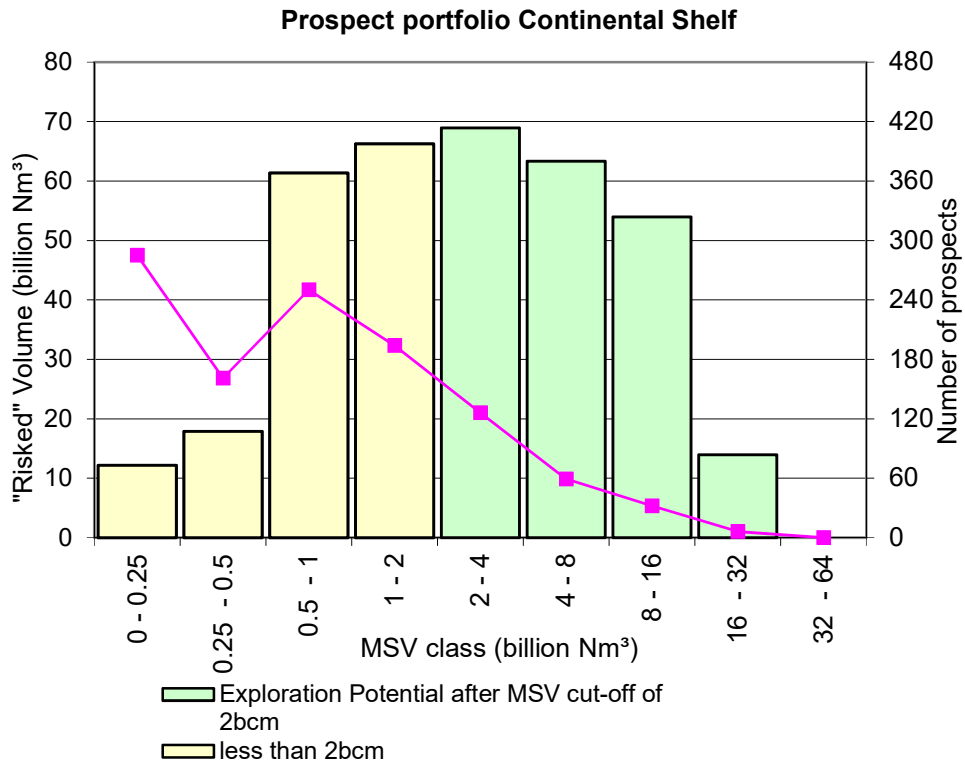


Figure 3. Prospect portfolio characteristics: Number of prospects, in volume classes. Green columns show the exploration potential after applying an MSV lower cut-off (see text for explanation)

### Gas portfolio characteristics

The prospect portfolio is characterised by the number of prospects and the associated volume of gas. The volume of a prospect can be expressed in terms of the expected recoverable volume in the case of a discovery (the so-called Mean Success Volume, MSV), or as the risked volume (the so-called Expectation volume, EXP), which is the product of the MSV and the probability of finding natural gas (the Possibility of Success: POS). The prospect portfolio characteristics as of 1 January 2017 are presented in Figure 3 for Territory and Continental Shelf. Per MSV volume class, the number of prospects and the cumulative risked volumes are given in figure 3. The total number of prospects in the Continental Shelf has decreased slightly compared to January 2016, and re-evaluation of multiple prospects has also led to a slight decreased risked volume.

In the Territory, the number of prospects has slightly decreased in comparison to January 2016. Similarly, a minor decrease in risked volume can also be noted for the Dutch Territory.

### Exploration potential

The exploration potential is that part of the prospect portfolio that meets certain minimum conditions. This section aims to present the exploration potential through three methodologies which quantify the attractiveness of the portfolio. These methods define prospects based on gas volumes (MSV), expected monetary value (EMV) and expected, risked rate of returns (RVIR).

#### *Analysis based on recoverable gas volumes (MSV)*

Since the first report on the exploration potential in 1992, a lower cut-off (MSV) has been defined for the expected recoverable volume in the case of discovery. This cut-off is 0.5 billion m<sup>3</sup> for Territory prospects and 2 billion m<sup>3</sup> for continental shelf prospects. The green columns in figure 3 represent the risked volume of the prospects with an MSV above this cut-off. This volume is called the exploration potential based on the MSV lower cut-off.

The estimate of the exploration potential (see table 5) is expressed as a range, to indicate its inherent uncertainty.

Table 5. Exploration potential for natural gas as at 1 January 2017, after applying the MSV lower cut-off to the prospect portfolio

<b>Area</b>	<b>MSV cut-off [bill. Nm<sup>3</sup>]</b>	<b>Exploration potential [bill. Nm<sup>3</sup>]</b>
Territory	0.5	62 – 192
Continental shelf	2	133 – 295

The consequence of a minimum MSV-based lower cut-off is that other factors determining the commercial attractiveness of prospects are not considered. These factors are partly related to individual prospects (possibility of success, distance to infrastructure, type of field development, gas quality, productivity, etc.) and partly to generic factors, in particular the anticipated costs and yields.

### *Economic analysis based on expected monetary value (EMV)*

An alternative lower cut-off, first presented in the annual review of 2006, requires that for a prospect to be included in the exploration potential the expected net cash value of a project must be positive. A discounted cash flow model takes account of the factors determining the commercial attractiveness of prospects. Using the expected net cash value and taking account of the exploration risk, the Expected Monetary Value (EMV) is calculated for each prospect. The EMV is used to rank the prospects. The possibilities for developing individual prospects are determined using a holistic exploration simulator that takes account of the location of each prospect in relation to distance to infrastructure, probability of success and uncertainty about the volumes. In the bigger picture, the infrastructure of pipelines and the producing fields are considered, in order to realistically evaluate the new resources that are expected to be found. The EMV of each prospect is used to select the most attractive prospects (i.e. those with the highest EMV). The EMV (and RVIR method, see below) uses the long-term gas price as input. TNO uses the evaluation of gas prices as provided by the Ministry of Economic affairs. From 2017 onwards, a gas price of 17 eurocents per m<sup>3</sup> is used, this as compared to the gas price of 14 and 21.5 eurocents per m<sup>3</sup>, used in the annual reports 2015 and 2014 respectively.

Table 6 shows the expected volume for the exploration potential of prospects with a positive EMV cut-off at a gas price scenario of 17 eurocents per m<sup>3</sup>. A comparison with the figures in table 5 reveals that setting the lower cut-off EMV > 0 results in volumes close to the middle of the range of the exploration potential based on the MSV lower cut-off for the Territory. The Continental shelf values show that a significant portion of the gas volumes larger than 2 bcm are not economical under current economic conditions, these are mainly prospects which have poor productivity (“tight gas”) and which lie far from existing infrastructure. The small increase of expected values for the exploration potential as compared to 1 January 2016 is mostly caused by the increase in long term gas price. In order to illustrate the effect of the higher gas price Table 6 also shows the expected values of the exploration potential with the gas price of 21.5 eurocents per m<sup>3</sup> as used in the annual report 2015. This shows that the major decrease in values on the Continental Shelf can be attributed to the change in gas price and to a limited degree the re-evaluation.

Table 6. Exploration potentials for natural gas as at 1 January 2017, assuming an economic lower cut-off of EMV = €0 and a gas price of 17 and 21.5 eurocents per m<sup>3</sup>

Area	Expected value of exploration potential	Expected value of exploration potential
	17 ct/ m <sup>2</sup> [billion Nm <sup>3</sup> ]	21.5 ct/ m <sup>2</sup> [billion Nm <sup>3</sup> ]
Territoir	114	119
Continentaal plat	128	155

### *Economic analysis based on Risked Value to Investment Ratio (RVIR)*

This annual report presents an alternative lower cut-off, the *Risked Value to Investment Ratio (RVIR)*. The RVIR demands that the projected, risked return of a project is above a predetermined value. This methodology is commonly used in the gas and oil-industry, with a lower cut-off between 10 to 40%. TNO maintains a lower cut-off value of 10% to show the full potential of the portfolio. This RVIR lower cut-off is stricter than the EMV = 0 assumption in the EMV economic analysis. Similar to the EMV method, the RVIR of each prospect is used to rank them in the exploration simulator (i.e. highest RVIR).

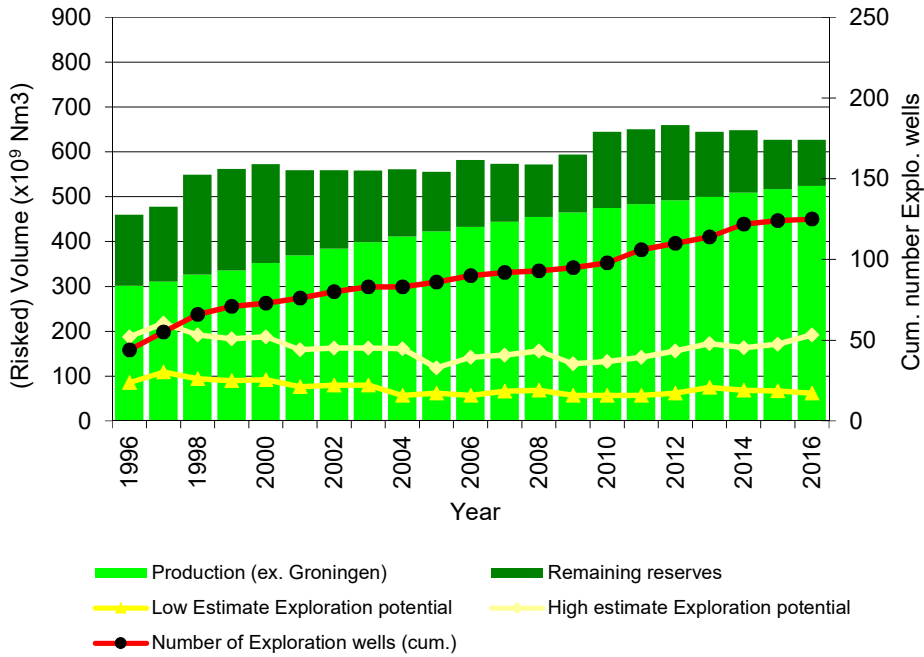
Table 7 shows the expected value of the exploration potential of prospects with an RVIR higher than 10% at a gas price of 17 cents per cubic meter. The rise in comparison to January 2016 is mostly caused by the long-term gas price increase. This trend is especially apparent on the continental shelf (see also EMV analysis).

#### **Exploration potential trend/history**

Figure 4 shows the trend in the exploration potential in the Netherlands. The graph for Territory shows a gradual decline from 1996 to 2009 followed by a slight increase continuing to the present, for both the high and the low estimates. Particularly striking in the graph for the continental shelf is the upward trend in the high estimate until about 2004, after which there is a downturn to the level of the 1990s.

Over the course of time, exploration wells have led to some of the exploration potential being transformed into reserves. This can be seen from the increase in cumulative production and remaining reserves (height of the green columns) in figure 4. The exploration potential of 100 billion m<sup>3</sup> for Territory reported in 1996 had already been added to the reserves in 2000. The exploration potential has nonetheless remained stable because of the dynamics in the prospect portfolio on which the estimates are based: Every year, prospects are removed from the portfolio after the drilling of exploration wells, and new prospects are added. Re-evaluations of prospects may also lead to changes in the values of the portfolio (see the paragraph 'Portfolio characteristics').

### Volume Trend Territory



### Volume Trend Continental Shelf

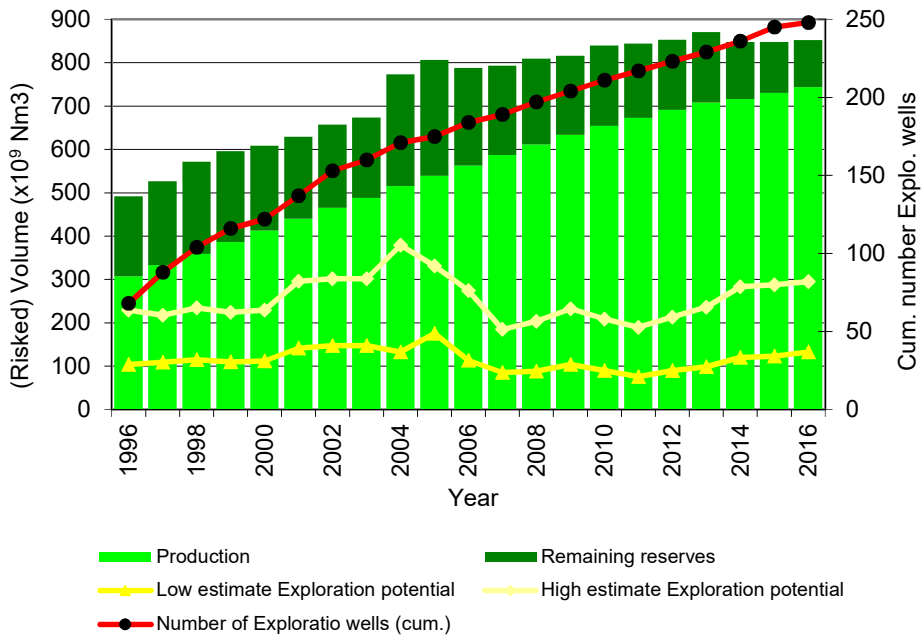


Figure 4. Trends in exploration potential, exploratory drilling, reserves and production 1992–present (excluding the Groningen field)



## INCENTIVES

The Decree on investment deduction for marginal gas accumulations on the continental shelf (*Regeling investeringsaftrek marginale gasvoorkomens continentaal plat*) came into force on 16 September 2010 to stimulate the development of marginal gas fields that would otherwise not be drilled. It allows licensees and co-licensees to offset 25 % of the sum they invest in assets for exploring and exploiting a given marginal field or prospect against the result over which they are liable for profit sharing. Applications for marginal fields are reviewed against the following three parameters: technically recoverable volume of gas, initial well productivity and transport distance to a platform.

Since the Decree came into force 61 applications have been filed, of which 44 have been successful. 9 applications are being processed, five were rejected and three were withdrawn.

At the same time and with the same purpose as the decree, an agreement came into force between the Minister of Economic Affairs and the mining companies active on the continental shelf. This covenant includes a voluntary procedure to stimulate companies holding licences for gas production on the continental shelf to transfer to third parties their fallow concessions (i.e. those that they neither actively exploit nor have concrete plans to bring into production, despite being given the opportunity). Since 1 July 2012, the Minister of Economic Affairs has determined which offshore production licences or parts thereof classify as fallow. The classification is updated annually and is adjusted if, in the interim, this is necessary because new data have become available. The most recent classification is published on NLOG. After a licence area has been declared fallow, the main licensee is notified by the Ministry of Economic Affairs and then has nine months to submit a plan for activities that are deemed significant under the Mining Act. If the main licensee does not make use of this opportunity, the co-licensees are allowed three months to submit their own activity plan. Finally, third parties may then submit their activity plans.

The current status of the production licences based on the abovementioned covenant can be found at [www.nlog.nl](http://www.nlog.nl). This site also gives the activities in the production licence areas onshore, classified under article 32a of the Mining Act.

## DOMESTIC SUPPLIES OF NATURAL GAS

This section of the annual review deals with the expected trend in the supply of Dutch natural gas (domestic production) in the next 25 years (2017 to 2041). Estimates are largely based on data submitted by operators. The reference date for the present review is 1 January 2017. All the volumes are given in billions of m<sup>3</sup> Groningen gas equivalents.

The prognosis of production from Dutch natural gas will again be restricted to the small fields this year. No long-term prediction of production from the Groningen field can be established due to the continuing discussion on gas extraction and associated induced seismicity above the Groningen field. The NAM has submitted an updated production plan for the Groningen field to the ministry of Economic Affairs for approval in April 2016. On 30 September 2016 the minister has made a decision on the level of production, which states that the level of production of gas from the Groningen field will be held at 24 billion m<sup>3</sup> per year. In order to establish security of supply, this decision allows for an increase in the maximum level should winters colder than average occur. The production plan must be updated after a maximum of 4 years. A further decrease of production to 21.6 billion m<sup>3</sup> per year was suggested at 24 May 2017. Currently this decision is being challenged in court (Raad van State).

The expected production of Dutch gas from the smaller and undiscovered fields (exploration potential) for the coming 25 years (2017 to 2041) is shown in figure 5. Besides the estimated production, figure 5 also shows the realized production from the small fields over the period 2007-2016. The production in 2016 was 88% of the planned amount for the smaller fields.

The estimated domestic production from the small fields is based on the following:

- The summation of the profiled **reserves** and **contingent resources from the subclass** 'development pending'. These profiles have been provided by the gas producers in their annual reports (in accordance with article 113 of the Mining Decree).
- The summation of the simulated production profiles of **as yet undiscovered accumulations**. These profiles have been prepared using a simulation model that takes into account the number of wells expected to be drilled (11 exploration wells per year and a minimum risked value to investment ratio (RVIR) of 0.1), the expected recoverable volumes of the prospects, the expected productivity of the well and the possibility of success.
- The production of the reserves in underground gas storage facilities (i.e. that part of the gas that at conversion to UGS was originally present in the reservoir) has not been taken into account in the prognosis of production. This as the timing of production of this gas is highly uncertain; currently this is not expected to start before 2040.

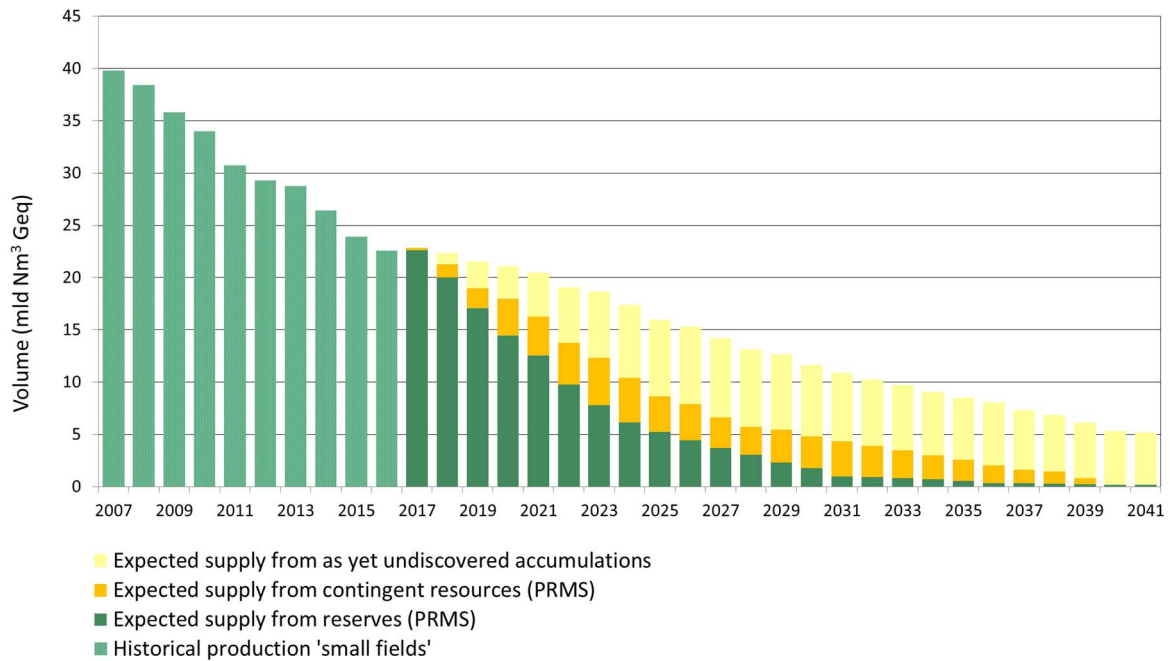


Figure 5. Actual production of natural gas from small fields in the Netherlands from 2001 - 2017 and production prognosis for the period 2017 - 2041. The Groningen field is excluded in this overview (see accompanying text).

**Total domestic production from small fields and the exploration potential**

Production from the small fields is estimated at 23 billion m<sup>3</sup>Geq for 2017, but will gradually decrease to approximately five billion m<sup>3</sup>Geq in 2041. The total estimated domestic production from the small fields will be 334 billion m<sup>3</sup>Geq over the next 25 years (Table 7).

Table 7. Domestic production of natural gas from small fields for the next 25 years, in billion m<sup>3</sup>Geq

	Past Production	Expected supply from reserves	Expected supply from contingent resources	Expected supply from undiscovered accumulations
2006	37.5			
2007	39.8			
2008	38.4			
2009	35.8			
2010	34.0			
2011	30.7			
2012	29.3			
2013	28.7			
2014	26.4			
2015	23.9			
2016	22.6			
2017		22.63	0.21	0.00
2018		20.02	1.25	1.09
2019		17.08	1.93	2.53
2020		14.45	3.54	3.08
2021		12.54	3.76	4.22
2022		9.80	3.96	5.27
2023		7.81	4.53	6.31
2024		6.18	4.24	6.98
2025		5.27	3.40	7.27
2026		4.45	3.48	7.40
2027		3.69	2.94	7.59
2028		3.07	2.67	7.39
2029		2.31	3.15	7.17
2030		1.77	3.06	6.84
2031		1.01	3.33	6.54
2032		0.93	3.01	6.33
2033		0.85	2.66	6.20
2034		0.71	2.28	6.07
2035		0.58	2.00	5.94
2036		0.37	1.69	6.00
2037		0.35	1.27	5.73
2038		0.31	1.16	5.41
2039		0.23	0.61	5.33
2040		0.20	0.00	5.16
2041		0.18	0.00	5.00
<b>Total</b>		<b>136.81</b>	<b>60.11</b>	<b>136.84</b>

## 2. OIL RESOURCES

On 1 January 2017 there were 52 proven oil accumulations in the Netherlands, 11 of which were producing. Since last year, four new fields were added. Q07-FC is a new find. Two other fields were discovered earlier, but not made public by the operator. One field had already been discovered but was considered not economically viable.

All oilfields are listed in summary annex 1, sorted by status and stating operator and licence.

Table 8. Number of proven oil accumulations as at 1 January 2017

Status of oil accumulation	Territory	Continental shelf	Total
<b>I. Developed</b>			
a. Producing	3	8	11
<b>II. Undeveloped</b>			
a. Production to start 2017-2020	0	5	5
b. Other	10	13	23
<b>III. Production</b>			
a. Ceased	1	0	1
b. Abandoned	8	4	12
<b>Total</b>	<b>22</b>	<b>30</b>	<b>52</b>

### Oil resources as at 1 January 2017

The resource estimates for developed fields are based on the figures and information submitted by the operators in accordance with the Mining Act. The estimates follow the Petroleum Resource Management System (SPE, 2011). Table 9 shows the reserves (i.e. that part of the resources that can be produced commercially and has been qualified as such by the operators) and also the contingent resources (i.e. 'production pending' – that part of the resources that may be reasonably be assumed to be commercially recoverable, but which do not yet meet all the criteria for classification as such). The contingent resources with higher uncertainty of coming into production (On hold, unclarified or unviable) have not been included in table 9.

As the resource classification is project-based, reserves and contingent resources may both be present within one accumulation.

The total oil resources are 31.3 million Sm<sup>3</sup>: 12.9 million Sm<sup>3</sup> oil reserves plus 18.4 million Sm<sup>3</sup> contingent resources.

Table 9. Oil resources in million Sm<sup>3</sup> as at 1 January 2017

Area	Reserves	Contingent resources (development pending)	Total
Territory	9.2	9.1	18.3
Continental shelf	3.7	9.3	13.0
<b>Total</b>	<b>12.9</b>	<b>18.4</b>	<b>31.3</b>

## Revised estimates of the oil resources compared with 1 January 2017

Table 10 shows the adjustments made to the Dutch oil resources as a result of:

- Re-evaluations of previously proven accumulations
- Production during 2016.

Oil reserve levels have almost stayed the same compared to 2016, mostly due to a positive re-evaluation of the continental shelf reserves. This positive appraisal compensates most of the decrease in reserves as a result of the oil production in 2016 (1.1 million Sm<sup>3</sup>) and the re-evaluation of the terrestrial reserves. The net result is a decrease in oil reserves of 0.2 million Sm<sup>3</sup> compared to reserves on the 1<sup>st</sup> of January 2016.

Table 10. Revised estimates of oil resources compared with 1 January 2016, in million Sm<sup>3</sup>

Area	Re-evaluation	Production	Total
Territory	-2.0	-0.2	-2.2
Continental shelf	2.9	-0.9	2.0
Total	0.9	-1.1	-0.2

Figure 6 and table 11 show oil production since 2006 and the production prognosis for the next 25 years. This prognosis is based on the annual reports of the operators. Compared to last year's forecast, the production has lagged substantially behind expected production. Only 63% of the expected production was realized. This is due to the long halt in production in the Schoonebeek field as a result of problems in disposal of produced water. The 2016 and 2017 reserves are classified as contingent resources, since the development of several oil fields will start later than originally planned. This is also shown by the strong increase in production from 2022 onwards. The abrupt decrease in production in 2041 is caused by the production prognosis being limited to the year 2040 for multiple contingent fields.

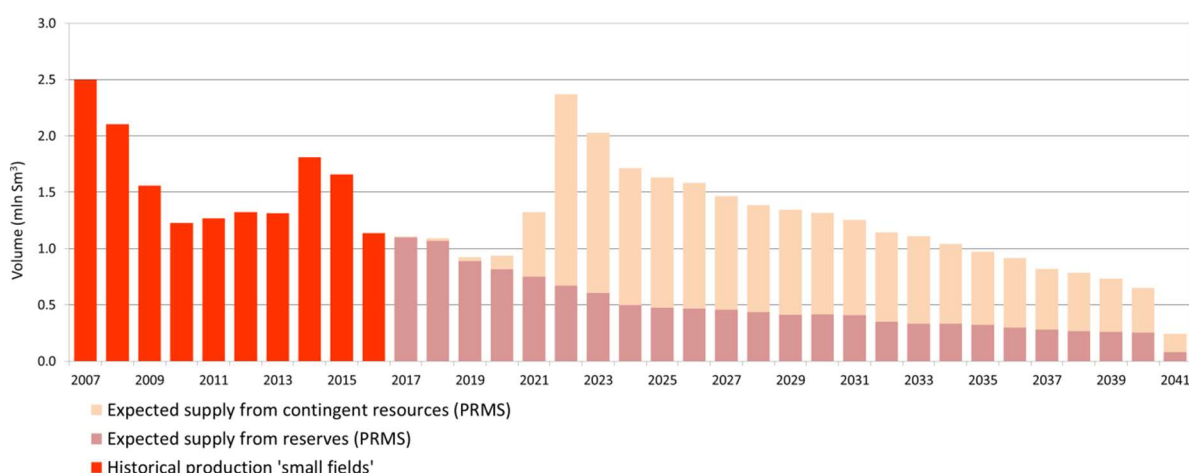


Figure 6. Historical oil production and prognosis for production until 2041

Table 11. Domestic production of oil for the next 25 years, in million Sm<sup>3</sup>

	Past production	Expected supply from reserves	Expected supply from contingent resources
2006	1.56		
2007	2.50		
2008	2.10		
2009	1.56		
2010	1.23		
2011	1.27		
2012	1.32		
2013	1.31		
2014	1.81		
2015	1.66		
2016	1.14		
2017		1.10	0.01
2018		1.07	0.02
2019		0.89	0.03
2020		0.82	0.12
2021		0.75	0.57
2022		0.67	1.70
2023		0.60	1.42
2024		0.50	1.22
2025		0.47	1.16
2026		0.47	1.12
2027		0.46	1.01
2028		0.44	0.95
2029		0.41	0.93
2030		0.41	0.90
2031		0.41	0.85
2032		0.35	0.79
2033		0.33	0.78
2034		0.33	0.71
2035		0.32	0.65
2036		0.30	0.62
2037		0.28	0.54
2038		0.27	0.52
2039		0.26	0.47
2040		0.25	0.40
2041		0.08	0.16
<b>Total</b>		<b>12.25</b>	<b>17.64</b>

### 3. HYDROCARBON LICENCES, changes in 2016 Netherlands Territory

Changes in the licences for hydrocarbon exploration and production onshore, which took place during 2016 in the onshore Territory, are listed in the tables below. Figure 7 shows the license situation as at 1 January 2017, licence changes which occurred during 2016 are depicted in Figure 8.

Total area	Under licence
41 785 km <sup>2</sup>	18 224 km <sup>2</sup> (43.61%)

#### EXPLORATION LICENCES, Netherlands Territory

##### Applied for

Licence	Publication	Date	Closing date	Applicant(s)
De Kempen *	Official Journal C 174 Govern. Gazette 11 021	15-06-2011	14-09-2011	Basgas Energia, Cuadrilla Brabant
Breda-Maas *	Official Journal C 178 Govern. Gazette 11 810	18-06-2011	19-09-2011	Cuadrilla Brabant
Waskemeer *	Official Journal, C 84 Govern. Gazette 10 937	22-03-2014	23-06-2014	NAM
Slootdorp-Oost *	Official Journal, C 55 Govern. Gazette 10 234	14-02-2015	18-05-2015	Vermilion
Brielle *	Official Journal, C 170 Govern. Gazette 15 891	23-05-2015	24-08-2015	Oranje-Nassau cs, Vermilion

\* Current application, formerly published in Annual Report

##### Prolonged

Licence holder	Licence	In force	Up to
Tulip Oil Netherlands B.V. cs	Schagen	23-02-2016	31-07-2018
Vermilion Energy Netherlands B.V.	Utrecht	24-11-2016	23-11-2018
Vermilion Energy Netherlands B.V.	Engelen	24-11-2016	23-11-2018
Vermilion Energy Netherlands B.V.	Oosterwolde	24-11-2016	23-11-2018



## PRODUCTION LICENCES, Netherlands Territory

### Applied for

Licence	Publication	Date	Closing date	Applicant(s)
Terschelling-Noord *	-	10-11-2014	-	Tulip Oil
Akkrum	-	02-06-2016	-	Vermilion

\* Current application, formerly published in Annual Report

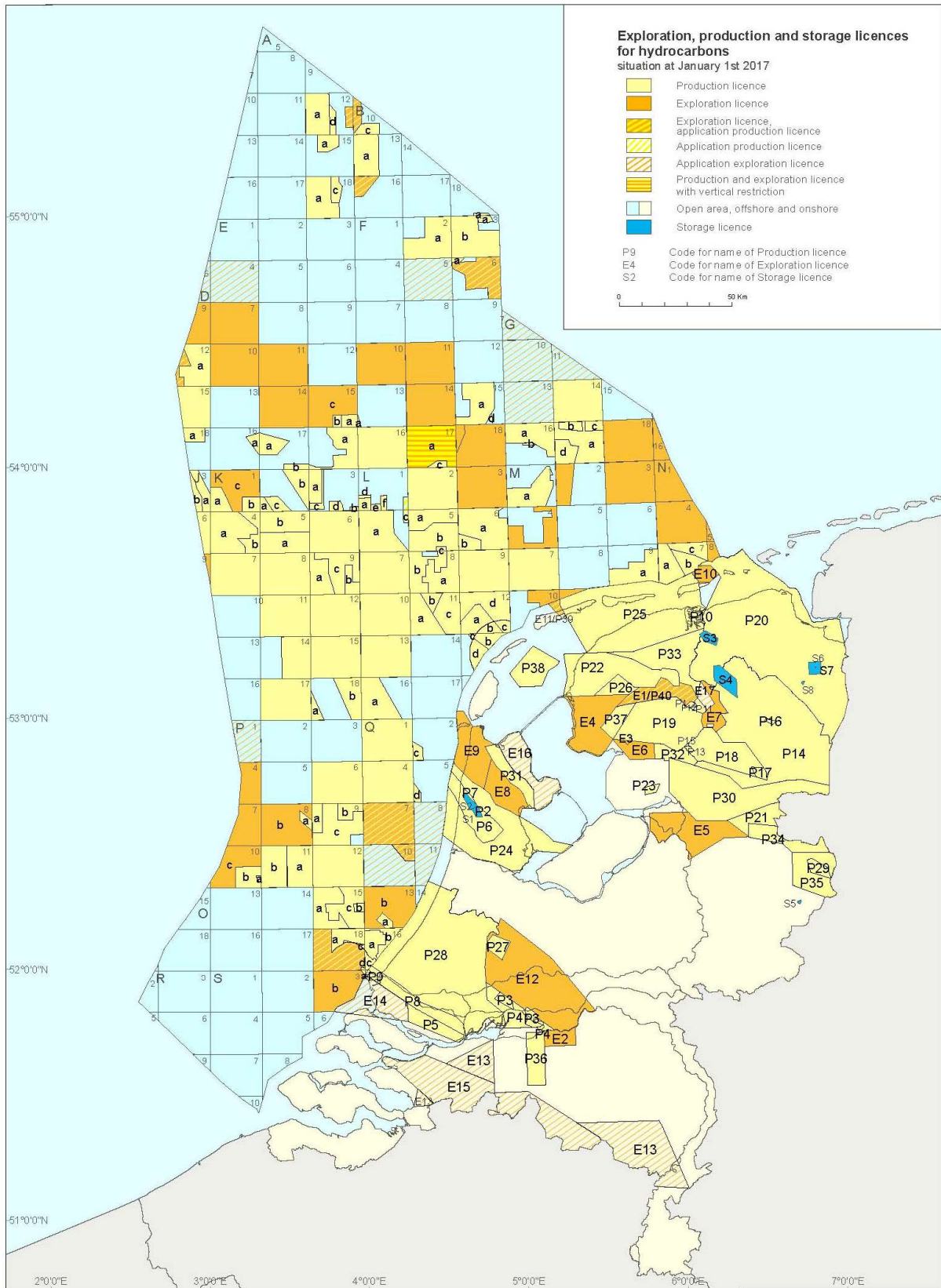


Figure 7: Exploration, production and storage licences for hydrocarbons

The names of exploration, production and storage licenses for hydrocarbons on the Netherlands Territory as shown in Figure 7. The licenses on the Continental Shelf are named after the corresponding parts of blocks.

<b>Exploration licences</b>			
E1	Akkrum	E7	Oosterwolde
E2	Engelen	E8	Opmeer
E3	Follega	E9	Schagen
E4	Hemelum	E10	Schiermonnikoog-Noord
E5	IJsselmuiden	E11	Terschelling-Noord
E6	Lemsterland	E12	Utrecht
<b>Exploration licences as applied for</b>			
E13	Breda-Maas	E16	Slootdorp-Oost
E14	Brielle	E17	Waskemeer
E15	De Kempen		
<b>Production licences</b>			
P1	Akkrum 11	P20	Groningen
P2	Alkmaar	P21	Hardenberg
P3	Andel Va	P22	Leeuwarden
P4	Andel Vb	P23	Marknesse
P5	Beijerland	P24	Middelie
P6	Bergen II	P25	Noord-Friesland
P7	Bergermeer	P26	Oosterend
P8	Botlek II	P27	Papekop
P9	Botlek-Maas	P28	Rijswijk
P10	De Marne	P29	Rossum-De Lutte
P11	Donkerbroek	P30	Schoonebeek
P12	Donkerbroek-West	P31	Slootdorp
P13	Drenthe IIa	P32	Steenwijk
P14	Drenthe IIb	P33	Tietjerksteradeel
P15	Drenthe IIIa	P34	Tubbergen
P16	Drenthe IV	P35	Twenthe
P17	Drenthe V	P36	Waalwijk
P18	Drenthe VI	P37	Zuid-Friesland III
P19	Gorredijk	P38	Zuidwal
<b>Production licences as applied for</b>			
P39	Terschelling-Noord	P40	Akkrum
<b>Storage licences</b>			
S1	Alkmaar	S5	Twenthe-Rijn De Marssteden
S2	Bergermeer	S6	Winschoten II
S3	Grijpskerk	S7	Winschoten III
S4	Norg	S8	Zuidwending

#### 4. HYDROCARBON LICENCES, changes in 2016 Netherlands Continental Shelf

Changes in the licences for hydrocarbon exploration and production, which took place during 2016 on the Continental Shelf, are listed in the tables below. Also all current licence applications are included. Figure 7 shows the license situation as at 1 January 2017, license changes which occurred during 2016 are depicted in Figure 8. The licences on the continental shelf are named after corresponding blocks.

Total area	Under licence
56 814 km <sup>2</sup>	28 419 km <sup>2</sup> (50.02%)

#### EXPLORATION LICENCES, continental shelf

##### Applied for

Licence	Publication	Date	Closing date	Applicant(s)
F5 *	Official Journal C 256 Govern. Gazette 29 117	05-08-2015	04-11-2015	Van Dyke, ENGIE, HALO
Q8 *	Official Journal C 331 Govern. Gazette 39 129	08-10-2015	07-01-2016	Tulip Oil, Van Dyke
Q10b *	Official Journal C 331 Govern. Gazette 39 129	08-10-2015	07-01-2016	Tulip Oil, Van Dyke
Q11 *	Official Journal C 331 Govern. Gazette 39 129	08-10-2015	07-01-2016	Tulip Oil, Van Dyke
D6	Publicatieblad EU, C 342 Staatscourant 52 953	17-09-2016	19-12-2016	Simwell
E4	Publicatieblad EU, C 342 Staatscourant 52 953	17-09-2016	19-12-2016	Simwell
G7	Publicatieblad EU, C 342 Staatscourant 52 950	17-09-2016	19-12-2016	NAM
G10	Publicatieblad EU, C 342 Staatscourant 52 950	17-09-2016	19-12-2016	NAM
G11	Publicatieblad EU, C 342 Staatscourant 52 950	17-09-2016	19-12-2016	NAM
G13	Publicatieblad EU, C 342 Staatscourant 52 950	17-09-2016	19-12-2016	NAM, ENGIE
P1	Publicatieblad EU, C 453 Staatscourant ...	03-12-2016	06-03-2017	

\* Current application, formerly published in Annual Report

## Awarded

Licence holder	Licence	In force	km <sup>2</sup>
ENGIE E&P Nederland B.V. cs	L3	13-05-2016	406
Jetex Petroleum Ltd	P10c	21-07-2016	249
Oranje-Nassau Energie B.V. cs	S3b	07-09-2016	337
Jetex Petroleum Ltd	P4, P7 & P8b	07-10-2016	785
Total			1 777

## Prolonged

Licence holder	Licence	In force	Up to
Nederlandse Aardolie Maatschappij B.V. cs	J9	28-05-2016	27-05-2018
Sterling Resources Netherlands B.V. cs	F17a-ondiep	19-07-2016	31-12-2020
Sterling Resources Netherlands B.V. cs	F18a-ondiep	30-07-2016	31-12-2020
ENGIE E&P Nederland B.V. cs	K1c	21-09-2016	03-01-2019
Wintershall Noordzee B.V. cs	F18-diep	19-11-2016	31-03-2019
Oranje-Nassau Energie B.V. cs	M2a	24-11-2016	02-01-2020
Oranje-Nassau Energie B.V. cs	M4a	24-11-2016	02-01-2020

## Restricted

Licence holder	Licence	In force	km <sup>2</sup>
Dana Petroleum Netherlands B.V. cs	F6b	19-05-2016	260
Wintershall Noordzee B.V. cs	F18a-diep	19-11-2016	31
Total			291

## Lapsed/Relinquished

Licence holder	Licence	In force	km <sup>2</sup>
Oranje-Nassau Energie B.V.	F9a	24-11-2016	86
ENGIE E&P Nederland B.V. cs	E18b	20-12-2016	192
Petrogas E&P Netherlands B.V. cs	B17a	20-12-2016	80
Total			358

## PRODUCTION LICENCES, continental shelf

### Applied for

Licence	Publication	Date	Closing date	Applicant(s)
A12b & B10a *	Govern. Gazette 22	30-12-1999	-	Petrogas cs
B16a *	Govern. Gazette 105	06-05-1993	-	Petrogas cs
B17a **	Govern. Gazette 106	30-05-1997	-	Petrogas cs
B17b **	-	29-07-2010	-	Petrogas cs
L1c *	-	27-02-2014	-	ENGIE
P18b *	-	10-12-2015	-	Oranje-Nassau cs
D12b	-	01-03-2016	-	Wintershall cs
Q7 & Q10a	-	07-04-2016	-	Tulip
F6b	-	11-05-2016	-	Dana cs

\* Current application, formerly published in Annual Report

\*\* Application has been withdrawn this year

### Awarded

Licence holder	Licence	In force	km <sup>2</sup>
Wintershall Noordzee B.V. cs	F17a-diep	14-05-2016	386
Oranje-Nassau Energie B.V. cs	L11c	14-07-2016	179
		Total	565

### Applied for fallow area

Licence	Publication	Date	Closing date	Applicant(s)
F3b	<a href="http://www.nlog.nl">www.nlog.nl</a>	01-07-2013	30-09-2013	Petrogas E&P UK Ltd.

### Prolonged

Licence holder	Licence	In force	Up to
Wintershall Noordzee B.V. cs	L5c	19-07-2016	31-12-2018
Total E&P Nederland B.V.	L1d	30-09-2016	31-12-2023
Total E&P Nederland B.V. cs	L1a	30-09-2016	31-12-2023

## Restricted

Licence holder	Licence	In force	km <sup>2</sup>
Centrica Production Nederland B.V.	B18a	31-12-2016	8
Centrica Production Nederland B.V.	F3a	31-12-2016	18
Total			26

## Relinquished

Licence holder	Licence	In force	km <sup>2</sup>
Dana Petroleum Netherlands B.V. cs	P14a	09-06-2016	50
Total			50

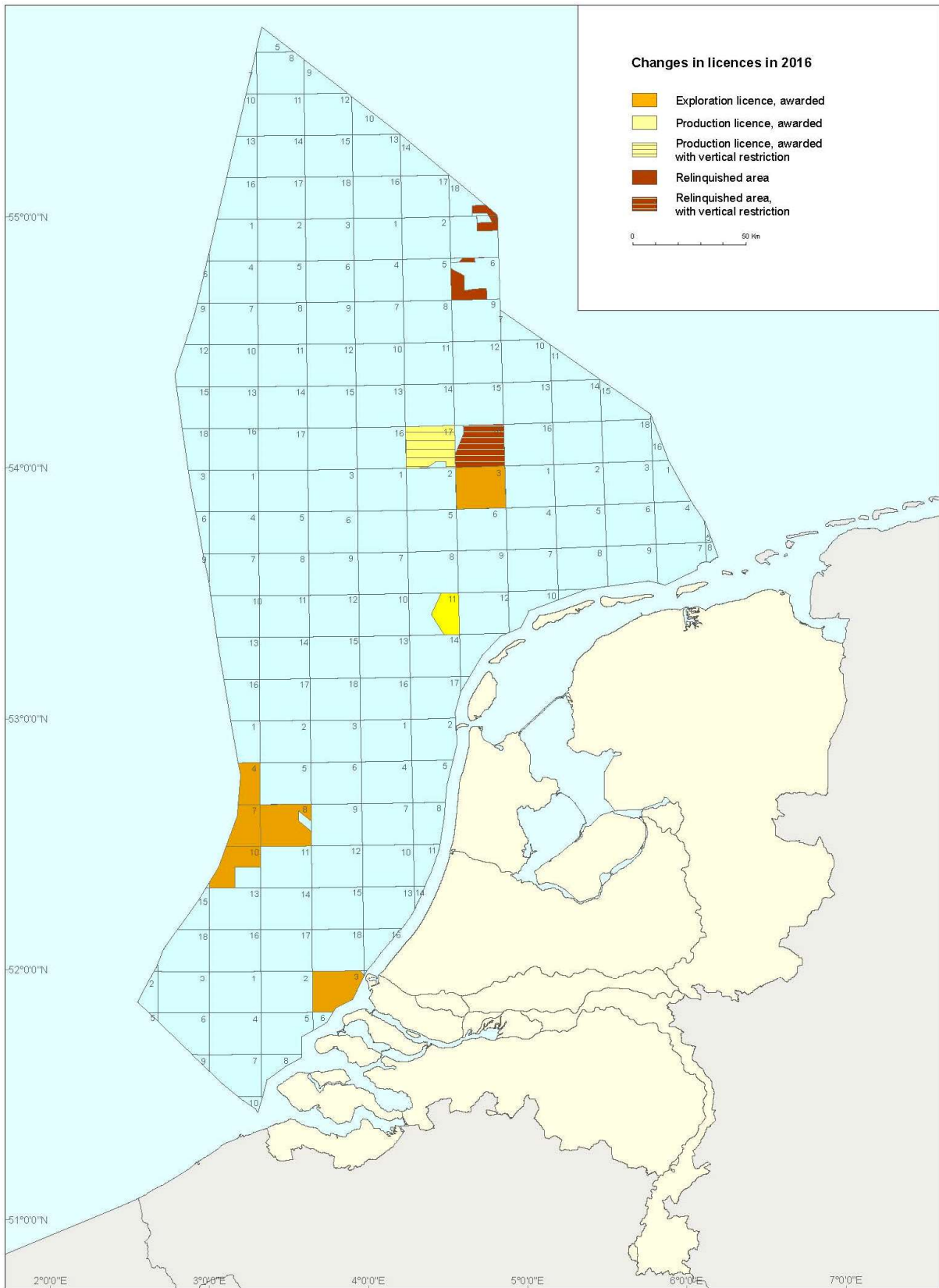


Figure 8: Changes in licences during the year 2016



## 5. HYDROCARBON LICENCES: COMPANY CHANGES, NAME CHANGES AND LEGAL MERGERS IN 2016

The tables below list changes in chronological order which took place during 2016, as a result of mutations in consortiums of companies that participate in licences as well as name changes of participating companies or name changes as a result of legal mergers

### Company changes in exploration licences

Licence	Relinquishing company	Acquiring company	In force	Govern. Gazette
P18b *	-	-	09-03-2016	
N4	-	Oranje-Nassau Energie B.V.	31-12-2016	
N5 *	-	Oranje-Nassau Energie B.V.	31-12-2016	3 194
N8	-	Oranje-Nassau Energie B.V.	31-12-2016	

\* New operator: Oranje-Nassau Energie B.V.

### Company changes in production licences

Licence	Relinquishing company	Acquiring company	In force	Govern. Gazette
L12b & L15b	Dutch Gas Development B.V.	Delta Hydrocarbons B.V.	03-06-2016	30 875
L12c *	Dutch Gas Development B.V.	Delta Hydrocarbons B.V. Oranje-Nassau Energie B.V.	03-06-2016	30 874
L12d *	Dutch Gas Development B.V.	Delta Hydrocarbons B.V.	03-06-2016	30 872
L15d *	Dutch Gas Development B.V.	Delta Hydrocarbons B.V. Oranje-Nassau Energie B.V.	03-06-2016	30 870
Q4	Dutch Gas Development B.V.	Delta Hydrocarbons B.V.	03-06-2016	30 867
Drenthe VI	Nederlandse Aardolie Maatschappij B.V.	-	19-10-2016	56 740
N7c	-	Oranje-Nassau Energie B.V.	31-12-2016	3 190

\* New operator: Oranje-Nassau Energie B.V.

### Name changes

Previous company name	New company name
Vermilion Oil & Gas Netherlands B.V.	Vermilion Energy Netherlands B.V.
PA Resources UK Ltd	Petrogas E&P UK Ltd.

## 6. SEISMIC SURVEYS

In 2016 no seismic surveys were carried out, neither onshore or offshore. For a long-term overview of seismic data acquisition see annex 8

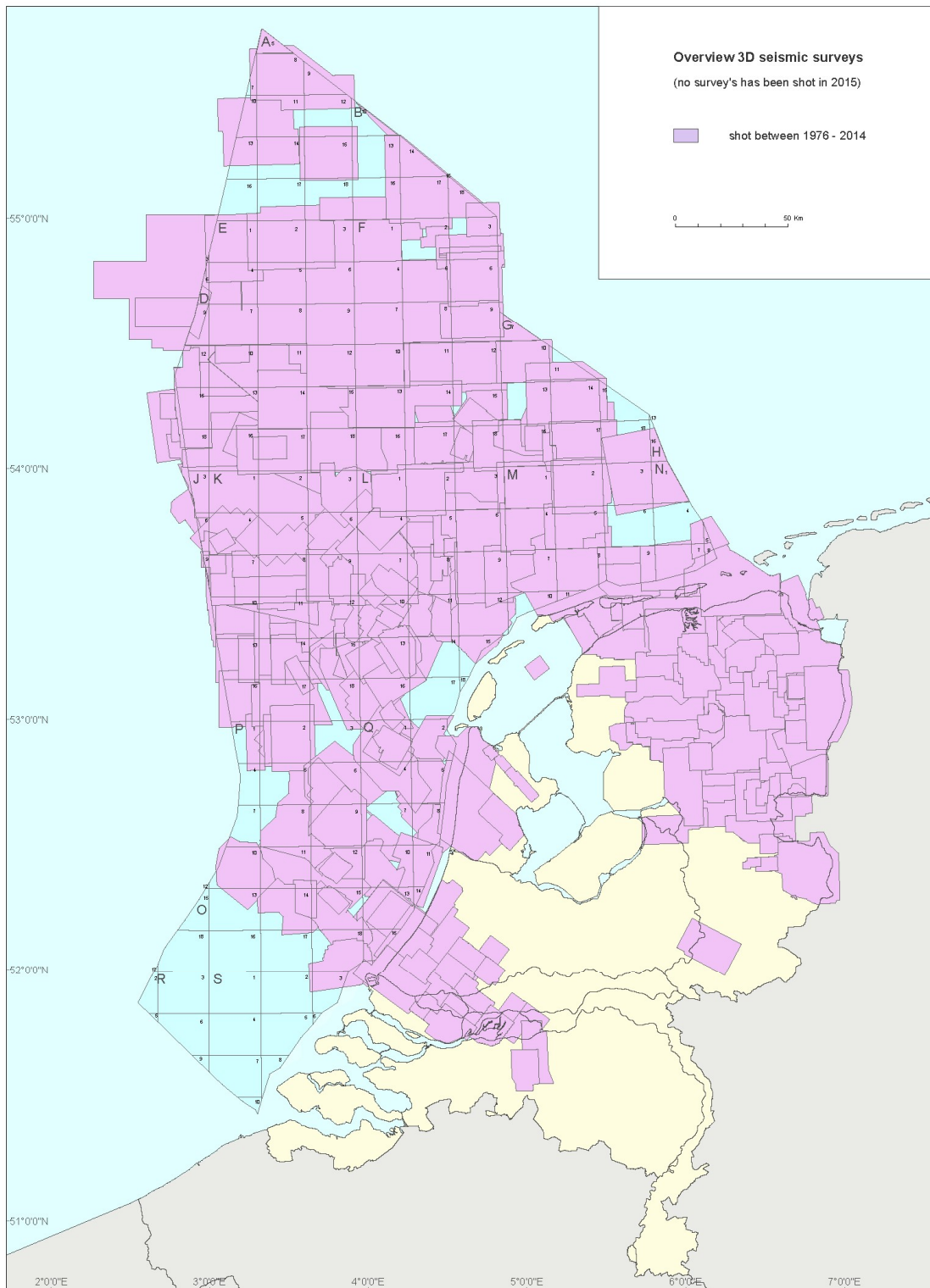


Figure 9 Overview 3D Seismic

## 7. OIL AND GAS WELLS COMPLETED IN 2016

The wells completed in 2016 have been grouped according to drilling location (on Netherlands Territory or on the continental shelf) and then according to whether they are exploration, appraisal, or production wells. An overview of other types of wells is also presented. This concerns wells for gas- or waterinjection or to observe seismic activity. The final table is an aggregated overview of the drilling activities in 2016. Three of the four exploration wells encountered gas. This is a success rate of 75%. However, the number of exploration wells has more than halved compared with the previous year. The single appraisal well confirmed an accumulation discovered earlier. Seventeen production wells were drilled in 2016.

One well was drilled to observe subsidence around the De Wijk gas field, four wells were drilled to develop the De Wijk accumulation storage through injection.

### TERRITORY

#### Exploration wells

	Name of well	License	Operator	Result
1	Langezwaag-03	Gorredijk	Vermilion	Gas

#### Production wells

	Name of well	License	Operator	Result
1	Andel-06-Sidetrack1	Andel Va	Vermilion	Gas
2	Hemrik-01-Sidetrack1	Donkerbroek West	Tulip Oil	Gas
3	Moddergat-05	Noord-Friesland	NAM	Gas
4	Vries-10	Drenthe IIb	NAM	Gas
5	De Wijk-39	Schoonebeek	NAM	Gas
6	De Wijk-41	Schoonebeek	NAM	Gas
7	De Wijk-42	Schoonebeek	NAM	Gas
8	De Wijk-44	Schoonebeek	NAM	Gas

#### Other wells

	Name of well	License	Operator	Function
1	De Wijk-201	Schoonebeek	NAM	Injection
2	De Wijk-202	Schoonebeek	NAM	Injection
3	De Wijk-36	Schoonebeek	NAM	Injection
4	De Wijk-37	Schoonebeek	NAM	Injection
5	De Wijk-43	Schoonebeek	NAM	Observation

## CONTINENTAL SHELF

### Exploration wells

	Name of well	License	Operator	Result
1	K07-13	K07	NAM	Gas
2	P11-12	P11a	Oranje-Nassau	Gas
3	Q07-07	Q07	Tulip Oil	Dry

### Appraisal wells

	Name of well	License	Operator	Result
1	M07-10	M07	Oranje-Nassau	Gas

### Production wells

	Name of well	License	Operator	Result
1	A18-A-01	A18a	Petrogas	Gas
2	A18-A-03	A18a	Petrogas	Gas
3	K02-A-04-Sidetrack3	K02b	ENGIE	Gas
4	K05-F-03-Sidetrack1	K04b & K05a	Total	Gas
5	K07-FD-105	K07	NAM	Gas
6	K12-G-05-Sidetrack1	K12	ENGIE	Gas
7	K14-FA-108-Sidetrack1	K14a	NAM	Gas
8	K15-FK-106-Sidetrack1	K15	NAM	Gas
9	M07-A-02-Sidetrack3	M07	Oranje-Nassau	Gas

## SUMMARY OF WELLS completed in in 2016

	Type	Result					Total		
		Gas	Gas shows	Oil	Oil shows	Oil & Gas		Dry	Other
<b>Territory</b>	Exploration	1						1	
	Appraisal								
	Production	8						8	
	Other							5	
	<b>Subtotal</b>	9						5	14
<b>Continental Shelf</b>	Exploration	2					1	3	
	Appraisal	1						1	
	Production	9						9	
	<b>Subtotal</b>	12					1	13	
<b>Total</b>		21					1	5	27



Figure 10: Changes in wells in 2016

## 8. PLATFORMS AND PIPELINES, Netherlands continental shelf

In 2016 one new platform was installed on the continental shelf and none were removed. two new pipelines were laid.

For a complete list of platforms and pipelines, see annexes 16 and 17. The pipeline data was supplied by State Supervision of Mines (*Staatstoezicht op de Mijnen*).

### Platforms installed in 2016

Platform	Operator	No. legs	Gas/Oil	Function
P11-E	ONE	4	G	platform

### New pipelines in 2016

Operator	From	To	Diameter (inches)	Length (km)	Carries*
ONE	L11-b	L8-G-NGT Sidetap	8	0.2	g
ONE	P11-E	P15-F	8	9.0	g

\* g = gas, c = condensate, m = methanol, o=oil

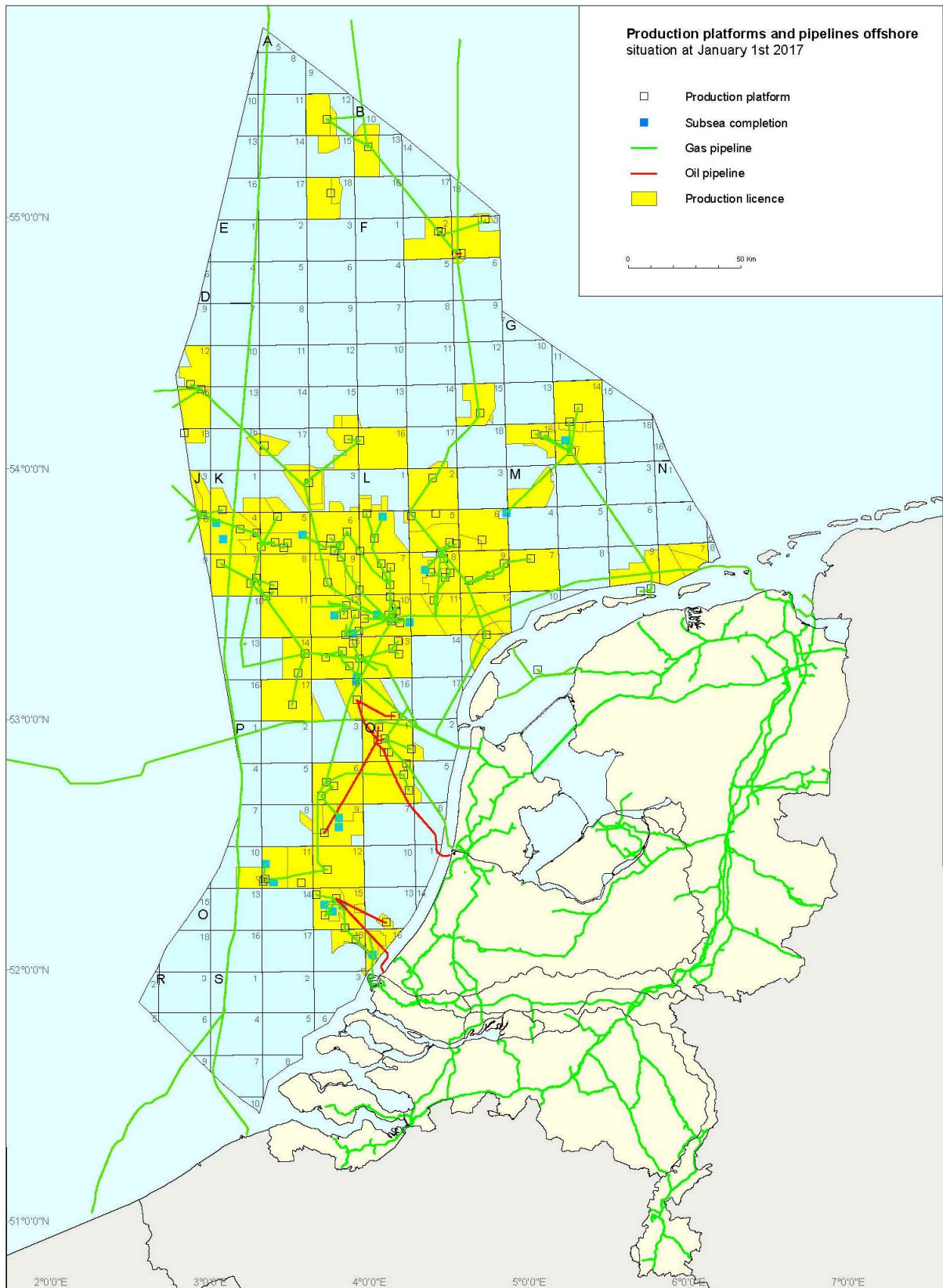


Figure 11 Pipelines and Platforms Offshore (source Rijkswaterstaat)

## 9. PRODUCTION OF GAS AND OIL

The tables below list the aggregated production figures for natural gas, oil and condensate for 2016. Condensate is considered to be a by-product of oil or gas production. Changes compared with 2015 are given in absolute figures and as percentages. The information in the tables is based on figures supplied by the operators.

The fall in gas production compared with 2015 is largely attributable to production from the Groningen field being reduced. The decline in production from the small gas fields reflects the gradual depletion of the producing fields. The decrease in oil production offshore is largely to blame on lower production out of the Q13 Amstel field. The decrease in oil production onshore is caused by technical problems with the transport of injection water at the Schoonebeek field.

In 2016 the following fields came on stream or stopped producing.

Production start	Field	Producing	Year discovered
January – 2016	Pieterzijl Oost	Gas	2015
March – 2016	K15-FH	Gas	1992
October – 2016	L11-Gillian	Gas	2015
October - 2016	P11a-E	Gas	2014
November - 2016	P11-12	Gas	2016

Production ceased	Field	Producing	Year discovered
June - 2016	Helm	Oil	1979
July - 2016	Hoorn	Oil	1981
August- 2016	Oudendijk	Gas	2014
August - 2016	Spijkenisse-West	Gas	1992
September - 2016	Pieterzijl Oost	Gas	2015



**Overview of natural gas, oil and condensate production in 2016 and the changes compared with 2015**

Gas	Production 2016	Changes compared with 2015	
	10 <sup>9</sup> Nm <sup>3</sup>	10 <sup>9</sup> Nm <sup>3</sup>	%
Territory (total)	34.6	-1.0	-3.0
<i>Groningen field</i>	27.6	-0.5	-1.8
<i>Other onshore fields</i>	7.0	-0.5	-7.2
Continental shelf	13.3	-0.7	-5.1
Total	47.9	-1.8	-3.6

Oil	Production 2016	Changes compared with 2015	
	10 <sup>3</sup> Sm <sup>3</sup>	10 <sup>3</sup> Sm <sup>3</sup>	%
Territory (total)	179	-170	-48.8
Continental shelf	957	-350	-26.8
Total	1 136	-520	-31.4
Average daily oil production		3 111	Sm <sup>3</sup> /day

Condensate	Production 2016	Changes compared with 2015	
	10 <sup>3</sup> Sm <sup>3</sup>	10 <sup>3</sup> Sm <sup>3</sup>	%
Territory	212	-128	-38.7
Continental shelf	164	-28	-14.6
Total	376	-156	-29.3

The table below gives monthly production figures per production licence.

Annexes 18 to 20 give the historical annual figures for the production of natural gas and oil. Annual totals may differ slightly due to the rounding off of the monthly production totals.

## PRODUCTION OF NATURAL GAS, Netherlands Territory in 2016 (in million Nm<sup>3</sup>)

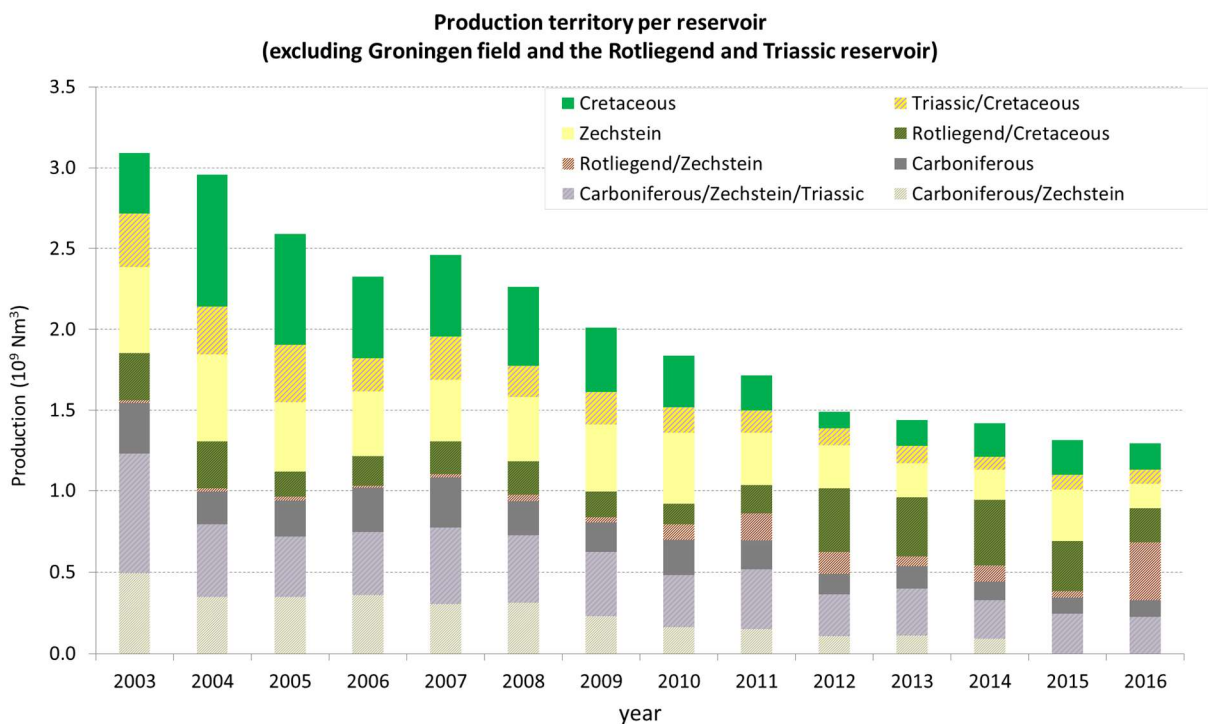
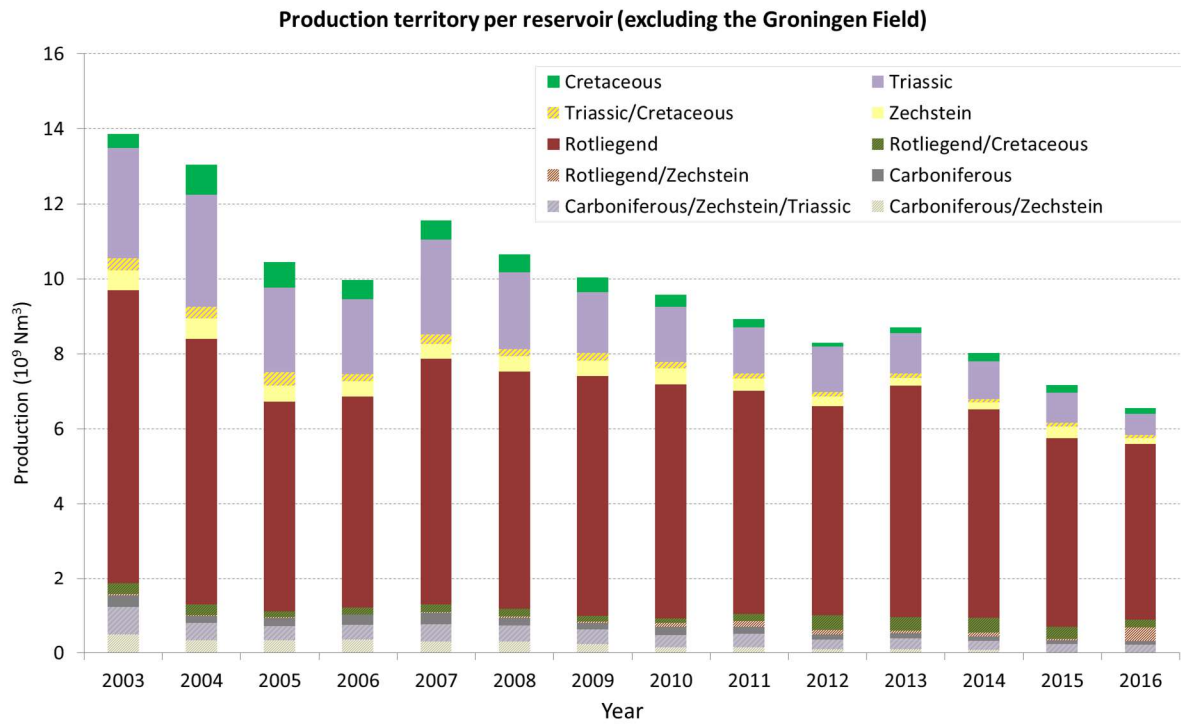
Production per licence is the total of the production from wells with a wellhead within the licence area. Data supplied by the operating companies.

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Akkrum 11	Tulip	4.9	0.0	0.0	0.0	1.7	2.8	0.5	0.0	0.0	0.0	0.0	0.0	0.0
Andel Va	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beijerland	NAM	79.1	8.7	8.6	7.1	7.3	6.3	6.4	6.5	5.9	5.8	6.1	5.2	5.1
Bergen II	Taq	45.4	5.0	4.5	4.6	4.1	2.2	5.1	2.6	1.3	5.1	3.3	2.4	5.2
Botlek II	NAM	263.0	32.4	27.9	27.1	24.8	21.9	23.6	24.0	25.0	16.6	10.8	14.4	14.5
Botlek II	ONE	150.2	28.4	26.9	30.0	4.3	18.0	7.4	7.1	9.4	6.8	2.6	5.0	4.3
Donkerbroek	Tulip	21.0	0.0	0.0	0.0	0.0	2.3	2.9	3.0	2.9	2.5	2.9	2.7	1.9
Drenthe IIa	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Drenthe IIb	NAM	473.0	37.1	37.9	39.9	32.9	39.2	40.0	40.7	45.9	42.6	36.2	38.1	42.5
Drenthe IV	Vermilion	5.1	0.7	0.6	0.6	0.5	0.5	0.4	0.4	0.3	0.3	0.3	0.2	0.2
Drenthe V	Vermilion	20.2	1.8	1.7	1.8	1.6	2.0	1.5	1.7	1.6	1.5	1.7	1.7	1.5
DrentheVII	Vermilion	249.0	23.1	22.4	24.0	25.1	27.2	26.3	27.4	14.9	14.4	14.9	14.4	14.9
Gorredijk	Vermilion	205.3	14.6	14.5	17.8	18.4	18.4	16.1	16.8	19.3	17.4	16.3	17.0	18.7
Groningen	NAM	28,858.7	2,585.9	2,417.6	2,467.2	2,758.6	2,792.5	2,404.2	2,300.3	2,261.0	2,061.4	1,971.0	2,351.5	2,487.5
Hardenberg	NAM	94.2	8.0	8.6	10.2	8.9	9.2	8.8	8.1	7.6	6.7	6.9	5.6	5.5
Leeuwarden	Vermilion	63.0	5.4	4.7	4.9	4.3	4.0	5.0	6.7	6.2	5.4	5.4	5.6	5.3
Middelie	NAM	379.3	34.4	33.5	34.8	34.3	34.5	22.2	33.0	31.7	29.1	31.5	28.7	31.6
Noord-Friesland	NAM	2,613.4	240.1	221.1	237.8	207.6	224.7	209.8	219.9	219.4	210.7	208.3	207.5	206.5
Oosterend	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rijswijk	NAM	201.8	11.7	12.0	18.5	16.7	17.1	19.8	22.1	20.9	16.5	16.7	15.1	14.7
Schoonebeek	NAM	486.9	43.1	37.9	44.2	41.7	42.5	36.9	44.1	39.6	31.8	42.4	40.6	42.1
Slootdorp	Vermilion	191.9	23.2	20.2	21.0	19.8	11.1	15.1	15.5	15.7	15.0	14.8	14.2	6.4
Steenwijk	Vermilion	10.9	2.2	1.5	0.4	0.0	0.0	0.0	0.0	1.2	1.2	0.7	1.8	2.0
Tietjerksteradeel	NAM	126.0	10.4	10.7	13.4	8.9	12.7	13.5	14.9	8.7	7.9	9.6	6.3	9.1
Waalwijk	Vermilion	19.4	0.0	0.0	0.0	0.0	0.7	2.9	2.7	2.6	2.4	2.8	2.3	3.0
Zuidwal	Vermilion	26.8	2.3	2.2	2.3	1.6	2.4	2.3	2.2	2.2	2.1	2.3	2.5	2.4
<b>Total</b>		<b>34,588.3</b>	<b>3,118.6</b>	<b>2,914.9</b>	<b>3,007.9</b>	<b>3,223.2</b>	<b>3,292.2</b>	<b>2,870.8</b>	<b>2,799.6</b>	<b>2,743.2</b>	<b>2,502.9</b>	<b>2,407.3</b>	<b>2,782.7</b>	<b>2,925.1</b>

### Natural gas production from small fields on Netherlands Territory, per stratigraphic reservoir

The bar graphs below show the contribution of each stratigraphic reservoir level to the total gas production from the small onshore fields. Production from fields with multiple reservoir levels is depicted by hatched shading. The Groningen field (excluded from this overview) lies in the Rotliegend reservoir. The first bar graph shows that the biggest contribution to the gas production from the small fields is from the Rotliegend and Triassic reservoirs. The steep decline in production (by about 10% annually) during the period 2003 – 2006 was halted in 2007, largely thanks to gas production from under the Wadden Sea. Since then, there has been a general decline of about 5% per annum. However, in 2013 there was an upturn, largely thanks to production from Rotliegend fields. The second bar graph shows production excluding that from the Rotliegend and Triassic reservoirs. This reveals the contribution from the Cretaceous, Zechstein and Carboniferous reservoirs to the gas production. (Note that onshore there is no

production from Jurassic reservoirs). Production from these reservoirs declined steadily in previous years but as a whole levelled since 2012. This stabilisation is mainly due to additional production from Cretaceous and Zechstein (Slootdorp accumulation) while the production from the combined Rotliegend/Cretaceous reservoirs is decreasing (mainly depletion of the Vinkega accumulation). The increase in total production from the Rotliegend/Zechstein reservoirs in 2016 is due to a production increase from 29 to 161 mln. from the Middelie field NM3 and the reclassification of Slootdorp due to additional production from the Rotliegend formation (in the past, production used to be from Zechstein only).



## PRODUCTION OF NATURAL GAS, Continental shelf in 2016 (in million Nm<sup>3</sup>)

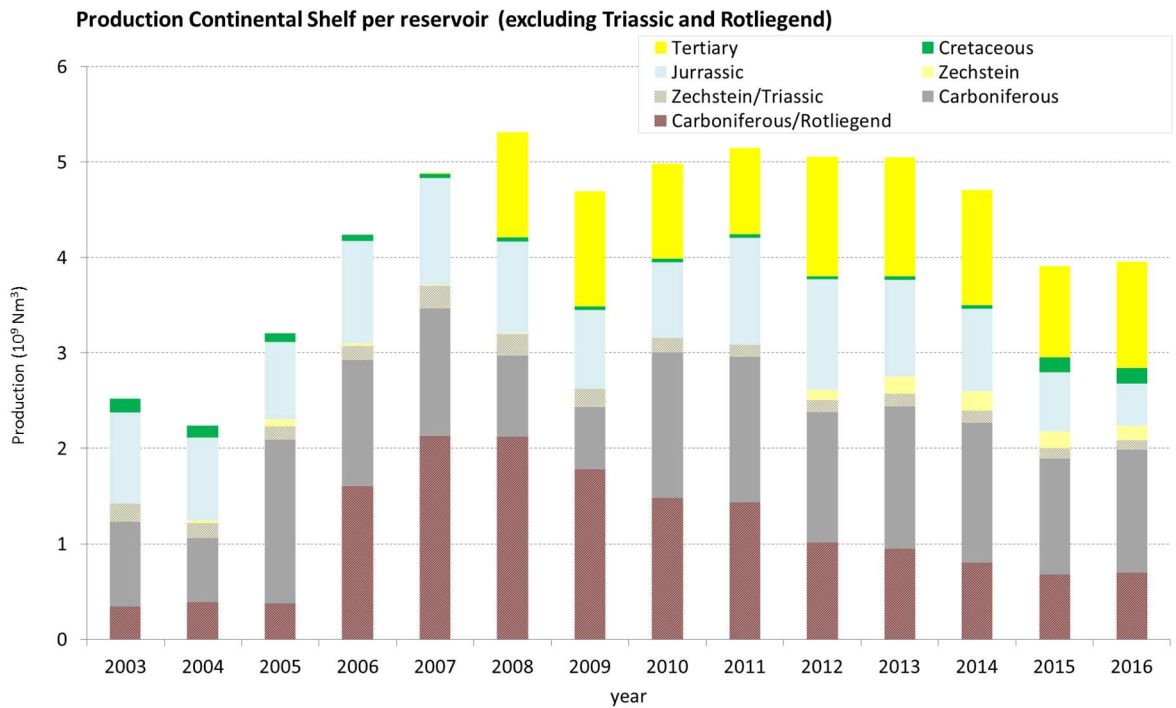
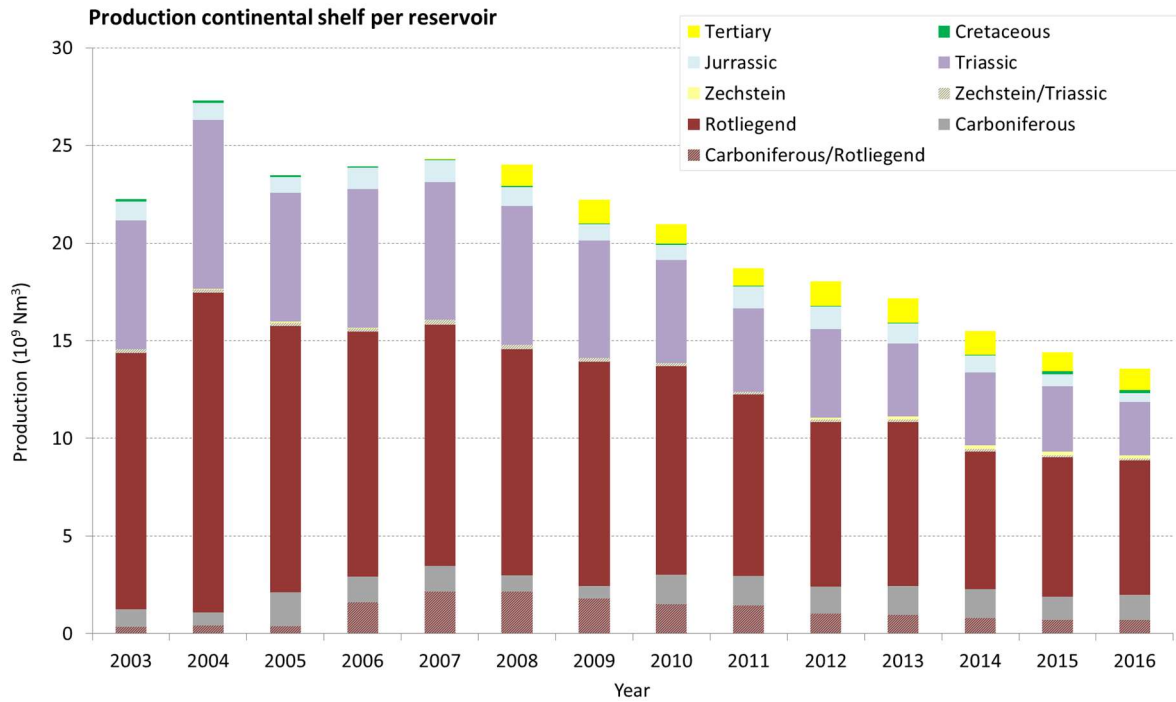
The production per licence is the total production of all producing wells with a wellhead within the licence area. Production data are supplied by the operating companies.

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
A12a	Petrogas	165.7	14.0	10.1	12.7	17.5	13.7	13.1	15.9	3.4	4.9	18.5	21.2	20.7
A18a	Petrogas	509.1	17.1	39.7	54.5	51.7	52.9	52.7	55.9	12.3	17.4	52.0	51.0	51.9
B10c & B13a	Petrogas	408.5	41.7	39.8	43.1	38.6	38.1	36.6	38.6	8.3	13.9	39.8	34.8	35.3
D12a	Wintershall	24.6	0.9	1.1	1.2	0.0	1.6	0.0	2.7	1.9	0.9	2.3	5.0	7.0
D15	ENGIE	19.9	0.0	0.0	0.0	4.5	5.1	4.9	0.1	0.0	0.0	0.0	3.1	2.2
D18a	ENGIE	37.0	3.7	2.9	4.2	3.5	3.5	3.4	3.0	3.4	1.0	2.3	3.0	3.0
E17a & E17b	ENGIE	925.2	94.3	85.5	90.6	82.5	83.5	76.9	62.7	77.5	64.7	68.3	66.6	72.3
E18a	Wintershall	53.9	6.6	5.8	5.6	5.0	4.6	4.0	4.2	4.6	4.0	3.8	2.5	3.1
F02a	Dana	39.6	4.9	3.7	3.5	3.0	2.1	1.1	3.5	0.9	2.1	6.2	3.7	4.8
F03a	Centrica	116.2	17.8	8.0	17.7	15.9	18.5	16.8	17.7	3.4	0.1	0.1	0.1	0.1
F03b	ENGIE	171.1	19.8	18.1	17.1	18.9	19.6	18.9	19.0	4.0	0.0	6.1	15.0	14.5
F15a	Total	109.6	12.0	11.1	13.3	11.3	10.0	9.2	8.9	2.0	4.0	9.9	8.8	9.2
F16	Wintershall	146.1	9.9	9.5	9.8	9.4	15.2	13.1	13.3	14.6	14.0	13.7	9.9	13.6
G14 & G17b	ENGIE	821.1	75.4	85.4	78.3	83.6	84.6	26.5	33.2	81.8	69.6	68.0	68.4	66.2
G16a	ENGIE	431.5	45.9	43.0	43.6	39.6	37.5	14.6	18.8	42.8	35.1	37.1	37.4	36.0
G17c & G17d	ENGIE	94.5	11.6	7.5	6.7	6.2	5.7	1.1	1.3	5.5	7.5	14.9	13.5	13.0
J03b & J06	Centrica	34.3	3.1	2.7	2.2	2.9	2.9	0.7	1.8	3.0	2.0	3.0	4.1	5.9
J03b & J06	Total	73.7	7.5	6.7	6.5	7.3	7.4	1.6	4.1	7.0	5.9	7.1	6.2	6.5
K01a	Total	244.7	22.1	21.8	19.3	23.4	25.0	5.5	14.1	25.6	21.1	23.3	21.6	21.9
K02b	ENGIE	359.1	33.3	29.5	26.8	29.2	37.4	33.7	24.8	32.7	27.9	27.2	28.4	28.2
K04a	Total	625.1	57.6	53.1	55.2	57.2	59.1	39.1	60.1	58.6	41.7	48.8	46.9	47.6
K04b & K05a	Total	906.4	82.9	74.8	78.8	78.6	78.9	55.9	77.9	81.1	63.9	78.0	76.3	79.3
K05b	Total	102.8	10.7	9.2	9.7	7.3	9.2	5.8	10.0	8.9	4.3	10.1	8.5	9.0
K06 & L07	Total	428.1	38.8	36.9	39.1	35.8	37.5	35.2	30.2	37.1	34.3	36.1	32.1	34.8
K07	NAM	119.9	11.1	7.7	9.6	11.7	10.8	5.2	16.0	10.7	9.1	10.1	9.6	8.1
K08 & K11	NAM	352.9	31.6	27.2	32.2	30.9	38.0	20.3	34.2	31.0	23.1	27.6	29.8	26.9
K09a & K09b	ENGIE	257.7	33.0	17.6	10.2	28.2	26.6	23.4	21.0	23.9	18.4	22.1	18.8	14.6
K09a & K09b	Total	2.2	0.4	0.5	0.4	0.3	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1
K09c	ENGIE	12.0	1.4	1.3	1.4	1.3	1.3	1.3	1.2	1.0	0.8	0.2	0.4	0.3
K12	ENGIE	634.8	56.5	52.5	55.0	37.4	54.5	62.1	40.5	47.7	54.9	50.1	59.5	64.3
K14a	NAM	235.6	5.1	3.4	18.0	24.7	26.5	13.2	27.1	24.0	22.5	25.3	23.7	22.0
K15	NAM	672.5	69.0	63.5	68.9	66.8	52.7	26.0	62.1	58.9	49.7	53.1	51.9	49.8
K17	NAM	87.1	10.3	8.0	8.8	8.8	8.4	4.0	6.9	6.2	6.0	6.9	6.3	6.4
K18b	Wintershall	465.1	44.3	29.5	28.2	44.4	47.9	7.7	33.9	51.8	51.4	53.6	44.0	28.3
L02	NAM	320.9	34.7	32.3	34.3	32.5	33.1	30.2	33.0	6.8	0.1	15.2	34.9	33.8
L04a	Total	271.3	25.6	25.1	23.7	13.5	26.0	24.3	19.9	23.0	21.3	23.6	22.5	22.7
L05a	ENGIE	47.6	13.8	13.6	12.9	7.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
L05b	Wintershall	166.0	16.5	15.4	15.9	3.5	10.0	15.6	13.9	15.9	15.6	15.9	14.6	13.2
L06a	Wintershall	108.8	0.0	3.8	14.9	2.2	4.4	13.6	9.8	11.2	11.8	11.9	6.4	18.6
L08a	Wintershall	30.4	3.2	3.5	3.5	0.8	3.4	3.6	2.4	3.3	3.6	3.2	0.0	0.0
L08b	Wintershall	83.2	8.0	7.0	7.8	1.5	5.8	6.4	6.1	8.3	6.8	7.0	9.1	9.4
L09	NAM	358.7	32.2	33.3	33.0	34.2	28.9	28.7	13.0	5.0	0.9	46.5	48.7	54.3
L10 & L11a	ENGIE	467.1	46.2	52.0	54.7	26.0	44.0	40.2	36.3	42.8	36.6	34.1	27.1	27.0
L11b	ONE	79.0	9.8	9.9	7.1	0.0	0.0	0.0	0.0	0.0	0.0	16.9	17.7	17.6

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
L12b & L15b	ENGIE	350.9	38.4	35.0	36.9	33.0	35.0	31.6	30.4	7.5	11.2	36.4	26.4	28.9
L13	NAM	127.6	17.8	14.0	14.5	12.8	8.2	0.0	8.0	11.7	10.1	9.6	10.7	10.2
M07	ONE	107.1	0.6	11.9	11.5	4.6	0.0	0.0	6.6	2.8	3.4	21.1	22.8	21.7
P06	Wintershall	127.7	11.7	12.6	12.8	12.4	12.7	11.9	9.7	11.6	0.0	11.0	10.7	10.7
P09a & P09b	Petrogas	14.2	1.7	1.5	1.4	1.2	1.2	1.1	1.1	1.2	0.0	1.4	1.3	1.1
P09c	Petrogas	2.3	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2
P09c	Wintershall	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P11a	ONE	50.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.3	18.3	26.8
P11b	Dana	248.7	27.6	3.4	8.9	27.4	27.5	26.0	20.2	26.3	9.7	26.6	26.5	18.5
P12	Wintershall	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P15a & P15b	Taqqa	64.2	7.1	7.2	6.9	7.3	5.5	2.1	6.8	6.9	5.6	4.0	3.4	1.5
P15c	Taqqa	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P18a	Taqqa	112.0	11.9	7.7	10.7	9.6	8.5	3.7	11.0	11.7	10.4	9.6	9.4	7.6
Q01	Petrogas	3.5	0.4	0.4	0.4	0.4	0.4	0.2	0.2	0.2	0.2	0.2	0.2	0.2
Q01	Wintershall	159.5	16.8	13.2	12.8	13.2	13.6	2.4	15.0	15.5	14.3	14.1	14.4	14.0
Q04	Wintershall	229.0	20.4	20.5	22.9	18.5	22.6	10.0	11.9	20.6	13.0	23.3	22.3	23.0
Q13a	ENGIE	33.8	4.0	3.7	4.0	3.1	2.7	0.5	2.9	3.1	2.8	2.5	2.2	2.3
Q16a	ONE	83.0	8.1	7.5	7.8	7.6	7.1	2.7	8.0	7.7	7.2	7.2	5.3	6.8
Total		13334.2	1251.1	1151.7	1232.0	1160.5	1221.2	888.7	1031.4	1019.1	861.3	1172.6	1167.7	1177.1

### Gas production, Netherlands continental shelf per stratigraphic reservoir.

The two bar graphs below show the contribution of the gas reservoirs to gas production from the continental shelf. From the first graph it can be seen that on the continental shelf (just as onshore) the biggest contribution to the gas production is from the Rotliegend and Triassic reservoirs. Production increase slightly from 2003–2008, but thereafter declined steadily, with 2011 being the first year in which offshore production fell below 20 billion Sm<sup>3</sup>/year. The second graph shows production excluding that from the Rotliegend (s.s.) and Triassic reservoirs, in order that the contribution from reservoirs at other levels can more clearly be seen. During the period 2005–2007 the contribution from fields with combined Carboniferous–Rotliegend reservoirs almost tripled, but since 2008 production from this reservoir level has again been declining steadily. The start of production from the shallow (Tertiary) reservoirs in the northern part of the Dutch continental shelf in 2008 is striking. Production from the Tertiary reservoirs has remained fairly stable, thanks to B13-A coming on stream in 2015.



## OIL PRODUCTION in 2016 (in 1000 Sm<sup>3</sup>)

The production per licence is the total production from all producing wells with a wellhead within the licence area. Production data are supplied by the operating companies.

Licence	Operato	Total	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec
Botlek	NAM	1.7	1.6	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rijswijk	NAM	114.3	12.4	6.7	10.6	10.1	10.7	12.3	12.2	10.3	3.4	3.6	10.5	11.5
Schoonebeek	NAM	62.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.4	18.0	18.9	24.3
F02a	Dana	180.6	16.5	15.6	15.8	14.0	16.8	15.6	15.4	8.6	16.3	16.2	14.5	15.2
F03b	ENGIE	42.6	5.0	4.6	4.4	4.8	4.9	4.9	4.6	1.1	0.0	1.4	3.6	3.4
P09c	Petrogas	31.4	2.5	2.7	2.9	2.8	2.8	1.6	2.7	2.7	2.6	2.8	2.6	2.5
P11b	Dana	81.9	10.1	1.6	3.0	9.3	10.3	7.9	6.7	8.1	3.0	6.4	7.8	7.9
P15a & P15b	TAQA	61.8	4.6	4.0	7.1	6.8	5.6	0.0	6.1	6.3	5.7	5.7	5.0	4.8
Q01	Petrogas	85.3	9.5	9.0	9.4	8.9	8.5	4.5	5.5	6.2	5.4	6.4	5.9	6.1
Q13a	ENGIE	473.1	56.3	52.6	56.0	44.5	37.8	7.2	40.4	43.0	38.7	34.2	29.8	32.4
Total		1135.4	118.6	96.7	109.3	101.2	97.4	54.1	93.7	86.3	76.6	94.7	98.7	108.1

## CONDENSATE PRODUCTION\* in 2016 (in 1000 Sm<sup>3</sup>)

Production data are supplied by the operating companies.

Licence	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Territory gas fields	212.3	28.1	25.4	24.7	13.9	19.4	15.8	14.2	16.4	14.7	11.5	13.5	14.8
Continental shelf gas fields	163.5	15.2	12.4	14.1	15.7	15.0	9.4	13.0	12.8	9.8	13.5	15.1	17.7
Total	375.8	43.3	37.7	38.7	29.7	34.4	25.2	27.2	29.2	24.5	25.0	28.6	32.4

\* Condensate is also referred to as natural gasoline or natural gas liquids (NGL).

## 10. UNDERGROUND STORAGE

In 2016 no new storage licences applications have been submitted. Two applications from previous years are still in the process of application. These are concerned with the storage of filling material to stabilise a salt cavern and storage of brine. The commencement date of the CO<sub>2</sub> storage licence from Taqa has changed.

### STORAGE LICENCES, Netherlands Territory Changes in 2016

#### Applied for

Licence	Publication	Date	Closing date	Storage of	Applicant(s)
Luttelgeest	Government Gazette 5 395	04-03-13	03-06-13	Saline water	Leo Hoogweg B.V.
Twenthe-Rijn Boeldershoek	-	24-01-14	-	Filler	AkzoNobel

\* Application ongoing, published in an earlier annual review.

### STORAGE LICENCES, Netherlands Continental Shelf Changes in 2016

#### Awarded

Licenceholder	Licence	In Force	km <sup>2</sup>
TAQA Offshore B.V.	P18-4	01-01-2018/ 01-01-2021	11
		Total	11



## UNDERGROUND STORAGE in 2016

The tables below show the monthly figures for volumes of natural gas, nitrogen and diesel injected and withdrawn in 2016, per storage facility. Data supplied by licensees.

### NATURAL GAS

#### STORED natural gas (in million Nm<sup>3</sup>)

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Alkmaar	TAQA	352	0	0	0	0	123	109	103	16	0	0	0	0
Bergermeer	TAQA	2513	1	0	0	219	553	509	709	250	271	0	0	0
Grijpskerk	NAM	1338	0	0	0	0	375	319	419	225	0	0	0	0
Norg	NAM	5599	0	0	121	738	1199	1154	1129	914	343	0	0	0
Zuidwending	Gasunie	776	42	60	80	60	75	85	112	44	78	55	47	38
<b>Total</b>		<b>10578</b>	<b>43</b>	<b>60</b>	<b>201</b>	<b>1018</b>	<b>2326</b>	<b>2177</b>	<b>2472</b>	<b>1449</b>	<b>692</b>	<b>55</b>	<b>47</b>	<b>38</b>

#### DISCHARGED natural gas (in million Nm<sup>3</sup>)

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Alkmaar	TAQA	510	54	50	231	0	0	0	0	0	0	0	20	154
Bergermeer	TAQA	4219	565	560	773	100	6	15	0	197	84	386	772	760
Grijpskerk	NAM	2231	235	61	746	123	1	0	0	3	11	9	484	658
Norg	NAM	4878	1523	968	374	0	0	0	0	0	0	7	847	1148
Zuidwending	Gasunie	849	123	47	81	47	43	60	24	71	45	114	83	110
<b>Total</b>		<b>12788</b>	<b>2510</b>	<b>1686</b>	<b>2207</b>	<b>270</b>	<b>51</b>	<b>75</b>	<b>24</b>	<b>271</b>	<b>141</b>	<b>516</b>	<b>2207</b>	<b>2831</b>

### NITROGEN

#### STORED nitrogen (in million Nm<sup>3</sup>)

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Winschoten II	Gasunie	23.0	2.8	1.7	2.3	0.0	1.7	1.4	3.7	0.0	0.0	4.3	3.3	1.8

#### DISCHARGED nitrogen (in million Nm<sup>3</sup>)

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Winschoten II	Gasunie	24.0	3.2	0.9	3.2	0.2	0.6	1.0	4.4	0.1	0.3	5.3	3.1	1.5

### DIESEL

#### STORED diesel (in Sm<sup>3</sup>)

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Twente-Rijn	Akzo Nobel	957	46	105	122	58	69	32	59	34	32	122	177	101

#### DISCHARGED diesel (in Sm<sup>3</sup>)

Licence	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Twente-Rijn	Akzo Nobel	748	32	38	21	32	44	66	47	30	44	116	186	92

## 11. COAL

No coal has been mined in the Netherlands since 1974. By then, almost 570 million tonnes of coal had been mined. Conventional mining is not expected to become profitable again in the future but interest has been shown in producing coal bed methane (CBM). Although research has indicated that a large resource of CBM may be present in the coal seams, the economic feasibility of recovering it has not yet been demonstrated.

On 1 January 2017 there were five production licences for coal in force. In 2016 there were again no mining activities in the licence areas.

### PRODUCTION LICENCES, Netherlands Territory, on 1 January 2017

Licensee	Licence	Effective from	km <sup>2</sup>
DSM	Staatsmijn Beatrix (1)	27-09-1920	130
DSM	Staatsmijn Emma (2)	26-10-1906	73
DSM	Staatsmijn Hendrik (3)	08-08-1910	24
DSM	Staatsmijn Maurits (4)	12-03-1915	51
DSM	Staatsmijn Wilhelmina (5)	08-01-1903	6
Total			284

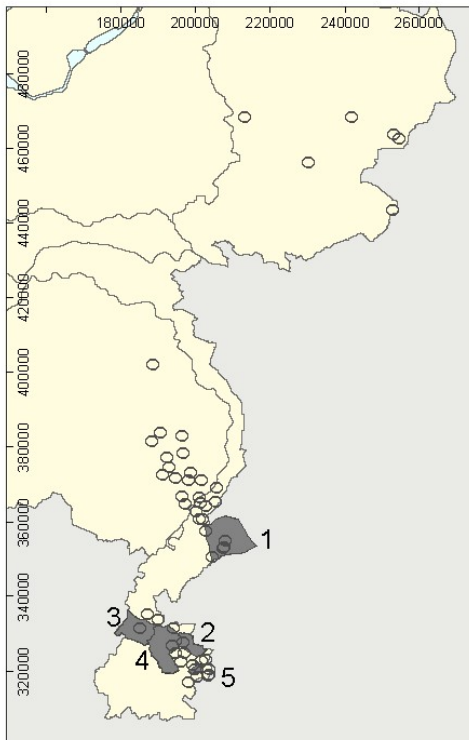


Figure 12 Licences for coal at 1 January 2017

## 12. ROCK SALT

Changes which took place during 2016 in relation to licences for the exploration and mining of salt are listed in the tables below, together with all ongoing applications for licences. In addition, monthly salt production per location is given, as well as an overview of annual production since 2003.

In 2016 one application for an exploration licence, submitted the previous year, was still ongoing.

On 1 January 2017 16 production and no exploration licences were in force. A complete list of all production licences can be found in Annex 6. The licenses are all located in the north and east of the country, which is where the salt is found in Zechstein and Triassic deposits.

### PRODUCTION LICENCES, Netherlands Territory: changes in 2016

#### Applied for

Licence	Publication	Date	Closing date	Applicant(s)
Barradeel-Oost *	Government Gazette 249	19-12-07	24-03-08	Frisia

\* Application ongoing, published in an earlier annual review.

## ROCK SALT PRODUCTION, 2016 (in 1000 tonnes)

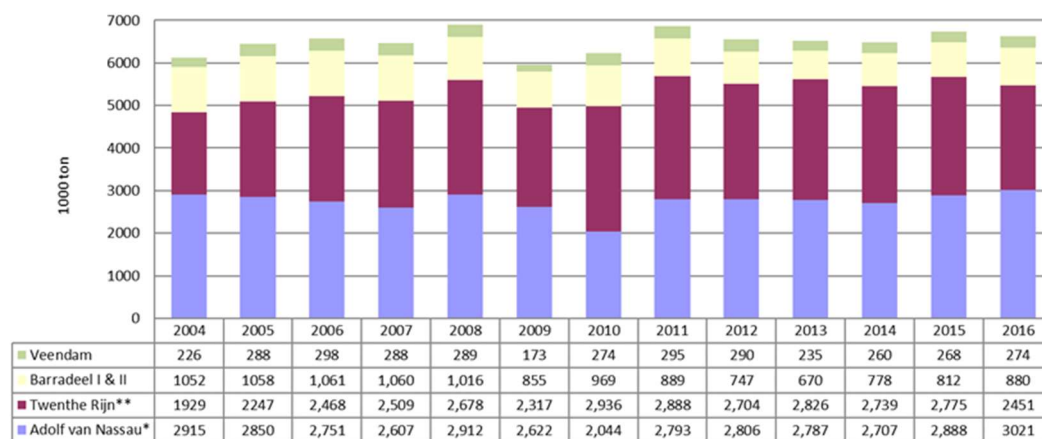
Production	Operator	Total	Jan	Feb	Mar	April	May	June	July	Aug	Sept	Oct	Nov	Dec
Adolf van Nassau	AKZO	1394	112	110	118	116	100	111	128	122	118	112	120	126
Adolf van Nassau*	AKZO	1627	136	113	144	142	145	108	142	137	143	136	136	146
Barradeel	Frisia	446	33	33	36	1	31	47	54	53	31	28	49	50
Barradeel II	Frisia	434	37	32	25	15	47	44	43	52	38	26	42	35
Twenthe–Rijn	AKZO	1302	116	112	0	99	127	128	113	133	115	108	128	121
Twenthe–Rijn**	AKZO	316	30	35	0	32	36	34	26	29	15	21	29	29
Twenthe–Rijn***	AKZO	833	92	77	0	74	77	80	76	80	51	60	71	94
Veendam	Nedmag	274	34	24	28	14	19	24	25	22	25	19	16	23
<b>Total</b>		<b>6625</b>	<b>589</b>	<b>536</b>	<b>351</b>	<b>493</b>	<b>582</b>	<b>577</b>	<b>607</b>	<b>629</b>	<b>534</b>	<b>511</b>	<b>591</b>	<b>625</b>

\* Extension of Adolf van Nassau

\*\*Extension of Twenthe–Rijn Helmerzijde

\*\*\* Extension of Twenthe–Rijn

## ROCK SALT PRODUCTION 2004 – 2016



\* Including extension of Adolf van Nassau

\*\* Including extension of Twenthe – Rijn

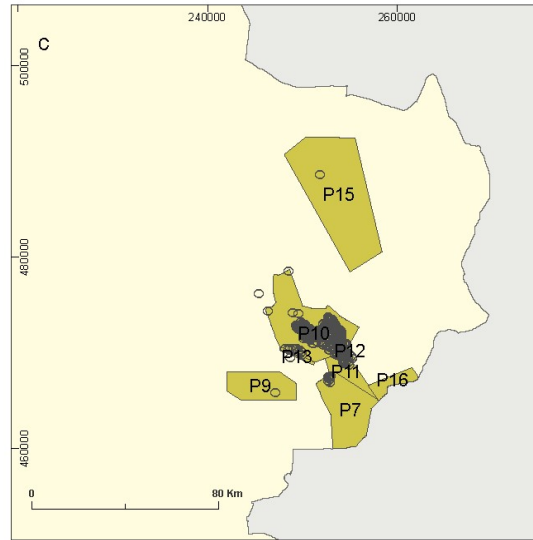
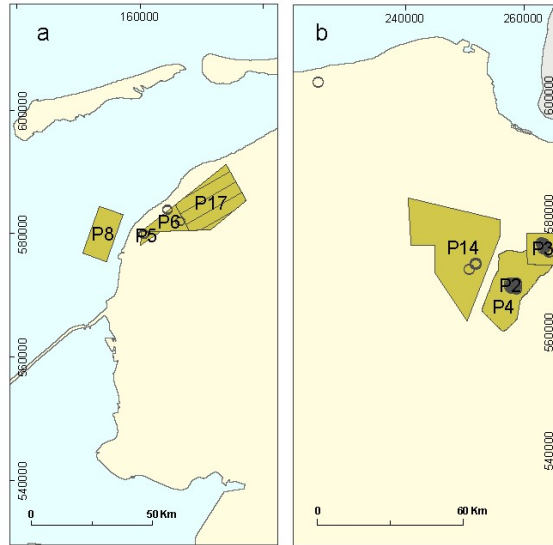


Figure 13 licences for rock salt at 1 January 2017

**Production licences for rock salt**

- P1 Adolf van Nassau II
- P2 Uitbreiding Adolf van Nassau II
- P3 Adolf van Nassau III
- P4 Uitbreiding Adolf van Nassau III
- P5 Barradeel
- P6 Barradeel II
- P7 Buurse
- P8 Havenmond
- P9 Isidorushoeve
- P10 Twenthe-Rijn
- P11 Uitbreiding Twenthe-Rijn
- P12 Twenthe-Rijn Helmerzijde
- P13 Twenthe-Rijn Oude Maten
- P14 Veendam
- P15 Weerselo
- P16 Zuidoost-Enschede

**Applied production licences for rock salt**

- P17 Barradeel-Oost

## 13. GEOTHERMAL ENERGY

### Geothermal licences as at January 1<sup>st</sup>, 2017.

In 2016 there were five new applications for exploration licences for geothermal energy. As at 1 January 2017 a total of twelve geothermal energy exploration licences were in the process of the application procedure. During 2016 no geothermal exploration licences were awarded. one exploration licences was split into two new ones. One licence was spatially restricted. Five geothermal energy licences were extended. Three licences expired, were withdrawn or relinquished. As at 1 January 2017 there were a total of 51 geothermal energy exploration licences in effect (see Appendix 7).

In 2016 there were three new application for a production licence for geothermal energy. At the first of January 2017 six geothermal energy production licences are in the application procedure. No geothermal energy production licence was issued resulting in total eight effective geothermal energy production licences as at 1<sup>st</sup> January 2017.

Changes in the licences for the exploration and production of geothermal energy which took place during 2016 are listed in the tables at the end of this chapter.

### Geothermal wells and production installations

In 2016 five geothermal wells were completed (see figure 14). They were drilled in the licence areas Californië-V, Kwintsheul and Honselersdijk-2. Realising these wells increased the geothermal production installations in the Netherlands in 2017 by two. The well in the licence area Kwintsheul is the first of a doublet. The second well will be completed in 2017.

### Geothermal wells completed in 2016

	Name of well	Geothermal energy licence	Operator
1	CAL-GT-04	Californië-V	Californië Lipzig Gielen
2	CAL-GT-05	Californië-V	Californië Lipzig Gielen
3	KHL-GT-01	Kwintsheul	Nature's Heat
4	PLD-GT-01	Honselersdijk-2	Aardwarmte Vogelaer
5	PLD-GT-02	Honselersdijk-2	Aardwarmte Vogelaer

As at January 2017 there were a total of sixteen geothermal installations. Although the installation of Heerlerheide (wells HLH-GT-1 & 2) is classed under mining legislation as being for geothermal energy it is actually a heat/cold storage facility and as such will not be included in the following overview. The other fifteen geothermal systems produce heat from the deep subsurface. In general, these installations are named doublets as they consist of two wells. One well pumps up the warm water and after extracting the heat, the second well injects the cooled down water back into the aquifer. Twelve of these geothermal systems are operational in 2017 with reference to the fact that they provide (energy) production figures according to art. 111 and 119 of the mining decree.

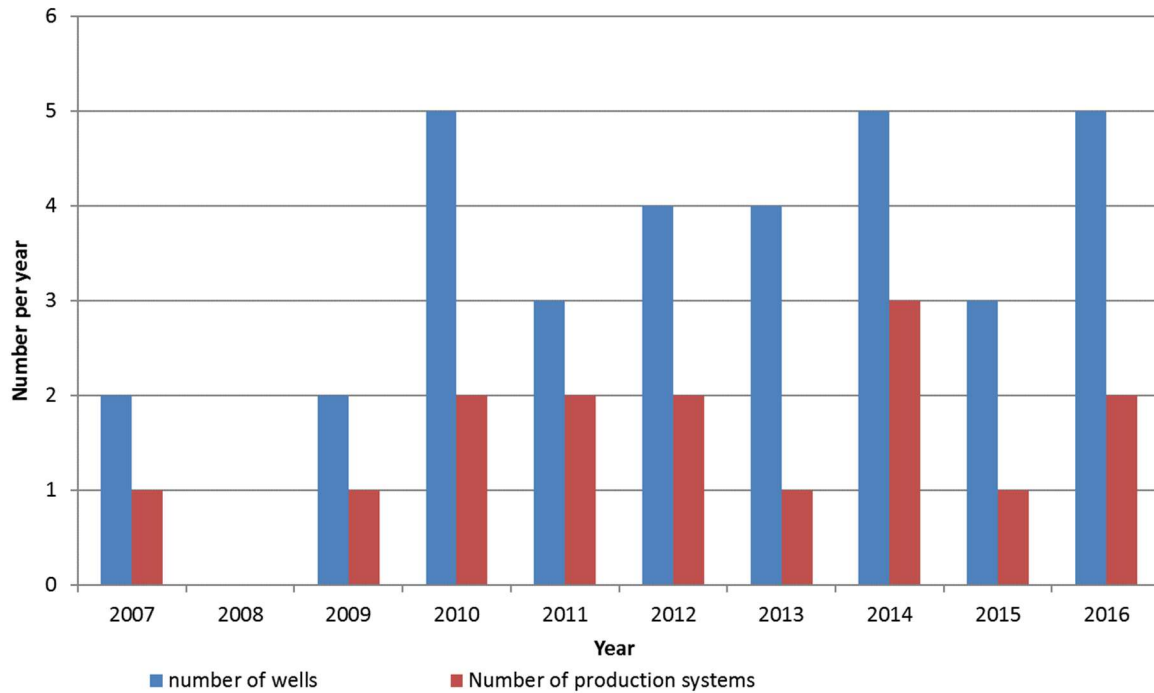


Figure 14. Number of geothermal wells completed per calendar year and number of installations completed since 2007

The heat is produced from different depth intervals from 1600 to 2700 meter and from strata in various geological units. (Figure 15). Most of the geothermal energy is produced from rocks in the Upper-Jurassic and Lower-Cretaceous; these installations are located in the southwest of the Netherlands. One installation in the southwest of the Netherlands expects to produce from Triassic strata. The four production installations in Noord-Holland and Overijssel produce from Rotliegend strata, whereas the installation in North-Limburg produces from Lower Carboniferous strata. The depth of the different production wells is shown in figure 15b.

The heat produced by the installations is mainly used to heat commercial greenhouses. One project also supplies heat to a public utility facility and buildings. Another project intends to supply heat to a heating network in an urban area (Figure 15c).

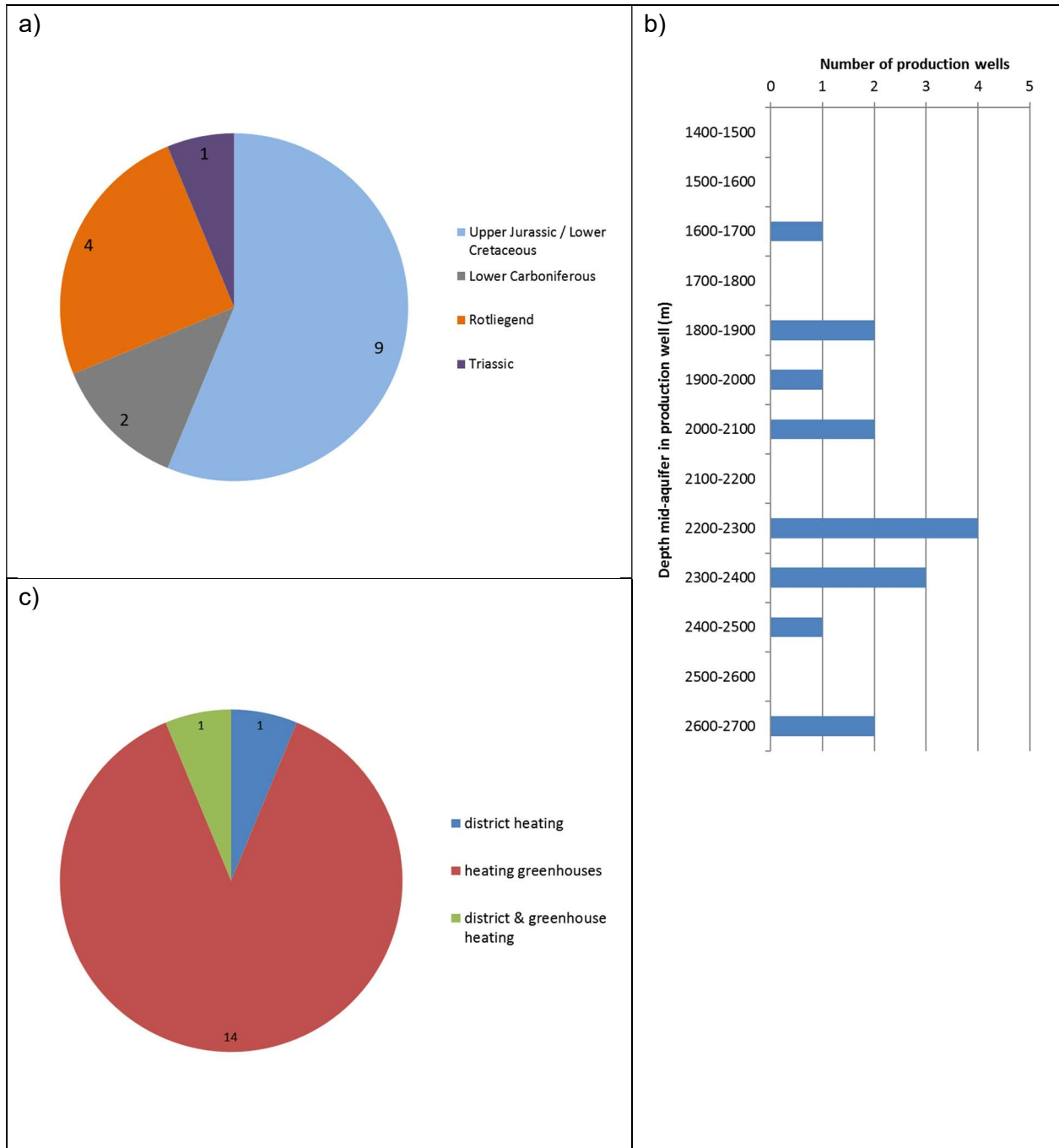


Figure 15. a) Stratigraphy of the productive interval, b) Depth to mid of aquifer, c) uses of the heat produced

### Production of geothermal energy in 2016

Of the fifteen geothermal systems twelve were operational in 2016. These operational systems have submitted the obligatory monthly production figures. Of the three remaining non-operational installations two were in the start-up phase while the other was temporarily closed in. Seven producing installations operate under a formal production licence (excluding the Heerlerheide installation), the remaining five geothermal installations produce as an 'extended well test'. During this test period the licence will gather data to enable an efficient operation for future times. At the end of 2016 all producing operators had applied for a formal production licence and had submitted a production plan.



Table 11: Geothermal installations.

	Name of geothermal energy installation	Wells	Geothermal energy licence	Operational in 2016
1	Californie Geothermie	CAL-GT-1,2&3	Californie IV	Yes
2	De Lier Geothermie	LIR-GT-1&2	De Lier	Yes
3	Honselersdijk Geothermie	HON-GT-1&2	Honselersdijk	Yes
4	Installatie Berkel en Rodenrijs	VDB-GT-3&4	Bleiswijk-1b	Yes
5	Installatie Bleiswijk	VDB-GT-1&2	Bleiswijk	Yes
6	Koekoekspolder Geothermie	KKP-GT-1&2	Kampen	Yes
7	Mijnwater energiecentrale Heerlen	HLH-G-1&2	Heerlen	Yes, HCS
8	Pijnacker-Nootdorp Geothermie	PNA-GT-1&2	Pijnacker-Nootdorp-4	Yes
9	Pijnacker-Nootdorp Zuid Geothermie	PNA-GT-3&4	Pijnacker-Nootdorp-5	Yes
10		HAG-GT-1&2	Den Haag	Closed In
11	Heemskerk Geothermie	HEK-GT-1&2	Heemskerk	Yes
12	Middenmeer Geothermie I	MDM-GT-1&2	Middenmeer	Yes
13	Middenmeer Geothermie II	MDM-GT-3&4	Middenmeer	Yes
14	Vierpolders.	BRI-GT-1&2	Vierpolders	Yes
15	Californie Lipzig Gielen	CAL-GT-1&2	Californië-V	No
16	Poeldijk	PLD-GT-1&2	Honselersdijk-2	No



Figure 16: Monthly production of geothermal energy in tera joules and the number of geothermal energy production systems contributing to the reported production (excluding Heerlen mine water power station)

Figure 16 shows the aggregate production of geothermal energy per month in tera joules (TJ) and also the number of installations contributing to the monthly total. Not all installations were operational throughout the year. The cumulative reported annual production is 2681 TJ in 2017 (Figure 17).

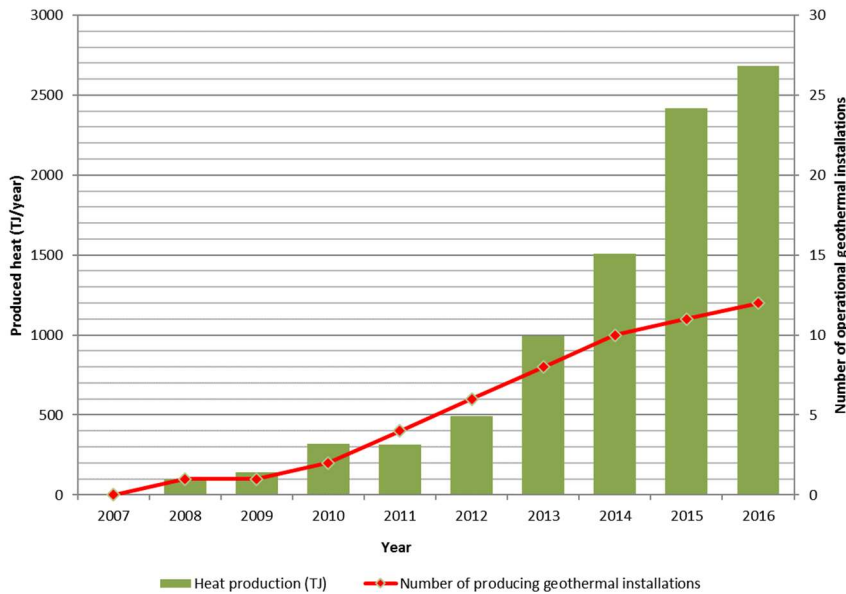


Figure 17. Annual production of geothermal energy (TJ/year)

Small amounts of hydrocarbons are co-produced with the geothermal energy. In most installations the hydrocarbon is gas, but in one installation oil is produced as well. The gas is usually dissolved in the formation water and released when the pressure of the production water in the production installation falls below the ‘bubble point’. Five installations reported the volumes of gas captured (Figure 18). In the remaining installations no gas or oil was captured.

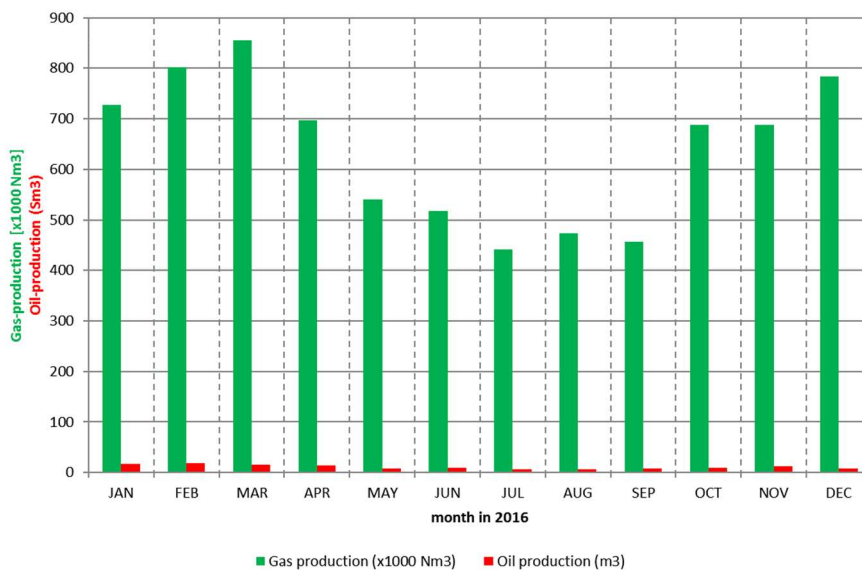


Figure 18: Volumes of hydrocarbons co-produced with geothermal energy. Gas in 1000 Nm<sup>3</sup> and oil in Sm<sup>3</sup>.

Year	Energy produced (TJ)	Co-produced gas (x1000Nm <sup>3</sup> )	Co-produced oil (Sm <sup>3</sup> )
2008	96*	-	-
2009	142*	-	-
2010	318*	-	-
2011	316*	-	-
2012	495*	-	-
2013	993*	-	-
2014	1509	3267	429
2015	2417	4378	186
2016	2681	7670	130

\* Figure derived from: *Hernieuwbare energie in Nederland 2013*. Statistics Netherlands, The Hague/Heerlen, 2014. ISBN: 978-90-357-1857-9

- no value reported

## EXPLORATION LICENCES Netherlands Territory as at 1 January 2017

### Applied for

Licence	Government Gazette	Date	Closing date	Applicant(s)
Franekeradeel *	Staatscourant 13 167	25-08-2010	24-11-2010	A.C. Hartman Beheer cs
Hoogeveen *	Staatscourant 19 287	03-12-2010	04-03-2011	Gemeente Hoogeveen
Monster 3 *	-	04-01-2011	-	Opti-flor B.V.
Monster 2 *	Staatscourant 2 440	07-02-2011	09-05-2011	Fa. Van den Ende Rozen
Den Haag 3 *	Staatscourant 7 444	18-03-2014	17-06-2014	Gemeente Den Haag cs
Maasland 3 **	Staatscourant 15 889	15-06-2015	14-09-2015	Kwekerij de Westhoek B.V. cs
Leeuwarden 3 *	Staatscourant 45 673	16-12-2015	16-03-2016	FrieslandCampina
Middenmeer 3 *	Staatscourant 45 674	16-12-2015	16-03-2016	Vermilion Energy Netherlands B.V.
Zwolle	Staatscourant 17 374	07-04-2016	07-07-2016	gemeente Zwolle
Helmond 3	Staatscourant 19 039	15-04-2016	15-07-2016	Hydreco GeoMEC B.V. cs
Haarlem-Schalkwijk	Staatscourant 20 776	25-04-2016	25-07-2016	gemeente Haarlem
Drachten	Staatscourant 35 773	11-07-2016	10-10-2016	DDH Energy B.V.
Maasbree 2	Staatscourant 50 690	28-09-2016	28-12-2016	Warmtebedrijf Siberië B.V.

\* Application ongoing, published in an earlier annual review.

\*\* Application withdrawn per 19-10-2016

### Rejected

Applicant(s)	Area	Date	km <sup>2</sup>
Gemeente Eindhoven	Eindhoven	29-06-2016	137
Total			137

### Awarded

Licensee	Licence	Effective from	km <sup>2</sup>
Ekowarmte B.V.	Velden	09-02-2016	21
Gipmans Verhuur B.V.	Venlo	09-02-2016	24
Trias Westland B.V. cs	Naaldwijk 3	15-04-2016	10
Total			55

## Prolonged

Licensee	Licence	Effective from	Effective till
Grondexploitatie maatschappij Californië B.V.	Californië VI	12-01-2016	30-12-2018
Hydreco GeoMEC B.V. cs	Vierpolders	09-04-2016	29-06-2016
Hydreco GeoMEC B.V. cs	Brielle 2	09-04-2016	29-06-2016
ECW Geoholding B.V.	Andijk	19-05-2016	30-12-2017
Hollandplant Vastgoed B.V.	Lansingerland	19-05-2016	30-09-2017
A.P.M. Zuidgeest cs	Maasdijk	19-05-2016	31-05-2018
Coöperatieve Bloemenveiling FloraHolland U.A.	Naaldwijk 2II	02-07-2016	30-12-2017
Coöperatieve Bloemenveiling FloraHolland U.A. cs	Naaldwijk 3	02-07-2016	30-12-2017
Hydreco GeoMEC B.V. cs	Brielle 2	14-07-2016	29-09-2016
Hydreco GeoMEC B.V. cs	Vierpolders	14-07-2016	29-09-2016
Hydreco GeoMEC B.V.	Pijnacker-Nootdorp 6a	14-07-2016	30-06-2017
Nature's Heat B.V.	Kwintsheul II	14-07-2016	31-12-2017
Hydreco GeoMEC B.V. cs	Brielle 2	01-11-2016	30-12-2016
Hydreco GeoMEC B.V. cs	Vierpolders	01-11-2016	30-12-2016
Kwekerij de Westhoek B.V. cs	Maasland	06-12-2016	31-12-2017
Vereniging van Eigenaren Oude Campspolder	Maasland 2	06-12-2016	31-12-2017
EnergieWende B.V. cs	De Lier 3II	23-12-2016	19-01-2019
Provincie Drenthe cs	Erica	24-12-2016	06-12-2018
Provincie Drenthe cs	Klazienaveen	24-12-2016	30-11-2018
Gedeputeerde Staten van Overijssel	Koekoekspolder IIa	30-12-2016	30-12-2018
Wayland Developments B.V.	Waddinxveen 2	31-12-2016	31-12-2019

NB Extension request De Lier III effective from 27-10-2016 is rejected

## Restricted

Licensee	Licence	Effective from	km <sup>2</sup>
ECW Geoholding B.V.	Middenmeer	01-06-2016	5
Geothermie De Lier B.V. cs	De Lier III	14-07-2016	15
Total			20

## Expired

Licensee	Licence	Effective from	km <sup>2</sup>
SC Johnson Europlant B.V.	Mijdrecht	14-03-2016	41
Eneco Solar, Bio & Hydro B.V.	Den Haag 2	17-04-2016	62
W.G.M. Tas cs	Zevenhuizen	16-04-2016	9
Hydreco GeoMEC B.V.	Rozenburg	07-08-2016	45
Eneco Solar, Bio & Hydro B.V.	Rotterdam 6-Trias	15-08-2016	13
A.P.M. Ammerlaan cs	Bleiswijk 4	31-12-2016	7
Total			177

## PRODUCTION LICENCES, Netherlands Territory

### Applied for

Licence	Publication	Date	Closing date	Applicant(s)
Den Haag *	-	21-09-2011	-	Gemeente Den Haag
Honselersdijk *	-	15-01-2013	-	J.W.M. Scheffers, G. Verkade B.V.
Middenmeer *	-	21-03-2013	-	ECW Geoholding B.V.
Californië IV	-	06-06-2016	-	Californië Wijnen Geothermie B.V.
Californië V	-	21-09-2016	-	Californië Lipzig Gielen Geothermie B.V.
Vierpolders	-	19-12-2016	-	Hydreco GeoMEC B.V. cs

\* Application ongoing, published in an earlier annual review.

### Awarded

Licensee	Licence	Effective from	km <sup>2</sup>
Ce-Ren Beheer B.V.	Heemskerk	15-04-2016	3
Geothermie De Lier B.V. cs	De Lier III	14-07-2016	6
Ammerlaan Real Estate B.V.	Pijnacker-Nootdorp 4	24-12-2016	4
Gebroeders Duijvestijn Energie B.V.	Pijnacker-Nootdorp 5	24-12-2016	5
Total			18

## Company changes in 2016

The table below lists in chronological order the changes which took place during 2016 as a result of mutations in consortiums of companies with licences.

### Company changes in exploration licences

Licence	Relinquishing company	Acquiring company	Effective from	Staats courant
Kwintsheul II *	TomSelect B.V.	Nature's Heat B.V.	03-02-2016	6 456
Honselersdijk 4 **	Zuidgeest Growers B.V.	Aardwarmte Vogelaer B.V.	04-05-2016	29 410
Honselersdijk 2 **	A.P.M. Zuidgeest L.M.M. Zuidgeest- Vijverberg M.T.M. Zuidgeest P.E.M. Zuidgeest-van den Berg W.M.J. Zuidgeest Y.C.M. Zuidgeest-van Kester	Aardwarmte Vogelaer B.V.	04-05-2016	29 418
Lansingerland ***	Hollandplant Vastgoed B.V.	Warmtebedrijf Bergschenhoek B.V.	29-06-2016	35 777
Naaldwijk 2II ****	Coöperatieve Bloemenveiling FloraHolland U.A.	Trias Westland B.V.	02-07-2016	35 767
Naaldwijk 3	Coöperatieve Bloemenveiling FloraHolland U.A.		02-07-2016	35 765
Den Haag *****	Gemeente Den Haag	Hydreco GeoMEC B.V. HAL B.V.	01-10-2016	52 938

- \* New operator: Nature's Heat B.V.
- \*\* New operator: Aardwarmte Vogelaer B.V.
- \*\*\* New operator: Warmtebedrijf Bergschenhoek B.V.
- \*\*\*\* New operator: Trias Westland B.V.
- \*\*\*\*\* New operator: Hydreco GeoMEC B.V.

### Company changes in production licences

<b>Licence</b>	<b>Relinquishing company</b>	<b>Acquiring company</b>	<b>Effective from</b>
Pijnacker-Nootdorp 4	Ammerlaan Real Estate B.V.	Ammerlaan Geothermie B.V.	24-12-2016

### Company name changes

<b>Original company</b>	<b>New company</b>
Geothermie De Lier B.V.	EnergieWende B.V.



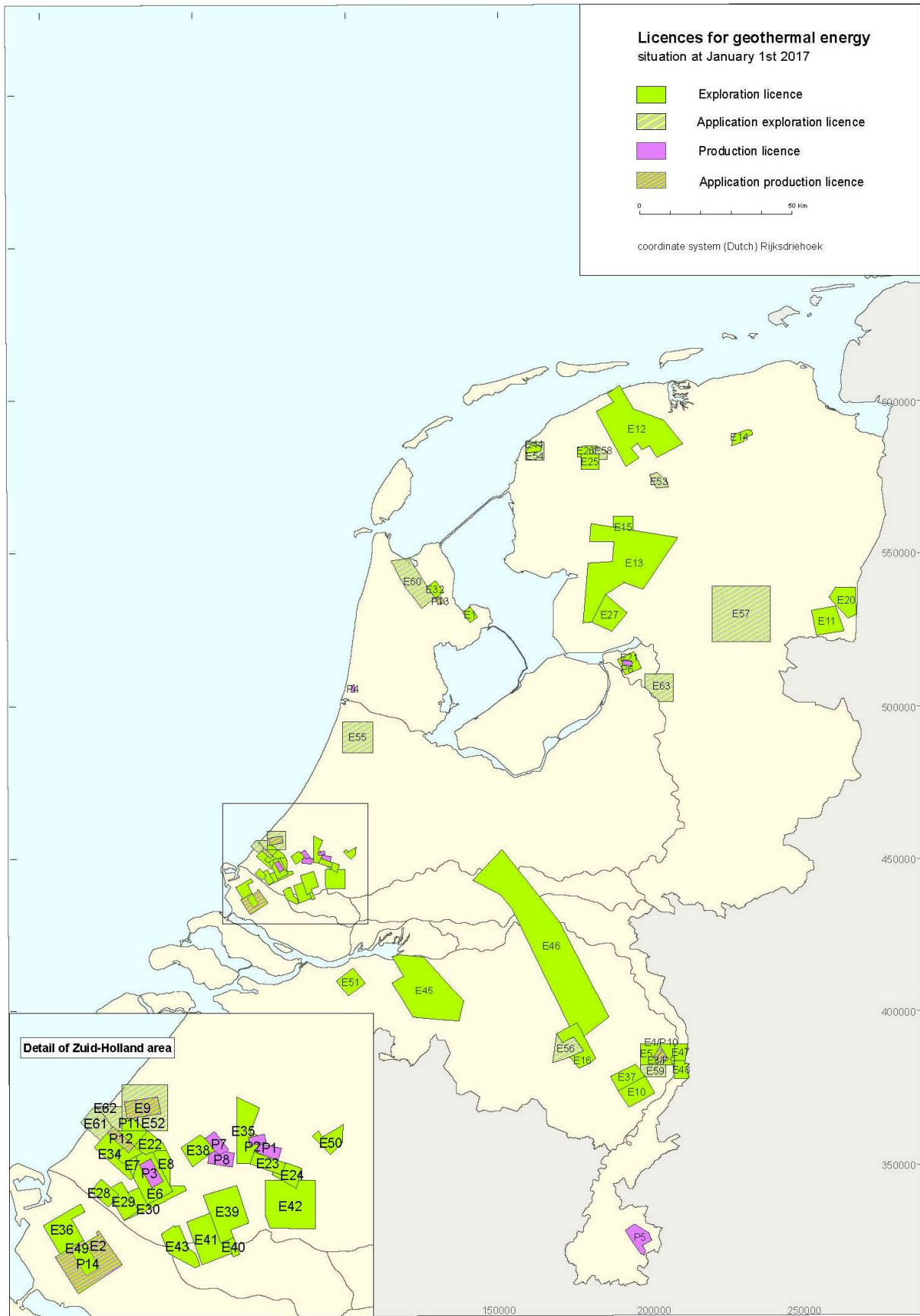


Figure 19 Licences for Geothermal Energy

Legend to names of exploration and production licences for geothermal energy, Netherlands Territory, as indicated on the map on previous page:

<b>Exploration licences</b>					
E1	Andijk	E19	Honselersdijk 4	E37	Peel en Maas
E2	Brielle 2	E20	Klazienaveen	E38	Pijnacker-Nootdorp 6a
E3	Californië IV	E21	Koekoekspolder IIa	E39	Rotterdam 2
E4	Californië V	E22	Kwintsheul II	E40	Rotterdam 3
E5	Californië VI	E23	Lansingerland	E41	Rotterdam 4
E6	De Lier III	E24	Lansingerland 4	E42	Rotterdam 5
E7	De Lier IV	E25	Leeuwarden	E43	Rotterdam- Vlaardingen
E8	De Lier 3II	E26	Leeuwarden 2	E44	Sexbierum
E9	Den Haag	E27	Luttelgeest	E45	Tilburg- Geertruidenberg
E10	Egchel	E28	Maasdijk	E46	Utrecht- Noord-Brabant
E11	Erica	E29	Maasland	E47	Velden
E12	Friesland-Noord	E30	Maasland 2	E48	Venlo
E13	Friesland-Zuid	E31	Middenmeer	E49	Vierpolders
E14	Groningen 2	E32	Middenmeer 2	E50	Waddinxveen 2
E15	Heerenveen	E33	Naaldwijk 2II	E51	Zevenbergen
E16	Helmond 2	E34	Naaldwijk 3		
E17	Honselersdijk	E35	Oostland		
E18	Honselersdijk 2	E36	Oostvoorne		
<b>Exploration licences as applied for</b>					
E52	Den Haag 3	E56	Helmond 3	E60	Middenmeer 3
E53	Drachten	E57	Hoogeveen	E61	Monster 2
E54	Franekeradeel	E58	Leeuwarden 3	E62	Monster 3
E55	Haarlem-Schalkwijk	E59	Maasbree 2	E63	Zwolle
<b>Production licences</b>					
P1	Bleiswijk	P4	Heemskerk	P7	Pijnacker-Nootdorp 4
P2	Bleiswijk 1b	P5	Heerlen	P8	Pijnacker-Nootdorp 5
P3	De Lier III	P6	Kampen		
<b>Production licences as applied for</b>					
P9	Californië IV	P11	Den Haag	P13	Middenmeer
P10	Californië V	P12	Honselersdijk	P14	Vierpolders



## ANNEXES

## NATURAL GAS AND OIL ACCUMULATIONS BY STATUS as at 1 January 2017

### NATURAL GAS ACCUMULATIONS

#### I. DEVELOPED ACCUMULATIONS

Accumulation	Company	Licence name***	Gas/Oil
<b>a) Producing</b>			
Ameland-Oost	NAM	Noord-Friesland [wv]	G
Ameland-Westgat	NAM	Noord-Friesland [wv]	G
Anjum	NAM	Noord-Friesland [wv]	G
Annerveen	NAM	Drenthe IIb [wv], Groningen [wv]	G&O
Assen	NAM	Drenthe IIb [wv]	G
Bedum	NAM	Groningen [wv]	G
Bergen	TAQA	Bergen II [wv]	G
Blija-Ferwerderadeel	NAM	Noord-Friesland [wv]	G
Blija-Zuid	NAM	Noord-Friesland [wv]	G
Blija-Zuidoost	NAM	Noord-Friesland [wv]	G
Blijham	NAM	Groningen [wv]	G
Boerakker	NAM	Groningen [wv]	G
Botlek	NAM	Botlek II [wv], Rijswijk [wv]	G
Coevorden	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Collendoorn	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Collendoornerveen	NAM	Schoonebeek [wv]	G
Dalen	NAM	Drenthe IIb [wv], Drenthe V [wv], Schoonebeek [wv]	G
De Hoeve	Vermillion	Gorredijk [wv]	G
De Lier	NAM	Rijswijk [wv]	G&O
De Wijk	NAM	Drenthe IIb [wv], Schoonebeek [wv]	G
Den Velde	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Diever	Vermillion	Drenthe VI [wv]	G
Donkerbroek - Main	Tulip	Donkerbroek [wv], Donkerbroek-West [wv]	G
Donkerbroek - West	Tulip	Donkerbroek [wv], Donkerbroek-West [wv]	G
Een	NAM	Drenthe IIb [wv], Groningen [wv]	G
Eernewoude	Vermillion	Leeuwarden [wv]	G
Eesveen	Vermillion	Drenthe VI [wv], Steenwijk [wv]	G
Eleveld	NAM	Drenthe IIb [wv]	G
Emmen	NAM	Drenthe IIb [wv], Groningen [wv]	G
Emmen-Nieuw			
Amsterdam	NAM	Drenthe IIb [wv], Schoonebeek [wv]	G
Ezumazijl	NAM	Noord-Friesland [wv]	G
Faan	NAM	Groningen [wv]	G
Feerwerd	NAM	Groningen [wv]	G
Gaag	NAM	Rijswijk [wv]	G
Gasselternijveen	NAM	Drenthe IIb [wv]	G
Geesbrug	Vermillion	Drenthe V [wv]	G
Groet	TAQA	Bergen II [wv], Bergermeer [wv]	G

Grolloo	Vermillion	Drenthe IV [wv]	G
Groningen	NAM	Groningen [wv]	G
Grootegast	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Hardenberg	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Hardenberg-Oost	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Harkema	NAM	Tietjerksteradeel [wv]	G
Heinenoord	NAM	Botlek II [wv]	G
Hekelingen	NAM	Beijerland [wv], Botlek II [wv]	G
Hemrik (Akkrum 11)	Tulip	Akkrum 11 [wv]	G
Kiel-Windeweer	NAM	Drenthe IIb [wv], Groningen [wv]	G
Kollum	NAM	Noord-Friesland [wv], Tietjerksteradeel [wv]	G
Kollum-Noord	NAM	Noord-Friesland [wv], Tietjerksteradeel [wv]	G
Kommerzijl	NAM	Groningen [wv]	G
Langezwaag	Vermillion	Gorredijk [wv]	G
Lauwersoog	NAM	Noord-Friesland [wv]	G
Leens	NAM	Groningen [wv]	G
		Akkrum [opv], Leeuwarden [wv], Tietjerksteradeel	
Leeuwarden en Nijega	Vermillion	[wv]	G
Loon op Zand	Vermillion	Waalwijk [wv]	G
Loon op Zand-Zuid	Vermillion	Waalwijk [wv]	G
Maasdijk	NAM	Rijswijk [wv]	G
Marum	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Metslawier-Zuid	NAM	Noord-Friesland [wv]	G
Middelburen	Vermillion	Leeuwarden [wv]	G
Middelie	NAM	Middelie [wv]	G
Moddergat	NAM	Noord-Friesland [wv]	G
Molenpolder	NAM	Groningen [wv]	G
Monster	NAM	Rijswijk [wv]	G
		De Marne [wv], Groningen [wv], Noord-Friesland	
Munnekezijl	NAM	[wv]	G
Nes	NAM	Noord-Friesland [wv]	G
Noordwolde	Vermillion	Gorredijk [wv]	G
Oosterhesselen	NAM	Drenthe IIb [wv], Drenthe V [wv], Drenthe VI [wv]	G
Oostrum	NAM	Noord-Friesland [wv]	G
Opeinde	Vermillion	Leeuwarden [wv], Tietjerksteradeel [wv]	G
Opeinde-Zuid	Vermillion	Akkrum [opv], Leeuwarden [wv]	G
Opende-Oost	NAM	Groningen [wv]	G
Oud-Beijerland Zuid	NAM	Beijerland [wv], Botlek II [wv]	G
Oude Pekela	NAM	Groningen [wv]	G
Oudeland	NAM	Beijerland [wv]	G
Pernis-West	NAM	Rijswijk [wv]	G
Reedijk	NAM	Botlek II [wv]	G
Ried	Vermillion	Leeuwarden [wv]	G
Rustenburg	NAM	Middelie [wv]	G
Saaksum	NAM	Groningen [wv]	G
Schermer	TAQA	Bergen II [wv]	G
Schoonebeek (gas)	NAM	Schoonebeek [wv]	G
Sebaldeburen	NAM	Groningen [wv]	G
's-Gravenzande	NAM	Rijswijk [wv]	G

Slootdorp	Vermillion	Slootdorp [wv]	G
Sonnega-			
Weststellingwerf	Vermillion	Gorredijk [wv], Steenwijk [wv]	G
Spijkenisse-Oost	NAM	Botlek II [wv]	G
Spijkenisse-West	NAM	Beijerland [wv], Botlek II [wv]	G
Sprang	Vermillion	Waalwijk [wv]	G
Surhuisterveen	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Tietjerksteradeel	NAM	Leeuwarden [wv], Tietjerksteradeel [wv]	G
Ureterp	NAM	Tietjerksteradeel [wv]	G
		De Marne [wv], Groningen [wv], Noord-Friesland	
Vierhuizen	NAM	[wv]	G
Vinkega	Vermillion	Drenthe IIa [wv], Drenthe IIIa [wv], Gorredijk [wv]	G
Vries	NAM	Drenthe IIb [wv]	G
Waalwijk-Noord	Vermillion	Waalwijk [wv]	G
Wanneperveen	NAM	Schoonebeek [wv]	G
Warffum	NAM	Groningen [wv]	G
Warga-Wartena	Vermillion	Leeuwarden [wv], Tietjerksteradeel [wv]	G
Westbeemster	NAM	Bergen II [wv], Middelle [wv]	G
		Groningen [wv], Noord-Friesland [wv],	
Wieringa	NAM	Tietjerksteradeel [wv]	G
Zevenhuizen	NAM	Groningen [wv]	G
Zuidwal	Vermillion	Zuidwal [wv]	G
Zuidwending-Oost	NAM	Groningen [wv]	G
A12-FA	Petrogas	A12a [wv], A12d [wv]	G
A18-FA	Petrogas	A18a [wv], A18c [wv]	G
B13-FA	Petrogas	B10c & B13a [wv]	G
D12-A	Wintershall	D12a [wv], D15 [wv]	G
D15a-A	ENGIE	D12a [wv], D15 [wv]	G
D18a-A	ENGIE	D15 [wv], D18a [wv]	G
E17a-A	ENGIE	E16a [wv], E17a & E17b [wv]	G
E18-A	Wintershall	E15a [wv], E15b [wv], E18a [wv]	G
F02a-Pliocene	Dana Petroleum	F02a [wv]	G
F03-FA	Centrica	B18a [wv], F03a [wv]	G
F03-FB	ENGIE	F02a [wv], F03b [wv], F06a [wv]	G&O
F15a-A	Total	F15a [wv]	G
F15a-B	Total	F15a [wv]	G
F16-E	Wintershall	E15a [wv], E18a [wv], F13a [wv], F16 [wv]	G
G14-A&B	ENGIE	G14 & G17b [wv]	G
G14-C	ENGIE	G14 & G17b [wv]	G
G16a-A	ENGIE	G16a [wv]	G
G16a-B	ENGIE	G16a [wv]	G
G16a-C	ENGIE	G16a [wv]	G
G16a-D	ENGIE	G16a [wv]	G
G17a-S1	ENGIE	G17a [wv], G17c & G17d [wv]	G
G17cd-A	ENGIE	G17c & G17d [wv]	G
J03-C Unit	Total	J03a [wv], J03b & J06 [wv], K01a [wv], K04a [wv]	G
K01-A Unit	Total	J03a [wv], K01a [wv], K04a [wv]	G
		E17a & E17b [wv], E18a [wv], K02b [wv], K03a [wv],	
K02b-A	ENGIE	K03c [wv]	G

K04-A	Total	K04a [wv], K04b & K05a [wv], K05b [wv]	G
K04a-B	Total	K04a [wv], K04b & K05a [wv]	G
K04a-D	Total	J03b & J06 [wv], K04a [wv]	G
K04a-Z	Total	K04a [wv]	G
K04-E	Total	K04a [wv], K04b & K05a [wv]	G
K04-N	Total	K04a [wv], K04b & K05a [wv]	G
K05a-A	Total	K04a [wv], K04b & K05a [wv], K08 & K11 [wv]	G
K05a-B	Total	K04b & K05a [wv], K05b [wv]	G
K05a-D	Total	K04b & K05a [wv]	G
K05a-En	Total	K04b & K05a [wv], K05b [wv]	G
K05-C North	Total	K01b & K02a [wv], K05b [wv]	G
K05-C Unit	Total	K04b & K05a [wv], K05b [wv]	G
K05-F	Total	K04b & K05a [wv], K05b [wv], K06 & L07 [wv]	G
K05-U	Total	K01b & K02a [wv], K02c [wv], K05b [wv]	G
K06-A	Total	K03b [wv], K06 & L07 [wv]	G
K06-C	Total	K06 & L07 [wv]	G
K06-D	Total	K06 & L07 [wv], K09c [wv]	G
K06-DN	Total	K06 & L07 [wv]	G
K06-G	Total	K06 & L07 [wv]	G
K07-FA	NAM	K07 [wv], K08 & K11 [wv]	G
K07-FB	NAM	J09 [opv], K07 [wv]	G
K07-FC	NAM	K07 [wv], K08 & K11 [wv]	G
K07-FD	NAM	K07 [wv]	G
K07-FE	NAM	K07 [wv]	G
K08-FA	NAM	K08 & K11 [wv]	G
K08-FC	NAM	K08 & K11 [wv]	G
K09ab-A	ENGIE	K06 & L07 [wv], K09a & K09b [wv], K09c [wv], K12 [wv], L10 & L11a [wv]	G
K09ab-B	ENGIE	K09a & K09b [wv]	G
K09ab-D	ENGIE	K09a & K09b [wv]	G
K09c-A	ENGIE	K06 & L07 [wv], K09c [wv]	G
K12-B	ENGIE	K12 [wv], K15 [wv]	G
K12-B9	ENGIE	K12 [wv], K15 [wv]	G
K12-D	ENGIE	K12 [wv]	G
K12-G	ENGIE	K12 [wv], L10 & L11a [wv]	G
K12-L	ENGIE	K09c [wv], K12 [wv]	G
K12-M	ENGIE	K12 [wv]	G
K12-S2	ENGIE	K12 [wv]	G
K12-S3	ENGIE	K12 [wv]	G
K14-FA	NAM	K14a [wv]	G
K14-FB	NAM	K14a [wv], K17 [wv]	G
K15-FA	NAM	K15 [wv], L13 [wv]	G
K15-FB	NAM	K15 [wv]	G
K15-FC	NAM	K15 [wv]	G
K15-FD	NAM	K15 [wv]	G
K15-FE	NAM	K15 [wv]	G
K15-FG	NAM	K15 [wv]	G
K15-FH	NAM	K15 [wv]	G
K15-FI	NAM	K15 [wv]	G



K15-FK	NAM	K15 [wv]	G
K15-FL	NAM	K12 [wv], K15 [wv]	G
K15-FM	NAM	K15 [wv]	G
K15-FN	NAM	K15 [wv]	G
K15-FO	NAM	K15 [wv]	G
K15-FP	NAM	K15 [wv]	G
K17-FA	NAM	K17 [wv]	G
K18-Golf	Wintershall	K15 [wv], K18b [wv]	G
L01-A	Total	L01a [wv], L01d [wv], L04a [wv]	G
L02-FA	NAM	L02 [wv]	G
L02-FB	NAM	F17c [wv], L02 [wv]	G
L04-A	Total	L04a [wv]	G
L04-D	Total	L04a [wv]	G
L04-F	Total	L01e [wv], L04a [wv]	G
L04-G	Total	L01f [wv], L04a [wv]	G
L04-I	Total	L04a [wv]	G
L05a-A	ENGIE	L02 [wv], L04c [wv], L05a [wv]	G
L05-B	Wintershall	L05b [wv]	G
L05-C	Wintershall	L05b [wv], L06b [wv]	G
L06-B	Wintershall	L06a [wv]	G
L07-B	Total	K06 & L07 [wv]	G
L07-C	Total	K06 & L07 [wv]	G
L07-G	Total	K06 & L07 [wv]	G
L07-H	Total	K06 & L07 [wv]	G
L08-A-West	Wintershall	L08a [wv], L08b [wv]	G
L08-D	ONE	L08a [wv], L08b [wv], L11b [wv]	G
L08-P	Wintershall	L05c [wv], L08b [wv]	G
L09-FA	NAM	L09 [wv]	G
L09-FB	NAM	L09 [wv]	G
L09-FD	NAM	L09 [wv]	G
L09-FE	NAM	L09 [wv]	G
L09-FF	NAM	L09 [wv]	G
L09-FG	NAM	L09 [wv]	G
L09-FH	NAM	L09 [wv]	G
L09-FJ	NAM	L09 [wv]	G
L09-FK	NAM	L09 [wv]	G
L09-FL	NAM	L09 [wv]	G
L09-FM	NAM	L09 [wv]	G
L10-CDA	ENGIE	L10 & L11a [wv]	G
L10-M	ENGIE	L10 & L11a [wv]	G
L10-N	ENGIE	L10 & L11a [wv]	G
L10-O	ENGIE	K12 [wv], L10 & L11a [wv]	G
L10-P	ENGIE	L10 & L11a [wv]	G
L11-Gillian	ONE	L11b [wv], L11c [wv]	G
L12a-B	ENGIE	L12a [wv], L12b & L15b [wv], L15c [wv]	G
L12b-C	ENGIE	L12a [wv], L12b & L15b [wv]	G
L13-FC	NAM	L13 [wv]	G
L13-FD	NAM	L13 [wv]	G
L13-FE	NAM	L13 [wv]	G

L13-FF	NAM	L13 [wv]	G
L15b-A	ENGIE	L12b & L15b [wv]	G
M07-B	ONE	M07 [wv]	G
Markham	Centrica	J03a [wv], J03b & J06 [wv]	G
N07-FA	NAM	N07a [wv], Noord-Friesland [wv]	G
P06-D	Wintershall	P06 [wv], P09c [wv]	G
P06-Main	Wintershall	P06 [wv]	G
P09-A	Wintershall	P09a & P09b [wv], P09c [wv]	G
P10a-De Ruyter Western			
Extension	Dana Petroleum	P10a [wv]	G&O
P11-12	ONE	P11a [wv]	G
P11a-E	ONE	P11a [wv]	G
P11b-Van Nes	Dana Petroleum	P11b [wv]	G
P15-09	TAQA	P15a & P15b [wv], P18a [wv]	G
P15-11	TAQA	P15a & P15b [wv]	G
P15-13	TAQA	P15a & P15b [wv]	G
P15-19	TAQA	P15a & P15b [wv]	G
P18-2	TAQA	P18a [wv], P18c [wv]	G
P18-4	TAQA	P15a & P15b [wv], P18a [wv]	G
P18-6	TAQA	P15c [wv], P18a [wv]	G
Q01-B	Wintershall	Q01 [wv], Q04 [wv]	G
Q01-D	Wintershall	Q01 [wv]	G
Q04-A	Wintershall	Q04 [wv]	G
Q04-B	Wintershall	Q04 [wv], Q05d [wv]	G
Q16-FA	ONE	Q16a [wv]	G
Q16-Maas	ONE	Botlek-Maas [wv], P18d [wv], Q16b & Q16c-Diep [wv], S03a [wv], T01 [wv]	G
<b>b) Underground gas storage</b>			
Aardgasbuffer	Gasunie	Zuidwending [osv]	G
Zuidwending			
Alkmaar	TAQA	Alkmaar [osv]	G
Bergermeer	TAQA	Bergermeer [osv]	G
Grijpskerk	NAM	Grijpskerk [osv]	G
Norg	NAM	Norg [osv]	G

## II. UNDEVELOPED ACCUMULATIONS

Accumulation	Company	Licence name***	Gas/Oil
<b>a) Production expected to start 2016–2019</b>			
Assen-Zuid	NAM	Drenthe IIb [wv]	G
Marknesse	Tulip	Marknesse [wv]	G
Marumerlage	NAM	Groningen [wv]	G
Nes-Noord	NAM	Noord-Friesland [wv]	G
Oppenhuizen	Vermillion	Zuid-Friesland III [wv]	G
Papekop	Vermillion	Papekop [wv]	G&O
Rodewolt	NAM	Groningen [wv]	G
Ternaard	NAM	Noord-Friesland [wv]	G
Terschelling-Noord	Tulip	M10a & M11 [opv], Terschelling-Noord [opv]	G
Usquert	NAM	Groningen [wv]	G
Woudsend	Vermillion	Zuid-Friesland III [wv]	G
A15-A	Petrogas	A12a [wv], A12d [wv], A15a [wv]	G
B10-FA	Petrogas	A12b & B10a [opv]	G
D12-B	Wintershall	D12a [wv], D12b [opv]	G
D15 Tourmaline	ENGIE	D15 [wv]	G
F16-P	Wintershall	E18a [wv], F16 [wv]	G
K09c-B	ENGIE	K09a & K09b [wv], K09c [wv]	G
L05a-D	ENGIE	L02 [wv], L05a [wv], L05b [wv]	G
L07-F	Total	K06 & L07 [wv], L08b [wv]	G
L08-I	Wintershall	L08a [wv]	G
L10-19	ENGIE	L10 & L11a [wv]	G
L11-7	ENGIE	L10 & L11a [wv]	G
L12-FA	ENGIE	L12a [wv], L12b & L15b [wv]	G
L13-FI	NAM	L13 [wv]	G
M01-A	ONE	M01a [wv]	G
M09-FA	NAM	M09a [wv], Noord-Friesland [wv]	G
M10-FA	Tulip	M10a & M11 [opv]	G
M11-FA	Tulip	M10a & M11 [opv], Noord-Friesland [wv]	G
P11b-Van Ghent East	Dana Petroleum	P11b [wv]	G&O
P11b-Witte de With	Dana Petroleum	P11b [wv]	G
P18-7	ONE	P18b [opv], P18c [wv], Q16a [wv]	G
Q07-FA	Tulip	Q07 [opv], Q10a [opv]	G
<b>b) Production to start after 2019</b>			
Beerta	NAM	Groningen [wv]	G
Boskoop	NAM	Rijswijk [wv]	G
Buma	NAM	Drenthe IIb [wv]	G
Burum	NAM	Tietjerksteradeel [wv]	G
Deurningen	NAM	Twenthe [wv]	G
Egmond-Binnen	NAM	Middelie [wv]	G
Exloo	NAM	Drenthe IIb [wv]	G
Haakswold	NAM	Schoonebeek [wv]	G
Heiloo	TAQA	Bergen II [wv]	G
Hollum-Ameland	NAM	Noord-Friesland [wv]	G

Accumulation	Company	Licence name***	Gas/Oil
Kerkwijk	NAM	Andel Vb [wv], Utrecht [opv]	G
Kijkduin-Zee	NAM	Rijswijk [wv]	G
Langebrug	NAM	Groningen [wv]	G
Lankhorst	NAM	Schoonebeek [wv]	G
Maasgeul	NAM	Botlek II [wv], Q16b & Q16c-Diep [wv]	G
Midlaren	NAM	Drenthe IIb [wv], Groningen [wv]	G&O
Molenaarsgraaf	NAM	Andel Vb [wv], Rijswijk [wv]	G
Newhorne	Vermillion	Gorredijk [wv]	G
Newschans	NAM	Groningen [wv]	G
Oosterwolde	0	open	G
Oude Leede	NAM	Rijswijk [wv]	G
Rammelbeek	NAM	Twenthe [wv]	G
Schiermonnikoog-Wad	NAM	Noord-Friesland [wv]	G
Terschelling-West	NAM	open	G
Valthermond	NAM	Drenthe IIb [wv]	G
Vlagtwedde	NAM	Groningen [wv]	G
Wassenaar-Diep	NAM	Rijswijk [wv]	G
Werkendam-Diep	NAM	Rijswijk [wv]	G&O
Witten	NAM	Drenthe IIb [wv]	G
Zevenhuizen-West	NAM	Groningen [wv]	G
Zuidwijk	TAQA	Bergen II [wv], Middelie [wv]	G
B16-FA	Petrogas	B10c & B13a [wv], B16a [opv]	G
B17-A	Petrogas	open	G
D12 Ilmenite	Wintershall	D09 & E07 [opv], D12a [wv]	G
E11-Vincent	Tullow	E11 [opv]	G
E12 Lelie	0	open	G
E12 Tulp East	0	open	G
E13 Epidoot	0	open	G
J09 Alpha North	NAM	J09 [opv]	G
K08-FB	NAM	K08 & K11 [wv]	G
K08-FD	NAM	K04b & K05a [wv], K08 & K11 [wv]	G
K08-FE	NAM	K08 & K11 [wv], K09a & K09b [wv]	G
K08-FF	NAM	K08 & K11 [wv]	G
K14-FC	NAM	K08 & K11 [wv], K14a [wv]	G
K15-FF	NAM	K15 [wv]	G
K16-5	0	open	G
K17-FB	NAM	K17 [wv]	G
K17-Zechstein	NAM	K17 [wv]	G
K18-FB	Wintershall	K18b [wv]	G
K6-GT4	Total	K06 & L07 [wv]	G
L02-FC	NAM	L02 [wv]	G
L05b-A	Wintershall	L05b [wv]	G
L07-D	Total	K06 & L07 [wv]	G
L10-6	ENGIE	L10 & L11a [wv]	G
L11-1	ENGIE	L10 & L11a [wv]	G
L11a-B	ENGIE	L10 & L11a [wv]	G
L12-FD	Tullow	L09 [wv], L12d [wv]	G
L13-FA	NAM	L13 [wv]	G

Accumulation	Company	Licence name***	Gas/Oil
L13-FJ	NAM	L13 [wv]	G
L13-FK	NAM	L13 [wv]	G
L14-FB	ENGIE	L13 [wv]	G
L16-Alpha	Wintershall	L16a [wv]	G
L16-Bravo	Wintershall	L16a [wv]	G
L16-FA	Wintershall	K18b [wv], L16a [wv]	G
M09-FB	NAM	M09a [wv], N07a [wv], Noord-Friesland [wv]	G
P01-FA	Petrogas	open	G
P01-FB	Petrogas	open	G
P02-Delta	Petrogas	open	G
P02-E	Petrogas	open	G
P06-Northwest	Wintershall	P06 [wv]	G
P10b-Van Brakel	Dana Petroleum	P10b [wv]	G
P12-14	Wintershall	P12 [wv]	G
Q02-A	0	open	G
Q13-FC	ENGIE	Q13b [opv]	G
Q14-A	ONE	Q13b [opv]	G

## III. PRODUCTION CEASED

Accumulation	Status**	Company	Licence name***	Gas/Oil
Akkrum 1	A	Chevron USA	Akkrum [opv], Leeuwarden [wv]	G
Akkrum 13	A	Chevron USA	Akkrum [opv], Gorredijk [wv]	G
Akkrum 3	A	Chevron USA	Akkrum [opv]	G
Akkrum 9	A	Chevron USA	Akkrum [opv]	G
Ameland-Noord	T	NAM	M09a [wv], Noord-Friesland [wv]	G
Appelscha	T	NAM	Drenthe IIb [wv]	G
Barendrecht- Ziedewij	T	NAM	Rijswijk [wv]	G
Blesdijke	T	Vermillion	Gorredijk [wv], Steenwijk [wv]	G
Boekel	U	TAQA	Bergen II [wv]	G
Bozum	U	Vermillion	Oosterend [wv]	G
Brakel	T	Vermillion	Andel Va [wv]	G&O
Burum-Oost	U	NAM	Tietjerksteradeel [wv]	G
Castricum-Zee	A	Wintershall	Middelie [wv]	G
De Blesse	T	Vermillion	Gorredijk [wv], Steenwijk [wv]	G
De Klem	U	NAM	Beijerland [wv]	G
De Lutte	U	NAM	Rossum-De Lutte [wv], Twenthe [wv]	G
Emshoern	A	NAM	Groningen [wv]	G
Engwierum	U	NAM	Noord-Friesland [wv]	G
Franeker	U	Vermillion	Leeuwarden [wv]	G
Geestvaartpolder	U	NAM	Rijswijk [wv]	G
Groet-Oost	U	TAQA	Middelie [wv]	G
Grouw	T	Vermillion	Leeuwarden [wv], Oosterend [wv]	G
Harlingen Lower Cretaceous	U	Vermillion	Leeuwarden [wv]	G
Harlingen Upper Cretaceous	T	Vermillion	Leeuwarden [wv]	G
Hoogenweg	A	NAM	Hardenberg [wv]	G
Houwerzijl	T	NAM	Groningen [wv]	G
Kollumerland	T	NAM	Tietjerksteradeel [wv]	G
Leeuwarden 101 Rotliegend	U	Vermillion	Leeuwarden [wv]	G
Leidschendam	A	NAM	Rijswijk [wv]	G
Metslawier	U	NAM	Noord-Friesland [wv]	G
Middenmeer	T	Vermillion	Slootdorp [wv]	G
Nijensleek	U	Vermillion	Drenthe IIa [wv], Steenwijk [wv]	G
Noorderdam	T	NAM	Rijswijk [wv]	G
Norg-Zuid	U	NAM	Drenthe IIb [wv]	G
Oldelamer	T	Vermillion	Gorredijk [wv], Lemsterland [opv]	G
Oldenzaal	U	NAM	Rossum-De Lutte [wv], Twenthe [wv]	G
Oudendijk	T	NAM	Beijerland [wv]	G
Pasop	U	NAM	Drenthe IIb [wv], Groningen [wv]	G
Pernis	U	NAM	Rijswijk [wv]	G
Pieterzijl Oost	T	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Rauwerd	T	Vermillion	Leeuwarden [wv], Oosterend [wv]	G

Accumulation	Status**	Company	Licence name***	Gas/Oil
Roden	T	NAM	Drenthe IIb [wv], Groningen [wv]	G
Rossum-Weerselo	U	NAM	Rossum-De Lutte [wv], Twenthe [wv]	G
Roswinkel	A	NAM	Drenthe IIb [wv], Groningen [wv]	G
Sleen	A	NAM	Drenthe IIb [wv]	G
Starnmeer	U	TAQA	Bergen II [wv]	G
Suawoude	T	NAM	Tietjerksteradeel [wv]	G
Tubbergen	U	NAM	Tubbergen [wv]	G
Tubbergen- Mander	U	NAM	Tubbergen [wv]	G
Weststellingwerf	U	Vermillion	Gorredijk [wv]	G
Wijk en Aalburg	T	Vermillion	Andel Va [wv]	G
Wimmenum- Egmond	A	NAM	Middelie [wv]	G
Witterdiep	T	NAM	Drenthe IIb [wv]	G
Zuid-Schermer	U	TAQA	Bergen II [wv]	G
D15a-A104	U	ENGIE	D15 [wv]	G
Halfweg	U	Petrogas	Q01 [wv], Q02c [wv]	G
K05a-Es	U	Total	K04b & K05a [wv]	G
K05-G	U	Total	K04b & K05a [wv]	G
K06-N	U	Total	K06 & L07 [wv]	G
K06-T	U	Total	K06 & L07 [wv]	G
K09ab-C	T	ENGIE	K09a & K09b [wv], K09c [wv]	G
K10-B (gas)	A	Wintershall	open	G
K10-C	A	Wintershall	open	G
K10-V	A	Wintershall	K07 [wv]	G
K11-FA	A	NAM	K08 & K11 [wv]	G
K11-FB	A	ENGIE	K08 & K11 [wv], K12 [wv]	G
K11-FC	A	ENGIE	K08 & K11 [wv]	G
K12-A	A	ENGIE	K12 [wv]	G
K12-C	U	ENGIE	K12 [wv]	G
K12-E	A	ENGIE	K12 [wv], L10 & L11a [wv]	G
K12-K	T	ENGIE	K12 [wv]	G
K12-S1	A	ENGIE	K12 [wv]	G
K13-A	A	Wintershall	open	G
K13-B	A	Wintershall	open	G
K13-CF	A	Wintershall	open	G
K13-DE	A	Wintershall	open	G
K15-FJ	T	NAM	K15 [wv]	G
K15-FQ	T	NAM	K15 [wv], L13 [wv]	G
L04-B	A	Total	K06 & L07 [wv], K09c [wv], L04a [wv]	G
L06d-S1	A	ONE	open	G
L07-A	A	Total	K06 & L07 [wv]	G
L07-H South-East	U	Total	K06 & L07 [wv]	G
L07-N	U	Total	K06 & L07 [wv]	G
L08-A	U	Wintershall	L08a [wv], L08b [wv]	G
L08-G	U	Wintershall	L08a [wv]	G
L08-H	U	Wintershall	L08a [wv]	G
L09-FC	U	NAM	L09 [wv]	G

Accumulation	Status**	Company	Licence name***	Gas/Oil
L09-FI	T	NAM	L09 [wv]	G
L10-G	U	ENGIE	L10 & L11a [wv]	G
L10-K	A	ENGIE	K06 & L07 [wv], L10 & L11a [wv]	G
L10-S1	A	ENGIE	L10 & L11a [wv]	G
L10-S2	U	ENGIE	L10 & L11a [wv]	G
L10-S3	A	ENGIE	L10 & L11a [wv]	G
L10-S4	U	ENGIE	L10 & L11a [wv]	G
L11a-A	A	ENGIE	L10 & L11a [wv]	G
L11b-A	U	ONE	L11b [wv]	G
L11-Lark	A	ENGIE	L10 & L11a [wv]	G
L13-FB	U	NAM	L13 [wv]	G
L13-FG	T	NAM	L13 [wv]	G
L13-FH	A	NAM	L13 [wv]	G
L14-FA	A	Transcanada Int.	L10 & L11a [wv]	G
M07-A	T	ONE	M07 [wv]	G
P02-NE	A	Clyde	open	G
P02-SE	A	Clyde	open	G
P06-South	A	Wintershall	P06 [wv], P09c [wv]	G
P09-B	U	Wintershall	P09c [wv]	G
P12-C	A	Wintershall	P12 [wv]	G
P12-SW	U	Wintershall	P12 [wv]	G
P14-A	A	Wintershall	P11a [wv]	G
P15-10	U	TAQA	P15c [wv]	G
P15-12	T	TAQA	P15a & P15b [wv]	G
P15-14	U	TAQA	P15c [wv]	G
P15-15	U	TAQA	P15a & P15b [wv]	G
P15-16	U	TAQA	P15a & P15b [wv]	G
P15-17	U	TAQA	P15a & P15b [wv]	G
Q05-A	A	Wintershall	open	G
Q08-A	A	Wintershall	Middelie [wv]	G
Q08-B	A	Wintershall	open	G

\*\* T = production halted temporarily, U= production halted, A = abandoned

\*\*\* el = exploration licence, pl = production licence, open = open area; sl = storage licence.



## OIL ACCUMULATIONS

### I. DEVELOPED ACCUMULATIONS

Accumulation	Company	Licence name***	Gas/Oil
<b>a) Producing</b>			
Oud-Beijerland Noord	NAM	Botlek II [wv]	O&G
Rotterdam	NAM	Rijswijk [wv]	O
Schoonebeek (olie)	NAM	Schoonebeek [wv]	O
F02a-Hanze	Dana Petroleum	F02a [wv]	O
Haven	Petrogas	Q01 [wv]	O
Helder	Petrogas	Q01 [wv]	O
Horizon	Petrogas	P09a & P09b [wv], P09c [wv]	O
P11b-De Ruyter	Dana Petroleum	P10a [wv], P11b [wv]	O
P11b-Van Ghent	Dana Petroleum	P11b [wv]	O&G
P15 Rijn	TAQA	P15a & P15b [wv]	O&G
Q13a-Amstel	ENGIE	Q13a [wv]	O

### II. UNDEVELOPED ACCUMULATIONS

Accumulation	Company	Licence name***	Gas/Oil
<b>a) Production start expected between 2017 - 2019</b>			
F06b-Snellius	Dana Petroleum	F06b [opv]	O
F17-NE (Rembrandt)	Wintershall	F17a-Diep [wv], F17c [wv]	O
F17-SW Culmination	Wintershall	F17a-Diep [wv], F17c [wv], L02 [wv]	O
P08-A Horizon-West	Petrogas	P08a [wv], P09a & P09b [wv]	O
Q01-Northwest	Petrogas	Q01 [wv]	O
<b>b) Production start after 2019</b>			
Alblasserdam	NAM	Rijswijk [wv]	O
Denekamp	NAM	Tubbergen [wv]	O
Gieterveen	NAM	Drenthe IIb [wv], Groningen [wv]	O
Lekkerkerk/blg	NAM	Rijswijk [wv]	O
Noordwijk	NAM	Rijswijk [wv]	O
Ottoland	Vermillion	Andel Va [wv]	O&G
Stadskanaal	NAM	Groningen [wv]	O&G
Wassenaar-Zee	NAM	Q13b [opv], Rijswijk [wv]	O
Woubrugge	NAM	Rijswijk [wv]	O
Zweelo	NAM	Drenthe IIb [wv]	O
B18-FA	Centrica	B18a [wv], F03a [wv]	O
F03-FC	Centrica	F03a [wv]	O
F06b-Zulu North	Dana Petroleum	F03b [wv], F06b [opv]	O
F14-FA	0	F14 [opv]	O
F17-Brigantijn (F17-FB)	Sterling	F17a-Ondiep [opv]	O

F17-Korvet (F17-FA)	Sterling	F17a-Ondiep [opv]	O
F18-Fregat (F18-FA)	Sterling	F18a-Ondiep [opv]	O
K10-B (oil)	Wintershall	open	O
L01-FB	0	open	O
L05a-E	ENGIE	L02 [wv], L04c [wv], L05a [wv]	O
P12-3	Wintershall	P12 [wv]	O
Q07-FC	Tulip	Q07 [opv]	O&G
Q13-FB	NAM	Q13b [opv], Q16b & Q16c-Diep [wv], Rijswijk [wv]	O

### III. PRODUCTION CEASED

Accumulation	Status	Company	Licence name***	Gas/Oil
Barendrecht	T	NAM	Rijswijk [wv]	O&G
Berkel	A	NAM	Rijswijk [wv]	O&G
De Lier	A	NAM	Rijswijk [wv]	G&O
IJsselmonde	A	NAM	Rijswijk [wv]	O&G
Moerkapelle	A	NAM	Rijswijk [wv]	O
Pijnacker	A	NAM	Rijswijk [wv]	O
Rijswijk	A	NAM	Rijswijk [wv]	O&G
Wassenaar	A	NAM	Rijswijk [wv]	O
Werkendam	A	NAM	Rijswijk [wv]	O
Zoetermeer	A	NAM	Rijswijk [wv]	O
Helm	U	Petrogas	Q01 [wv]	O
Hoorn	U	Petrogas	Q01 [wv]	O
Kotter	U	Wintershall	K18b [wv]	O
Logger	U	Wintershall	L16a [wv], Q01 [wv]	O

\*\* T = production halted temporarily, U= production halted, A = abandoned

\*\*\* el = exploration licence, pl = production licence, open = open area; sl = storage licence.

## EXPLORATION LICENCES FOR HYDROCARBONS: Netherlands Territory as at 1 January 2017

	Licensee	Licence	km <sup>2</sup>	Effective from	Expires	Govern. Gazette
1	<b>ENGIE E&amp;P Nederland B.V.</b>	Schiermonnikoog-Noord	62	05-06-2013	16-07-2017	16 234
2	<b>Tulip Oil Netherlands B.V.</b> PA Resources UK Ltd.	Schagen	355	20-6-2009	31-7-2017	118
3	<b>Tulip Oil Netherlands B.V.</b>	Terschelling-Noord	23	30-7-2013		22 215
4	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Akkrum	210	14-3-2013		10 461
5	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Engelen	97	14-10-2009	23-11-2018	16 878
6	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Lundin Netherlands B.V.	Follega	3	15-6-2010	25-7-2017	9 426
7	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Hemelum	450	17-1-2012	26-2-2017	1 490
8	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	IJsselmuiden	447	17-1-2014	27-2-2018	1 958
9	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Lundin Netherlands B.V.	Lemsterland	111	15-6-2010	25-7-2017	9 427
10	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Oosterwolde	127	20-4-2007	23-11-2018	83
11	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Opmeer	229	19-12-2012	18-12-2018	205
12	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Utrecht	1144	26-4-2007	23-11-2018	85
Total			3259	km <sup>2</sup>		

**PRODUCTION LICENCES FOR HYDROCARBONS:  
Netherlands Territory as at 1 January 2017**

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Awarded</b>	<b>Expires</b>	<b>Govern Gazette</b>
1	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Beijerland	140	14-2-1997	14-2-2027	243
2	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Botlek II	232	4-3-2014	19-7-2026	7 445
3	<b>Nederlandse Aardolie Maatschappij B.V.</b> ExxonMobil Producing Netherlands B.V.	De Marne	7	4-10-1994	4-10-2034	189
4	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Drenthe IIb	1881	17-3-2012		6 883
5	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Groningen	2970	30-5-1963		126
6	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Hardenberg	161	22-10-1990	22-10-2035	149
7	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Middelie	946	12-5-1969		94
8	<b>Nederlandse Aardolie Maatschappij B.V.</b> ExxonMobil Producing Netherlands B.V.	Noord-Friesland	1593	27-2-1969		47
9	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Rijswijk	2090	3-1-1955		21
10	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Rossum-de Lutte	46	12-5-1961		116
11	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Schoonebeek	930	3-5-1948		110
12	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Tietjerksteradeel	411	27-2-1969		47
13	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Tubbergen	177	11-3-1953		80
14	<b>Nederlandse Aardolie Maatschappij B.V.</b>	Twenthe	276	1-4-1977		26
15	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	Botlek-Maas	3	4-3-2014	19-7-2026	7 445
16	<b>TAQA Onshore B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V.	Bergen II	221	23-12-2006		232
17	<b>TAQA Onshore B.V.</b>	Bergermeer	19	23-12-2006		232
18	<b>TAQA Piek Gas B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V.	Alkmaar	12	23-12-2006		232

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Awarded</b>	<b>Expires</b>	<b>Govern Gazette</b>
19	<b>Tulip Oil Netherlands B.V.</b>	Akkrum 11	6	26-7-2012	4-4-2026	6 909
20	<b>Tulip Oil Netherlands B.V.</b>	Donkerbroek	22	4-4-1995	4-4-2026	66
21	<b>Tulip Oil Netherlands B.V.</b>	Donkerbroek- West	2	16-3-2011	4-4-2026	4 902
22	<b>Tulip Oil Netherlands B.V.</b>	Marknesse	19	26-1-2010	9-3-2030	1 446
23	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Nederlandse Aardolie Maatschappij B.V. Parkmead (E&P) Ltd.	Andel Va	61	5-8-2015	29-12-2038	29 954
24	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Nederlandse Aardolie Maatschappij B.V. Parkmead (E&P) Ltd.	Andel Vb	164	5-8-2015	29-12-2038	29 954
25	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Drenthe IIa	7	17-3-2012		6 883
26	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Drenthe IIIa	1	17-3-2012		6 885
27	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Parkmead (E&P) Ltd.	Drenthe IV	7	18-7-2007		140
28	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Parkmead (E&P) Ltd.	Drenthe V	25	20-6-2015		18 037
29	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Nederlandse Aardolie Maatschappij B.V. Parkmead (E&P) Ltd.	Drenthe VI	363	20-6-2015		18 037
30	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Lundin Netherlands B.V.	Gorredijk	629	29-7-1989	29-7-2024	145
31	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Lundin Netherlands B.V.	Leeuwarden	614	27-2-1969		46
32	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Lundin Netherlands B.V.	Oosterend	92	5-9-1985		84
33	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Parkmead (E&P) Ltd.	Papekop	63	8-6-2006	19-7-2031	113
34	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Lundin Netherlands B.V.	Slootdorp	162	1-5-1969		94

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Awarded</b>	<b>Expires</b>	<b>Govern Gazette</b>
35	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Steenwijk	99	16-9-1994	16-9-2029	177
36	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Gas Storage Ltd. Overseas Gas Storage Ltd.	Waalwijk	186	17-8-1989	17-8-2024	154
37	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V. Total E&P Nederland B.V.	Zuid-Friesland III	105	9-3-2010	19-4-2030	4 016
38	<b>Vermilion Oil &amp; Gas Netherlands B.V.</b>	Zuidwal	225	7-11-1984		190
		<b>Total</b>	<b>14967</b>	<b>km<sup>2</sup></b>		

**UNDERGROUND STORAGE LICENCES:  
Netherlands Territory as at 1 January 2017**

	Licensee	Licence	km <sup>2</sup>	Effective from	Expires	Govern. Gazette	Substance
1	<b>Akzo Nobel Salt B.V.</b>	Twenthe-Rijn de Marssteden	2	02-10-2010	12-11-2040	15 650	Gasolie
2	<b>Akzo Nobel Salt B.V.</b>	Winschoten III	28	15-11-2010	13-05-2079	18 321	Stikstof
3	<b>N.V. Nederlandse Gasunie</b>	Winschoten II	<1	15-11-2010	13-05-2079	18 321	Stikstof
4	<b>N.V. Nederlandse Gasunie</b> Akzo Nobel Salt B.V. Gasunie Zuidwending B.V. Gasunie Underground Storage B.V. Nuon Storage B.V.	Zuidwending	1	11-04-2006	11-04-2036	77	Aardgas
5	<b>Nederlandse Aardolie Mij. B.V.</b>	Grijpskerk	27	01-04-2003		67	Aardgas
6	<b>Nederlandse Aardolie Mij. B.V.</b>	Norg	81	01-04-2003		68	Aardgas
7	<b>Oasen N.V.</b>	Ridderkerk	1	19-12-2012	29-01-2018	7 641	Zout water
8	<b>TAQA Onshore B.V.</b>	Bergermeer	19	08-01-2007	30-06-2050	7	Aardgas
9	<b>TAQA Offshore B.V.</b>	P18-4	11	01-01-2018	31-12-2025	21 233	Kooldioxide
10	<b>TAQA Piek Gas B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V.	Alkmaar	12	01-04-2003		68	Aardgas
		Total	183	km <sup>2</sup>			

**EXPLORATION LICENCES FOR ROCK SALT:  
Netherlands Territory as at 1 January 2017**

No ongoing exploration licences at 1 januari 2017



**PRODUCTION LICENCES FOR ROCK SALT:  
Netherlands Territory as at 1 January 2017**

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
1	<b>Akzo Nobel Salt B.V.</b>	Adolf van Nassau III	28	16-11-2010		18 324
4	<b>Akzo Nobel Salt B.V.</b>	Burse	30	18-06-1918		Staatsblad 421
5	<b>Akzo Nobel Salt B.V.</b>	Isidorushoeve	20	08-06-2012	19-07-2052	14 668
6	<b>Akzo Nobel Salt B.V.</b>	Twenthe-Rijn	48	20-10-1933		207
8	<b>Akzo Nobel Salt B.V.</b>	Twenthe-Rijn Helmerzijde	1	29-10-2008	09-12-2048	216
9	<b>Akzo Nobel Salt B.V.</b>	Twenthe-Rijn Oude Maten	1	01-06-2013	12-07-2053	18 332
2	<b>Akzo Nobel Salt B.V.</b>  N.V. Nederlandse Gasunie Gasunie Zuidwending B.V. Gasunie Underground Storage B.V.	Uitbreiding Adolf van Nassau II	1	21-12-2009		81
3	<b>Akzo Nobel Salt B.V.</b>	Uitbreiding Adolf van Nassau III	77	21-12-2009		81
7	<b>Akzo Nobel Salt B.V.</b>	Uitbreiding Twenthe- Rijn	9	01-12-1994		249
10	<b>Akzo Nobel Salt B.V.</b>	Weerselo	80	13-03-1967		76
11	<b>Frisia Zout B.V.</b>	Barradeel	3	22-08-1998	22-08-2054	157
12	<b>Frisia Zout B.V.</b>	Barradeel II	17	12-06-2004	26-04-2062	110
13	<b>Frisia Zout B.V.</b>	Havenmond	32	03-01-2012	13-02-2052	405
14	<b>N.V. Nederlandse Gasunie</b>	Adolf van Nassau II	<1	16-11-2010		18 324
15	<b>Nedmag Industries Mining &amp; Manufacturing B.V.</b>	Veendam	171	010-8-1980		148
16	<b>Salzgewinnungsgesellschaft Westfalen mbH &amp; Co KG</b>	Zuidoost-Enschede	6	07-03-2014	17-04-2064	7 304
		<b>Total</b>	<b>526</b>	<b>km<sup>2</sup></b>		

**EXPLORATION LICENCES FOR GEOTHERMAL ENERGY:  
Netherlands Territory as at 1 January 2017**

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>	<b>NB</b>
1	<b>A-ware Production B.V.</b>	Heerenveen	46	28-10-2014	8-12-2018	31 141	
2	<b>Bernhard Plantenkwekerij B.V.</b> ECL Netwerk B.V. Stichting Nieuwland	Luttelgeest	72	8-4-2014	19-5-2018	11 152	
3	<b>A en G van den Bosch B.V.</b>	Lansingerland 4	6	27-9-2014	7-11-2018	28 237	
4	<b>Grondexploitatie­maatschap pij Californië B.V.</b>	Californie vi	63	1-10-2015	30-12-2018	34 771	
5	<b>Duurzaam Voorne Holding B.V.</b>	Oostvoorne	17	9-3-2010	31-12-2017	4 013	
6	<b>E.ON Benelux N.V.</b>	Rotterdam 4	20	18-12-2012	28-1-2017	208	
7	<b>E.ON Benelux N.V.</b>	Rotterdam 5	39	18-12-2012	28-1-2017	733	
8	<b>ECW Geoholding B.V.</b>	Andijk	12	5-3-2010	30-12-2017	3 831	
9	<b>ECW Geoholding B.V.</b>	Middenmeer	5	16-7-2009		11 070	pla
10	<b>ECW Geoholding B.V.</b>	Middenmeer 2	15	13-10-2009	23-11-2017	15 999	
11	<b>Ekowarmte B.V.</b>	Velden	21	9-2-2016	21-3-2020	9 270	
12	<b>Eneco Solar, Bio &amp; Hydro B.V.</b>	Rotterdam 2	26	18-12-2012	28-1-2017	206	
13	<b>Eneco Solar, Bio &amp; Hydro B.V.</b>	Rotterdam 3	2	18-12-2012	28-1-2017	203	
14	<b>EnergieWende B.V.</b> De Bruijn Geothermie B.V.	De lier 3II	10	1-5-2015	19-1-2019	13 276	
15	<b>EnergieWende B.V.</b> De Bruijn Geothermie B.V.	De lier III	15	1-7-2015	19-1-2017	21 833	
16	<b>DDH Energy B.V.</b>	Leeuwarden 2	14	1-4-2015	12-5-2019	10 222	

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>	<b>NB</b>
17	<b>Gedeputeerde Staten van Overijssel</b>	Koekoekspolder II	28	21-3-2014	30-12-2018	9 051	
18	<b>Gemeente Groningen</b>	Groningen 2	18	16-4-2011	31-10-2017	7 134	
19	<b>Geothermie De Kievit B.V.</b>	Peel en maas	48	19-12-2014	29-1-2019	243	
20	<b>GeoWeb B.V.</b>	Egchel	62	26-11-2013	6-1-2018	34 027	
21	<b>Gipmans Verhuur B.V.</b>	Venlo	24	9-2-2016	21-3-2020	9268	
22	<b>AC Hartman Beheer B.V.</b> Gemeente Franekeradeel	Sexbierum	11	17-7-2009	30-11-2017	11 805	
23	<b>Hydreco GeoMEC B.V.</b> GeoMEC-4P Realisatie & Exploitatie B.V.	Brielle 2	29	13-10-2009		15 990	pla
24	<b>Hydreco GeoMEC B.V.</b> HAL B.V.	Den haag	10	3-4-2009		69	pla
25	<b>Hydreco GeoMEC B.V.</b>	Helmond 2	71	26-8-2015	6-10-2019	30 252	
26	<b>Hydreco GeoMEC B.V.</b>	Pijnacker-nootdorp 6a	9	26-8-2015	30-6-2017	30 241	
27	<b>Hydreco GeoMEC B.V.</b>	Tilburg- geertruidenberg	325	10-7-2015	20-8-2019	21 858	
28	<b>Hydreco GeoMEC B.V.</b> GeoMEC-4P Realisatie & Exploitatie B.V.	Vierpolders	7	10-2-2010		2 211	pla
29	<b>Californië Lipzig Gielen Geothermie B.V.</b>	Californie v	5	1-10-2015		34 771	pla
30	<b>Nature's Heat B.V.</b>	Kwintsheul II	7	1-5-2015	31-12-2017	13 276	
31	<b>Dick Oosthoek</b> Kees Ammerlaan	Oostland	18	31-1-2015	13-3-2019	4 370	
32	<b>Vereniging van Eigenaren Oude Campspolder</b>	Maasland 2	5	15-10-2010	31-12-2017	16 611	
33	<b>Provincie Drenthe</b> Gemeente Emmen	Erica	72	27-10-2010	6-12-2018	17 250	

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>	<b>NB</b>
34	<b>Provincie Drenthe</b> Gemeente Emmen	Klazienaveen	61	27-10-2010	30-11-2018	17 245	
35	<b>J.W.M. Scheffers</b> G. Verkade B.V.	Honselersdijk	5	20-6-2009		118	pla
36	<b>Transmark Renewable Products B.V.</b>	Friesland-noord	326	19-11-2014	21-10-2018	34 411	
37	<b>Transmark Renewable Products B.V.</b>	Friesland-zuid	456	19-11-2014	21-10-2018	34 411	
38	<b>Transmark Renewable Products B.V.</b>	Utrecht - noord-brabant	757	11-9-2013	22-10-2018	26 009	
39	<b>Trias Westland B.V.</b>	De IJzer	2	1-7-2015	19-1-2017	21 833	
40	<b>Trias Westland B.V.</b>	Naaldwijk 2II	4	1-5-2015	30-12-2017	13 276	
41	<b>Trias Westland B.V.</b>	Naaldwijk 3	10	15-4-2016	30-12-2017	20 814	
42	<b>Visser en Smit Hanab B.V.</b>	Zevenbergen	43	19-9-2015	30-10-2019	32 288	
43	<b>Aardwarmte Vogelaer B.V.</b>	Honselersdijk 2	4	14-10-2009	31-5-2017	15 957	
44	<b>Aardwarmte Vogelaer B.V.</b>	Honselersdijk 4	4	3-10-2014	31-5-2017	28 896	
45	<b>Vopak Terminal Vlaardingen B.V.</b>	Rotterdam-vlaardingen	13	22-11-2013	2-1-2018	33 332	
46	<b>Warmtebedrijf Bergschenhoek B.V.</b>	Lansingerland	7	4-12-2008	30-9-2017	240	
47	<b>Wayland Developments B.V.</b>	Waddinxveen 2	7	5-3-2010	31-12-2019	3 829	
48	<b>Kwekerij de Westhoek B.V.</b> Van Geest Groep B.V.	Maasland	9	18-12-2009	31-12-2017	79	
49	<b>Californië Wijnen Geothermie B.V.</b>	Californië IV	10	1-10-2015		34 771	pla
50	<b>Van Wijnen Gorredijk B.V.</b>	Leeuwarden	30	28-10-2014	8-12-2018	31 137	
51	<b>A.P.M. Zuidgeest</b> L.M.M. Zuidgeest-Vijverberg M.T.M. Zuidgeest	Maasdijk	6	21-10-2009	31-5-2018	16 041	

Licensee	Licence	km <sup>2</sup>	Effective from	Expires	Govern. Gazette	NB
P.E.M. Zuidgeest-van den Berg						
W.M.J. Zuidgeest						
Y.C.M. Zuidgeest-van Kester						
	Total	2885		km <sup>2</sup>		

\* Pla = Licensee has applied for a production licence

**PRODUCTION LICENCES FOR GEOTHERMAL ENERGY:  
Netherlands Territory as at 1 January 2017**

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
1	<b>Ammerlaan Geothermie B.V.</b>	Pijnacker-nootdorp 4	4	24-12-2016	3-2-2052	
2	<b>A en G van den Bosch B.V.</b>	Bleiswijk	4	28-11-2008	8-1-2039	237
3	<b>A en G van den Bosch B.V.</b>	Bleiswijk 1b	2	20-3-2015	30-4-2032	8 784
4	<b>Ce-Ren Beheer B.V.</b>	Heemskerk	3	15-4-2016	26-5-2046	20 802
5	<b>Gebroeders Duijvestijn Energie B.V.</b>	Pijnacker-nootdorp 5	5	24-12-2016	3-2-2052	
6	<b>EnergieWende B.V.</b> De Bruijn Geothermie B.V.	De IJser III	6	14-7-2016	24-8-2051	38 394
7	<b>Gemeente Heerlen</b>	Heerlen	41	13-10-2009	23-11-2044	15 963
8	<b>Aardwarmtecluster I KKP B.V.</b>	Kampen	5	27-9-2014	7-11-2044	28 239
			<b>Total</b>	<b>71</b>	<b>km<sup>2</sup></b>	

**EXPLORATION LICENCES FOR HYDROCARBONS:  
Netherlands continental shelf as at 1 January 2017**

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>	<b>NB</b>
1	<b>Dana Petroleum Netherlands B.V.</b> Dyas B.V. Tulip Oil Netherlands B.V.	F06b	260	7-4-2009		70	pla
2	<b>ENGIE E&amp;P Nederland B.V.</b>	D09 & E07	548	4-9-2015	16-10-2019	27 592	
3	<b>ENGIE E&amp;P Nederland B.V.</b> Tullow Exploration & Production Netherlands B.V.	E10	401	16-1-2008	31-12-2017	13	
4	<b>ENGIE E&amp;P Nederland B.V.</b> Tullow Exploration & Production Netherlands B.V.	E11	401	22-4-2009	31-12-2017	84	
5	<b>ENGIE E&amp;P Nederland B.V.</b> Tullow Exploration & Production Netherlands B.V.	E14	403	15-1-2008	31-12-2017	12	
6	<b>ENGIE E&amp;P Nederland B.V.</b> Gas Plus Netherlands B.V. Tullow Exploration & Production Netherlands B.V.	E15c	343	22-4-2008	31-12-2017	78	
7	<b>ENGIE E&amp;P Nederland B.V.</b> Total E&P Nederland B.V.	K01c	274	22-11-2011	3-1-2019	21 372	
8	<b>ENGIE E&amp;P Nederland B.V.</b> Nederlandse Aardolie Maatschappij B.V.	L03	406	13-5-2016	23-6-2022	24 426	
9	<b>ENGIE E&amp;P Nederland B.V.</b>	Q13b	369	1-5-2015	8-5-2019	13 281	
10	<b>Hansa Hydrocarbons Limited</b> ENGIE E&P Nederland B.V.	G18	405	18-9-2012	29-10-2018	23 464	
11	<b>Hansa Hydrocarbons Limited</b> ENGIE E&P Nederland B.V.	H16	73	18-9-2012	29-10-2018	23 463	
12	<b>Hansa Hydrocarbons Limited</b> ENGIE E&P Nederland B.V.	M03	406	18-9-2012	29-10-2018	23 462	
13	<b>Hansa Hydrocarbons Limited</b> ENGIE E&P Nederland B.V.	N01	217	18-9-2012	29-10-2018	23 460	

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>	<b>NB</b>
14	<b>Hansa Hydrocarbons Limited</b> Oranje-Nassau Energie B.V.	N04	381	14-3-2015	17-4-2020	6 003	
15	<b>Hansa Hydrocarbons Limited</b> Oranje-Nassau Energie B.V.	N08	34	14-3-2015	17-4-2020	6 003	
16	<b>Jetex Petroleum Ltd</b>	P04, P07 & P08b	785	7-10-2016	18-11-2020	52 818	
17	<b>Jetex Petroleum Ltd</b>	P10c	249	21-7-2016	2-9-2020	38 277	
18	<b>Nederlandse Aardolie Maatschappij B.V.</b> Oranje-Nassau Energie B.V. Tullow Exploration & Production Netherlands B.V. Wintershall Noordzee B.V.	J09	18	11-4-2014	27-5-2018	10 508	
19	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V.	M02a	134	22-11-2011	2-1-2020	1 486	
20	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V.	M04a	209	21-9-2010	2-1-2020	14 900	
21	<b>Oranje-Nassau Energie B.V.</b> Hansa Hydrocarbons Limited	N05	14	14-3-2015	17-4-2020	6 003	
22	<b>Oranje-Nassau Energie B.V.</b> TAQA Offshore B.V.	P18b	311	24-3-2012		6 865	pla
23	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	S03b	337	7-9-2016	18-10-2020	46 557	
24	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	A12b & B10a	79	16-4-2005		77	pla
25	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	B16a	67	11-5-1987		70	pla
26	<b>Sterling Resources Netherlands B.V.</b> Petro Ventures Netherlands B.V.	F17a-ondiep	386	30-12-2009	31-12-2020	154	



	Licensee	Licence	km <sup>2</sup>	Effective from	Expires	Govern. Gazette	NB
27	<b>Sterling Resources Netherlands B.V.</b> Petro Ventures Netherlands B.V.	F18-ondiep	404	30-12-2009	31-12-2020	152	
28	<b>Tulip Oil Netherlands B.V.</b>	M10a & M11	110	28-7-2007	30-6-2017	152	
29	<b>Tulip Oil Netherlands Offshore B.V.</b>	Q07	419	16-1-2008		13	pla
30	<b>Tulip Oil Netherlands Offshore B.V.</b>	Q10a	53	6-8-2008		155	pla
31	<b>Wintershall Noordzee B.V.</b> GAZPROM International UK Ltd. ENGIE E&P Nederland B.V. Oranje-Nassau Energie B.V.	D12b	41	25-2-2011		5 287	pla
32	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Nederland B.V. TAQA Offshore B.V. Rosewood Exploration Ltd.	F10	401	19-12-2014	30-1-2019	36 868	
33	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Nederland B.V. TAQA Offshore B.V. Rosewood Exploration Ltd.	F11	401	19-12-2014	30-1-2019	36 868	
34	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Nederland B.V. Rosewood Exploration Ltd. TAQA Offshore B.V.	F14	403	10-4-2015	20-11-2018	11 794	
35	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Nederland B.V. Rosewood Exploration Ltd.	F18a-diep	31	30-12-2009	31-3-2019	152	
Total			9776	km <sup>2</sup>			

\*pla: Licensee has applied for a production licence

**PRODUCTION LICENCES FOR HYDROCARBONS :  
Netherlands continental shelf as at 1 January 2017**

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
1	<b>Centrica Production Nederland B.V.</b>	B18a	8	10-10-1985	10-10-2025	182
2	<b>Centrica Production Nederland B.V.</b>	F03a	18	13-12-2007	9-9-2022	245
3	<b>Centrica Production Nederland B.V.</b> Dyas B.V. Total E&P Nederland B.V.	J03b & J06	126	6-11-1992	6-11-2032	219
4	<b>Dana Petroleum Netherlands B.V.</b> Dyas B.V. Oranje-Nassau Energie B.V. TAQA Offshore B.V.	F02a	307	24-8-1982	24-8-2022	139
5	<b>Dana Petroleum Netherlands B.V.</b>	P10a	5	31-5-2005	11-7-2020	102
6	<b>Dana Petroleum Netherlands B.V.</b>	P10b	100	7-4-2009	19-5-2019	70
7	<b>Dana Petroleum Netherlands B.V.</b>	P11b	210	3-4-2004	14-5-2019	67
8	<b>ENGIE E&amp;P Nederland B.V.</b> Faroe Petroleum (UK) Ltd. Wintershall Noordzee B.V.	D15	247	6-9-1996	6-9-2021	138
9	<b>ENGIE E&amp;P Nederland B.V.</b> Faroe Petroleum (UK) Ltd. Wintershall Noordzee B.V.	D18a	58	29-8-2012	9-10-2032	19 757
10	<b>ENGIE E&amp;P Nederland B.V.</b> Lundin Netherlands B.V. Total E&P Nederland B.V.	E16a	29	29-6-2007	9-8-2021	128
11	<b>ENGIE E&amp;P Nederland B.V.</b> Lundin Netherlands B.V. Total E&P Nederland B.V.	E17a & E17b	114	28-6-2007	8-8-2021	128
12	<b>ENGIE E&amp;P Nederland B.V.</b> TAQA Offshore B.V.	F03b	335	13-12-2007	9-9-2022	245
13	<b>ENGIE E&amp;P Nederland B.V.</b> Nederlandse Aardolie Maatschappij B.V. TAQA Offshore B.V.	G14 & G17b	441	15-12-2006	14-12-2019	248

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
14	<b>ENGIE E&amp;P Nederland B.V.</b>	G16a	224	6-1-1992	6-1-2032	245
15	<b>ENGIE E&amp;P Nederland B.V.</b>	G16b	5	11-10-2003	6-1-2032	198
16	<b>ENGIE E&amp;P Nederland B.V.</b>	G17a	237	19-7-2006	14-12-2019	143
17	<b>ENGIE E&amp;P Nederland B.V.</b> Wintershall Noordzee B.V.	G17c & G17d	130	10-11-2000	10-11-2025	188
18	<b>ENGIE E&amp;P Nederland B.V.</b>	K02b	110	20-1-2004	24-8-2023	16
19	<b>ENGIE E&amp;P Nederland B.V.</b>	K03a	83	24-8-1998	24-8-2023	122
20	<b>ENGIE E&amp;P Nederland B.V.</b>	K03c	32	26-11-2005	6-1-2021	233
21	<b>ENGIE E&amp;P Nederland B.V.</b> Oranje-Nassau Energie B.V. Rosewood Exploration Ltd. XTO Netherlands Ltd.	K09a & K09b	211	11-8-1986	11-8-2026	129
22	<b>ENGIE E&amp;P Nederland B.V.</b> Oranje-Nassau Energie B.V. Rosewood Exploration Ltd. XTO Netherlands Ltd.	K09c	199	18-12-1987	18-12-2027	229
23	<b>ENGIE E&amp;P Nederland B.V.</b> Oranje-Nassau Energie B.V. Production North Sea Netherlands Ltd. Rosewood Exploration Ltd. XTO Netherlands Ltd.	K12	411	18-2-1983	18-2-2023	11
24	<b>ENGIE E&amp;P Nederland B.V.</b>	L04c	12	7-1-1994	7-1-2034	2
25	<b>ENGIE E&amp;P Nederland B.V.</b>	L05a	163	15-3-1991	15-3-2031	55
26	<b>ENGIE E&amp;P Nederland B.V.</b> ENGIE E&P Participation Nederland B.V. Oranje-Nassau Energie B.V. Rosewood Exploration Ltd. XTO Netherlands Ltd.	L10 & L11a	596	13-1-1971	1-1-2025	4
27	<b>ENGIE E&amp;P Nederland B.V.</b> Delta Hydrocarbons B.V. Oranje-Nassau Energie B.V. Wintershall Noordzee B.V.	L12a	119	25-9-2008	14-3-2030	189

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
28	<b>ENGIE E&amp;P Nederland B.V.</b> Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L12b & L15b	92	6-8-2008	12-3-2030	155
29	<b>ENGIE E&amp;P Nederland B.V.</b>	L15c	4	7-9-1990	7-9-2030	172
30	<b>ENGIE E&amp;P Nederland B.V.</b> Rosewood Exploration Ltd. XTO Netherlands Ltd.	N07b	87	14-2-2015	9-3-2034	5 845
31	<b>ENGIE E&amp;P Nederland B.V.</b> Aceiro Energy B.V. TAQA Offshore B.V.	Q13a	30	28-11-2006	28-12-2021	231
32	<b>Hansa Hydrocarbons Limited</b> Oranje-Nassau Energie B.V.	N07c	87	14-2-2015	9-3-2034	5 845
33	<b>Nederlandse Aardolie Maatschappij B.V.</b>	F17c	18	4-12-1996	4-12-2024	207
34	<b>Nederlandse Aardolie Maatschappij B.V.</b>	K07	408	8-7-1981	8-7-2021	120
35	<b>Nederlandse Aardolie Maatschappij B.V.</b> Oranje-Nassau Energie B.V. Tullow Exploration & Production Netherlands B.V. Wintershall Noordzee B.V.	K08 & K11	820	26-10-1977	26-10-2017	197
36	<b>Nederlandse Aardolie Maatschappij B.V.</b>	K14a	237	16-1-1975	31-12-2030	6
37	<b>Nederlandse Aardolie Maatschappij B.V.</b>	K15	412	14-10-1977	14-10-2017	197
38	<b>Nederlandse Aardolie Maatschappij B.V.</b>	K17	414	19-1-1989	19-1-2029	12
39	<b>Nederlandse Aardolie Maatschappij B.V.</b> Wintershall Noordzee B.V.	K18a	36	15-3-2007	9-5-2023	57
40	<b>Nederlandse Aardolie Maatschappij B.V.</b>	L02	406	15-3-1991	15-3-2031	55

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
41	<b>Nederlandse Aardolie Maatschappij B.V.</b>	L09	409	18-9-2010	9-5-2035	14 911
42	<b>Nederlandse Aardolie Maatschappij B.V.</b> Oranje-Nassau Energie B.V. Tullow Exploration & Production Netherlands B.V. Wintershall Noordzee B.V.	L13	413	26-10-1977	26-10-2017	197
43	<b>Nederlandse Aardolie Maatschappij B.V.</b> ExxonMobil Producing Netherlands B.V.	M09a	213	10-4-1990	10-4-2030	56
44	<b>Nederlandse Aardolie Maatschappij B.V.</b>	N07a	141	23-12-2003	10-3-2034	252
45	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	L11b	47	15-6-1984	15-6-2024	110
46	<b>Oranje-Nassau Energie B.V.</b> ENGIE E&P Nederland B.V.	L11c	179	14-7-2016	24-8-2031	38 538
47	<b>Oranje-Nassau Energie B.V.</b> Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L12c	30	6-8-2008	12-3-2030	155
48	<b>Oranje-Nassau Energie B.V.</b> Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L12d	225	25-9-2008	14-3-2030	189
49	<b>Oranje-Nassau Energie B.V.</b> Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L15d	62	6-8-2008	12-3-2030	155
50	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V.	M01a	213	28-6-2007	8-8-2022	128
51	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	M07	409	22-3-2001	22-3-2021	19
52	<b>Oranje-Nassau Energie B.V.</b> TAQA Offshore B.V.	P11a	210	23-9-2015	3-11-2025	45 676

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
53	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	P18d	2	20-9-2012	31-10-2027	23 457
54	<b>Oranje-Nassau Energie B.V.</b> Lundin Netherlands B.V. Total E&P Nederland B.V.	Q16a	85	29-12-1992	29-12-2032	227
55	<b>Oranje-Nassau Energie B.V.</b>  Energy06 Investments B.V. TAQA Offshore B.V.	Q16b & Q16c-diep	80	20-9-2012	31-10-2027	23 465
56	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	S03a	2	20-9-2012	31-10-2027	23 466
57	<b>Oranje-Nassau Energie B.V.</b> Energy06 Investments B.V. TAQA Offshore B.V.	T01	1	20-9-2012	31-10-2027	23 467
58	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	A12a	195	1-7-2005	11-8-2025	129
59	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	A12d	33	1-7-2005	11-8-2025	129
60	<b>Petrogas E&amp;P Netherlands B.V.</b> Dana Petroleum Netherlands B.V. Oranje-Nassau Energie B.V.	A15a	67	27-12-2011	3-2-2027	746
61	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	A18a	229	1-7-2005	11-8-2025	129
62	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V.	A18c	47	1-7-2005	11-8-2025	125
63	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	B10c & B13a	252	1-7-2005	11-8-2025	129
64	<b>Petrogas E&amp;P Netherlands B.V.</b> Van Dyke Energy Company	P08a	26	21-10-2006	1-12-2021	214

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
65	<b>Petrogas E&amp;P Netherlands B.V.</b> Aceiro Energy B.V. Dyas B.V. TAQA Offshore B.V. Wintershall Noordzee B.V.	P09a & P09b	126	16-8-1993	16-8-2033	127
66	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V. Wintershall Noordzee B.V.	P09c	267	16-8-1993	16-8-2033	126
67	<b>Petrogas E&amp;P Netherlands B.V.</b> TAQA Offshore B.V. Wintershall Noordzee B.V.	Q01	416	11-7-1980	11-7-2020	110
68	<b>Petrogas E&amp;P Netherlands B.V.</b> Dyas B.V. TAQA Offshore B.V.	Q02c	32	14-7-1994	14-7-2034	18
69	<b>TAQA Offshore B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V. Oranje-Nassau Energie B.V. Van Dyke Netherlands Inc. Wintershall Noordzee B.V.	P15a & P15b	220	12-7-1984	12-7-2024	110
70	<b>TAQA Offshore B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V. Oranje-Nassau Energie B.V. Wintershall Noordzee B.V.	P15c	203	7-5-1992	7-5-2032	114
71	<b>TAQA Offshore B.V.</b>	P18a	105	30-4-1992	30-4-2032	99
72	<b>TAQA Offshore B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V.	P18c	6	2-6-1992	2-6-2032	99
73	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V. TAQA Offshore B.V.	F06a	8	9-9-1982	9-9-2022	139
74	<b>Total E&amp;P Nederland B.V.</b> Dyas B.V. First Oil Expro Ltd. Lundin Netherlands B.V.	F15a	233	6-5-1991	6-5-2031	52

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
75	<b>Total E&amp;P Nederland B.V.</b> Dyas B.V. First Oil Expro Ltd. Lundin Netherlands B.V.	F15d	4	15-6-1992	15-6-2032	97
76	<b>Total E&amp;P Nederland B.V.</b> Nederlandse Aardolie Maatschappij B.V.	J03a	72	12-1-1996	12-1-2036	22
77	<b>Total E&amp;P Nederland B.V.</b> Nederlandse Aardolie Maatschappij B.V.	K01a	83	10-2-1997	10-2-2022	46
78	<b>Total E&amp;P Nederland B.V.</b>	K01b & K02a	75	20-6-2009	31-7-2022	11 801
79	<b>Total E&amp;P Nederland B.V.</b>	K02c	46	21-1-2004	7-11-2021	16
80	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V.	K03b	7	30-1-2001	30-1-2021	19
81	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V.	K03d	26	1-4-1999	1-4-2024	58
82	<b>Total E&amp;P Nederland B.V.</b>	K04a	307	29-12-1993	29-12-2033	220
83	<b>Total E&amp;P Nederland B.V.</b> Dyas B.V. Lundin Netherlands B.V.	K04b & K05a	305	1-6-1993	1-6-2033	87
84	<b>Total E&amp;P Nederland B.V.</b>	K05b	204	7-11-1996	7-11-2021	207
85	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V.	K06 & L07	817	20-6-1975	19-6-2020	112
86	<b>Total E&amp;P Nederland B.V.</b> Van Dyke Netherlands Inc.	L01a	31	12-9-1996	31-12-2023	135
87	<b>Total E&amp;P Nederland B.V.</b>	L01d	7	13-11-1996	31-12-2023	207
88	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V.	L01e	12	13-11-1996	13-11-2018	207
89	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V.	L01f	17	14-1-2003	14-1-2033	235
90	<b>Total E&amp;P Nederland B.V.</b> Lundin Netherlands B.V.	L04a	313	30-12-1981	30-12-2021	230



	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
91	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Participation Nederland B.V.	D12a	214	6-9-1996	6-9-2021	138
92	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. ENGIE E&P Nederland B.V. Tullow Exploration & Production Netherlands B.V.	E15a	39	4-10-2002	21-10-2032	175
93	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. Tullow Exploration & Production Netherlands B.V.	E15b	21	20-2-2008	1-4-2033	38
94	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. ENGIE E&P Nederland B.V. Tullow Exploration & Production Netherlands B.V.	E18a	212	4-10-2002	21-10-2032	175
95	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. ENGIE E&P Nederland B.V. Tullow Exploration & Production Netherlands B.V.	F13a	4	4-10-2002	21-10-2032	175
96	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Nederland B.V.	F16	404	4-10-2002	21-10-2032	175
97	<b>Wintershall Noordzee B.V.</b> ENGIE E&P Nederland B.V. Rosewood Exploration Ltd. TAQA Offshore B.V.	F17a-diep	386	14-5-2016	24-6-2033	43 400
98	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V. Nederlandse Aardolie Maatschappij B.V.	K18b	155	15-3-2007	9-5-2023	57
99	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V.	L05b	237	28-6-2003	9-8-2038	134
100	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V.	L05c	8	3-12-1996	31-12-2028	209
101	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V.	L06a	332	24-11-2010	4-1-2031	18 910

	<b>Licensee</b>	<b>Licence</b>	<b>km<sup>2</sup></b>	<b>Effective from</b>	<b>Expires</b>	<b>Govern. Gazette</b>
102	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V.	L06b	60	1-7-2003	11-8-2038	134
103	<b>Wintershall Noordzee B.V.</b> Oranje-Nassau Energie B.V. TAQA Offshore B.V.	L08a	213	18-8-1988	18-8-2028	146
104	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. Oranje-Nassau Energie B.V.	L08b	181	17-5-1993	17-5-2033	78
105	<b>Wintershall Noordzee B.V.</b> Dana Petroleum Netherlands B.V. Dyas B.V. Nederlandse Aardolie Maatschappij B.V.	L16a	238	12-6-1984	12-6-2024	84
106	<b>Wintershall Noordzee B.V.</b> Dyas B.V. Gas-Union GmbH	P06	417	14-4-1982	14-4-2022	54
107	<b>Wintershall Noordzee B.V.</b> Dyas B.V. Vermilion Energy Netherlands B.V.	P12	421	8-3-1990	8-3-2030	27
108	<b>Wintershall Noordzee B.V.</b> Delta Hydrocarbons B.V. Dyas B.V.	Q04	417	2-12-1999	2-12-2019	228
109	<b>Wintershall Noordzee B.V.</b> Delta Hydrocarbons B.V. Dyas B.V.	Q05d	20	15-2-2001	15-2-2021	19
		<b>Total</b>	<b>19061</b>	<b>km<sup>2</sup></b>		

**BLOCKS AND OPERATORS**  
**Netherlands continental shelf as at 1 January 2017**

Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
A04	0			
A05	91			
A07	47			
A08	382			
A09	141			
A10	129			
A11	392			
A12a		Petrogas		195
A12b		Petrogas	31	
A12c	130			
A12d		Petrogas		33
A13	211			
A14	393			
A15a		Petrogas		67
A15b	326			
A16	293			
A17	395			
A18a		Petrogas		229
A18b	119			
A18c		Petrogas		47
B10a		Petrogas	48	
B10b	85			
B10c		Petrogas		46
B13a		Petrogas		206
B13b	187			
B14	198			
B15	0			
B16a		Petrogas	67	
B16b	327			
B17	395			
B18a		Centrica		8
B18b	192			
D03	2			
D06	60			
D09		ENGIE	149	
D12a		Wintershall		214
D12b		Wintershall	41	
D15		ENGIE		247
D18a		ENGIE		58

Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
D18b	139			
E01	374			
E02	396			
E03	396			
E04	398			
E05	398			
E06	398			
E07		ENGIE	400	
E08	400			
E09	400			
E10		ENGIE	401	
E11		ENGIE	401	
E12	401			
E13	403			
E14		ENGIE	403	
E15a		Wintershall		39
E15b		Wintershall		21
E15c		ENGIE	343	
E16a		ENGIE		29
E16b	375			
E17a		ENGIE		87
E17b		ENGIE		27
E17c	290			
E18a		Wintershall		212
E18b	192			
F01	396			
F02a		Dana nl		307
F02b	89			
F03a		Centrica		18
F03b		ENGIE		335
F03c	44			
F04	398			
F05	398			
F06a		Total		8
F06b		Dana nl	260	
F06c	118			
F06d	12			
F07	400			
F08	400			
F09	400			
F10		Wintershall	401	
F11		Wintershall	401	
F12	402			
F13a		Wintershall		4

Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
F13b	399			
F14		Wintershall	403	
F15a		Total		233
F15b	73			
F15c	93			
F15d		Total		4
F16		Wintershall		404
F17a		Sterling / Wintershall	386	386
F17c		NAM		18
F18		Sterling	404	
F18a		Wintershall	31	
G07	120			
G10	396			
G11	169			
G13	403			
G14		ENGIE		403
G15	226			
G16a		ENGIE		224
G16b		ENGIE		5
G16c	176			
G17a		ENGIE		237
G17b		ENGIE		38
G17c		ENGIE		34
G17d		ENGIE		96
G18		Hansa	405	
H13	1			
H16		Hansa	73	
J03a		Total		72
J03b		Centrica		42
J03c	30			
J06		Centrica		83
J09		NAM	18	
K01a		Total		83
K01b		Total		50
K01c		ENGIE	274	
K02a		Total		25
K02b		ENGIE		110
K02c		Total		46
K02d	225			
K03a		ENGIE		83
K03b		Total		7
K03c		ENGIE		32

Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
K03d		Total		26
K03e	258			
K04a		Total		307
K04b		Total		101
K05a		Total		204
K05b		Total		204
K06		Total		408
K07		NAM		408
K08		NAM		409
K09a		ENGIE		150
K09b		ENGIE		61
K09c		ENGIE		199
K10	374			
K11		NAM		411
K12		ENGIE		411
K13	324			
K14a		NAM		237
K14b	175			
K15		NAM		412
K16	267			
K17		NAM		414
K18a		NAM		36
K18b		Wintershall		155
K18c	223			
L01a		Total		31
L01b	339			
L01d		Total		7
L01e		Total		12
L01f		Total		17
L02		NAM		406
L03		ENGIE	406	
L04a		Total		313
L04b	82			
L04c		ENGIE		12
L05a		ENGIE		163
L05b		Wintershall		237
L05c		Wintershall		8
L06a		Wintershall		332
L06b		Wintershall		60
L06c	16			
L07		Total		409
L08a		Wintershall		213
L08b		Wintershall		181
L08c	16			
L09		NAM		409

Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
L10		ENGIE		411
L11a		ENGIE		185
L11b		Oranje-nassau		47
L11c		Oranje-nassau		179
L12a		ENGIE		119
L12b		ENGIE		37
L12c		Oranje-nassau		30
L12d		Oranje-nassau		225
L13		NAM		413
L14	413			
L15a	81			
L15b		ENGIE		55
L15c		ENGIE		4
L15d		Oranje-nassau		62
L16a		Wintershall		238
L16b	176			
L17	388			
L18	13			
M01a		Oranje-nassau		213
M01b	193			
M02a		Oranje-nassau	134	
M02b	273			
M03		Hansa	406	
M04a		Oranje-nassau	209	
M04b	199			
M05	408			
M06	408			
M07		Oranje-nassau		409
M08	391			
M09a		NAM		213
M09b	158			
M10a		Tulip	82	
M10b	113			
M11		Tulip	28	
N01		Hansa	217	
N04		Hansa	381	
N05		Oranje-nassau	14	
N07a		NAM		141
N07b		ENGIE		87
N07c		Hansa		87
N08		Hansa	34	
O12	2			
O15	142			

Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
O17	3			
O18	367			
P01	209			
P02	416			
P03	416			
P04		Jetex	170	
P05	417			
P06		Wintershall		417
P07		Jetex	222	
P08a		Petrogas		26
P08b		Jetex	393	
P09a		Petrogas		59
P09b		Petrogas		67
P09c		Petrogas		267
P09d	26			
P10a		Dana nl		5
P10b		Dana nl		100
P10c		Jetex	249	
P11a		Oranje-nassau		210
P11b		Dana nl		210
P12		Wintershall		421
P13	422			
P14	422			
P15a		Taqqa		203
P15b		Taqqa		17
P15c		Taqqa		203
P16	423			
P17	424			
P18a		Taqqa		105
P18b		Oranje-nassau	311	
P18c		Taqqa		6
P18d		Oranje-nassau		2
Q01		Petrogas		416
Q02a	304			
Q02c		Petrogas		32
Q04		Wintershall		417
Q05a	0			
Q05b	277			
Q05d		Wintershall		20
Q07		Tulip	419	
Q08	244			
Q10a		Tulip	53	
Q10b	367			
Q11	147			



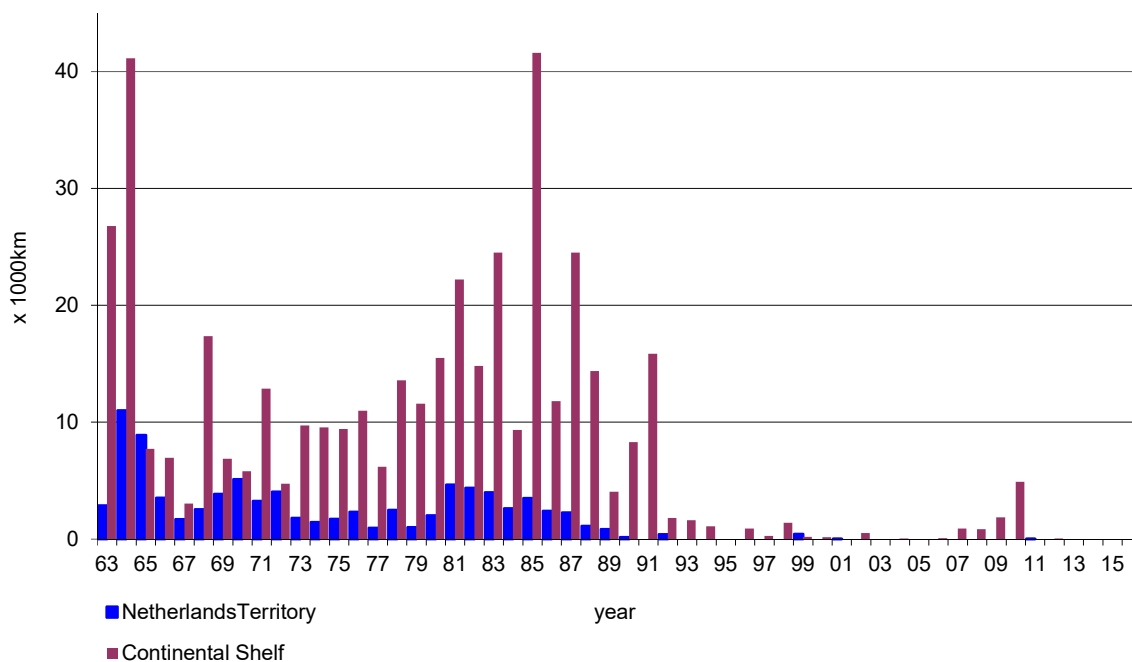
Block (part of)	Open area (km <sup>2</sup> )	Operator	Licence (km <sup>2</sup> )	
			Exploration	Production
Q13a		ENGIE		30
Q13b		ENGIE	369	
Q14	24			
Q16a		Oranje-nassau		85
Q16b		Oranje-nassau		59
Q16c		Oranje-nassau		21
R02	103			
R03	425			
R05	7			
R06	311			
R09	28			
S01	425			
S02	425			
S03a		Oranje-nassau		2
S03b		Oranje-nassau	337	
S04	427			
S05	349			
S06	10			
S07	360			
S08	95			
S10	36			
S11	0			
T01		Oranje-nassau		1
<b>Total</b>	<b>28165</b>		<b>9776</b>	<b>19061</b>

## SEISMIC SURVEYS

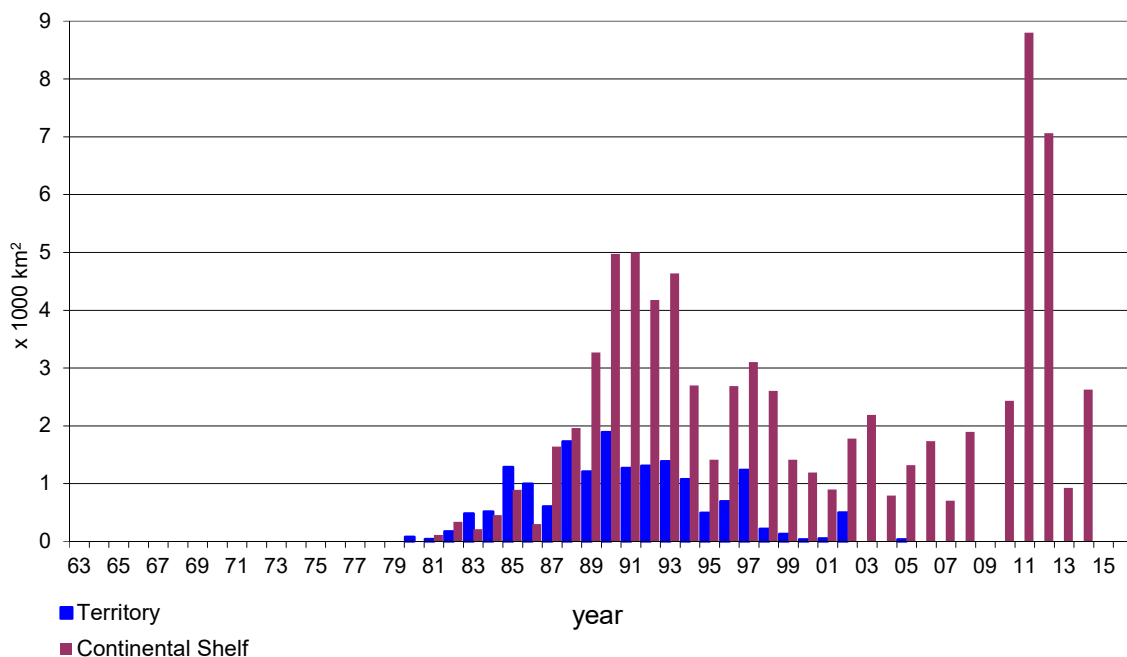
Year	Territory		Continental shelf	
	2D (km)	3D (km <sup>2</sup> )	2D (km)	3D (km <sup>2</sup> )
63	2 860	-	26 778	-
64	10 992	-	41 136	-
1965	8 885	-	7 707	-
66	3 510	-	6 939	-
67	1 673	-	3 034	-
68	2 541	-	17 349	-
69	3 857	-	6 846	-
1970	5 113	-	5 780	-
71	3 252	-	12 849	-
72	4 034	-	4 716	-
73	1 783	-	9 708	-
74	1 422	-	9 536	-
1975	1 706	-	9 413	-
76	2 318	-	10 963	-
77	948	-	6 184	-
78	2 466	-	13 568	-
79	986	-	11 575	-
1980	2 017	76	15 497	-
81	4 627	37	22 192	110
82	4 363	170	14 791	337
83	3 980	478	24 498	208
84	2 523	512	9 314	455
1985	3 480	1 282	41 593	892
86	2 386	993	11 795	296
87	2 243	601	24 592	1 637
88	1 103	1 726	14 356	1 958
89	828	1 206	4 033	3 264
1990	160	1 889	8 288	4 972
91	-	1 268	15 853	5 002
92	388	1 307	1 799	4 173
93	-	1 382	1 591	4 637
94	-	1 074	1 089	2 694
1995	-	491	-	1 408
96	-	689	892	2 686
97	-	1 236	260	3 101
98	-	214	1 383	2 603
99	43	124	181	1 409
2000	-	33	160	1 189

Year	Territory		Continental shelf	
	2 D (km)	3 D (km <sup>2</sup> )	2 D (km)	3 D (km <sup>2</sup> )
01	5	47	-	898
02	-	-	495	1 778
03	-	-	-	2 185
04	-	-	34	790
2005	-	32	-	1 314
06	-	-	53	1 732
07	-	-	886	700
08	-	-	838	1 893
09	-	-	1849	-
2010	-	-	4898	2431
11	14	-	-	8 800
12	-	-	37	7 060
13	-	-	-	925
14	-	-	-	2 624
2015	-	-	-	-
16	-	-	-	-

### 2D Seismic surveys 1963 – 2016



### 3D Seismic surveys 1963 – 2016



## OIL AND GAS WELLS: Number of wells, Netherlands Territory

Year	Exploration					Appraisal					Production
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	Σ
to1967	2	26	-	61	89	-	8	-	4	12	278
68	-	3	-	4	7	-	2	-	2	4	23
69	-	2	-	11	13	-	2	-	1	3	27
1970	-	3	-	11	14	-	1	-	-	1	25
71	-	3	-	9	12	-	3	-	1	4	55
72	-	3	-	7	10	-	-	-	2	2	64
73	-	2	-	2	4	-	1	-	-	1	46
74	-	-	-	2	2	-	4	-	1	5	50
1975	-	3	-	5	8	-	-	-	2	2	48
76	-	2	-	5	7	-	12	-	-	12	37
77	-	3	-	4	7	2	10	-	1	13	14
78	-	2	-	4	6	-	20	-	-	20	36
79	-	4	-	2	6	2	11	-	2	15	42
1980	1	2	-	2	5	2	16	-	4	22	33
81	2	2	-	11	15	5	7	-	2	14	23
82	-	5	-	9	14	-	8	-	2	10	14
83	-	4	-	4	8	1	13	-	1	15	8
84	1	6	-	7	14	4	8	-	4	16	32
1985	1	5	-	9	15	2	10	-	-	12	34
86	-	2	-	10	12	-	3	-	-	3	35
87	-	1	2	6	9	-	1	-	-	1	22
88	-	5	1	2	8	1	4	-	-	5	17
89	-	2	1	6	9	2	5	-	-	7	11
1990	-	3	1	4	8	-	3	1	1	5	17
91	-	7	1	3	11	-	3	-	1	4	11
92	-	5	2	4	11	-	1	-	-	1	12
93	-	8	-	2	10	-	-	-	-	-	11
94	-	4	-	1	5	2	2	-	1	5	4
1995	-	3	-	10	13	-	3	-	-	3	14
96	-	2	-	3	5	2	3	-	2	7	30
97	-	8	-	3	11	-	6	-	-	6	12
98	-	7	-	4	11	-	7	-	-	7	8
99	-	2	-	3	5	-	3	-	-	3	7
2000	-	2	-	-	2	-	2	-	-	2	5

Year	Exploration					Appraisal					Production
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	Σ
01	-	2	-	1	3	-	-	-	-	-	6
02	-	1	-	3	4	-	1	-	-	1	5
03	-	1	-	2	3	-	-	-	-	-	7
04	-	-	-	-	-	-	1	-	-	1	1
2005	-	2	-	1	3	-	-	-	-	-	3
06	-	3	-	1	4	-	1	-	-	1	6
07	-	2	-	-	2	-	3	-	2	5	9
08	-	1	-	-	1	-	1	-	-	1	1
09	-	1	-	1	2	-	3	-	-	3	26
2010	-	2	-	1	3	-	-	-	-	-	34
11	-	5	1	2	8	-	-	1	-	1	24
12	-	3	-	1	4	-	3	-	-	3	8
13	-	2	-	-	2	-	1	-	-	1	8
14	-	5	-	3	8	-	-	-	-	0	7
2015	-	2	-	-	2	-	2	-	-	2	4
16	-	1	-	-	1	-	-	-	-	-	8
<b>Total:</b>	<b>7</b>	<b>174</b>	<b>9</b>	<b>246</b>	<b>436</b>	<b>25</b>	<b>198</b>	<b>2</b>	<b>36</b>	<b>261</b>	<b>1262</b>

O = oil

G = gas

G&amp;O = gas &amp; oil

D = dry

Σ = total

## OIL AND GAS WELLS: Number of wells, Netherlands continental shelf

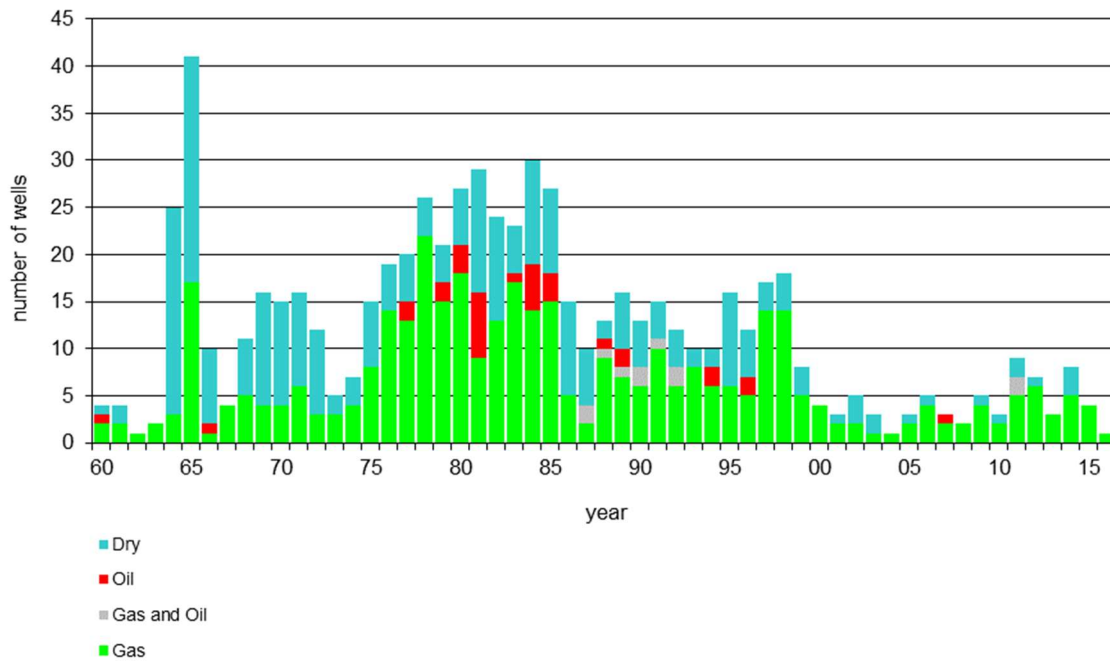
Year	Exploration					Appraisal					Production	
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	Σ	
to1967	-	-	-	3	3	-	-	-	-	-	-	-
68	-	2	-	5	7	-	-	-	-	-	-	-
69	-	2	-	13	15	-	-	-	1	1	-	-
1970	-	6	-	7	14	-	-	-	-	-	-	-
71	1	3	-	15	18	1	-	-	-	1	-	-
72	-	10	-	6	16	-	-	-	1	1	-	-
73	-	4	-	13	17	-	1	-	1	2	2	2
74	-	7	-	8	16	-	1	-	-	1	9	9
1975	1	6	-	9	15	-	1	-	2	3	12	12
76	-	5	-	11	16	1	2	-	-	3	14	14
77	-	3	-	20	23	1	3	-	1	5	18	18
78	-	4	-	14	18	1	2	-	2	5	14	14
79	-	7	-	9	17	-	3	-	1	4	9	9
1980	1	6	-	16	26	2	2	-	1	5	7	7
81	4	3	-	11	15	6	5	-	6	17	5	5
82	1	6	-	22	35	1	6	-	3	10	20	20
83	7	3	-	27	31	1	2	-	9	12	15	15
84	1	6	-	19	26	3	1	-	3	7	24	24
1985	1	9	-	24	36	2	4	-	1	7	35	35
86	3	9	-	14	25	2	2	-	1	5	15	15
87	2	9	1	12	22	1	2	1	1	5	13	13
88	-	12	1	8	21	-	4	-	1	5	21	21
89	-	10	-	13	23	-	4	-	1	5	17	17
1990	-	8	-	21	29	-	6	-	-	6	14	14
91	-	15	-	26	43	-	2	-	-	2	18	18
92	2	8	-	11	19	-	-	-	1	1	15	15
93	-	3	-	10	13	-	1	-	-	1	17	17
94	-	4	-	5	10	1	1	-	-	2	10	10
1995	1	2	-	3	5	-	1	1	1	3	16	16
96	-	10	1	12	24	-	5	-	-	5	6	6
97	1	7	-	13	21	1	8	-	1	10	13	13
98	1	9	-	8	17	1	1	-	1	3	13	13
99	-	7	-	5	12	-	1	-	1	2	6	6
2000	-	4	-	2	6	-	6	-	-	6	9	9

Year	Exploration					Appraisal					Production
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	Σ
01	-	9	-	6	15	-	2	-	2	4	12
02	-	6	-	10	16	-	1	-	2	3	13
03	-	6		1	7	-	3	-	1	4	13
04	-	7	-	4	11	-	2	-	-	2	6
2005	-	3	-	1	4	-	1	-	-	1	8
06	-	3	-	6	9	1	2	-	-	3	16
07	-	3	-	2	5	-	2	-	-	2	12
08	-	4	1	3	8	-	3	-	-	3	13
09	-	4	-	3	7	-	3	-	-	3	11
2010	-	4	-	3	7	-	2	-	-	2	12
11	-	1	1	4	6	1	2	-	-	3	15
12	1	5	-	1	7	1	1	-	-	2	11
13	-	2	-	2	4	2	-	-	-	2	10
14	1	4	1	3	9	2	2			4	11
2015	-	6	-	3	9	1	2	-	-	3	11
16	-	2	-	1	3	-	1	-	-	1	9
<b>Total:</b>	<b>29</b>	<b>278</b>	<b>6</b>	<b>468</b>	<b>781</b>	<b>39</b>	<b>106</b>	<b>2</b>	<b>46</b>	<b>187</b>	<b>570</b>
O = oil	G = gas	G&O = gas & oil	D = dry	Σ = total							

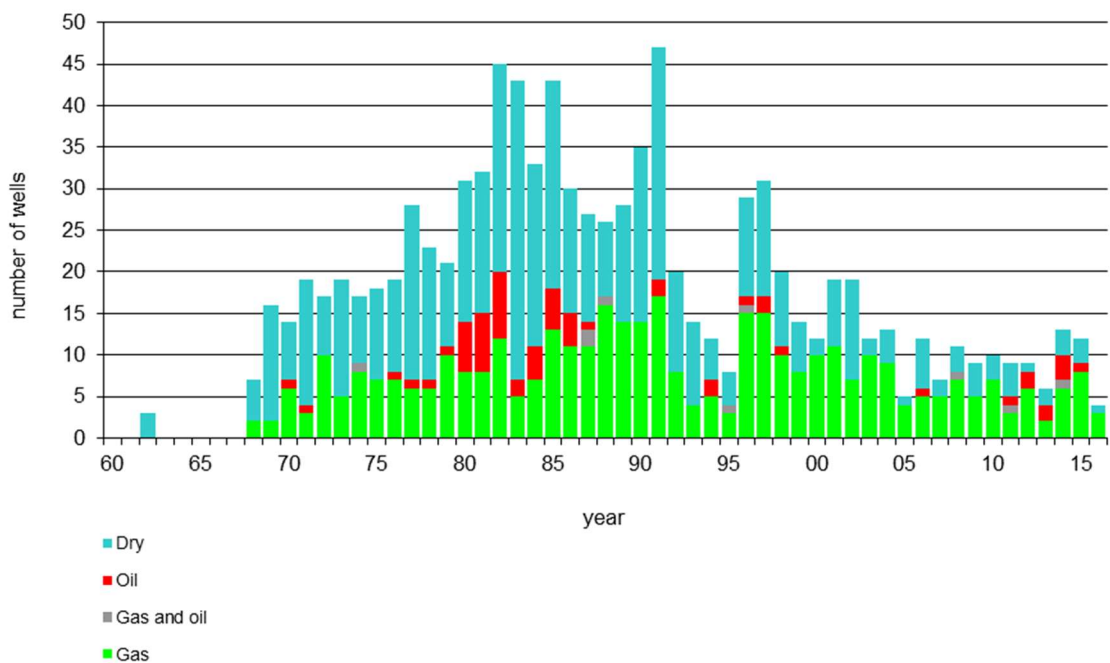


## NUMBER OF WELLS: Netherlands Territory and continental shelf since 1960

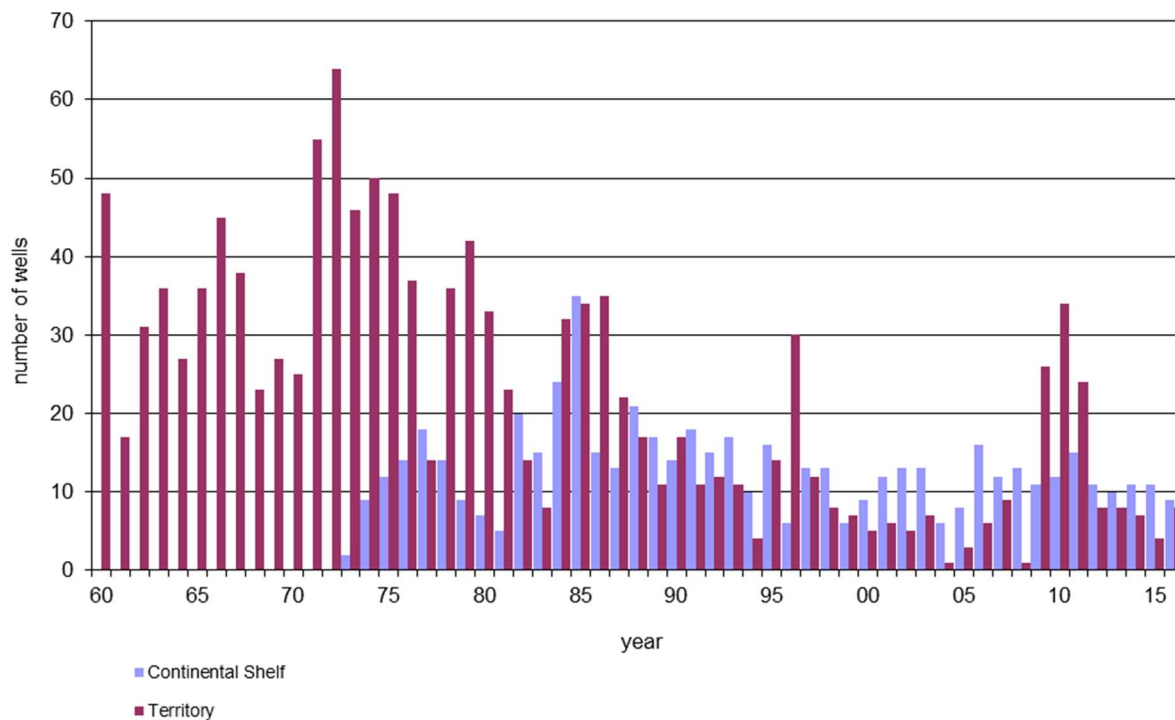
### Exploration and appraisal wells. Netherlands Territory 1960 - 2016



### Exploration and appraisal wells. Continental shelf 1960 – 2016



### Production wells 1960 – 2016



**PLATFORMS: Netherlands continental shelf as at 1 January 2017**

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
K13-A	Wintershall	1974	8	G	production/compression
K13-A	Wintershall	1974	4	G	Wellhead
L10-A	ENGIE	1974	8	G	production
L10-A	ENGIE	1974	10	G	wellhead/compression
L10-A	ENGIE	1974	4	G	Riser
L10-B	ENGIE	1974	4	G	Satellite
L10-C	ENGIE	1974	4	G	Satellite
K14-FA-1	NAM	1975	10	G	Integrated
L7-B	Total	1975	4	G	Integrated
K15-FA-1	NAM	1977	10	G	Integrated
K8-FA-1	NAM	1977	10	G	Integrated
K8-FA-2	NAM	1977	4	G	Satellite
L10-D	ENGIE	1977	4	G	Satellite
L10-E	ENGIE	1977	4	G	Satellite
L7-C(C)	Total	1977	4	G	Wellhead
L7-C(P)	Total	1977	8	G	production
L7-C(Q)	Total	1977	4	--	accommodation
K15-FB-1	NAM	1978	10	G	Integrated
L7-BB	Total	1978	4	G	wellhead
K7-FA-1	NAM	1980	4	G	Wellhead
L10-BB	ENGIE	1980	3	G	Wellhead
L10-F	ENGIE	1980	4	G	Satellite
K10-B	Wintershall	1981	6	G	production
K10-B	Wintershall	1981	6	G	Wellhead
L4-A(PA)	Total	1981	8	G	Integrated
Q1-HELM	Unocal	1981	6	O	Production
Q1-HELM	Unocal	1981	4	O	Wellhead
K7-FA-1	NAM	1982	6	G	Production
P6-A	Wintershall	1982	8	G	Integrated
Q1-HELDER-A	Unocal	1982	6	O	production
Q1-HELDER-A	Unocal	1982	4	O	Wellhead
K12-A	ENGIE	1983	4	--	Jacket
L7-C(PK)	Total	1983	4	G	Compression
Q1-HOORN	Unocal	1983	6	O	Production
Q1-HOORN	Unocal	1983	4	O	wellhead
K12-C	ENGIE	1984	4	G	satellite
K18-KOTTER	Wintershall	1984	8	O	production
K18-KOTTER	Wintershall	1984	6	O	wellhead
K8-FA-3	NAM	1984	6	G	satellite
L10-EE	ENGIE	1984	3	G	wellhead
L10-G	ENGIE	1984	4	G	satellite
L4-B	Total	1984	4	G	wellhead
L7-A	Total	1984	4	G	satellite

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
AWG-1	NAM	1985	3	G	riser
AWG-1P	NAM	1985	6	G	production
AWG-1W	NAM	1985	4	G	wellhead
K12-D	ENGIE	1985	4	G	satellite
K14-FA-1C	NAM	1985	8	G	compression
L16-LOGGER	Wintershall	1985	4	O	production
L16-LOGGER	Wintershall	1985	4	O	wellhead
P15-RIJN-A	TAQA	1985	4	O	wellhead
P15-RIJN-C	TAQA	1985	6	O	production
P6-B	Wintershall	1985	4	G	satellite
L11b-A	Unocal	1986	4	G	integrated
L13-FC-1	NAM	1986	4	G	wellhead
L13-FC-1	NAM	1986	6	G	production
Q8-A	Wintershall	1986	3	G	wellhead
K12-BD	ENGIE	1987	4	G	wellhead
K12-BP	ENGIE	1987	8	G	production
K9ab-A	ENGIE	1987	4	G	integrated
K9c-A	ENGIE	1987	4	G	integrated
L10-AC	ENGIE	1987	4	G	compression
Zuidwal	Total	1987	8	G	wellhead
K12-CC	ENGIE	1988	4	G	compression
L10-L	ENGIE	1988	4	G	satellite
L10-S-1	ENGIE	1988	-	G	subsea completion
L13-FD-1	NAM	1988	4	G	satellite
L7-N	Total	1988	4	G	satellite
L8-A	Wintershall	1988	4	G	satellite
L8-G	Wintershall	1988	6	G	integrated
L8-H	Wintershall	1988	4	G	satellite
K15-FC-1	NAM	1989	4	G	satellite
L13-FE-1	NAM	1989	4	G	satellite
L7-H	Total	1989	4	G	satellite
Q1-HAVEN-A	Unocal	1989	1	O	satellite
K15-FG-1	NAM	1990	4	G	satellite
L11a-A	ENGIE	1990	4	--	jacket
P12-SW	Wintershall	1990	4	G	satellite
AME-2	NAM	1991	4	G	wellhead
AME-2	NAM	1991	4	G	production
K12-S1	ENGIE	1991	-	G	subsea completion
K6-D	Total	1991	4	G	wellhead
K6-P	Total	1991	4	G	production
L2-FA-1	NAM	1991	6	G	integrated
F15-A	Total	1992	6	G	integrated
F3-FB-1P	NAM	1992	3+GBS	G+O	integrated
J6-A	ENI	1992	6	G	integrated
K6-C	Total	1992	4	G	wellhead/riser
K6-DN	Total	1992	4	G	satellite

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
L5-FA-1	NAM	1992	6	G	integrated
P15-10S	TAQA	1992	-	G	subsea completion
P15-12S	TAQA	1992	-	G	subsea completion
P15-14S	TAQA	1992	-	G	subsea completion
F3-FB-AP	NAM	1993	3	G+O	accommodation
F3-OLT	NAM	1993	1	O	offshore loading tower
K6-N	Total	1993	4	G	satellite
L15-FA-1	NAM	1993	6	G	integrated
P15-D	TAQA	1993	6	G	production
P15-E	TAQA	1993	4	G	satellite
P15-F	TAQA	1993	4	G	satellite
P15-G	TAQA	1993	4	G	satellite
P18-A	TAQA	1993	4	G	satellite
P9-Horizon	Unocal	1993	4	O	integrated
P9-Seafox-1	Unocal	1993	4	O	accommodation
K5-A	Total	1994	4	G	wellhead
K5-D	Total	1994	4	G	satellite
K5-P	Total	1994	4	G	production
L8-P	Wintershall	1994	4	G	satellite
Q8-B	Wintershall	1994	4	G	satellite
K5-B	Total	1995	4	G	satellite
L13-FH-1	NAM	1995	-	G	subsea completion
Q1-Halfweg	Unocal	1995	4+GBS	G	satellite
K14-FB-1	NAM	1997	4	G	satellite
K4a-D	Total	1997	-	G	subsea completion
K5-EN/C	Total	1997	4	G	satellite
L10-S-2	ENGIE	1997	-	G	subsea completion
L10-S-3	ENGIE	1997	-	G	subsea completion
L10-S-4	ENGIE	1997	-	G	subsea completion
N7-FA-SP	NAM	1997	1	G	satellite
P2-NE	Wintershall	1997	4	G	satellite
P6-S	Wintershall	1997	4	G	satellite
K4-A	Total	1998	4	G	satellite
K6-GT	Total	1998	4	G	satellite
K7-FD-1	NAM	1998	4	G	satellite
L9-FF-1P	NAM	1998	6	G	production
L9-FF-1W	NAM	1998	4	G	wellhead
Q16-FA-1	NAM	1998	-	G	subsea completion
D15-FA-1	NAM	1999	6	G	integrated
K9ab-B	ENGIE	1999	4	G	satellite
L4-PN	Total	1999	4	G	satellite
F2-A-Hanze	PCN	2000	GBS	G+O	integrated
K4-BE	Total	2000	4	G	satellite
L10-M	ENGIE	2000	4	G	satellite
L8-A-west	Wintershall	2000	-	G	subsea completion
L8-P4	Wintershall	2000	4	G	integrated

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
Q4-A	Wintershall	2000	4	G	satellite
P6-D	Wintershall	2001	4	G	satellite
K12-G	ENGIE	2001	4	G	satellite
G17d-A	ENGIE	2001	4	G	jacket
K8-FA-1P	NAM	2001	4	--	accommodation
K1-A	Total	2001	4	G	satellite
G17d-A	ENGIE	2002	4	G	satellite
K12-S2	ENGIE	2002	-	G	subsea completion
K15-FK-1	NAM	2002	4	G	satellite
K5-PK	Total	2002	4	G	satellite
Q4-B	Wintershall	2002	4	G	satellite
K7-FB-1	NAM	2003	4	G	satellite
K12-S3	ENGIE	2003	0	G	subsea completion
L5-B	Wintershall	2003	4	G	satellite
Q4-C	Wintershall	2003	4	G	satellite
D12-A	Wintershall	2004	4	G	satellite
Q5-A1	Wintershall	2004	-	G	subsea completion
F16-A	Wintershall	2005	6	G	integrated
G14-A	ENGIE	2005	4	G	satellite
G16-A	ENGIE	2005	4	G	satellite
G17a-S1	ENGIE	2005	-	G	subsea completion
G17d-AP	ENGIE	2005	4	G	production
K2b-A	ENGIE	2005	4	G	satellite
K17-FA-1	NAM	2005	1	G	satellite
L4-G	Total	2005	-	G	subsea completion
L6d-2	ATP	2005	-	G	subsea completion
P11-B-DeRuyter	PCN	2006	GBS	O	integrated
J6-C	CH4	2006	4	G	riser/compressor
L5-C	Wintershall	2006	4	G	satellite
K12-K	ENGIE	2006	4	G	wellhead
G14-B	ENGIE	2006	4	G	wellhead
A12-CPP	Chevron	2007	4	G	Integrated
L09-FA-01	NAM	2007	1	G	wellhead
L09-FB-01	NAM	2007	1	G	wellhead
K05-F	Total	2008	-	G	subsea completion
E17-A	ENGIE	2009	4	G	satellite
E18-A	Wintershall	2009	4	G	satellite
M7-A	Cirrus	2009	1	G	satellite
P9-A	Wintershall	2009	-	G	subsea completion
P9-B	Wintershall	2009	-	G	subsea completion
F03-FA	Centrica	2010	4	G	production/compression
K5-CU	Total	2010	4	G	satellite
B13-A	Chevron	2012	4	G	satellite
G16a-B	ENGIE	2012	4	G	satellite
K18-G1	Wintershall	2012	-	G	subsea completion
P11-B-Nes	Dana	2012	-	G	subsea completion

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
P11-C-Van Ghent	Dana	2012	-	O & G	subsea completion
Q08-A	Wintershall	2012		G	wellhead
Q08-B	Wintershall	2012		G	satellite
D18a-A	ENGIE	2014	4	G	wellhead
K4-Z	Total	2014	-	G	subsea completion
L5a-D	ENGIE	2014	4	G	wellhead
Q01-D	Wintershall	2014	4	G	wellhead
Q13a-A	ENGIE	2014	4	G	wellhead
L6-B	Wintershall	2015	1	G	monopile
A-18	Petrogas	2015	1	G	Satellite
K18-G2	Wintershall	2015	-	G	subsea completion
P11-E	ONE	2016	4	G	platform

GBS = Gravity Based Structure

## PIPELINES: Netherlands continental shelf as at 1 January 2017

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
ENGIE	L10-C	L10-AP	10.75 * 2.375	1974	1.1	g + m
ENGIE	L10-B	L10-AP	10.75 * 2.375	1974	7.4	g + m
NGT	L10-AR	Uithuizen	36	1975	179.0	g
Wintershall	K13-AP	Callantsoog	36	1975	120.5	g
ENGIE	L10-D	L10-AP	10.75 * 2.375	1977	1.1	g + m
ENGIE	L10-E	L10-AP	10.75 * 2.375	1977	4.0	g + m
NAM	K8-FA-1	K14-FA-1P	24	1977	30.9	g
NAM	K14-FA-1P	WGT-pipe (s)	24	1977	0.1	g + co
TotalFinaElf	L7-B	L7-P	12.75.4.5.3.5	1977	7.9	g + w + g
TotalFinaElf	L7-P	L10-AR	16	1977	15.8	g
Wintershall	K13-B	K13-AP	10 * 2	1977	9.2	aband.
NAM	K11-FA-1	K8-FA-1	6.625	1978	6.0	aband.
NAM	K8-FA-1	K8-FA-2	3	1978	4.0	c
NAM	K8-FA-2	K8-FA-1	10.75	1978	3.8	g + co
NAM	K15-FA-1	WGT-pipe (s)	24	1978	0.1	co
Wintershall	K13-D	K13-C	10 * 2	1978	3.5	aband.
Wintershall	K13-C (Bypass)	K13-AP	20	1978	10.2	g
ENGIE	L10-F	L10-AP	10.75 * 2.375	1980	4.3	g + m
TotalFinaElf	L4-A	L7-P	12.75 .3.5	1981	22.8	g + gl
NAM	K7-FA-1P	K8-FA-1	18	1982	9.4	g + co
Unocal	Q1-Helder-AW	Q1-Helm-AP	20	1982	6.2	o
Unocal	Q1-Helm-AP	IJmuiden	20	1982	56.7	o
Wintershall	K10-C (Bypass)	K10-B	10 * 2	1982	5.2	g + m
Wintershall	K10-B	K13-C (Bypass)	20	1982	7.4	g
ENGIE	K12-A	L10-AP	14 * 2.375	1983	29.2	g + m
NAM	K15-FB-1	Callantsoog	24	1983	74.3	g + co
Unocal	Q1-Hoorn-AP	Q1-Helder-AW	10.75	1983	3.5	o
Wintershall	P6-A	L10-AR	20	1983	78.7	g
ENGIE	L10-G	L10-B / L10-A (s)	10.75 * 2.375	1984	4.7	g + m
ENGIE	L10-K	L10-B / L10-A (s)	10.75 * 2.375	1984	5.8	aband.
ENGIE	L10-B	L10-AD	14	1984	6.8	g
ENGIE	L10-EE	L10-B / L10-A (s)	10	1984	0.2	g
ENGIE	K12-C	K12-A / L10-A (s)	10 * 2	1984	0.4	g + m
Wintershall	K18-Kotter-P	Q1-Helder-A	12	1984	20.2	o
TAQA	P15-C	Hoek v. Holland	10	1985	42.6	o
TAQA	P15-B	P15-C	10	1985	3.4	aband.
TAQA	P15-B	P15-C	6	1985	3.4	aband.
TAQA	P15-C	P15-B	6	1985	3.4	aband.
TAQA	P15-B	P15-C	4	1985	3.4	aband.
ENGIE	K12-D	K12-C	10.75 * 2.375	1985	4.3	g + m
NAM	AWG-1R	NGT-pipe (s)	20	1985	7.1	g + co +ci
NAM	AME-1	AWG-1R	20	1985	4.2	g + co
TotalFinaElf	L4-B	L7-A	10.75 . 3.5	1985	10.1	g + gl
TotalFinaElf	L7-A	L7-P	10.75. 3.5	1985	10.4	g + gl



Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
Wintershall	L16-Logger-P	K18-Kotter-P	8	1985	18.9	o
Wintershall	K18-Kotter-P	L16-Logger-P	6	1985	18.9	w
Wintershall	P6-B	P6-A	12 * 3	1985	3.9	g + gl
Wintershall	P6-C (toek.plf)	P6-B	12 * 3	1985	2.9	g + gl
ENGIE	K12-A/ L10-A (s)	K12-E	2.375	1986	3.9	aband.
ENGIE	K12-E	K12-C	10.75	1986	6.3	aband.
NAM	L13-FC-1P	K15-FA-1	18	1986	15.4	g + co
NAM	K8-FA-3	K7-FA-1P	12.75	1986	8.9	g
NGT	L11-B	NGT-pipe (s)	14	1986	6.8	g
Unocal	Q1-Helder-B	Q1-Helder-AW	8.625	1986	1.8	aband.
Wintershall	Q8-A	Wijk aan Zee	10	1986	13.7	g
NAM	K15-FA-1	K14-FA-1C	18	1987	24.2	g + co
NGT	K12-BP	L10-AR	18	1987	21.4	g
NGT	K9c-A	L10-AR	16	1987	36.6	g
NGT	K9c-A/L10-AR(s)	K9ab-A	16	1987	0.1	g
TotalFinaElf	Zuidwal	Harlingen TC	20 . 3 . 3	1987	20.3	g + gl + c
ENGIE	K12-A	K12-CC	10.75	1988	8.3	g
ENGIE	L10-L	L10-AP	10.75 * 2.375	1988	2.2	g + m
ENGIE	L10-S1	L10-AP	6.625 * 2.375	1988	11.5	aband.
ENGIE	K12-E	L10-S1	90 mm	1988	4.6	aband.
NGT	L8-G	L11b-A	14	1988	14.4	g
TotalFinaElf	L7-P	L7-N	10.75 * 3.5	1988	4.2	g + gl
Wintershall	L8-H	L8-A / L8-G(s)	8	1988	0.2	g
Wintershall	K13-C (Bypass)	K10-B / K13-A (s)	20	1988	2.5	g
Wintershall	L8-A	L8-G	8	1988	10.0	g
NAM	L13-FD-1	L13-FC-1P	10	1989	3.7	g + co
NAM	L13-FC-1P	L13-FD-1	3.6	1989	3.6	c
NAM	K8-FA-2	K8-FA-1	10.75	1989	4.0	g + co +ci
TotalFinaElf	L7-H	L7-N	10.75 * 3.5	1989	10.4	g + gl
Unocal	Q1-Haven-A	Q1-Helder-AW	8.625	1989	5.8	aband.
ENGIE	L14-S1	L11a-A	6.625 * 2.375	1990	6.0	aband.
ENGIE	K12-B	K12-S1	3.5	1990	4.9	c
NAM	K15-FC-1	K15-FB-1	10.75	1990	7.9	g + co
NAM	K15-FB-1	K15-FC-1	4.03	1990	7.9	c
NAM	K15-FG-1	K15-FA-1	14.3	1990	7.0	g + co
NAM	K15-FA-1	K15-FG-1	4.03	1990	7.0	c
NAM	L13-FE-1	L13-FC-1P	12.98	1990	4.3	g + co
NAM	L13-FC-1P	L13-FE-1	3.76	1990	4.3	c
NGT	L11-A	NGT-pipe (s)	10.75	1990	11.8	aband.
Wintershall	P12-C	P12-SW	8 * 3	1990	6.9	aband.
Wintershall	P12-SW	P6-A	12 * 3	1990	42.0	g + gl
ENGIE	K12-S1	K12-BP	6.625 * 2.375	1991	4.9	aband.
NAM	AME-2	AWG-1R	13.6	1991	5.2	g + co
NAM	AWG-1R	AME-2	4.02	1991	5.2	c
NAM	F3-FB-1P	L2-FA-1	24	1991	108.1	g + co
NAM	L2-FA-1	Callantsoog	36	1991	144.2	g + co
NAM	L5-FA-1	NOGAT-pipe (s)	16	1991	0.4	g + co

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
NAM	L15-FA-1	NOGAT-pipe (s)	16	1991	0.4	g + co
NAM	F15-A	NOGAT-pipe (s)	16	1991	0.3	g + co
NGT	K6-C	K9c-A	16	1991	5.2	g
TotalFinaElf	K6-D	K6-C	10.75 * 3.5	1991	3.8	g + gl
TotalFinaElf	K6-DN	K6-C	12.75 * 3.5	1992	5.4	g + gl
Wintershall	J6-A	K13-AW	24	1992	85.8	g
TAQA	P15-D	Maasvlakte	26	1993	40.1	g
TAQA	P15-E	P15-D	10 * 2	1993	13.9	g + m
TAQA	P15-F	P15-D	12 * 3	1993	9.1	g + m
TAQA	P15-G	P15-D	12 * 3	1993	9.1	g + m
TAQA	P15-10S	P15-D	4 * 2	1993	3.9	g + m
TAQA	P15-D	P15-10S	90 mm	1993	3.9	c
TAQA	P15-12S	P15-D	4 * 2	1993	6.1	g + m
TAQA	P15-D	P15-12S	90 mm	1993	6.1	c
TAQA	P15-14S	P15-G	4 * 2	1993	3.7	g + m
TAQA	P15-D	P15-14S	90 mm	1993	8.0	c
TAQA	P18-A	P15-D	16 * 3	1993	20.8	g + m
NAM	F3-FB-1P	F3-OLT	16	1993	2.0	o
NAM	F3-FB-1P	F3-OLT	3.21	1993	2.0	c
TotalFinaElf	K6-N	K6-C	12.75 * 3.5	1993	8.5	g + gl
Unocal	P9-Horizon-A	Q1-Helder-AW	10.75	1993	4.8	o + w
Wintershall	K10-V	K10-C (Bypass)	10 * 2	1993	10.3	g + m
Wintershall	P14-A	P15-D	10 * 2	1993	12.6	aband.
Lasmo	Markham ST1 (UK)	J6-A	12 * 3	1994	5.5	g + m
TotalFinaElf	K5-D	K5-A	12.75 * 3.6	1994	10.6	g + gl
Wintershall	Q8-B	Q8-A	8 * 2	1994	8.3	g + m
Wintershall	K5-A	J6-A / K13-AW (s)	18	1994	0.3	g
Wintershall	L8-P	L8-G	8 * 2	1994	7.5	g + m
ENGIE	K11-B	K12-C	14 * 2.375	1995	16.1	aband.
NAM	L13-FH-1	K15-FA-1	6.625	1995	9.4	g + co + m + ci
NAM	K15-FA-1	L13-FH-1	2.98	1995	9.4	c
TotalFinaElf	K5-B	K5-A	346 mm	1995	6.4	g
TotalFinaElf	K5-A	K5-B	3.5	1995	6.4	m + c
Unocal	Q1-Halfweg	Q1-Hoorn-AP	12.75 * 2.375	1995	12.4	g + co + m
Unocal	Q1-Hoorn-AP	Q1-Halfweg	70.9 mm	1995	12.4	c
Unocal	Q1-Hoorn-AP	WGT-pipe (s)	12.75	1995	17.2	g + co
Unocal	Q1-Haven-A	Q1-Helder-AW	8.625	1995	5.8	o + w
Wintershall	P2-NE	P6-A	10	1996	38.2	aband.
Wintershall	P6-S	P6-B	203 mm	1996	6.5	g
ENGIE	L10-S2	L10-AP	6.625 * 2.375	1997	6.3	g + m
ENGIE	L10-AP	L10-S2	84 mm	1997	7.0	c
ENGIE	L10-S3	L10-AP	6.625 * 2.375	1997	1.9	g + gl
ENGIE	K12-E	L10-S3	3.5	1997	4.5	c
ENGIE	L10-S4	L10-AP	6.625 * 2.375	1997	8.3	g + m
ENGIE	L10-AP	L10-S4	84 mm	1997	8.4	c
NAM	K14-FA-1P	K15-FB-1	16	1997	16.6	g

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
NAM	K14-FB-1	K14-FA-1P	10.75	1997	9.2	g + co
NAM	K14-FA-1P	K14-FB-1	3.65	1997	9.2	c
NAM	L9-FF-1P	NOGAT-pipe (s)	24	1997	19.3	g + co
TotalFinaElf	K4a-D	J6-A	183 mm	1997	7.3	g
TotalFinaElf	J6-A	K4a-D	2.5	1997	7.4	m + c
TotalFinaElf	K5-EN/C	K5-D	303 mm	1997	2.7	aband.
TotalFinaElf	K5-D	K5-EN/C	2.5	1997	2.7	gl
TotalFinaElf	K5-B	K5-EN/C	70 mm	1997	6.2	c
NAM	K7-FD-1	K8-FA-1	12	1998	9.4	g + co
NAM	K7-FD-1	K8-FA-1	3.4	1998	9.4	c
NAM	K8-FA-1	K14-FA-1C	24	1998	30.9	g
NAM	Q16-FA-1	P18-A	8.625	1998	10.3	g + co
NAM	P18-A	Q16-FA-1	2.375	1998	10.3	m
NAM	Q16-FA-1	P18-A	3.4	1998	10.3	c
TotalFinaElf	K4-A	K5-A	12 * 3	1998	6.9	g + gl
TotalFinaElf	K6-GT	L4-B	10 * 3	1998	10.7	g + gl
TotalFinaElf	K4-A	K5-A	2.5	1998	6.7	c
ENGIE	K9ab-B	D15-FA-1/L10-A (s)	10	1999	0.1	g
NGT	D15-FA-1	L10-AC	36	1999	140.7	g
TotalFinaElf	L4-PN	L4-A	10	1999	11.4	aband.
TotalFinaElf	L4-A	L4-PN	4	1999	11.4	gl
ENGIE	L10-M	L10-AP	10.75 * 2.375	2000	11.9	g + m
Petro-Canada	F2-A-Hanze	TMLS	16	2000	1.5	o
TotalFinaElf	K4-BE	K4-A	9.5	2000	8.0	aband.
TotalFinaElf	K4-A	K4-BE	2.5	2000	8.0	gl
Wintershall	Q4-A	P6-A	14	2000	35.2	g + co
Wintershall	Duitsland (A6)	F3-FB-1P	20 . 4	2000	119.0	g + co
Wintershall	L8-A-West	L8-P4	6	2000	10.2	g + co
Wintershall	L8-P4	L8-A-West	82 mm	2000	10.2	c
Wintershall	L8-P	L8-P4	12	2000	2.8	g
Wintershall	L8-P4	NGT-pipe (s)	16	2000	28.0	g + co
ENGIE	K12-G	L10-AP	14 . 2	2001	15.6	g + m
NGT	G17d-A	NGT-pipe (s)	18	2001	64.5	g
Petro-Canada	F2-A-Hanze	A6 / B4 (s)	4	2001	0.1	g
Petro-Canada	F2-A-Hanze	A6 / B4 (s)	62.1 mm	2001	0.1	c
Petro-Canada	F2-A-Hanze	TMLS	62.1 mm	2001	1.5	c
TotalFinaElf	K5-EN/C	K5-D	10.75	2001	2.8	g
TotalFinaElf	K1-A	J6-A	14.75 * 3.5	2001	9.2	g + m
Wintershall	P6-D	P6-B	12	2001	6.8	g
ENGIE	K12-S2	K12-C	6.625	2002	6.9	g
ENGIE	K12-S2	K12-C	95.5 mm	2002	6.9	c
Wintershall	Q4-B	Q4-A	10.75	2002	7.3	g
Wintershall	Q4-C	Q1-Hoorn	16 * 2	2002	14.3	g + gl
ENGIE	K12-S3	K12-BP	6	2003	3.4	g
ENGIE	K12-BP	K12-S3	95.5 mm	2003	3.4	c
Maersk	Denemarken (Tyra WE)	F3-FB-1P	26	2003	38.0	g

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
Maersk	F3-FB-1P	subsea valve station	4	2003	0.3	c
NAM	K7-FB-1	K7-FD-1	12	2003	17.0	g
NAM	K8-FA-1	K7-FB-1	4	2003	26.0	c
NAM	K15-FK-1	K15-FB-1	10	2003	8.0	g
NAM	K15-FK-1	K15-FB-1	4	2003	8.0	c
Wintershall	L5-B	L8-P4	10 . 4	2003	6.4	g + c
Total	K4-BE	K4-A	10	2004	8.0	g
Wintershall	D12-A	D15-FA-1	10	2004	4.9	g
Wintershall	D12-A	D15-FA-1	10	2004	4.9	c
Wintershall	Q5-A1	Q8-B	8	2004	13.5	g
Wintershall	Q5-A1	Q8-B	4	2004	13.5	c
Wintershall	F16-A	NGT	24	2005	32.0	g
ENGIE	G14-A	G17d-AP	12 + 2	2005	19.8	g + m
ENGIE	G17a-S1	G17d-AP	6 + 92.5 mm	2005	5.67	g + c
ENGIE	K2b-A	D15-FA-1/L10-A	12	2005	2.8	
		NGT-pipe (s)				
NAM	K17-FA-1	K14-FB-1	16 * 2	2005	14.4	g + m
Total	L4-G	L4-A	6 + 4	2005	9.6	g + c
ATP	L6d-2	G17d-AP	6 + 73 mm	2005	40.0	g + c
Petro-Canada	P11-B-Ruyter	P11-B-TMLS	16	2005	1.5	o
Petro-Canada	P11-B-Ruyter	P12-SW	8	2005	29.0	g
ATP	L6d	G17d-AP	6 * 73 mm	2006	40.0	g + c
CH4 Limited	Chiswick (UK)	J6-CT	10 * 1.5	2006	18.3	g + m
ENGIE	G16A-A	G17d-AP	10 * 2	2006	17.8	g + m
ENGIE	Minke (UK)	D15-FA-1	8 . 90.6 mm	2006	15.1	g + c
Grove	Grove (UK)	J6-CT	10 * 2	2006	13.4	g + m
NAM	K17-FA-1	K14-FB-1	16 * 2	2006	14.4	g + m
Petro-Canada	P11-B-Ruyter	P11-B-TMLS	16	2006	1.5	o
Petro-Canada	P11-B-Ruyter	P12-SW	8	2006	29.0	g
Total	L4G	L4-PA	6 . 92 mm	2006	10.6	g + c
Wintershall	L5-C	L8-P4	10 . 82 mm	2006	8.1	g + c
Chevron	A12 CCP	B10 NOGAT	16	2007	16.0	g
ENGIE	G14-B	G17-D-AP	12	2007	13.4	g + m
Venture	Stamfort (UK)	J6-CT	6	2008	7.0	g
Total	L4PN	L4A	10	2008	11.4	g
NAM	L9FA	via L9FB-1» L9FF-1	16 and 2x2	2008	20.0	g + gl + gi
Total	K5-F	K6N	8	2008	10.0	g
ENGIE	G14-B	G17-D-AP	12 + 2	2008	13.4	g + m
ENGIE	K12-K	K12-BP	14+ 2	2008	10.3	g + m
ENGIE	E17-A	NGT	12	2009	2	g
Wintershall	E18-A	F16-A	10 + 84mm	2009	5.4	g+c
Wintershall	P9B	P6D	8 + 70mm	2009	16.8	g+c
Wintershall	P9A	P9B – P6D	8 + 70mm	2009	-	g+c
Cirrus	M7-A	L09-FF	6 + 2	2009	12	g+c
Wintershall	Wingate (UK)	D15-A	12 + 2	2010	20.6	g
Chevron	B13-A	A12-CPP	16	2011	22	g
ENGIE	G16a-B	G17d-AP	14	2011	14	g

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
NAM	K18-G1	K15-FA-1	8	2011	10	g+c
Dana	P11-B-Nes	P11-B-De Ruyter	8	2011	8	g+c
Dana	P11-C-Van Ghent	P11-B-De Ruyter	8	2011	4.5	g+c
Wintershall	Q4C	Q8A	10	2012	8.3	g
Total	K5-B	K5-A	8	2012	13.5	g
Wintershall	K5A	J6A/K13-A	14	2012	13.5	c
ENGIE	D18a-A	D15-A	8.2	2014	21.5	g, m
Total	K4-Z	K5-A	6	2014	17	g+c
ENGIE	L5a-D	L5-FA-1	8	2014		g
Wintershall	Q01-D	Q1-Hoorn-Q4C (s)	8	2014	2.5	g
ENGIE	Q13a-A	P15-C	8	2014	24.5	o
ONE	L6-B	L8-P4	8	2015	19.2	g
Wintershall	K18-G1	K18-G2	4	2015	0.05	g
Petrogas	A18-A	A12-A	8	2015	33	9
ONE	L11-b	L8-G-NGT Sidetap	8	2016	0.2	g
ONE	P11-E	P15-F	8	2016	9.0	g

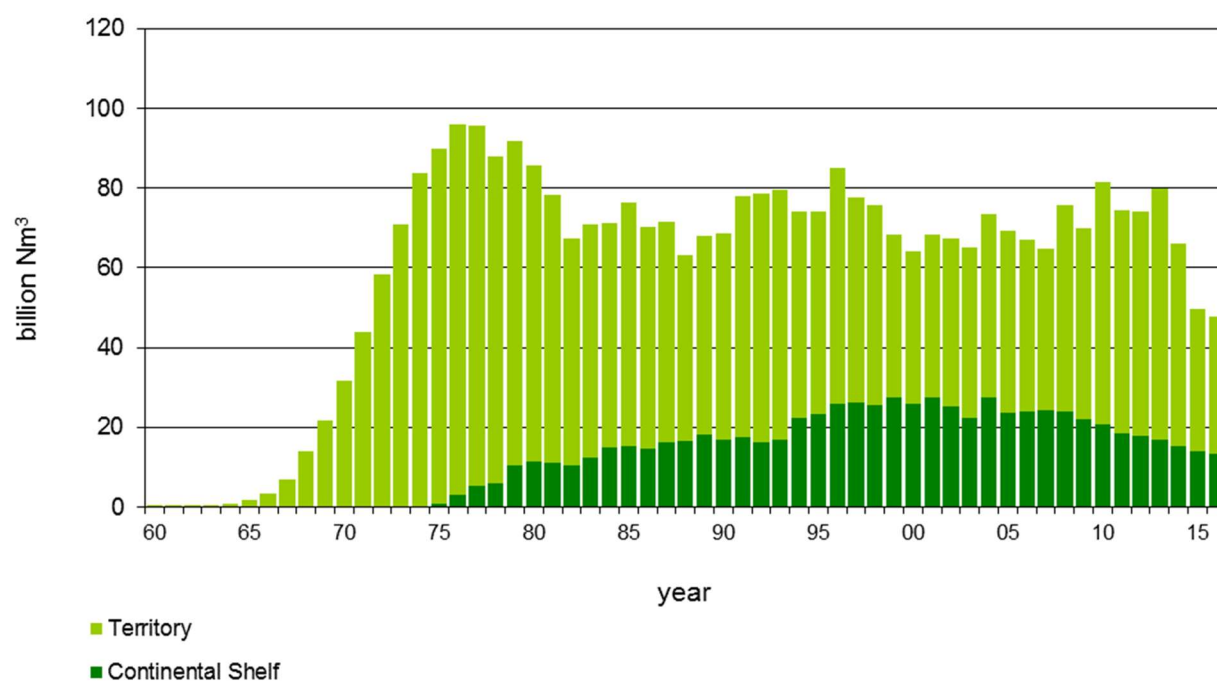
*	= multiple pipeline	gl	= glycol
,	= laid separately	m	= methanol
c	= control cable	ci	= corrosion inhibitor
o	= oil	l	= instrument air
g	= gas	(s)	= side-tap
co	= condensate	aband..	= abandoned

**PRODUCTION OF NATURAL GAS (in million Nm<sup>3</sup>)**

Year	Territory	Continental shelf	Total
1960	363.8	0.0	363.8
61	451.0	0.0	451.0
62	509.8	0.0	509.8
63	571.3	0.0	571.3
64	830.0	0.0	830.0
1965	1722.6	0.0	1722.6
66	3376.9	0.0	3376.9
67	7033.3	0.0	7033.3
68	14107.3	0.0	14107.3
69	21884.4	0.0	21884.4
1970	31663.6	7.5	31671.0
71	43820.0	2.3	43822.3
72	58423.8	1.3	58425.1
73	70840.8	7.4	70848.2
74	83720.2	13.8	83734.0
1975	88993.0	912.7	89905.7
76	93145.9	2930.3	96076.2
77	90583.8	5191.9	95775.8
78	81935.1	5967.8	87902.9
79	81354.2	10351.9	91706.2
1980	74103.0	11466.6	85569.7
81	67204.3	11178.9	78383.2
82	56853.8	10492.0	67345.7
83	58302.5	12480.7	70783.2
84	56236.0	14958.5	71194.5
1985	61182.9	15227.2	76410.1
86	55409.8	14732.7	70142.5
87	55039.3	16364.7	71404.0
88	46514.7	16667.7	63182.3
89	49810.1	18286.8	68096.8
1990	51719.3	16918.6	68637.8
91	60378.5	17705.3	78083.8
92	62252.6	16371.9	78624.5
93	62680.9	16914.2	79595.1
94	51982.7	22301.2	74283.9
1995	50826.7	23409.8	74236.5
96	59024.5	25914.7	84939.2
97	51412.3	26133.0	77545.3
98	49993.9	25716.1	75710.0
99	40574.8	27673.6	68248.4
2000	38203.4	26031.5	64234.9
01	40951.7	27518.3	68470.0
02	42137.6	25364.7	67502.3
03	42881.1	22273.8	65154.9

Year	Territory	Continental shelf	Total
04	45880.1	27592.8	73472.9
2005	45498.2	23779.6	69277.8
06	43169.5	23858.0	67027.5
07	40464.5	24259.0	64723.5
08	51860.7	23900.0	75760.7
09	47696.4	22165.0	69861.4
2010	60475.0	20921.0	81396.0
11	55881.7	18551.2	74432.9
12	56233.1	17899.8	74132.9
13	63043.5	17004.1	80047.5
14	50696.9	15257.6	65954.5
2015	35640.0	14049.0	49689.0
16	34588.0	13334.0	47923.0
Total	2692134.7	750060.2	3442196.0

### Production of natural gas 1960-2016



## GAS RESERVES AND CUMULATIVE PRODUCTION IN BILLION Nm<sup>3</sup>

Year	Territory	Continental shelf			Total		
		as at 1 Jan.	expected reserves	cumulative production	expected reserves	cumulative production	expected reserves
1974		2125	256	200		2325	256
1975			339			2325	339
76	2026	428	322	1		2347	429
77	1923	522	348	4		2271	525
78	1891	612	344	9		2235	621
79	1827	694	325	15		2152	709
1980	1917	775	288	25		2205	801
81	1850	849	282	37		2133	886
82	1799	917	261	48		2060	965
83	1748	973	258	59		2006	1032
84	1714	1032	257	71		1971	1103
1985	1662	1088	266	86		1928	1174
86	1615	1149	275	101		1889	1250
87	1568	1205	284	116		1852	1321
88	1523	1260	287	132		1810	1392
89	1475	1306	303	149		1778	1455
1990	1444	1356	323	167		1767	1523
91	1687	1408	316	184		2002	1592
92	1648	1468	329	202		1976	1670
93	1615	1530	337	218		1953	1749
94	1571	1593	334	235		1904	1828
1995	1576	1645	316	257		1892	1902
96	1545	1696	304	281		1850	1977
97	1504	1755	325	307		1829	2062
98	1491	1806	353	333		1845	2139
99	1453	1856	341	359		1794	2215
2000	1420	1897	319	386		1740	2283
01	1371	1935	313	412		1684	2347
02	1332	1976	316	440		1647	2416
03	1290	2018	310	465		1600	2483
04	1286	2061	244	487		1530	2548
2005	1236	2107	253	515		1489	2622
06	1218	2152	213	539		1431	2691
07	1168	2196	195	563		1363	2758
08	1129	2236	188	587		1317	2823
09	1101	2288	173	611		1274	2899
2010	1143	2336	174	633		1317	2969
11	1080	2396	155	654		1236	3050
12	1012	2452	153	673		1165	3124

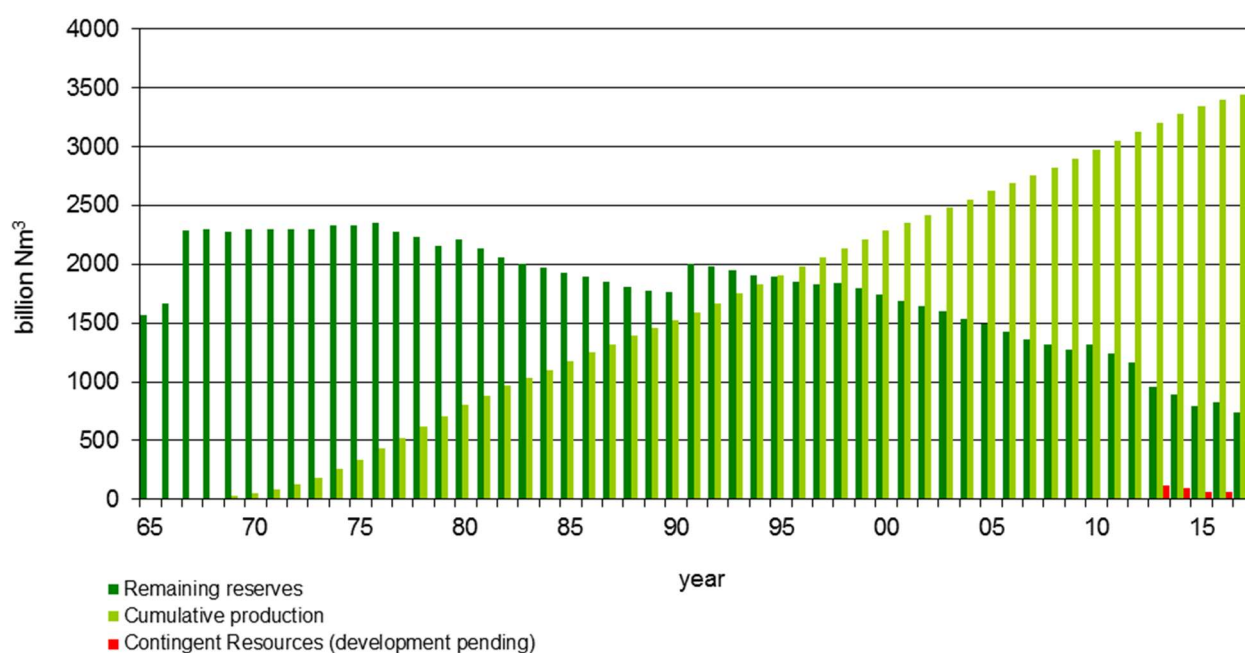


## From 2013 onwards the table has been modified, to take account of the introduction of PRMS

Rem Res = remaining reserves  
 Cont Res = contingent resources (development pending)  
 Cum Prod = cumulative production

Year	Territory			Continental shelf			Total		
As at 1 January	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod
2013	850	67	2508	105	49	690	955	117	3199
2014	805	60	2571	92	32	707	897	92	3279
2015	705	41	2622	94	24	723	799	65	3345
2016	734	40	2658	92	25	737	825	66	3394
2017	653	41	2692	87	21	750	740	62	3442

## Gas reserves and cumulative production (1 January 2016), 1965 – 2016

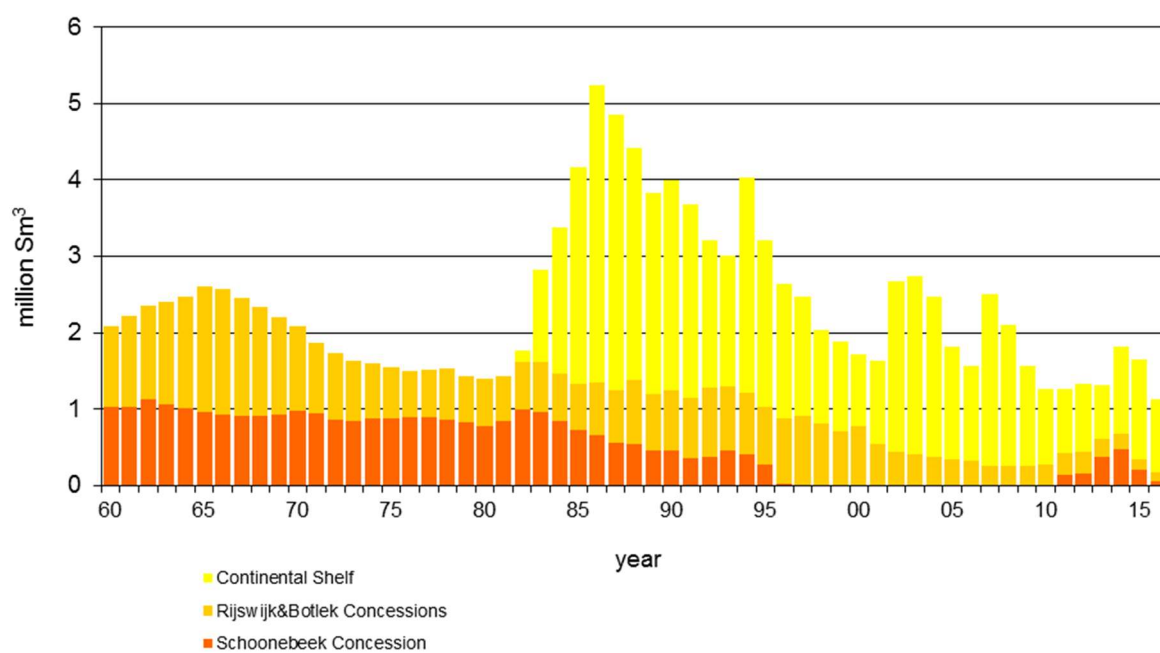


**OIL PRODUCTION in 1000 Sm<sup>3</sup>**

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Continental shelf	Total
to 1969	21 662.0	13 776 0	--	35 438.0
1970	976.0	1 112.2	--	2 088.2
71	940.7	926.8	--	1 867.5
72	856.3	883.1	--	1 739.4
73	838.2	787.4	--	1 625.6
74	878.0	715.5	--	1 593.5
1975	877.0	671.5	--	1 548.5
76	891.9	605.2	--	1 497.1
77	890.8	617.8	--	1 508.6
78	862.3	667.8	--	1 530.1
79	820.4	615.6	--	1 436.0
1980	778.9	617.7	--	1 396.6
81	839.2	596.5	--	1 435.7
82	987.9	625.3	159.7	1 772.9
83	960.0	655.6	1 209.1	2 824.7
84	846.9	615.6	1 921.7	3 384.2
1985	734.5	602.8	2 825.4	4 162.7
86	658.9	688.8	3 889.7	5 237.4
87	556.4	692.5	3 607.8	4 856.7
88	536.0	844.9	3 032.9	4 413.8
89	464.3	731.6	2 634.5	3 830.4
1990	463.0	784.9	2 744.5	3 992.4
91	366.0	777.3	2 527.9	3 671.2
92	379.3	907.3	1 920.7	3 207.3
93	454.0	849.0	1 709.8	3 012.8
94	406.4	811.4	2 804.8	4 022.6
1995	268.3	760.9	2 182.1	3 209.3
96	23.2	856.5	1 767.2	2 647.0
97	-	917.6	1 556.8	2 474.4
98	-	810.4	1 218.9	2 029.3
99	-	714.6	1 173.2	1 887.8
2000	-	776.1	936.4	1 712.5
01	-	542.2	1 085.4	1 627.6
02	-	439.0	2 236.4	2 675.4
03	-	416.2	2 324.6	2 740.0
04	-	381.3	2 081.7	2 463.0
2005	-	335.4	1 489.7	1 825.1
06	-	322.2	1 238.3	1 560.5
07	-	264.1	2 232.9	2 497.0
08	-	261.3	1 841.1	2 102.4
09	-	260.0	1 295.7	1 559.7
2010	-	280.6	981.7	1 262.3

11	144.5	277.3	847.9	1 269.7
12	149.4	289.5	883.9	1 322.8
13	374.3	229.8	709.6	1 313.7
14	472.7	204.1	1 132.7	1 809.5
2015	214.4	134.8	1 307.0	1 656.2
16	62.7	116.0	957.0	1 136.0
<b>Total</b>	<b>41 634.8</b>	<b>41 774.0</b>	<b>62 468.7</b>	<b>145 877.8</b>

### Oil production 1960 – 2016



## OIL RESERVES AND CUMULATIVE PRODUCTION IN MILLION Sm<sup>3</sup>

Year	Territory	Continental shelf		Total		
		as at 1 Jan.	expected reserves	cumulative production	expected reserves	cumulative production
1970				35.4		35.4
71				37.5		37.5
72				39.4		39.4
73				41.1	-	41.1
74	27			42.8	-	42.8
1975	40		14	44.4	-	44.4
76	51		14	45.9	65	45.9
77	49		16	47.4	65	47.4
78	46		7	48.9	53	48.9
79	44		9	50.4	53	50.4
1980	43		11	51.9	54	51.9
81	41		14	53.3	55	53.3
82	39		20	54.7	59	54.7
83	38		49	56.3	87	56.5
84	37		41	57.9	78	59.3
1985	41		34	59.4	75	62.7
86	42		36	60.7	78	66.8
87	40		35	62.1	75	72.1
88	41		33	63.3	74	76.9
89	39		32	64.7	71	81.4
1990	41		27	65.9	68	85.2
91	40		24	67.2	64	89.2
92	38		26	68.3	64	92.9
93	37		24	69.6	61	96.1
94	35		23	70.9	58	99.1
1995	34		22	72.1	56	103.1
96	33		17	73.1	50	106.3
97	33		22	74.0	55	109.0
98	12		25	74.9	37	111.4
99	8		26	75.7	34	113.5
2000	7		25	76.5	32	115.3
01	6		24	77.2	30	117.1
02	5		23	77.8	28	118.7
03	5		23	78.2	28	121.4
04	21		17	78.6	38	124.1
2005	19		15	79.0	34	126.6
06	23		13	79.3	35	128.4
07	24		14	79.7	38	129.9
08	24		13	79.9	37	132.4
09	25		9	80.2	34	134.5

Year	Territory	Continental shelf			Total		
		as at 1 Jan.	expected reserves	cumulative production	expected reserves	cumulative production	expected reserves
2010		37	80.5	13	55.6	50	136.0
2011		34	80.7	12	56.6	46	137.4
2012		29	81.2	11	57.5	40	138.6

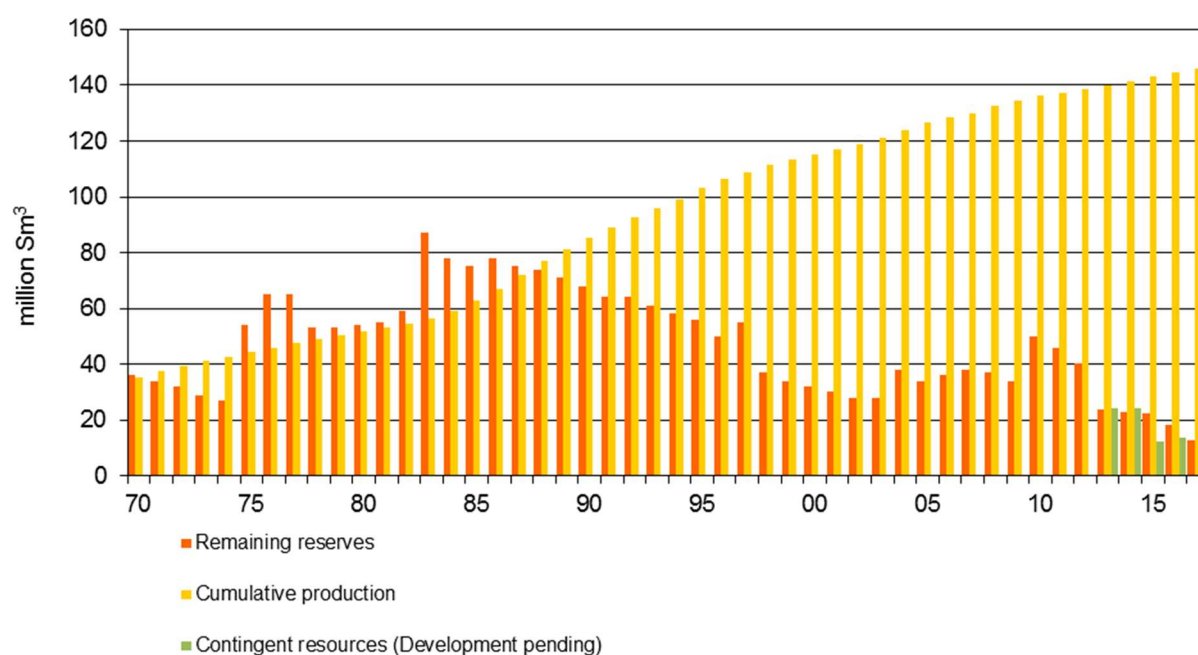
This table has been corrected to take account of the cumulative rounding-off error

### From 2017 onwards the table has been modified, to take account of the introduction of PRMS

Rem Res = remaining reserves  
 Cont Res = contingent resources (development pending)  
 Cum Prod = cumulative production

Year	Territory	Continental shelf			Total					
		as at 1 Jan.	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod		
13		17.7	23.7	81.6	6.1	0.6	58.4	23.8	24.3	140.0
14		18.0	18.7	82.2	5.0	5.4	59.1	23.0	24.1	141.3
2015		18.2	9.6	82.9	4.1	2.8	60.2	22.3	12.4	143.1
16		9.0	11.5	83.2	9.1	2.0	61.5	18.0	13.5	144.7
17		9.2	9.1	83.4	3.7	9.3	62.5	12.9	18.4	145.9

### Oil reserves and cumulative production in million Sm<sup>3</sup> 1970 – 2017



## NATURAL GAS REVENUES

Year	Non-tax revenue (€10 <sup>9</sup> )	Corporation tax (€10 <sup>9</sup> )	Total (€10 <sup>9</sup> )
1965	0	0	0
66	0	0.01	0.01
67	0.01	0.04	0.05
68	0.02	0.07	0.09
69	0.05	0.14	0.19
1970	0.09	0.18	0.27
71	0.14	0.27	0.41
72	0.14	0.41	0.55
73	0.23	0.54	0.77
74	0.41	0.86	1.27
1975	1.27	1.09	2.36
76	2.18	1.18	3.36
77	2.72	1.23	3.95
78	2.68	1.27	3.95
79	3.09	1.36	4.45
1980	4.36	1.91	6.27
81	6.22	2.45	8.67
82	6.35	2.45	8.8
83	6.22	2.45	8.67
84	7.40	2.54	9.94
1985	8.58	2.54	11.12
86	5.45	1.86	7.31
87	2.86	1.23	4.09
88	2.00	0.86	2.86
89	2.18	0.78	2.96
1990	2.61	0.96	3.57
91	3.72	1.17	4.89
92	3.04	1.02	4.06
93	2.83	0.95	3.78
94	2.34	0.91	3.25
1995	2.64	1.13	3.77
96	3.10	1.26	4.36
97	3.01	1.30	4.31
98	2.33	1.12	3.45
99	1.69	0.92	2.61
2000	3.02	1.47	4.49
01	4.37	1.98	6.35
02	3.67	1.58	5.25
03	4.31	1.74	6.05
04	4.74	1.94	6.68
2005	5.88	1.80	7.68
06	8.40	2.18	10.58
07	8.09	1.86	9.95

Year	Non-tax revenue (€10 <sup>9</sup> )	Corporation tax (€10 <sup>9</sup> )	Total (€10 <sup>9</sup> )
08	12.83	2.54	15.37
09	8.51	1.60	10.11
2010	9.14	1.50	10.64
11	10.33	1.55	11.88
12	12.58	1.72	14.30
13	13.60	1.78	15.38
14	9.10	1.29	10.39
2015	4.60	0.54	5.14
16	2.43	0.13	2.41
<b>Prognosis</b>			
17	2.43	0.16	2.59
18	2.42	0.15	2.57
19	2.32	0.14	2.46
2020	2.26	0.14	2.40

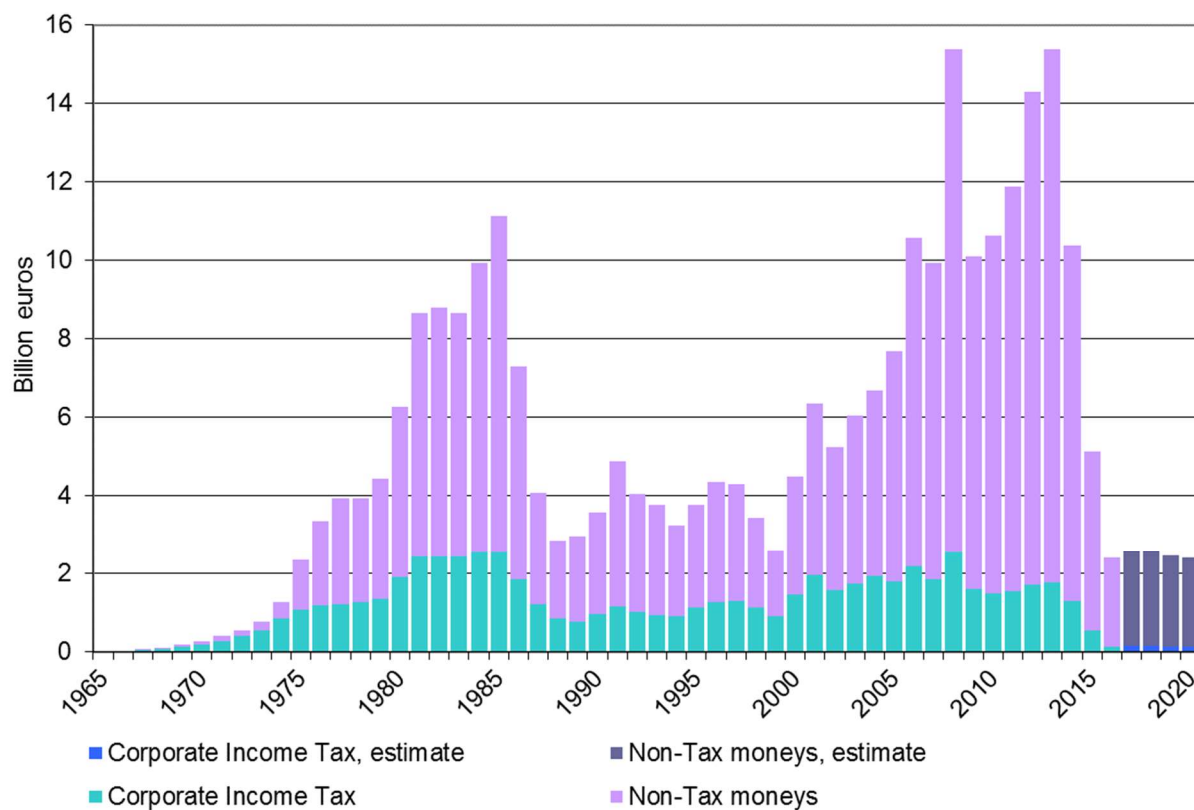
The revenues presented here are transaction-based, i.e. they have been allocated to the year in which the production that yielded the revenue took place. (By contrast, revenue recorded on a cash basis is recorded at the time the State actually receives the revenue, which is some time later than the transaction-based revenue).

Non-tax revenue comprises bonus, surface rights, royalties, the State profit shares, the special payments to the State on production from the Groningen field and the profit paid out by EBN B.V. (the State participant in the production).

Tax income for the years 2017 until the end of 2020 is anticipated based on the expected price at gas trading hubs such as TTF. The TTF price per Sm<sup>3</sup> gas used to calculate the estimates is expected at 17 euro cents. The calculations do not take into account modifications in the production from the Groningen field.

The revenues as calculated for the last year are preliminary and may still change (due to, amongst others, information from the tax authority). Therefore the numbers presented here may diverge from numbers presented by e.g. the CBS.

### Natural gas revenues 1965 – 2020





## AUTHORITIES INVOLVED IN MINING OPERATIONS

### Ministry of Economic Affairs

#### Energy Market Directorate

address: Directorate-General of Energy, Telecom and Markets  
Energy and Environmental Management  
Energy Market and Innovation

Bezuidenhoutseweg 73                      P.O. Box 20411  
2594 AC The Hague                      2500 EK The Hague

Telephone                                      : 070-3798911  
[www.rijksoverheid.nl](http://www.rijksoverheid.nl)

### TNO – Economic Affairs Advisory Group

Address: Princetonlaan 6                      P.O. Box 80015  
3584 CB Utrecht                      3508 EC Utrecht

Telephone                                      : 088 866 46 00  
[www.tno.nl](http://www.tno.nl)

### State Supervision of Mines

#### (a department of the Ministry of Economic Affairs)

Address: Henri Faasdreef 312                      P.O. Box 24037  
2492 JP The Hague                      2490 AA The Hague

Telephone                      : 070 379 8400  
E-mail                      : [info@sodm.nl](mailto:info@sodm.nl)  
[www.sodm.nl](http://www.sodm.nl)

### Netherlands Oil and Gas Portal,

#### [www.nlog.nl](http://www.nlog.nl)

The Netherlands Oil and Gas Portal provides information about mineral resources and geothermal energy in Netherlands Territory and the continental shelf with the aim of making information supplied by the Dutch government easily and clearly accessible. The portal is administered by TNO, *Geological Survey of the Netherlands* on the authority of the Ministry of Economic Affairs.

## DEFINITIONS OF SELECTED TERMS

### **Territory/Netherlands Territory:**

In this review, Territory and Netherlands Territory refer to the Netherlands mainland and that part of the Netherlands territorial waters located on the landward side of the line referred to in article 1, sub c, of the Mining Act.

### **Continental shelf:**

In this review, continental shelf and Netherlands continental shelf refer to that part of the continental shelf over which the Kingdom of the Netherlands has sovereign rights and which is located on the seaward side of the line referred to in article 1, sub c, of the Mining Act.

### **Reconnaissance licence:**

a licence to carry out a reconnaissance survey on the continental shelf; since 1 January 2003 a reconnaissance survey has only been mandatory for certain areas.

**Exploration licence:** A licence to explore for the minerals stipulated therein.

### **Production licence:**

A licence to produce the mineral resources specified in the licence, and also to explore for these mineral resources.

### **Seismic surveys:**

This review differentiates between 2D and 3D seismic techniques. There is a long tradition of two-dimensional (2D) seismic surveying in the oil industry. Vibrations are generated along a line on the surface of the ground. They are reflected back by the layers in the earth's crust and recorded by geophones or hydrophones. As the vibrations do not always propagate solely in the vertical plane underneath the recording line, the representations of geological structures in the 2D seismic sections only approximate the real-life situation. The approximation is far superior in 3D seismic surveys, in which a large number of recording lines are positioned close together in a relatively small area. Modern electronic data processing makes it possible to correct for deviations of the wave fronts that are not in the vertical plane underneath an individual recording line, making it possible to generate an accurate model of the geological structures at any desired location.

### **Wells:**

- Exploration well: a well to explore a prospective underground accumulation of oil, or gas, or of both;
- Appraisal well: A well drilled to establish the volume and extent of a gas field, or an oilfield, or a combined gas/oilfield;
- Production well: A well drilled in order to produce a gas field or an oilfield.

**Gas field / oilfield:**

A natural, isolated accumulation of gas and/or oil in an underground reservoir consisting of a porous rock that is capped or enclosed by impermeable rock. In this review, the terms reservoir, field and accumulation are used synonymously.

**Resource categories and definitions:**

In the following definitions, natural gas and oil are referred to collectively as hydrocarbons.

- 1 **Gas/oil initially in place (GIIP/OIIP)**  
the total volume of hydrocarbons initially present in a reservoir, calculated on the basis of the mean values of the parameters used in the calculations.
- 2 **Expected initial reserves**  
the total volume of hydrocarbons in a reservoir estimated to be ultimately commercially recoverable, calculated on the basis of the mean values of the parameters used in the calculations.
- 3 **Proven initial reserves**  
the volume of hydrocarbons in a reservoir estimated to be ultimately commercially recoverable (with a 90% probability, based on an expectation curve).
- 4 **Remaining expected reserves**  
that part of the expected initial reserves remaining after subtracting the cumulative production (this is the total volume of hydrocarbons produced from the reservoir concerned by the end of the year under review).
- 5 **Remaining proven reserves**  
the volume of hydrocarbons with a 90% probability of still being recoverable from a reservoir. This volume is calculated by subtracting the cumulative production from the proven initial reserves.
- 6 **Contingent resources**  
The volume of hydrocarbons in a reservoir estimated to have a 90% probability of being potentially recoverable, but currently not considered commercially recoverable due to one or more contingencies. In this annual review, only the contingent resources in the 'pending production' subclass are considered.
- 7 **Expected contingent resources**  
The volume of hydrocarbons in a reservoir expected to be commercially viable to produce under certain conditions. It is calculated using mean values of the parameters. In this annual review, only the contingent resources in the 'pending production' subclass are considered.
- 8 **Future reserves**  
The volumes of hydrocarbons not yet proven by drilling but having a certain possibility of success of contributing to reserves in the future. The following datasets and definitions have been used to estimate future reserves:
  - a. **Prospect database**  
Database containing all prospective structures ('prospects') known to the Netherlands government which may potentially contain gas or oil (future reserves). The main

source of data for this database is the annual reports submitted by the operating companies in accordance with article 113 of the Mining Act.

**b. Prospect portfolio**

The selection of prospects from the prospect database located within 'proven play' areas.

**c. Exploration potential**

Cumulative 'risked volumes' of all prospects in the prospect portfolio that meet certain selection criteria. Since 1992 the prospect folio as reported in the exploration potential reports has contained only those prospects with an expected reserve exceeding a certain minimum value. In certain reports the term 'firm futures' has been used. It is largely synonymous with exploration potential.

**d. Potential futures in proven plays**

Volume of gas expected to be present in as yet unmapped structures in the 'proven play' areas.

**e. Potential futures in as yet unproven plays**

Volume of gas expected to be present in valid plays that have not yet been proven in the Netherlands.

**f. Potential futures in hypothetical plays**

Volume of gas in plays in which one or more of the basic play elements such as reservoir, seal and source rock are not yet known.

In the definitions above, the term 'expected' is used in the statistical sense and thus the figure given represents the expected value (or expectation). The following explanation may be helpful.

All data used for the purpose of calculating volumes have an intrinsic uncertainty. By processing these uncertainties statistically, an expectation curve can be determined for each accumulation. This is a cumulative probability distribution curve, i.e. a graph in which reserve values are plotted against the associated probabilities that they will be achieved or exceeded. As production from a hydrocarbon reservoir progresses, various uncertainties decrease and the expected value will deviate less and less from the 50% value on the cumulative probability distribution curve.

In practice, the stated reserves of a given field are the expected values. This is the most realistic estimate of the volume of hydrocarbons present in a reservoir.

The recoverability of hydrocarbons from an accumulation is determined by the geological and reservoir characteristics of that accumulation, the recovery techniques available at the time of reporting and the economic conditions prevailing at that time.

**Probabilistic summation of the proven reserves:**

In this method, the probability distributions of the reserves of the individual fields are combined in order to take account of the uncertainties inherent to all reserve estimates. The result of applying the probabilistic summation method is that the total figure obtained for the proven reserves in the Netherlands is statistically more reliable. In other words, the probability that the actual reserves exceed the value stated is 90%.

**Exploration potential:**

The exploration potential has been calculated using the ExploSim program, which is described in

LUTGERT, J., MIJNLIEFF, H. & BREUNESE, J. 2005. Predicting gas production from future gas discoveries in the Netherlands: quantity, location, timing, quality. In: DORE, A. G. & VINING, B. A. (eds) Petroleum Geology: North-West Europe and Global Perspectives—

Proceedings of the 6th Petroleum Geology Conference, 77–84. q Petroleum Geology Conferences Ltd. Published by the Geological Society, London.

**Units:**

**Standard m<sup>3</sup>:** natural gas and oil reserves are expressed in cubic metres at a pressure of 101.325 kPa (or 1.01325 bar) and 15°C. This m<sup>3</sup> is defined as a standard m<sup>3</sup> in Standard no. 5024-1976(E) of the International Organisation for Standardisation (ISO) and is usually abbreviated Sm<sup>3</sup>.

**Normal m<sup>3</sup>:** natural gas and oil reserves are expressed in cubic metres at a pressure of 101.325 kPa (or 1.01325 bar) and 0°C. This m<sup>3</sup> is defined as a normal m<sup>3</sup> in Standard no. 5024-1976(E) of the International Organisation for Standardisation (ISO) and is usually abbreviated Nm<sup>3</sup>.

**Groningen gas equivalent:** In order to be able to incorporate volumes of natural gas of different qualities in calculations, they have been converted to Groningen gas equivalents (Geq). This is achieved by converting the volume of gas that differs in quality from the gas in the Groningen field to a volume of gas that is hypothetically of the same quality as the gas in the Groningen field (which is 35.17 Mega joules upper value per m<sup>3</sup> of 0°C and 101.325 kPa. or 1.01325 bar).

One Nm<sup>3</sup> gas with a calorific value of 36.5 MJ is equivalent to 36.5/35.17 Nm<sup>3</sup> Geq.  
The Groningen gas equivalent is commonly used in the Netherlands, including by N.V. Netherlands Gasunie.

Figures given as Groningen gas equivalents can easily be converted into equivalents for other fuels, such as tonnes of oil equivalents (TOE) and coal equivalents (CE).

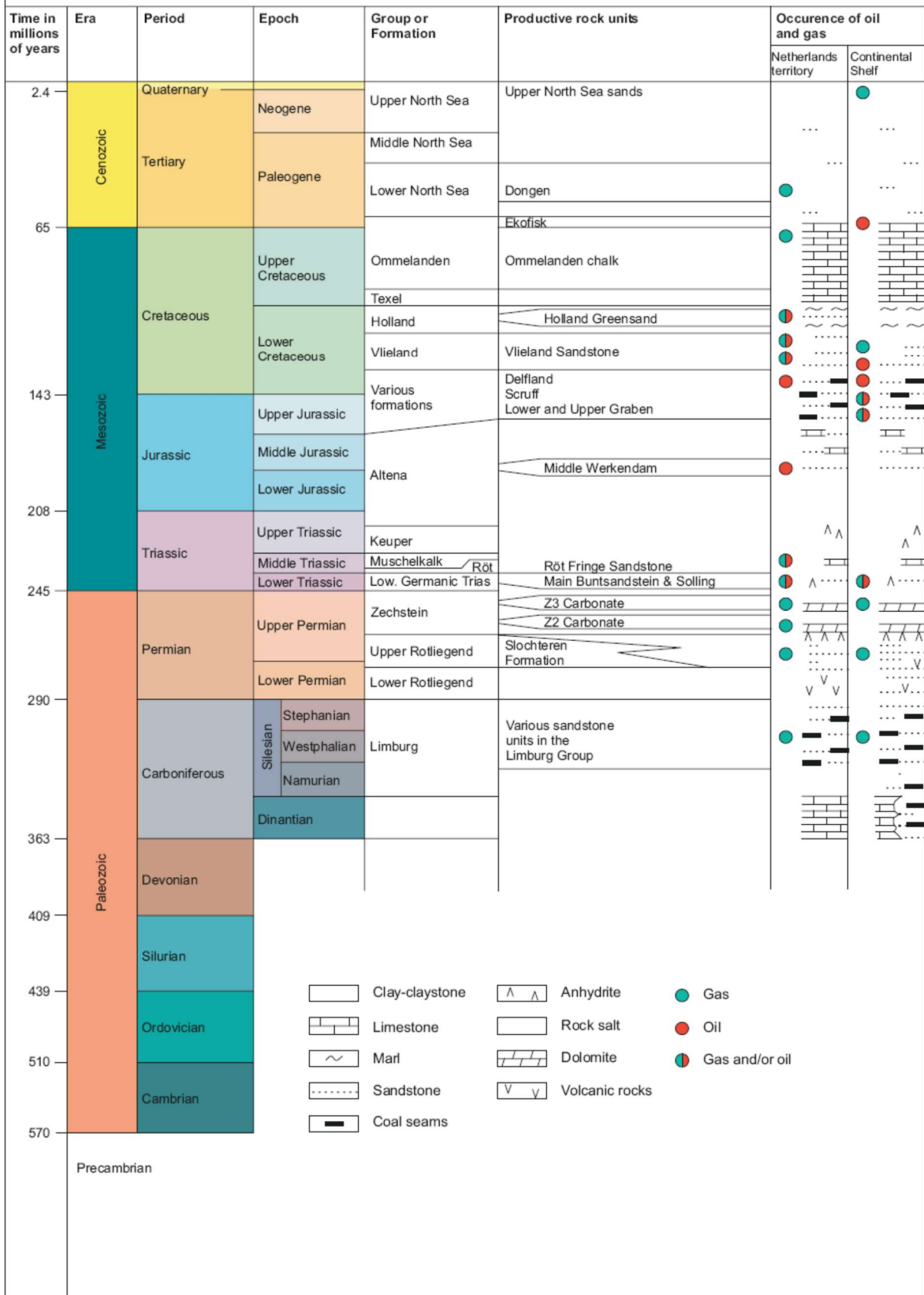
<b>Fuel</b>	<b>Unit</b>	<b>Giga joule</b>	<b>Giga calorie</b>	<b>Oil equiv. tonnes</b>	<b>Oil equiv. barrels</b>	<b>Coal equiv. tonnes</b>	<b>Gas equiv. 1 000 m<sup>3</sup></b>
Fuelwood (dry)	tonnes	13.51	3.23	0.32	2.36	0.46	0.43
Coal	tonnes	29.30	7.00	0.70	5.11	1.00	0.93
Lignite	tonnes	17.00	4.06	0.41	2.96	0.58	0.54
Coke	tonnes	28.50	6.81	0.68	4.97	0.97	0.90
Coke-oven gas	1000 m <sup>3</sup>	17.60	4.20	0.42	3.07	0.60	0.56
Blast furnace gas	1000 m <sup>3</sup>	3.80	0.91	0.09	0.66	0.13	0.12
Crude oil	tonnes	42.70	10.20	1.02	7.45	1.46	1.35
Oil equivalent	tonnes	41.87	10.00	1.00	7.30	1.43	1.32
Refinery gas	1000 m <sup>3</sup>	46.10	11.01	1.10	8.04	1.57	1.46
LPG	1000 m <sup>3</sup>	45.20	10.79	1.08	7.88	1.54	1.43
Naphtha	tonnes	44.00	10.51	1.05	7.67	1.50	1.39
Aviation fuel	tonnes	43.49	10.39	1.04	7.58	1.48	1.37
Petrol	tonnes	44.00	10.51	1.05	7.67	1.50	1.39
Paraffin	tonnes	43.11	10.29	1.03	7.52	1.47	1.36
Domestic fuel oil	tonnes	42.70	10.20	1.02	7.45	1.46	1.35
Heavy fuel oil	tonnes	41.00	9.79	0.98	7.15	1.40	1.30
Petroleum coke	tonnes	35.20	8.41	0.84	6.14	1.20	1.11
Natural gas	1000 m <sup>3</sup>	31.65	7.56	0.76	5.52	1.08	1.00
Electricity *	MWh	3.60	0.86	0.09	0.63	0.12	0.11

\* In this energy conversion table the energy value of one MWh electricity is to be understood as the energy content of a generated unit of electricity. In order to produce this unit of energy, more energy is necessary. The amount required depends on the efficiency of the conversion.

## APPENDICES

# Geological time scale

with composite stratigraphic column  
of the Netherlands and the Continental Shelf





# Mining legislation map

