

Natural resources and geothermal energy in the Netherlands

NATURAL RESOURCES AND GEOTHERMAL ENERGY IN THE NETHERLANDS

2017 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 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 2017. The second part of this report comprises annexes giving an overview of the situation as at 1 January 2018, 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 2017 and the resulting situation as of 1 January 2018. 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.

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 2018.

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Note:

In this annual report, the natural gas volumes are given in normal cubic metres (Nm³). 'Normal' relates to the reference conditions 0°C and 101.325 kPa. 1 Nm³ = 1.0554 Sm³.

In a few instances, the volumes of natural gas are given in Groningen gas equivalents (m³Geq) of 35.17 mega joules gross calorific value per m³ 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 (Sm³). 'Standard' relates to the reference conditions 15°C and 101.325 kPa.

Key figures for 2017

Natural gas and oil resources

The natural gas resources as at 1 January 2018 are estimated at 757 billion Nm³, of which 563 billion Nm³ are in the Groningen gas field. The small fields in Netherlands Territory (i.e. onshore) contain 96 billion Nm³ natural gas; those in the Dutch sector of the continental shelf contain 99 billion Nm³ natural gas.

Oil resources at 1 January 2018 were 28.6 million Sm³, of which 17.2 million Nm³ are in onshore oilfields and 11.5 million Sm³ in fields on the continental shelf.

Hydrocarbon licences

5 exploration licences and 2 production licences are pending for the Dutch Territory. In 2017, 3 exploration licences were prolonged for a duration of 1.5 to 4 years. 1 licence was restricted and 1 was relinquished.

On the continental shelf, 19 exploration licences and 4 production licences were pending in 2017. 11 exploration licences were extended. Exploration licences F18a-ondiep, Q13b, E15c, F11a and F14a were reduced in total area.

3 production licences were granted in 2017 on the Dutch continental shelf. This includes the Q7 & Q10a licence for Tulip, P18b licence for Oranje Nassau and D12b licence for Wintershall. 4 production licences were prolonged in the K & L blocks of the continental shelf. 8 production licences were reduced in total area. Petrogas E&P Netherlands B.V. has abandoned its production licence for P8a. For details, see Chapters 3 and 4 and Annexes 2, 3, 9 and 10.

Wells

In total, 14 wells were drilled for oil and gas, 13 fewer than in 2016. 6 exploration wells were drilled in 2017. Of these, 5 found gas, thus the technical success rate was 83%. In addition, 1 appraisal well and 7 production wells were drilled (territory plus continental shelf). Details can be found in Chapter 7 and Annex Table 2.

Natural gas production

In 2017 the volume of natural gas produced from Dutch fields was 41.8 billion Nm³. Onshore gas fields accounted for 29.5 billion Nm³. Of the total of 29.5 billion Nm³, 6 billion Nm³ came from small fields and 23.6 billion Nm³ from the Groningen gas field. The gas fields on the continental shelf produced 12.3 billion Nm³. As a result, total production in 2017 was 12.7% less than in 2016. For details, see Chapter 9.

Oil production

In 2017 a total of 1.12 million Sm³ oil was produced, this is 1.1% less than in 2016. Territory (i.e. onshore) fields accounted for 0.42 million Sm³, which is 134% more than in 2016. Production on the continental shelf was 0.705 million Sm³, a decrease of 26.3%. Average daily oil production in 2018 was 3080 Sm³. For details, see Chapter 9.

Underground storage

In 2017 no new applications for storage licences were submitted. One licence application submitted previously is still in the procedure. This licence is 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 2017. There are still five coal production licences in force. See Chapter 11.

Rock salt

In 2017 one exploration licence application which was applied for before 2017 was still in the application procedure. In total, 16 production licences and no exploration licences were in force at 1 January 2018. Production of rock salt in 2017 was 6.9 million tonnes. For details, see Chapter 12 and Annexes 5 and 6.

Geothermal energy

In 2017 there were 22 new applications for exploration licences for geothermal energy. 2 new exploration licences were granted in 2017. 18 exploration licences were extended, 2 licences have been split into 4 new licences and 6 licences were limited in extent. 7 exploration licences either expired or were withdrawn.

In 2017, 2 new applications for production licences were submitted, making 5 total running applications. 4 production licences were granted, making a total of 12 production licences. In 2017, 9 geothermal wells (excluding sidetracks) were drilled. Further 4 new geothermal production facilities were realised, adding up to 20 realised production facilities of which 14 facilities are actually producing. For details, see Chapter 13 and Annexes 7 and 8.

1. Natural gas resources and future domestic production

1.1. 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 2018 and the changes compared with the resources as at 1 January 2017. 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 (2018–2042).

Figures

In accordance with the Mining Act (article 113, 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)¹, 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.

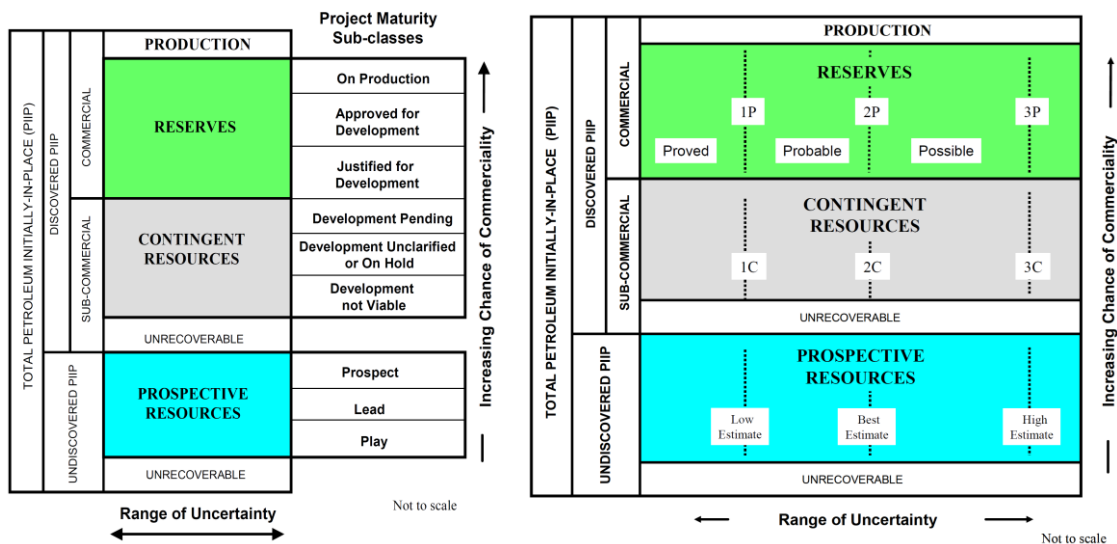


Figure 1.1. Schematic representation of the PRMS classification¹.

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.

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

The prospective resources are defined as the part of the gas considered recoverable in accumulations which have not been demonstrated yet. The subdivision of these three classes is shown in Figure 1.1. 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 1st of January 2018. 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 1st of January 2018.

Further information on the PRMS is available at www.spe.org.

1.2. 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 2018, there were 482 proven accumulations of natural gas in the Netherlands (see Table 1) and over half (247) 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 109 accumulations were not being exploited, but it is expected that 32 of them will be brought into production in the next five years (2018–2022). It is uncertain whether the remaining 77 will be developed. 121 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 1 compared to 1 January 2017. This includes two new discoveries (see Table 4) and two accumulations which have been combined to one. During 2017, a total of four fields ceased production. A complete list of all fields, grouped according to status and with information on operators and licences, is presented in Annex 1 (part two of this review).

Table 1. Proven natural gas accumulations as at 1 January 2018, classified according to their status.

Status of gas accumulation	Territory	Continental shelf	Total
I. Developed			
a. Producing	103	144	247
b. Natural gas storage	5*	0	5
II. Undeveloped			
a. Production to start 2018 - 2022	11	21	32
b. Other	32	45	77
III. Production ceased			
a. Temporarily abandoned	15	10	25
b. Abandoned	39	57	96
Total	205	277	482

* Including gas storage in caverns.

1.3. Resource estimates

Gas resources as at 1 January 2018

On 1 January 2018 the total gas resource in developed and undeveloped accumulations was 757.1 billion Nm³ (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 10th, 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 Table 2a (in billion Nm³) and Table 2b (in billion m³ Groningen gas equivalents, m³ 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 2018 the remaining reserves totalled 694.7 billion Nm³: 557.5 billion Nm³ reserves in the Groningen field and 137.2 billion Nm³ in the remaining (small) fields.

Due to seismic activity, caused by production from the Groningen gas field, the government has decided to cease production from the Groningen field as soon as possible. (letter to the House of Representatives, 29 March 2018). This implies that the reserves as of 1 January 2018 (see Table 2a) will be adjusted downwards. Awaiting the final production estimate, this annual report shows the full reserves of gas in the Groningen field.

That part of the contingent resources which is likely to be produced, is partly in producing accumulations and the greater share is in as yet undeveloped accumulations. All in all the small fields contain contingent resources of 33.4 billion Nm³ on the Territory (onshore) and 23.9 billion Nm³ on the Continental Shelf (offshore).

Table 2a. Netherlands natural gas resources as at 1 January 2018, in billion Nm³.

Accumulations	Reserves	Contingent resources (development pending)	Total
Groningen	557.5	5.1	562.6
Other territory	62.0	33.4	95.5
Continental shelf	75.1	23.9	99.0
Total	694.7	62.5	757.1

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/Nm³, the calorific value of the original content of the Groningen field. Since 2010, however, a calorific value of 35.08 MJ/Nm³ 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 2018, in billion m³ Geq.

Accumulations	Reserves	Contingent resources (development pending)	Total
Groningen	556.4	5.1	561.5
Other territory	67.9	34.8	102.7
Continental shelf	85.4	25.8	111.2
Total	709.7	65.7	775.4

Revised estimates compared to 1 January 2017

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 2017.

Table 3: Revised estimates of expected natural gas resources compared with 1 January 2018, in billion Nm³.

Area	New discoveries	Re-evaluation	Production	Total
Groningen field	0.0	-5.4	-23.6	-29.0
Other Territory	0.0	-1.1	-6.0	-7.0
Continental shelf	4.9	0.3	-12.1	-7.0
Total	4.9	-6.2	-41.7	-43.0

The net result is a decrease of the resource by 43.4 billion Nm³ compared with 1 January 2017. A brief explanation of the figures follows below.

New discoveries

Two exploration wells that struck gas seem to have found commercially recoverable volumes; Both are new fields (Table 4). The locations of the new discoveries are indicated by asterisks in Figure 1.2.

Table 4. Natural gas accumulations discovered in 2017.

Name of accumulation	Discovery well	Licence [Type]	Operator
K09c-C	K09-13	K09c [pl]	ENGIE
Ruby	N05-01-S1	N04 [el], N05 [el], N08 [el]	HANSA

El: exploration licence, pl: production licence

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 43 billion Nm³ in 2017. The revision is on the Groningen field (23.6 billion Nm³ in 2017), 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 in other fields and their associated resources are therefore not included in the overviews.

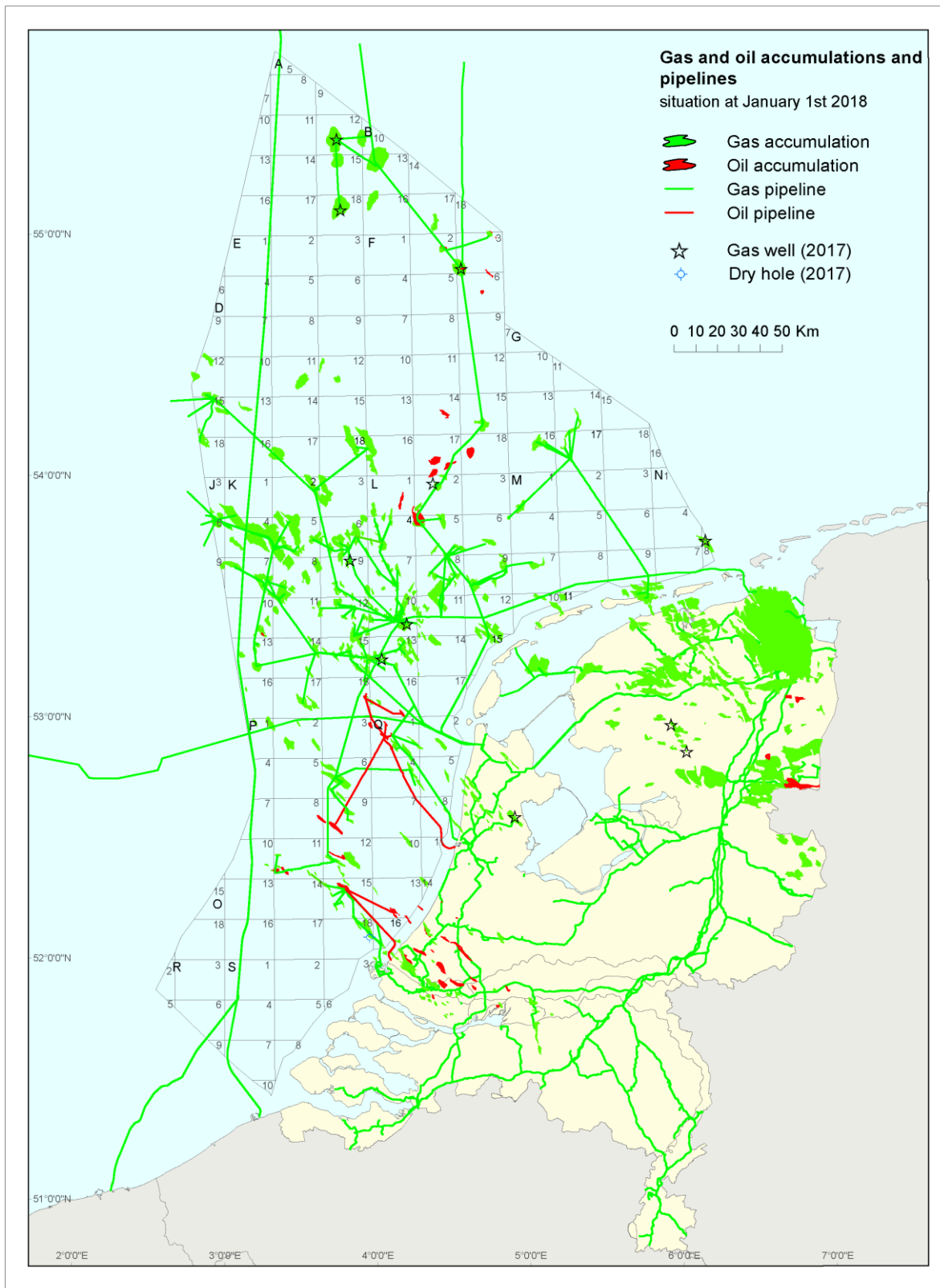


Figure 1.2. Map showing oil and gas accumulations in the Netherlands (as at 1 January 2018).

1.4. 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 data that operators provide in their annual reports for their licensed areas in accordance with article 113 of the Mining Decree. For other areas TNO uses data from its own database. In this evaluation information provided by the licensees is preferred.

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 6 offshore and 2 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 result in a large decrease in drilling intensity. The exploration potential figures presented are therefore representative on long time scales (~25 years).

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.

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. However TNO does not take into account prospects in non-proven plays or as yet unidentified prospects, thus the exploration potential will be conservative.

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 either 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). The expectation volume 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 2018 are presented in Figure 1.3 for Territory and Continental Shelf. Per MSV volume class, the number of prospects and the cumulative risked volumes are given in Figure 1.3. The total number of prospects in the Continental Shelf has decreased slightly compared to January 2017. Re-evaluation of multiple prospects has led to a major decrease in cumulative risked volume of ~40 bln Nm³.

In the Territory, the number of prospects has slightly decreased in comparison to January 2017. Similarly, a decrease in risked volume of ~10 bln Nm³ can also be noted for the Dutch Territory.

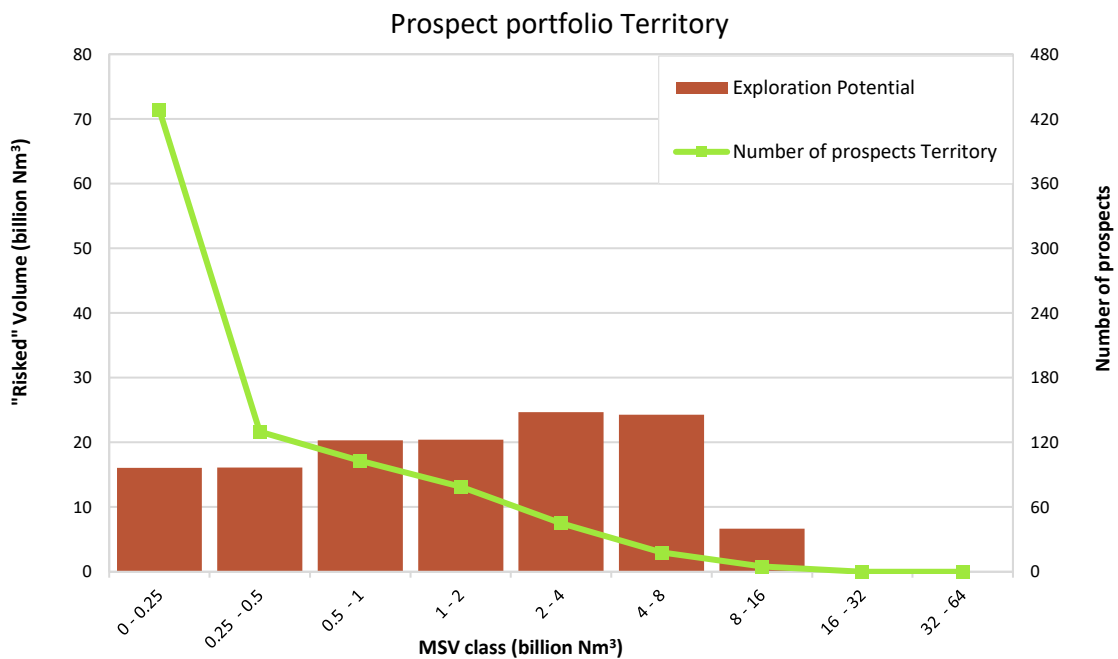
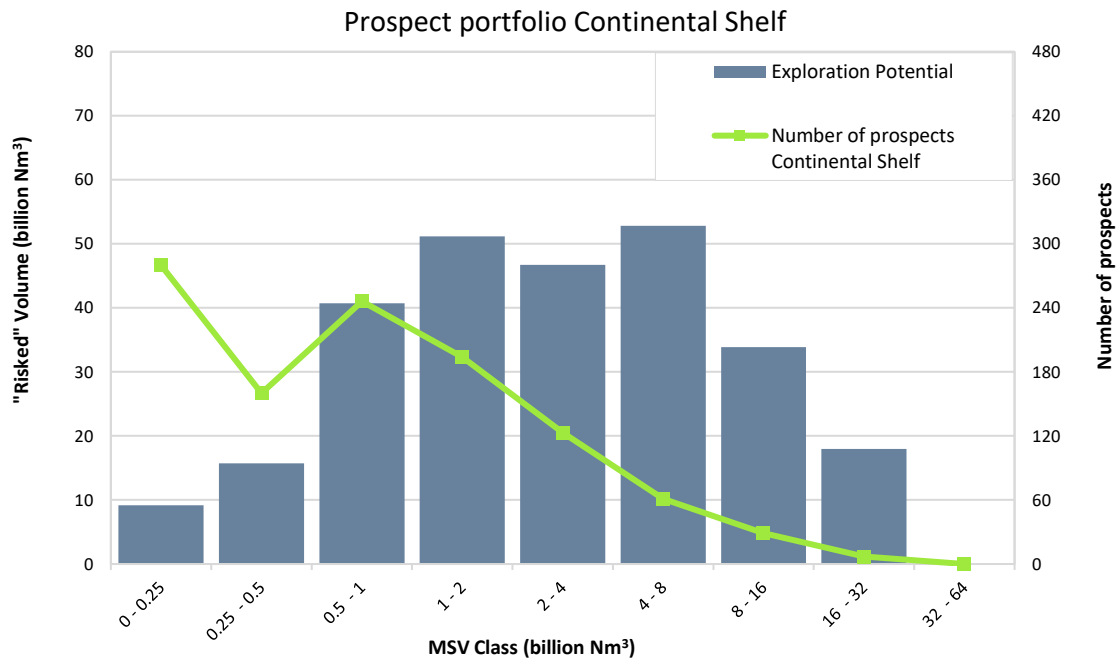


Figure 1.3. Prospect portfolio characteristics for the continental shelf and territory in volume (mean success volume - MSV) classes: Number of prospects and the cumulative (exploration potential) per MSV class.

Exploration potential

The exploration potential is that part of the prospect portfolio that meets certain minimum economic conditions. This economic threshold is based on (amongst others) the annual number of exploration wells (i.e. number of prospects drilled), the expected gasprice, the spatial distribution and availability of infrastructure, the expected volumes, productivity and the spatial distribution of the prospects. This section aims to present the exploration potential defined by two methodologies which quantify the economical attractiveness of the portfolio. The economic analysis based on Expected Monetary Value and on Risked Value to Investment Ratio.

Economic analysis based on Expected Monetary Value

Economic analysis based on Expected Monetary Value (EMV), 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 EMV is calculated for each prospect.

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, uncertainty about the prospective resources and the producing fields. 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 gas prices as provided by the Ministry of Economic affairs & Climate. From 2018 onwards, a gas price of 16.5 eurocents per Nm³ is used, this as compared to the gas price of 17 and 21.5 eurocents per Nm³, used in the annual reports 2016 and 2015 respectively.

Table 5 shows the expected volume for the exploration potential of prospects with a positive EMV cut-off at a gas price scenario's of 16.5 and 21.5 eurocents per Nm³. This at a fixed drilling rate (of 8 wells), should the exploration drilling rate decrease or the timeframe during which exploration continues then the potential will be lower.

The decrease in the expected volume of the exploration potential as compared to the status of 1 January 2017 is mainly due to the significant reevaluation and subsequent decrease of the portfolio on the continental shelf and to a lesser extent on the territory. In order to illustrate the effect of the gas price on the expected volume Table 5 also shows the expected values of the exploration potential with the gas price of 21.5 eurocents per Nm³ as used in the annual report 2016. This shows that the trend of decreasing volumes on the Continental Shelf since 2016 can be attributed to a combination of lower gas price and the aforementioned re-evaluation.

Table 5. Exploration potentials for natural gas at 1 January 2018, assuming an economic lower cut-off of EMV = 0 Euro, and a gas price of 16.5 and 21.5 eurocents per normal cubic meter.

Area	Expected volume of exploration potential [billion Nm ³] 16.5 ct/Nm ³ .	Expected volume of exploration potential [billion Nm ³] 21.5 ct/Nm ³ .
Territory	98	116
Continental shelf	85	105

Economic analysis based on Risked Value to Investment Ratio

The Risked Value to Investment Ratio (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).

Exploration potential trend/history

Figure 1.4 and Figure 1.5 shows the trend in the high and low estimate of exploration potential in the Netherlands. The graph for Territory (Figure 1.4) shows a gradual decline from 1996 to 2005 followed by a slight increase continuing to 2016. The continental shelf estimate (Figure 1.5) illustrates an upward trend in the high and low estimate until circa 2004, after which there is a downturn to the level of the 1990s. This is followed by a rapid increase from 2011 to 2015 and finally a decrease from 2016 onwards. As mentioned above this recent decrease is mostly due to an extensive reevaluation of the volumetrics of individual prospects and gasprice decrease.

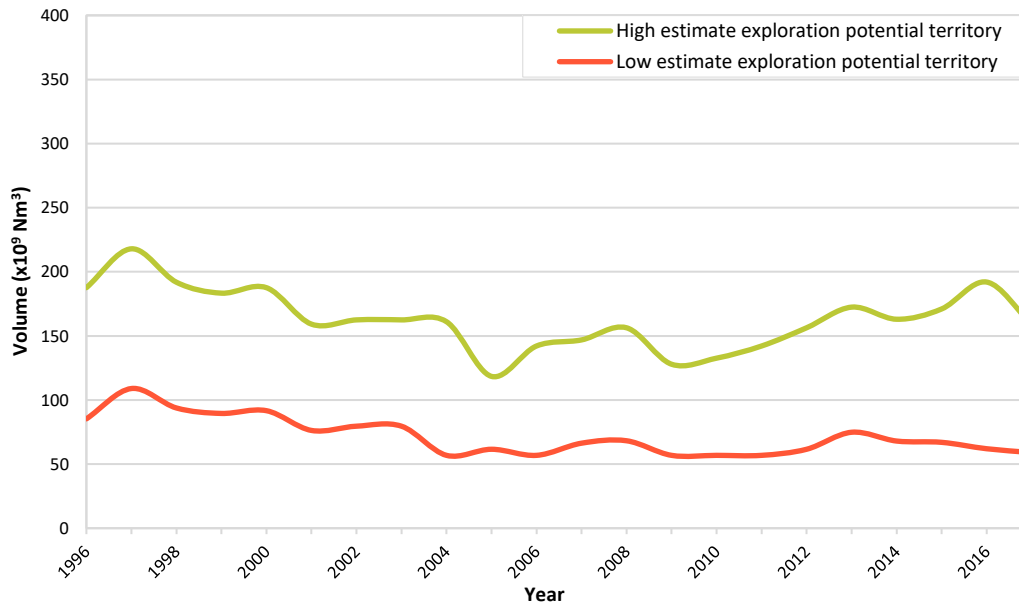


Figure 1.4. Onshore exploration potential development, over the period 1996 till now.

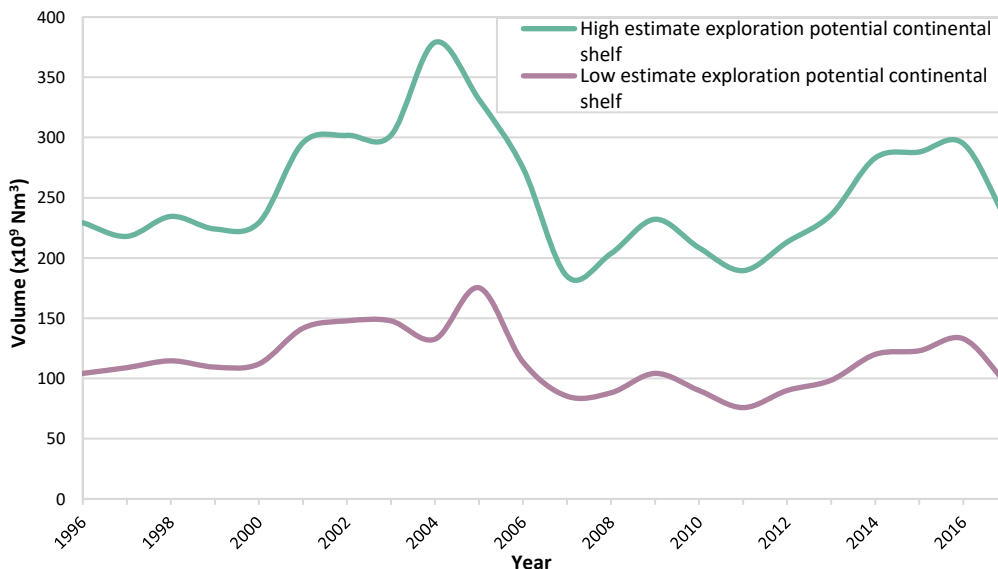


Figure 1.5. Offshore exploration potential development, over the period 1996 till now.

1.5. 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 65 applications have been filed, of which 51 have been successful. six 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. This site also gives the activities in the production licence areas onshore, classified under article 32a of the Mining Act.

1.6. 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 (2018 to 2042). Estimates are largely based on data submitted by operators. The reference date for the present review is 1 January 2017. All the volumes in this paragraph are given in billions of m³ Groningen gas equivalents. Plans on production from the Groningen gasfield are based on the cabinet decision of March 29th 2018 (letter to House of Representatives, DGETM-EI / 18057375)

Groningen Gasfield

The minister of Economic Affairs and Climate Policy has indicated that the cabinet (letter to House of Representatives, DGETM-EI / 18057375, March 29 2018) intends to lower gas production from the Groningen gasfield to below 12 billion Nm³ before October 2022, possibly a year earlier.

The “baseline path” suggested by the cabinet encompasses the conversion of 53 major (industrial) gas consumers from L-gas to H-gas and the introduction of a new nitrogen plant. A successful conversion of the major gas consumers will allow a reduction of annual gas production from the Groningen field to 7.5 billion Nm³. The production rate might be significantly lower from October 2022 onwards depending on the effect of several additional measures such as; additional nitrogen plant capacity, further conversion of major consumers, expedited decrease of export of low calorific gas, increasing sustainability of the built environment and greenhouses and never producing more gas than necessary.

The decrease of production of the Groningen gas is expected to result in cessation of production in 2030 based on current effort levels and assuming “cold” years. However, it remains to be seen how the reduction to zero is reached. This will be further expanded upon by, amongst others, NAM and GTS.

Figure 1.6 shows the “baseline path” (without additional measures) as proposed by the cabinet for a cold, average and warm year. These scenarios are included as seismicity is mostly influenced by the total produced volume and not by the peaks in production. In an average year production rate will drop below 5 billion Nm³ by 2023, even if none of the additional measures taken will have an effect.

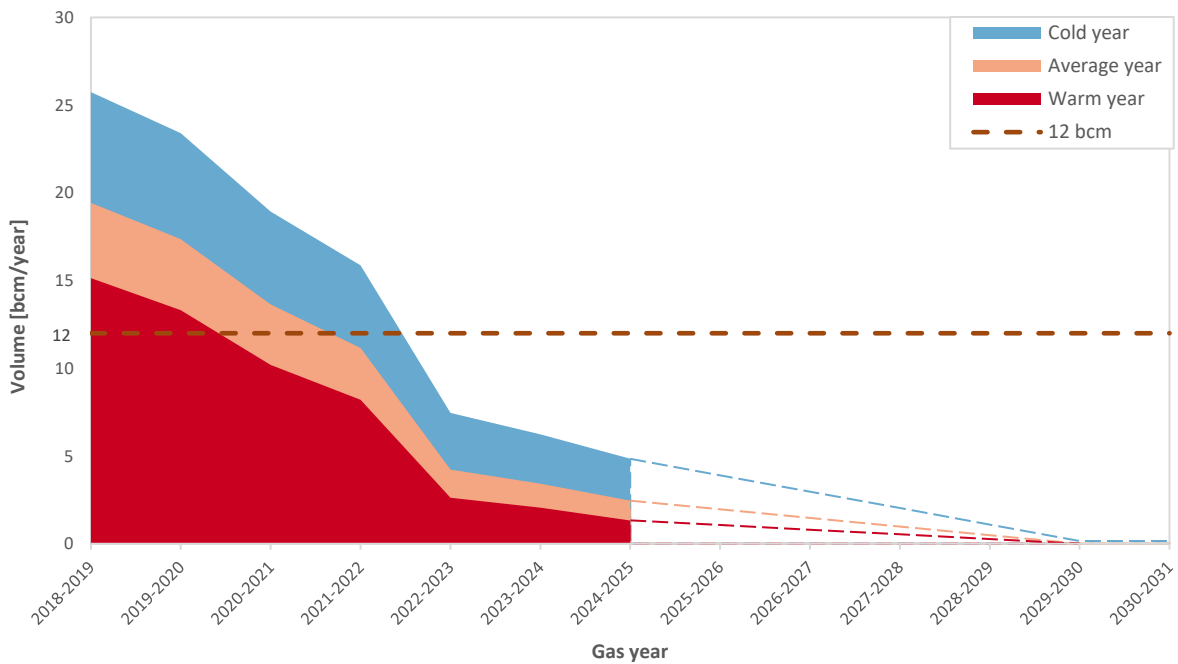


Figure 1.6. Production profile for the Groningen gas field for a cold, average and warm year according to the 'basic path' proposed by the government (letter to the House of Representatives, DGETM-EI / 18057375, 29 March 2018).

Small fields

The expected production of gas from the smaller and yet undiscovered fields (exploration potential) for 2018 is estimated at 19 billion m³ Geq. Over the coming 25 years (2018 to 2042) this will decrease to roughly 4 billion m³ Geq (figure 1.7). Total production over this period will be 311.1 billion m³ Geq (table 6). In addition to the estimated production, figure 1.7 also shows the realized production from the small fields over the period 2008-2017. The production in 2017 was 89% of the planned amount for the small fields.

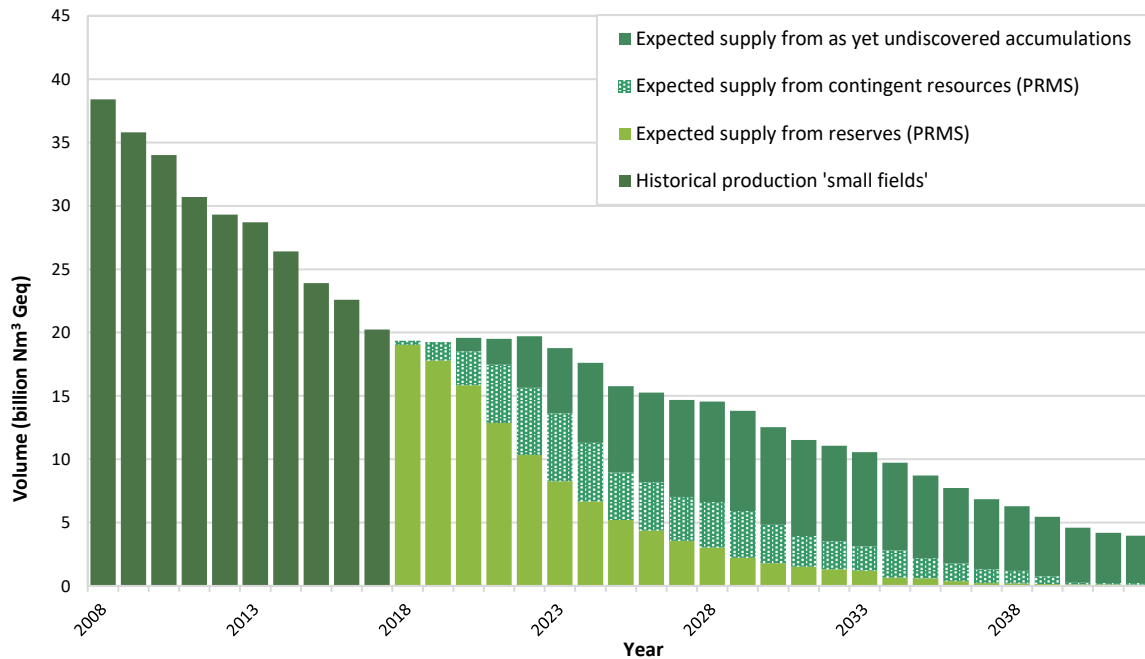


Figure 1.7. Realised and prognosed production of natural gas from small fields in the Netherlands from 2008 – 2042 (see also table 6). The Groningen gas field is excluded (see text).

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 (8 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 (34,5 billion Nm³ of gas that was present in the reservoir at time of conversion to UGS) 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. Production of UGS related reserves is mostly dependent on the developments pertaining to the Groningen field and the energy transition.

Table 6. Domestic production and supply of natural gas from small fields for the period 2018 – 2042, in billion m³ Geq. (for graphic representation see figure 1.7).

Year	Past production	Expected supply from reserves	Expected supply from contingent resources	Expected supply from undiscovered accumulations
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	20.2	-	-	-
2018	-	19.0	0.3	0.0
2019	-	17.8	1.4	0.0
2020	-	15.9	2.7	1.1
2021	-	12.9	4.6	2.0
2022	-	10.3	5.3	4.1
2023	-	8.3	5.4	5.2
2024	-	6.7	4.6	6.3
2025	-	5.2	3.7	6.8
2026	-	4.4	3.8	7.1
2027	-	3.6	3.5	7.7
2028	-	3.0	3.6	7.9
2029	-	2.2	3.7	7.9
2030	-	1.8	3.0	7.7
2031	-	1.5	2.4	7.6
2032	-	1.3	2.2	7.5
2033	-	1.2	1.9	7.4
2034	-	0.6	2.2	6.9
2035	-	0.6	1.6	6.5
2036	-	0.4	1.4	6.0
2037	-	0.2	1.1	5.5
2038	-	0.2	1.0	5.1
2039	-	0.1	0.6	4.7
2040	-	0.1	0.1	4.3
2041	-	0.1	0.1	4.0
2042	-	0.1	0.1	3.8
Total		117.6	60.4	133.1

A part of the exploration potential has over time been added to reserves. This is shown by the increase in cumulative production and remaining reserves in Figure 1.7 up to ~2012. Since 2011 for the continental shelf and 2013 for the territory the line of cumulative production and remaining reserves is decreasing (Figure 1.8 and Figure 1.9). Additional reserves from exploration wells and/or contingent resources have not been sufficient to counteract the negative reevaluations of remaining reserves.

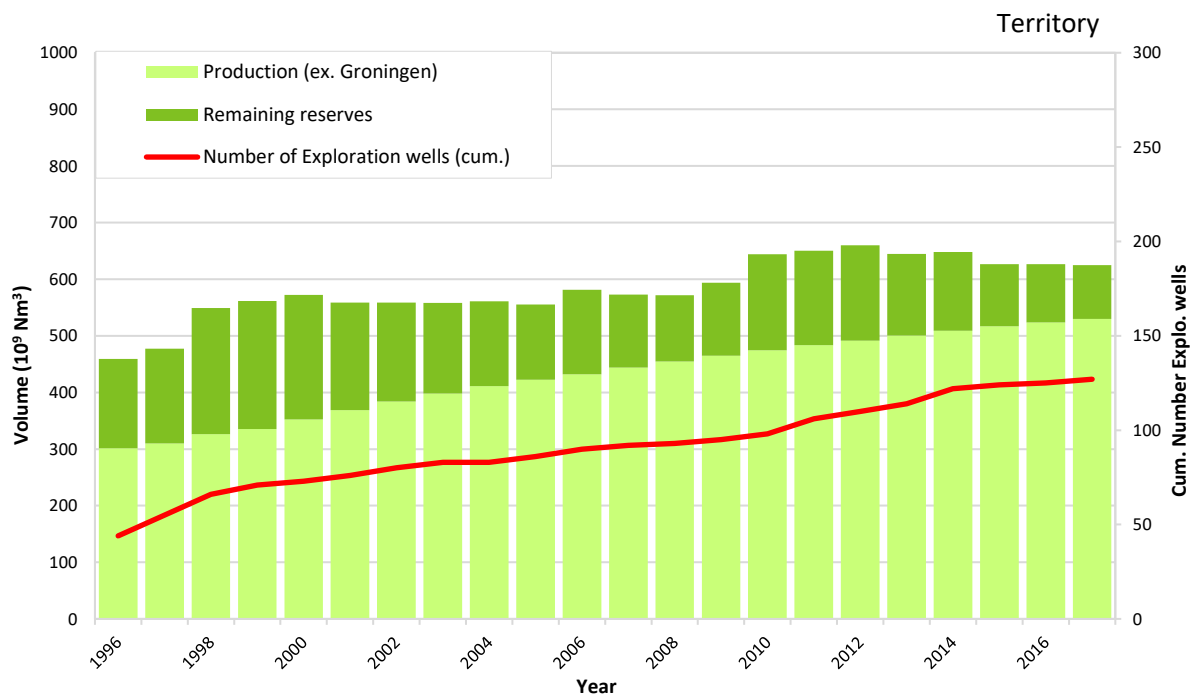


Figure 1.8. Trends in exploration potential, exploratory drilling, reserves and production 1996 - present (excluding the Groningen field).

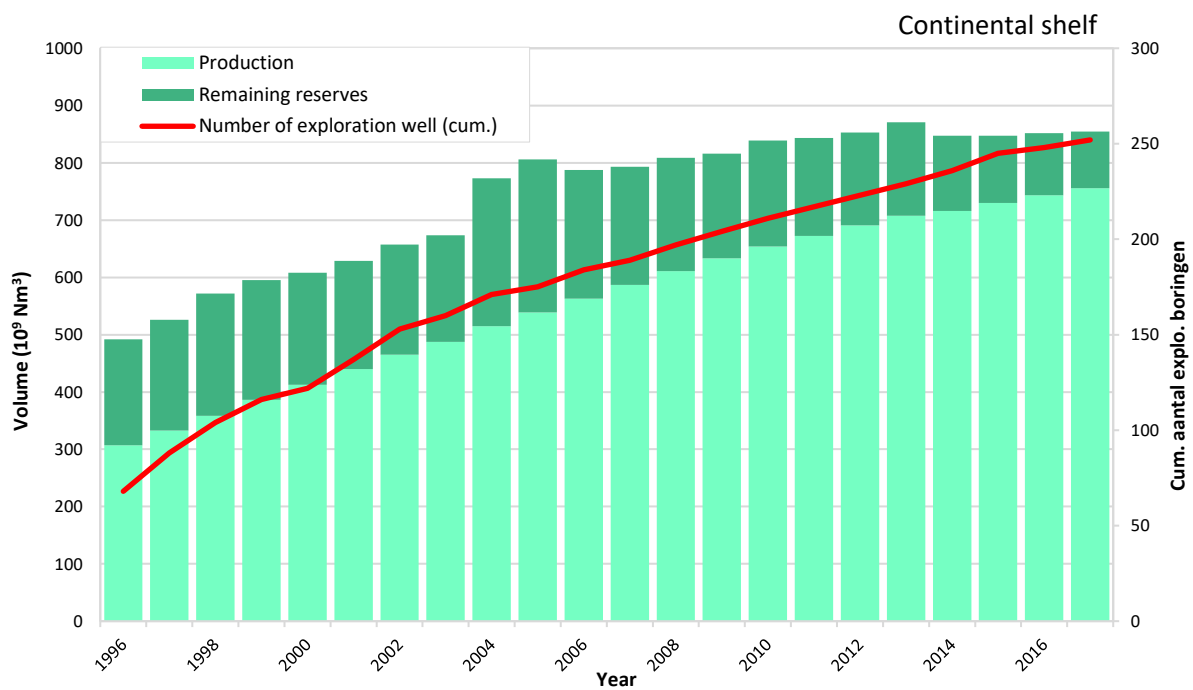


Figure 1.9. Trends in exploration potential, exploratory drilling, reserves and production 1996 - present (excluding the Groningen field).

2. Oil resources

On 1 January 2018 there were 53 proven oil accumulations in the Netherlands, 11 of which were producing. Since last year, one new field was added (Q07-FB), which was not made public by the operator at time of development. All oilfields are listed in summary annex 1.2, sorted by status and stating operator and licence.

Table 7. Number of proven oil accumulations as at 1 January 2018.

Status of oil accumulation	Territory	Continental shelf	Total
I. Developed			
Producing	3	8	11
II. Undeveloped			
a. Production to start 2018 - 2022	0	5	5
b. Other	10	14	24
III. Production ceased			
a. Ceased	1	0	1
b. Abandoned	8	4	12
Total	22	31	53

Oil resources as at 1 January 2018

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 8 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 8. As the resource classification is project-based, reserves and contingent resources may both be present within one accumulation. The total oil resources are 28.6 million Sm³ of which 11.8 million Sm³ oil reserves plus 16.8 million Sm³ contingent resources.

Table 8. Oil resources in million Sm³ as at January 2018.

Area	Reserves	Contingent resources (development pending)	Total
Territory	8.2	8.9	17.2
Continental shelf	3.6	7.9	11.5
Total	11.8	16.8	28.6

Revised estimates of the oil resources compared to 1 January 2017

Table 9 shows the adjustments made to the Dutch oil resources as a result of:

- Re-evaluations of previously proven accumulations
- Production during 2017
- One new field added

Oil reserve levels have decreased compared to 2017, mostly due to production from both continental shelf and territory reserves. The net result is a decrease of reserves of 2.7 million Sm³ as compared to reserves on the 1st of January 2017.

Table 9. Revised estimates of oil reserves compared with 1 January 2017, in million Sm³.

Area	Discoveries	Re-evaluation	Production	Total
Territory	0.0	-0.7	-0.4	-1.1
Continental shelf	0.0	-0.9	-0.7	-1.6
Total	0.0	-1.5	-1.1	-2.7

Figure 2.1 and Table 10 show oil production since 2008 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 been as expected. As the development of several oil fields will start later than originally planned the reserves have now been classified as contingent, 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 several fields with contingent resources.

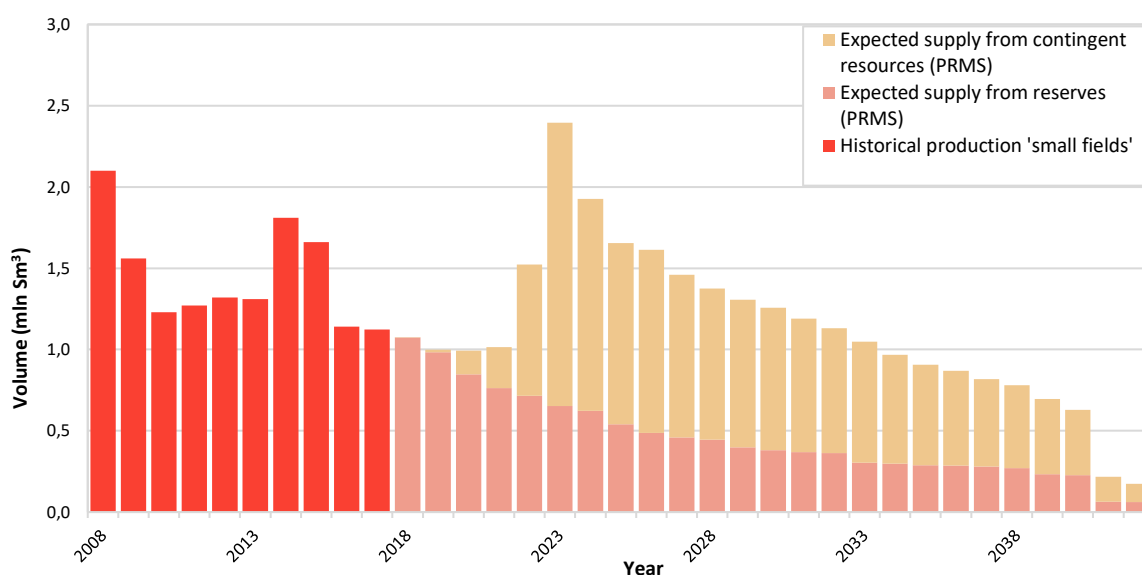


Figure 2.1. Historical oil production and prognosis for production until 2042 (in million Sm³).

Table 10. Domestic production of oil for the next 25 years, in million Sm³.

Year	Past production	Expected supply from reserves (PRMS)	Expected supply from contingent resources (PRMS)
2008	2.1	-	-
2009	1.6	-	-
2010	1.2	-	-
2011	1.3	-	-
2012	1.3	-	-
2013	1.3	-	-
2014	1.8	-	-
2015	1.7	-	-
2016	1.1	-	-
2017	1.1	-	-
2018	-	1.1	0.0
2019	-	1.0	0.0
2020	-	0.8	0.1
2021	-	0.8	0.3

Year	Past production	Expected supply from reserves (PRMS)	Expected supply from contingent resources (PRMS)
2022	-	0.7	0.8
2023	-	0.7	1.7
2024	-	0.6	1.3
2025	-	0.5	1.1
2026	-	0.5	1.1
2027	-	0.5	1.0
2028	-	0.4	0.9
2029	-	0.4	0.9
2030	-	0.4	0.9
2031	-	0.4	0.8
2032	-	0.4	0.8
2033	-	0.3	0.7
2034	-	0.3	0.7
2035	-	0.3	0.6
2036	-	0.3	0.6
2037	-	0.3	0.5
2038	-	0.3	0.5
2039	-	0.2	0.5
2040	-	0.2	0.4
2041	-	0.1	0.2
2042	-	0.1	0.1
Total	-	11.4	16.6

3. Hydrocarbon licences, changes in 2017 Netherlands Territory

Changes in the onshore licences for hydrocarbon exploration and production, which took place during 2017, are listed in the tables below. This also includes all pending applications for permits. Figure 3.1 shows the licence situation as at 1 January 2018, licence changes which occurred during 2017 are depicted in Figure 4.1.

Total area	Under licence
42 203 km ²	18 012 km ² (42,7%)

3.1. Exploration licences, Netherlands Territory

Applied for

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

* Application ongoing, published in an earlier annual review.

Prolonged

Licence holder	Licence	Effective from	Up to
Vermilion Energy Netherlands B.V.	Hemelum	27-02-2017	31-01-2023
Vermilion Energy Netherlands B.V. cs	Follega	25-07-2017	30-06-2025
Vermilion Energy Netherlands B.V. cs	Lemsterland	25-07-2017	30-06-2025

Relinquished

Licence holder	Licence	Effective from	Km ²
ENGIE E&P Nederland B.V. cs	Schiermonnikoog-Noord	17-07-2017	62
		Total	62

3.2. 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

* Application ongoing, published in an earlier annual review.

Restricted

Licence holder	Licence	Effective from	Km ²
Vermilion Energy Netherlands B.V.	Zuidwal	23-12-2017	74

3.3. Exploration, production and storage licenses as at 1 January 2018

Names of exploration, production and storage licences for hydrocarbons on the Netherlands territory as show in Figure 3.1.

Exploration licences			
E1	Akkrum	E7	Oosterwolde
E2	Engelen	E8	Opmeer
E3	Follega	E9	Schagen
E4	Hemelum	E10	Terschelling-Noord
E5	IJsselmuiden	E11	Utrecht
E6	Lemsterland		
Exploration licences as applied for			
E12	Breda-Maas	E15	Slootdorp-Oost
E13	Brielle	E16	Waskemeer
E14	De Kempen		
Production licences			
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
Production licences as applied for			
P39	Terschelling-Noord	P40	Akkrum
Storage licences			
S1	Alkmaar	S5	Twenthe-Rijn De Marssteden
S2	Bergermeer	S6	Winschoten II
S3	Grijpskerk	S7	Winschoten III
S4	Norg	S8	Zuidwending

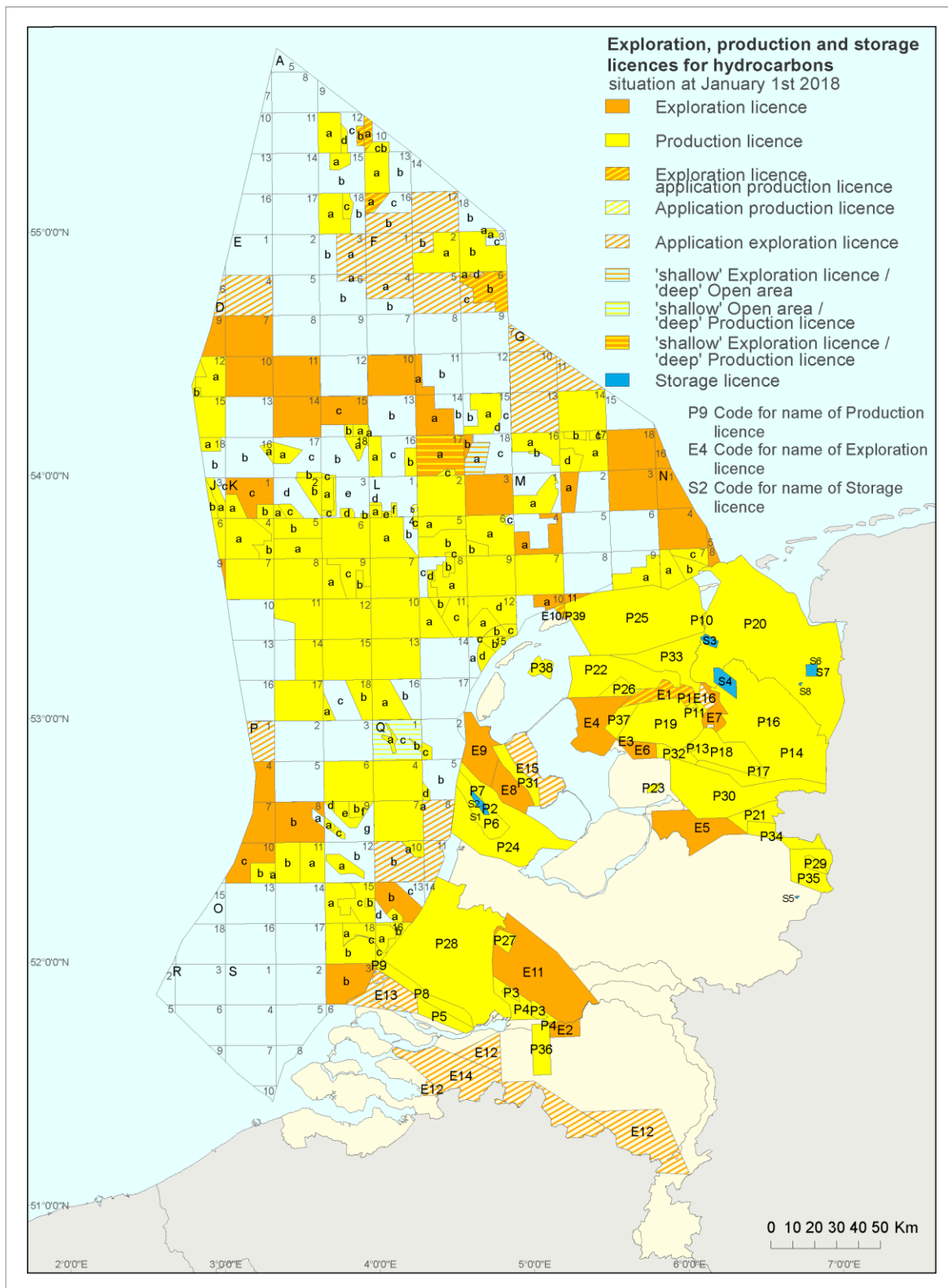


Figure 3.1. Exploration, production and storage licences for hydrocarbons as of 1 January 2018.

4. Hydrocarbon licences, changes in 2018 Netherlands Continental shelf

Changes in the licences for hydrocarbon exploration and production, which took place during 2017 on the continental shelf, are listed in the tables below. Also all current licence applications are included. Figure 3.1 shows the licence situation as at 1 January 2018, licence changes which occurred during 2017 are depicted in Figure 4.1. The licences on the continental shelf are named after the corresponding blocks.

Total area	Under Licence
56 396 km ²	26 452 km ² (46.9%)

4.1. Exploration licences, Continental shelf

Applied for

Licence	Publication	Date	Closing date	Applicant(s)
F5 *	Publicatieblad EU, C 256 Staatscourant 29 117	05-08-2015	04-11-2015	Van Dyke, ENGIE, HALO
Q8 *	Publicatieblad EU, C 331 Staatscourant 39 129	08-10-2015	07-01-2016	Tulip Oil, Van Dyke
Q10b *	Publicatieblad EU, C 331 Staatscourant 39 129	08-10-2015	07-01-2016	Tulip Oil, Van Dyke
Q11 *	Publicatieblad EU, C 331 Staatscourant 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
F6c & F6d	Publicatieblad EU, C 403 Staatscourant 200	28-11-2017	27-02-2018	
P1 **	Publicatieblad EU, C 444 Staatscourant 6 265	23-12-2017	26-03-2018	
B16b	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	
B17	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	
E3a	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	
E6a	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	

Licence	Publication	Date	Closing date	Applicant(s)
F1	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	
F2b	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	
F4a	Publicatieblad EU, C 444 Staatscourant 7 464	23-12-2017	26-03-2018	

* Application ongoing, published in an earlier annual review.

** Republished application 3-12-2016.

Prolonged

Licence holder	Licence	Effective from	Up to
ENGIE E&P Nederland B.V. cs	E10	08-04-2017	31-12-2018
ENGIE E&P Nederland B.V. cs	E11	08-04-2017	31-12-2018
ENGIE E&P Nederland B.V. cs	E14	08-04-2017	31-12-2018
Hansa Hydrocarbons Limited	G18	02-06-2017	31-12-2021
Hansa Hydrocarbons Limited	H16	02-06-2017	31-12-2021
Hansa Hydrocarbons Limited	M3	02-06-2017	31-12-2021
Hansa Hydrocarbons Limited	N1	02-06-2017	31-12-2021
ENGIE E&P Nederland B.V. cs	E15c	20-06-2017	31-12-2018
Tulip Oil Netherlands B.V.	M10a & M11	01-07-2017	30-06-2022
ENGIE E&P Nederland B.V.	D9 & E7	20-07-2017	16-10-2020
Nederlandse Aardolie Maatschappij B.V. cs	J9	21-12-2017	31-12-2019

Restricted

Licence holder	Licence	Effective from	km ²
Sterling Resources Netherlands B.V. cs	F18a-ondiep	16-02-2017	170
ENGIE E&P Nederland B.V.	Q13b	15-06-2017	237
ENGIE E&P Nederland B.V. cs	E15c	20-06-2017	283
Wintershall Noordzee B.V. cs	F11a	23-12-2017	80
Wintershall Noordzee B.V. cs	F14a	23-12-2017	266

4.2. Production licences, Continental shelf

Applied for

Licence	Publication	Date	Closing date	Applicant(s)
A12b & B10a *	Staatscourant 22	30-12-1999	-	Petrogas cs
B16a *	Staatscourant 105	06-05-1993	-	Petrogas cs
L1c *	-	27-02-2014	-	ENGIE
F6b *	-	11-05-2016	-	Dana cs

Awarded

Licence holder	Licence	Effective from	km ²
Tulip Oil Netherlands Offshore B.V.	Q7 & Q10a	14-07-2017	472
Oranje-Nassau Energie B.V. cs	P18b	14-07-2017	311
Wintershall Noordzee B.V. cs	D12b	03-06-2017	41
		Total	824

Split

Licence holder	Licence	Effective from	km ²
- Before			
Petrogas E&P Netherlands B.V. cs	Q1		416
- After			
Petrogas E&P Netherlands B.V. cs	Q1-ondiep	23-12-2017	416
Petrogas E&P Netherlands B.V. cs	Q1-diep	23-12-2017	416

Applied for fallow area

Licence	Publication	Date	Closing date	Applicant(s)
F3b	www.nlog.nl	01-07-2013	30-09-2013	Petrogas E&P UK Ltd.

Prolonged

Licence holder	Licence	Effective from	Up to
Nederlandse Aardolie Maatschappij B.V.	K15	21-09-2017	31-12-2030
Nederlandse Aardolie Maatschappij B.V. cs	L13	21-09-2017	31-12-2030
Nederlandse Aardolie Maatschappij B.V. cs	K8 & K11a	21-09-2017	31-12-2030
Nederlandse Aardolie Maatschappij B.V.	K7	21-09-2017	31-12-2030

Restricted

Licence holder	Licence	Effective from	km ²
Petrogas E&P Netherlands B.V. cs	P9a, P9b & P9d	09-09-2017	90
Petrogas E&P Netherlands B.V. cs	P9c, P9e & P9f	09-09-2017	101
Nederlandse Aardolie Maatschappij B.V. cs	K8 & K11a	21-09-2017	737
Wintershall Noordzee B.V. cs	E18a & E18c	21-10-2017	76
Wintershall Noordzee B.V. cs	F16a & F16b	21-10-2017	180
Wintershall Noordzee B.V. cs	L8b & L8d	21-10-2017	83
Wintershall Noordzee B.V. cs	P12a	21-10-2017	96
Petrogas E&P Netherlands B.V.	Q1a-ondiep & Q1b-ondiep	23-12-2017	43

Relinquished

Licence holder	Licence	Effective from	km ²
Petrogas E&P Netherlands B.V.	P8a	12-12-2017	62
		Total	62

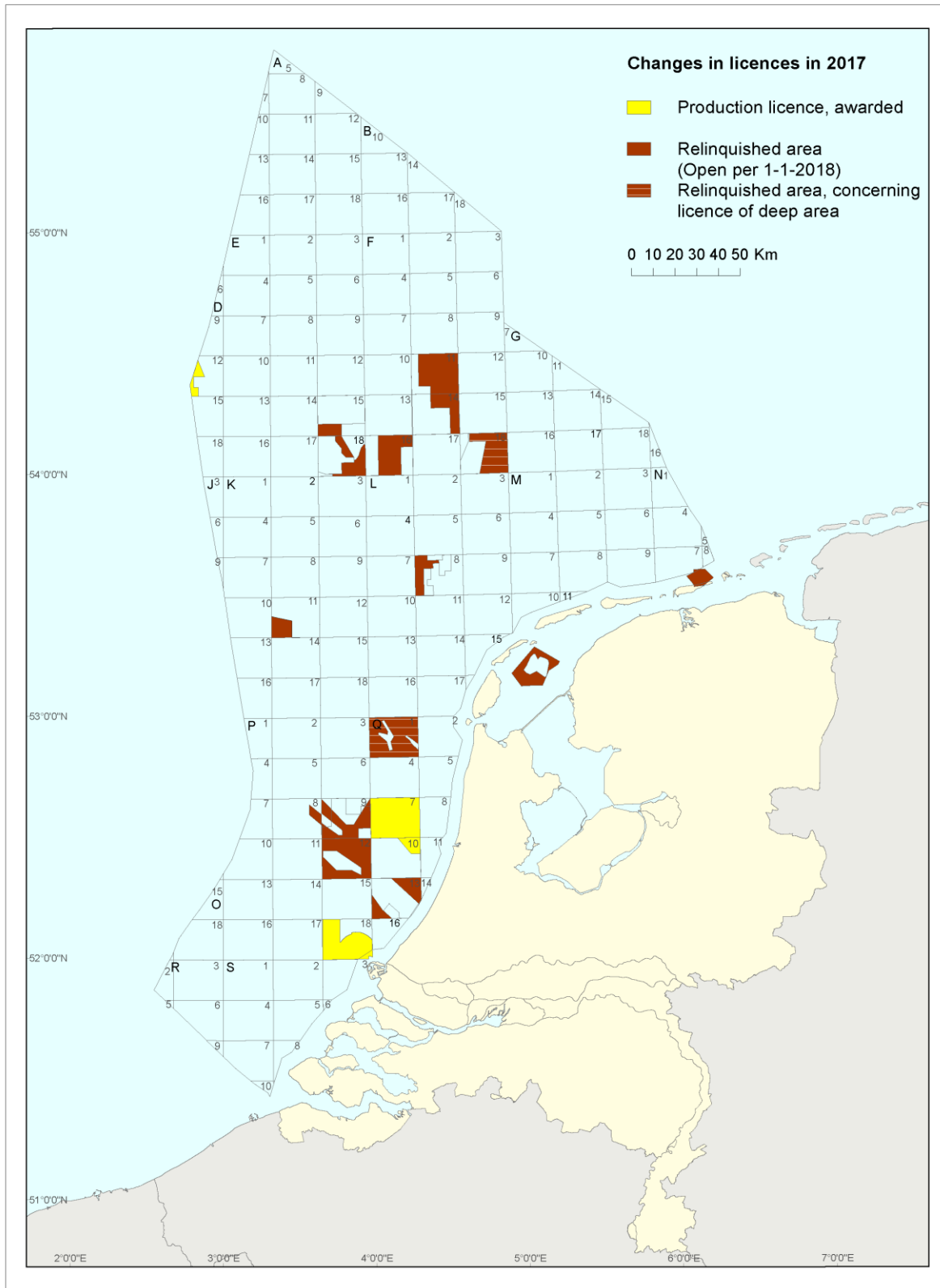


Figure 4.1. Changes in licences during the year 2017.

5. Hydrocarbon licences: company changes, name changes and legal mergers in 2017

The tables below list changes in chronological order which took place during 2017, as a result of mutations in consortia of companies participating 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	Effective from	Govern. Gazette
G18 *	ENGIE E&P Nederland B.V.	-	17-02-2017	-
H16 *	ENGIE E&P Nederland B.V.	-	17-02-2017	-
M3 *	ENGIE E&P Nederland B.V.	-	17-02-2017	-
N1 *	ENGIE E&P Nederland B.V.	-	17-02-2017	-
N5 **	-	-	01-09-2017	52 122

* Concerns a positive fictitious decision.

** New operator: Hansa Hydrocarbons Limited

Company changes in production licences

Licence	Relinquishing company	Acquiring company	Effective from	Govern. Gazette
K18b *	Dana Petroleum Netherlands B.V.	-	15-03-2017	-
L16a *	Dana Petroleum Netherlands B.V.	-	15-03-2017	-
P15a & P15b	Van Dyke Netherlands Inc.	-	08-04-2017	67 434
L8a *	TAQA Offshore B.V.	-	17-04-2017	-
L11b *	TAQA Offshore B.V.	-	17-04-2017	-
P9c	TAQA Offshore B.V.	-	24-06-2017	38 545
Q2c	TAQA Offshore B.V.	-	24-06-2017	38 536
P9a, P9b & P9d	TAQA Offshore B.V.	-	07-11-2017	64 497
Waalwijk	Gas Storage Ltd. Overseas Gas Storage Ltd.	-	21-12-2017	
Q1-ondiep	TAQA Offshore B.V. Wintershall Noordzee B.V.	-	23-12-2017	193
Q1-diep	Petrogas E&P Netherlands B.V.	-	23-12-2017	193

* Concerns a positive fictitious decision.

Name changes

Previous company name	New company name
Lundin Netherlands B.V.	IPC Netherlands B.V.
Sterling Resources Netherlands B.V.	Oranje-Nassau Energie Resources B.V.
Tullow Exploration & Production Netherlands B.V.	HALO Exploration & Production Netherlands B.V.
Centrica Production Nederland B.V.	Spirit Energy Nederland B.V.

6. Seismic surveys

Figure 6.1 shows the situation as at 1st of January 2018. In 2017 Petrogas acquired a 3D survey of 593 km² in blocks A12, A14, B10 and B13, in the northern part of the Netherlands continental shelf. In the Territory, Vermilion acquired two 3D surveys: 270 km² in the Akkrum exploration licence and 370 km² in the Zuid-Friesland III production licence. For a long-term overview see annex 12.

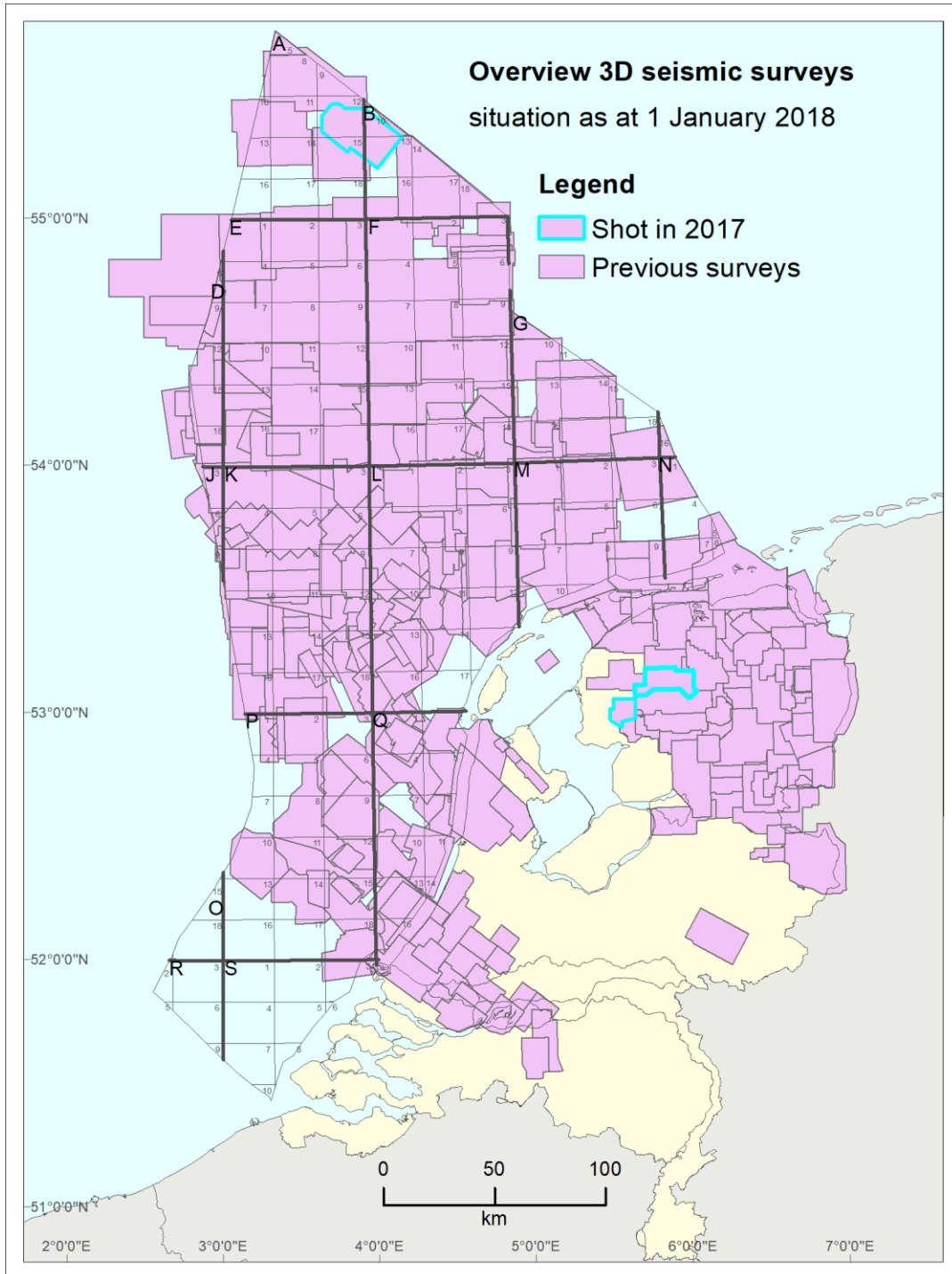


Figure 6.1. Overview of 3D seismic surveys as of 1 January 2018.

7. Oil and gas wells completed in 2017

The wells completed in 2017 have been grouped according to drilling location (Netherlands territory or the continental shelf) and then according to whether they are exploration, appraisal, or production wells. The final table is an aggregated overview of the drilling activities in 2017. Six of the seven exploration wells encountered gas. This is a success rate of 86%. The number of exploration wells has almost doubled compared with the previous year. The single appraisal well confirmed an accumulation discovered earlier. Seven production wells were drilled in 2017, which is quite less than last year.

7.1. Netherlands Territory

Exploration wells

	Name of well	Licence	Operator	Result
1	Eesveen-02	Steenwijk	Vermilion	Gas
2	Nieuwehorne-02	Gorredijk	Vermilion	Gas

Production wells

	Name of well	Licence	Operator	Result
1	Middelie-304	Middelie	NAM	Gas

7.2. Continental shelf

Exploration wells

	Name of well	Licence	Operator	Result
1	K09-13	K09c	ENGIE	Gas
2	L02-09	L02	NAM	Gas
3	N05-01-Sidetrack1	N05	Oranje-Nassau	Gas
4	P18-08	P18b	Oranje-Nassau	Dry

Appraisal wells

	Well name	Licence	Operator	Result
1	N05-01-Sidetrack3	N05	Oranje-Nassau	Gas

Production wells

	Well name	Licence	Operator	Result
1	A12-A-08	A12a	Petrogas	Gas
2	A12-A-09	A12a	Petrogas	Gas
3	A18-A-04	A18a	Petrogas	Gas
4	F03-FB-106-Sidetrack2	F03b	ENGIE	Gas
5	L10-F-03-Sidetrack2	L10	ENGIE	Gas
6	L13-FI-103-Sidetrack1	L13	NAM	Gas

7.3. Summary

Wells completed in 2017

Area	Type	Result							Total
		Gas	Gas shows	Oil	Oil shows	Oil & Gas	Dry	Other	
Territory	Exploration	2	-	-	-	-	-	-	2
	Appraisal	-	-	-	-	-	-	-	-
	Production	1	-	-	-	-	-	-	1
	Other	-	-	-	-	-	-	-	-
	Subtotal	3	-	-	-	-	-	-	3
Continental shelf	Exploration	3	-	-	-	-	1	-	4
	Appraisal	1	-	-	-	-	-	-	1
	Production	6	-	-	-	-	-	-	6
	Subtotal	10	-	-	-	-	1	-	11
	Total	13	-	-	-	-	1	-	14



Figure 7.1. Wells completed in 2017.

8. Platforms en pipelines, Netherlands Continental shelf

In 2017 one new platform was installed on the continental shelf and non were removed. Two new pipelines were laid (Figure 8.1).

For a complete list of platforms and pipelines, see Annexes 16 and 17. The pipeline data was supplied by State Supervision of Mines (SODM).

Platforms installed in 2017

Platform	Operator	No. Legs	Gas/Oil	Function
L13-FI-1	NAM	1	G	Platform

New pipelines in 2017

Operator	From	To	Diameter (inches)	Length (km ²)	Carries*
Total	L04-A	K6-GT	10	12.6	g
NAM	L13-FI-1	K15-FA-1	2	6.5	g

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

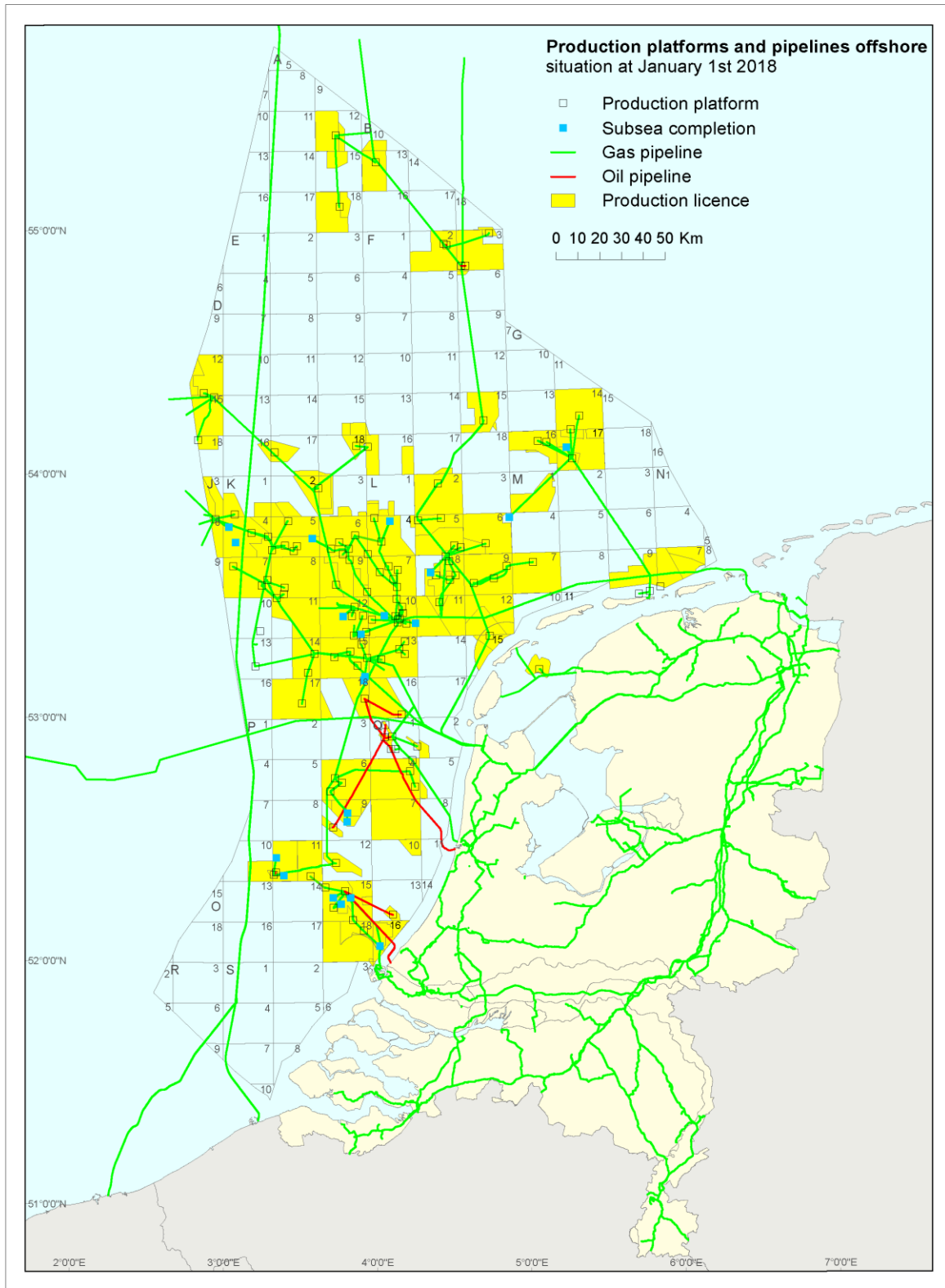


Figure 8.1. Offshore production platforms and pipelines as of 1 January 2018.

9. Production of gas and oil

The tables below list the aggregated production figures for natural gas, oil and condensate for 2017. Condensate is considered to be a by-product of oil or gas production. Changes compared with 2016 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 2016 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 due to lower production out of the Q13 Amstel field. The increase in oil production onshore is caused by production from the Schoonebeek field coming back on stream.

In 2017 the following fields came on stream or stopped producing.

Field production start in 2017

Production start	Field	Producing	Year discovery
April - 2017	Brakel	Gas	1992
Augustus - 2017	Noorderdam	Gas	1998
December - 2017	Oudendijk	Gas	2014
December - 2017	L05a-D	Gas	2010

Field production ceased in 2017

Production ceased	Field	Producing	Year discovery
April - 2017	Hemrik (Akkrum 11)	Gas	1978
April - 2017	Donkerbroek-Main	Gas	1991
Mei - 2017	Sonnega-Weststellingwerf	Gas	1963
Augustus - 2017	P11b Van Nes	Gas	2007

Overview production in 2017 & changes compared to 2016

Gas production in 2017 & changes compared to 2016

Gas	Production 2016	Changes compared with 2016	
	[10 ⁹ Nm ³]	[10 ⁹ Nm ³]	%
Territory (total)	29.5	-5.1	-14.6
<i>Groningen field</i>	23.6	-4.0	-14.6
<i>Other onshore fields</i>	6.0	-1.0	-14.7
Continental shelf	12.3	-1.0	-7.6
Total	41.8	-6.1	-12.7

Oil production in 2017 & changes compared to 2016

Oil	Production 2016	Changes compared with 2016	
	[10 ³ Sm ³]	[10 ³ Sm ³]	%
Territory (total)	419	240	134.0
Continental shelf	705	-252	-26.3
Total	1 124	-12	-1.1
Average daily oil production		3 080	Sm ³ /day

Condensate production in 2017 & changes compared to 2016

Condensate	Production 2016	Changes compared with 2016	
	[10 ³ Sm ³]	[10 ³ Sm ³]	%
Territory	149	-63	-29.5
Continental shelf	169	5	3.3
Total	319	-57	-15.2

9.1. Production of natural gas in 2017, Netherlands territory

The table below gives monthly production figures per production licence. The production per licence is a summation of well production of those wells with surface locations within the licence area. The information is based on figures supplied by the operators.

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.

Gas production in 2017, Netherlands territory (million Nm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Akkrum 11	Tulip	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
Alkmaar	TAQA	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
Andel Va	Vermilion	1.1	0.0	0.0	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.3	0.5
Beijerland	NAM	48.9	4.8	4.5	5.0	4.6	4.4	4.0	3.8	3.4	3.5	3.5	3.0	4.4
Bergen II	TAQA	47.3	4.8	4.3	4.7	3.8	1.7	2.7	2.6	5.4	4.3	4.0	4.7	4.4
Botlek II	NAM	283.3	14.5	27.8	27.0	26.2	23.3	23.2	23.5	23.7	22.8	25.1	22.7	23.4
Botlek II	ONE	35.6	4.8	3.8	4.0	3.5	3.4	3.2	2.7	2.8	0.8	2.6	2.2	1.9
Donkerbroek	Tulip	6.9	1.6	1.2	0.7	0.5	0.4	0.5	0.4	0.3	0.3	0.3	0.3	0.3
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	474.7	51.4	42.8	46.2	42.0	41.0	34.4	40.8	40.5	33.1	36.9	33.0	32.6
Drenthe IV	Vermilion	4.7	0.2	0.4	0.4	0.4	0.3	0.3	0.3	0.6	0.5	0.4	0.5	0.4
Drenthe V	Vermilion	18.7	2.0	1.6	1.5	1.3	1.4	1.6	1.4	1.9	1.4	1.6	1.5	1.6
Drenthe VI	Vermilion	216.3	10.7	0.0	13.5	14.0	14.5	9.2	14.3	14.4	27.3	33.0	32.8	32.7
GORredijk	Vermilion	143.7	21.3	21.1	17.0	14.6	14.1	8.3	13.8	14.6	8.3	1.3	0.5	8.8
Groningen	NAM	24 561.6	2 506.4	2 473.9	2 133.9	2 187.7	1 738.5	1 738.9	1 829.3	1 887.5	1 704.6	1 849.1	2 216.2	2 295.6
Hardenberg	NAM	42.7	4.9	4.1	3.8	4.0	3.8	3.4	2.9	3.5	2.9	3.3	3.0	3.0
Leeuwarden	Vermilion	63.1	5.5	4.7	5.8	5.2	5.1	3.4	6.6	5.7	5.6	5.5	5.2	4.8
Middelie	NAM	326.0	34.4	29.8	32.7	32.0	30.1	28.4	29.2	29.2	27.3	18.6	12.9	21.5
Noord-Friesland	NAM	2.384.2	211.3	198.0	183.2	200.2	209.7	203.9	203.1	209.2	189.5	194.4	188.7	193.1
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	251.4	16.7	22.5	28.2	24.4	19.5	12.1	16.8	18.9	23.7	23.8	21.1	23.8
Schoonebeek	NAM	454.5	42.7	37.6	37.0	40.3	40.3	36.6	37.0	38.1	37.5	36.7	35.2	35.7
Slootdorp	Vermilion	97.1	11.4	14.0	10.2	7.0	7.2	6.8	6.7	3.9	5.4	2.4	9.8	12.3
Steenwijk	Vermilion	35.6	0.2	1.7	1.5	1.1	0.9	0.2	0.0	0.2	0.6	12.7	13.2	3.5
Tietjerksteradeel	NAM	107.1	7.8	7.7	7.3	9.2	9.0	8.7	8.3	10.0	10.3	9.5	9.5	9.7
Waalwijk	Vermilion	28.2	2.5	2.4	1.8	2.6	2.4	2.1	1.7	2.3	2.8	2.7	2.7	2.2
Zuidwal	Vermilion	28.7	2.5	2.2	2.5	2.5	2.5	2.4	2.5	2.5	2.4	1.9	2.4	2.4
Total		29 661.2	2 962.5	2 906.2	2 567.7	2 627.0	2 173.4	2 134.3	2 247.5	2 318.6	2 114.7	2 269.2	2 621.5	2 718.6

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

Figure 9.1 and Figure 9.2 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) comprises the Rotliegend reservoir. Figure 9.1 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 a slight increase in production from Rotliegend fields. Figure 9.2 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 up until 2016. 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. Nm³ from the Middelie field and the reclassification of Slootdorp due to additional production from the Rotliegend formation (in the past, production used to be from Zechstein only). 2017 production shows a general decrease due to depletion from existing fields.

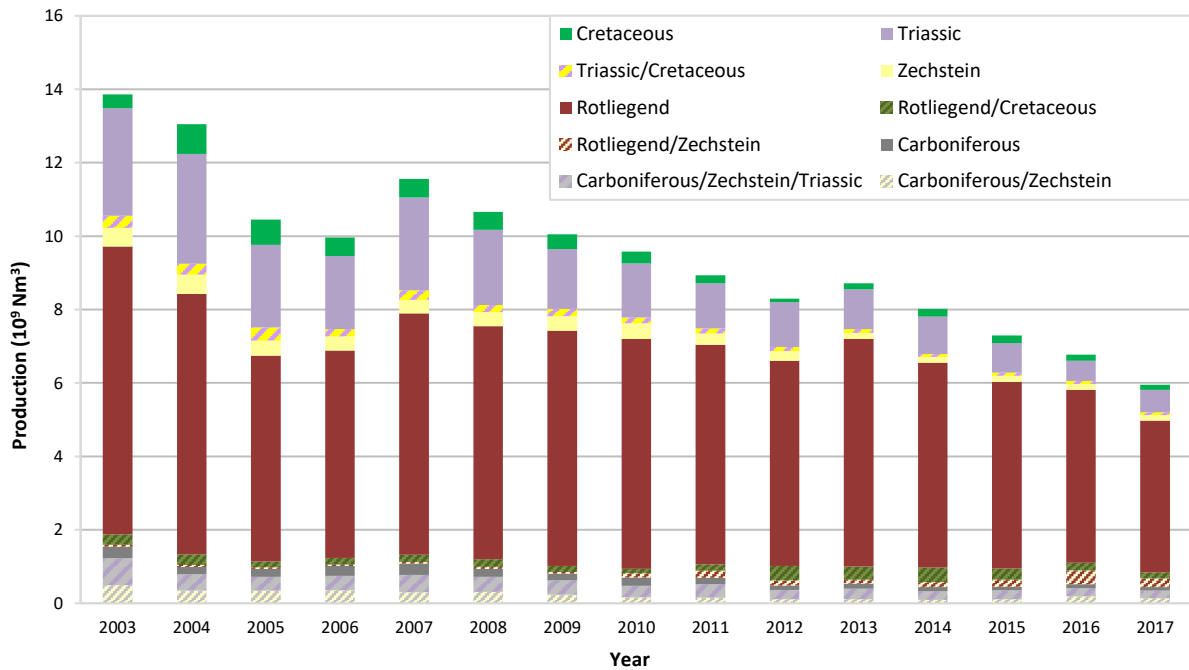


Figure 9.1. Production territory per reservoir (excluding the Groningen field).

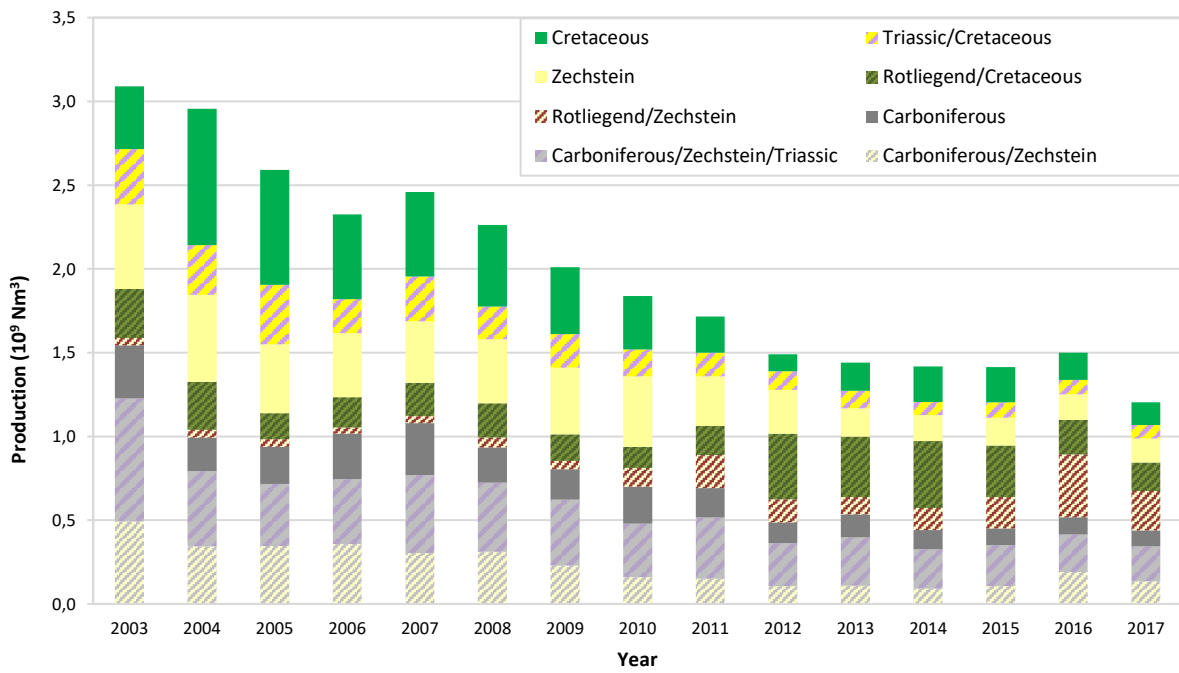


Figure 9.2. Production territory per reservoir (excluding the Groningen field and the Rotliegend and Triassic reservoirs).

9.2. Production of natural gas in 2017, Continental shelf

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.

Gas production in 2017, Continental shelf (million Nm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
A12a	Petrogas	145.7	18.6	15.9	10.2	12.7	14.7	11.2	1.9	0.0	6.6	14.0	21.0	19.0
A18a	Petrogas	648.1	56.1	52.6	66.1	61.0	58.5	47.7	26.1	50.7	43.9	64.5	60.3	60.7
B10c & B13a	Petrogas	336.1	35.2	30.1	34.2	32.8	32.0	30.8	15.4	26.6	18.0	28.5	26.8	25.6
D12a	Wintershall	6.2	4.8	1.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
D15	ENGIE	1.7	0.1	0.6	0.2	0.3	0.0	0.4	0.0	0.0	0.0	0.0	0.0	0.0
D18a	ENGIE	26.3	2.6	2.2	1.8	2.6	2.0	2.5	2.4	2.3	1.9	1.5	2.2	2.2
E17a & E17b	ENGIE	741.8	75.5	54.0	70.4	71.0	65.0	58.4	68.0	65.6	54.8	58.8	52.7	47.6
E18a & E18c	Wintershall	31.1	3.6	3.0	3.0	3.4	3.3	2.9	3.2	3.2	2.5	2.0	0.3	0.7
F02a	Dana	49.3	4.1	4.4	4.7	4.2	4.3	4.7	4.8	2.3	2.4	5.0	4.8	3.7
F03a	Centrica	70.2	0.1	0.1	0.1	0.1	0.8	12.9	15.0	11.6	9.1	8.0	6.8	5.9
F03b	ENGIE	174.1	13.1	14.0	19.4	22.3	20.3	20.2	22.7	21.0	20.6	0.7	0.0	0.0
F15a	Total	88.5	7.6	7.8	9.2	8.2	8.8	4.7	7.4	8.8	6.1	8.8	8.0	3.1
F16a & F16b	Wintershall	141.5	13.2	11.5	13.2	12.6	13.0	12.2	12.3	11.9	11.4	11.4	4.9	13.8
G14 & G17b	ENGIE	568.2	59.5	54.0	57.5	59.5	51.6	15.2	44.3	49.9	43.4	43.8	44.2	45.2
G16a	ENGIE	357.4	31.3	33.6	34.9	30.8	31.9	10.0	31.5	32.4	28.2	31.1	30.2	31.4
G17c & G17d	ENGIE	128.9	12.2	11.8	12.5	12.0	10.8	3.2	10.2	12.3	10.7	11.2	11.0	11.1
J03b & J06	Centrica	35.4	5.5	4.3	5.0	3.7	1.8	0.0	0.0	3.7	4.5	2.7	2.0	2.3
J03b & J06	Total	52.5	5.5	4.5	6.4	6.4	6.1	1.8	0.0	0.0	5.2	5.5	5.6	5.3
K01a	Total	201.2	20.2	16.1	22.2	20.8	22.3	7.2	0.0	15.3	20.8	19.1	19.4	17.7
K02b	ENGIE	257.3	26.6	21.6	24.4	23.3	19.9	24.1	19.7	23.8	19.5	20.2	19.3	14.9
K04a	Total	478.6	46.2	41.9	47.2	45.1	43.6	16.1	42.8	39.5	28.9	43.7	41.0	42.4
K04b & K05a	Total	791.8	72.7	67.0	72.6	71.4	74.7	31.5	70.6	69.4	48.5	75.1	70.6	67.8
K05b	Total	84.7	8.8	6.3	8.2	7.7	7.6	3.4	8.2	7.6	5.2	7.5	7.1	7.2
K06 & L07	Total	306.4	34.3	30.4	32.1	30.9	15.9	24.9	22.2	25.2	24.6	25.9	22.2	17.8
K07	NAM	76.2	7.1	7.7	7.2	7.1	8.1	3.7	5.0	9.8	5.1	5.2	4.8	5.3
K08 & K11a	NAM	323.2	29.7	31.7	37.7	25.0	30.2	12.8	26.5	28.5	24.3	28.4	25.6	22.8
K09a & K09b	ENGIE	173.6	13.8	13.3	16.9	12.3	15.0	14.5	14.9	16.4	15.3	13.1	14.0	14.1
K09a & K09b	Total	0.3	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
K09c	ENGIE	13.5	1.2	1.2	1.1	1.2	0.9	1.1	1.2	1.2	1.1	1.2	1.0	1.1
K12	ENGIE	591.1	57.3	54.0	59.1	41.3	53.2	44.5	47.9	50.6	43.5	44.0	45.7	50.0
K14a	NAM	244.5	23.6	20.6	23.5	19.5	21.1	9.2	20.3	25.8	16.1	25.1	18.5	21.2
K15	NAM	577.0	59.2	57.2	59.9	55.9	59.4	38.1	32.6	32.5	36.5	47.5	45.9	52.3
K17	NAM	72.6	5.5	4.4	5.1	4.7	6.2	2.5	5.7	8.4	6.9	8.8	7.0	7.7
K18b	Wintershall	295.8	23.7	18.7	16.2	18.3	16.6	12.0	0.5	31.3	35.4	45.8	34.3	43.2
L02	NAM	361.1	35.1	30.0	34.0	32.7	31.1	29.7	30.0	23.7	27.8	28.9	28.8	29.3
L04a	Total	205.2	21.3	19.3	20.9	13.7	4.0	20.8	17.8	19.0	15.2	19.0	19.2	15.1
L05a	ENGIE	115.2	0.0	0.1	0.1	5.0	14.2	16.6	13.3	8.7	12.5	15.4	14.8	14.4
L05b	Wintershall	119.7	12.4	11.6	12.6	7.1	4.2	10.3	12.2	12.0	11.0	10.7	6.6	8.9
L06a	Wintershall	266.5	25.1	21.2	23.8	12.8	22.4	23.0	23.4	24.8	20.3	23.5	23.3	22.8
L08b & L08d	Wintershall	77.9	9.0	6.6	6.0	4.6	2.6	6.8	6.7	6.6	6.3	6.4	7.4	8.8
L09	NAM	493.4	50.9	40.6	45.9	42.1	40.5	41.3	41.6	33.0	42.3	41.8	37.0	36.3
L10 & L11a	ENGIE	387.7	36.5	33.9	31.3	17.5	31.7	19.3	28.1	40.7	40.2	41.3	31.6	35.4
L11b	ONE	188.7	16.2	14.5	6.1	10.1	23.8	20.0	19.2	17.4	16.7	15.9	14.0	14.6
L12b & L15b	ENGIE	303.4	35.4	25.6	34.2	32.4	32.5	30.3	31.2	30.2	1.1	2.3	15.2	33.0
L13	NAM	176.9	12.0	16.1	25.2	20.1	17.6	2.8	0.9	22.0	17.1	17.3	13.8	12.0
M07	ONE	198.9	19.0	5.9	21.7	20.1	18.5	18.8	17.0	12.3	17.5	17.8	16.1	14.2
P06	Wintershall	96.1	9.6	8.7	9.7	9.7	9.9	9.3	9.3	9.5	4.6	0.0	5.7	10.1
P09a, P09b & P09d	Wintershall	8.3	1.1	0.9	1.0	0.9	1.0	0.9	0.9	0.9	0.4	0.0	0.3	0.0
P09c, P09e & P09f	Petrogas	2.0	0.2	0.2	0.2	0.2	0.0	0.2	0.2	0.1	0.2	0.2	0.2	0.2
P09c, P09e & P09f	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	324.2	30.2	29.0	34.6	32.5	32.6	10.2	18.5	31.6	29.0	31.8	27.8	16.4
P11b	Dana	175.4	18.5	18.5	16.9	20.0	12.3	13.6	14.5	9.4	10.1	11.9	15.7	14.0
P15a & P15b	TAQA	25.7	1.3	1.0	3.1	1.9	2.7	0.8	2.1	3.2	2.8	2.6	2.2	2.0
P15c	TAQA	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	TAQA	99.1	9.1	7.6	8.4	7.8	9.6	2.9	6.4	8.9	9.5	9.8	10.6	8.5
Q01a-ondiep & Q01b-ondiep	Petrogas	2.2	0.2	0.2	0.2	0.2	0.2	0.1	0.2	0.2	0.2	0.2	0.2	0.2
Q01-diep	Wintershall	139.7	14.9	13.4	13.4	11.5	11.3	6.6	12.6	11.4	11.3	12.9	11.2	9.1
Q04	Wintershall	231.8	22.2	19.4	21.5	19.2	19.7	15.9	21.1	21.9	17.4	12.4	17.0	24.0
Q13a	ENGIE	19.4	2.4	2.1	2.2	1.8	1.6	0.2	0.3	1.6	1.8	1.9	1.8	1.8
Q16a	ONE	69.7	7.1	6.4	7.0	6.7	6.5	1.9	4.3	5.3	6.0	6.5	6.1	6.0
Total		12 178.8	1 168.3	1 030.5	1 162.3	1 058.7	1 070.1	786.6	915.3	1 042.1	922.4	1 038.4	983.9	1 000.2

Natural gas production from small fields per stratigraphic reservoir, Continental shelf

Figure 9.3 and Figure 9.4 Show the contribution of the gas reservoirs to gas production from the continental shelf. Figure 9.3 illustrates 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 Nm³/year. Figure 9.4 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.

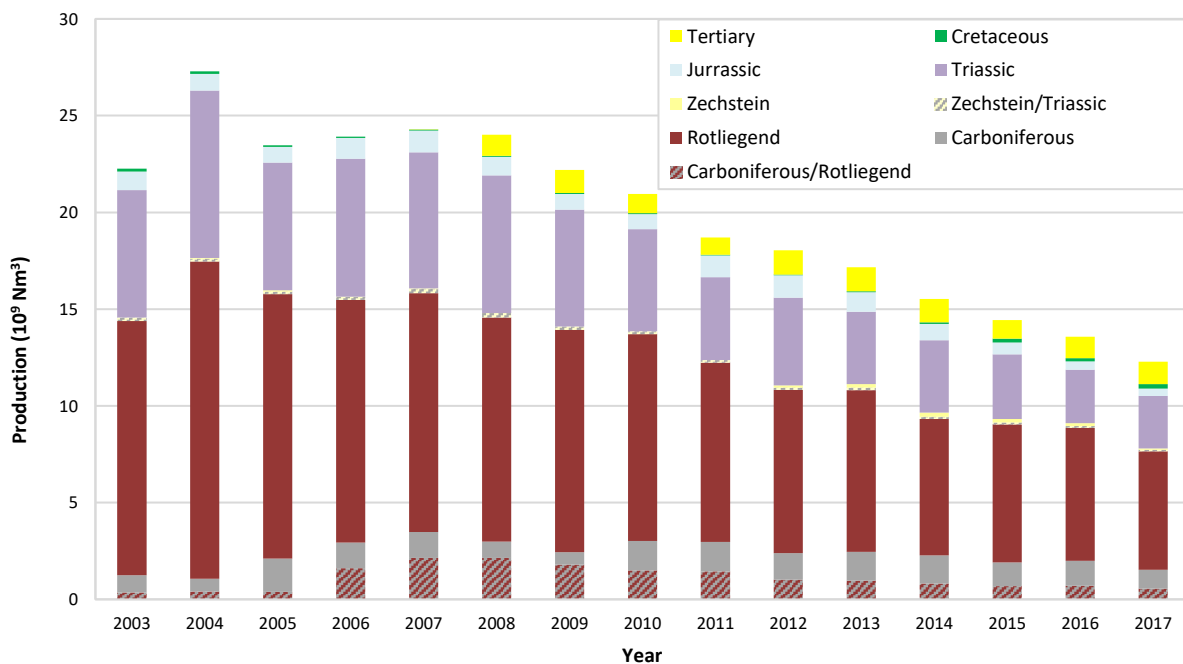


Figure 9.3. Production continental shelf per reservoir.

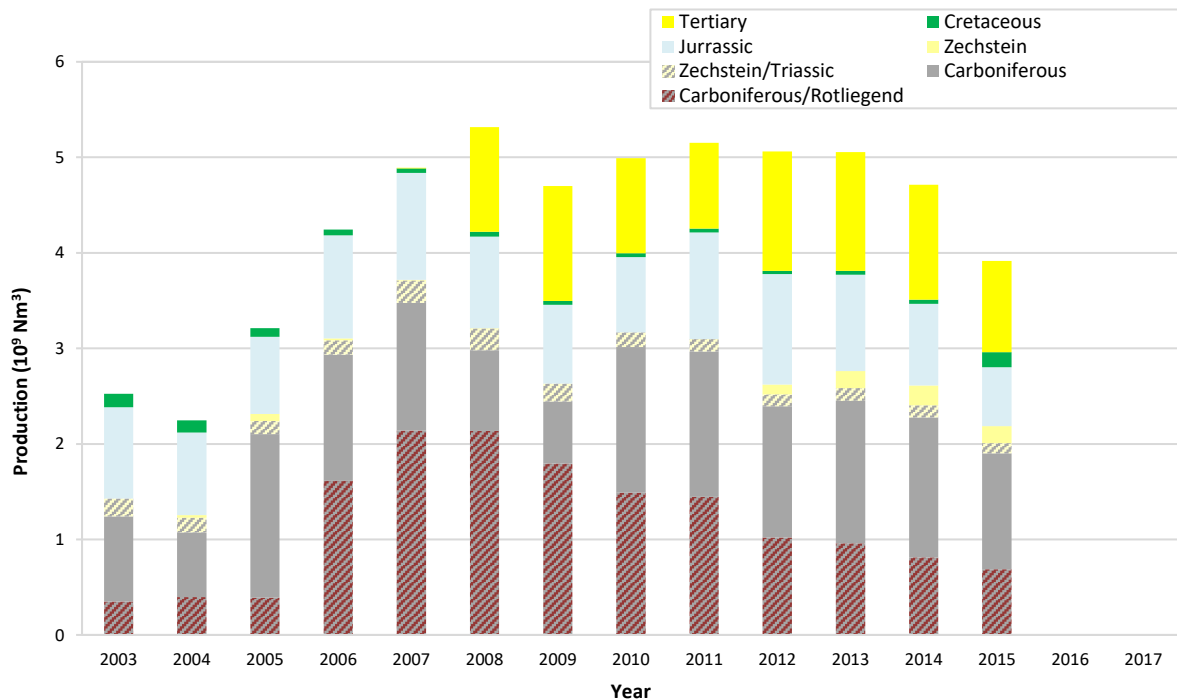


Figure 9.4. Production Continental shelf per reservoir (excluding Triassic and Rotliegend reservoirs).

Oil and condensate production

Oil production in 2017 (in 1000 Sm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Botlek II	NAM	10.0	0.0	0.1	1.9	1.5	1.6	2.0	2.2	0.7	0.0	0.0	0.0	0.0
Rijswijk	NAM	99.0	11.3	11.1	11.1	8.9	10.9	10.9	9.8	11.2	0.1	0.0	3.9	9.8
Schoonebeek	NAM	310.0	26.5	23.7	26.2	22.2	23.1	23.0	24.9	23.8	21.9	27.6	32.3	34.7
F02a	Dana	159.6	15.0	13.1	14.8	13.9	14.4	13.9	14.0	5.5	15.1	14.4	12.4	13.0
F03b	ENGIE	42.5	3.2	3.5	4.8	5.6	5.0	4.9	5.3	5.0	5.0	0.3	0.0	0.0
P09c, P09e & P09f	Petrogas	25.7	2.6	2.3	2.7	2.6	0.7	1.9	1.9	1.7	2.2	2.3	2.3	2.5
P11b	Dana	101.8	6.6	7.2	6.6	7.7	9.6	8.5	9.3	10.4	10.2	8.6	8.4	8.7
P15a & P15b	TAQA	42.7	4.7	3.1	3.9	3.6	3.6	1.1	1.8	4.3	4.1	4.2	4.3	4.1
Q01a-ondiep & Q01b-ondiep	Petrogas	62.5	5.7	4.7	6.3	6.3	4.9	2.6	5.2	5.1	5.5	4.6	5.2	6.3
Q13a	ENGIE	270.2	33.3	28.9	30.1	25.2	22.3	3.3	3.9	22.1	24.4	26.9	24.9	24.9
Total		1 124.0	109.0	97.7	108.4	97.5	96.1	72.0	78.3	89.8	88.6	88.9	93.7	104.0

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

Condensate* production in 2017 (in 1000 Sm³)

Licence	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Territory gas fields	158.2	17.6	17.0	16.8	11.9	12.8	11.9	13.2	11.5	10.5	11.3	12.1	11.7
Continental shelf gas fields	160.5	18.0	9.7	17.7	15.9	15.5	8.8	11.2	14.0	12.3	13.5	12.8	11.1
Total	318.8	35.6	26.7	34.5	27.8	28.3	20.7	24.4	25.6	22.7	24.8	24.9	22.8

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

10. Subsurface storage

Storage licences, Netherlands Territory, as of 1 January 2018

In 2017 no new storage licence applications have been submitted. One application from previous years is still in the process of application. This one is concerned with the storage of filling material to stabilize a salt cavern and storage of brine. The commencement date of the CO₂ storage licence of TAQA has changed.

Applied for

Licence	Publication	Date	Closing date	Storage of	Applicant(s)
Twenthe-Rijn Boeldershoek	-	24-01-2014	-	Filling	AkzoNobel

Started

Licence holder	Licence	Effective from	km ²
TAQA Offshore B.V.	P18-4	01-01-2019/01-01-2021	11
		Total	11

Subsurface storage in 2017

The tables below show the monthly figures for volume of natural gas and nitrogen injected and withdrawn in 2017, per storage facility. Data supplied by licensees.

Stored natural gas (in million Nm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Alkmaar	TAQA	262	0	0	0	0	0	61	15	76	110	0	0	0
Bergermeer	TAQA	2718	826	462	65	10	13	54	0	1	12	0	645	630
Grijpskerk	NAM	2219	0	0	0	207	445	433	423	397	315	0	0	0
Norg	NAM	5099	0	0	8	802	861	924	1043	1092	369	0	0	0
Zuidwending	Gasunie	725	56	74	71	27	57	28	56	52	68	158	10	68
Total			882	536	144	1046	1376	1500	1537	1618	874	158	655	698

Discharged natural gas (in million Nm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Alkmaar	TAQA	223	126	25	0	0	59	0	0	0	0	0	13	0
Bergermeer	TAQA	3027	0	0	80	400	533	472	550	537	446	0	3	5
Grijpskerk	NAM	2293	650	344	64	0	0	0	0	0	0	46	331	857
Norg	NAM	4675	1839	1162	350	44	0	0	0	0	0	2	233	1045
Zuidwending	Gasunie	681	67	41	33	62	39	78	29	29	76	40	86	100
Total			2681	1573	527	506	631	550	579	567	522	89	667	2007

Stored nitrogen (in million Nm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Winschoten II	Gasunie	30.1	1.8	2.0	0.3	0.6	8.3	3.5	1.7	1.8	1.7	1.6	1.7	5.1

Discharged nitrogen (in million Nm³)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Winschoten II	Gasunie	31.9	2.5	1.1	2.6	9.8	0.0	1.0	2.2	2.2	1.7	0.9	4.2	3.7

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 2018 there were five production licences for coal in force. In 2017 there were no mining activities in the licence areas (see Figure 11.1).

Production licences on 1 January 2018, Netherlands Territory

Licence holder	Licence	Effective from	km ²
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

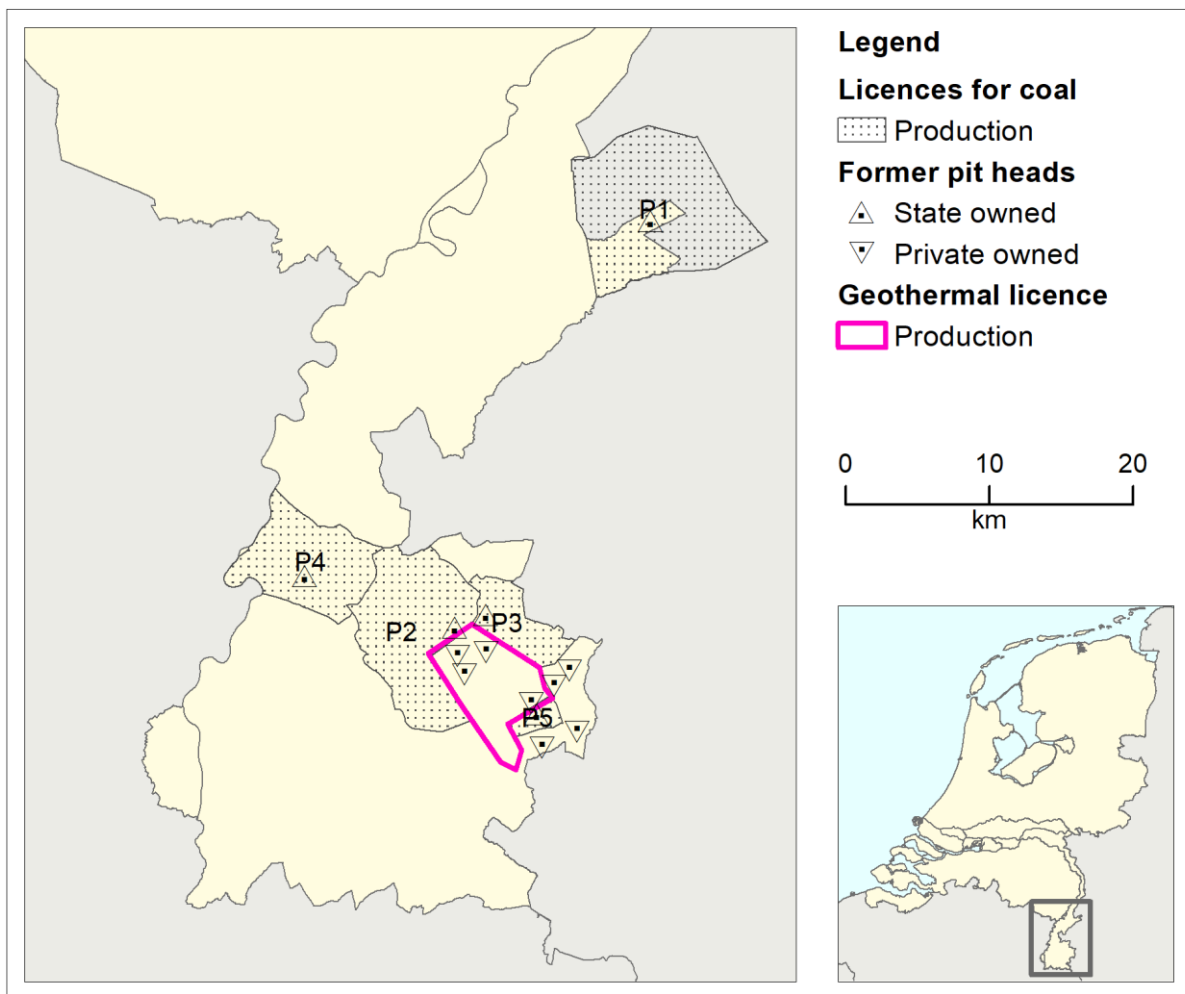


Figure 11.1. Licences for coal at 1 January 2018.

12. Rock salt

On 1 January 2018 sixteen production and no exploration licences were in force. A complete list of all production licences is to be found in Annex 6. The license areas for rock salt are all located in the north and east of the country, which is where the salt is found in Zechstein and Triassic deposits. In 2017 one application for a production licence, submitted in a previous year, was still ongoing. Changes which took place during 2017, concerning licences for the exploration and mining of salt, are listed in the tables below.

Production licences, Netherlands Territory, applied for

Licence	Publication	Date	Closing date	Applicant(s)
Barradeel-Oost *	Staatscourant 249	19-12-2007	24-03-2008	Frisia

* Application ongoing, published in an earlier annual review.

Name changes in 2017

Previous company name	New company name
Nedmag Industries Mining & Manufacturing B.V.	Nedmag B.V.

In 2017 seven salt wells were completed. In the Groningen province Nedmag has converted, by means of a sidetrack, a water injection well into a salt production well; the production of magnesium salts started in October. In Twente Akzo completed six wells of which four new salt production wells in the Ganzebos area, on the south west edge of the salt pillow. Well Twente-Rijn-055B has been drilled to the existing "cavity 55" for stabilisation of the solution mined cavity by means of filling it with slurry. Twente-Rijn-007A is a research well intended for measuring the stability of the soil.

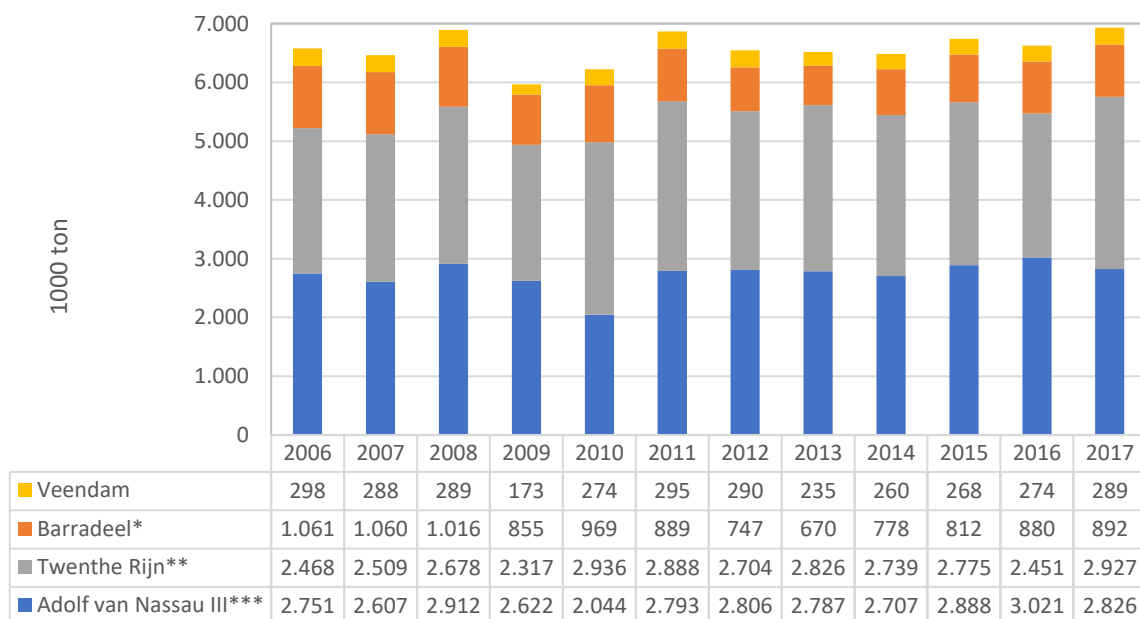
Wells ceased in 2017

	Name of well	Licence	Operator	Function
1	Tripscompagnie-03-Sidetrack1	Veendam	Nedmag B.V.	Development
2	Twente-Rijn-528	Twenthe-Rijn	Akzo Nobel Salt B.V.	Development
3	Twente-Rijn-541	Twenthe-Rijn	Akzo Nobel Salt B.V.	Development
4	Twente-Rijn-542	Twenthe-Rijn Oude Maten	Akzo Nobel Salt B.V.	Development
5	Twente-Rijn-543	Twenthe-Rijn Oude Maten	Akzo Nobel Salt B.V.	Development
6	Twente-Rijn-007A	Twenthe-Rijn	Akzo Nobel Salt B.V.	Observation
7	Twente-Rijn-055B	Twenthe-Rijn	Akzo Nobel Salt B.V.	Observation

Rock salt production in 2017 (in 1000 Ton)

Production	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Adolf van Nassau III	AKZO	1 200	118	101	118	108	103	108	96	91	89	83	89	95
Uitbreiding AvN III	AKZO	1 626	140	125	151	145	119	148	144	141	112	120	143	138
Barradeel	Frisia	607	50	51	55	45	19	54	57	58	56	57	57	48
Barradeel II	Frisia	284	40	34	32	31	3	0	0	39	30	24	14	37
Twenthe-Rijn	AKZO	1 611	126	122	142	123	134	116	135	138	114	142	153	163
Uitbreiding Tw-Rijn	AKZO	1 003	105	86	99	79	84	67	83	89	77	89	71	76
Tw-Rijn Helmerzijde	AKZO	313	23	20	21	21	24	23	31	37	32	29	25	29
Veendam	Nedmag	289	26	27	30	18	12	20	26	20	29	27	21	32
Total		6 935	628	566	648	571	498	537	572	614	539	570	573	619

Rock salt production 2005 – 2017 (in 1000 ton)



* Including Barradeel II.

** Including Uitbreiding Twenthe-Rijn en Twenthe-Rijn Helmerzijde.

*** Including Uitbreiding Adolf van Nassau III.

Names of rock salt production licences on the Netherlands territory, as indicated on the map in Figure 12.1.

Production licence for rock salt			
P1	Adolf van Nassau II	P9	Isidorushoeve
P2	Uitbreiding Adolf van Nassau II	P10	Twenthe-Rijn
P3	Adolf van Nassau III	P11	Uitbreiding Twenthe-Rijn
P4	Uitbreiding Adolf van Nassau III	P12	Twenthe-Rijn Helmerzijde
P5	Barradeel	P13	Twenthe-Rijn Oude Maten
P6	Barradeel II	P14	Veendam
P7	Buurse	P15	Weerselo
P8	Havenmond	P16	Zuidoost-Enschede
Applied production licence for rock salt			
P17	Barradeel-Oost		

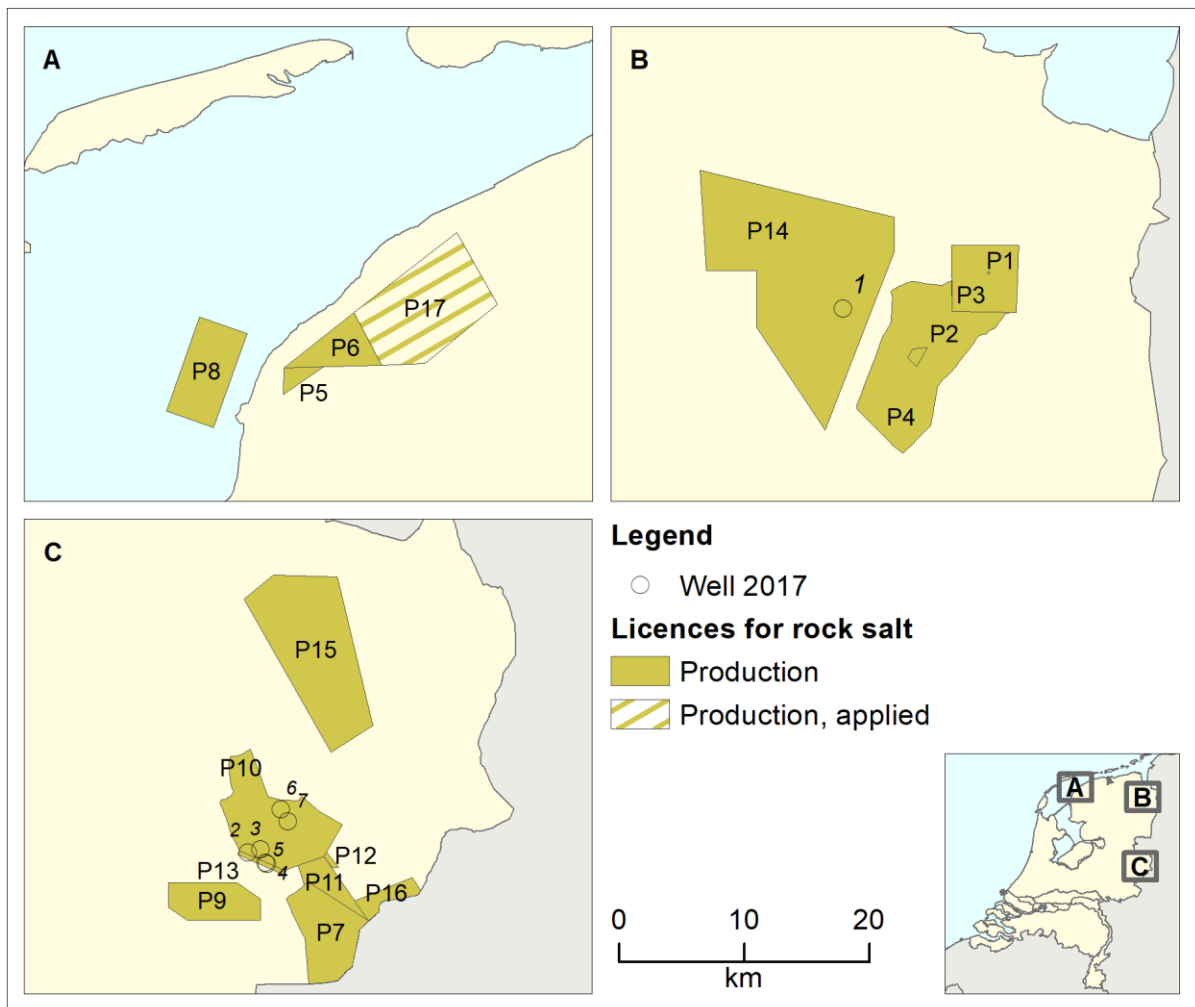


Figure 12.1. Licences for rock salt production at 1 January 2018.

13. Geothermal Energy

13.1. Geothermal licences as at 1 January 2018

In 2017 there were 22 new applications for exploration licences for geothermal energy. As at 1 January 2018 a total of 31 geothermal energy exploration licences were in the process of application. During 2017 2 geothermal exploration licences were awarded, 2 exploration licences were split into 4 new ones and 6 licences were spatially restricted. Further, 18 geothermal exploration licences were extended, and 6 licences expired, were withdrawn or relinquished. One application for an exploration licence was withdrawn in 2017. As at 1 January 2018 there were a total of 47 geothermal energy exploration licences in effect (see Annex 7).

In 2017 there were 2 new applications for a production licence for geothermal energy. At the first of January 2018 5 geothermal energy production licences are in the application procedure and 4 geothermal energy production licences were issued. Resulting in 12 effective geothermal energy production licences as at 1st January 2018.

Changes in the licences for the exploration and production of geothermal energy which took place during 2017 are listed in the tables at the end of this chapter.

13.2. Geothermal wells and production installations

In 2017 15 geothermal wells were completed (see Figure 13.1 and Table 11).

The geothermal systems (will) 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

Realising these wells increased the geothermal production installations in the Netherlands by four while two more installations were initiated (licence areas Andijk and Zevenbergen II). These doublets will be completed in 2018.

As at 1 January 2018 there were a total of 20 geothermal installations of which the installation of Heerlerheide (wells HLH-GT-1 & 2) is actually a heat/cold storage facility and as such will not be included in the following overview. In 2017 14 geothermal systems were operational with reference to the fact that they provide (energy) production figures according to art. 111 and 119 of the mining decree.

Table 11. Geothermal wells completed in 2017.

	Name of well	Geothermal energy licence	Operator
1	KHL-GT-02	Kwintsheul	Nature's Heat B.V.
2	MDM-GT-05	Middenmeer 2	ECW Geomanagement B.V.
3	MDM-GT-06	Middenmeer	ECW Geomanagement B.V.
4	MDM-GT-06-S1	Middenmeer	ECW Geomanagement B.V.
5	MDM-GT-06-S2	Middenmeer	ECW Geomanagement B.V.
6	MLD-GT-01	Maasland	Kwekerij de Westhoek B.V. cs
7	MLD-GT-01-S1	Maasland	Kwekerij de Westhoek B.V. cs
8	MLD-GT-02	Maasland	Kwekerij de Westhoek B.V. cs
9	MLD-GT-02-S1	Maasland	Kwekerij de Westhoek B.V. cs
10	MLD-GT-02-S2	Maasland	Kwekerij de Westhoek B.V. cs
11	LSL-GT-01	Lansingerland	Warmtebedrijf Bergschenhoek B.V.
12	LSL-GT-02	Lansingerland	Warmtebedrijf Bergschenhoek B.V.
13	ZVB-GT-01	Zevenbergen II	Visser & Smit Hanab B.V.
14	ADK-GT-01	Andijk	ECW Geoholding B.V.
15	ADK-GT-01-S1	Andijk	ECW Geoholding B.V.

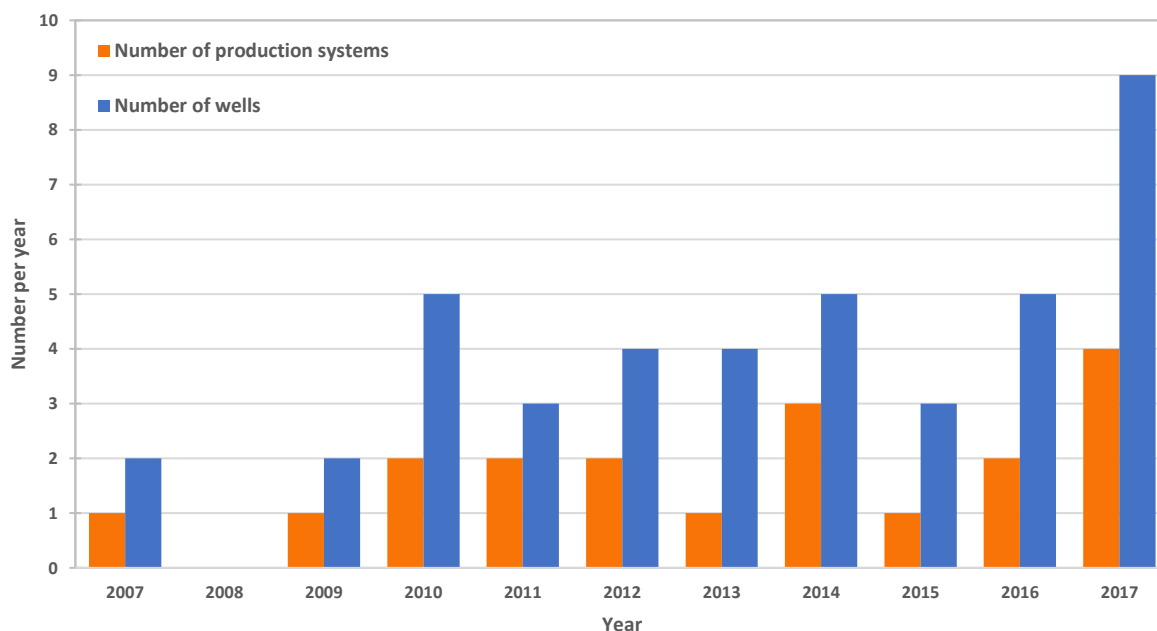


Figure 13.1. Number of geothermal wells completed (sidetracks excluded) per calendar year and number of installations completed since 2007.

The heat is produced from depth intervals between 1600 and 2800 meter and from various geological units (Figure 13.2a and b). Most of the geothermal energy is produced from rocks in the Upper-Jurassic and Lower-Cretaceous in the southwest of the Netherlands. One other installation in the southwest of the Netherlands produces from Triassic strata. The five production installations in Noord-Holland and Overijssel produce from Rotliegend strata, whereas two installations in North-Limburg produce from Lower Carboniferous strata.

The produced heat is mainly used to heat commercial greenhouses. One project also supplies heat to a public utility facility and several buildings. Another project will supply heat to a heating network in an urban area (Figure 13.2c).

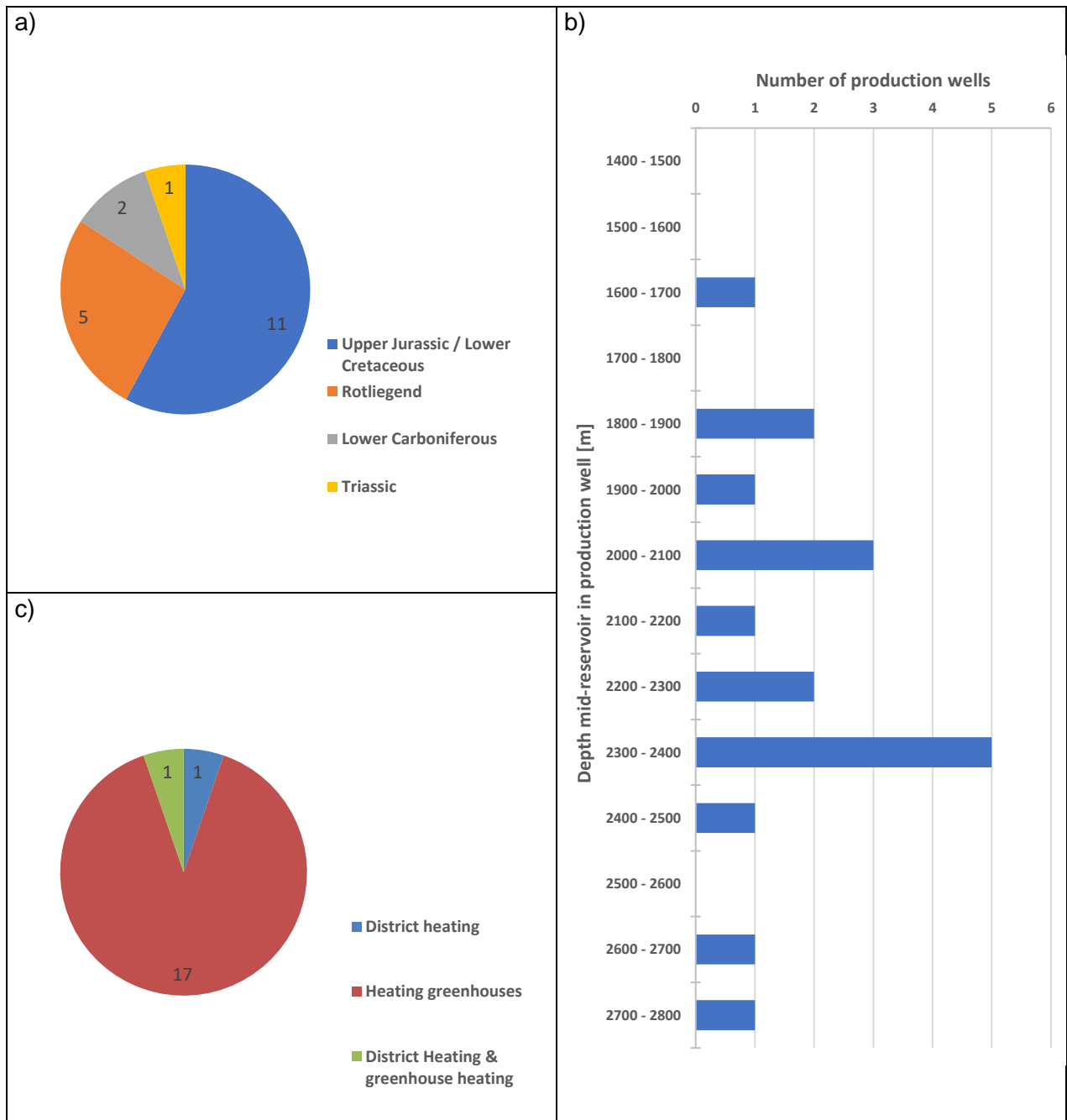


Figure 13.2. a) Stratigraphy of the productive interval, b) Depth to mid of aquifer, c) uses of the heat produced.

13.3. Production of geothermal energy in 2017

Of the 19 geothermal systems 14 were operational in 2017 (Table 12). These operational systems have submitted the obligatory monthly production figures. Of the 5 remaining non-operational installations 4 were in the start-up phase while the other was temporarily closed in. Of the 14 operational installations 12 operate under a formal production licence (excluding the Heerlerheide installation), the remaining geothermal installations operate as an 'extended well test'. During this test period the licensee will gather data to enable efficient operation in future times. At the end of 2017 all producing operators had applied for a formal production licence.

Table 12. Geothermal installations.

	Name geothermal energy installation	Wells	Geothermal energy licence	Operational in 2017
1	Californië Geothermie	CAL-GT-1,2&3	Californië 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	Californië Lipzig Gielen	CAL-GT-1&2	Californië-V	Yes
16	Poeldijk	PLD-GT-1&2	Honselersdijk-2	Yes
17	Kwintsheul Geothermie	KHL-GT-1&2	Kwintsheul II	No
18	Lansingerland	LSL-GT-1&2	Lansingerland	No
19	Middenmeer III	MDM-GT-5&6	Middenmeer	No
20	Maasland	MLD-GT-1&2	Maasland	No

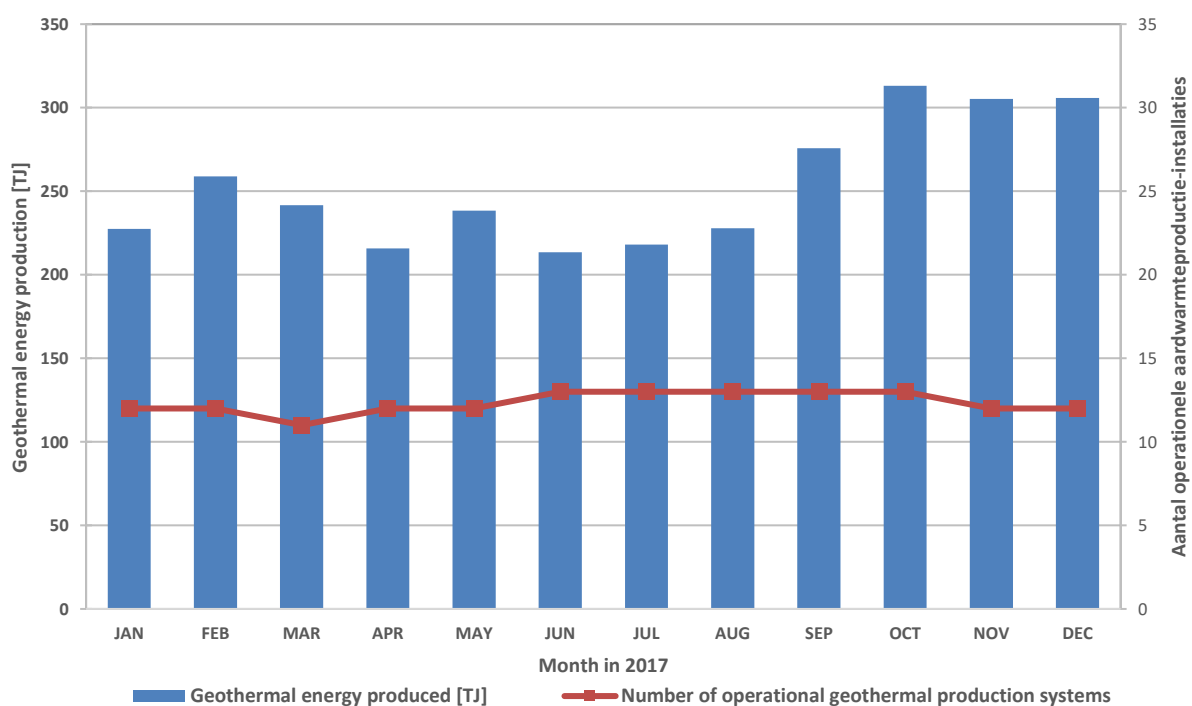


Figure 13.3. Monthly production of geothermal energy in tera joules and the number of geothermal energy production systems contributing to the reported production (excluding Mijnwater energiecentrale Heerlen).

Figure 13.3 shows the aggregate production of geothermal energy per month in TJ ($\times 10^{12}$ Joule) and the number of installations contributing to the monthly total. Not all installations were operational throughout the year. The cumulative reported annual production is 3.042 PJ in 2017 (Figure 13.4). The cumulative reported annual production for 2016 is higher than reported in the annual review 2016. This is because not all data was available at the time of publication of 2016 report.

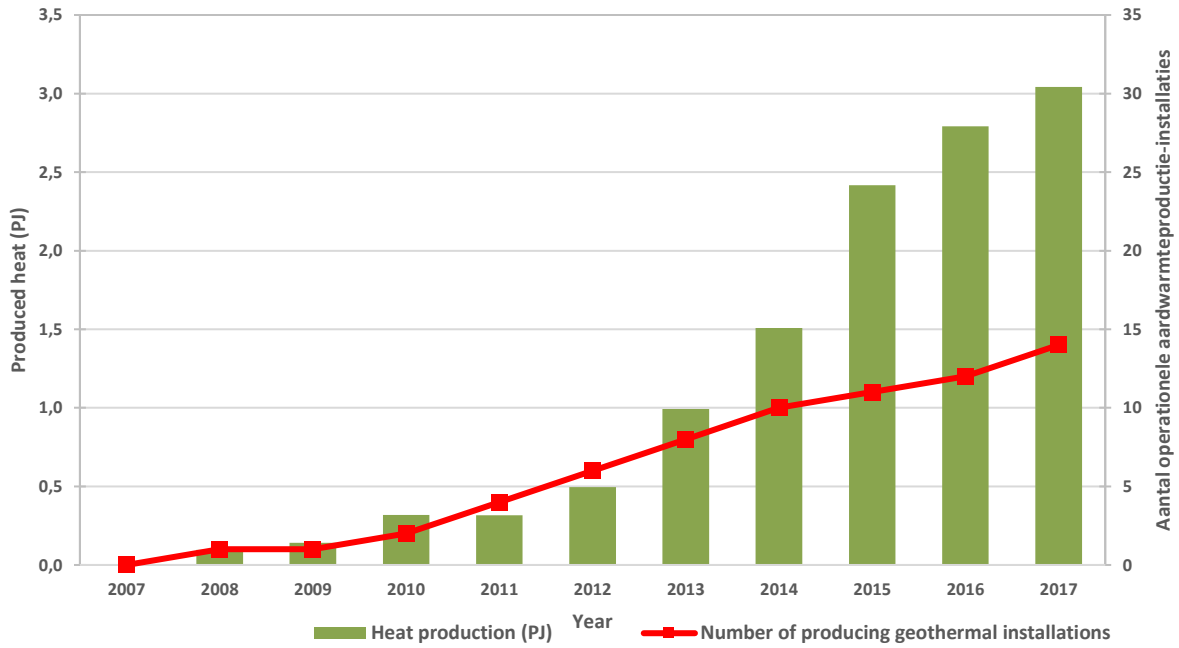


Figure 13.4. Annual production of geothermal energy (PJ/year).

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'. Nine installations reported the volumes of gas captured (Figure 13.5). Table 13 gives an overview of the produced geothermal energy, co-produced gas and co-produced oil per year since 2008.

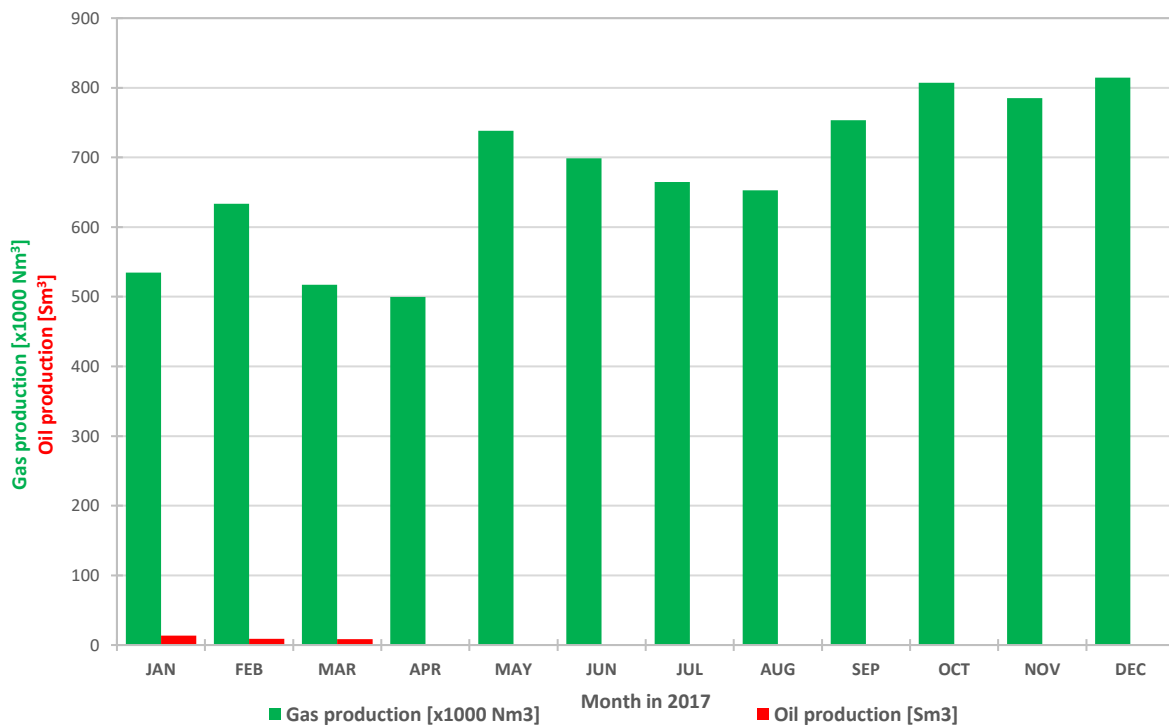


Figure 13.5. Volumes of hydrocarbons co-produced with geothermal energy. Gas in 1000 Nm³ and oil in Sm³.

Table 13. Overview of produced geothermal energy [TJ], co-produced gas [x1000 Nm³] and co-produced oil [Sm³].

Year	Energy produced [TJ]	Co-produced gas [x1000Nm ³]	Co-produced oil [Sm ³]
2008	96*	-	-
2009	142*	-	-
2010	318*	-	-
2011	316*	-	-
2012	495*	-	-
2013	993*	-	-
2014	1509	3267	429
2015	2417	4378	186
2016	2792**	7670	130
2017	3042	8100	31

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

- No value reported

** Adjustment of reported figure in 2016.

13.4. Exploration licences, Netherlands Territory

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
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.
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
Maasbree 2 *	Staatscourant 50 690	28-09-2016	28-12-2016	Warmtebedrijf Siberië B.V.
Leeuwarden 4	Staatscourant 5 832	03-02-2017	05-05-2017	FrieslandCampina
Middenmeer 4	Staatscourant 19 430	07-04-2017	07-07-2017	ECW Geoholding B.V.
Zuidplas	Staatscourant 25 944	10-05-2017	09-08-2017	Wayland Energy B.V.
De Lier V	Staatscourant 25 945	10-05-2017	09-08-2017	Trias Westland B.V., EnergieWende B.V. cs
Westland Zuidwest	Staatscourant 25 946	10-05-2017	09-08-2017	Energie Transitie Partners B.V.
Alkmaar	Staatscourant 25 947	10-05-2017	09-08-2017	N.V. HVC
Lelystad	Staatscourant 27 124	17-05-2017	16-08-2017	N.V. HVC
Den Helder	Staatscourant 27 494	18-05-2017	17-08-2017	N.V. HVC
Drechtsteden	Staatscourant 29 764	31-05-2017	30-08-2017	N.V. HVC
De Lier VI	Staatscourant 52 076	15-09-2017	15-12-2017	EnergieWende B.V.cs
Velsen	Staatscourant 52 119	15-09-2017	15-12-2017	N.V. HVC
Sneek	Staatscourant 53 129	21-09-2017	21-12-2017	DDGeothermie Sneek B.V.
Midwoud	Staatscourant 53 132	21-09-2017	21-12-2017	Vermilion Energy Netherlands B.V.
Rotterdam-Haven	Staatscourant 53 130	21-09-2017	21-12-2017	Havenbedrijf Rotterdam N.V.
West-Brabant	Staatscourant 55 280	03-10-2017	02-01-2018	
Breda	Staatscourant 61 268	24-10-2017	23-01-2018	
Noordwest-Brabant	Staatscourant 65 459	16-11-2017	15-02-2018	
Zuidwest-Brabant	Staatscourant 65 458	16-11-2017	15-02-2018	
Noord-Zeeland	Staatscourant 65 460	16-11-2017	15-02-2018	
Den Haag 4	Staatscourant 67 834	28-11-2017	27-02-2018	
Bleiswijk 6	Staatscourant 73 833	27-12-2017	28-03-2018	
Terheijden	Staatscourant 73 835	27-12-2017	28-03-2018	

* Application ongoing, published in an earlier annual review.

** Application withdrawn per 31-8-2017.

Awarded

Operator	Licence	Effective from	km²
DDH Energy B.V.	Drachten	12-09-2017	19
Gemeente Zwolle	Zwolle	23-12-2017	74
		Total	93

Prolonged

Operator	Licence	Effective from	Effective till
Trias Westland B.V.	De Lier IV	08-02-2017	30-12-2018
Uniper Benelux N.V.	Rotterdam 4	25-03-2017	30-06-2020
Uniper Benelux N.V.	Rotterdam 5	25-03-2017	30-06-2020
Hydreco GeoMEC B.V. cs	Vierpolders	21-06-2017	30-12-2021
Hydreco GeoMEC B.V. cs	Brielle 2	21-06-2017	30-12-2021
Warmtebedrijf Bergschenhoek B.V.	Lansingerland	21-06-2017	30-09-2018
Hydreco GeoMEC B.V.	Pijnacker-Nootdorp 6a	23-06-2017	30-06-2019
Hydreco GeoMEC B.V. cs	Den Haag	06-07-2017	29-06-2018
Californië Wijnen Geothermie B.V.	Californië IV	06-08-2017	30-12-2020
ECW Geoholding B.V.	Andijk	31-08-2017	30-03-2019
Gemeente Groningen	Groningen 2	27-10-2017	31-05-2018
ECW Geoholding B.V.	Middenmeer 2	17-11-2017	30-12-2022
AC Hartman Beheer B.V. cs	Sexbierum	30-11-2017	29-02-2020
Vereniging van Eigenaren Oude Campspolder	Maasland 2	22-12-2017	31-12-2018
Duurzaam Voorne Holding B.V.	Oostvoorne	31-12-2017	30-12-2019
Trias Westland B.V.	Naaldwijk 2II	30-12-2017	30-12-2018
Trias Westland B.V.	Naaldwijk 3	30-12-2017	30-12-2020
Kwekerij de Westhoek B.V. cs	Maasland	31-12-2017	30-06-2018

Split

Operator	Licence	Effective from	km²
Before			
- Bernhard Plantenkwekerij B.V. cs	Luttelgeest		72
- Visser en Smit Hanab B.V.	Zevenbergen		43
After			
- Bernhard Plantenkwekerij B.V. cs	Luttelgeest I	08-04-2017	13
- Bernhard Plantenkwekerij B.V. cs	Luttelgeest II	08-04-2017	59
- Visser en Smit Hanab B.V.	Zevenbergen II	06-07-2017	4
- Visser en Smit Hanab B.V.	Zevenbergen III	06-07-2017	39

Restricted

Operator	Licence	Effective from	km²
Transmark Renewable Products B.V.	Utrecht - Noord-Brabant	08-04-2017	198
Hydreco GeoMEC B.V. cs	Vierpolders	21-06-2017	5
Hydreco GeoMEC B.V. cs	Brielle 2	21-06-2017	25
Californië Lipzig Gielen Geothermie B.V.	Californië V	06-07-2017	<1
Californië Wijnen Geothermie B.V.	Californië IV	06-08-2017	6
Transmark Renewable Products B.V.	Friesland-Zuid	08-08-2017	197
		Total	432

Expired

Operator	Licence	Effective from	km²
EnergieWende B.V.	De Lier III	20-01-2017	15
Eneco Solar, Bio & Hydro B.V.	Rotterdam 2	29-01-2017	26
Eneco Solar, Bio & Hydro B.V.	Rotterdam 3	29-01-2017	2
Dick Oosthoek cs	Oostland	14-06-2017	18
Transmark Renewable Products B.V.	Friesland-Noord	22-06-2017	326
Californië Lipzig Gielen Geothermie B.V.	Californië V	31-12-2017	<1
		Total	387

13.5. Production Licences, Netherlands Territory

Applied for

Licence	Publication	Date	Closing date	Applicant(s)
Den Haag *	-	21-09-2011	-	Hydreco GeoMEC B.V. cs
Honselersdijk *	-	15-01-2013	-	J.W.M. Scheffers cs
Middenmeer *	-	21-03-2013	-	ECW Geoholding B.V.
Kwintsheul	-	16-02-2017	-	Nature's Heat B.V.
Zevenbergen	-	25-09-2017	-	Visser en Smit Hanab B.V. cs

* Application ongoing, published in an earlier annual review.

Awarded

Operator	Licence	Effective from	km²
Hydreco GeoMEC B.V. cs	Vierpolders	21-06-2017	6
Californië Wijnen Geothermie B.V. cs	Californië IV	06-07-2017	4
Californië Lipzig Gielen Geothermie B.V.	Californië V	06-07-2017	5
Aardwarmte Vogelaer B.V.	Poeldijk	31-08-2017	5
		Total	20

13.6. Company changes in 2017

The table below lists in chronological order the changes which took place during 2017 as a result of mutations in consortiums of companies with licences.

Company changes in exploration licences

Licence	Relinquishing company	Acquiring company	Effective from	Government Gazette
Luttelgeest II	Bernhard Plantenkwekerij B.V.	Hoogweg Aardwarmte B.V. *	08-04-2017	25 792
Zevenbergen II	-	GeoBrothers B.V.	06-07-2017	39 858
Groningen 2	Gemeente Groningen	WarmteStad B.V. *	27-10-2017	62 682
Luttelgeest I	ECL Netwerk B.V. Stichting Nieuwland	-	15-11-2017	66 347
Luttelgeest II	ECL Netwerk B.V. Stichting Nieuwland	Hoogweg Aardwarmte B.V.	15-11-2017	66 348
Lansingerland 4	A en G van den Bosch B.V.	Wayland Energy B.V. *	13-12-2017	

Company changes in production licences

Licence	Relinquishing company	Acquiring company	Effective from	Government Gazette
-	-	-	-	-

Company name changes

Original company	New company
E.ON E&P Benelux N.V.	Uniper Benelux N.V. *
Warmtebedrijf Bergschenhoek B.V.	Wayland Energy Bergschenhoek

* per 28-4-2016

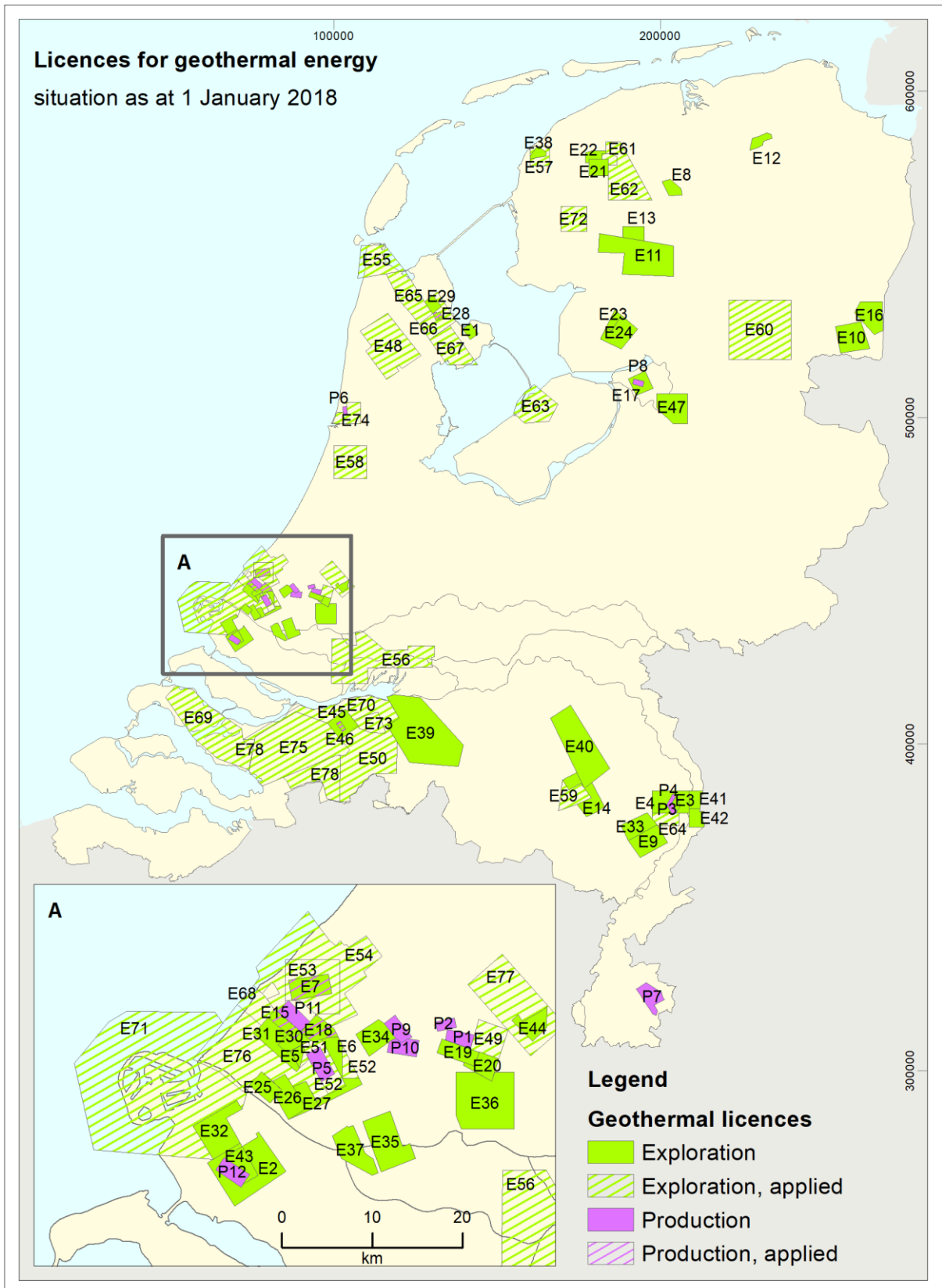


Figure 13.6. Licences for geothermal energy per 1 januari 2018.

Names of exploration and production licences for geothermal energy, Netherlands Territory, as indicated in Figure 13.6.

Exploration					
E1	Andijk	E18	Kwintsheul II	E35	Rotterdam 4
E2	Brielle 2	E19	Lansingerland	E36	Rotterdam 5
E3	Californië IV	E20	Lansingerland 4	E37	Rotterdam- Vlaardingen
E4	Californië VI	E21	Leeuwarden	E38	Sexbierum
E5	De Lier IV	E22	Leeuwarden 2	E39	Tilburg- Geertruidenberg
E6	De Lier 3II	E23	Luttelgeest I	E40	Utrecht- Noord-Brabant
E7	Den Haag	E24	Luttelgeest II	E41	Velden
E8	Drachten	E25	Maasdijk	E42	Venlo
E9	Egchel	E26	Maasland	E43	Vierpolders
E10	Erica	E27	Maasland 2	E44	Waddinxveen 2
E11	Friesland-Zuid	E28	Middenmeer	E45	Zevenbergen II
E12	Groningen 2	E29	Middenmeer 2	E46	Zevenbergen III
E13	Heerenveen	E30	Naaldwijk 2II	E47	Zwolle
E14	Helmond 2	E31	Naaldwijk 3		
E15	Honselersdijk	E32	Oostvoorne		
E16	Klazienaveen	E33	Peel en Maas		
E17	Koekoekspolder IIa	E34	Pijnacker-Nootdorp 6a		
Exploration, applied					
E48	Alkmaar	E59	Helmond 3	E70	Noordwest-Brabant
E49	Bleiswijk 6	E60	Hoogeveen	E71	Rotterdam-Haven
E50	Breda	E61	Leeuwarden 3	E72	Sneek
E51	De Lier V	E62	Leeuwarden 4	E73	Terheijden
E52	De Lier VI	E63	Lelystad	E74	Velsen
E53	Den Haag 3	E64	Maasbree 2	E75	West-Brabant
E54	Den Haag 4	E65	Middenmeer 3	E76	Westland Zuidwest
E55	Den Helder	E66	Middenmeer 4	E77	Zuidplas
E56	Drechtsteden	E67	Midwoud	E78	Zuidwest-Brabant
E57	Franekeradeel	E68	Monster 2		
E58	Haarlem-Schalkwijk	E69	Noord-Zeeland		
Production					
P1	Bleiswijk	P5	De Lier III	P9	Pijnacker-Nootdorp 4
P2	Bleiswijk 1b	P6	Heemskerk	P10	Pijnacker-Nootdorp 5
P3	Californië IV	P7	Heerlen	P11	Poeldijk
P4	Californië V	P8	Kampen	P12	Vierpolders
Production, applied					
E7	Den Haag	E18	Kwintsheul	E45	Zevenbergen
E15	Honselersdijk	E28	Middenmeer		

Annexes

1. Natural gas and oil accumulations by status as at 1 January 2018

1.1. Natural gas accumulations

Developed accumulations

Accumulation	Company	Licence name [Type]***	Gas/Oil
Ameland-Oost	NAM	Noord-Friesland [wv]	G
Anjum	NAM	Noord-Friesland [wv]	G
Assen	NAM	Drenthe IIb [wv]	G
Annerveen	NAM	Drenthe IIb [wv], Groningen [wv]	G&O
Ameland-Westgat	NAM	Noord-Friesland [wv]	G
Bedum	NAM	Groningen [wv]	G
Bergen	TAQA	Bergen II [wv]	G
Blijham	NAM	Groningen [wv]	G
Blija-Ferwerderadeel	NAM	Noord-Friesland [wv]	G
Blija-Zuid	NAM	Noord-Friesland [wv]	G
Blija-Zuidoost	NAM	Noord-Friesland [wv]	G
Boerakker	NAM	Groningen [wv]	G
Botlek	NAM	Botlek II [wv], Rijswijk [wv]	G
Brakel	Vermillion	Andel Va [wv]	G&O
Collendoorn	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Collendoornerveen	NAM	Schoonebeek [wv]	G
Coevorden	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Dalen	NAM	Drenthe IIb [wv], Drenthe V [wv], Schoonebeek [wv]	G
De Hoeve	Vermillion	Gorredijk [wv]	G
Diever	Vermillion	Drenthe VI [wv]	G
Donkerbroek - West	Tulip	Donkerbroek [wv], Donkerbroek-West [wv]	G
Den Velde	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Een	NAM	Drenthe IIb [wv], Groningen [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
Eernewoude	Vermillion	Leeuwarden [wv]	G
Eesveen	Vermillion	Drenthe VI [wv], Steenwijk [wv]	G
Ezumazijl	NAM	Noord-Friesland [wv]	G
Faan	NAM	Groningen [wv]	G
Feerwerd	NAM	Groningen [wv]	G
Gaag	NAM	Rijswijk [wv]	G
Grootegast	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Grolloo	Vermillion	Drenthe IV [wv]	G
Groningen	NAM	Groningen [wv]	G
Groet	TAQA	Bergen II [wv], Bergermeer [wv]	G
Geesbrug	Vermillion	Drenthe V [wv]	G
Gasselternijveen	NAM	Drenthe IIb [wv]	G
Hardenberg	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Hardenberg-Oost	NAM	Hardenberg [wv], Schoonebeek [wv]	G
Hekelingen	NAM	Beijerland [wv], Botlek II [wv]	G
Heinenoord	NAM	Botlek II [wv]	G
Harkema	NAM	Tietjerksteradeel [wv]	G
Kollum	NAM	Noord-Friesland [wv], Tietjerksteradeel [wv]	G
Kollum-Noord	NAM	Noord-Friesland [wv], Tietjerksteradeel [wv]	G
Kommerzijl	NAM	Groningen [wv]	G
Kiel-Windeweer	NAM	Drenthe IIb [wv], Groningen [wv]	G
Leens	NAM	Groningen [wv]	G
Loon op Zand	Vermillion	Waalwijk [wv]	G
Loon op Zand-Zuid	Vermillion	Waalwijk [wv]	G
Leeuwarden en Nijega	Vermillion	Akkrum [opv], Leeuwarden [wv], Tietjerksteradeel [wv]	G
Lauwersoog	NAM	Noord-Friesland [wv]	G
Langezwaag	Vermillion	Gorredijk [wv]	G
De Lier	NAM	Rijswijk [wv]	G&O

Accumulation	Company	Licence name [Type]***	Gas/Oil
Marum	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Middelburen	Vermillion	Leeuwarden [wv]	G
Metslawier-Zuid	NAM	Noord-Friesland [wv]	G
Moddergat	NAM	Noord-Friesland [wv]	G
Middelie	NAM	Middelie [wv]	G
Munnekezijl	NAM	De Marne [wv], Groningen [wv], Noord-Friesland [wv]	G
Monster	NAM	Rijswijk [wv]	G
Molenpolder	NAM	Groningen [wv]	G
Maasdijk	NAM	Rijswijk [wv]	G
Noorderdam	NAM	Rijswijk [wv]	G
Nes	NAM	Noord-Friesland [wv]	G
Noordwolde	Vermillion	Gorredijk [wv]	G
Oud-Beijerland Zuid	NAM	Beijerland [wv], Botlek II [wv]	G
Oudendijk	NAM	Beijerland [wv]	G
Oudeland	NAM	Beijerland [wv]	G
Opeinde	Vermillion	Leeuwarden [wv], Tietjerksteradeel [wv]	G
Oude Pekela	NAM	Groningen [wv]	G
Opende-Oost	NAM	Groningen [wv]	G
Opeinde-Zuid	Vermillion	Akkrum [opv], Leeuwarden [wv]	G
Oosterhesselen	NAM	Drenthe IIb [wv], Drenthe V [wv], Drenthe VI [wv]	G
Oostrum	NAM	Noord-Friesland [wv]	G
Pernis-West	NAM	Rijswijk [wv]	G
Reedijk	NAM	Botlek II [wv]	G
Ried	Vermillion	Leeuwarden [wv]	G
Rustenburg	NAM	Middelie [wv]	G
Schoonebeek (gas)	NAM	Schoonebeek [wv]	G
Sebaldeburen	NAM	Groningen [wv]	G
's-Gravenzande	NAM	Rijswijk [wv]	G
Surhuisterveen	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Slootdorp	Vermillion	Slootdorp [wv]	G
Sprang	Vermillion	Waalwijk [wv]	G
Spijkenisse-Oost	NAM	Botlek II [wv]	G
Schermer	TAQA	Bergen II [wv]	G
Saaksum	NAM	Groningen [wv]	G
Tietjerksteradeel	NAM	Leeuwarden [wv], Tietjerksteradeel [wv]	G
Ureterp	NAM	Tietjerksteradeel [wv]	G
Vierhuizen	NAM	De Marne [wv], Groningen [wv], Noord-Friesland [wv]	G
Vinkega	Vermillion	Drenthe IIa [wv], Drenthe IIIa [wv], Gorredijk [wv]	G
Vries	NAM	Drenthe IIb [wv]	G
Wanneperveen	NAM	Schoonebeek [wv]	G
Westbeemster	NAM	Bergen II [wv], Middelie [wv]	G
Wieringa	NAM	Groningen [wv], Noord-Friesland [wv], Tietjerksteradeel [wv]	G
Warffum	NAM	Groningen [wv]	G
Warga-Wartena	Vermillion	Leeuwarden [wv], Tietjerksteradeel [wv]	G
Waalwijk-Noord	Vermillion	Waalwijk [wv]	G
De Wijk	NAM	Drenthe IIb [wv], Schoonebeek [wv]	G
Zuidwal	Vermillion	Zuidwal [wv]	G
Zevenhuizen	NAM	Groningen [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 & E18c [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

Accumulation	Company	Licence name [Type]***	Gas/Oil
F16-E	Wintershall	E15a [wv], E18a & E18c [wv], F13a [wv], F16a & F16b [wv]	G
G14-A&B	ENGIE	G14 & G17b [wv]	G
G14-C	ENGIE	G14 & G17b [wv]	G
G16a-B	ENGIE	G16a [wv]	G
G16a-C	ENGIE	G16a [wv]	G
G16a-D	ENGIE	G16a [wv]	G
G16a-A	ENGIE	G16a [wv]	G
G17cd-A	ENGIE	G17c & G17d [wv]	G
G17a-S1	ENGIE	G17a [wv], G17c & G17d [wv]	G
F02a-Pliocene	Dana Petroleum	F02a [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
K02b-A	ENGIE	E17a & E17b [wv], E18a & E18c [wv], K02b [wv], K03a [wv], 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
K04-E	Total	K04a [wv], K04b & K05a [wv]	G
K04-N	Total	K04a [wv], K04b & K05a [wv]	G
K04a-Z	Total	K04a [wv]	G
K05a-A	Total	K04a [wv], K04b & K05a [wv], K08 & K11a [wv]	G
K05a-B	Total	K04b & K05a [wv], K05b [wv]	G
K05-C Unit	Total	K04b & K05a [wv], K05b [wv]	G
K05-C North	Total	K01b & K02a [wv], K05b [wv]	G
K05a-D	Total	K04b & K05a [wv]	G
K05a-E	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 & K11a [wv]	G
K07-FB	NAM	J09 [opv], K07 [wv]	G
K07-FC	NAM	K07 [wv], K08 & K11a [wv]	G
K07-FD	NAM	K07 [wv]	G
K08-FA	NAM	K08 & K11a [wv]	G
K08-FC	NAM	K08 & K11a [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

Accumulation	Company	Licence name [Type]***	Gas/Oil
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-D	ENGIE	L02 [wv], L05a [wv], L05b [wv]	G
L05-B	Wintershall	L05b [wv]	G
L05-C	Wintershall	L05b [wv], L06b [wv]	G
L05a-A	ENGIE	L02 [wv], L04c [wv], L05a [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 & L08d [wv]	G
L08-D	ONE	L08a [wv], L08b & L08d [wv], L11b [wv]	G
L08-P	Wintershall	L05c [wv], L08b & L08d [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
Markham	Centrica	J03a [wv], J03b & J06 [wv]	G
M07-B	ONE	M07 [wv]	G
N07-FA	NAM	N07a [wv], Noord-Friesland [wv]	G
P06-D	Wintershall	P06 [wv], P09c, P09e & P09f [wv]	G
P06-Main	Wintershall	P06 [wv]	G
P09-A	Wintershall	P09a, P09b & P09d [wv], P09c, P09e & P09f [wv]	G
P10a-De Ruyter Western Extension	Dana Petroleum	P10a [wv]	G&O
P11a-E	ONE	P11a [wv]	G
P11-12	ONE	P11a [wv]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
P15-13	TAQA	P15a & P15b [wv]	G
P15-09	TAQA	P15a & P15b [wv], P18a [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-Diep [wv], Q04 [wv]	G
Q01-D	Wintershall	Q01-Diep [wv], Q01a-Ondiep & Q01b-Ondiep [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
Alkmaar	TAQA	Alkmaar [osv]	G
Bergermeer	TAQA	Bergermeer [osv]	G
Grijpskerk	NAM	Grijpskerk [osv]	G
Norg	NAM	Norg [osv]	G
Aardgasbuffer Zuidwending	Gasunie	Zuidwending [osv]	G

Undeveloped accumulations

Accumulation	Company	Licence name [Type]***	Gas/Oil
Production expected to start between 2017 - 2020			
Allardsoog	NAM	Drenthe IIb [wv], Groningen [wv], Oosterwolde [opv]	G
Assen-Zuid	NAM	Drenthe IIb [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
Terschelling-Noord	Tulip	M10a & M11 [opv], Terschelling-Noord [opv]	G
Ternaard	NAM	Noord-Friesland [wv]	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 [wv]	G
D15 Tourmaline	ENGIE	D15 [wv]	G
F16-P	Wintershall	F16a & F16b [wv]	G
K09c-B	ENGIE	K09a & K09b [wv], K09c [wv]	G
K09c-C	ENGIE	K09c [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-Witte de With	Dana Petroleum	P11b [wv]	G
P18-7	ONE	P18b [wv], P18c [wv], Q16a [wv]	G
Q07-A	Tulip	Q07 & Q10a [wv]	G
Ruby	HANSA	N04 [opv], N05 [opv], N08 [opv]	G
P11b-Van Ghent East	Dana Petroleum	P11b [wv]	G&O
Production start unknown			
Boskoop	NAM	Rijswijk [wv]	G
Burum	NAM	Tietjerksteradeel [wv]	G
Beerta	NAM	Groningen [wv]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
Buma	NAM	Drenthe IIb [wv]	G
Deurningen	NAM	Twenthe [wv]	G
Egmond-Binnen	NAM	Middelie [wv]	G
Exloo	NAM	Drenthe IIb [wv]	G
Haakswoold	NAM	Schoonebeek [wv]	G
Heiloo	TAQA	Bergen II [wv]	G
Hollum-Ameland	NAM	Noord-Friesland [wv]	G
Kijkduin-Zee	NAM	Rijswijk [wv]	G
Kerkwijk	NAM	Andel Vb [wv], Utrecht [opv]	G
Lankhorst	NAM	Schoonebeek [wv]	G
Langebrug	NAM	Groningen [wv]	G
Marknesse	Tulip	Marknesse [wv]	G
Midlaren	NAM	Drenthe IIb [wv], Groningen [wv]	G&O
Molenaarsgraaf	NAM	Andel Vb [wv], Rijswijk [wv]	G
Maasgeul	NAM	Botlek II [wv], Q16b & Q16c-Diep [wv]	G
Nieuweschans	NAM	Groningen [wv]	G
Nieuwehorne	Vermillion	Gorredijk [wv]	G
Oude Leede	NAM	Rijswijk [wv]	G
Oosterwolde	-	open	G
Rammelbeek	NAM	Twenthe [wv]	G
Schiermonnikoog-Wad	NAM	Noord-Friesland [wv]	G
Terschelling-West	-	open	G
Vlagtwedde	NAM	Groningen [wv]	G
Valthermond	NAM	Drenthe IIb [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	-	open	G
D12 Ilmenite	Wintershall	D09 & E07 [opv], D12a [wv]	G
E11-Vincent	Tullow	E11 [opv]	G
E12 Lelie	-	open	G
E12 Tulp East	-	open	G
E13 Epidoot	-	open	G
J09 Alpha North	NAM	J09 [opv], K07 [wv]	G
K08-FB	NAM	K08 & K11a [wv]	G
K08-FD	NAM	K04b & K05a [wv], K08 & K11a [wv]	G
K08-FE	NAM	K08 & K11a [wv], K09a & K09b [wv]	G
K08-FF	NAM	K08 & K11a [wv]	G
K14-FC	NAM	K08 & K11a [wv], K14a [wv]	G
K15-FF	NAM	K15 [wv]	G
K16-5	-	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
L07-F	Total	K06 & L07 [wv]	G
L10-6	ENGIE	L10 & L11a [wv]	G
L11a-B	ENGIE	L10 & L11a [wv]	G
L11-1	ENGIE	L10 & L11a [wv]	G
L12-FD	Tullow	L09 [wv], L12d [wv]	G
L13-FA	NAM	L13 [wv]	G
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

Accumulation	Company	Licence name [Type]***	Gas/Oil
L16-FA	Wintershall	K18b [wv], L16a [wv]	G
M09-FB	NAM	M09a [wv], N07a [wv], Noord-Friesland [wv]	G
P01-FA	-	open	G
P01-FB	-	open	G
P02-E	-	open	G
P02-Delta	-	open	G
P06-Northwest	Wintershall	P06 [wv]	G
P12-F (P12-14)	Wintershall	P12a [wv]	G
Q02-A	-	open	G
Q13-FC	ENGIE	Q13b [opv]	G
Q14-A	-	open	G
P10b-Van Brakel	Dana Petroleum	P10b [wv]	G

Production ceased

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Akkrum 1	A	Chevron USA	Akkrum [opv], Leeuwarden [wv]	G
Hemrik (Akkrum 11)	T	Tulip	Akkrum 11 [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	U	NAM	Drenthe IIb [wv]	G
Boekel	U	TAQA	Bergen II [wv]	G
Blesdijke	T	Vermillion	Gorredijk [wv], Steenwijk [wv]	G
De Blesse	T	Vermillion	Gorredijk [wv], Steenwijk [wv]	G
Burum-Oost	U	NAM	Tietjerksteradeel [wv]	G
Barendrecht-Ziedewij	U	NAM	Rijswijk [wv]	G
Bozum	U	Vermillion	Oosterend [wv]	G
Castricum-Zee	A	Wintershall	Middelie [wv]	G
Donkerbroek - Main	T	Tulip	Donkerbroek [wv], Donkerbroek-West [wv]	G
Emshoern	A	NAM	Groningen [wv]	G
Engwierum	U	NAM	Noord-Friesland [wv]	G
Franeke	U	Vermillion	Leeuwarden [wv]	G
Groet-Oost	U	TAQA	Middelie [wv]	G
Grouw-Rauwerd	T	Vermillion	Leeuwarden [wv], Oosterend [wv]	G
Geestvaartpolder	U	NAM	Rijswijk [wv]	G
Hoogenweg	A	NAM	Hardenberg [wv]	G
Houwerzijl	U	NAM	Groningen [wv]	G
Harlingen Lower Cretaceous	U	Vermillion	Leeuwarden [wv]	G
Harlingen Upper Cretaceous	T	Vermillion	Leeuwarden [wv]	G
De Klem	U	NAM	Beijerland [wv]	G
Kollumerland	U	NAM	Tietjerksteradeel [wv]	G
Leidschendam	A	NAM	Rijswijk [wv]	G
Leeuwarden 101	U	Vermillion	Leeuwarden [wv]	G
Rotliegend	U	Vermillion	Leeuwarden [wv]	G
De Lutte	U	NAM	Rossum-De Lutte [wv], Twenthe [wv]	G
Middenmeer	U	Vermillion	Slootdorp [wv]	G
Metslawier	U	NAM	Noord-Friesland [wv]	G
Norg-Zuid	U	NAM	Drenthe IIb [wv]	G
Nijensleek	U	Vermillion	Drenthe IIa [wv], Steenwijk [wv]	G
Oldelamer	T	Vermillion	Gorredijk [wv], Lemsterland [opv]	G
Oldenzaal	U	NAM	Rossum-De Lutte [wv], Twenthe [wv]	G
Pieterzijl Oost	T	NAM	Groningen [wv], Tietjerksteradeel [wv]	G
Pernis	U	NAM	Rijswijk [wv]	G
Pasop	U	NAM	Drenthe IIb [wv], Groningen [wv]	G
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

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Sleen	A	NAM	Drenthe I Ib [wv]	G
Sonnega- Weststellingwerf	T	Vermillion	Gorredijk [wv], Steenwijk [wv]	G
Spijkenisse-West	T	NAM	Beijerland [wv], Botlek II [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
Wijk en Aalburg	T	Vermillion	Andel Va [wv]	G
Wimmenum- Egmond	A	NAM	Middelie [wv]	G
Weststellingwerf	U	Vermillion	Gorredijk [wv]	G
Witterdiep	T	NAM	Drenthe I Ib [wv]	G
Zuid-Schermer	U	TAQA	Bergen II [wv]	G
D15a-A104	U	ENGIE	D15 [wv]	G
Halfweg	U	Petrogas	Q01-Diep [wv], Q01a-Ondiep & Q01b-Ondiep [wv], Q02c [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
K07-FE	T	NAM	K07 [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 & K11a [wv]	G
K11-FB	A	ENGIE	K08 & K11a [wv], K12 [wv]	G
K11-FC	A	ENGIE	K08 & K11a [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 & L08d [wv]	G
L08-G	U	Wintershall	L08a [wv]	G
L08-H	U	Wintershall	L08a [wv]	G
L09-FC	U	NAM	L09 [wv]	G
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

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
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, P09e & P09f [wv]	G
P09-B	U	Wintershall	P09c, P09e & P09f [wv]	G
P11b-Van Nes	U	Dana Petroleum	P11b [wv]	G
P12-C	A	Wintershall	P12a [wv]	G
P12-SW	U	Wintershall	P12a [wv]	G
P14-A	A	Wintershall	P11a [wv]	G
P15-10	U	TAQA	P15c [wv]	G
P15-11	U	TAQA	P15a & P15b [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
P15-19	T	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

*** opv = exploration licence, wv = production licence, osv = storage licence.

1.2. Oil accumulations

Developed accumulations

Accumulation	Company	Licence name [type]***	Gas/Oil
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-Diep [wv], Q01a-Ondiep & Q01b-Ondiep [wv]	O
Helder	Petrogas	Q01-Diep [wv], Q01a-Ondiep & Q01b-Ondiep [wv]	O
Horizon	Petrogas	P09a, P09b & P09d [wv], P09c, P09e & P09f [wv]	O
P11b-De Ruyter	Dana Petroleum	P10a [wv], P11b [wv]	O
Q13a-Amstel	ENGIE	Q13a [wv]	O
P15 Rijn	TAQA	P15a & P15b [wv]	O&G
P11b-Van Ghent	Dana Petroleum	P11b [wv]	O&G

Undeveloped accumulations

Accumulation	Company	Licence name [type]***	Gas/Oil
Production start expected between 2017 - 2020			
F06b-Snellius	Dana Petroleum	F06b [opv]	O
F17-NE (Rembrandt)	Wintershall	F17a-Diep [wv], F17a-Ondiep [opv], F17c [wv]	O
F17-SW Culmination	Wintershall	F17a-Diep [wv], F17a-Ondiep [opv], F17c [wv], L02 [wv]	O
P08-A Horizon-West	Petrogas	P09a, P09b & P09d [wv]	O
Q01-Northwest	Petrogas	Q01-Diep [wv]	O
Production start unknown			
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	Wintershall	F14a [opv]	O
F17-Korvet (F17-FA)	ONE	F17a-Diep [wv], F17a-Ondiep [opv]	O
F17-Brigantijn (F17-FB)	ONE	F17a-Diep [wv], F17a-Ondiep [opv]	O
F18-Fregat (F18-FA)	ONE	F18a-Ondiep [opv]	O
K10-B (oil)	-	open	O
L01-FB	-	open	O
L05a-E	ENGIE	L02 [wv], L04c [wv], L05a [wv]	O
P12-West (P12-3)	Wintershall	P12a [wv]	O
Q07-FB	Tulip	Q07 [wv]	O
Q07-FC	Tulip	Q07 & Q10a [wv]	O&G
Q13-FB	NAM	Q13b [opv], Q16b & Q16c-Diep [wv], Rijswijk [wv]	O

Production ceased

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Berkel	A	NAM	Rijswijk [wv]	O&G
Barendrecht	T	NAM	Rijswijk [wv]	O&G
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-Diep [wv], Q01a-Ondiep & Q01b-Ondiep [wv]	O
Hoorn	U	Petrogas	Q01-Diep [wv], Q01a-Ondiep & Q01b-Ondiep [wv]	O
Kotter	U	Wintershall	K18b [wv]	O
Logger	U	Wintershall	L16a [wv], Q01-Diep [wv]	O

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

*** opv = exploration licence, wv = production licence, osv = storage licence.

2. Exploration licences for hydrocarbons, Netherlands territory as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette
1	Tulip Oil Netherlands B.V. Petrogas E&P UK Ltd.	Schagen	355	20-6-2009	31-7-2018	118
2	Tulip Oil Netherlands B.V. *	Terschelling-noord	23	30-7-2013		22 215
3	Vermilion Energy Netherlands B.V. *	Akkrum	210	14-3-2013		10 461
4	Vermilion Energy Netherlands B.V.	Engelen	97	14-10-2009	23-11-2018	16 878
5	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Follega	3	15-6-2010	30-6-2025	9 426
6	Vermilion Energy Netherlands B.V.	Hemelum	450	17-1-2012	31-1-2023	1 490
7	Vermilion Energy Netherlands B.V.	Ijsselmuiden	447	17-1-2014	27-2-2018	1 958
8	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Lemsterland	111	15-6-2010	30-6-2025	9 427
9	Vermilion Energy Netherlands B.V.	Oosterwolde	127	20-4-2007	23-11-2018	83
10	Vermilion Energy Netherlands B.V.	Opmeer	229	19-12-2012	18-12-2018	205
11	Vermilion Energy Netherlands B.V.	Utrecht	1144	26-4-2007	23-11-2018	85
		Total	3197			

* Applied for production licence.

3. Production licences for hydrocarbons, Netherlands territory as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette
1	Nederlandse Aardolie Maatschappij B.V.	Beijerland	140	14-2-1997	14-2-2027	243
2	Nederlandse Aardolie Maatschappij B.V.	Botlek II	232	4-3-2014	19-7-2026	7 445
3	Nederlandse Aardolie Maatschappij B.V. ExxonMobil Producing Netherlands B.V.	De Marne	7	4-10-1994	4-10-2034	189
4	Nederlandse Aardolie Maatschappij B.V.	Drenthe IIb	1881	17-3-2012		6 883
5	Nederlandse Aardolie Maatschappij B.V.	Groningen	2970	30-5-1963		126
6	Nederlandse Aardolie Maatschappij B.V.	Hardenberg	161	22-10-1990	22-10-2035	149
7	Nederlandse Aardolie Maatschappij B.V.	Middelie	946	12-5-1969		94
8	Nederlandse Aardolie Maatschappij B.V. ExxonMobil Producing Netherlands B.V.	Noord-Friesland	1593	27-2-1969		47
9	Nederlandse Aardolie Maatschappij B.V.	Rijswijk	2090	3-1-1955		21
10	Nederlandse Aardolie Maatschappij B.V.	Rossum-de Lutte	46	12-5-1961		116
11	Nederlandse Aardolie Maatschappij B.V.	Schoonebeek	930	3-5-1948		110
12	Nederlandse Aardolie Maatschappij B.V.	Tietjerksteradeel	411	27-2-1969		47
13	Nederlandse Aardolie Maatschappij B.V.	Tubbergen	177	11-3-1953		80
14	Nederlandse Aardolie Maatschappij B.V.	Twenthe	276	1-4-1977		26
15	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	Botlek-maas	3	4-3-2014	19-7-2026	7 445
16	TAQA Onshore B.V. Dana Petroleum Netherlands B.V. Dyas B.V.	Bergen II	221	23-12-2006		232
17	TAQA Onshore B.V.	Bergermeer	19	23-12-2006		232
18	TAQA Piek Gas B.V. Dana Petroleum Netherlands B.V. Dyas B.V.	Alkmaar	12	23-12-2006		232
19	Tulip Oil Netherlands B.V.	Akkrum 11	6	26-7-2012	4-4-2025	6 909
20	Tulip Oil Netherlands B.V.	Donkerbroek	22	4-4-1995	4-4-2025	66

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
21	Tulip Oil Netherlands B.V.	Donkerbroek-West	2	16-3-2011	4-4-2025	4 902
22	Tulip Oil Netherlands B.V.	Marknesse	19	26-1-2010	9-3-2030	1 446
23	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Andel Va	61	5-8-2015	29-12-2038	29 954
24	Vermilion Energy Netherlands B.V. Nederlandse Aardolie Maatschappij B.V. Parkmead (E&P) Ltd.	Andel Vb	164	5-8-2015	29-12-2038	29 954
25	Vermilion Energy Netherlands B.V.	Drenthe IIa	7	17-3-2012		6 883
26	Vermilion Energy Netherlands B.V.	Drenthe IIIa	1	17-3-2012		6 885
27	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe IV	7	18-7-2007		140
28	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe V	25	20-6-2015		18 037
29	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe VI	363	20-6-2015		18 037
30	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Gorredijk	629	29-7-1989	29-7-2024	145
31	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Leeuwarden	614	27-2-1969		46
32	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Oosterend	92	5-9-1985		84
33	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Papekop	63	8-6-2006	19-7-2031	113
34	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Slootdorp	162	1-5-1969		94
35	Vermilion Energy Netherlands B.V.	Steenwijk	99	16-9-1994	16-9-2029	177
36	Vermilion Energy Netherlands B.V.	Waalwijk	186	17-8-1989	17-8-2024	154
37	Vermilion Energy Netherlands B.V.	Zuid-Friesland III	105	9-3-2010	19-4-2030	4 016
38	Vermilion Energy Netherlands B.V. IPC Netherlands B.V.	Zuidwal	74	7-11-1984		190
			Total	14815		

4. Subsurface storage licences, as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette	Substance
1	Akzo Nobel Salt B.V.	Twenthe-Rijn de Marssteden	2	2-10-2010	12-11-2040	15 650	Gasoil
2	Akzo Nobel Salt B.V.	Winschoten III	28	15-11-2010	13-5-2079	18 321	Nitrogen
3	EnergyStock B.V. Akzo Nobel Salt B.V.	Zuidwending	1	11-4-2006	11-4-2036	77	Gas
4	Gasunie Transport Services B.V.	Winschoten II	<1	15-11-2010	13-5-2079	18 321	Nitrogen
5	Nederlandse Aardolie Maatschappij B.V.	Grijpskerk	27	1-4-2003		67	Gas
6	Nederlandse Aardolie Maatschappij B.V.	Norg	81	1-4-2003		68	Gas
7	TAQA Onshore B.V.	Bergermeer	19	8-1-2007	30-6-2050	7	Gas
8	TAQA Offshore B.V.	P18-4	11	1-1-2019	31-12-2026	21 233	CO ₂
9	TAQA Piek Gas B.V. Dana Petroleum Netherlands B.V. Dyas B.V.	Alkmaar	12	1-4-2003		68	Gas
			Total	182			

5. Exploration licences for rock salt, Netherlands territory as at 1 January 2018

No ongoing exploration licences at 1 January 2018.

6. Production licences for rock salt, Netherlands territory as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette
1	Akzo Nobel Salt B.V.	Adolf Van Nassau III	28	16-11-2010		18 324
2	Akzo Nobel Salt B.V.	Buurse	30	18-6-1918		Staatsblad 421
3	Akzo Nobel Salt B.V.	Isidorushoeve	20	8-6-2012	19-7-2052	14 668
4	Akzo Nobel Salt B.V.	Twenthe-Rijn	48	20-10-1933		207
5	Akzo Nobel Salt B.V.	Twenthe-Rijn Helmerzijde	1	29-10-2008	9-12-2048	216
6	Akzo Nobel Salt B.V.	Twenthe-Rijn Oude Maten	1	1-6-2013	12-7-2053	18 332
7	Akzo Nobel Salt B.V. EnergyStock B.V.	Uitbreiding Adolf Van Nassau II	1	21-12-2009		81
8	Akzo Nobel Salt B.V.	Uitbreiding Adolf Van Nassau III	77	21-12-2009		81
9	Akzo Nobel Salt B.V.	Uitbreiding Twenthe-Rijn	9	1-12-1994		249
10	Akzo Nobel Salt B.V.	Weerselo	80	13-3-1967		76
11	Frisia Zout B.V.	Barradeel	3	22-8-1998	22-8-2054	157
12	Frisia Zout B.V.	Barradeel II	17	12-6-2004	26-4-2062	110
13	Frisia Zout B.V.	Havenmond	32	3-1-2012	13-2-2052	405
14	Gasunie Transport Services B.V.	Adolf Van Nassau II	<1	16-11-2010		18 324
15	Nedmag B.V.	Veendam	171	1-8-1980		148
16	Salzgewinnungsgesellschaft Westfalen mbH & Co KG	Zuidoost-Enschede	6	7-3-2014	17-4-2064	7 304
Total			526			

7. Exploration licences for geothermal energy, Netherlands territory as at 1 January 2018

	Licensee	Licence	Km ²	Effective from	Expires	Govern. Gazette
1	A-ware Production B.V.	Heerenveen	46	28-10-2014	8-12-2018	31 141
2	Warmtebedrijf Bergschenhoek B.V.	Lansingerland	7	4-12-2008	30-9-2018	240
3	Bernhard Plantenkwekerij B.V.	Luttelgeest I	13	8-4-2017	19-5-2018	25 792
4	Grondexploitatie maatschappij Californië B.V.	Californie VI	63	1-10-2015	30-12-2018	34 771
5	DDH Energy B.V.	Drachten	19	12-9-2017	23-10-2021	52 546
6	DDH Energy B.V.	Leeuwarden 2	14	1-4-2015	12-5-2019	10 222
7	ECW Geoholding B.V.	Andijk	12	5-3-2010	30-3-2019	3 831
8	ECW Geoholding B.V. *	Middenmeer	5	16-7-2009		11 070
9	ECW Geoholding B.V.	Middenmeer 2	15	13-10-2009	30-12-2022	15 999
10	Ekowarmte B.V.	Velden	21	9-2-2016	21-3-2020	9 270
11	EnergieWende B.V. De Bruijn Geothermie B.V.	De Lier 3II	10	1-5-2015	19-1-2019	13 276
12	Gedeputeerde Staten van Overijssel	Koekoekspolder IIa	28	21-3-2014	30-12-2018	9 051
13	Gemeente Zwolle	Zwolle	74	23-12-2017	2-2-2021	2018/202
14	GeoWeb B.V.	Egchel	62	26-11-2013	6-1-2018	34 027
15	Gipmans Verhuur B.V.	Venlo	24	9-2-2016	21-3-2020	9268
16	AC Hartman Beheer B.V. Gemeente Franekeradeel	Sexbierum	11	17-7-2009	29-2-2020	11 805
17	Hoogweg Aardwarmte B.V.	Luttelgeest II	59	8-4-2017	19-5-2018	25 792
18	Hydreco GeoMEC B.V. GeoMEC-4P Realisatie & Exploitatie B.V.	Brielle 2	25	13-10-2009	30-12-2021	15 990
19	Hydreco GeoMEC B.V. * HAL B.V.	Den Haag	10	3-4-2009		69
20	Hydreco GeoMEC B.V.	Helmond 2	71	26-8-2015	6-10-2019	30 252
21	Hydreco GeoMEC B.V.	Pijnacker-Nootdorp 6a	9	26-8-2015	30-6-2019	30 241

	Licensee	Licence	Km²	Effective from	Expires	Govern. Gazette
22	Hydreco GeoMEC B.V.	Tilburg-Geertruidenberg	325	10-7-2015	20-8-2019	21 858
23	Hydreco GeoMEC B.V. GeoMEC-4P Realisatie & Exploitatie B.V.	Vierpolders	5	10-2-2010	30-12-2021	2 211
24	Geothermie De Kievit B.V.	Peel En Maas	48	19-12-2014	29-1-2019	243
25	Nature's Heat B.V. *	Kwintsheul II	7	1-5-2015		13 276
26	Vereniging van Eigenaren Oude Campspolder	Maasland 2	5	15-10-2010	31-12-2018	16 611
27	Provincie Drenthe Gemeente Emmen	Erica	72	27-10-2010	6-12-2018	17 250
28	Provincie Drenthe Gemeente Emmen	Klazienaveen	61	27-10-2010	30-11-2018	17 245
29	J.W.M. Scheffers * G. Verkade B.V.	Honselersdijk	5	20-6-2009		118
30	Transmark Renewable Products B.V.	Friesland-Zuid	197	19-11-2014	21-10-2018	34 411
31	Transmark Renewable Products B.V.	Utrecht - Noord-Brabant	198	11-9-2013	22-10-2018	26 009
32	Trias Westland B.V.	De Lier IV	2	1-7-2015	30-12-2018	21 833
33	Trias Westland B.V.	Naaldwijk 2II	4	1-5-2015	30-12-2018	13 276
34	Trias Westland B.V.	Naaldwijk 3	10	15-4-2016	30-12-2020	20 814
35	Uniper Benelux N.V.	Rotterdam 4	20	18-12-2012	30-6-2020	208
36	Uniper Benelux N.V.	Rotterdam 5	39	18-12-2012	30-6-2020	733
37	Visser en Smit Hanab B.V. * GeoBrothers B.V.	Zevenbergen II	4	6-7-2017		39 858
38	Visser en Smit Hanab B.V.	Zevenbergen III	39	6-7-2017	30-10-2019	39 858
39	Duurzaam Voorne Holding B.V.	Oostvoorne	17	9-3-2010	30-12-2019	4 013
40	Vopak Terminal Vlaardingen B.V.	Rotterdam-Vlaardingen	13	22-11-2013	2-1-2018	33 332
41	WarmteStad B.V.	Groningen 2	18	16-4-2011	31-5-2018	7 134
42	Wayland Developments B.V.	Waddinxveen 2	7	5-3-2010	31-12-2019	3 829

	Licensee	Licence	Km²	Effective from	Expires	Govern. Gazette
43	Wayland Energy B.V.	Lansingerland 4	6	27-9-2014	7-11-2018	28 237
44	Kwekerij de Westhoek B.V. Van Geest Groep B.V.	Maasland	9	18-12-2009	30-6-2018	79
45	Californië Wijnen Geothermie B.V.	Californië IV	6	1-10-2015	30-12-2020	34 771
46	Van Wijnen Gorredijk B.V.	Leeuwarden	30	28-10-2014	8-12-2018	31 137
47	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	Maasdijk	6	21-10-2009	31-5-2018	16 041
			Total	1751		

* Applied for a production licence.

8. Production licences for geothermal energy, Netherlands territory as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette
1	Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4	4	24-12-2016	3-2-2052	3 132
2	A en G van den Bosch B.V.	Bleiswijk	4	28-11-2008	8-1-2039	237
3	A en G van den Bosch B.V.	BLEISWIJK 1b	2	20-3-2015	30-4-2032	8 784
4	Ce-Ren Beheer B.V.	Heemskerk	3	15-4-2016	26-5-2046	20 802
5	Gebroeders Duijvestijn Energie B.V.	Pijnacker-Nootdorp 5	5	24-12-2016	3-2-2052	3 136
6	EnergieWende B.V. De Bruijn Geothermie B.V.	De Lier III	6	14-7-2016	24-8-2051	38 394
7	Gemeente Heerlen	Heerlen	41	13-10-2009	23-11-2044	15 963
8	Hydreco GeoMEC B.V. GeoMEC-4P Realisatie & Exploitatie B.V.	Vierpolders	6	21-6-2017	1-8-2052	36194
9	Aardwarmtecluster I KKP B.V.	Kampen	5	27-9-2014	7-11-2044	28 239
10	Californië Lipzig Gielen Geothermie B.V.	Californië V	5	6-7-2017	16-8-2052	39 833
11	Aardwarmte Vogelaer B.V.	Poeldijk	5	31-8-2017	11-10-2047	52 090
12	Californië Wijnen Geothermie B.V. GeoWeb B.V.	Californië IV	4	6-7-2017	16-8-2052	39 843
Total			91			

9. Exploration licences for hydrocarbons, Netherlands continental shelf as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette
1	Dana Petroleum Netherlands B.V. * Dyas B.V. Tulip Oil Netherlands B.V.	F06b	260	7-4-2009		70
2	ENGIE E&P Nederland B.V.	D09 & E07	548	4-9-2015	16-10-2020	27 592
3	ENGIE E&P Nederland B.V. HALO Exploration & Production Netherlands B.V.	E10	401	16-1-2008	31-12-2018	13
4	ENGIE E&P Nederland B.V. HALO Exploration & Production Netherlands B.V.	E11	401	22-4-2009	31-12-2018	84
5	ENGIE E&P Nederland B.V. HALO Exploration & Production Netherlands B.V.	E14	403	15-1-2008	31-12-2018	12
6	ENGIE E&P Nederland B.V. Gas Plus Netherlands B.V. HALO Exploration & Production Netherlands B.V.	E15c	283	22-4-2008	31-12-2018	78
7	ENGIE E&P Nederland B.V. Total E&P Nederland B.V.	K01c	274	22-11-2011	3-1-2019	21 372
8	ENGIE E&P Nederland B.V. Nederlandse Aardolie Maatschappij B.V.	L03	406	13-5-2016	23-6-2022	24 426
9	ENGIE E&P Nederland B.V.	Q13b	237	1-5-2015	8-5-2019	13 281
10	Hansa Hydrocarbons Limited	G18	405	18-9-2012	31-12-2021	23 464
11	Hansa Hydrocarbons Limited	H16	73	18-9-2012	31-12-2021	23 463
12	Hansa Hydrocarbons Limited	M03	406	18-9-2012	31-12-2021	23 462
13	Hansa Hydrocarbons Limited	N01	217	18-9-2012	31-12-2021	23 460
14	Hansa Hydrocarbons Limited Oranje-Nassau Energie B.V.	N04	381	14-3-2015	17-4-2020	6 003
15	Hansa Hydrocarbons Limited Oranje-Nassau Energie B.V.	N05	14	14-3-2015	17-4-2020	6 003
16	Hansa Hydrocarbons Limited Oranje-Nassau Energie B.V.	N08	34	14-3-2015	17-4-2020	6 003

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
17	Jetex Petroleum Ltd	P04, P07 & P08b	785	7-10-2016	18-11-2020	52 818
18	Jetex Petroleum Ltd	P10c	249	21-7-2016	2-9-2020	38 277
19	Nederlandse Aardolie Maatschappij B.V. Oranje-Nassau Energie B.V. HALO Exploration & Production Netherlands B.V. Wintershall Noordzee B.V.	J09	18	11-4-2014	31-12-2019	10 508
20	Oranje-Nassau Energie Resources B.V. Petro Ventures Netherlands B.V.	F17a-ondiep	386	30-12-2009	31-12-2020	154
21	Oranje-Nassau Energie Resources B.V. Petro Ventures Netherlands B.V.	F18a-ondiep	170	30-12-2009	31-12-2020	152
22	Oranje-Nassau Energie B.V. Energy06 Investments B.V.	M02a	134	22-11-2011	2-1-2020	1 486
23	Oranje-Nassau Energie B.V. Energy06 Investments B.V.	M04a	209	21-9-2010	2-1-2020	14 900
24	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	S03b	337	7-9-2016	18-10-2020	46 557
25	Petrogas E&P Netherlands B.V. * Dyas B.V. TAQA Offshore B.V.	A12b & B10a	79	16-4-2005		77
26	Petrogas E&P Netherlands B.V. * Dyas B.V. TAQA Offshore B.V.	B16a	67	11-5-1987		70
27	Tulip Oil Netherlands B.V.	M10a & M11	110	28-7-2007	30-6-2022	152
28	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V. TAQA Offshore B.V. Rosewood Exploration Ltd.	F10	401	19-12-2014	30-1-2019	36 868
29	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V. TAQA Offshore B.V. Rosewood Exploration Ltd.	F11a	80	19-12-2014	30-1-2019	36 868
30	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V. Rosewood Exploration Ltd. TAQA Offshore B.V.	F14a	266	10-4-2015	20-11-2018	11 794

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
31	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V. Rosewood Exploration Ltd.	F18b-diep	31	30-12-2009	31-3-2019	152
			Totaal	8067		

* Applied for a production licence.

10. Production licences for hydrocarbons, Netherlands continental shelf as at 1 January 2018

	Licensee	Licence	km ²	Effective from	Expires	Govern. Gazette
1	Dana Petroleum Netherlands B.V. Dyas B.V. Oranje-Nassau Energie B.V. TAQA Offshore B.V.	F02a	307	24-8-1982	24-8-2022	139
2	Dana Petroleum Netherlands B.V.	P10a	5	31-5-2005	11-7-2020	102
3	Dana Petroleum Netherlands B.V.	P10b	100	7-4-2009	19-5-2019	70
4	Dana Petroleum Netherlands B.V.	P11b	210	3-4-2004	14-5-2019	67
5	ENGIE E&P Nederland B.V. Faroe Petroleum (UK) Ltd. Wintershall Noordzee B.V.	D15	247	6-9-1996	6-9-2021	138
6	ENGIE E&P Nederland B.V. Faroe Petroleum (UK) Ltd. Wintershall Noordzee B.V.	D18a	58	29-8-2012	9-10-2032	19 757
7	ENGIE E&P Nederland B.V. IPC Netherlands B.V. Total E&P Nederland B.V.	E16a	29	29-6-2007	9-8-2021	128
8	ENGIE E&P Nederland B.V. IPC Netherlands B.V. Total E&P Nederland B.V.	E17a & E17b	114	28-6-2007	8-8-2021	128
9	ENGIE E&P Nederland B.V. TAQA Offshore B.V.	F03b	335	13-12-2007	9-9-2022	245
10	ENGIE E&P Nederland B.V. Nederlandse Aardolie Maatschappij B.V. TAQA Offshore B.V.	G14 & G17b	441	15-12-2006	14-12-2019	248
11	ENGIE E&P Nederland B.V.	G16a	224	6-1-1992	6-1-2032	245
12	ENGIE E&P Nederland B.V.	G16b	5	11-10-2003	6-1-2032	198
13	ENGIE E&P Nederland B.V.	G17a	237	19-7-2006	14-12-2019	143
14	ENGIE E&P Nederland B.V. Wintershall Noordzee B.V.	G17c & G17d	130	10-11-2000	10-11-2025	188
15	ENGIE E&P Nederland B.V.	K02b	110	20-1-2004	24-8-2023	16
16	ENGIE E&P Nederland B.V.	K03a	83	24-8-1998	24-8-2023	122
17	ENGIE E&P Nederland B.V.	K03c	32	26-11-2005	6-1-2021	233

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
18	ENGIE E&P Nederland B.V. Oranje-Nassau Energie B.V. Rosewood Exploration Ltd. XTO Netherlands Ltd.	K09a & K09b	211	11-8-1986	11-8-2026	129
19	ENGIE E&P Nederland B.V. Oranje-Nassau Energie B.V. Rosewood Exploration Ltd. XTO Netherlands Ltd.	K09c	199	18-12-1987	18-12-2027	229
20	ENGIE E&P Nederland B.V. 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
21	ENGIE E&P Nederland B.V.	L04c	12	7-1-1994	7-1-2034	2
22	ENGIE E&P Nederland B.V.	L05a	163	15-3-1991	15-3-2031	55
23	ENGIE E&P Nederland B.V. 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
24	ENGIE E&P Nederland B.V. Delta Hydrocarbons B.V. Oranje-Nassau Energie B.V. Wintershall Noordzee B.V.	L12a	119	25-9-2008	14-3-2030	189
25	ENGIE E&P Nederland B.V. Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L12b & L15b	92	6-8-2008	12-3-2030	155
26	ENGIE E&P Nederland B.V.	L15c	4	7-9-1990	7-9-2030	172
27	ENGIE E&P Nederland B.V. Rosewood Exploration Ltd. XTO Netherlands Ltd.	N07b	87	14-2-2015	9-3-2034	5 845
28	ENGIE E&P Nederland B.V. Aceiro Energy B.V. TAQA Offshore B.V.	Q13a	30	28-11-2006	28-12-2021	231
29	Hansa Hydrocarbons Limited Oranje-Nassau Energie B.V.	N07c	87	14-2-2015	9-3-2034	5 845
30	Nederlandse Aardolie Maatschappij B.V.	F17c	18	4-12-1996	4-12-2024	207

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
31	Nederlandse Aardolie Maatschappij B.V.	K07	408	8-7-1981	31-12-2030	120
32	Nederlandse Aardolie Maatschappij B.V. Oranje-Nassau Energie B.V. HALO Exploration & Production Netherlands B.V. Wintershall Noordzee B.V.	K08 & K11a	737	26-10-1977	31-12-2030	197
33	Nederlandse Aardolie Maatschappij B.V.	K14a	237	16-1-1975	31-12-2030	6
34	Nederlandse Aardolie Maatschappij B.V.	K15	412	14-10-1977	31-12-2030	197
35	Nederlandse Aardolie Maatschappij B.V.	K17	414	19-1-1989	19-1-2029	12
36	Nederlandse Aardolie Maatschappij B.V. Wintershall Noordzee B.V.	K18a	36	15-3-2007	9-5-2023	57
37	Nederlandse Aardolie Maatschappij B.V.	L02	406	15-3-1991	15-3-2031	55
38	Nederlandse Aardolie Maatschappij B.V.	L09	409	18-9-2010	9-5-2035	14 911
39	Nederlandse Aardolie Maatschappij B.V. Oranje-Nassau Energie B.V. HALO Exploration & Production Netherlands B.V. Wintershall Noordzee B.V.	L13	413	26-10-1977	31-12-2030	197
40	Nederlandse Aardolie Maatschappij B.V. ExxonMobil Producing Netherlands B.V.	M09a	213	10-4-1990	10-4-2030	56
41	Nederlandse Aardolie Maatschappij B.V.	N07a	141	23-12-2003	10-3-2034	252
42	Oranje-Nassau Energie B.V. Energy06 Investments B.V.	L11b	47	15-6-1984	15-6-2024	110
43	Oranje-Nassau Energie B.V. ENGIE E&P Nederland B.V.	L11c	179	14-7-2016	24-8-2031	38 538
44	Oranje-Nassau Energie B.V. Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L12c	30	6-8-2008	12-3-2030	155
45	Oranje-Nassau Energie B.V. Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L12d	225	25-9-2008	14-3-2030	189

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
46	Oranje-Nassau Energie B.V. Delta Hydrocarbons B.V. Wintershall Noordzee B.V.	L15d	62	6-8-2008	12-3-2030	155
47	Oranje-Nassau Energie B.V. Energy06 Investments B.V.	M01a	213	28-6-2007	8-8-2022	128
48	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	M07	409	22-3-2001	22-3-2021	19
49	Oranje-Nassau Energie B.V. TAQA Offshore B.V.	P11a	210	23-9-2015	3-11-2025	45 676
50	Oranje-Nassau Energie B.V. TAQA Offshore B.V.	P18b	311	14-7-2017	24-8-2030	41 916
51	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	P18d	2	20-9-2012	31-10-2027	23 457
52	Oranje-Nassau Energie B.V. IPC Netherlands B.V. Total E&P Nederland B.V.	Q16a	85	29-12-1992	29-12-2032	227
53	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	Q16b & Q16c- diep	80	20-9-2012	31-10-2027	23 465
54	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	S03a	2	20-9-2012	31-10-2027	23 466
55	Oranje-Nassau Energie B.V. Energy06 Investments B.V. TAQA Offshore B.V.	T01	1	20-9-2012	31-10-2027	23 467
56	Petrogas E&P Netherlands B.V. Dyas B.V. TAQA Offshore B.V.	A12a	195	1-7-2005	11-8-2025	129
57	Petrogas E&P Netherlands B.V. Dyas B.V. TAQA Offshore B.V.	A12d	33	1-7-2005	11-8-2025	129
58	Petrogas E&P Netherlands B.V. Dana Petroleum Netherlands B.V. Oranje-Nassau Energie B.V.	A15a	67	27-12-2011	3-2-2027	746
59	Petrogas E&P Netherlands B.V. Dyas B.V. TAQA Offshore B.V.	A18a	229	1-7-2005	11-8-2025	129

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
60	Petrogas E&P Netherlands B.V. Dyas B.V.	A18c	47	1-7-2005	11-8-2025	125
61	Petrogas E&P Netherlands B.V. Dyas B.V. TAQA Offshore B.V.	B10c & B13a	252	1-7-2005	11-8-2025	129
62	Petrogas E&P Netherlands B.V. Aceiro Energy B.V. Dyas B.V. Wintershall Noordzee B.V.	P09a, P09b & P09d	90	16-8-1993	16-8-2033	127
63	Petrogas E&P Netherlands B.V. Dyas B.V. Wintershall Noordzee B.V.	P09c, P09e & P09f	101	16-8-1993	16-8-2033	126
64	Petrogas E&P Netherlands B.V.	Q01a-ondiep & Q01b-ondiep	43	23-12-2017	11-7-2020	193
65	Petrogas E&P Netherlands B.V. Dyas B.V.	Q02c	32	14-7-1994	14-7-2034	18
66	Spirit Energy Nederland B.V.	B18a	8	10-10-1985	10-10-2025	182
67	Spirit Energy Nederland B.V.	F03a	18	13-12-2007	9-9-2022	245
68	Spirit Energy Nederland B.V. Dyas B.V. Total E&P Nederland B.V.	J03b & J06	126	6-11-1992	6-11-2032	219
69	TAQA Offshore B.V. Dana Petroleum Netherlands B.V. Dyas B.V. Oranje-Nassau Energie B.V. Wintershall Noordzee B.V.	P15a & P15b	220	12-7-1984	12-7-2024	110
70	TAQA Offshore B.V. 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	TAQA Offshore B.V.	P18a	105	30-4-1992	30-4-2032	99
72	TAQA Offshore B.V. Dana Petroleum Netherlands B.V. Dyas B.V.	P18c	6	2-6-1992	2-6-2032	99
73	Total E&P Nederland B.V. IPC Netherlands B.V. TAQA Offshore B.V.	F06a	8	9-9-1982	9-9-2022	139

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
74	Total E&P Nederland B.V. Dyas B.V. First Oil Expro Ltd. IPC Netherlands B.V.	F15a	233	6-5-1991	6-5-2031	52
75	Total E&P Nederland B.V. Dyas B.V. First Oil Expro Ltd. IPC Netherlands B.V.	F15d	4	15-6-1992	15-6-2032	97
76	Total E&P Nederland B.V. Nederlandse Aardolie Maatschappij B.V.	J03a	72	12-1-1996	12-1-2036	22
77	Total E&P Nederland B.V. Nederlandse Aardolie Maatschappij B.V.	K01a	83	10-2-1997	10-2-2022	46
78	Total E&P Nederland B.V.	K01b & K02a	75	20-6-2009	31-7-2022	11 801
79	Total E&P Nederland B.V.	K02c	46	21-1-2004	7-11-2021	16
80	Total E&P Nederland B.V. IPC Netherlands B.V.	K03b	7	30-1-2001	30-1-2021	19
81	Total E&P Nederland B.V. IPC Netherlands B.V.	K03d	26	1-4-1999	1-4-2024	58
82	Total E&P Nederland B.V.	K04a	307	29-12-1993	29-12-2033	220
83	Total E&P Nederland B.V. Dyas B.V. IPC Netherlands B.V.	K04b & K05a	305	1-6-1993	1-6-2033	87
84	Total E&P Nederland B.V.	K05b	204	7-11-1996	7-11-2021	207
85	Total E&P Nederland B.V. IPC Netherlands B.V.	K06 & L07	817	20-6-1975	19-6-2020	112
86	Total E&P Nederland B.V. Van Dyke Netherlands Inc.	L01a	31	12-9-1996	31-12-2023	135
87	Total E&P Nederland B.V.	L01d	7	13-11-1996	31-12-2023	207
88	Total E&P Nederland B.V. IPC Netherlands B.V.	L01e	12	13-11-1996	13-11-2018	207
89	Total E&P Nederland B.V. IPC Netherlands B.V.	L01f	17	14-1-2003	14-1-2033	235
90	Total E&P Nederland B.V. IPC Netherlands B.V.	L04a	313	30-12-1981	30-12-2021	230

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
91	Tulip Oil Netherlands Offshore B.V.	Q07 & Q10a	472	14-7-2017	24-8-2042	41 910
92	Wintershall Noordzee B.V. ENGIE E&P Participation Nederland B.V.	D12a	214	6-9-1996	6-9-2021	138
93	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V. GAZPROM International UK Ltd. Oranje-Nassau Energie B.V.	D12b	41	3-6-2017	14-7-2037	32 476
94	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V. ENGIE E&P Nederland B.V. HALO Exploration & Production Netherlands B.V.	E15a	39	4-10-2002	21-10-2032	175
95	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V. HALO Exploration & Production Netherlands B.V.	E15b	21	20-2-2008	1-4-2033	38
96	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V. ENGIE E&P Nederland B.V. HALO Exploration & Production Netherlands B.V.	E18a & E18c	76	4-10-2002	21-10-2032	175
97	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V. ENGIE E&P Nederland B.V. HALO Exploration & Production Netherlands B.V.	F13a	4	4-10-2002	21-10-2032	175
98	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V.	F16a & F16b	180	4-10-2002	21-10-2032	175
99	Wintershall Noordzee B.V. ENGIE E&P Nederland B.V. Rosewood Exploration Ltd. TAQA Offshore B.V.	F17a-diep	386	14-5-2016	24-6-2033	43 400
100	Wintershall Noordzee B.V. Dyas B.V. Nederlandse Aardolie Maatschappij B.V.	K18b	155	15-3-2007	9-5-2023	57
101	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V.	L05b	237	28-6-2003	9-8-2038	134
102	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V.	L05c	8	3-12-1996	31-12-2028	209

	Licensee	Licence	km²	Effective from	Expires	Govern. Gazette
103	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V.	L06a	332	24-11-2010	4-1-2031	18 910
104	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V.	L06b	60	1-7-2003	11-8-2038	134
105	Wintershall Noordzee B.V. Oranje-Nassau Energie B.V.	L08a	213	18-8-1988	18-8-2028	146
106	Wintershall Noordzee B.V. Dana Petroleum Netherlands B.V. Oranje-Nassau Energie B.V.	L08b & L08d	83	17-5-1993	17-5-2033	78
107	Wintershall Noordzee B.V. Dyas B.V. Nederlandse Aardolie Maatschappij B.V.	L16a	238	12-6-1984	12-6-2024	84
108	Wintershall Noordzee B.V. Dyas B.V. Gas-Union GmbH	P06	417	14-4-1982	14-4-2022	54
109	Wintershall Noordzee B.V. Dyas B.V. Vermilion Energy Netherlands B.V.	P12a	96	8-3-1990	8-3-2030	27
110	Wintershall Noordzee B.V. TAQA Offshore B.V.	Q01-diep	416	23-12-2017	11-7-2020	193
111	Wintershall Noordzee B.V. Delta Hydrocarbons B.V. Dyas B.V.	Q04	417	2-12-1999	2-12-2019	228
112	Wintershall Noordzee B.V. Delta Hydrocarbons B.V. Dyas B.V.	Q05d	20	15-2-2001	15-2-2021	19
Total			18845			

11. Blocks and operators, Netherlands continental shelf as at 1 January 2018

Block (part of)	Open area (km ²)	Operator	Licence (km ²)	
			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		Spirit		8
B18b	192			
D03	2			
D06	60			
D09		ENGIE	149	
D12a		Wintershall		214
D12b		Wintershall		41
D15		ENGIE		247
D18a		ENGIE		58
D18b	139			
E01	374			
E02	396			
E03	396			
E04	398			
E05	398			
E06	398			

Block (part of)	Open area (km ²)	Operator	Licence (km ²)	
			Exploration	Production
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	283	
E15d	60			
E16a		ENGIE		29
E16b	375			
E17a		ENGIE		87
E17b		ENGIE		27
E17c	290			
E18a		Wintershall		68
E18b	328			
E18c		Wintershall		8
F01	396			
F02a		Dana NI		307
F02b	89			
F03a		Spirit		18
F03b		ENGIE		335
F03c	44			
F04	398			
F05	398			
F06a		Total		8
F06b		Dana NI	260	
F06c	118			
F06d	12			
F07	400			
F08	400			
F09	400			
F10		Wintershall	401	
F11a		Wintershall	80	
F11b	321			
F12	402			
F13a		Wintershall		4
F13b	399			
F14a		Wintershall	266	
F14b	137			
F15a		Total		233
F15b	73			
F15c	93			
F15d		Total		4
F16a		Wintershall		109
F16b		Wintershall		71
F16c	224			
F17a		Oranje-Nassau / Wintershall	386	386
F17c		NAM		18

Block (part of)	Open area (km ²)	Operator	Licence (km ²)	
			Exploration	Production
F18a	(diep) 138	Oranje-Nassau	170	
F18b		Oranje-Nassau / Wintershall	31	
F18c	235			
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		Spirit		42
J03c	30			
J06		Spirit		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
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			
K11a		NAM		328
K11b	83			
K12		ENGIE		411
K13	324			

Block (part of)	Open area (km ²)	Operator	Licence (km ²)	
			Exploration	Production
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		42
L08c	114			
L08d		Wintershall		41
L09		NAM		409
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			

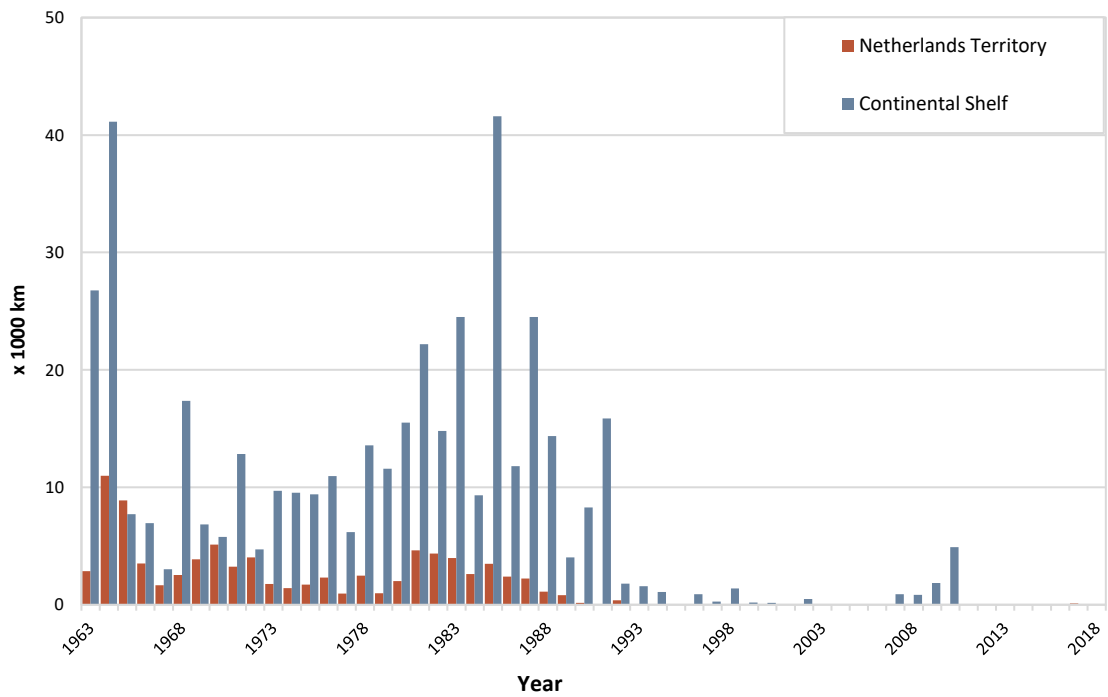
Block (part of)	Open area (km ²)	Operator	Licence (km ²)	
			Exploration	Production
M03		Hansa	406	
M04a		Oranje-Nassau	209	
M04b	199			
M05	408			
M06	408			
M07		Oranje-Nassau		409
M08	391			
M09a		NAM		213
M09b	158			
M10a		Tulip	82	
M10b	113			
M11		Tulip	28	
N01		Hansa	217	
N04		Hansa	381	
N05		Hansa	14	
N07a		NAM		141
N07b		ENGIE		87
N07c		Hansa		87
N08		Hansa	34	
O12	2			
O15	142			
O17	3			
O18	367			
P01	209			
P02	416			
P03	416			
P04		Jetex	170	
P05	417			
P06		Wintershall		417
P07		Jetex	222	
P08a	26			
P08b		Jetex	393	
P09a		Petrogas		17
P09b		Petrogas		62
P09c		Petrogas		18
P09d		Petrogas		11
P09e		Petrogas		80
P09f		Petrogas		3
P09g	228			
P10a		Dana NI		5
P10b		Dana NI		100
P10c		Jetex	249	
P11a		Oranje-Nassau		210
P11b		Dana NI		210
P12a		Wintershall		96
P12b	325			
P13	422			
P14	422			
P15a		TAQA		203
P15b		TAQA		17
P15c		TAQA		203

Block (part of)	Open area (km ²)	Operator	Licence (km ²)	
			Exploration	Production
P16	423			
P17	424			
P18a		TAQA		105
P18b		Oranje-Nassau		311
P18c		TAQA		6
P18d		Oranje-Nassau		2
Q01a		Petrogas / Wintershall		33
Q01b		Petrogas / Wintershall		10
Q01c	(ondiep) 373	Wintershall		373
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			
Q13a		ENGIE		30
Q13b		ENGIE	237	
Q13c	87			
Q13d	45			
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
Total	30 655	170	8067	18 845

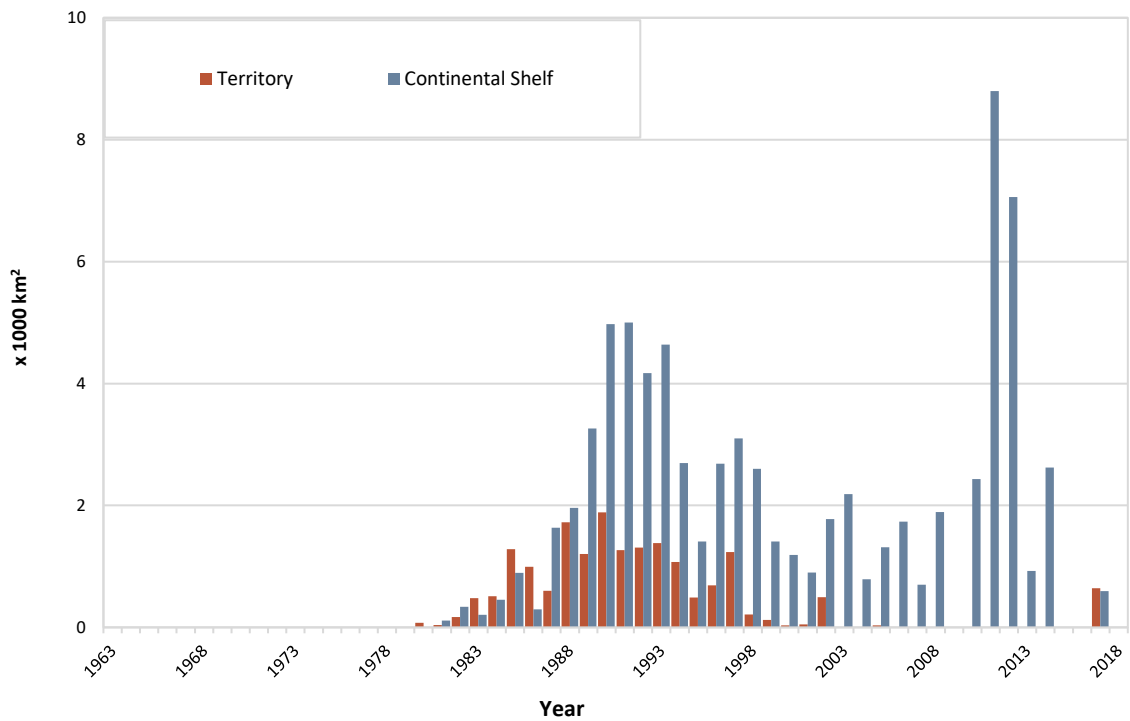
12. Seismic surveys

Year	Territory		Continental shelf	
	2 D (km)	3 D (km ²)	2 D (km)	3 D (km ²)
1963	2860	0	26778	0
1964	10992	0	41136	0
1965	8885	0	7707	0
1966	3510	0	6939	0
1967	1673	0	3034	0
1968	2541	0	17349	0
1969	3857	0	6846	0
1970	5113	0	5780	0
1971	3252	0	12849	0
1972	4034	0	4716	0
1973	1783	0	9708	0
1974	1422	0	9536	0
1975	1706	0	9413	0
1976	2318	0	10963	0
1977	948	0	6184	0
1978	2466	0	13568	0
1979	986	0	11575	0
1980	2017	76	15497	0
1981	4627	37	22192	110
1982	4363	170	14791	337
1983	3980	478	24498	208
1984	2616	512	9314	455
1985	3480	1282	41593	892
1986	2386	993	11795	296
1987	2243	601	24492	1637
1988	1103	1726	14356	1958
1989	828	1206	4033	3264
1990	160	1889	8288	4972
1991	0	1268	15853	5002
1992	388	1307	1799	4173
1993	0	1382	1591	4637
1994	0	1074	1089	2694
1995	0	491	0	1408
1996	0	689	892	2686
1997	0	1236	260	3101
1998	0	214	1380	2603
1999	43	124	181	1409
2000	0	33	160	1188.5
2001	5	47	0	897.9
2002	0	495	490	1778
2003	0	0	0	2185
2004	0	0	34	790
2005	0	32	0	1314
2006	0	0	53	1732
2007	0	0	886	700
2008	0	0	838	1893
2009	0	0	1849	0
2010	0	0	4898	2431
2011	14	0	0	8800
2012	0	0	37	7060
2013	0	0	0	925
2014	0	0	0	2624
2015	0	0	0	0
2016	0	0	0	0
2017	94	640	0	593

2D seismisch onderzoek 1963 - 2017



3D seismisch onderzoek 1963 - 2017



13. 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
t/m 1945	3	-	-	53	56	-	-	-	-	-	5
46	-	-	-	1	1	-	-	-	-	-	19
47	-	-	-	3	3	-	-	-	-	-	17
48	-	1	-	8	9	-	-	-	-	-	42
49	1	1	-	14	16	-	-	-	-	-	21
1950	-	1	-	7	8	-	-	-	-	-	26
51	-	5	-	9	14	-	-	-	-	-	38
52	1	2	2	6	11	-	2	-	-	2	44
53	4	1	-	5	10	1	-	-	-	1	58
54	4	1	-	12	17	-	-	-	-	-	45
1955	2	2	-	4	8	-	-	-	-	-	17
56	1	3	1	3	8	-	-	-	1	1	14
57	1	2	-	1	4	1	-	-	-	1	60
58	3	1	-	4	8	-	-	-	1	1	35
59	1	2	-	7	10	-	-	-	-	-	30
1960	-	1	-	1	2	-	1	-	-	1	48
61	1	2	-	2	5	-	-	-	-	-	22
62	2	-	-	-	2	-	1	-	-	1	27
63	-	2	-	-	2	-	1	-	-	1	32
64	-	6	-	17	23	-	1	-	-	1	26
1965	2	13	-	17	32	-	6	-	4	10	36
66	1	1	-	6	8	-	4	-	1	5	42
67	-	4	-	-	4	-	1	1	-	2	44
68	-	6	-	6	12	-	1	-	1	2	21
69	-	4	-	11	15	-	2	-	3	5	13
1970	-	5	-	10	15	-	6	-	1	7	19
71	-	4	1	9	14	-	7	-	2	9	47
72	-	5	-	6	11	-	5	-	1	6	55
73	-	3	-	3	6	-	10	-	1	11	37
74	-	1	-	1	2	1	4	-	-	5	46
1975	-	5	-	3	8	-	9	-	2	11	45
76	1	2	-	2	5	-	9	-	1	10	47
77	-	4	-	3	7	3	12	-	1	16	28
78	-	2	-	3	5	-	22	-	-	22	45
79	-	4	-	2	6	5	10	-	2	17	58
1980	1	2	-	3	6	3	18	-	4	25	67
81	1	2	1	11	15	3	7	-	2	12	49
82	-	6	1	5	12	-	17	-	-	17	26
83	1	8	-	3	12	-	13	-	1	14	17
84	2	6	-	6	14	5	8	-	2	15	18
1985	1	3	1	6	11	2	10	-	-	12	36
86	-	4	1	6	11	-	3	-	-	3	16
87	-	2	2	6	10	-	2	-	-	2	22
88	-	5	1	1	7	1	3	-	-	4	17
89	-	2	1	6	9	2	5	-	-	7	11
1990	-	1	3	3	7	-	3	1	1	5	20
91	-	7	1	2	10	-	3	-	1	4	11
92	-	6	1	4	11	-	1	-	-	1	12
93	-	9	-	1	10	-	-	-	-	-	11
94	-	4	-	1	5	2	1	1	-	4	4
1995	-	7	-	5	12	-	2	-	-	2	10
96	-	2	1	2	5	-	3	-	3	6	24
97	-	9	-	2	11	-	4	-	-	4	14
98	-	6	-	4	10	-	7	-	1	8	7
99	-	3	-	1	4	-	4	-	-	4	7
2000	-	2	-	-	2	-	-	-	-	-	4
1	-	2	-	1	3	-	-	-	-	-	6
2	-	2	-	3	5	-	-	-	-	-	5

Year	Exploration					Appraisal					Production
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	
3	-	2	-	1	3	-	-	-	-	-	8
4	-	1	-	-	1	-	1	-	-	1	1
2005	-	2	-	-	2	-	-	-	-	-	6
6	-	3	-	1	4	-	2	-	-	2	5
7	-	2	-	-	2	1	-	-	-	1	8
8	-	1	-	-	1	-	1	-	-	1	1
9	1	1	-	-	2	-	3	-	-	3	24
2010	-	3	-	-	3	-	-	-	-	-	34
11	-	5	1	2	8	-	1	-	-	1	22
12	-	3	-	1	4	-	3	-	-	3	7
13	-	2	-	-	2	-	2	-	-	2	8
14	-	5	-	3	8	-	2	-	-	2	7
2015	-	2	-	-	2	-	2	-	-	2	5
16	-	1	-	-	1	-	-	-	-	-	12
17	-	2	-	-	2	-	-	-	-	-	1
Total	35	231	19	329	614	30	245	3	37	315	1772

O = Oil; G = Gas; G&O = Gas and oil; D = Dry; Σ = Total.

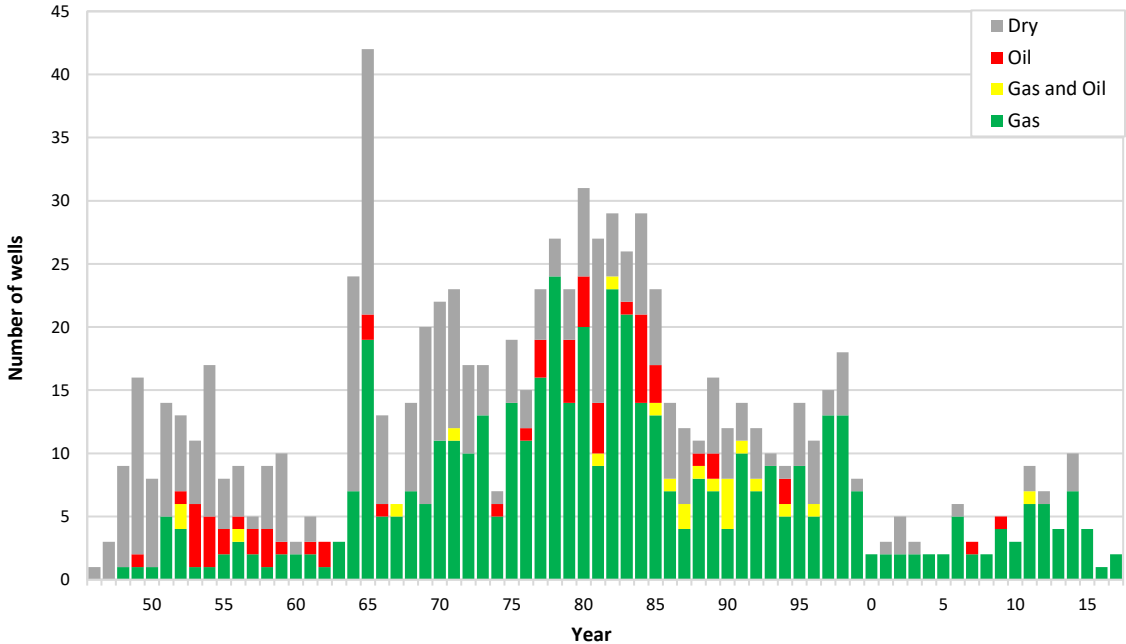
14. Oil and gas wells: number of wells, Netherlands continental shelf

Year	Exploration					Appraisal					Production
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	Σ
62	0	1	1	1	3	0	0	0	0	0	0
63	0	0	0	0	0	0	0	0	0	0	0
64	0	0	0	1	1	0	0	0	0	0	0
1965	0	0	0	0	0	0	0	0	0	0	0
66	0	0	0	0	0	0	0	0	0	0	0
67	0	0	0	0	0	0	0	0	0	0	0
68	0	2	0	5	7	0	0	0	0	0	0
69	1	8	0	8	17	0	0	0	0	0	0
1970	1	7	0	5	13	0	0	0	0	0	0
71	1	5	1	12	19	0	0	0	0	0	0
72	0	11	1	6	18	0	0	0	0	0	0
73	0	7	0	11	18	0	1	0	0	1	2
74	0	8	2	6	16	0	1	0	0	1	4
1975	0	7	0	8	15	0	2	0	3	5	11
76	0	6	1	10	17	0	5	0	2	7	12
77	0	5	0	18	23	0	6	1	0	7	14
78	0	7	0	13	20	0	0	0	1	1	17
79	1	7	0	9	17	0	5	0	1	6	9
1980	6	9	0	10	25	2	2	0	1	5	5
81	1	2	0	14	17	7	6	0	1	14	7
82	8	5	2	18	33	1	6	1	4	12	21
83	3	3	1	24	31	4	3	0	2	9	19
84	4	5	1	16	26	3	1	0	3	7	27
1985	4	8	0	14	26	2	3	0	1	6	29
86	2	11	0	11	24	2	2	0	1	5	34
87	5	10	1	9	25	1	3	0	1	5	8
88	0	15	2	4	21	0	4	1	1	6	20
89	1	14	0	12	27	0	6	0	0	6	17
1990	0	13	1	14	28	0	6	0	0	6	14
91	4	17	1	19	41	0	2	0	0	2	13
92	0	10	1	7	18	0	0	0	1	1	14
93	1	5	0	7	13	0	1	0	0	1	19
94	1	3	0	3	7	1	1	0	0	2	9
1995	0	3	0	4	7	0	2	0	0	2	17
96	1	14	1	8	24	0	5	0	0	5	6
97	1	11	1	7	20	1	7	0	0	8	11
98	1	11	0	7	19	0	0	0	1	1	11
99	0	7	0	4	11	0	2	0	2	4	7
2000	0	4	0	2	6	0	3	0	0	3	9
1	0	10	0	4	14	0	3	0	0	3	13
2	0	9	0	8	17	0	1	0	1	2	13
3	0	6	0	1	7	0	3	0	0	3	16
4	0	8	0	3	11	0	1	0	1	2	6
2005	0	4	0	1	5	0	0	0	0	0	10
6	0	3	0	6	9	1	2	0	0	3	15
7	0	3	0	2	5	0	2	0	0	2	12
8	0	7	1	2	10	0	1	0	0	1	14
9	0	5	0	2	7	0	4	0	0	4	10
2010	0	6	0	1	7	0	2	0	0	2	12
11	1	2	1	2	6	1	2	0	0	3	14
12	1	5	0	1	7	1	1	0	0	2	11
13	1	0	2	2	5	2	0	0	0	2	10
14	3	3	1	3	10	2	3	0	0	5	12
2015	0	6	0	3	9	1	2	0	0	3	11
16	0	2	0	1	3	0	1	0	0	1	9
17	0	3	0	1	4	0	1	0	0	1	6
Total:	53	343	23	370	789	32	114	3	28	177	580

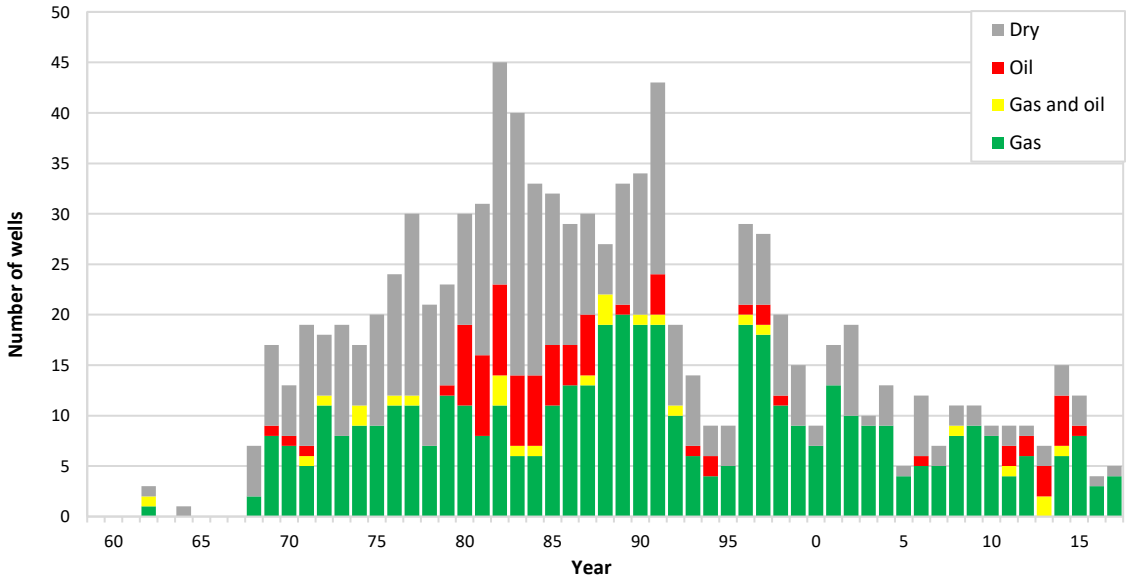
O = Oil; G = Gas; G&O = Gas and oil; D = Dry; Σ = Total.

15. Number of wells: Netherlands territory and continental shelf since 1960

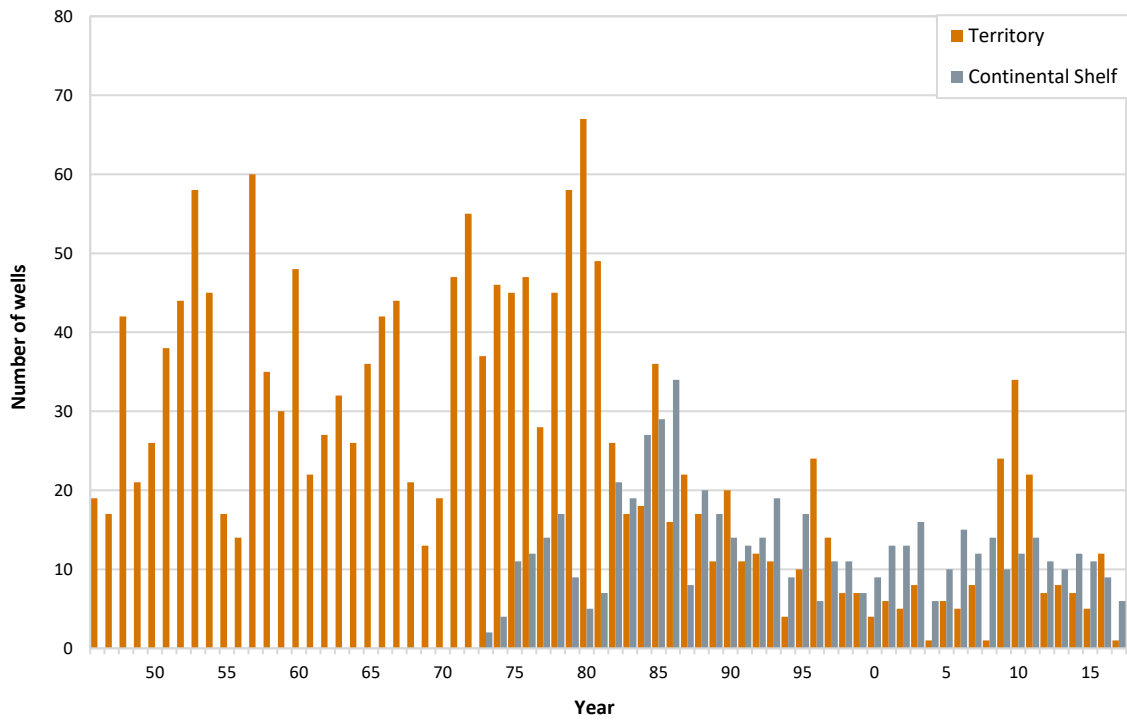
Exploration and appraisal wells, Netherlands territory 1960 – 2017



Exploration and appraisal wells, continental shelf 1960 – 2016



Production wells 1960 – 2017



16. Platforms, Netherlands continental shelf as at 1 January 2018

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
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

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
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
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

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
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
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
P11-C-Van Ghent	Dana	2012	-	O & G	subsea completion
Q08-A	Wintershall	2012		G	wellhead

Platform	Operator	Year installed	No. legs	Gas / Oil	Function
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
L13-FI-1	NAM	2017	1	G	Platform

GBS = Gravity Based Structure.

17. Pipelines, Netherlands continental shelf as at 1 January 2018

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
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

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
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
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

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
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	def. verl.
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
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

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
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
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

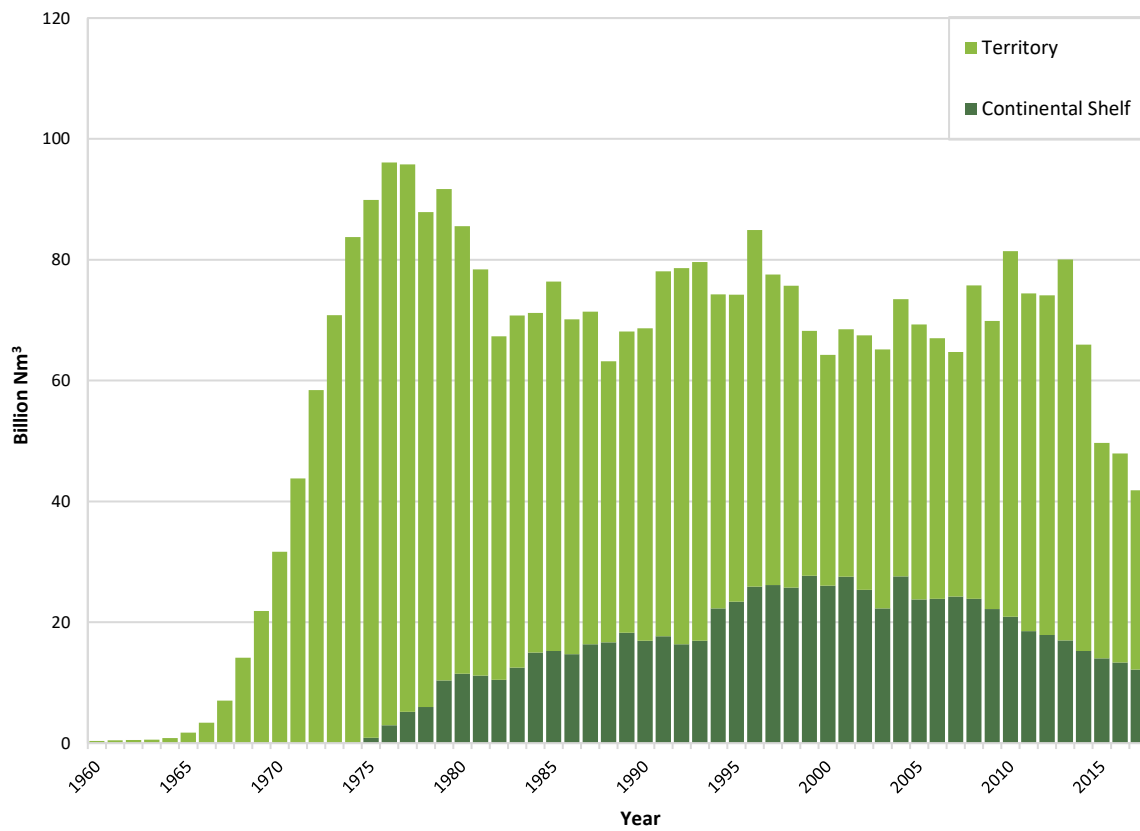
Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
Total	L4G	L4-PA	6 , 92 mm	2006	10.6	g + c
Wintershall	L5-C	L8-P4	10 , 82 mm	2006	8.1	g + c
Chevron	A12 CCP	B10 NOGAT	16	2007	16.0	g
ENGIE	G14-B	G17-D-AP	12	2007	13.4	g + m
Venture	Stamfort (UK)	J6-CT	6	2008	7.0	g
Total	L4PN	L4A	10	2008	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
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	P11-E	P15-F	8	2015	19.2	g
Wintershall	K18-G1	K18-G2	4	2015	0.05	g
Petrogas	A18-A	A12-A	8	2015	33	g
ONE	L11-b	L8-G-NGT Sidetap	8	2016	0.2	g
ONE	P11-E	P15-F	8	2016	9.0	g
Total	L04-A	K6-GT	10	2017	12.6	g
NAM	L13-FI-1	K15-FA-1	2	2017	6.5	g

* = Multiple pipelines
 , = Laid separately
 c = Control cable
 o = Oil
 g = Gas
 co = Condensate
 gl = Glycol
 m = Methanol
 ci = Corrosion inhibitor
 l = Instrument air
 (s) = Side-tap
 Aband. = Abandoned

18. Production of natural gas (in million Nm³)

Year	Territory	Continental shelf	Total
1960	363.8	0.0	363.8
1961	451.0	0.0	451.0
1962	509.8	0.0	509.8
1963	571.3	0.0	571.3
1964	830.0	0.0	830.0
1965	1722.6	0.0	1722.6
1966	3376.9	0.0	3376.9
1967	7033.3	0.0	7033.3
1968	14107.3	0.0	14107.3
1969	21884.4	0.0	21884.4
1970	31663.6	7.5	31671.0
1971	43820.0	2.3	43822.3
1972	58423.8	1.3	58425.1
1973	70840.8	7.4	70848.2
1974	83720.2	13.8	83734.0
1975	88993.0	912.7	89905.7
1976	93145.9	2930.3	96076.2
1977	90583.8	5191.9	95775.8
1978	81935.1	5967.8	87902.9
1979	81354.2	10351.9	91706.2
1980	74103.0	11466.6	85569.7
1981	67204.3	11178.9	78383.2
1982	56853.8	10492.0	67345.7
1983	58302.5	12480.7	70783.2
1984	56236.0	14958.5	71194.5
1985	61182.9	15227.2	76410.1
1986	55409.8	14732.7	70142.5
1987	55039.3	16364.7	71404.0
1988	46514.7	16667.7	63182.3
1989	49810.1	18286.8	68096.8
1990	51719.3	16918.6	68637.8
1991	60378.5	17705.3	78083.8
1992	62252.6	16371.9	78624.5
1993	62680.9	16914.2	79595.1
1994	51982.7	22301.2	74283.9
1995	50826.7	23409.8	74236.5
1996	59024.5	25914.7	84939.2
1997	51412.3	26133.0	77545.3
1998	49993.9	25716.1	75710.0
1999	40574.8	27673.6	68248.4
2000	38203.4	26031.5	64234.9
2001	40951.7	27518.3	68470.0
2002	42137.6	25364.7	67502.3
2003	42881.1	22273.8	65154.9
2004	45880.1	27592.8	73472.9
2005	45498.2	23779.6	69277.8
2006	43169.5	23858.0	67027.5
2007	40464.5	24259.0	64723.5
2008	51860.7	23900.0	75760.7
2009	47696.4	22165.0	69861.4
2010	60475.0	20921.0	81396.0
2011	55881.7	18551.2	74432.9
2012	56233.1	17899.8	74132.9
2013	63043.5	17004.1	80047.5
2014	50696.9	15257.6	65954.5
2015	35640.0	14049.0	49689.0
2016	34588.0	13334.0	47922.0
2017	29661.0	12179.0	41840.0
Total	2 721 795.7	762 239.2	3 484 035.0

Production of natural gas 1960 – 2017



19. Gas reserves and cumulative production in billion Nm³

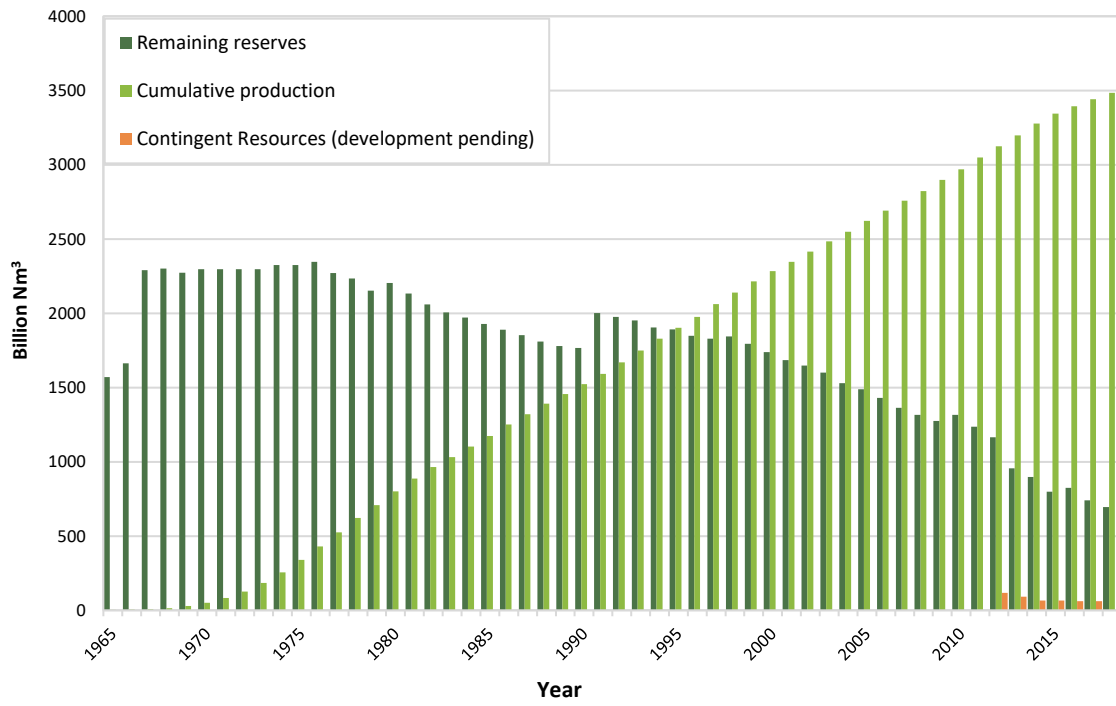
Year As at 1 Jan.	Territory		Continental shelf			Total	
	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production	
1974	2125	256	200	0	2325	256	
1975	2125	339	200	0	2325	339	
1976	2025	428	322	1	2347	429	
1977	1923	521	348	4	2271	525	
1978	1891	612	344	9	2235	621	
1979	1827	694	325	15	2152	709	
1980	1917	775	288	25	2205	801	
1981	1850	849	282	37	2133	886	
1982	1799	917	261	48	2060	965	
1983	1748	973	258	59	2006	1032	
1984	1714	1032	257	71	1971	1103	
1985	1662	1088	266	86	1928	1174	
1986	1615	1149	275	101	1889	1250	
1987	1568	1205	284	116	1852	1321	
1988	1523	1260	287	132	1810	1392	
1989	1475	1306	303	149	1778	1455	
1990	1444	1356	323	167	1767	1523	
1991	1687	1408	316	184	2002	1592	
1992	1648	1468	329	202	1976	1670	
1993	1615	1530	337	218	1953	1749	
1994	1571	1593	334	235	1904	1828	
1995	1576	1645	316	257	1892	1902	
1996	1545	1696	304	281	1850	1977	
1997	1504	1755	325	307	1829	2062	
1998	1491	1806	353	333	1845	2139	
1999	1453	1856	341	359	1794	2215	
2000	1420	1897	319	386	1740	2283	
2001	1371	1935	313	412	1684	2347	
2002	1332	1976	316	440	1648	2416	
2003	1290	2018	310	465	1600	2483	
2004	1286	2061	244	487	1530	2548	
2005	1236	2107	253	515	1489	2622	
2006	1218	2152	213	539	1431	2691	
2007	1168	2196	195	563	1363	2758	
2008	1129	2236	188	587	1317	2823	
2009	1101	2288	173	611	1274	2899	
2010	1143	2336	174	633	1317	2969	
2011	1080	2396	155	654	1236	3050	
2012	1012	2452	153	673	1165	3124	

From 2013 onwards the table has been modified, to take account of the introduction of PMRS:

- Rem Res = Remaining reserves.
- Cont Res = Contingent resources (development pending).
- Cum Prod = Cumulative production.

Year As at 1 Jan.	Territory			Continental shelf			Total		
	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
2018	620	39	2722	75	24	762	664	62	3484

Gas reserves and cumulative production (1 januari 2018), 1965 – 2018

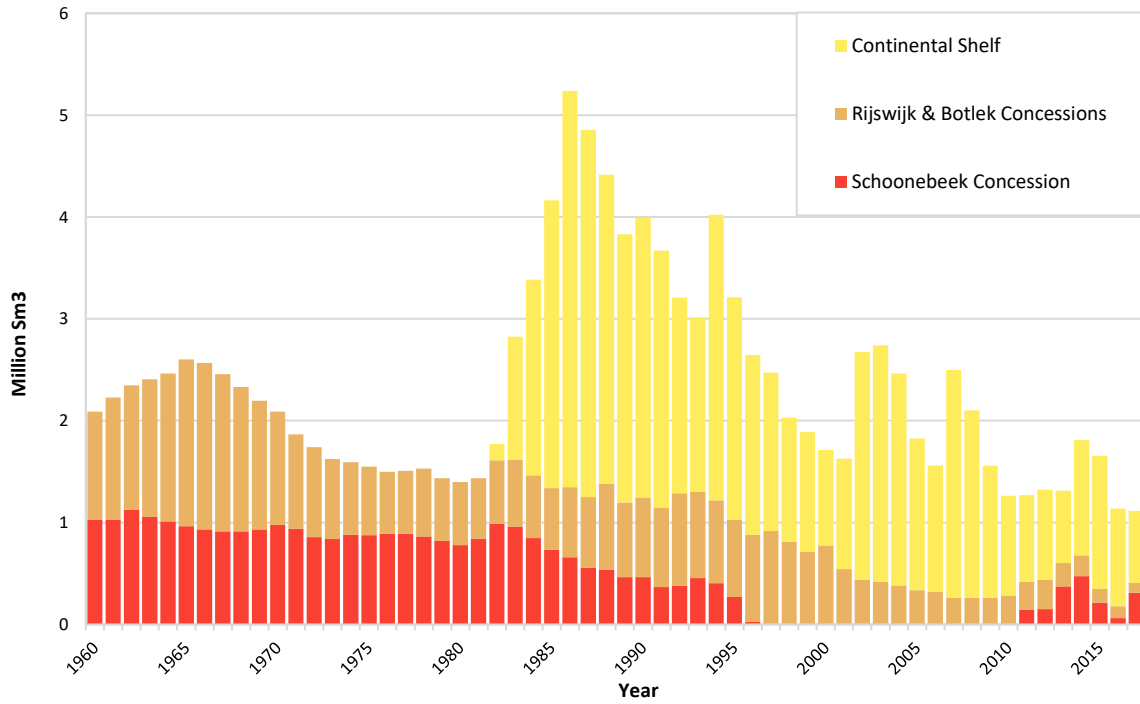


20. Oil production in 1000 Sm³

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Continental shelf	Total
to 1959	11.749	0.000	0.000	11.749
1960	1.031	1.058	0.000	2.089
1961	1.030	1.197	0.000	2.227
1962	1.129	1.217	0.000	2.346
1963	1.057	1.350	0.000	2.407
1964	1.011	1.454	0.000	2.465
1965	0.963	1.638	0.000	2.601
1966	0.932	1.636	0.000	2.568
1967	0.913	1.545	0.000	2.458
1968	0.914	1.419	0.000	2.333
1969	0.933	1.262	0.000	2.195
1970	0.976	1.112	0.000	2.088
1971	0.941	0.927	0.000	1.868
1972	0.856	0.883	0.000	1.739
1973	0.838	0.787	0.000	1.626
1974	0.878	0.716	0.000	1.594
1975	0.877	0.672	0.000	1.549
1976	0.892	0.605	0.000	1.497
1977	0.891	0.618	0.000	1.509
1978	0.862	0.668	0.000	1.530
1979	0.820	0.616	0.000	1.436
1980	0.779	0.618	0.000	1.397
1981	0.839	0.597	0.000	1.436
1982	0.988	0.625	0.160	1.773
1983	0.960	0.656	1.209	2.825
1984	0.847	0.616	1.922	3.384
1985	0.735	0.603	2.825	4.163
1986	0.659	0.689	3.890	5.237
1987	0.556	0.693	3.608	4.857
1988	0.536	0.845	3.033	4.414
1989	0.464	0.732	2.635	3.830
1990	0.463	0.785	2.745	3.992
1991	0.366	0.777	2.528	3.671
1992	0.379	0.907	1.921	3.207
1993	0.454	0.849	1.710	3.013
1994	0.406	0.811	2.805	4.023
1995	0.268	0.761	2.182	3.211
1996	0.023	0.857	1.767	2.647
1997	0.000	0.918	1.557	2.474
1998	0.000	0.810	1.219	2.029
1999	0.000	0.715	1.173	1.888
2000	0.000	0.776	0.936	1.713
2001	0.000	0.542	1.085	1.628
2002	0.000	0.439	2.236	2.675
2003	0.000	0.416	2.325	2.741
2004	0.000	0.381	2.082	2.463
2005	0.000	0.335	1.490	1.825
2006	0.000	0.322	1.238	1.561
2007	0.000	0.264	2.233	2.497
2008	0.000	0.261	1.841	2.102
2009	0.000	0.264	1.296	1.560
2010	0.000	0.281	0.982	1.262
2011	0.144	0.277	0.848	1.270
2012	0.149	0.290	0.884	1.323
2013	0.374	0.230	0.710	1.314
2014	0.473	0.204	1.133	1.809
2015	0.214	0.135	1.307	1.656
2016	0.063	0.116	0.957	1.136

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Continental shelf	Total
2017	0.310	0.099	0.705	1.114
Total	41.945	41.873	63.174	146.991

Oil production 1960 – 2017



21. Oil reserves and cumulative production in million Sm³

Year As at 1 January	Territory		Continental shelf		Total	
	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
1970	36.0	35.4	-	0.0	36.0	35.4
1971	34.0	37.5	-	0.0	34.0	37.5
1972	32.0	39.4	-	0.0	32.0	39.4
1973	29.0	41.1	-	0.0	29.0	41.1
1974	27.0	42.8	-	0.0	27.0	42.8
1975	40.0	44.4	14.0	0.0	54.0	44.4
1976	51.0	45.9	14.0	0.0	65.0	45.9
1977	49.0	47.4	16.0	0.0	65.0	47.4
1978	46.0	48.9	7.0	0.0	53.0	48.9
1979	44.0	50.4	9.0	0.0	53.0	50.4
1980	43.0	51.9	11.0	0.0	54.0	51.9
1981	41.0	53.3	14.0	0.0	55.0	53.3
1982	39.0	54.7	20.0	0.0	59.0	54.7
1983	38.0	56.3	49.0	0.2	87.0	56.5
1984	37.0	57.9	41.0	1.4	78.0	59.3
1985	41.0	59.4	34.0	3.3	75.0	62.7
1986	42.0	60.7	36.0	6.1	78.0	66.8
1987	40.0	62.1	35.0	10.0	75.0	72.1
1988	41.0	63.3	33.0	13.6	74.0	76.9
1989	39.0	64.7	32.0	16.6	71.0	81.4
1990	41.0	65.9	27.0	19.3	68.0	85.2
1991	40.0	67.2	24.0	22.0	64.0	89.2
1992	38.0	68.3	26.0	24.6	64.0	92.9
1993	37.0	69.6	24.0	26.5	61.0	96.1
1994	35.0	70.9	23.0	28.2	58.0	99.1
1995	34.0	72.1	22.0	31.0	56.0	103.1
1996	33.0	73.1	17.0	33.2	50.0	106.3
1997	33.0	74.0	22.0	34.9	55.0	109.0
1998	12.0	74.9	25.0	36.5	37.0	111.4
1999	8.0	75.7	26.0	37.7	34.0	113.5
2000	7.0	76.5	25.0	38.9	32.0	115.3
2001	6.0	77.2	24.0	39.8	30.0	117.1
2002	5.0	77.8	23.0	40.9	28.0	118.7
2003	5.0	78.2	23.0	43.1	28.0	121.4
2004	21.0	78.6	17.0	45.5	38.0	124.1
2005	19.0	79.0	15.0	47.6	34.0	126.6
2006	23.0	79.3	13.0	49.0	36.0	128.4
2007	24.0	79.7	14.0	50.3	38.0	129.9
2008	24.0	79.9	13.0	52.5	37.0	132.4
2009	25.0	80.2	9.0	54.4	34.0	134.5
2010	37.0	80.5	13.0	55.6	50.0	136.1
2011	33.7	80.7	12.0	56.6	45.7	137.4
2012	28.6	81.2	11.8	57.5	40.4	138.6

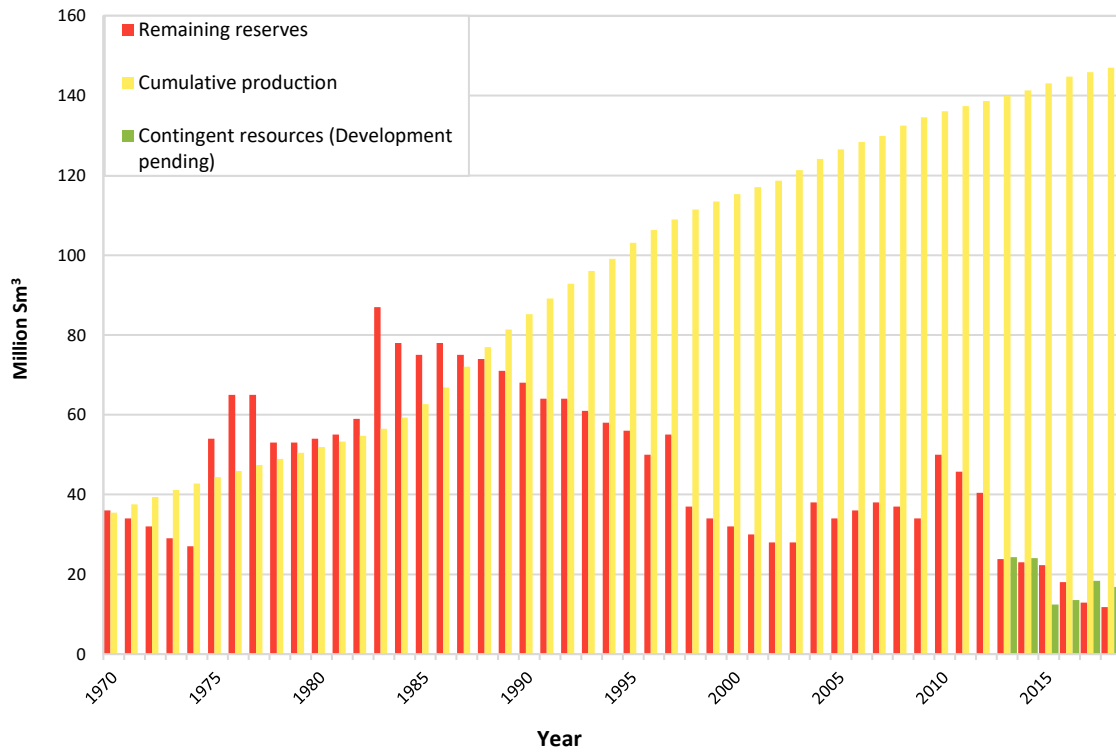
From 2013 onwards the table has been modified, to take account of the introduction of PRMS.

- Rem Res = Remaining reserves.
- Cont Res = Contingent resources (development pending).
- Cum Prod = Cumulative production.

Year As at 1 January	Territory			Continental shelf			Total		
	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod
2013	17.7	23.7	81.6	6.1	0.6	58.4	23.8	24.3	140.0
2014	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
2016	9.0	11.5	83.2	9.1	2.0	61.5	18.0	13.5	144.7
2017	9.2	9.1	83.4	3.7	9.3	62.5	12.9	18.4	145.9

Year As at 1 January	Territory			Continental shelf			Total		
	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod
2018	8.2	8.9	83.8	3.6	7.9	63.2	11.8	16.8	147.0

Oil reserves and cumulative production in million Sm³ 1970 - 2018



22. Natural gas revenues

Year	Non-tax revenue (€10 ⁹)	Corporation taks (€10 ⁹)	Total (€10 ⁹)
1965	0	0	0
1966	0	0.01	0.01
1967	0.01	0.04	0.05
1968	0.02	0.07	0.09
1969	0.05	0.14	0.19
1970	0.09	0.18	0.27
1971	0.14	0.27	0.41
1972	0.14	0.41	0.55
1973	0.23	0.54	0.77
1974	0.41	0.86	1.27
1975	1.27	1.09	2.36
1976	2.18	1.18	3.36
1977	2.72	1.23	3.95
1978	2.68	1.27	3.95
1979	3.09	1.36	4.45
1980	4.36	1.91	6.27
1981	6.22	2.45	8.67
1982	6.35	2.45	8.8
1983	6.22	2.45	8.67
1984	7.4	2.54	9.94
1985	8.58	2.54	11.12
1986	5.45	1.86	7.31
1987	2.86	1.23	4.09
1988	2.00	0.86	2.86
1989	2.18	0.78	2.96
1990	2.61	0.96	3.57
1991	3.72	1.17	4.89
1992	3.04	1.02	4.06
1993	2.83	0.95	3.78
1994	2.34	0.91	3.25
1995	2.64	1.13	3.77
1996	3.1	1.26	4.36
1997	3.01	1.3	4.31
1998	2.33	1.12	3.45
1999	1.69	0.92	2.61
2000	3.02	1.47	4.49
2001	4.37	1.98	6.35
2002	3.67	1.58	5.25
2003	4.31	1.74	6.05
2004	4.74	1.94	6.68
2005	5.88	1.8	7.68
2006	8.4	2.18	10.58
2007	8.09	1.86	9.95
2008	12.83	2.54	15.37
2009	8.51	1.60	10.11
2010	9.14	1.50	10.64
2011	10.33	1.55	11.88
2012	12.58	1.72	14.3
2013	13.60	1.78	15.38
2014	9.10	1.29	10.39
2015	4.60	0.54	5.14
2016	2.48	0.25	2.73
2017	2.40	0.20	2.6
Prognosis			
2018	2.45	0.20	2.65
2019	2.30	0.20	2.5
2020	2.15	0.20	2.35
2021	1.90	0.20	2.1

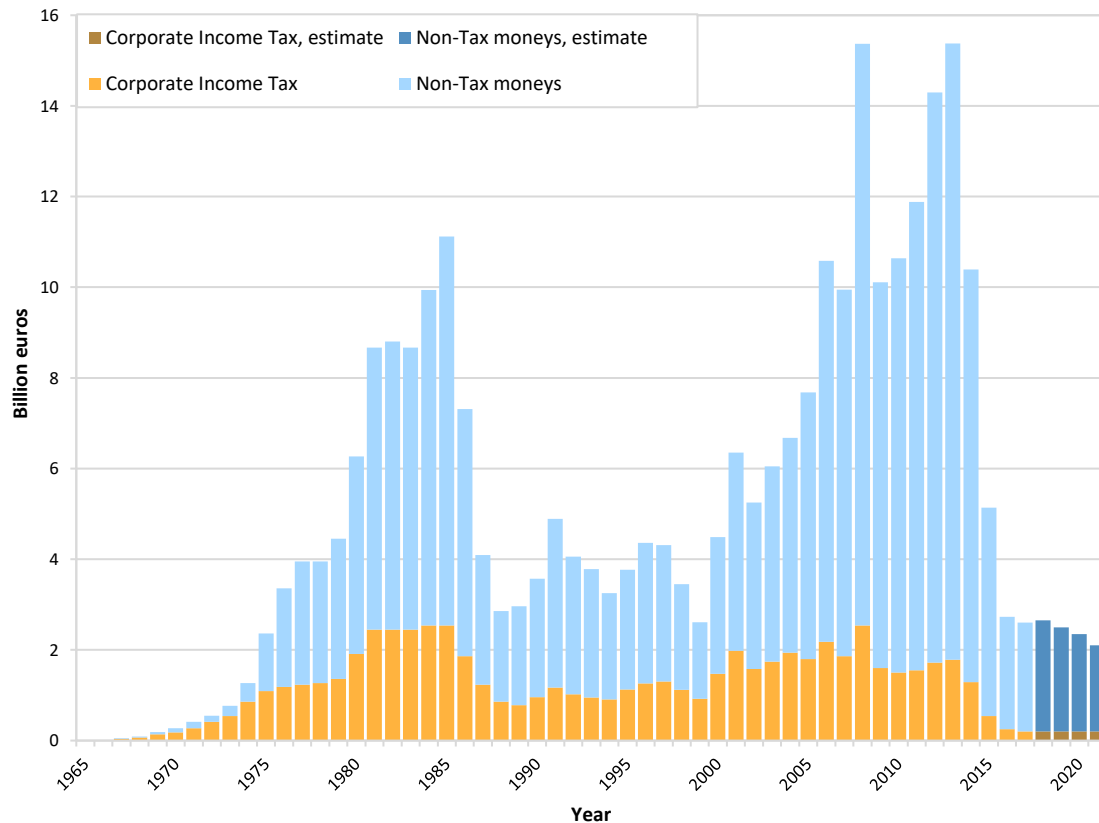
The revenues presented here are transaction-based, i.e. they have been allocated to the year in which the production that yielded the revenue took place. (By contrast, revenue recorded on a cash basis is recorded at the time the State actually receives the revenue, which is some time later than the transaction-based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

Tax income for the years 2018 until the end of 2021 is anticipated based on the expected price at gas trading hubs such as TTF. The TTF price per Sm³ gas used to calculate the estimates is expected to be 16.5 euro cents. The calculations do not take into account modifications in the production from the Groningen field.

The revenues as calculated for the last years 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 – 2022



23. Authorities involved in mining operations

Ministry of Economic Affairs & Climate, Energy market directorate

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

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

Telephone 070-3798911
www.rijksoverheid.nl

TNO – Advisory group Economic Affairs

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

Telephone 088 866 46 00
www.tno.nl

State Supervision of Mines – part of Ministry of Economic Affairs & Climate

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
www.sodm.nl

Netherlands Oil and Gas Portal – www.nlog.nl

The Netherlands Oil and Gas Portal provides information about mineral resources and geothermal energy in the Netherlands territory and 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 and Climate.

24. Defenition 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:

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:

Licence to explore for the minerals stipulated therein.

Production licence:

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

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

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

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

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

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

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

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 m³:**

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 m³ is defined as a standard m³ in Standard no. 5024-1976(E) of the International Organisation for Standardisation (ISO) and is usually abbreviated Sm³.

Normal m³:

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 m³ is defined as a normal m³ in Standard no. 5024-1976(E) of the International Organisation for Standardisation (ISO) and is usually abbreviated Nm³.

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 m³ of 0°C and 101.325 kPa. or 1.01325 bar).

One Nm³ gas with a calorific value of 36.5 MJ is equivalent to 36.5/35.17 Nm³ Geq.

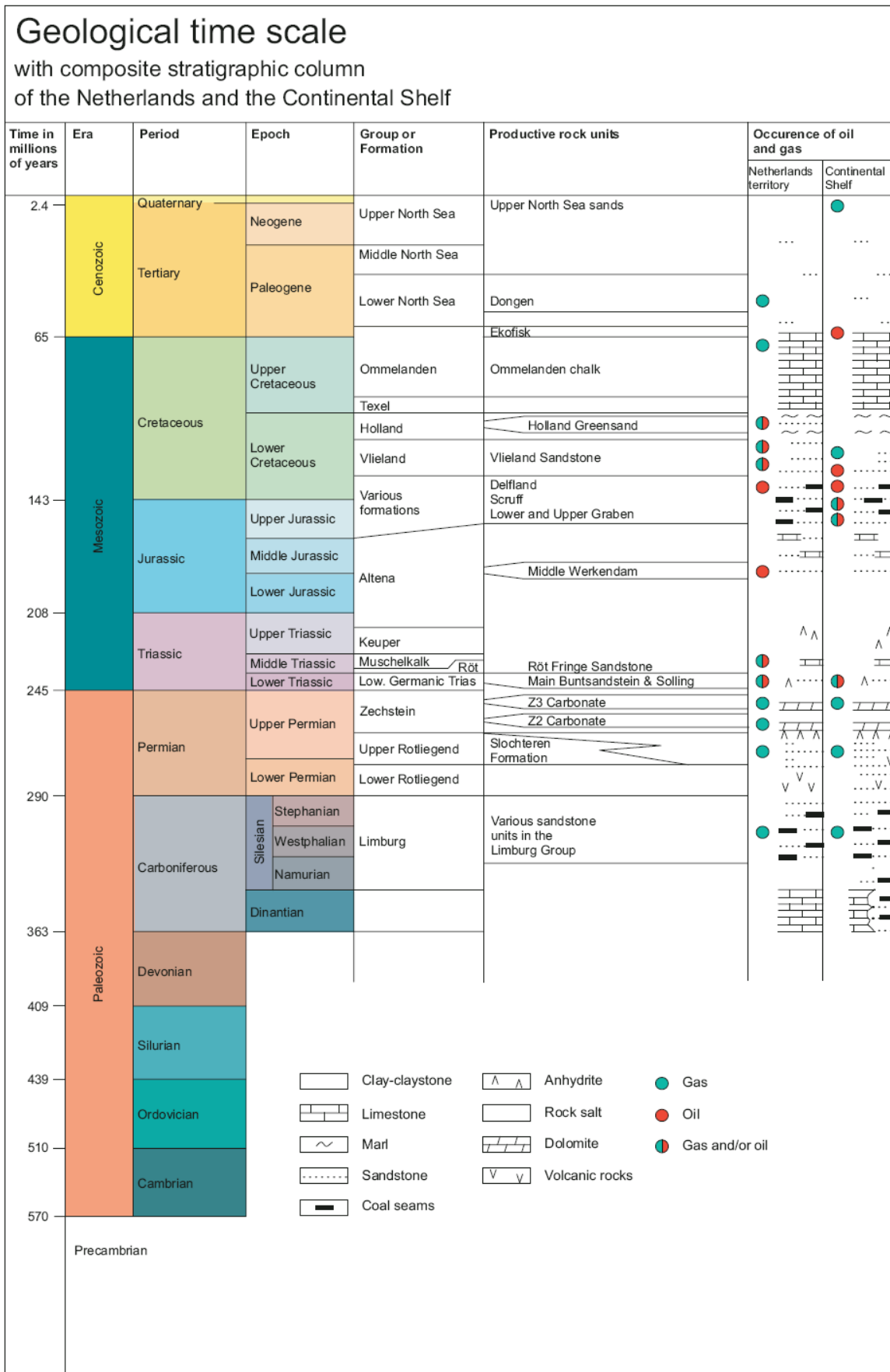
The Groningen gas equivalent is commonly used in the Netherlands, including by N.V. Netherlands Gasunie.

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).

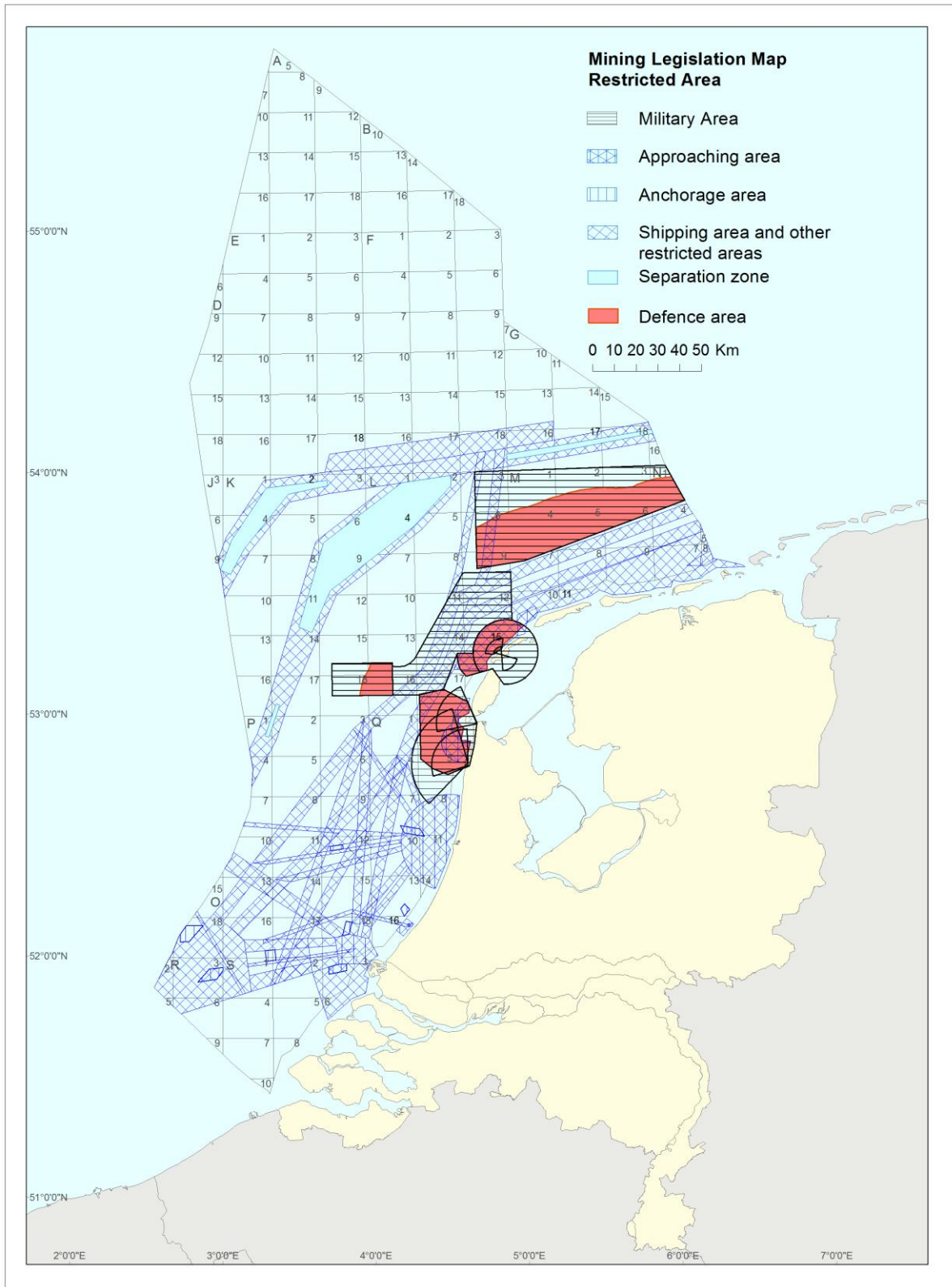
Fuel	Unit	Giga joule	Giga calorie	Oil equiv. tonnes	Oil equiv. barrels	Coal equiv. tonnes	Gas equiv. 1000 m ³
Fuelwood (dry)	tonnes	13.51	3.23	0.32	2.36	0.46	0.43
Coal	tonnes	29.30	7.00	0.70	5.11	1.00	0.93
Lignite	tonnes	17.00	4.06	0.41	2.96	0.58	0.54
Coke	tonnes	28.50	6.81	0.68	4.97	0.97	0.90
Coke-oven gas	1000 m ³	17.60	4.20	0.42	3.07	0.60	0.56
Blast furnace gas	1000 m ³	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 ³	46.10	11.01	1.10	8.04	1.57	1.46
LPG	1000 m ³	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 ³	31.65	7.56	0.76	5.52	1.08	1.00

* 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.

1. Appendix – Geological timescale



2. Appendix – Mining legislation map





Ministry of Economic Affairs and Climate Policy
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