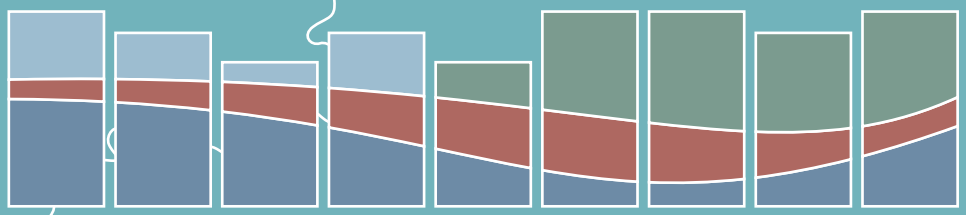
Ministry of Economic Affairs and Climate Policy



Natural resources and geothermal energy in the Netherlands

Annual review 2018

NATURAL RESOURCES AND GEOTHERMAL ENERGY IN THE NETHERLANDS

2018 Annual review

An overview of exploration, production and subsurface 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 subsurface storage of natural gas, oil, nitrogen, brine and CO_2. 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 2018. The second part of this report comprises annexes giving an overview of the situation as at 1 January 2019, and the developments during preceding decades.

Chapters 1 and 2 review the changes in the estimates of natural gas and oil resources in 2018 and the resulting situation as at 1 January 2019.
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). For the Groningen gas field production profiles are reported conform the letter of the Minister of Economic Affairs and Climate Policy to the House of Representatives (DGETM-EI / 18057375, 29 March 2018). **Chapter 3** shows an overview of the produced natural gas, oil and condensate. **Chapter 4** reports on the developments regarding subsurface storage. **Chapters 5, 6 and 7** give an overview of the developments regarding geothermal energy, rock salt and coal. **Chapters 8, 9 and 10** contain information on developments relating to offshore and onshore licensing and company changes. **Chapters 11, 12 and 13** report on seismic surveys, drilling activities, the placing of new platforms and the laying of pipelines.

This report has been compiled by TNO, at the request of the **Directorate General of Climate and Energy** of the Dutch Ministry of Economic Affairs and Climate Policy. It includes data that the Minister of Economic Affairs and Climate Policy 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.

The Hague, July 2019.

Contents

Note:

In this annual report, the natural gas volumes are given in normal cubic metres (Nm^3).
'Normal' relates to the reference conditions 0 °C and 101.325 kPa. 1 Nm^3 = 0.9457 Sm^3.

In a few instances, the volumes of natural gas are given in Groningen gas equivalents (m^3 Geq) of 35.17 megajoules gross calorific value per m^3 at 0 °C and 101.325 kPa.
This is explicitly indicated in the text.

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

Key figures

Natural gas and oil resources

The natural gas resources as at 1 January 2019 are estimated at 246 billion Nm^3, of which 73 billion Nm^3 are in the Groningen gas field. This major reduction compared to 1 January 2018 is due to the write-down of the Groningen reserves. The small fields in Netherlands territory (i.e. onshore) contain 70 billion Nm^3 natural gas; those on the Netherlands continental shelf contain 103 billion Nm^3 natural gas.

Oil resources at 1 January 2019 were 28.6 million Sm^3, of which 16.8 million Sm^3 are in onshore oilfields and 11.8 million Sm^3 in fields on the continental shelf.

Natural gas production

In 2018 the volume of natural gas produced from Dutch fields was 35.1 billion Nm^3. Onshore gas fields accounted for 23.9 billion Nm^3. Of the total of 23.9 billion Nm^3, 5.1 billion Nm^3 came from small fields and 18.8 billion Nm^3 from the Groningen gas field. The gas fields on the continental shelf produced 11.1 billion Nm^3. As a result, total production in 2018 was 16.2% less than in 2017. For details, see Chapter 3.

Oil production

In 2017 a total of 1.06 million Sm^3 oil was produced, this is 5.3% less than in 2017. Territory (i.e. onshore) fields accounted for 0.51 million Sm^3, which is 21.3% more than in 2017. Production on the continental shelf was 0.56 million Sm^3, a decrease of 21.1%. Average daily oil production in 2018 was 2916 Sm^3. For details, see Chapter 3.

Subsurface storage

In 2018 one new application for storage licence was submitted, for the storage of brine. Two licence applications submitted previously are still in the procedure. The two pending applications are for storage of a filler to stabilize a salt cavern and for the storage of brine.

Geothermal energy

In 2018 twelve geothermal wells were realised. Five geothermal installation have been installed. As at 1 January 2019 there are 24 production installations, of which 18 are currently producing. The cumulative reported annual production in 2018 was 3.71 PJ. For details, see Chapter 5.

Rock salt

In 2018 one application for a production licence was submitted. As at 1 January 2019 there were 16 production licences and no exploration licences in force. The production of rock salt in 2018 was 6.7 million tonnes. For details, see Chapter 6.

Coal

There are no developments to report for 2018. There are still five coal production licences in force. For details, see Chapter 7.

Hydrocarbon licences

Five exploration licences and 2 production licences are pending for the Netherlands territory. In 2018, 1 exploration licence was prolonged for a duration of 4 years. One licence was relinquished.

On the continental shelf, 17 exploration licences and 5 production licences were pending in 2018. Nine exploration licences and 4 production licences were prolonged on the continental shelf.
In 2018 one production licence was awarded on the continental shelf; P8a for Petrogas. One exploration licence was awarded; Q8, Q10b & Q11 for Tulip. One production licence was restricted. For details, see Chapters 8 and 9.

Geothermal licences

In 2018 sixteen applications for exploration licences were published. Nine exploration licences were awarded. Fifteen exploration licences were prolonged, and 5 exploration licences were relinquished or withdrawn.
In 2018 4 applications for production licences were submitted, in total 10 applications are pending. No production licences were awarded in 2018. For details, see Chapter 8.

Wells

In total, 13 wells were drilled for oil and gas in 2018, 3 fewer than in 2017. Six exploration wells were drilled in 2018. Of these, 3 found gas, thus the technical success rate was 67%. In addition, 7 production wells were drilled (territory plus continental shelf). For details, see Chapter 12.

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 2019 and the changes compared to the resources as at 1 January 2018. 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 (2019–2043).

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.

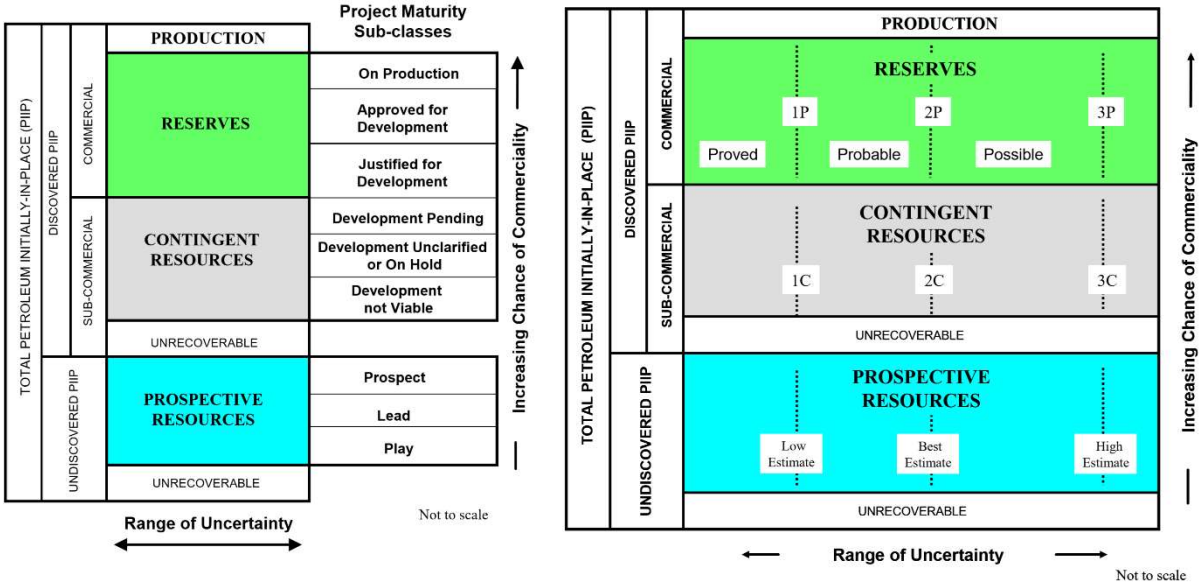


Figure 1.1 Schematic representation of the PRMS classification[1].

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

The gas reserves that are linked to projects are split into three classes. Reserves, the gas volume in proven plays that is regarded to be economically viable by well-defined projects. The contingent resources, the gas volume in proven plays that is recoverable in (incremental) projects, but only considered economically viable when one or more (technical, economic or legal) conditions are met. The prospective resources are defined as the part of the gas 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 1.1. 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 2019. 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.

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

1.2 Resources

As at 1 January 2019, there were 486 proven accumulations of natural gas in the Netherlands (see Table 1.1) and almost half (241) 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 110 accumulations were not developed, but it is expected that 26 of them will be brought into production in the next five years (2019–2023). It is uncertain whether the remaining 84 will be developed. 130 of the accumulations that were not producing at the time, had been producing previously but their exploitation had been (temporarily) abandoned. The total number of fields increased by 4 compared to 1 January 2018. This includes one new discovery and three accumulations which were re-evaluated and are now assumed to have economical potential. During 2018, a total of five fields on the territory and eight on the continental shelf ceased production and were abandoned. A complete list of all fields, grouped according to status and with information on operators and licences, is presented in Annex A.1 (part two of this review).

Table 1.1 Proven natural gas accumulations as at 1 January 2019, classified according to their status.

Status of gas accumulation	Territory	Continental shelf	Total
I. Developed			
a. Producing	99	142	241
b. Natural gas storage	* 5	0	5
II. Undeveloped			
a. Production to start 2019-2023	9	17	26
b. Other	34	50	84
III. Production ceased			
a. Temporarily ceased	15	8	23
b. Ceased	42	65	107
Total	204	282	486

* Including gas storage in caverns.

1.3 Resource estimates

Gas resources as at 1 January 2019

On 1 January 2019 the total gas resource in developed and undeveloped accumulations was 245.9 billion Nm^3 (Table 1.2).

Restriction to conventional accumulations of gas

The estimates of resources in this review relate solely to resources that are proven plays, and thus the review is limited to conventional natural gas accumulations and excludes shale gas. On 11 June 2018 the Minister of Infrastructure and Water Management sent the Subsoil Structural Vision to the House of Representatives. The Vision document entails that exploration and production of shale gas will be banned for the entire area by implemented policy also after the duration of the current cabinet. This means that there will be no shale gas production.

Reserves and contingent resources

Figures for the gas resources are given in Table 1.2 (in billion Nm^3) and Table 1.3 (in billion m^3 Groningen gas equivalents, m^3 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 2019 the remaining reserves totalled 245.9 billion Nm^3: 73.0 billion Nm^3 reserves in the Groningen field and 172.9 billion Nm^3 in the remaining (small) fields. The major reduction in reserves of the Groningen field are caused by the decision of the government to cease production. This decision to stop production as soon as possible is prompted by safety issues associated with induced seismicity (Letter to the House of Representatives, 29 March 2018).

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 18.0 billion Nm^3 on the territory (onshore) and 32.0 billion Nm^3 on the continental shelf (offshore).

Table 1.2 Netherlands natural gas resources as at 1 January 2019, in billion Nm^3.

Area	Reserves	Contingent resources (development pending)	Total
Groningen	73.0	-	73.0
Other territory	52.1	18.0	70.1
Continental shelf	70.8	32.0	102.8
Total	195.9	50.0	245.9

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 1.3). The Groningen gas equivalent used to be calculated relative to a calorific value of 35.17 MJ/Nm^3, the calorific value of the original content of the Groningen field. Since 2010, however, a calorific value of 35.08 MJ/Nm^3 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 1.3 Netherlands natural gas resources as at 1 January 2019, in billion m^3 Geq.

Accumulations	Reserves	Contingent resources (development pending)	Total
Groningen	72.8	-	72.8
Other territory	56.4	19.2	75.6
Continental shelf	79.3	35.4	114.6
Total	208.5	54.6	263.1

Table 1.4 shows the estimates for the Dutch natural gas resources after revision to account for

- Re-evaluations of previously proven accumulations including new discoveries
- Production during 2018.

Table 1.4 Revised estimates of expected natural gas resources compared to 1 January 2018, in billion Nm^3.

Area	Re-evaluation	Production	Total
Groningen	-470.9	-18.8	-489.7
Other territory	-20.2	-5.1	-25.3
Continental shelf	14.9	-11.1	3.8
Total	-476.2	-35.0	-511.2

The net result is a decrease of the resource by 511.2 billion Nm^3 compared to 1 January 2018. Production in 2018 is described in detail in Chapter 3.

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 511.2 billion Nm^3 in 2018. The revision is largely in the Groningen field (470.9 billion Nm^3). For the re-evaluation of the small fields upward and downward revisions of the resources were occur. In total for all the small fields this results in a net decrease of 5.3 billion Nm^3.

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, the associated resources are classified as reserves. Currently this technique is assumed non-proven in other fields and their associated resources are therefore classified as ‘development not viable’.

Two exploration wells that struck gas seem to have found commercially recoverable volumes; D12-AN has started producing and N07-B has also technically recoverable resources of gas (Table 1.5). The

locations of the new discoveries are indicated by asterisks in Figure 1.2. The gas resources in these new accumulations have been taken into account in the re-evaluation (Table 1.4).

Table 1.5 Natural gas accumulations discovered in 2018.

Accumulation	Discovery well	Licence [Type]	Operator
D12-AN	D12-07	D12a [pl]	Wintershall
N07-B	N07-04A-S1	N04 [el], N07c [pl], N08 [el]	ONE

el: exploration licence

pl: production licence

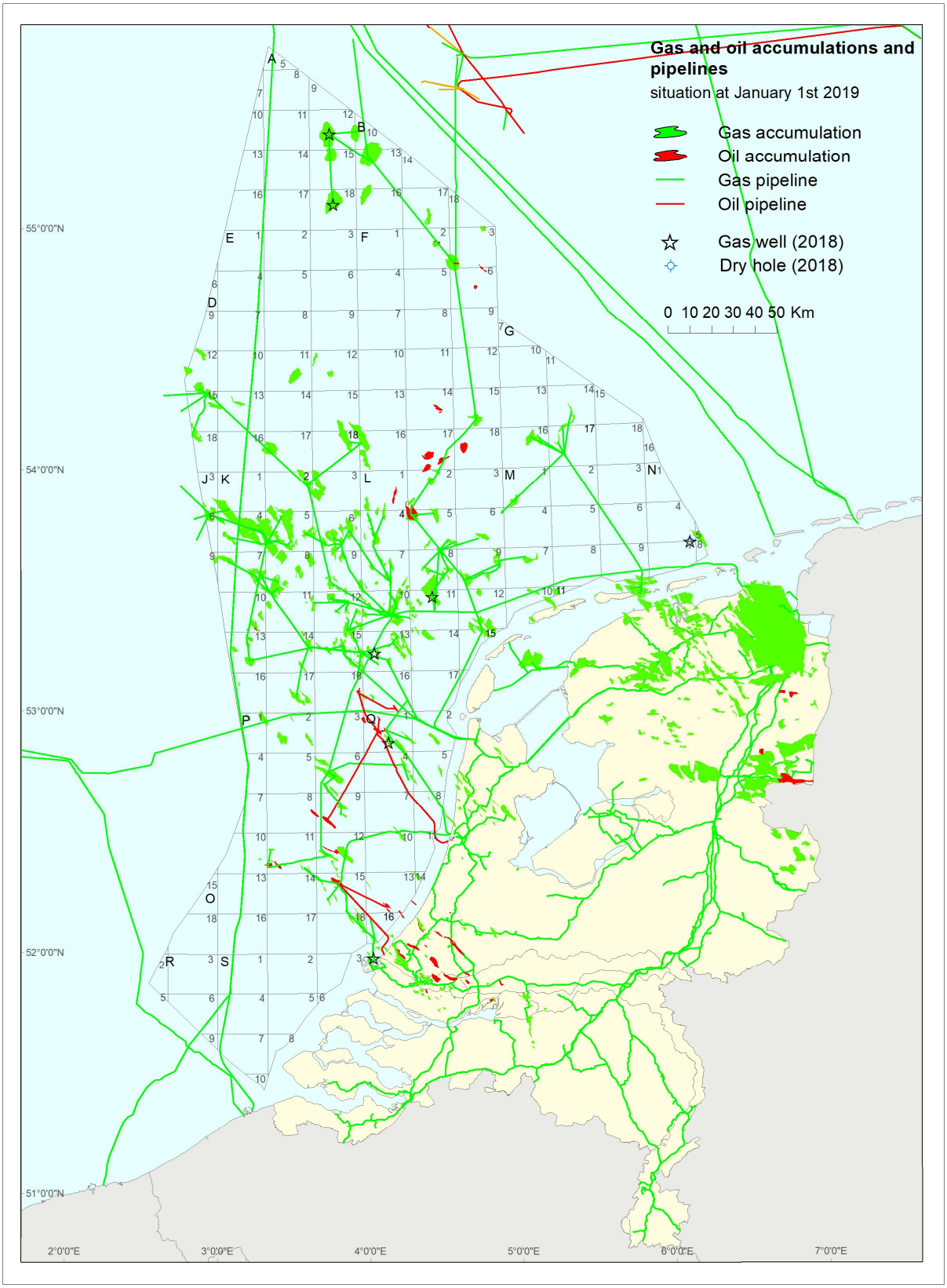


Figure 1.2 Map showing oil and gas accumulations in the Netherlands as at 1 January 2019.

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 5 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 not directly result in a major decrease in drilling intensity. The exploration potential figures presented should therefore be taken as 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 at 1 January 2019 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 2018. Re-evaluation of multiple prospects has however led to a major an increase in cumulative risked volume.

In the territory, the number of prospects has slightly increased in comparison to 1 January 2018. This is associated with an increase in risked volume.

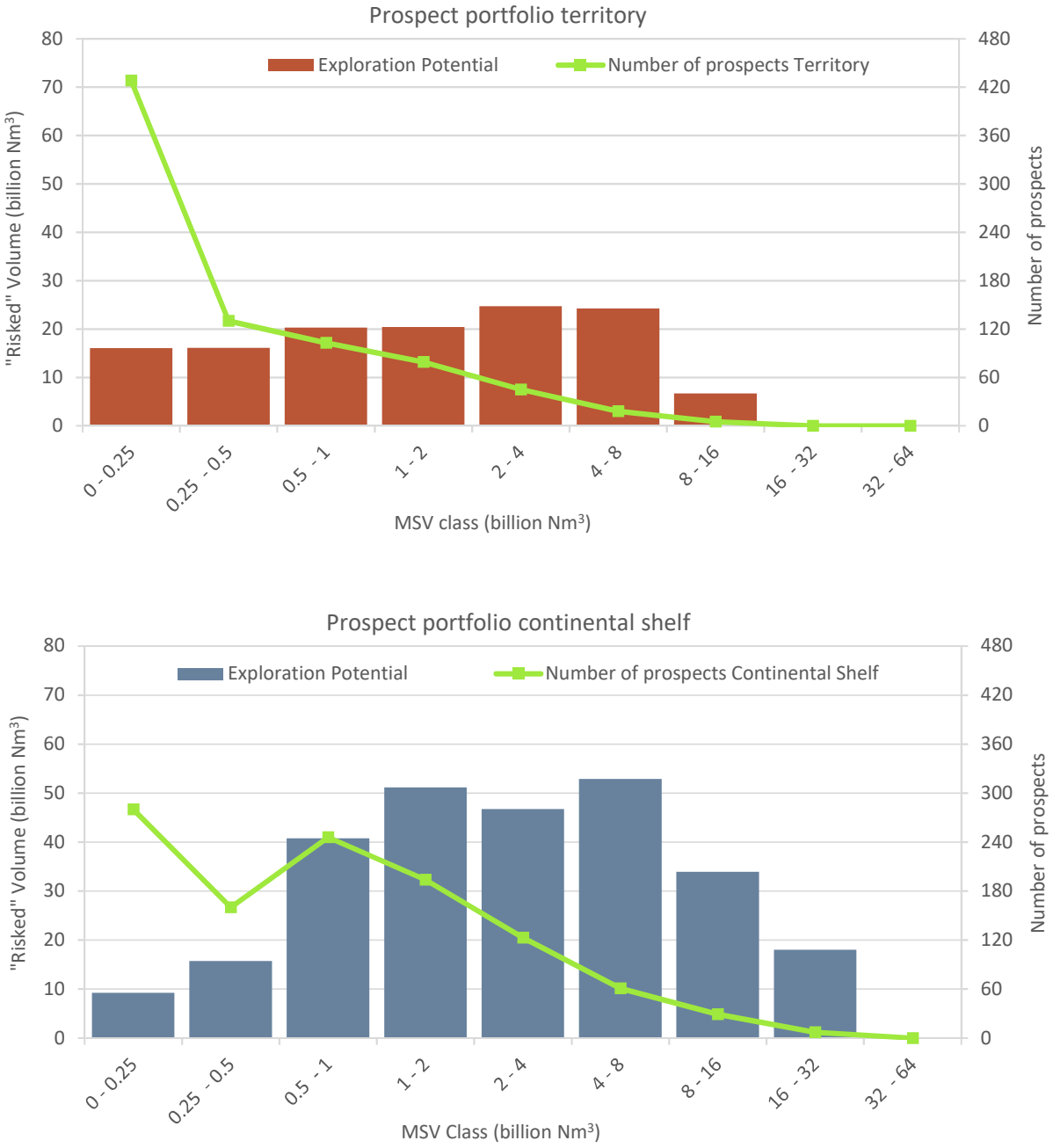


Figure 1.3. Prospect portfolio characteristics for the territory and the continental shelf in volume (mean success volume - MSV) classes: Number of prospects and the cumulative (exploration potential) per MSV class.

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 gas price, 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.

Economic analysis based on Expected Monetary Value

Economic analysis based on Expected Monetary Value (EMV) 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 monetary 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 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 and Climate Policy. From 2019 onwards, a gas price of 17.5 eurocents per Nm^3 is used, this as compared to the gas price of 16.5, 17.0 and 21.5 eurocents per Nm^3, used in the annual reports 2017, 2016 and 2015 respectively.

Table 1.6 shows the expected volume for the exploration potential of prospects with a positive EMV cut-off at a gas price scenario of 17.5 eurocents per Nm^3. This is at a fixed drilling rate (of 7 wells), should the exploration drilling rate decrease or the timeframe during which exploration continues then the potential will be lower.

The increase in the expected volume of the exploration potential as compared to the status of 1 January 2018 is mainly due to a cumulative effect of:

- A limited re-evaluation with positive effect of a part of the portfolio
- The slightly higher gas price
- Continuation of low rig rates
- A re-evaluation of the expected productivity rates of prospects

These influences have turned the decreasing trend and resulted in a significant increase (see Figure 1.4 and 1.5).

Table 1.6 Exploration potentials for natural gas as at 1 January 2019, assuming an economic lower cut-off of EMV = 0 Euro, and a gas price of 17.5 eurocents per normal cubic meter.

Area	**Expected volume of exploration potential (billion Nm^3) 17,5 ct/Nm^3**
Territory	116
Continental shelf	117

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).

The production profile estimate resulting from the RVIR ranking method is shown in Figure 1.7 (in addition to the reserves and contingent resource profiles). The profile is based on the expectation value

of the stochastic simulations for the prospects with an RVIR greater than 10% and a gas price of 17.5 cent per cubic meter. The increase in yearly production rate as compared to the 1 January 2018 is caused primarily due to a re-evaluation of the existing portfolio and a higher expected productivity rate per prospect.

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. The current publication illustrates the recent upturn due to re-evaluation which is especially clear in the continental shelf values.

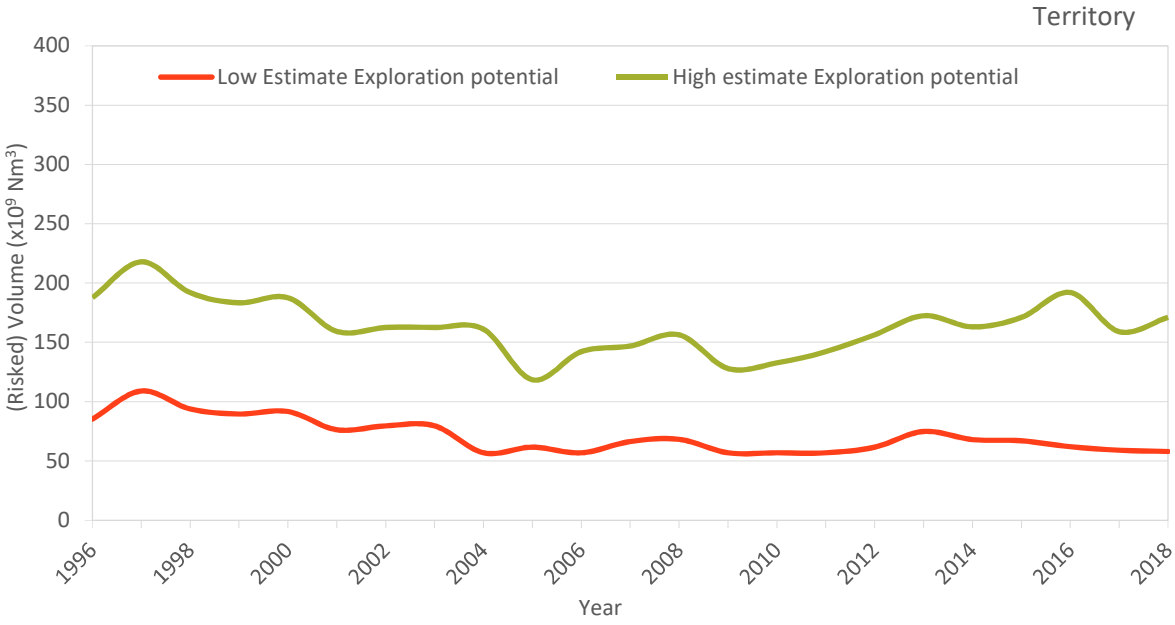


Figure 1.4 Exploration potential development Netherlands territory, over the period 1996 till present.

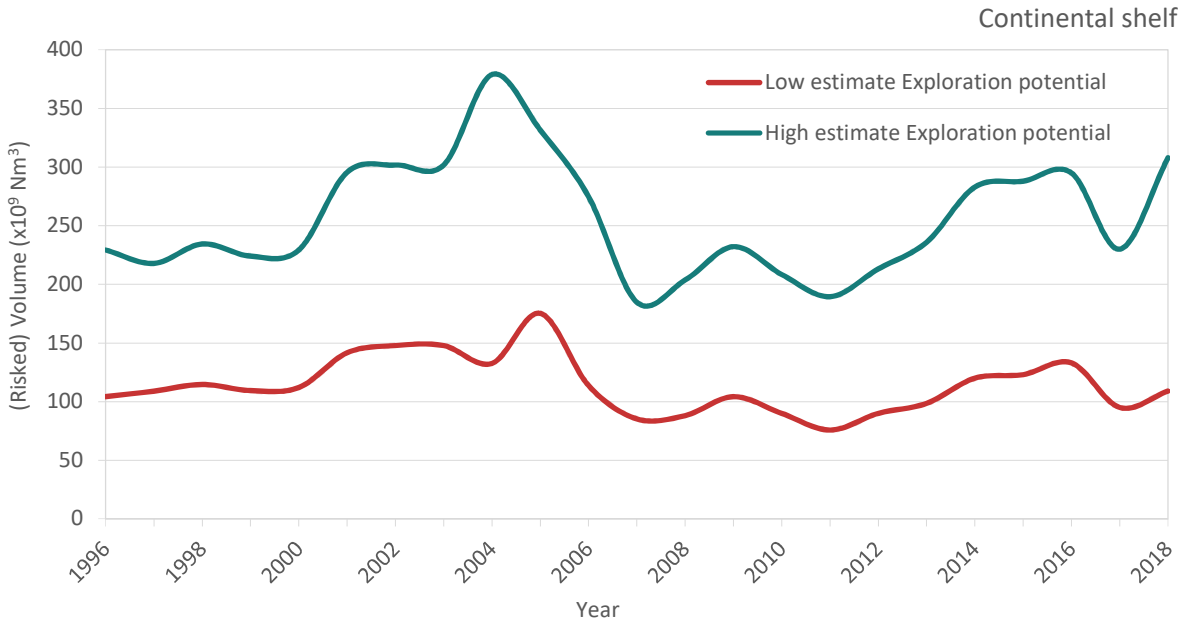


Figure 1.5 Exploration potential development Netherlands continental shelf, over the period 1996 till present.

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 72 applications have been filed, of which 51 have been successful. 13 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 Climate Policy 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 and Climate Policy 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 https://www.nlog.nl/en/fallow-areas. 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 for small fields and the Groningen gas field (domestic production) for the next 25 years (2019 to 2043).

Plans on production from the Groningen gas field are based on the cabinet decision of March 29th, 2018 (letter to House of Representatives, DGETM-EI / 18057375). Estimates are largely based on data submitted by operators. The reference date for the present review is 1 January 2019.

Groningen gas field

The Minister of Economic Affairs and Climate Policy has indicated that gas production from the Groningen gas field will be halted at the earliest moment possible (letter to House of Representatives, DGETM-EI / 18057375, March 29, 2018). The Cabinet's views this policy to be the best way to guarantee safety and the perception of safety in Groningen. The “baseline path” suggested by the cabinet encompasses a reduction of production rate to 7.5 billion Nm^3 per year as at October 2022. The production rate might be significantly lower depending on the effect of several additional measures.
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 Nm^3 by 2023, even if none of the additional measures taken will have an effect.

On 8 February 2019, the Minister of Economic Affairs and Climate Policy stated that, based on a recent estimate by GTS, a decrease in the demand for Groningen gas is foreseen to be faster than proposed as the 'baseline path' of 29 March 2018 (letter to House of Representatives DGKE-PGG / 19015460). This acceleration in reduction rate is mainly due to additional purchase of nitrogen planned by GTS and the accelerated reduction of exports to Germany. Since this estimate by GTS, the parties involved have gained more experience with minimizing gas production. The Minister of Economic Affairs and Climate Policy has requested advise from GTS to provide additional measures and the conditions where these measures are feasible (letter to House of Representatives DGKE-PGG / 19140823). GTS provided three specific measures to use the nitrogen capacity better, combined these can result in an additional reduction in production rate of a maximum of 3.1 billion Nm3. GTS indicates that a production rate of 12.8 billion Nm^3 can be achieved for the 2019/2020 gas year. These measures will be expanded upon further with the parties involved. In addition to these measures, the expansion of the Norg gas storage to the level of 12 billion Nm^3 is being explored. GTS will issue a final advice at the end of July 2019.
After the commissioning of the nitrogen plant in Zuidbroek in 2022, gas extraction will fall well below the level of 12 billion Nm^3 as recommended by the State Supervision of Mines (SSM). The government anticipates the definitive closure of the Groningen field in the years following this. The minister is drafting an operational reduction plan for the use of the Groningen field from gas year 2022/2023 onwards.

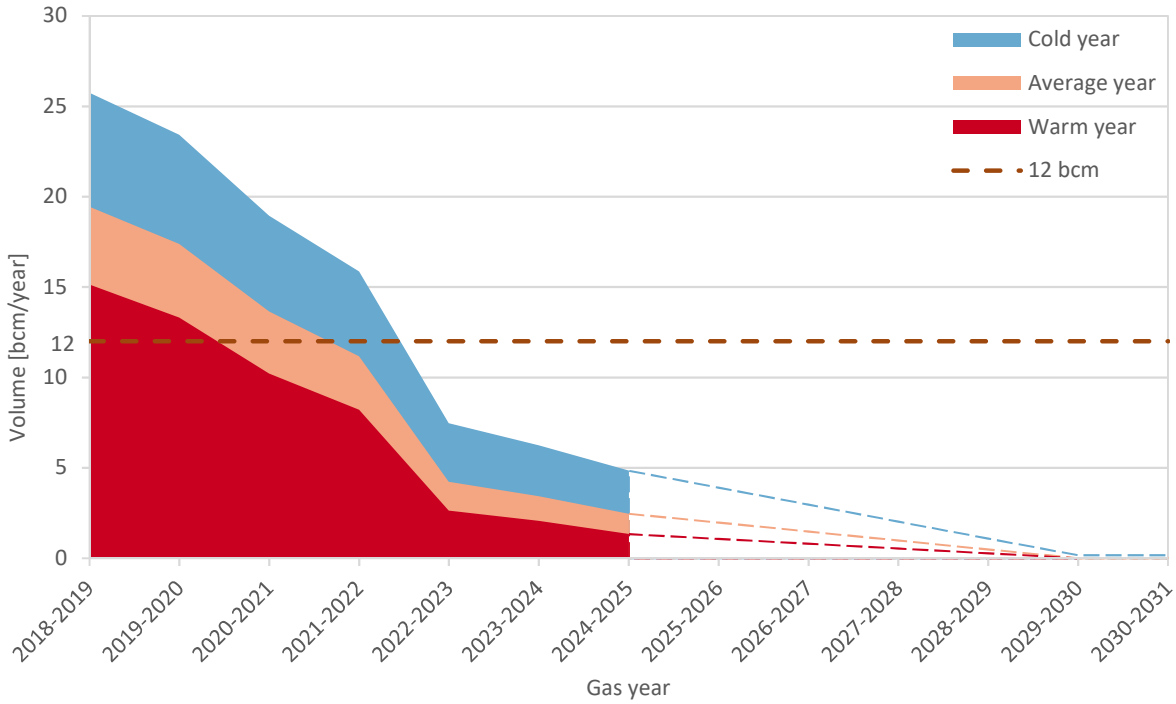


Figure 1.6. Production profile for the Groningen gas field for a cold, average and warm year according to the 'basic path' proposed by the government (letter to the House of Representatives, DGETM-EI / 18057375, 29 March 2018).

Small fields

The expected production of gas from the smaller and yet undiscovered fields (exploration potential) for 2019 is estimated at 17 billion m^3 Geq. Over the next 25 years (2019 to 2043) this will decrease to roughly 6 billion m^3 Geq (Figure 1.7). Total production over this period will be 298 billion m^3 Geq (Table 1.7). In addition to the estimated production, Figure 1.7 also shows the realized production from the small fields over the period 2009-2018. The production in 2018 was 94% of the planned amount for the small fields.

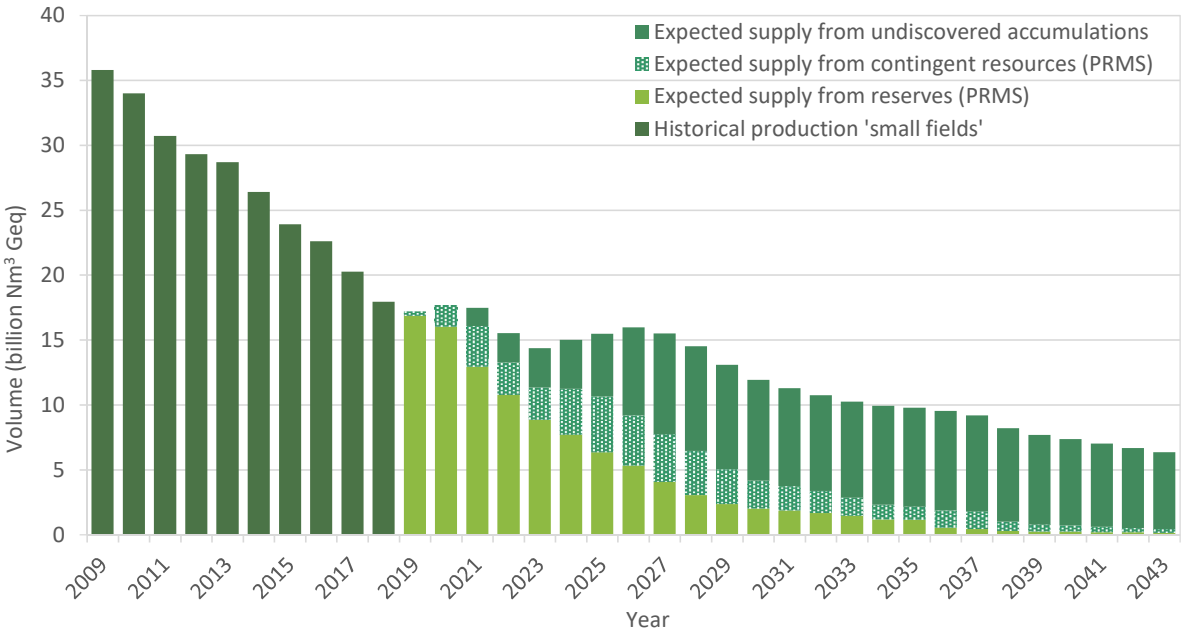


Figure 1.7 Realised and prognosed production of natural gas from small fields in the Netherlands from 2009 – 2043 (see also Table 1.7). The Groningen gas field is excluded (see text).

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 (7 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 (36 billion Nm^3 of gas that was present in the reservoir at time of conversion to UGS) are shown separately.

Table 1.7 Past production and supply of natural gas from small fields for the period 2019 – 2043, in billion m^3 Geq.

Year	Past production	Expected supply from reserves	Expected supply from contingent resources	Expected supply from undiscovered accumulations
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	17.9	-	-	-
2019	-	16.9	0.3	-
2020	-	16.0	1.6	-
2021	-	12.9	3.1	1.4
2022	-	10.8	2.5	2.3
2023	-	8.8	2.5	3.0
2024	-	7.7	3.5	3.8
2025	-	6.4	4.3	4.9
2026	-	5.3	3.9	6.8
2027	-	4.1	3.7	7.8
2028	-	3.0	3.4	8.1
2029	-	2.4	2.7	8.0
2030	-	2.0	2.1	7.8
2031	-	1.9	1.9	7.5
2032	-	1.7	1.7	7.4
2033	-	1.5	1.4	7.4
2034	-	1.2	1.1	7.6
2035	-	1.1	1.0	7.6
2036	-	0.5	1.4	7.7
2037	-	0.4	1.4	7.4
2038	-	0.3	0.7	7.2
2039	-	0.2	0.5	6.9
2040	-	0.2	0.5	6.6
2041	-	0.2	0.4	6.4
2042	-	0.2	0.3	6.2
2043	-	0.1	0.3	5.9
Total	-	105.8	46.2	145.5

Over time a part of the exploration potential has 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 been insufficient to counteract the negative re-evaluations of remaining reserves.

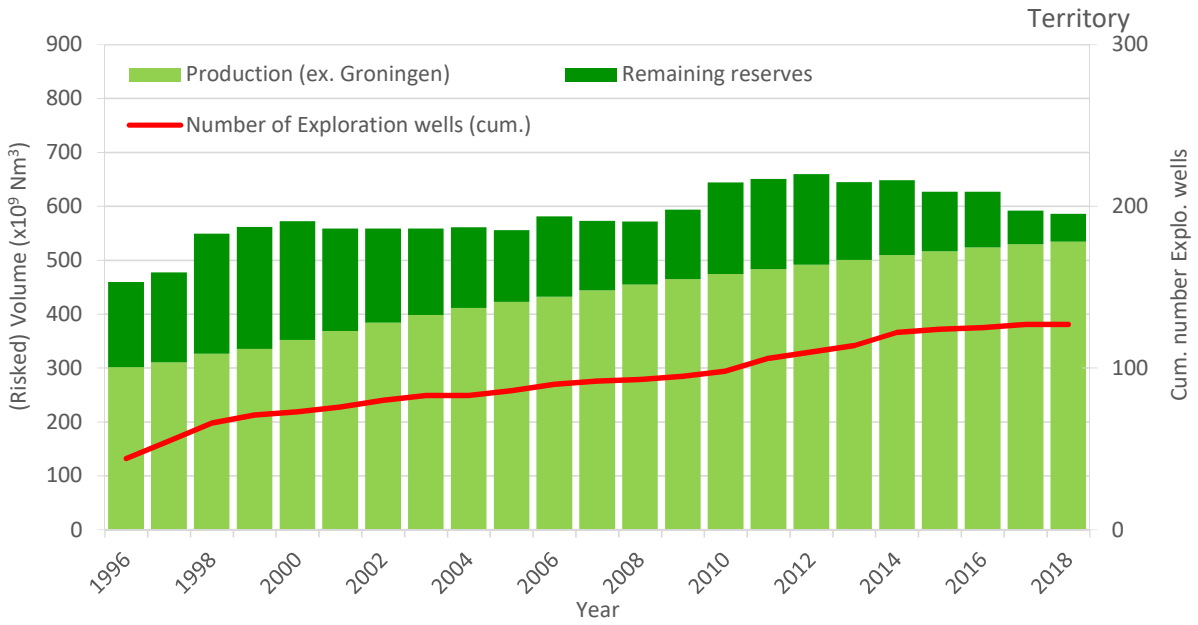


Figure 1.8 Trends in exploration potential, exploratory drilling, reserves and production Netherlands territory, 1996 – present (excluding the Groningen field).

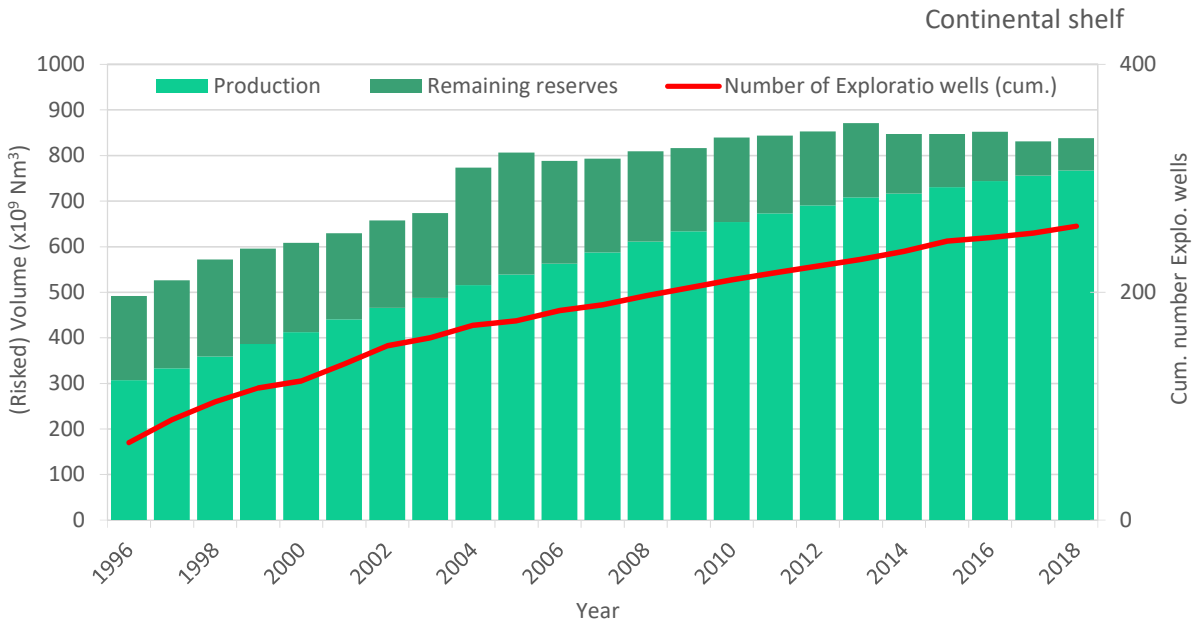


Figure 1.9 Trends in exploration potential, exploratory drilling, reserves and production, Netherlands continental shelf, 1996 – present.

2. Oil resources

On 1 January 2019 there were 54 proven oil accumulations in the Netherlands (see Table 2.1), 11 of which were producing. Since last year, one new field was added (Q07-FA), which has been defined as a separate accumulation at the same location as the gas field Q10-A. All oilfields are listed in summary Annex A.2, sorted by status and stating operator and licence.

Table 2.1 Number of proven oil accumulations as at 1 January 2019.

Status of oil accumulation	Territory	Continental shelf	Total
I. Developed			
Producing	3	8	11
II. Undeveloped			
a. Production to start 2018 - 2022	-	5	5
b. Other	10	15	25
III. Production ceased			
a. Temporarily ceased	1	-	1
b. Ceased	8	4	12
Total	22	32	54

Oil resources as at 1 January 2019

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 2.2 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 2.2. 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 Sm^3 of which 18.2 million Sm^3 oil reserves plus 10.4 million Sm^3 contingent resources.

Table 2.2 Oil resources in million Sm^3 as at 1 January 2019.

Area	Reserves	Contingent resources (development pending)	Total
Territory	7.9	8.9	16.8
Continental shelf	10.3	1.5	11.8
Total	18.2	10.4	28.6

Revised estimates of the oil resources compared to 1 January 2018

Table 2.3 shows the adjustments made to the Dutch oil resources as a result of:

- Re-evaluations of previously proven accumulations
- Production during 2018

Oil reserve levels has remained constant compared to 2017, as re-evaluation matched production from both continental shelf and territory reserves. The reserves have however increased substantially due to a reassignment of resources previously classified as contingent.

Table 2.3 Revised estimates of oil reserves compared to 1 January 2018, in million Sm^3.

Area	Re-evaluation	Production	Total
Territory	0.2	-0.5	-0.3
Continental shelf	0.9	-0.6	0.3
Total	1.1	-1.1	-

Figure 2.1 and Table 2.4 show oil production since 2009 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.

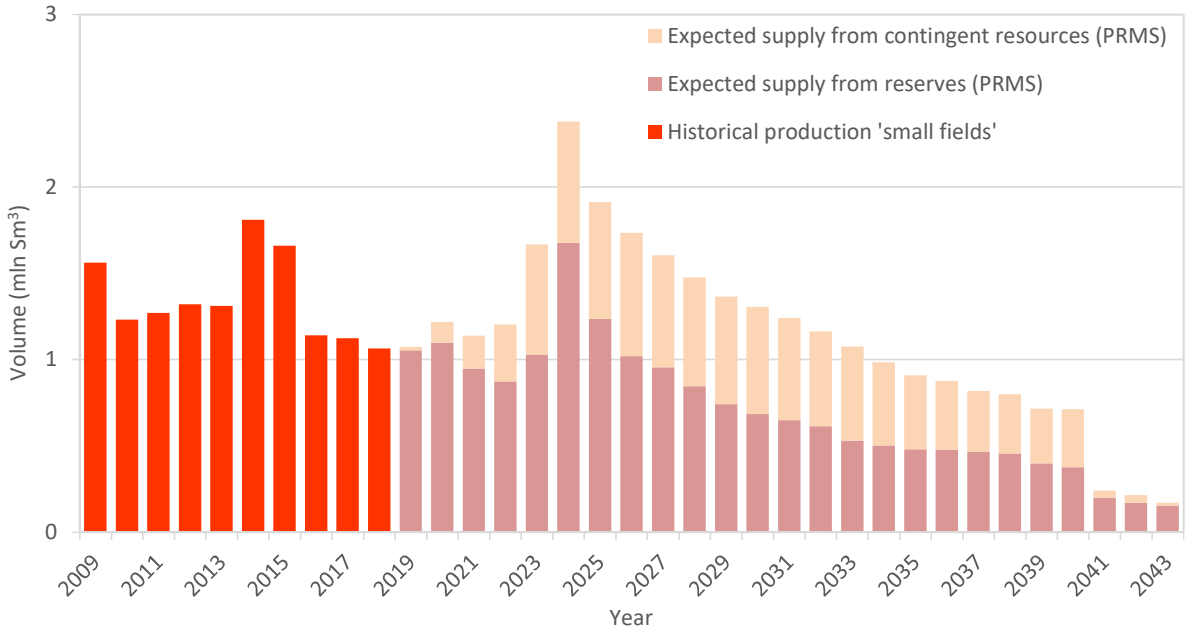


Figure 2.1 Historical oil production and prognosis for production until 2043 (in million Sm^3).

Table 2.4 Past production and supply from reserves from small fields during 2019-2043 (in million Sm^3).

Year	Past production	Expected supply from reserves (PMRS)	Expected supply from contingent resources (PRMS)
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	-	-
2019	-	1.1	-
2020	-	1.1	0.1
2021	-	0.9	0.2
2022	-	0.9	0.3
2023	-	1.0	0.6
2024	-	1.7	0.7
2025	-	1.2	0.7
2026	-	1.0	0.7
2027	-	1.0	0.6
2028	-	0.8	0.6
2029	-	0.7	0.6
2030	-	0.7	0.6
2031	-	0.6	0.6
2032	-	0.6	0.5
2033	-	0.5	0.5
2034	-	0.5	0.5
2035	-	0.5	0.4
2036	-	0.5	0.4
2037	-	0.5	0.4
2038	-	0.5	0.3
2039	-	0.4	0.3
2040	-	0.4	0.3
2041	-	0.2	-
2042	-	0.2	-
2043	-	0.2	-
Total		17.6	10.4

3. Production of gas, oil and condensate

In 2018 the following fields came on stream or stopped producing.

Field production start in 2018

Production start	Field	Producing	Year discovery
April-2018	D12-Andalusiet Noord	Gas	2018
July-2018	K09c-C	Gas	2017
May-2018	L13-FI	Gas	1988

Field production ceased in 2018

Production ceased	Field	Producing	Year discovery
January-2018	F15a-B	Gas	1998
January-2018	Gasselternijveen	Gas	1979
February-2018	Emmen	Gas	1969
May-2018	L07-G	Gas	1986
June-2018	Donkerbroek-West	Gas	2012
July-2018	P15-12	Gas	1990
Augustus-2018	F03-FA	Gas	1971
October-2018	E18-A	Gas	2006

The tables below list the aggregated production figures for natural gas, oil and condensate for 2018. Condensate is considered to be a by-product of oil or gas production. Changes compared to 2017 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 to 2017 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 in the Q13a license. The increase in oil production onshore is caused by rising production rates in the Schoonebeek and Rijswijk licenses.

Overview production in 2018 and changes compared to 2017

Gas production in 2018 and changes compared to 2017

Gas	Production 2018 (10^9 Nm^3)	Changes compared to 2017 (10^9 Nm^3)	%
Territory (total)	23.9	-5.6	-19.0
Groningen gas field	18.8	-4.8	-20.2
Territory other fields	5.1	-0.9	-14.6
Continental shelf	11.1	-1.2	-9.5
Total	35.1	-6.8	-16.2

Oil production in 2018 and changes compared to 2017

Oil	Production 2018 (10^3 Sm^3)	Changes compared to 2017 (10^3 Sm^3)	%
Territory	508	89	21,3
Continental shelf	556	-149	-21,1
Total	1,064	-60	-5,3
Average oil production per day	2.916		

Condensate production in 2018 and changes compared to 2017

Condensate	Production 2018 (10^3 Sm^3)	Changes compared to 2017 (10^3 Sm^3)	%
Territory	125	-25	-16,6
Continental shelf	145	-25	-14,5
Total	270	-49	-15,5

3.1 Production in 2018, 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 B and D 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 2018, Netherlands territory (million Nm^3)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Akkrum 11	Tulip	-	-	-	-	-	-	-	-	-	-	-	-	-
Alkmaar	TAQA	-	-	-	-	-	-	-	-	-	-	-	-	-
Andel Va	Vermilion	3.2	1.1	0.3	0.4	0.8	-	-	-	0.5	-	-	-	-
Beijerland	NAM	25.8	5.6	3.5	3.7	3.3	2.6	2.7	-	-	-	-	1.9	2.4
Bergen II	TAQA	40.7	3.6	1.9	3.9	1.8	1.3	4.4	4.8	4.2	4.4	3.9	3.4	3.1
Botlek II	NAM	298.4	25.2	22.7	20.6	20.1	19.6	18.0	9.6	23.3	29.5	32.9	38.3	38.8
Donkerbroek	Tulip	0.7	0.5	0.1	0.1	-	-	-	-	-	-	-	-	-
Drenthe IIa	Vermilion	-	-	-	-	-	-	-	-	-	-	-	-	-
Drenthe IIb	NAM	223.6	22.9	17.3	20.1	18.2	18.4	18.8	18.7	15.6	19.7	22.4	12.6	18.9
Drenthe IV	Vermilion	4.9	0.4	0.3	0.5	0.4	0.4	0.3	0.4	0.5	0.4	0.5	0.3	0.5
Drenthe V	Vermilion	17.0	1.7	1.3	1.5	1.4	1.2	0.4	1.6	1.6	1.5	1.7	1.5	1.7
Drenthe VI	Vermilion	472.0	23.3	33.2	44.4	44.0	45.7	43.9	44.0	44.6	35.0	38.0	37.9	38.1
Gorredijk	Vermilion	22.7	12.1	5.3	1.7	0.4	0.5	0.5	0.5	0.2	-	0.3	0.6	0.6
Groningen	NAM	19,770.8	20,92.6	1,688.9	2,301.6	1,386.1	1,515.5	1,428.9	1,439.1	1,429.5	1,467.4	1,265.2	1,827.6	1,928.4
Hardenberg	NAM	30.5	2.8	2.7	2.5	2.4	2.3	0.6	3.6	2.9	2.7	2.8	2.6	2.5
Leeuwarden	Vermilion	49.6	4.2	4.4	3.9	4.7	4.1	4.1	3.2	3.7	4.0	3.7	4.6	4.9
Middelie	NAM	385.4	36.2	32.0	37.7	34.0	31.0	33.2	32.3	25.4	28.3	31.8	32.0	31.6
Noord-Friesland	NAM	1,992.7	187.8	166.2	179.1	158.9	182.4	172.6	161.2	173.7	153.2	154.4	145.4	158.0
Oosterend	Vermilion	-	-	-	-	-	-	-	-	-	-	-	-	-
Rijswijk	NAM	180.6	22.1	19.0	13.9	13.6	17.3	17.7	13.1	9.1	11.7	14.8	14.0	14.4
Schoonebeek	NAM	348.7	29.9	26.1	26.8	31.8	27.8	7.2	34.0	34.1	32.7	34.1	30.6	33.7
Slootdorp	Vermilion	10.7	3.9	1.7	3.1	1.4	-	0.1	-	-	0.3	-	-	0.2
Steenwijk	Vermilion	66.8	1.1	2.5	0.2	-	0.2	2.5	1.2	4.5	14.1	13.7	13.3	13.6
Tietjerksteradeel II	Vermilion	60.5	6.5	5.0	2.1	4.5	4.6	2.6	5.2	4.9	5.6	6.0	7.0	6.5
Tietjerksteradeel III	NAM	34.3	3.9	3.5	3.6	2.8	2.9	3.2	2.5	3.0	2.7	0.4	3.0	2.7
Waalwijk	Vermilion	25.6	2.0	2.2	2.6	2.3	2.6	2.2	1.8	1.8	2.2	1.9	2.1	2.0
Zuidwal	Vermilion	23.0	2.4	2.1	1.9	2.1	2.2	2.1	1.7	2.0	1.8	1.8	1.9	1.1
Total		24,088.2	24,91.9	2,042.1	2,675.5	1,735.1	1,882.4	1,766.0	1,778.3	1,785.0	1,817.2	1,630.3	2,180.8	2,303.5

Production from small fields per stratigraphic reservoir, Netherlands territory

Figure 3.1 and Figure 3.2 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 3.1 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 due to a slight increase in production from Rotliegend fields. Following 2013 annual decline continued and decline rate increased to 12% and 15% for 2017 and 2018.

Figure 3.2 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 million Nm^3 from the Middelie field and the reclassification of Slootdorp due to additional production from the Rotliegend formation (in the past, production was defined as from Zechstein only). From 2017 onwards, production shows a general decrease due to depletion from existing fields.

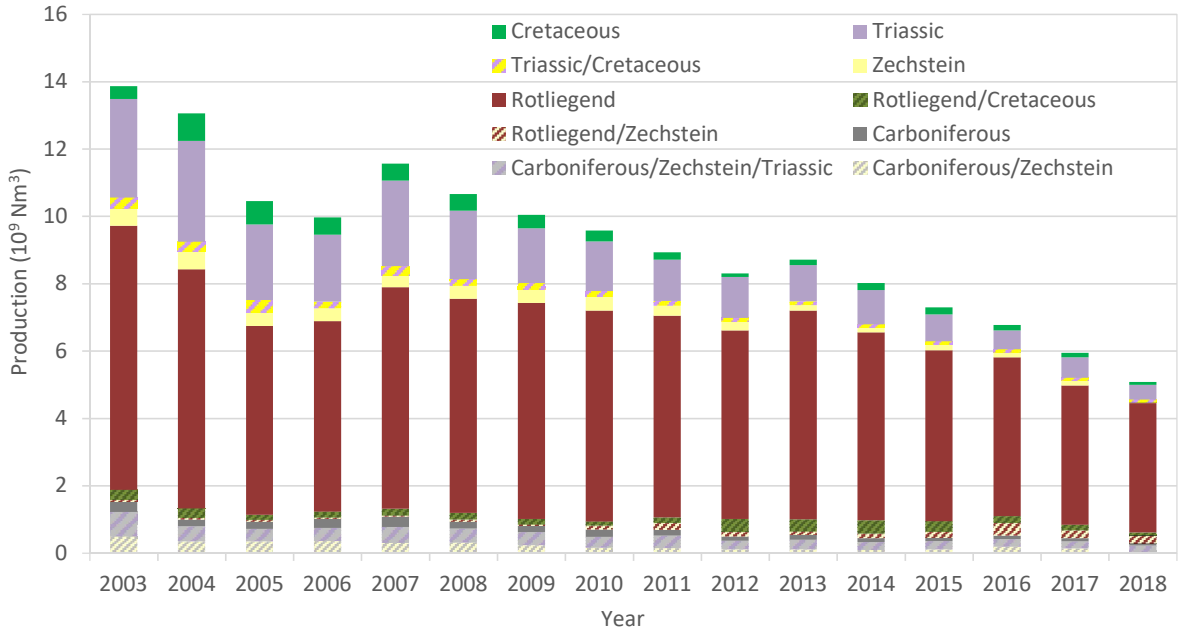


Figure 3.1 Production territory per reservoir (excluding the Groningen field).

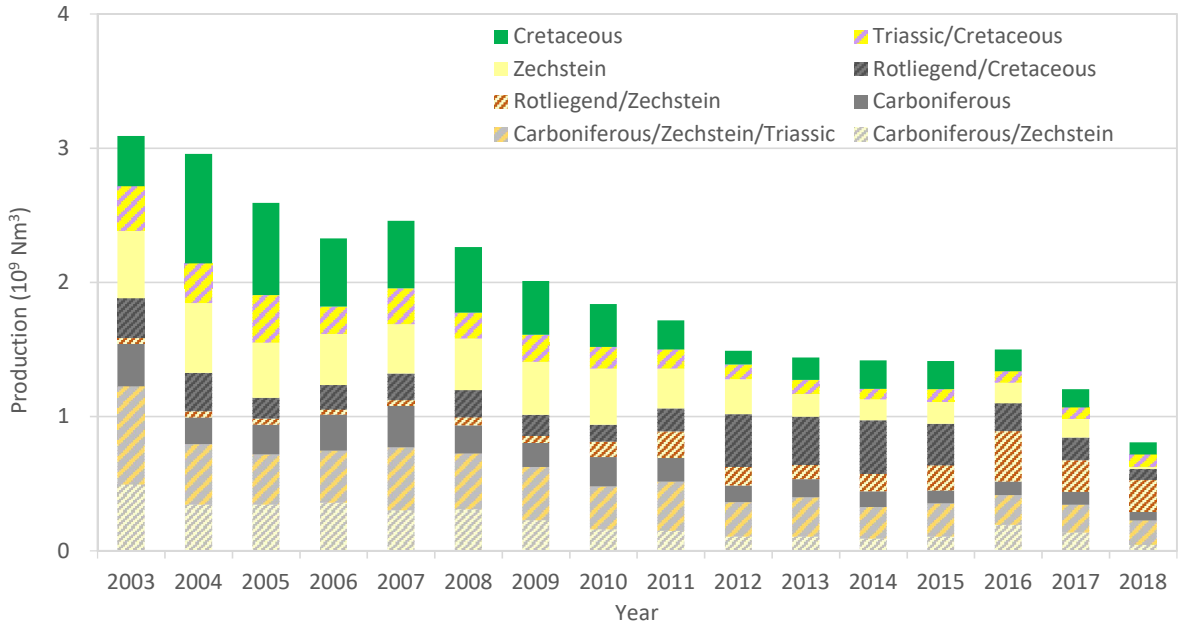


Figure 3.2 Production territory per reservoir (excluding the Groningen field and the Rotliegend and Triassic reservoirs).

3.2 Gas production in 2018, Netherlands 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 2018 (million Nm^3), Netherlands continental shelf

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
A12a	Petrogas	220.2	19.8	16.2	21.9	20.5	19.8	21.1	20.6	18.1	13.3	24.8	8.0	16.3
A18a	Petrogas	655.4	63.0	58.5	62.8	61.4	64.4	59.4	62.8	56.6	39.0	53.4	19.5	54.6
B10c & B13a	Petrogas	250.8	26.8	23.5	24.8	25.0	25.1	24.9	22.3	16.5	14.6	22.8	6.7	17.8
D12a	Wintershall	84.5	-	-	-	10.6	13.9	14.0	15.8	15.3	10.9	1.8	-	2.2
D15	Neptune	-	-	-	-	-	-	-	-	-	-	-	-	-
D18a	Neptune	19.5	2.1	1.8	1.6	1.9	1.7	1.8	1.7	1.6	0.8	0.9	1.7	1.9
E17a & E17b	Neptune	607.9	59.2	48.1	50.0	57.7	55.3	54.5	54.7	50.6	51.8	33.9	39.7	52.4
E18a & E18c	Wintershall	8.1	0.7	0.9	1.2	1.1	0.8	0.8	1.1	0.9	0.5	-	-	-
F02a	Dana	32.5	4.8	4.4	3.5	4.4	4.0	1.8	1.8	0.9	0.7	2.7	1.1	2.4
F03a	Spirit	24.0	4.6	4.4	3.8	4.0	4.0	3.1	-	-	-	-	-	-
F03b	Neptune	190.7	20.0	14.4	17.2	16.7	17.5	18.0	18.9	20.5	14.7	5.4	14.5	12.9
F15a	Total	-	-	-	-	-	-	-	-	-	-	-	-	-
F16a & F16b	Wintershall	120.5	12.3	10.8	11.4	11.4	10.3	9.1	12.0	11.2	10.7	6.8	7.5	7.1
G14 & G17b	Neptune	447.8	37.1	40.5	38.3	42.8	39.3	18.3	34.6	38.2	40.0	40.2	38.8	39.8
G16a	Neptune	320.6	24.5	26.5	30.0	32.6	29.7	15.2	28.4	30.6	27.6	25.7	24.0	25.8
G17c & G17d	Neptune	104.3	9.0	9.7	7.5	10.0	8.9	3.9	9.0	8.4	10.1	10.2	9.5	8.1
J03b & J06a	Spirit	91.4	8.1	10.3	6.7	8.5	9.9	4.3	7.7	6.6	7.8	5.8	8.9	6.9
K01a	Total	201.7	19.3	17.0	14.3	16.0	20.0	7.6	18.4	19.7	19.1	16.4	17.5	16.5
K02b	Neptune	148.2	10.5	11.1	12.0	11.3	14.0	11.8	14.2	15.0	12.0	13.3	10.8	12.2
K04a	Total	422.6	37.7	31.3	35.0	36.7	37.1	23.8	39.2	37.8	36.4	36.9	35.4	35.2
K04b & K05a	Total	702.2	67.0	55.1	65.3	63.1	62.6	42.2	62.9	60.9	57.8	60.3	57.1	47.9
K05b	Total	74.8	7.1	5.5	7.7	6.7	6.7	4.7	6.5	7.0	5.6	5.7	5.4	6.3
K06 & L07	Total	268.2	19.9	21.8	24.5	26.4	18.6	26.3	25.7	6.3	21.9	28.7	23.1	25.0
K07	NAM	59.1	4.2	7.9	6.8	7.3	7.0	5.2	2.2	2.2	0.1	3.3	7.1	5.9
K08 & K11a	NAM	216.7	24.6	20.3	19.8	25.4	24.0	21.6	15.1	20.5	1.3	3.6	18.0	22.4
K09a & K09b	Neptune	129.5	12.0	9.6	12.2	11.2	11.9	11.6	11.2	12.4	9.4	9.9	9.2	8.9
K09c	Neptune	39.9	1.1	1.0	0.9	1.1	0.8	-	4.0	7.0	5.8	6.5	5.8	5.9
K12	Neptune	562.9	53.2	44.3	48.2	43.9	50.1	43.2	49.6	46.9	47.0	47.8	42.0	46.8
K14a	NAM	209.5	20.9	17.7	17.4	20.0	20.1	14.1	16.2	18.8	17.6	17.2	15.4	14.2
K15	NAM	520.2	57.7	54.4	42.4	48.7	46.8	12.5	46.4	48.5	37.5	39.7	43.6	42.0
K17	NAM	81.3	7.8	6.8	7.4	7.0	7.1	5.7	7.3	6.8	6.6	5.8	6.7	6.3
K18b	Wintershall	375.7	39.8	34.4	36.4	34.2	35.0	18.4	30.2	31.3	29.5	30.0	28.9	27.8
L02	NAM	312.4	28.8	25.5	28.3	27.0	27.6	26.1	27.4	24.9	19.7	27.3	21.6	28.0
L04a	Total	169.4	17.7	15.3	14.9	16.6	11.9	15.9	15.2	3.7	13.5	13.7	13.1	17.9
L05a	Neptune	353.3	14.0	21.4	37.6	40.2	38.5	38.4	36.9	34.7	16.1	34.7	14.7	26.2
L05b	Wintershall	128.1	11.2	10.0	12.1	4.4	11.5	10.7	10.6	10.6	11.9	12.5	11.3	11.2
L06a	Wintershall	189.1	21.0	17.2	18.0	5.9	17.6	15.0	16.9	16.8	16.4	16.2	14.1	14.1

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
L08b & L08d	Wintershall	73.1	8.5	7.7	6.2	2.4	6.1	5.8	6.0	6.1	5.7	5.6	5.7	7.4
L09	NAM	392.2	37.2	34.5	35.4	35.1	33.9	33.3	34.0	32.7	27.0	34.2	24.7	30.3
L10 & L11a	Neptune	382.5	32.6	33.2	25.3	25.2	34.7	34.1	35.7	33.6	31.0	35.0	29.4	32.7
L11b	ONE	144.3	14.0	14.1	11.6	11.6	3.3	1.3	5.3	14.8	16.4	20.6	16.7	14.7
L12b & L15b	Neptune	279.2	30.9	25.9	28.2	26.5	23.1	24.5	26.1	24.3	17.5	10.1	14.9	27.1
L13	NAM	286.0	11.9	12.9	15.4	16.1	17.4	10.0	19.7	27.1	47.3	40.4	36.8	30.8
M07	ONE	159.8	16.7	5.9	14.8	14.8	14.8	14.5	14.8	14.6	10.2	13.8	11.3	13.6
P06	Wintershall	103.0	9.4	8.7	9.2	9.2	9.1	9.1	5.6	9.8	5.1	9.6	9.0	9.3
P09a, P09b & P09d	Wintershall	-	-	-	-	-	-	-	-	-	-	-	-	-
P09c, P09e & P09f	Petrogas	1.6	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.2	0.1	0.1	0.1	-
P11a	ONE	162.2	19.4	29.2	13.6	13.6	9.4	14.1	22.0	16.9	-	-	2.8	21.3
P11b	Dana	192.2	19.0	17.4	18.7	18.2	19.0	18.8	13.7	16.9	8.7	14.1	13.7	14.0
P15a & P15b	TAQA	7.2	1.4	0.6	0.8	1.7	1.2	0.5	0.3	0.2	-	-	0.2	0.3
P15c	TAQA	-	-	-	-	-	-	-	-	-	-	-	-	-
P18a	TAQA	61.5	7.0	5.8	5.7	7.3	5.9	7.0	7.2	6.1	0.2	-	1.3	8.0
Q01a-ondiep & Q01b-ondiep	Petrogas	2.2	0.2	0.2	0.2	0.2	0.1	0.1	0.2	0.2	0.2	0.2	0.2	0.1
Q01-diep	Wintershall	104.3	6.5	7.5	6.2	7.1	6.1	12.4	11.0	7.7	6.9	12.0	10.2	10.7
Q04	Wintershall	219.6	23.5	19.7	22.3	19.4	21.3	17.6	15.8	14.3	11.3	18.6	17.9	17.9
Q13a	Neptune	13.7	1.8	1.7	1.6	1.5	1.6	1.0	1.4	1.1	-	-	0.3	1.5
Q16a	ONE	40.2	5.6	6.4	5.6	5.6	-	-	6.1	4.6	0.1	-	0.7	5.3
UK49/5a	Spirit	-	-	-	-	-	-	-	-	-	-	-	-	-
Total		10,967.9	1,013.2	928.5	963.0	977.2	980.6	809.1	972.8	939.1	815.4	878.5	776.6	913.8

Production from small fields per stratigraphic reservoir, continental shelf

Figure 3.3 and Figure 3.4 Show the contribution of the gas reservoirs to gas production from the continental shelf.

Figure 3.3 illustrates that on the continental shelf (as holds true for onshore) the largest contribution to gas production is from the Rotliegend and Triassic reservoirs. Production increased slightly from 2003–2008, but thereafter declined steadily, with 2011 being the first year in which offshore production fell below 20 billion Nm^3/year. Figure 3.4 shows production excluding that from the Rotliegend and Triassic reservoirs, in order to better show the contribution from reservoirs at other levels. 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 Netherlands continental shelf in 2008 is striking. Production from the Tertiary reservoirs has remained fairly stable, thanks to B13-A coming on stream in 2015.

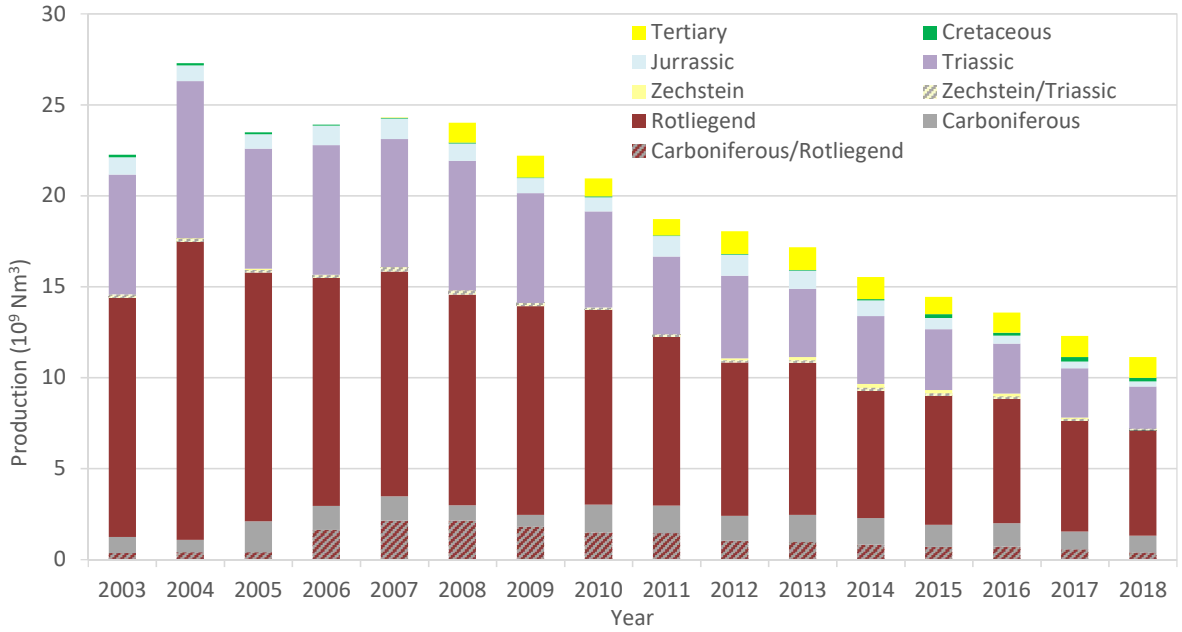


Figure 3.3 Production continental shelf per reservoir.

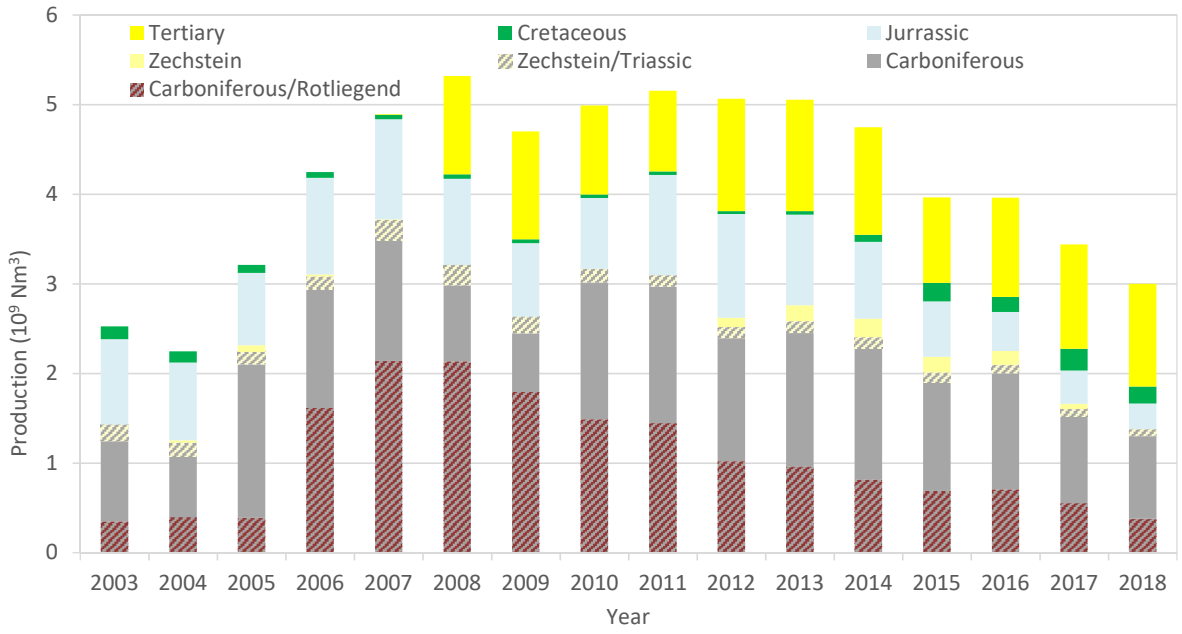


Figure 3.4 Production continental shelf per reservoir (excluding Triassic and Rotliegend reservoirs).

3.3 Oil and condensate production in 2018

Oil production in 2018 (in 1000 Sm^3)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
BOTLEK II	NAM	3.6	0.7	1.1	1.3	0.3	-	-	-	-	-	-	-	0.3
RIJSWIJK	NAM	129.5	10.9	10.8	11.8	10.4	10.0	11.1	10.0	10.9	11.1	11.6	10.3	10.6
SCHOONEBEEK	NAM	375.0	31.7	25.0	33.4	29.8	33.4	31.6	29.5	32.9	34.3	31.0	33.1	29.2
F02a	Dana	124.8	14.0	12.2	12.6	13.3	13.1	11.9	12.4	9.3	2.4	9.6	7.2	6.7
F03b	Neptune	44.2	4.8	3.5	4.1	4.0	4.2	4.4	4.0	4.3	3.2	1.2	3.1	3.3
P09c, P09e & P09f	Petrogas	26.4	2.3	2.2	2.5	2.5	2.4	2.3	2.3	2.3	2.4	1.9	2.0	1.4
P11b	Dana	89.4	8.5	7.6	8.2	7.6	6.2	7.7	7.5	7.6	7.0	7.6	6.9	7.1
P15a & P15b	TAQA	26.7	3.0	1.9	2.5	2.4	2.8	1.9	2.9	2.4	0.1	-	2.4	4.4
Q01a-ondiep & Q01b-ondiep	Petrogas	55.4	6.3	5.5	5.5	4.5	4.8	0.6	3.8	4.9	5.4	4.6	4.8	4.7
Q13a	Neptune	189.4	25.0	24.0	22.5	20.7	22.5	14.4	19.8	15.8	-	-	3.7	21.0
Total		1,064.3	107.3	93.8	104.5	95.5	99.3	85.8	92.3	90.3	65.8	67.5	73.5	88.6

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 2018 (in 1000 Sm^3)

Licence	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Gas fields territory	161.9	16.2	15.8	12.9	9.4	10.3	9.0	8.1	12.7	15.3	17.3	16.9	18.0
Gas fields continental shelf	107.7	10.9	13.5	9.0	10.1	8.4	7.7	9.6	8.6	6.3	6.9	7.8	8.9
Total	269.6	27.0	29.3	21.9	19.6	18.7	16.8	17.8	21.2	21.5	24.2	24.7	26.9

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

4. Subsurface storage

4.1 Preface subsurface storage

In 2018 a licence application for the storage of brine was submitted but no new storage permits were requested for neither the storage of natural gas nor for the storage of nitrogen. Two license applications from previous years are still pending.

As at 1 January 2019, from the three storage permits pending, two are intended for the permanent storage of the filter residue from the purification of saline groundwater into drinking water. This concentrated saline water will be pumped into a deeper groundwater aquifer. Because storage takes place at a depth greater than 100 meters a storage permit is required according to the Mining Act. The third storage license pending concerns the storage of a filler in an abandoned salt cavern. The filler will serve to stabilize the cavern. The applicant has indicated that fly ash will not be part of the composite filler. At the request of the applicant, processing of the application has been suspended until further notice.

As at 1 January 2019, there were eight storage permits in force and one storage permit for CO_2 had been granted but was not yet in force.
Five of these storage permits concern the underground storage of natural gas (Underground Gas Storage - UGS). The UGS of Norg and Grijpskerk have served as a buffer for the Dutch gas system to cope with seasonal fluctuations in demand since 1997. With increased demand, in particular in the winter, extra gas is supplied from Norg and Grijpskerk. The UGS in Alkmaar and Zuidwending is primarily to accommodate peak demands of one or more days. Bergermeer is essentially focused on gas trading. The gas is stored in (former) gas fields, except in Zuidwending where storage takes place in salt caverns.

Subsurface storage licences, Netherland territory and Netherlands continental shelf

Licence	Awarded	Operator	Product	State
Alkmaar	01-04-2003	Taqa	Gas	Effective
Bergermeer	08-01-2007	Taqa	Gas	Effective
Grijpskerk	01-04-2003	NAM	Gas	Effective
Norg	01-04-2003	NAM	Gas	Effective
Zuidwending	11-04-2006	Energystock	Gas	Effective
Twenthe-Rijn de Marssteden	02-10-2010	Akzo Nobel Salt B.V.	Oil	Effective
Winschoten II	15-11-2010	Gasunie (GTS)	Nitrogen	Effective
Winschoten III	15-11-2010	Akzo Nobel Salt B.V.	Nitrogen	Effective
P18-4	20-07-2013	Taqa	CO_2	Awarded

In Twente (Marssteden storage licence) a strategic oil supply is stored in one of the salt caverns, while in Winschoten (Heiligerlee) nitrogen used to convert high-calorific gas to low-calorific Groningen gas is stored.

A licence has been issued for the permanent storage of CO_2 for the depleted gas field P18-4, located just off the coast of Zuid-Holland. This licence is not yet in force.

An overview of all storage permits can be found in the table above and in Annex I.

4.2 Subsurface storage in 2018

The monthly quantities of natural gas and nitrogen that were stored in respectively recovered from the subsurface in 2018, are listed per licence in the tables below. The information has been provided by the license holders.

Stored natural gas (in million Nm^3)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Alkmaar	TAQA	383	-	-	-	-	22	-	122	118	112	9	-	-
Bergermeer	TAQA	2,433	1	-	-	1	585	-	457	457	381	457	56	37
Grijpskerk	NAM	2,281	-	-	33	422	177	446	415	409	377	2	-	-
Norg	NAM	4,974	-	-	-	569	870	840	800	950	946	-	-	-
Zuidwending	Gasunie	726	39	24	98	58	82	33	50	99	42	93	37	71
Total		10,797	39	24	131	1,049	1,736	1,319	1,845	2,033	1,857	562	93	108

Discharged natural gas (in million Nm^3)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Alkmaar	TAQA	514	29	167	302	-	-	-	-	-	-	-	16	-
Bergermeer	TAQA	2,859	509	764	612	412	-	-	-	-	8	2	173	379
Grijpskerk	NAM	1,256	686	452	61	23	-	-	-	-	-	-	17	18
Norg	NAM	5,179	1,221	1,745	664	50	-	-	-	-	-	49	685	765
Zuidwending	Gasunie	663	56	103	106	68	17	49	32	49	19	33	56	74
Total		10,471	2,501	3,232	1,745	553	17	49	32	49	27	84	947	1,236

Stored nitrogen (in million Nm^3)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Winschoten II	Gasunie	49.0	2.0	1.9	4.0	8.0	5.6	4.4	2.4	4.4	1.1	6.7	3.7	4.8

Discharged nitrogen (in million Nm^3)

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Winschoten II	Gasunie	59.5	1.2	6.9	9.3	1.2	2.7	4.7	3.9	2.4	6.4	3.6	5.8	11.3

5. Geothermal Energy

5.1 Preface geothermal energy

In 2018 there were 16 new applications for exploration licences for geothermal energy, of which one was also withdrawn in 2018. As at 1 January 2019 a total of 31 geothermal energy exploration licences were in the process of application. During 2018 nine geothermal exploration licences were awarded. No exploration licences were split or spatially restricted. Further, 15 geothermal exploration licences were extended, and 5 licences expired, were withdrawn or relinquished. Six applications for an exploration licence were withdrawn in 2018. As at 1 January 2019 there were a total of 51 geothermal energy exploration licences in force (see Figure 5.1).

In 2018 there were 4 new applications for a production licence for geothermal energy, resulting in a total of 9 applications. There were no production licences awarded in 2018. One production licence for geothermal energy was extended. Resulting in 12 effective geothermal energy production licences as at 1 January 2019.
Changes in the licences for the exploration and production of geothermal energy which took place during 2018 are listed in the tables in Chapter 8. Graph 5.1 shows the development of licences for geothermal energy, for the year 2018 the number of applications is presented as well.

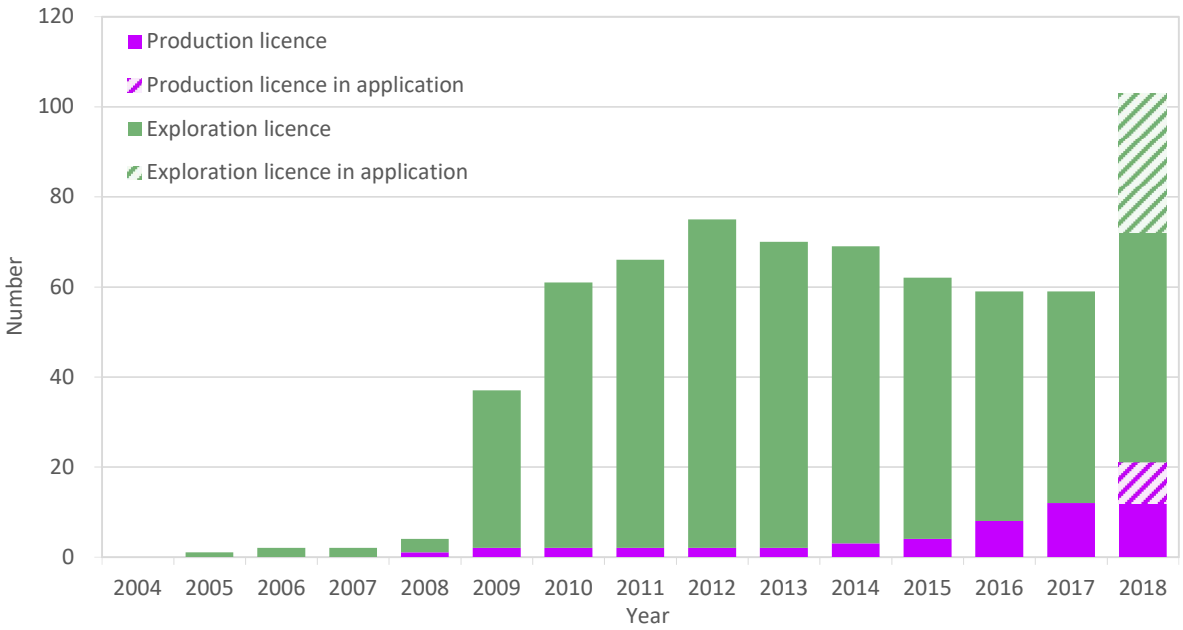


Figure 5.1 Number of licences for geothermal energy in force per year. For the year 2018 the number of applications is presented as well.

5.2 Geothermal wells and production installations as at 1 January 2019

In 2018 12 geothermal wells (sidetracks excluded) were completed (see Table 5.1 and Figure 5.2). This concerns the wells within the licences Andijk, Luttelgeest II, Naaldwijk 2II, Pijnacker-Nootdorp 4 and Zevenbergen II. Realising the wells within the licences Andijk, Luttelgeest II, Naaldwijk 2II and Zevenbergen II increased the geothermal production installations in the Netherlands by five. The wells in the licence Pijnacker-Nootdorp 4 were a replacement of the existing doublet.

As at 1 January 2019 there were a total of 25 geothermal production installations, of which the installation of Mijnwater Energiecentrale Heerlen is actually a heat/cold storage facility and as such will not be included in the following overview. The other 24 geothermal installations (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. Eighteen of these 24 geothermal production installations were operational with reference to the fact that they provide (energy) production figures according to art. 111 and 119 of the Mining Decree. During 2018 2 of the 18 geothermal energy production installations were decommissioned in consultation with SodM. Further research into the cause of two earthquakes that occurred near these geothermal installations has to show if future production within these installations can continue within the safety standards.

Table 5.1 Geothermal wells completed in 2018.

	Name of well	Geothermal energy licence	Operator
1	ADK-GT-02	Andijk	ECW Geo Andijk B.V.
2	ADK-GT-03	Andijk	ECW Geo Andijk B.V.
3	ADK-GT-04	Andijk	ECW Geo Andijk B.V.
4	LTG-GT-01	Luttelgeest II	Hoogweg Aardwarmte B.V.
5	LTG-GT-02	Luttelgeest II	Hoogweg Aardwarmte B.V.
6	LTG-GT-03	Luttelgeest II	Hoogweg Aardwarmte B.V.
7	NLW-GT-01	Naaldwijk 2II	Trias Westland B.V.
8	NLW-GT-02-S1	Naaldwijk 2II	Trias Westland B.V.
9	PNA-GT-05	Pijnacker-Nootdorp 4	Ammerlaan Geothermie B.V.
10	PNA-GT-06-S3	Pijnacker-Nootdorp 4	Ammerlaan Geothermie B.V.
11	ZVB-GT-01-S2	Zevenbergen II	Visser & Smit Hanab B.V.
12	ZVB-GT-02-S1	Zevenbergen II	Visser & Smit Hanab B.V.

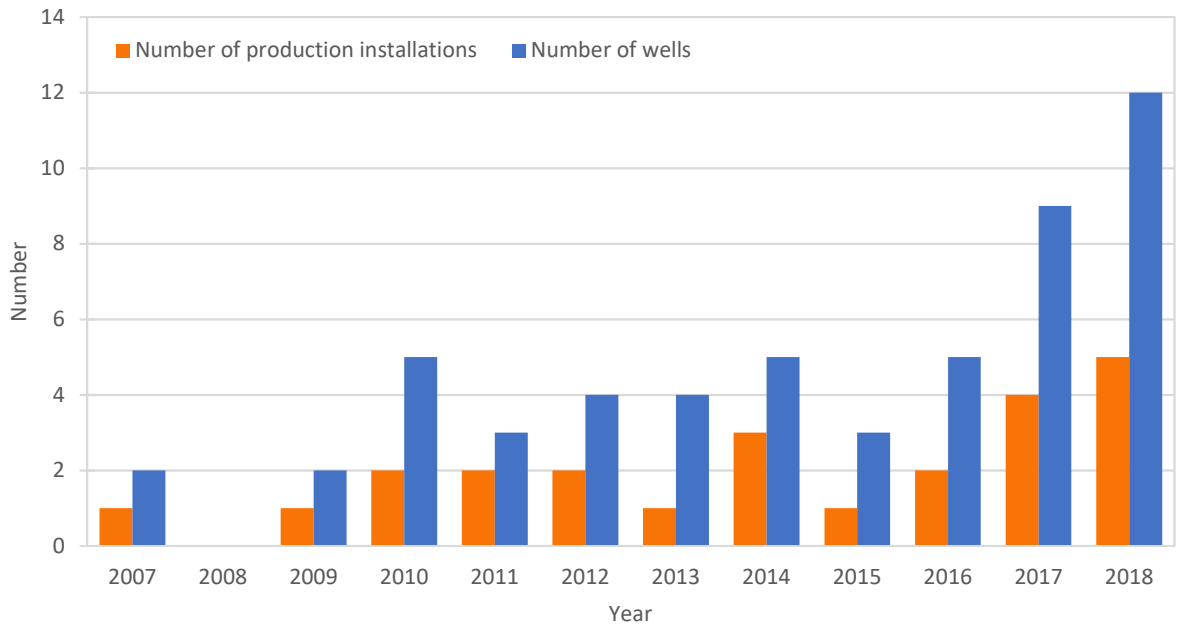


Figure 5.2 Number of geothermal wells completed (sidetracks excluded) per calendar year and number of installations completed since 2007.

The heat is produced from depth intervals between 700 and 2800 meter and from various geological units (Figure 5.3a and b). The depth of the mid of the producing zone is displayed in Figure 5.3 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 eight production installations in Noord-Holland, Overijssel and Flevoland produce from Rotliegend strata, whereas two installations in North-Limburg produce from Lower Carboniferous to Devoon 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 5.3 c).

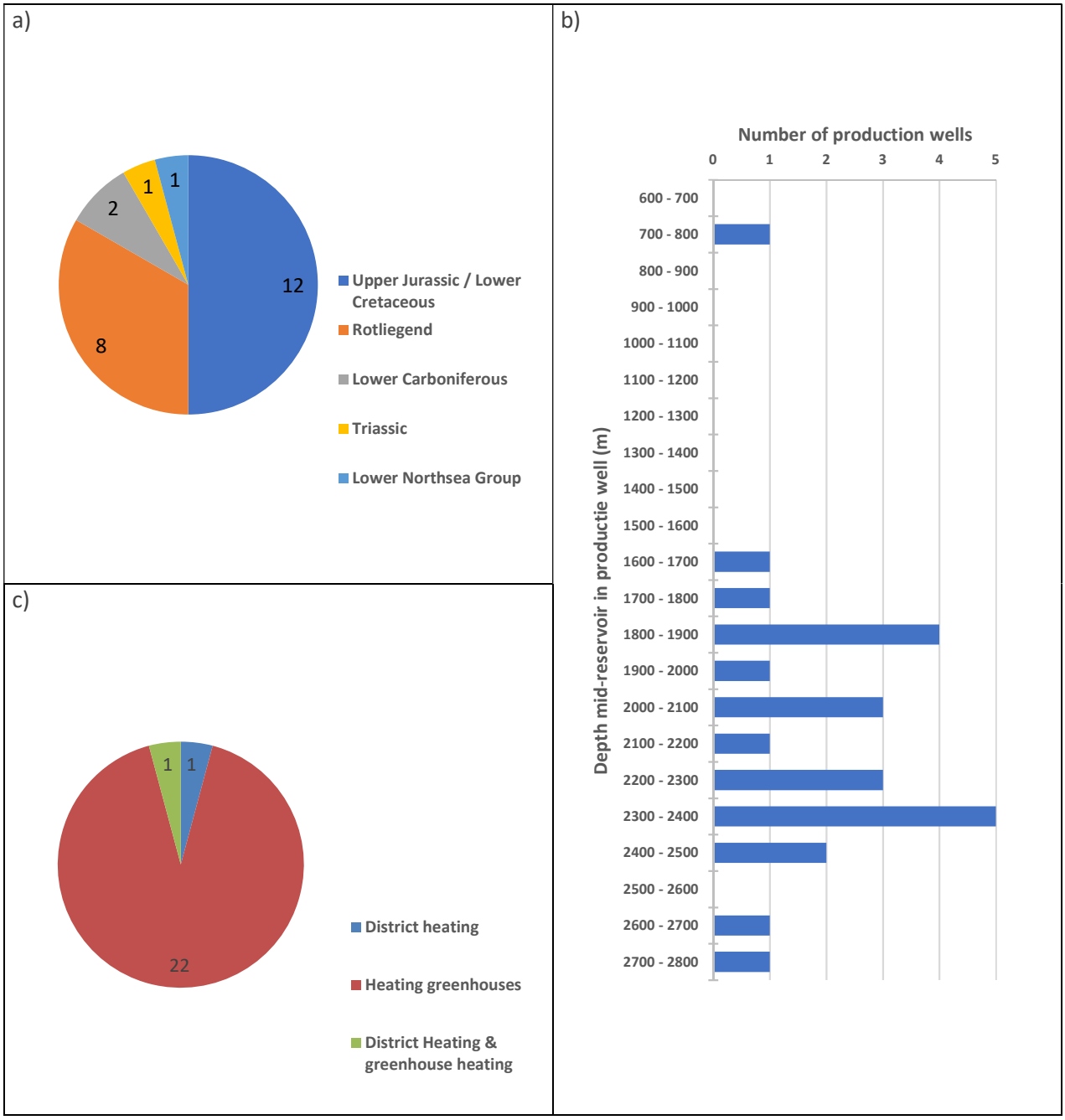


Figure 5.3. a) Stratigraphy of the productive interval, b) Depth to mid of aquifer, c) uses of the heat produced.

5.3 Production of geothermal energy in 2018

Of the 24 geothermal installations (Mijnwater Energiecentrale Heerlen excluded) 18 were operational in 2018 (Table 5.2). These operational installations have submitted the obligatory monthly production figures. Of the 6 remaining non-operational installations 4 were in the start-up phase while 2 were temporarily closed in. Of the 18 operational installations 12 operate under a formal production licence, the remaining geothermal installations operate as an 'extended well test'. During this test period the licence holder will gather data to enable efficient operation in future times. At the end of 2018 all producing operators and not yet producing operators owned a formal production licence or had applied for one.

Table 5.2 Geothermal installations.

	Name geothermal energy installation	Wells	Geothermal energy licence	Operational in 2018
1	Californië Geothermie	CAL-GT-1,2&3	Californië IV	Yes, shut down in May
2	De Lier Geothermie	LIR-GT-1&2	De Lier	Yes
3	Honselersdijk Geothermie	HON-GT-1&2	Honselersdijk	Yes
4	Installation Berkel en Rodenrijs	VDB-GT-3&4	Bleiswijk-1b	Yes
5	Installation 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, WKO
8	Pijnacker-Nootdorp Geothermie	PNA-GT-1&2	Pijnacker-Nootdorp-4	Temporarily closed in
9	Pijnacker-Nootdorp Zuid Geothermie	PNA-GT-3&4	Pijnacker-Nootdorp-5	Yes
10	-	HAG-GT-1&2	Den Haag	Temporarily closed in
11	Heemskerk Geothermie	HEK-GT-1&2	Heemskerk	Yes
12	MDM-GT-02 /MDM-GT-05	MDM-GT-2&5	Middenmeer I	Yes
13	MDM-GT-04 / MDM-GT-03	MDM-GT-3&4	Middenmeer II	Yes
14	Vierpolders	BRI-GT-1&2	Vierpolders	Yes
15	Californië Lipzig Gielen	CAL-GT-1&2	Californië-V	Yes, shut down in August
16	Poeldijk	PLD-GT-1&2	Honselersdijk-2	Yes
17	Kwintsheul Geothermie	KHL-GT-1&2	Kwintsheul II	Yes
18	Lansingerland	LSL-GT-1&2	Lansingerland	Yes
19	MDM-GT-06 / MDM-GT-01	MDM-GT-6&1	Middenmeer I	Yes
20	Maasland	MLD-GT-1&2	Maasland	Yes
21	Naaldwijk	NLW-GT-1&2	Naaldwijk	Nee
22	Zevenbergen	ZVB-GT-1&2	Zevenbergen	Nee
23	Andijk-GT-01/02	ADK-GT-1&2	Andijk	Nee
24	Andijk-GT-03/04	ADK-GT-3&4	Andijk	Nee
25	Luttelgeest	LTG-GT-1,2&3	Luttelgeest	Yes

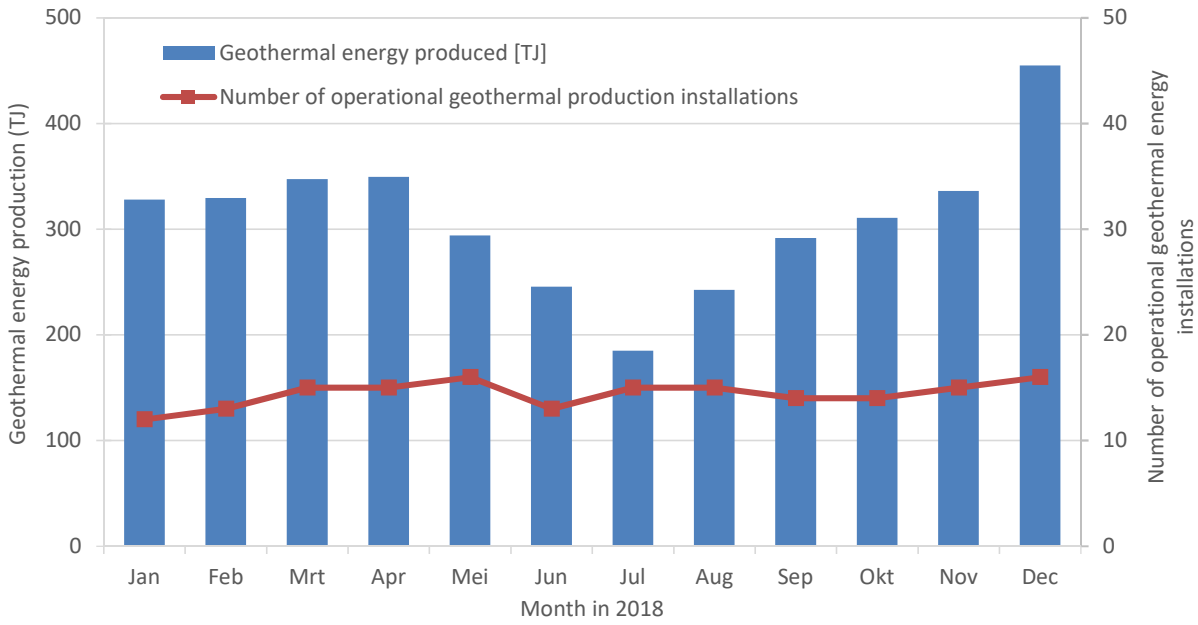


Figure 5.4 Monthly production of geothermal energy in terajoules and the number of geothermal energy production installations contributing to the reported production (Mijnwater Energiecentrale Heerlen excluded).

Figure 5.4 shows the aggregate production of geothermal energy per month in TJ (x10^{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 3.71 PJ in 2018 (Figure 5.5).

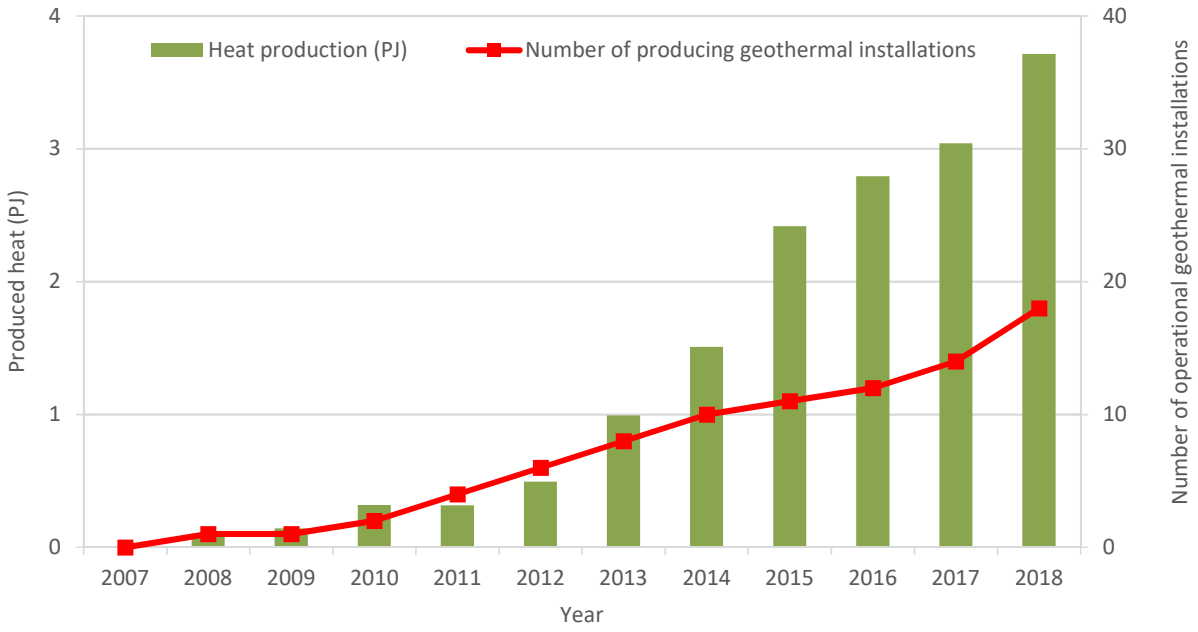


Figure 5.5 Annual production of geothermal energy (PJ/year).

Small amounts of hydrocarbons are co-produced with the geothermal energy. In most installations the hydrocarbon is gas (Figure 5.6), but in one installation oil is produced as well. The installation that co-produces oil is temporarily shut down. 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'. Table 5.3 gives an overview of the produced geothermal energy, co-produced gas and co-produced oil per year since 2008.

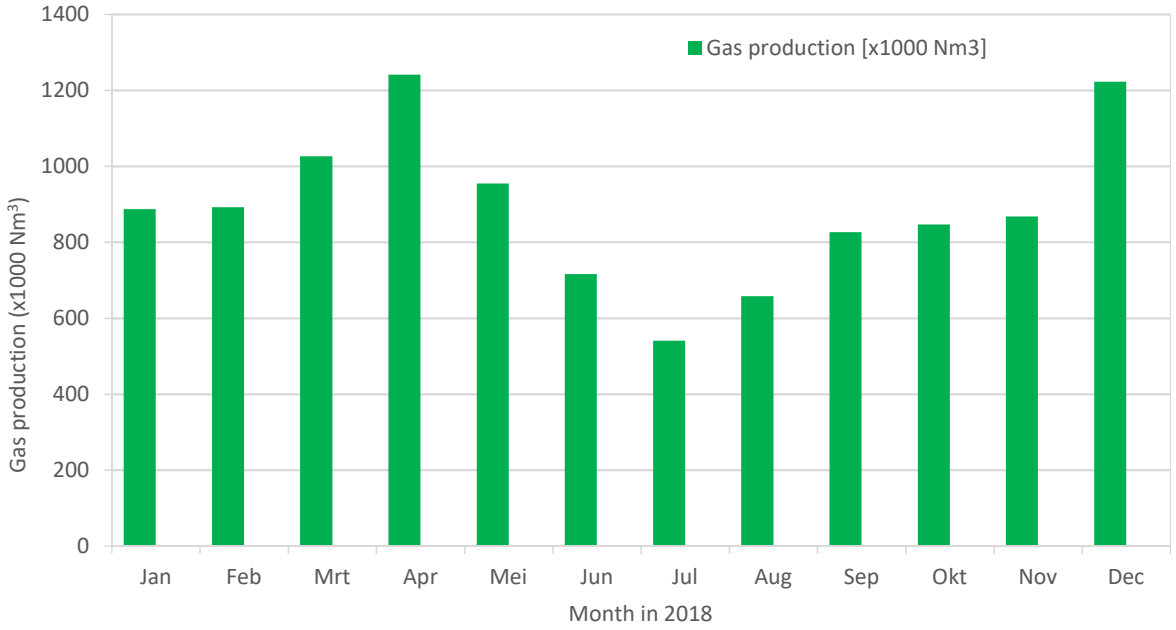


Figure 5.6 Volumes of hydrocarbons co-produced with geothermal energy. Gas in 1000 Nm^3 and oil in Sm^3.

Table 5.3 Overview of produced geothermal energy, co-produced gas and co-produced oil.

Year	Produced geothermal energy (TJ)	Co-produced gas (x1000 Nm^3)	Co-produced oil (Sm^3)
2008	* 96	-	-
2009	* 142	-	-
2010	* 318	-	-
2011	* 316	-	-
2012	* 495	-	-
2013	* 993	-	-
2014	1,509	3,267	429
2015	2,417	4,378	186
2016	** 2,792	7,670	130
2017	3,042	8,100	31
2018	3,714	10,676	-

* 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 Natural resources and geothermal energy in the Netherlands, Annual review 2016.

6. Rock salt

On 1 January 2019 sixteen production and no exploration licences were in force. A complete list of all production licences is to be found in Annex M. 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 2018 one application for a production licence was submitted by AkzoNobel, named “Twenthe-Rijn Welen Mos”. This application is adjacent to the production licences “Twenthe-Rijn Oude Maten”, “Twenthe-Rijn”, “Uitbreiding Twenthe-Rijn” and “Buurse” and includes the last development of the Ganzebos area located south of the villages Beckum and Boekelo. The previous application for the production licence “Barradeel-Oost” was already withdrawn by Frisia in 2014.

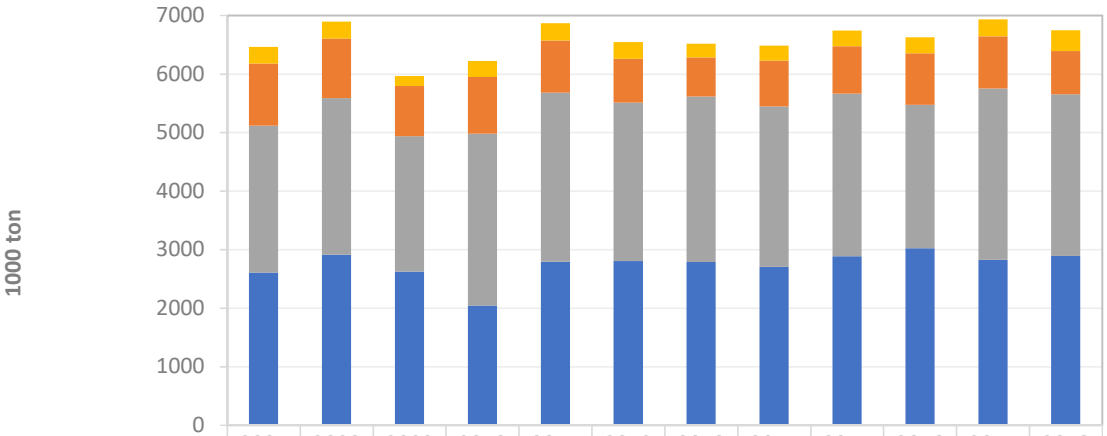
In 2018 four salt wells were completed. In the Groningen province AkzoNobel has drilled a second well in cavern A1. This well will be used for (sonar)analyses and blanketcontrole during the leaching phase. After leaching Cavern A1 will have a size of one million m^3 and will be the sixth gas storage cavern of “Aardgasbuffer Zuidwending”. The commissioning of this carven is expected in 2020. In the Twente province AkzoNobel has drilled three salt production wells in the production area Ganzebos west of the village Boekelo.

Wells ceased in 2018

	Name of well	Licence	Operator	Function
1	Twente-Rijn-544	Twenthe-Rijn Oude Maten	Akzo Nobel Salt B.V.	Production
2	Twente-Rijn-545	Twenthe-Rijn Oude Maten	Akzo Nobel Salt B.V.	Production
3	Twente-Rijn-546	Twenthe-Rijn Oude Maten	Akzo Nobel Salt B.V.	Production
4	Zuidwending-A1B	Uitbreiding Adolf van Nassau II	Akzo Nobel Salt B.V.	Production

Rock salt production in 2018 (in 1000 ton)

Production	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Adolf van Nassau III	AkzoNobel	1,187	113	104	114	118	107	92	119	94	85	78	89	74
Uitbreiding AvN III	AkzoNobel	1,704	146	137	145	146	134	139	151	149	143	123	142	149
Barradeel	Frisia	606	49	54	55	21	64	60	59	58	59	55	53	19
Barradeel II	Frisia	128	27	4	12	-	10	6	17	17	12	10	1	13
Twenthe-Rijn	AkzoNobel	1,674	159	148	158	100	129	138	133	133	145	141	136	155
Uitbreiding Tw-Rijn	AkzoNobel	809	71	60	78	24	83	78	73	73	66	72	62	68
Tw-Rijn Helmerzijde	AkzoNobel	275	27	23	30	9	25	22	15	15	23	30	27	30
Tw-Rijn O.Maten	AkzoNobel	6	-	-	-	-	-	-	-	-	1	1	1	2
Veendam	Nedmag	356	28	29	30	18	34	40	36	31	27	28	26	29
	Total	6,744	620	559	623	436	585	575	602	570	560	538	537	538



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Veendam	288	289	173	274	295	290	235	260	268	274	289	356
Barradeel*	1060	1016	855	969	889	747	670	778	812	880	892	734
Twenthe Rijn**	2509	2678	2317	2936	2888	2704	2826	2739	2775	2451	2927	2764
Adolf van Nassau III***	2607	2912	2622	2044	2793	2806	2787	2707	2888	3021	2826	2891

Figuur 6.1 Rock salt production 2007- 2018 (1000 tons).

* Including Barradeel II.

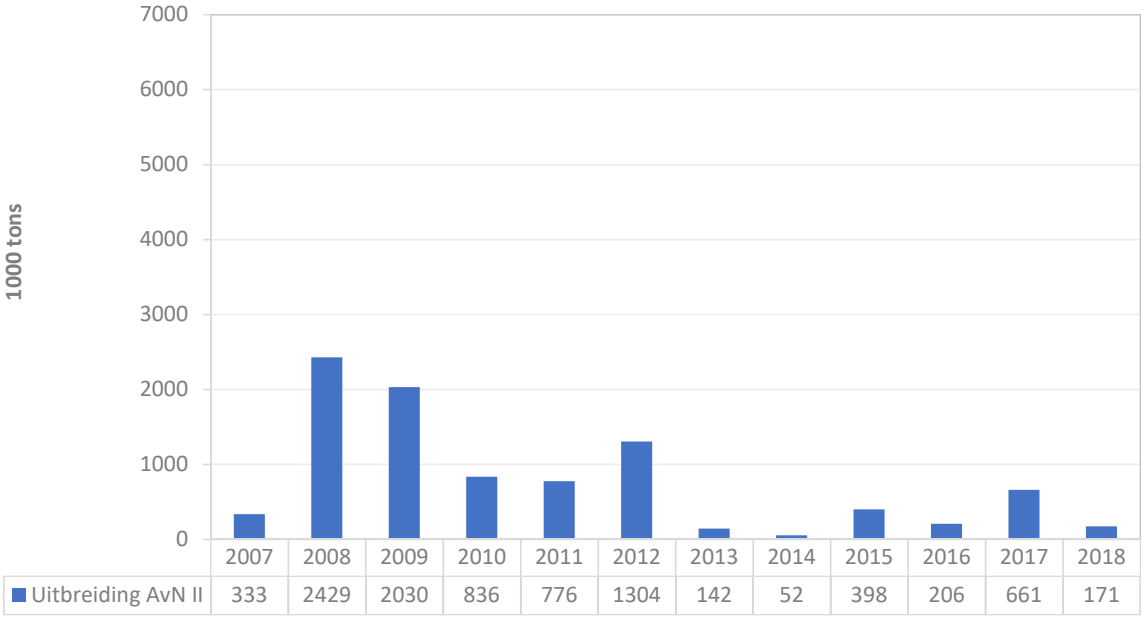
** Including Uitbreiding Twenthe-Rijn, Twenthe-Rijn Helmerzijde en Twenthe-Rijn Oude Maten.

*** Including Uitbreiding Adolf van Nassau III.

Storage cavern 'Aardgasbuffer Zuidwending'

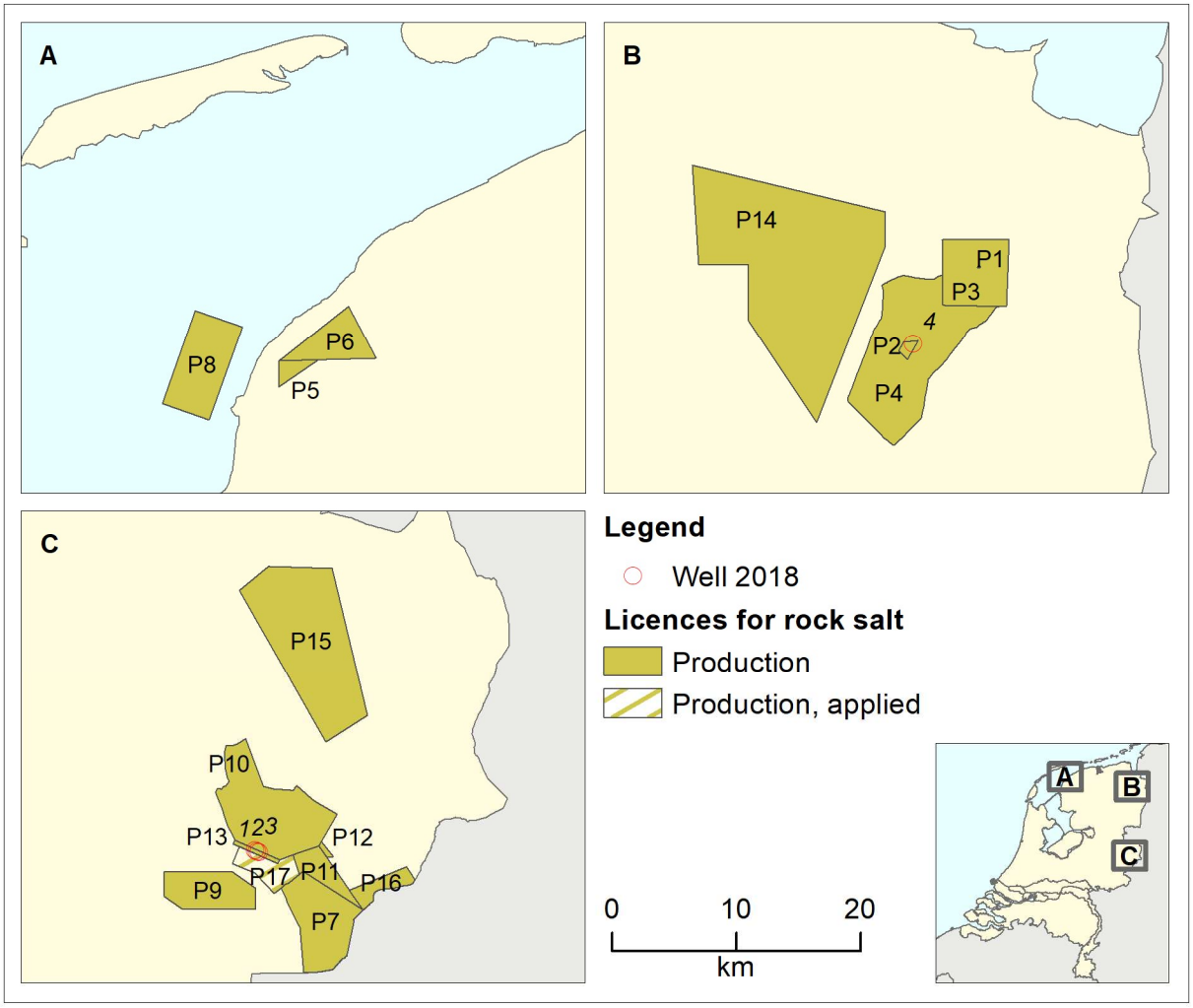
At the "Zuidwending" drilling site, municipality of Veendam, AkzoNobel leached four new caverns (A2, A3, A4 and A6), each of 0.6 million m^3, between October 2007 and March 2010 for the "Aardgasbuffer Zuidwending". The commissioning of this natural gas buffer dates from January 2011. The caverns are made in a salt layer that lies at a depth of one thousand to fifteen hundred meters. They have a diameter of fifty to eighty meters and are three to four hundred meters high.

AkzoNobel started leaching three more caverns in September 2010 (A1, A5 en A7). Cavern A7, with a size of one million m^3, was put into use at the end of 2013 for gas storage. The storage caverns are all located in the production licence "Uitbreiding Adolf van Nassau II". A total of more than 9 million tonnes salt comes from these caverns. The leaching of caverns A1 and A5 is still ongoing.



	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Uitbreiding AvN II	333	2429	2030	836	776	1304	142	52	398	206	661	171

Figuur 6.2 Rock salt production from storage caverns Zuidwending 2007-2018 (estimated, in 1000 tons).



Figuur 6.3 Licences for rock salt production as at 1 January 2019.

Names of rock salt production licences on the Netherlands territory, as indicated on the map in Figure 6.3.

	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	Twenthe-Rijn Welen Mos		

7. Coal

On 1 January 2019 there were five production licences for coal in force. In 2018 there were no mining activities in the licence areas.

Production licences as at 1 January 2019, Netherlands territory

	Licence	Licence holder	Effective from	km²
P1	Staatsmijn Beatrix	Koninklijke DSM N.V.	27-09-1920	130
P2	Staatsmijn Emma	Koninklijke DSM N.V.	26-10-1906	73
P3	Staatsmijn Hendrik	Koninklijke DSM N.V.	08-08-1910	24
P4	Staatsmijn Maurits	Koninklijke DSM N.V.	12-03-1915	51
P5	Staatsmijn Wilhelmina	Koninklijke DSM N.V.	08-01-1903	6
			Total	284

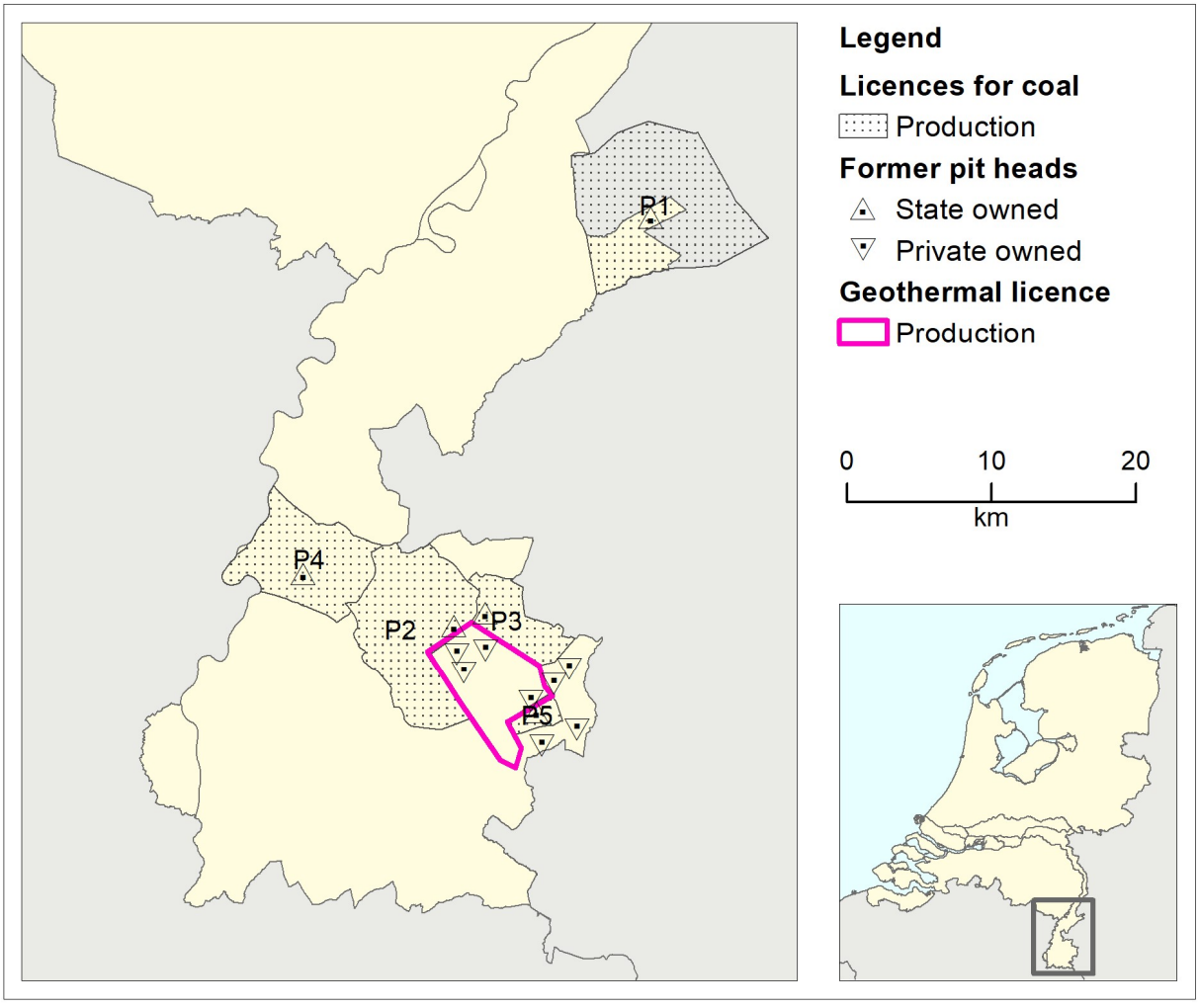


Figure 7.1 Licences for coal as at 1 January 2019.

8. Licences, Netherlands territory as at 1 January 2019

Changes in the onshore licences for hydrocarbon exploration and production, which took place during 2018, are listed in the tables below. This also includes all pending applications for permits.

8.1 Exploration licences hydrocarbons

Applied for

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

* Application ongoing, published in an earlier annual review.

Prolonged

Licence holder	Licence	Effective from	Effective till
Vermilion Energy Netherlands B.V.	IJsselmuiden *	27-02-2018	In application
Tulip Oil Netherlands B.V. cs	Schagen	31-07-2018	31-08-2022
Vermilion Energy Netherlands B.V.	Engelen	24-11-2018	In application
Vermilion Energy Netherlands B.V.	Oosterwolde	24-11-2018	In application
Vermilion Energy Netherlands B.V.	Utrecht	24-11-2018	In application
Vermilion Energy Netherlands B.V.	Opmeer	18-12-2018	In application

* Ongoing objections procedure.

8.2 Production licences hydrocarbons

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.

Split

Licence holder	Licence	Effective from		km²
Originally				
Nederlandse Aardolie Maatschappij B.V.	Tietjerksteradeel	-		411
After split				
Nederlandse Aardolie Maatschappij B.V.	Tietjerksteradeel II	25-01-2018		251
Nederlandse Aardolie Maatschappij B.V.	Tietjerksteradeel III	25-01-2018		168
			Total	* 411

* Except for overlapping sub-area due to horizontal splitting (7 km²).

Area

Total area Netherlands territory	Under licence for hydrocarbons
42,203 km²	18,012 km² (42,7%)

8.3 Subsurface storage licences

Applied for

Licence	Staatscourant	Date	Closing date	Storage of	Applicant(s)
Luttelgeest *	5 395	04-03-2013	03-06-2013	Brine	Leo Hoogweg B.V.
Twenthe-Rijn Boeldershoek *	-	24-01-2014	-	Filling	AkzoNobel
Andijk	66 383	27-11-2018	26-02-2019	Brine	

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

Change in remittance

Licence holder	Licence	Effective from		km²
Nederlandse Aardolie Maatschappij B.V.	Grijpskerk *	28-11-2018		27
Nederlandse Aardolie Maatschappij B.V.	Norg *	28-11-2018		81
			Total	108

* Remittance to the State will be relinquished; decree has a retroactive effect from 1 January 2018.

8.4 Exploration, production and storage licenses

Names of exploration, production and storage licences for hydrocarbons on the Netherlands territory as show in Figure 8.1.

	Exploration licence		
E1	Akkrum	E7	Oosterwolde
E2	Engelen	E8	Opmeer
E3	Follega	E9	Schagen
E4	Hemelum	E10	Terschelling-Noord
E5	IJsselmuiden	E11	Utrecht
E6	Lemsterland		
	Exploration licence as applied for		
E12	Breda-Maas	E15	Slootdorp-Oost
E13	Brielle	E16	Waskemeer
E14	De Kempen		
	Production licence		
P1	Akkrum 11	P21	Hardenberg
P2	Alkmaar	P22	Leeuwarden
P3	Andel Va	P23	Marknesse
P4	Andel Vb	P24	Middelie
P5	Beijerland	P25	Noord-Friesland
P6	Bergen II	P26	Oosterend
P7	Bergermeer	P27	Papekop
P8	Botlek II	P28	Rijswijk
P9	Botlek-Maas	P29	Rossum-De Lutte
P10	De Marne	P30	Schoonebeek
P11	Donkerbroek	P31	Slootdorp
P12	Donkerbroek-West	P32	Steenwijk
P13	Drenthe IIa	P33	Tietjerksteradeel II
P14	Drenthe IIb	P34	Tietjerksteradeel III
P15	Drenthe IIIa	P35	Tubbergen
P16	Drenthe IV	P36	Twenthe
P17	Drenthe V	P37	Waalwijk
P18	Drenthe VI	P38	Zuid-Friesland III
P19	Gorredijk	P39	Zuidwal
P20	Groningen		
	Production licence as applied for		
P40	Terschelling-Noord	P41	Akkrum
	Storage licences		
S1	Alkmaar	S5	Twenthe-Rijn De Marssteden
S2	Bergermeer	S6	Winschoten II
S3	Grijpskerk	S7	Winschoten III
S4	Norg	S8	Zuidwending

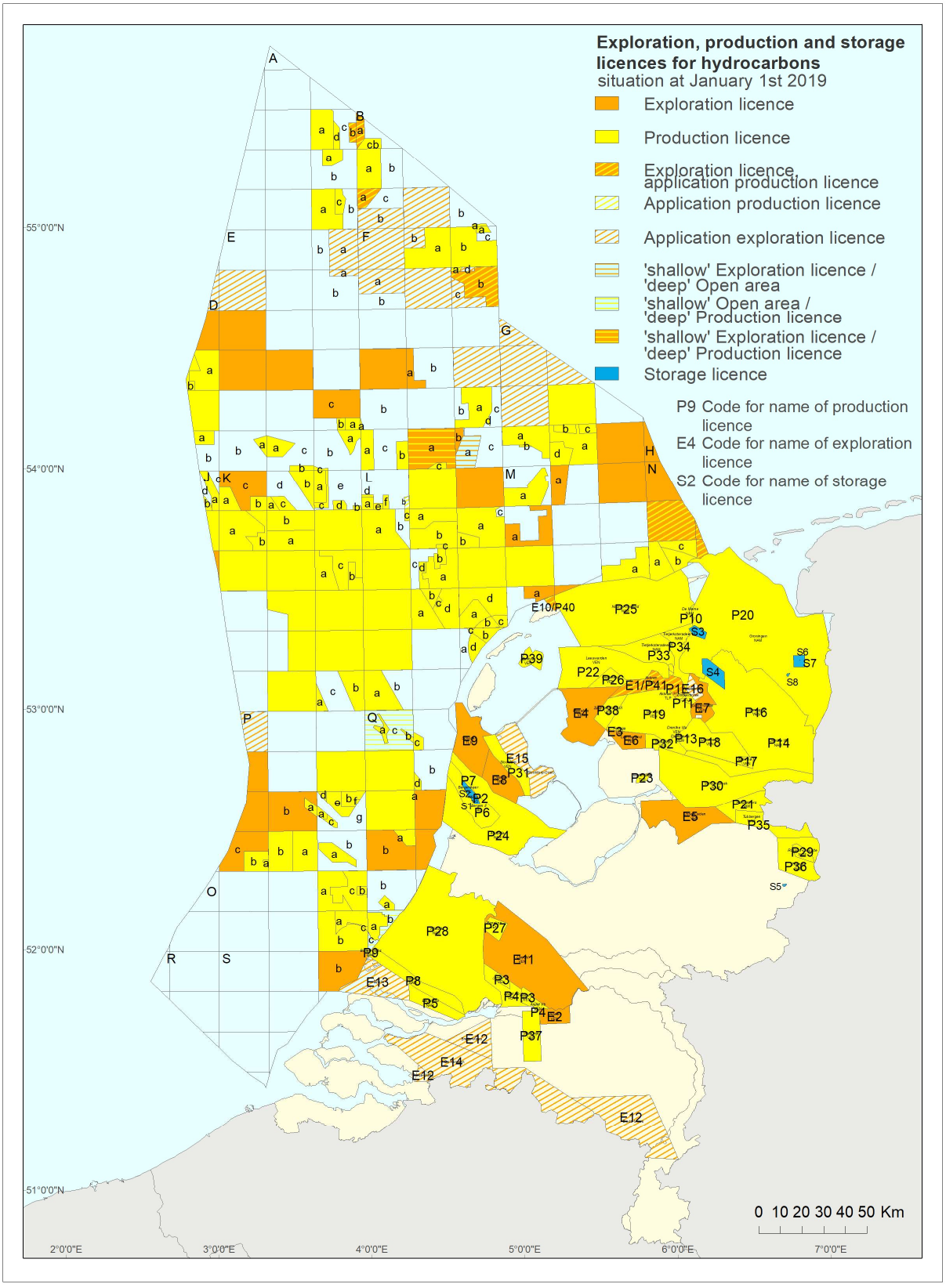


Figure 8.1 Exploration, production and storage licences for hydrocarbons as at 1 January 2019.

8.5 Exploration licences geothermal energy

Applied for

Licence	Staatscourant	Date	Closing date	Applicant(s)
Franekeradeel *[2]	13 167	25-08-2010	24-11-2010	A.C. Hartman Beheer cs
Hoogeveen *[6]	19 287	03-12-2010	04-03-2011	Gemeente Hoogeveen
Den Haag 3 *[3]	7 444	18-03-2014	17-06-2014	Gemeente Den Haag cs
Helmond 3 *[4]	19 039	15-04-2016	15-07-2016	Hydreco GeoMEC B.V. cs
Haarlem-Schalkwijk *	20 776	25-04-2016	25-07-2016	Gemeente Haarlem
Maasbree 2 *[5]	50 690	28-09-2016	28-12-2016	Warmtebedrijf Siberië B.V.
De Lier V *	25 945	10-05-2017	09-08-2017	Trias Westland B.V., EnergieWende B.V. cs
Westland Zuidwest *	25 946	10-05-2017	09-08-2017	Energie Transitie Partners B.V.
Drechtsteden *	29 764	31-05-2017	30-08-2017	N.V. HVC
De Lier VI *	52 076	15-09-2017	15-12-2017	EnergieWende B.V. cs
Sneek *	53 129	21-09-2017	21-12-2017	DDGeothermie Sneek B.V.
Rotterdam-Haven *	53 130	21-09-2017	21-12-2017	Havenbedrijf Rotterdam N.V.
Midwoud *	53 132	21-09-2017	21-12-2017	Vermilion Energy Netherlands B.V.
West-Brabant *	55 280	03-10-2017	02-01-2018	Geothermie Brabant cs
Breda *	61 268	24-10-2017	23-01-2018	Visser en Smit Hanab B.V.
Zuidwest-Brabant *	65 458	16-11-2017	15-02-2018	Visser en Smit Hanab B.V.
Noordwest-Brabant *	65 459	16-11-2017	15-02-2018	Visser en Smit Hanab B.V.
Noord-Zeeland *	65 460	16-11-2017	15-02-2018	Visser en Smit Hanab B.V.
Den Haag 4 *	67 834	28-11-2017	27-02-2018	Hydreco GeoMEC B.V. cs
Bleiswijk 6 *	73 833	27-12-2017	28-03-2018	Wayland Energy B.V.
Terheijden *	73 835	27-12-2017	28-03-2018	Izzy Projects cs
Wateringseveld *[7]	10 901	28-02-2018	30-05-2018	Energiecoöperaties Wateringse Veld, Harnaschpolder en Ypenburg
Den Hoorn *[8]	-	24-05-2018	-	Energie Transitie Partners B.V.
Maasdijk 2	10 904	28-02-2018	30-05-2018	Aardwarmte Maasdijk B.V.
Hoorn	10 906	28-02-2018	30-05-2018	N.V. HVC
Made 2	18 496	04-04-2018	04-07-2018	Geothermie Brabant B.V. cs
Den Haag 6	21 843	20-04-2018	20-07-2018	Hydreco GeoMEC B.V. cs
Noord-Holland Noord	28 807	28-05-2018	27-08-2018	Vermilion Energy Netherlands B.V.
Ypenburg	33 732	19-06-2018	18-09-2018	Hydreco GeoMec B.V. cs
Nootdorp-Oost	33 359	27-06-2018	26-09-2018	Nuon
Luttelgeest 2	44 780	09-08-2018	08-11-2018	Aardwarmte Combinatie Luttelgeest B.V.
Utrecht	44 789	09-08-2018	08-11-2018	ENGIE Energy Solutions B.V.
Rotterdam-Stad	51 800	17-09-2018	17-12-2018	Hydreco Geomec B.V.
Friesland-Midden	51 804	17-09-2018	17-12-2018	Vermilion Energy Netherlands B.V.
Rotterdam 7	54 002-n1	27-09-2018	27-12-2018	Shell Geothermal B.V.
Rotterdam Bar	54 014	27-09-2018	27-12-2018	ENGIE Energy Solutions B.V.
Ede	69 419	11-12-2018	12-03-2019	

* Application ongoing, published in an earlier annual review.

*[2] Application withdrawn per 23-01-2018.

*[3] Application withdrawn per 01-03-2018.

*[4] Application withdrawn per 27-06-2018.

*[5] Application withdrawn per 20-08-2018.

*[6] Application withdrawn by the Minister per 27-08-2018.

*[7] Application withdrawn per 24-09-2018.

*[8] Application in competition with the withdrawn application Wateringseveld (see *[7]).

Awarded

Operator	Licence	Effective from		km²
ECW Geoholding B.V.	Middenmeer 4	17-02-2018		62
Vermilion Energy Netherlands B.V.	Middenmeer 3	24-02-2018		98
FrieslandCampina Consumer Products International B.V.	Leeuwarden 5	14-03-2018		158
Wayland Energie B. V.	Zuidplas	22-08-2018		46
N.V. HVC	Alkmaar	17-10-2018		192
Energie Transitie Partners B.V. cs	Monster 2	26-10-2018		9
N.V. HVC	Den Helder	14-11-2018		100
N.V. HVC	Lelystad	14-11-2018		102
N.V. HVC	Velsen	18-12-2018		40
			Total	807

Prolonged

Operator	Licence	Effective from	Effective till
Trias Westland B.V.	Naaldwijk 2II	18-01-2018	30-12-2018
Trias Westland B.V.	Naaldwijk 3	18-01-2018	30-12-2020
Kwekerij de Westhoek B.V. cs	Maasland	24-01-2018	30-06-2018
WarmteStad B.V.	Groningen 2	01-06-2018	30-12-2018
Wayland Energy B.V.	Lansingerland 4	30-05-2018	30-09-2020
A.P.M. Zuidgeest cs	Maasdijk	27-06-2018	31-05-2020
Hydreco GeoMEC B.V. cs	Den Haag	31-08-2018	31-07-2019
Geothermie De Kievit B.V.	Peel en Maas	31-08-2018	31-07-2020
Geocombinatie Leeuwarden B.V. *, Ennatuurlijk B.V	Leeuwarden	07-10-2018	09-12-2021
Provincie Drenthe cs	Erica	21-11-2018	06-12-2020
Provincie Drenthe cs	Klazienaveen	21-11-2018	30-11-2020
A-ware Production B.V.	Heerenveen	19-12-2018	20-05-2021
Vereniging van Eigenaren Oude Campspolder	Maasland 2	31-12-2018	In application
Grondexploitatiemaatschappij Californië B.V.	Californië VI	30-12-2018	In application
WarmteStad B.V.	Groningen 2	30-12-2018	In application
Gedeputeerde Staten van Overijssel	Koekoekspolder IIa	30-12-2018	In application

Expired/Relinquished

Operator	Licence	Effective from		km²
GeoWeb B.V.	Egchel	07-01-2018		62
Vopak Terminal Vlaardingen B.V.	Rotterdam-Vlaardingen	03-01-2018		13
Bernhard Plantenkwekerij B.V.	Luttelgeest I	19-05-2018		13
Transmark Renewable Products B.V.	Friesland-Zuid	22-10-2018		197
Transmark Renewable Products B.V.	Utrecht - Noord-Brabant	23-10-2018		198
			Total	483

8.6 Production licences geothermal energy

Applied for

Licence	Date	Applicant(s)
Den Haag *[1]	21-09-2011	Hydreco GeoMEC B.V. cs
Honselersdijk *	15-01-2013	J.W.M. Scheffers cs
Middenmeer I/II*	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
Maasland	29-12-2017	Kwekerij de Westhoek B.V. cs
Lansingerland	23-01-2018	Wayland Energy Bergschenhoek
Luttelgeest	06-02-2018	Hoogweg Aardwarmte B.V.
Andijk	20-03-2018	ECW Geo Andijk B.V.
Naaldwijk	16-11-2018	Trias Westland B.V.

* Application ongoing, published in an earlier annual review.

*[1] Application withdrawn as at 14-11-2017.

Change decree grant: prolonged

Operator	Licence	Effective from	Effective till
Aardwarmte Vogelaer B.V.	Poeldijk	18-04-2018	11-10-2052

8.7 Exploration and production licences for geothermal energy

Names of exploration and production licences for geothermal energy, Netherlands territory, as indicated in Figure 8.2.

	Exploration licences				
E1	Alkmaar	E18	Kwintsheul II	E35	Naaldwijk 3
E2	Andijk	E19	Lansingerland	E36	Oostvoorne
E3	Brielle 2	E20	Lansingerland 4	E37	Peel en Maas
E4	Californië IV	E21	Leeuwarden	E38	Pijnacker-Nootdorp 6a
E5	Californië VI	E22	Leeuwarden 2	E39	Rotterdam 4
E6	De Lier IV	E23	Leeuwarden 5	E40	Rotterdam 5
E7	De Lier 3II	E24	Lelystad	E41	Sexbierum
E8	Den Haag	E25	Luttelgeest II	E42	Tilburg-Geertr.berg
E9	Den Helder	E26	Maasdijk	E43	Velden
E10	Drachten	E27	Maasland	E44	Velsen
E11	Erica	E28	Maasland 2	E45	Venlo
E12	Groningen 2	E29	Middenmeer	E46	Vierpolders
E13	Heerenveen	E30	Middenmeer 2	E47	Waddinxveen 2
E14	Helmond 2	E31	Middenmeer 3	E48	Zevenbergen II
E15	Honselersdijk	E32	Middenmeer 4	E49	Zevenbergen III
E16	Klazienaveen	E33	Monster 2	E50	Zuidplas
E17	Koekoekspolder IIa	E34	Naaldwijk 2II	E51	Zwolle
	Exploration licences as applied for				
E52	Bleiswijk 6	E63	Hoorn	E74	Rotterdam-Haven
E53	Breda	E64	Luttelgeest 2	E75	Rotterdam-Stad
E54	De Lier V	E65	Maasdijk 2	E76	Sneek
E55	De Lier VI	E66	Made 2	E77	Terheijden
E56	Den Haag 4	E67	Midwoud	E78	Utrecht
E57	Den Haag 6	E68	Noord-Holland N	E79	West-Brabant
E58	Den Hoorn	E69	Noord-Zeeland	E80	Westland Zuidwest
E59	Drechtsteden	E70	Noordwest-Brabant	E81	Ypenburg
E60	Ede	E71	Nootdorp-Oost	E82	Zuidwest-Brabant
E61	Friesland-Midden	E72	Rotterdam 7		
E62	Haarlem-Schalkwijk	E73	Rotterdam Bar		
	Production licences				
P1	Bleiswijk	P5	De Lier	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 licences as applied for				
P13	Andijk	P16	Lansingerland	P19	Middenmeer I/II
P14	Honselersdijk	P17	Luttelgeest	P20	Naaldwijk
P15	Kwintsheul	P18	Maasland	P21	Zevenbergen

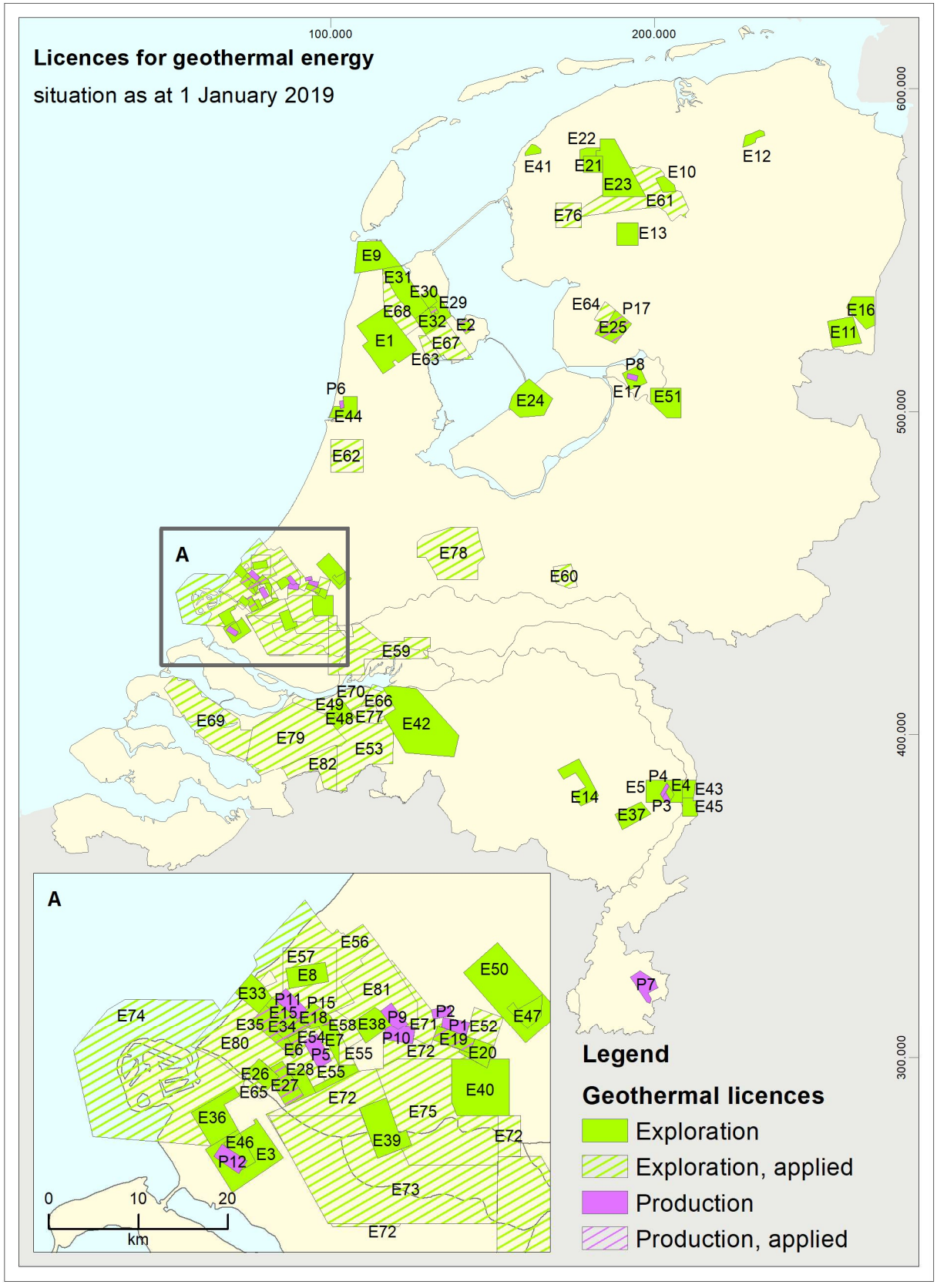


Figure 8.2 Licences for geothermal energy as at 1 January 2019.

8.8 Rock salt licences

Applied for

Licence	Staatscourant	Date	Closing date	Applicant(s)
Barradeel-Oost *	249	19-12-2007	24-03-2008	Frisia
Twenthe-Rijn Welen Mos	-	10-07-2018	-	AkzoNobel

***** Application withdrawn as at 19-02-2014.

8.9 Coal licences

No changes.

9. Licences, Netherlands continental shelf as at 1 January 2019

Changes in the licences for hydrocarbon exploration and production, which took place during 2018 on the continental shelf, are listed in the tables below. Also, all current licence applications are included.

9.1 Exploration licences hydrocarbons

Applied for

Licence	Official Journal of the EU	Date	Closing date	Staatscourant	Applicant(s)
F5 *	C 256	05-08-2015	04-11-2015	29 117	Van Dyke, Neptune, HALO
D6 *	C 342	17-09-2016	19-12-2016	52 953	Simwell
E4 *	C 342	17-09-2016	19-12-2016	52 953	Simwell
G7 *	C 342	17-09-2016	19-12-2016	52 950	NAM
G10 *	C 342	17-09-2016	19-12-2016	52 950	NAM
G11 *	C 342	17-09-2016	19-12-2016	52 950	NAM
G13 *	C 342	17-09-2016	19-12-2016	52 950	NAM, Neptune
F6c & F6d *	C 403	28-11-2017	27-02-2018	200	Oranje-Nassau
P1 **	C 444	23-12-2017	26-03-2018	6 265	Swift
B16b *	C 444	23-12-2017	26-03-2018	7 464	NAM
B17 *	C 444	23-12-2017	26-03-2018	7 464	NAM
E3a *	C 444	23-12-2017	26-03-2018	7 464	NAM
E6a *	C 444	23-12-2017	26-03-2018	7 464	NAM
F1 *	C 444	23-12-2017	26-03-2018	7 464	NAM
F2b *	C 444	23-12-2017	26-03-2018	7 464	NAM
F4a *	C 444	23-12-2017	26-03-2018	7 464	NAM, Neptune, HALO
F12	C 425	26-11-2018	25-02-2019	69 746	

* Application ongoing, published in an earlier annual review.

** Republished application 03-12-2016.

Awarded

Licence holder	Licence	Effective from	km²
Tulip Oil Netherlands Offshore B.V.	Q8, Q10b & Q11	29-09-2018	758

Prolonged

Licence holder	Licence	Effective from	Effective till
Neptune Energy Netherlands B.V.	K1c	02-03-2018	03-01-2020
Neptune Energy Netherlands B.V. cs	E10	21-03-2018	30-06-2019
Neptune Energy Netherlands B.V. cs	E11	21-03-2018	30-06-2019
Neptune Energy Netherlands B.V. cs	E14	21-03-2018	30-06-2019
Neptune Energy Netherlands B.V. cs	E15c	21-03-2018	30-06-2019
Oranje-Nassau Energie B.V. cs	G18	03-10-2018	31-12-2022
Oranje-Nassau Energie B.V. cs	H16	03-10-2018	31-12-2022
Oranje-Nassau Energie B.V. cs	M3	03-10-2018	31-12-2022
Oranje-Nassau Energie B.V. cs	N1	03-10-2018	31-12-2022

Relinquished

Licence holder	Licence	Effective from		km²
Neptune Energy Netherlands B.V.	Q13b	08-09-2018		237
Neptune Energy Netherlands B.V. cs	E14	24-11-2018		403
Wintershall Noordzee B.V. cs	F14a	21-11-2018		266
			Total	906

9.2 Production licences hydrocarbons

Applied for

Licence	Staatscourant	Date	Closing date	Applicant(s)
A12b & B10a *	22	30-12-1999	-	Petrogas cs
B16a *	105	06-05-1993	-	Petrogas cs
L1c *	-	27-02-2014	-	Neptune
F6b *	-	11-05-2016	-	Dana cs
N4, N5 & N8	-	20-07-2018	-	Oranje-Nassau cs

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

Awarded

Licence holder	Licence	Effective from	km²
Petrogas E&P Netherlands B.V.	P8a	07-12-2018	26

Split

Licence holder	Licence	Effective from		km²
Before				
Oranje-Nassau Energie B.V. cs	L11c			179
After				
Oranje-Nassau Energie B.V. cs	L11c	21-12-2018		7
Oranje-Nassau Energie B.V. cs	L11d	21-12-2018		172
			Total	179

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., Dana Petroleum Netherlands B.V.
F3b	www.nlog.nl	19-07-2018	18-10-2018	Dana Petroleum Netherlands B.V.

* No decision made.

Prolonged

Licence holder	Licence	Effective from	Effective till
Dana Petroleum Netherlands B.V.	P10a	20-09-2018	31-12-2027
Dana Petroleum Netherlands B.V.	P10b	20-09-2018	31-12-2027
Dana Petroleum Netherlands B.V.	P11b	20-09-2018	31-12-2027
Total E&P Nederland B.V. cs	L1e	08-11-2018	31-12-2027

Restricted

Licence holder	Licence	Effective from	km²
Spirit Energy Nederland B.V. cs	J3b & J6	02-06-2018	98

Area

Total area Netherlands continental shelf	In licence for hydrocarbons
56,396 km²	26,303 km² (46,6%)

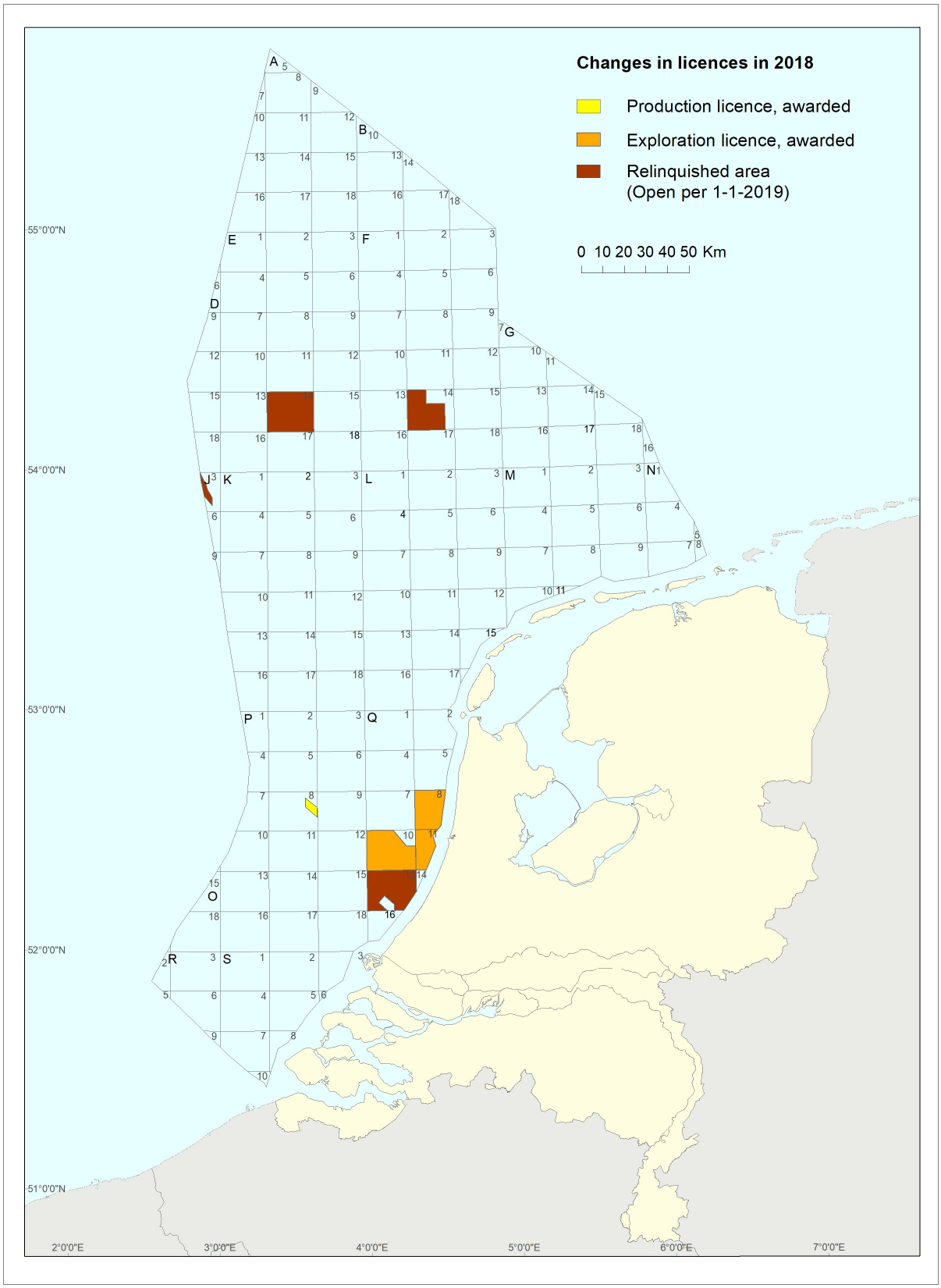


Figure 9.1 Changes in hydrocarbon licences during the year 2018.

9.3 Storage licences

Changes regarding storage licences during 2018 are listed in the table below.

Started

Licence holder	Licence	Effective from	km²
TAQA Offshore B.V.	P18-4	01-01-2020/01-01-2021	11

10. Licences, company changes, name changes and legal mergers in 2018

The tables below list changes in chronological order which took place during 2018, 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.

10.1 Hydrocarbons

Company changes in exploration licences

Licence	Relinquishing company	Acquiring company	Effective from	Staatscourant
F6b	Dyas B.V.	Oranje-Nassau Energie B.V.	18-01-2018	3 292
K1c	Total E&P Nederland B.V.	-	25-01-2018	5 142
N4 *	-	-	03-03-2018	13 363
N5 *	-	-	03-03-2018	13 365
N8 *	-	-	03-03-2018	13 367
H16 *	-	Oranje-Nassau Energie B.V.	27-06-2018	40 331
G18 *	-	Oranje-Nassau Energie B.V.	27-06-2018	40 196
M3 *	-	Oranje-Nassau Energie B.V.	27-06-2018	40 282
N1 *	-	Oranje-Nassau Energie B.V.	27-06-2018	40 212
M2a	Energy06 Investments B.V.	-	04-07-2018	40 453
M4a	Energy06 Investments B.V.	-	04-07-2018	40 396
S3b	Energy06 Investments B.V.	-	27-07-2018	44 498
F6b	Tulip Oil Netherlands B.V.	-	16-11-2018	65 978

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

Company changes in production licences

Licence	Relinquishing company	Acquiring company	Effective from	Staatscourant
N7c *	-	-	25-01-2018	66 962
Tietjerksteradeel II	Nederlandse Aardolie Maatschappij B.V.	Vermilion Energy Netherlands B.V.	25-01-2018	5 149
A15a	Oranje-Nassau Energie B.V.	Dyas B.V.	25-01-2018	5 154
M1a	Energy06 Investments B.V.	-	04-07-2018	40 377
L11b	Energy06 Investments B.V.	-	04-07-2018	43 330
Botlek-Maas	Energy06 Investments B.V.	-	27-07-2018	44 589
M7	Energy06 Investments B.V.	-	27-07-2018	53 846
P18d	Energy06 Investments B.V.	-	27-07-2018	44 518
Q16b & Q16c-diep	Energy06 Investments B.V.	-	27-07-2018	44 515
S3a	Energy06 Investments B.V.	-	27-07-2018	44 531
T1	Energy06 Investments B.V.	-	27-07-2018	44 536
L11c	Neptune Energy Netherlands B.V.	-	21-12-2018	143
Andel Vb	Nederlandse Aardolie Maatschappij B.V.	-	21-12-2018	140

* Change in operator: Oranje-Nassau Energie B.V., at start of drill N07-04 (17-2-2018, permanent).

Name changes

Previous company name	New company name
ENGIE E&P Nederland B.V.	Neptune Energy Netherlands B.V.
ENGIE E&P Participation Nederland B.V.	Neptune Energy Participation Netherlands B.V.
Dyas B.V.	RockRose (NL) CS1 B.V.
IPC Netherlands B.V.	Vermilion Energy Netherlands Non-Op B.V.

10.2 Storage

No changes.

10.3 Geothermal energy

Company changes in exploration licences

Licence	Relinquishing company	Acquiring company	Effective from	Staatscourant
Oostvoorne	-	Hydreco GeoMEC B.V. *	30-05-2018	31 033
Rotterdam 4	Uniper Benelux N.V.	Hydreco GeoMEC B.V. *	04-10-2018	58 122
Leeuwarden	Van Wijnen Gorredijk B.V.	Geocombinatie Leeuwarden B.V. *, Ennatuurlijk B.V.	17-10-2018	61 212
Maasdijk	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	Energie Transitie Partners B.V. *	07-12-2018	70 859

***** New operator.

Company changes in production licences

No changes.

Name changes

No changes.

10.4 Rock salt

Company changes

In this annual review AkzoNobel is listed as operator because no decision has yet been made about the name change to Nouryon.

10.5 Coal

No changes.

11. Seismic surveys

In 2018 Tulip Oil acquired a 2D survey of 35 lines in blocks Q7, Q10 and Q11 on the Netherlands continental shelf with a total length of approximately 480 km. In the territory, Wintershall-Germany acquired a 3D survey along the border with Germany in 2018, between Schoonebeek and Coevorden. Approximately 15 km^2 was acquired in the Netherlands. Figure 11.1 shows the situation as at 1 January 2019, for a long-term overview see Annex S.

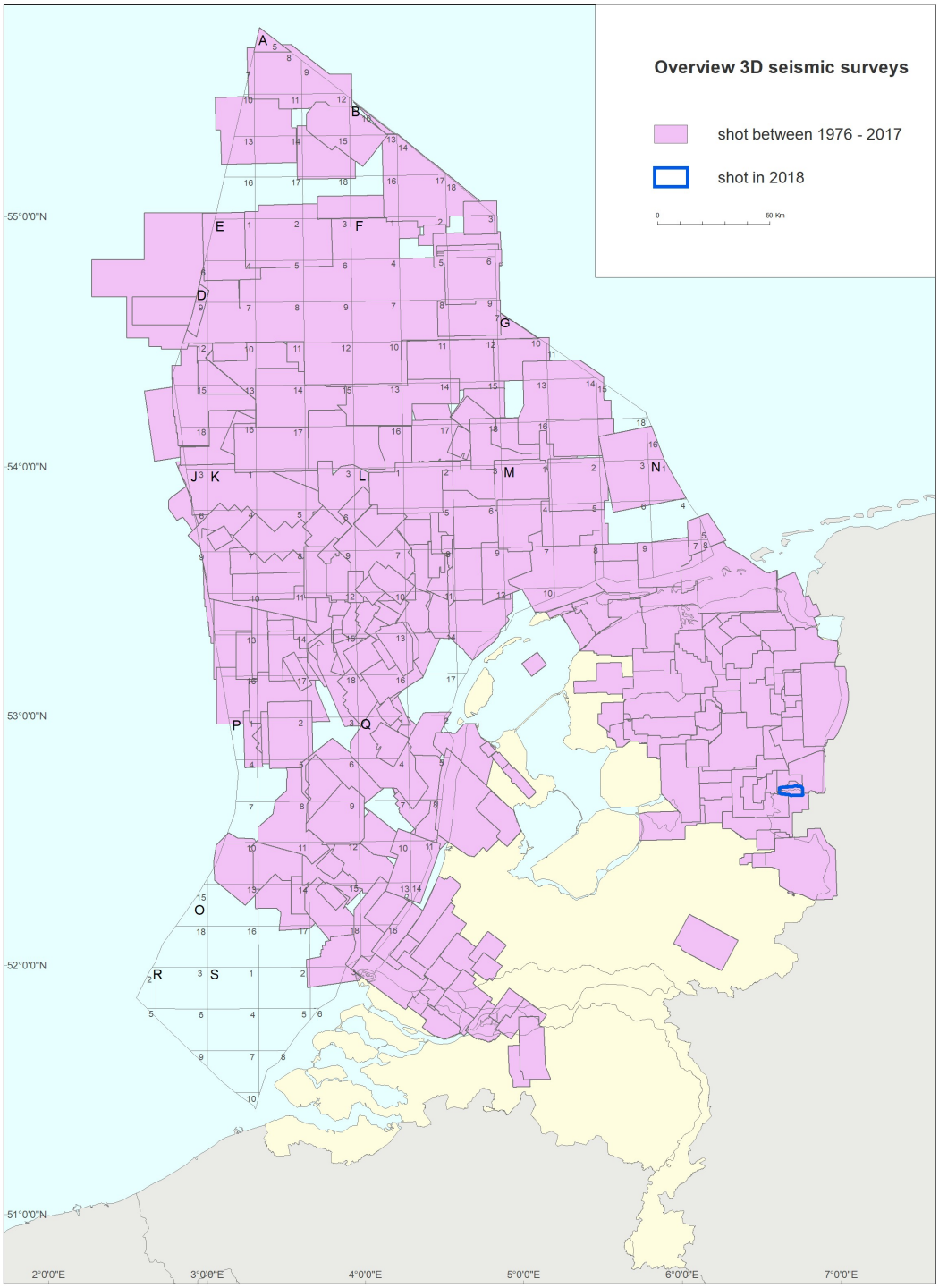


Figure 11.1 Overview of 3D seismic surveys as at 1 January 2019.

12. Oil and gas wells completed in 2018

The wells completed in 2018 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 2018.
This year all explorations wells have been drilled on the continental shelf. The production well Maasgeul-03-Sidetrack was drilled from the Netherlands territory but targeted the Q16-Maas field in the production license Q16b & Q16c-diep on the continental shelf. Three of the six exploration wells encountered gas. This is a success rate of 50%. The number of exploration wells (6) is equal compared to the previous year. No appraisal wells were drilled. Six production wells have been drilled in 2018, a same amount as last year. In 2018 all wells have been drilled in production licenses.

12.1 Netherlands territory

Production wells

	Name of well	License	Operator	Result
1	Maasgeul-03-Sidetrack	Q16b & Q16c-diep	Oranje-Nassau	Gas

12.2 Netherlands continental shelf

Exploration wells

	Name of well	License	Operator	Result
1	D12-07	D12a	Wintershall	Gas
2	F17-14	F17a-diep	Wintershall	Oil & Gas Shows
3	L10-39	L10	ENGIE	Gas
4	N07-04	N07c	Oranje-Nassau	Failed
5	N07-04A	N07c	Oranje-Nassau	Dry
6	N07-04A-Sidetrack	N07c	Oranje-Nassau	Gas

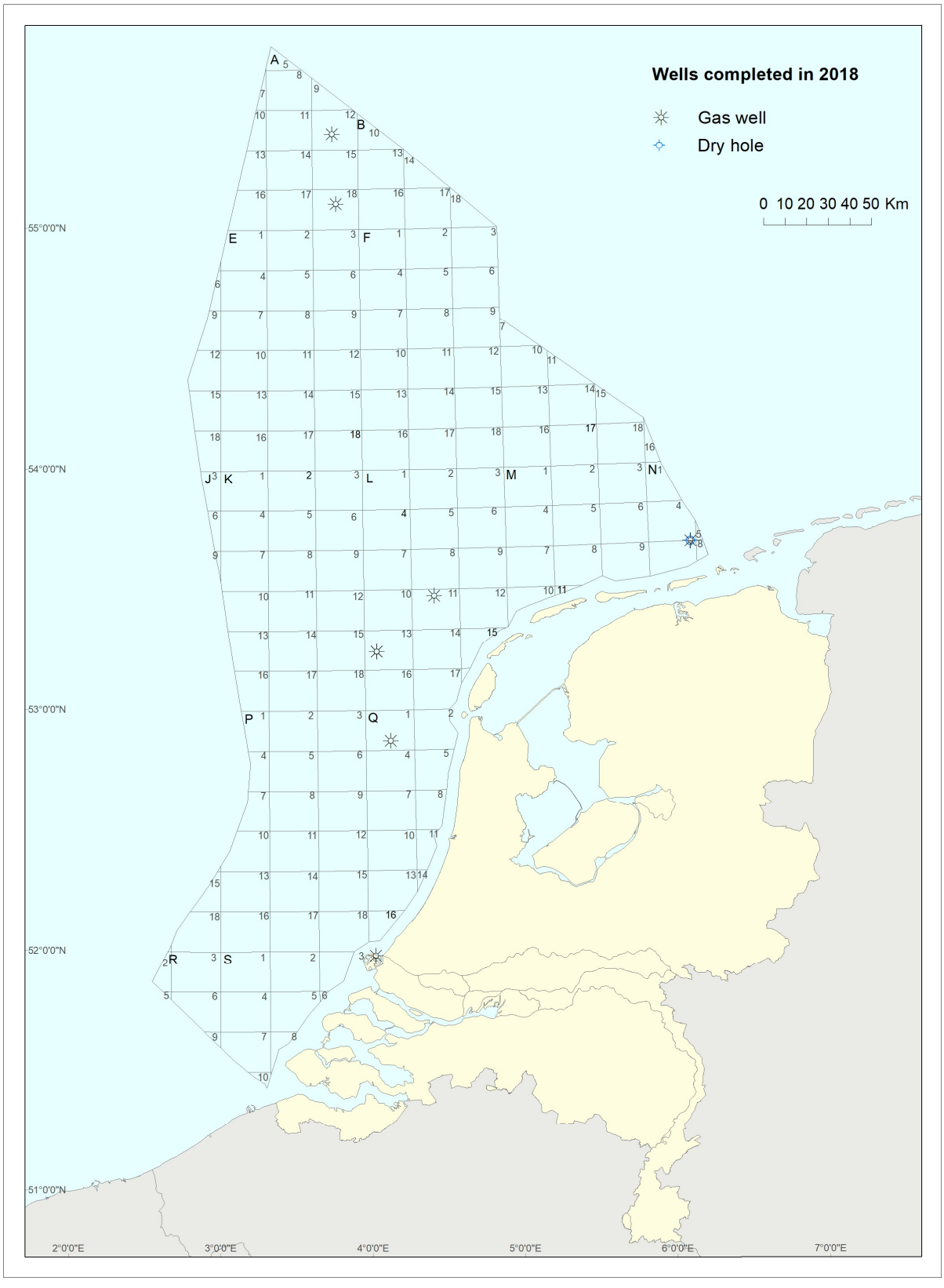
Production wells

	Name of well	License	Operator	Result
1	A12-A-04-Sidetrack	A12a	Petrogas	Gas
2	A18-A-05	A18a	Petrogas	Gas
3	L11B-A-10	L11b	Oranje-Nassau	Gas
4	L13-FI-101	L13	NAM	Gas
5	L13-FI-102	L13	NAM	Gas
6	Q01-D-02-Sidetrack	Q01-diep	Wintershall	Gas

12.3 Summary

Wells completed in 2018

Area	Type	Result							Total
		Gas	Gas shows	Oil	Oil shows	Oil & Gas	Dry	Other	
Territory	Exploration	-	-	-	-	-	-	-	-
	Appraisal	-	-	-	-	-	-	-	-
	Production	1	-	-	-	-	-	-	1
	Other	-	-	-	-	-	-	-	-
	Subtotal	1	-	-	-	-	-	-	1
Continental shelf	Exploration	3	-	-	-	1	1	1	6
	Appraisal	-	-	-	-	-	-	-	-
	Production	6	-	-	-	-	-	-	6
	Subtotal	9	-	-	-	1	1	1	12
	Total	10	-	-	-	1	1	1	13



Figuur 12.1 Wells completed in 2018.

13. Platforms en pipelines, Netherlands continental shelf

In 2018 one new platform was installed on the continental shelf and non were removed.

For a complete list of platforms and pipelines, see Annexes W and X. The pipeline data was supplied by Energie Beheer Nederland B.V.

Platforms installed in 2018

Platform	Operator	Placement	No. legs	Gas/Oil	Function
Q10-A	Tulip	2018	4	Gas	Satellite

New pipelines in 2018

Operator	From	To	Diameter (inches)	Constructed	Length (km)	Carries *
NAM	L13-FI-1	K15-FA-1	12"	2018	6.5	g
TULIP	Q10-A	P15-D	14"	2018	42.5	g

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

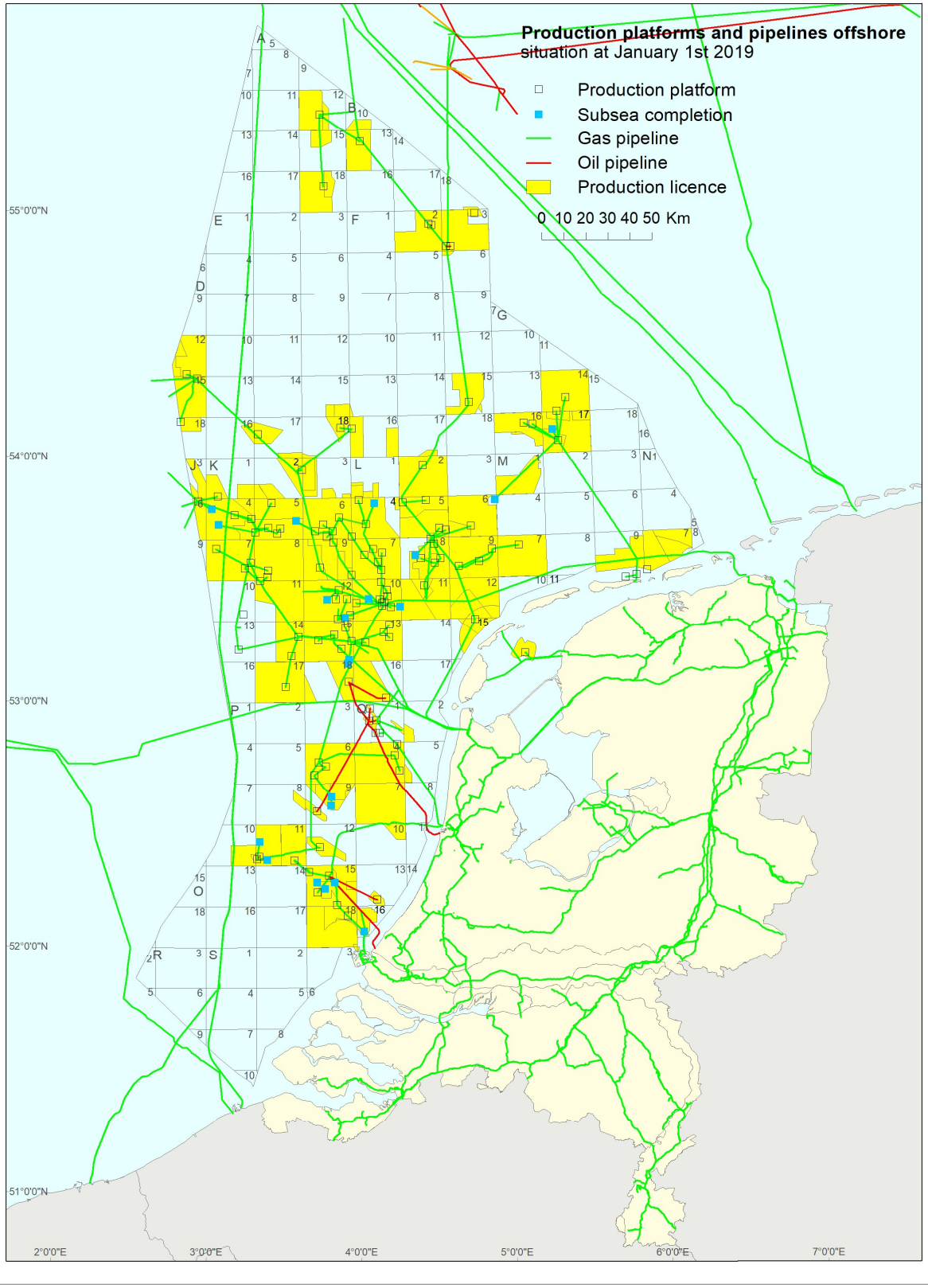


Figure 13.1 Offshore production platforms and pipelines as at 1 January 2019 (Source: https://data.overheid.nl/dataset/49129-pijpleidingen-op-de-Noordzee).

Annexes

A. Natural gas and oil accumulations by status as at 1 January 2019

A.1 Natural gas accumulations

Developed accumulations

Accumulation	Company	Licence name [Type]***	Gas/Oil
Ameland-Oost	NAM	NOORD-FRIESLAND [pl]	G
Ameland-Westgat	NAM	NOORD-FRIESLAND [pl]	G
Annerveen	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G&O
Assen	NAM	DRENTHE IIb [pl]	G
Bedum	NAM	GRONINGEN [pl]	G
Bergen	TAQA	BERGEN II [pl]	G
Blija-Ferwerderadeel	NAM	NOORD-FRIESLAND [pl]	G
Blija-Zuid	NAM	NOORD-FRIESLAND [pl]	G
Blija-Zuidoost	NAM	NOORD-FRIESLAND [pl]	G
Blijham	NAM	GRONINGEN [pl]	G
Boerakker	NAM	GRONINGEN [pl]	G
Botlek	NAM	BOTLEK II [pl], RIJSWIJK [pl]	G
Brakel	Vermillion	ANDEL Va [pl]	G&O
Coevorden	NAM	HARDENBERG [pl], SCHOONEBEEK [pl]	G
Collendoorn	NAM	HARDENBERG [pl], SCHOONEBEEK [pl]	G
Collendoornerveen	NAM	SCHOONEBEEK [pl]	G
Dalen	NAM	DRENTHE IIb [pl], DRENTHE V [pl], SCHOONEBEEK [pl]	G
De Hoeve	Vermillion	GORREDIJK [pl]	G
De Lier	NAM	RIJSWIJK [pl]	G&O
De Wijk	NAM	DRENTHE IIb [pl], SCHOONEBEEK [pl]	G
Den Velde	NAM	HARDENBERG [pl], SCHOONEBEEK [pl]	G
Diever	Vermillion	DRENTHE VI [pl]	G
Een	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G
Eernewoude	Vermillion	LEEUWARDEN [pl]	G
Eesveen	Vermillion	DRENTHE VI [pl], STEENWIJK [pl]	G
Eleveld	NAM	DRENTHE IIb [pl]	G
Emmen-Nieuw Amsterdam	NAM	DRENTHE IIb [pl], SCHOONEBEEK [pl]	G
Faan	NAM	GRONINGEN [pl]	G
Feerwerd	NAM	GRONINGEN [pl]	G
Gaag	NAM	RIJSWIJK [pl]	G
Geesbrug	Vermillion	DRENTHE V [pl]	G
Groet	TAQA	BERGEN II [pl], BERGERMEER [pl]	G
Grolloo	Vermillion	DRENTHE IV [pl]	G
Groningen	NAM	GRONINGEN [pl]	G
Grootegast	NAM	GRONINGEN [pl], TIETJERKSTERADEEL III [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
Hardenberg	NAM	HARDENBERG [pl], SCHOONEBEEK [pl]	G
Hardenberg-Oost	NAM	HARDENBERG [pl], SCHOONEBEEK [pl]	G
Harkema	NAM	TIETJERKSTERADEEL III [pl]	G
Heinenoord	NAM	BOTLEK II [pl]	G
Hekelingen	NAM	BEIJERLAND [pl], BOTLEK II [pl]	G
Kiel-Windeweer	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G
Kollum	NAM	NOORD-FRIESLAND [pl], TIETJERKSTERADEEL III [pl]	G
Kollum-Noord	NAM	NOORD-FRIESLAND [pl], TIETJERKSTERADEEL III [pl]	G
Kommerzijl	NAM	GRONINGEN [pl], TIETJERKSTERADEEL III [pl]	G
Langezwaag	Vermillion	GORREDIJK [pl]	G
Lauwersoog	NAM	NOORD-FRIESLAND [pl]	G
Leens	NAM	GRONINGEN [pl]	G
Leeuwarden en Nijega	Vermillion	AKKRUM [el], LEEUWARDEN [pl], TIETJERKSTERADEEL II [pl]	G
Loon op Zand	Vermillion	WAALWIJK [pl]	G
Loon op Zand-Zuid	Vermillion	WAALWIJK [pl]	G
Maasdijk	NAM	RIJSWIJK [pl]	G
Marum	NAM	GRONINGEN [pl], TIETJERKSTERADEEL III [pl]	G
Metslawier-Zuid	NAM	NOORD-FRIESLAND [pl]	G
Middelburen	Vermillion	AKKRUM [el], LEEUWARDEN [pl]	G
Middelie	NAM	MIDDELIE [pl]	G
Moddergat	NAM	NOORD-FRIESLAND [pl]	G
Molenpolder	NAM	GRONINGEN [pl]	G
Monster	NAM	RIJSWIJK [pl]	G
Munnekezijl	NAM	DE MARNE [pl], GRONINGEN [pl], NOORD-FRIESLAND [pl]	G
Nes	NAM	NOORD-FRIESLAND [pl]	G
Noorderdam	NAM	RIJSWIJK [pl]	G
Noordwolde	Vermillion	GORREDIJK [pl]	G
Oosterhesselen	NAM	DRENTHE IIb [pl], DRENTHE V [pl], DRENTHE VI [pl]	G
Oostrum	NAM	NOORD-FRIESLAND [pl]	G
Opeinde	Vermillion	LEEUWARDEN [pl], TIETJERKSTERADEEL II [pl], TIETJERKSTERADEEL III [pl]	G
Opeinde-Zuid	Vermillion	AKKRUM [el], LEEUWARDEN [pl]	G
Opende-Oost	NAM	GRONINGEN [pl]	G
Oud-Beijerland Zuid	NAM	BEIJERLAND [pl], BOTLEK II [pl]	G
Oude Pekela	NAM	GRONINGEN [pl]	G
Oudeland	NAM	BEIJERLAND [pl]	G
Oudendijk	NAM	BEIJERLAND [pl]	G
Pernis-West	NAM	RIJSWIJK [pl]	G
Reedijk	NAM	BOTLEK II [pl]	G
Ried	Vermillion	LEEUWARDEN [pl]	G
Rustenburg	NAM	MIDDELIE [pl]	G
Saaksum	NAM	GRONINGEN [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
Schermer	TAQA	BERGEN II [pl]	G
Schoonebeek Gas	NAM	SCHOONEBEEK [pl]	G
Sebaldeburen	NAM	GRONINGEN [pl]	G
's-Gravenzande	NAM	RIJSWIJK [pl]	G
Slootdorp	Vermillion	SLOOTDORP [pl]	G
Sonnega-Weststellingwerf	Vermillion	GORREDIJK [pl], STEENWIJK [pl]	G
Spijkenisse-Oost	NAM	BOTLEK II [pl]	G
Sprang	Vermillion	WAALWIJK [pl]	G
Surhuisterveen	NAM	GRONINGEN [pl], TIETJERKSTERADEEL III [pl]	G
Tietjerksteradeel	Vermillion	TIETJERKSTERADEEL II [pl]	G
Ureterp	NAM	TIETJERKSTERADEEL II [pl], TIETJERKSTERADEEL III [pl]	G
Vierhuizen	NAM	DE MARNE [pl], GRONINGEN [pl], NOORD-FRIESLAND [pl]	G
Vinkega	Vermillion	DRENTHE IIIa [pl], DRENTHE IIa [pl], GORREDIJK [pl]	G
Vries	NAM	DRENTHE IIb [pl]	G
Waalwijk-Noord	Vermillion	WAALWIJK [pl]	G
Wanneperveen	NAM	SCHOONEBEEK [pl]	G
Warffum	NAM	GRONINGEN [pl]	G
Warga-Wartena	Vermillion	LEEUWARDEN [pl], TIETJERKSTERADEEL II [pl]	G
Westbeemster	NAM	BERGEN II [pl], MIDDELIE [pl]	G
Wieringa	NAM	GRONINGEN [pl], NOORD-FRIESLAND [pl], TIETJERKSTERADEEL III [pl]	G
Zevenhuizen	NAM	GRONINGEN [pl]	G
Zuidwal	Vermillion	ZUIDWAL [pl]	G
Zuidwending-Oost	NAM	GRONINGEN [pl]	G
A12-FA	Petrogas	A12a [pl], A12d [pl]	G
A18-FA	Petrogas	A18a [pl], A18c [pl]	G
B13-FA	Petrogas	B10c & B13a [pl]	G
D12-A	Wintershall	D12a [pl], D15 [pl]	G
D12-Andalusiet Noord	Wintershall	D12a [pl]	G
D15a-A	Neptune	D12a [pl], D15 [pl]	G
D18a-A	Neptune	D15 [pl], D18a [pl]	G
E17a-A	Neptune	E16a [pl], E17a & E17b [pl]	G
F02a-Pliocene	Dana Petroleum	F02a [pl]	G
F03-FB	Neptune	F02a [pl], F03b [pl], F06a [pl]	G&O
F15a-A	Total	F15a [pl]	G
F16-E	Wintershall	E15a [pl], E18a & E18c [pl], F13a [pl], F16a & F16b [pl]	G
G14-A&B	Neptune	G14 & G17b [pl]	G
G14-C	Neptune	G14 & G17b [pl]	G
G16a-A	Neptune	G16a [pl]	G
G16a-B	Neptune	G16a [pl]	G
G16a-C	Neptune	G16a [pl]	G
G16a-D	Neptune	G16a [pl]	G
G17a-S1	Neptune	G17a [pl], G17c & G17d [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
G17cd-A	Neptune	G17c & G17d [pl]	G
J03-C Unit	Total	J03a [pl], J03b & J06a [pl], K01a [pl], K04a [pl]	G
K01-A Unit	Total	J03a [pl], K01a [pl], K04a [pl]	G
K02b-A	Neptune	E17a & E17b [pl], E18a & E18c [pl], K02b [pl], K03a [pl], K03c [pl]	G
K04-A	Total	K04a [pl], K04b & K05a [pl], K05b [pl]	G
K04-E	Total	K04a [pl], K04b & K05a [pl]	G
K04-N	Total	K04a [pl], K04b & K05a [pl]	G
K04a-B	Total	K04a [pl], K04b & K05a [pl]	G
K04a-D	Total	J03b & J06a [pl], K04a [pl]	G
K04a-Z	Total	K04a [pl]	G
K05-C North	Total	K01b & K02a [pl], K05b [pl]	G
K05-C Unit	Total	K04b & K05a [pl], K05b [pl]	G
K05-F	Total	K04b & K05a [pl], K05b [pl], K06 & L07 [pl]	G
K05-U	Total	K01b & K02a [pl], K02c [pl], K05b [pl]	G
K05a-A	Total	K04a [pl], K04b & K05a [pl], K08 & K11a [pl]	G
K05a-B	Total	K04b & K05a [pl], K05b [pl]	G
K05a-D	Total	K04b & K05a [pl]	G
K05a-E	Total	K04b & K05a [pl], K05b [pl]	G
K06-A	Total	K03b [pl], K06 & L07 [pl]	G
K06-C	Total	K06 & L07 [pl]	G
K06-D	Total	K06 & L07 [pl], K09c [pl]	G
K06-DN	Total	K06 & L07 [pl]	G
K06-G	Total	K06 & L07 [pl]	G
K07-FA	NAM	K07 [pl], K08 & K11a [pl]	G
K07-FB	NAM	J09 [el], K07 [pl]	G
K07-FC	NAM	K07 [pl], K08 & K11a [pl]	G
K07-FD	NAM	K07 [pl]	G
K08-FA	NAM	K08 & K11a [pl]	G
K08-FC	NAM	K08 & K11a [pl]	G
K09ab-A	Neptune	K06 & L07 [pl], K09a & K09b [pl], K09c [pl], K12 [pl], L10 & L11a [pl]	G
K09ab-B	Neptune	K09a & K09b [pl]	G
K09ab-D	Neptune	K09a & K09b [pl]	G
K09c-A	Neptune	K06 & L07 [pl], K09c [pl]	G
K09c-C	Neptune	K09c [pl]	G
K12-B	Neptune	K12 [pl], K15 [pl]	G
K12-B9	Neptune	K12 [pl], K15 [pl]	G
K12-D	Neptune	K12 [pl]	G
K12-G	Neptune	K12 [pl], L10 & L11a [pl]	G
K12-H (K12-S2 & K12-D5)	Neptune	K12 [pl]	G
K12-L	Neptune	K09c [pl], K12 [pl]	G
K12-M	Neptune	K12 [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
K12-S3	Neptune	K12 [pl]	G
K14-FA	NAM	K14a [pl]	G
K14-FB	NAM	K14a [pl], K17 [pl]	G
K15-FA	NAM	K15 [pl], L13 [pl]	G
K15-FB	NAM	K15 [pl]	G
K15-FC	NAM	K15 [pl]	G
K15-FD	NAM	K15 [pl]	G
K15-FE	NAM	K15 [pl]	G
K15-FG	NAM	K15 [pl]	G
K15-FH	NAM	K15 [pl]	G
K15-FI	NAM	K15 [pl]	G
K15-FJ	NAM	K15 [pl]	G
K15-FK	NAM	K15 [pl]	G
K15-FL	NAM	K12 [pl], K15 [pl]	G
K15-FM	NAM	K15 [pl]	G
K15-FN	NAM	K15 [pl]	G
K15-FO	NAM	K15 [pl]	G
K15-FP	NAM	K15 [pl]	G
K17-FA	NAM	K17 [pl]	G
K18-Golf	Wintershall	K15 [pl], K18b [pl]	G
L01-A	Total	L01a [pl], L01d [pl], L04a [pl]	G
L02-FA	NAM	L02 [pl]	G
L02-FB	NAM	F17c [pl], L02 [pl]	G
L04-A	Total	L04a [pl]	G
L04-D	Total	L04a [pl]	G
L04-F	Total	L01e [pl], L04a [pl]	G
L04-G	Total	L01f [pl], L04a [pl]	G
L04-I	Total	L04a [pl]	G
L05-B	Wintershall	L05b [pl]	G
L05-C	Wintershall	L05b [pl], L06b [pl]	G
L05a-A	Neptune	L02 [pl], L04c [pl], L05a [pl]	G
L05a-D	Neptune	L02 [pl], L05a [pl], L05b [pl]	G
L06-B	Wintershall	L06a [pl]	G
L08-A-West	Wintershall	L08a [pl], L08b & L08d [pl]	G
L08-D	ONE	L08a [pl], L08b & L08d [pl], L11b [pl]	G
L08-P	Wintershall	L05c [pl], L08b & L08d [pl]	G
L09-FA	NAM	L09 [pl]	G
L09-FB	NAM	L09 [pl]	G
L09-FD	NAM	L09 [pl]	G
L09-FE	NAM	L09 [pl]	G
L09-FF	NAM	L09 [pl]	G
L09-FG	NAM	L09 [pl]	G
L09-FH	NAM	L09 [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
L09-FJ	NAM	L09 [pl]	G
L09-FK	NAM	L09 [pl]	G
L09-FL	NAM	L09 [pl]	G
L09-FM	NAM	L09 [pl]	G
L10-CDA	Neptune	L10 & L11a [pl]	G
L10-M	Neptune	L10 & L11a [pl]	G
L10-N	Neptune	L10 & L11a [pl]	G
L10-O	Neptune	K12 [pl], L10 & L11a [pl]	G
L10-P	Neptune	L10 & L11a [pl]	G
L11-Gillian	ONE	L11b [pl], L11c [pl]	G
L12a-B	Neptune	L12a [pl], L12b & L15b [pl], L15c [pl]	G
L12b-C	Neptune	L12a [pl], L12b & L15b [pl]	G
L13-FC	NAM	L13 [pl]	G
L13-FD	NAM	L13 [pl]	G
L13-FE	NAM	L13 [pl]	G
L13-FF	NAM	L13 [pl]	G
L13-FI	NAM	L13 [pl]	G
L15b-A	Neptune	L12b & L15b [pl]	G
M07-B	ONE	M07 [pl]	G
Markham	Spirit	J03a [pl], J03b & J06a [pl]	G
N07-FA	NAM	N07a [pl], NOORD-FRIESLAND [pl]	G
P06-D	Wintershall	P06 [pl], P09c, P09e & P09f [pl]	G
P06-Main	Wintershall	P06 [pl]	G
P09-A	Wintershall	P09a, P09b & P09d [pl], P09c, P09e & P09f [pl]	G
P10a-De Ruyter Western Extension	Dana Petroleum	P10a [pl]	G&O
P11-12	ONE	P11a [pl]	G
P11a-E	ONE	P11a [pl]	G
P15-09	TAQA	P15a & P15b [pl], P18a [pl]	G
P15-13	TAQA	P15a & P15b [pl]	G
P18-2	TAQA	P18a [pl], P18c [pl]	G
P18-4	TAQA	P15a & P15b [pl], P18a [pl]	G
P18-6	TAQA	P15c [pl], P18a [pl]	G
Q01-B	Wintershall	Q01-diep [pl], Q04 [pl]	G
Q01-D	Wintershall	Q01-diep [pl], Q01a-ondiep & Q01b-ondiep [pl]	G
Q04-A	Wintershall	Q04 [pl]	G
Q04-B	Wintershall	Q04 [pl], Q05d [pl]	G
Q10-A	Tulip	Q07 & Q10a [pl]	G
Q16-FA	ONE	Q16a [pl]	G
Q16-Maas	ONE	BOTLEK-MAAS [pl], P18d [pl], Q16b & Q16c-diep [pl], S03a [pl], T01 [pl]	G
Aardgasbuffer Zuidwending	Gasunie	ZUIDWENDING [sl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
Alkmaar	TAQA	ALKMAAR [sl]	G
Bergermeer	TAQA	BERGERMEER [sl]	G
Grijpskerk	NAM	GRIJPSKERK [sl]	G
Norg	NAM	NORG [sl]	G

Undeveloped accumulations

Accumulation	Company	Licence name [Type]***	Gas/Oil
Production start expected between 2019 and 2023			
Assen-Zuid	NAM	DRENTHE IIb [pl]	G
Marumerlage	NAM	GRONINGEN [pl]	G
Nes-Noord	NAM	NOORD-FRIESLAND [pl]	G
Oppenhuizen	Vermillion	ZUID-FRIESLAND III [pl]	G
Papekop	Vermillion	PAPEKOP [pl]	G&O
Rodewolt	NAM	GRONINGEN [pl]	G
Ternaard	NAM	NOORD-FRIESLAND [pl]	G
Usquert	NAM	GRONINGEN [pl]	G
Woudsend	Vermillion	ZUID-FRIESLAND III [pl]	G
A15-A	Petrogas	A12a [pl], A12d [pl], A15a [pl]	G
B10-FA	Petrogas	A12b & B10a [el]	G
B16-FA	Petrogas	B10c & B13a [pl], B16a [el]	G
D12-B	Wintershall	D12a [pl], D12b [pl]	G
D15 Tourmaline	Neptune	D15 [pl]	G
F16-P	Wintershall	F16a & F16b [pl]	G
K09c-B	Neptune	K09a & K09b [pl], K09c [pl]	G
L08-I	Wintershall	L08a [pl]	G
L10-19	Neptune	L10 & L11a [pl]	G
L11-7	Neptune	L10 & L11a [pl]	G
L12-FA	Neptune	L12a [pl], L12b & L15b [pl]	G
M01-A	ONE	M01a [pl]	G
M09-FA	NAM	M09a [pl], NOORD-FRIESLAND [pl]	G
P11b-Van Ghent East	Dana Petroleum	P11b [pl]	G&O
P11b-Witte de With	Dana Petroleum	P11b [pl]	G
P18-7	ONE	P18b [pl], P18c [pl], Q16a [pl]	G
Ruby	ONE	N04 [el], N05 [el], N08 [el]	G
Productiestart onbekend			
Allardsoog	NAM	DRENTHE IIb [pl], GRONINGEN [pl], OOSTERWOLDE [el]	G
Beerta	NAM	GRONINGEN [pl]	G
Boskoop	NAM	RIJSWIJK [pl]	G
Buma	NAM	DRENTHE IIb [pl]	G
Burum	NAM	TIETJERKSTERADEEL III [pl]	G
Deurningen	NAM	TWENTHE [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
Egmond-Binnen	NAM	MIDDELIE [pl]	G
Exloo	NAM	DRENTHE IIb [pl]	G
Haakswold	NAM	SCHOONEBEEK [pl]	G
Heiloo	TAQA	BERGEN II [pl]	G
Hollum-Ameland	NAM	NOORD-FRIESLAND [pl]	G
Kerkwijk	NAM	ANDEL Vb [pl], UTRECHT [el]	G
Kijkduin-Zee	NAM	RIJSWIJK [pl]	G
Langebrug	NAM	GRONINGEN [pl]	G
Lankhorst	NAM	SCHOONEBEEK [pl]	G
Maasgeul	NAM	BOTLEK II [pl], Q16b & Q16c-diep [pl]	G
Marknesse	Tulip	MARKNESSE [pl]	G
Midlaren	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G&O
Molenaarsgraaf	NAM	ANDEL Vb [pl], RIJSWIJK [pl]	G
Nieuwehorne	Vermillion	GORREDIJK [pl]	G
Nieuweschans	NAM	GRONINGEN [pl]	G
Oosterwolde		open	G
Oude Leede	NAM	RIJSWIJK [pl]	G
Rammelbeek	NAM	TWENTHE [pl]	G
Schiermonnikoog-Wad	NAM	NOORD-FRIESLAND [pl]	G
Terschelling-Noord	Tulip	M10a & M11 [el], TERSCHELLING-NOORD [el]	G
Terschelling-West		open	G
Valthermond	NAM	DRENTHE IIb [pl]	G
Vlagtwedde	NAM	GRONINGEN [pl]	G
Wassenaar-Diep	NAM	RIJSWIJK [pl]	G
Werkendam-Diep	NAM	RIJSWIJK [pl]	G&O
Witten	NAM	DRENTHE IIb [pl]	G
Zevenhuizen-West	NAM	GRONINGEN [pl]	G
Zuidwijk	TAQA	BERGEN II [pl], MIDDELIE [pl]	G
B17-A		open	G
D12 Ilmenite	Wintershall	D09 & E07 [el], D12a [pl]	G
E11-Vincent	Tulip	E11 [el]	G
E12 Lelie		open	G
E12 Tulp East		open	G
E13 Epidoot		open	G
J09 Alpha North	NAM	J09 [el], K07 [pl]	G
K08-FB	NAM	K08 & K11a [pl]	G
K08-FD	NAM	K04b & K05a [pl], K08 & K11a [pl]	G
K08-FE	NAM	K08 & K11a [pl], K09a & K09b [pl]	G
K08-FF	NAM	K08 & K11a [pl]	G
K14-FC	NAM	K08 & K11a [pl], K14a [pl]	G
K15-FF	NAM	K15 [pl]	G
K16-5		open	G
K17-FB	NAM	K17 [pl]	G

Accumulation	Company	Licence name [Type]***	Gas/Oil
K17-Zechstein	NAM	K17 [pl]	G
K18-FB	Wintershall	K18b [pl]	G
K6-GT4	Total	K06 & L07 [pl]	G
L02-FC	NAM	L02 [pl]	G
L05b-A	Wintershall	L05b [pl]	G
L07-D	Total	K06 & L07 [pl]	G
L07-F	Total	K06 & L07 [pl]	G
L10-6	Neptune	L10 & L11a [pl]	G
L11-1	Neptune	L10 & L11a [pl]	G
L11a-B	Neptune	L10 & L11a [pl]	G
L12-FD	Tulip	L09 [pl], L12d [pl]	G
L13-FA	NAM	L13 [pl]	G
L13-FJ	NAM	L13 [pl]	G
L13-FK	NAM	L13 [pl]	G
L14-FB	Neptune	L13 [pl]	G
L16-Alpha	Wintershall	L16a [pl]	G
L16-Bravo	Wintershall	L16a [pl]	G
L16-FA	Wintershall	K18b [pl], L16a [pl]	G
M09-FB	NAM	M09a [pl], N07a [pl], NOORD-FRIESLAND [pl]	G
M10-FA	Tulip	M10a & M11 [el]	G
M11-FA	Tulip	M10a & M11 [el], NOORD-FRIESLAND [pl]	G
N07-B		open	G
P01-FA		open	G
P01-FB		open	G
P02-Delta		open	G
P02-E		open	G
P06-Northwest	Wintershall	P06 [pl]	G
P10b-Van Brakel	Dana Petroleum	P10b [pl]	G
P12-F (P12-14)	Wintershall	P12a [pl]	G
Q02-A		open	G
Q07-C	Tulip	Q07 & Q10a [pl]	O&G
Q10-Beta		open	G
Q11-Beta		open	G
Q13-FC		open	G
Q14-A		Q08, Q10b & Q11 [el]	G

Production ceased

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Akkrum 1	A	CHEVRON USA	AKKRUM [el], LEEUWARDEN [pl]	G
Akkrum 13	A	CHEVRON USA	AKKRUM [el], GORREDIJK [pl]	G
Akkrum 3	A	CHEVRON USA	AKKRUM [el]	G
Akkrum 9	A	CHEVRON USA	AKKRUM [el]	G

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Ameland-Noord	T	NAM	M09a [pl], NOORD-FRIESLAND [pl]	G
Andel-6 (Wijk & Aalburg)	T	Vermillion	ANDEL Va [pl]	G
Anjum	T	NAM	NOORD-FRIESLAND [pl]	G
Appelscha	U	NAM	DRENTHE IIb [pl]	G
Barendrecht-Ziedewij	U	NAM	RIJSWIJK [pl]	G
Blesdijke	T	Vermillion	GORREDIJK [pl], STEENWIJK [pl]	G
Boekel	U	TAQA	BERGEN II [pl]	G
Bozum	U	Vermillion	OOSTEREND [pl]	G
Burum-Oost	U	NAM	TIETJERKSTERADEEL III [pl]	G
Castricum-Zee	A	Wintershall	MIDDELIE [pl]	G
De Blesse	T	Vermillion	GORREDIJK [pl], STEENWIJK [pl]	G
De Klem	U	NAM	BEIJERLAND [pl]	G
De Lutte	U	NAM	ROSSUM-DE LUTTE [pl], TWENTHE [pl]	G
Donkerbroek - Main	T	Tulip	DONKERBROEK [pl], DONKERBROEK-WEST [pl]	G
Donkerbroek - West	U	Tulip	DONKERBROEK [pl], DONKERBROEK-WEST [pl]	G
Emmen	A	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G
Emshoern	A	NAM	GRONINGEN [pl]	G
Engwierum	U	NAM	NOORD-FRIESLAND [pl]	G
Ezumazijl	T	NAM	NOORD-FRIESLAND [pl]	G
Franeker	U	Vermillion	LEEUWARDEN [pl]	G
Gasselternijveen	U	NAM	DRENTHE IIb [pl]	G
Geestvaartpolder	U	NAM	RIJSWIJK [pl]	G
Groet-Oost	U	TAQA	MIDDELIE [pl]	G
Grouw-Rauwerd	T	Vermillion	LEEUWARDEN [pl], OOSTEREND [pl]	G
Harlingen Lower Cretaceous	U	Vermillion	LEEUWARDEN [pl]	G
Harlingen Upper Cretaceous	T	Vermillion	LEEUWARDEN [pl]	G
Hemrik (Akkrum 11)	T	Tulip	AKKRUM 11 [pl]	G
Hoogenweg	A	NAM	HARDENBERG [pl]	G
Houwerzijl	U	NAM	GRONINGEN [pl]	G
Kollumerland	U	NAM	TIETJERKSTERADEEL III [pl]	G
Leeuwarden 101 Rotliegend	U	Vermillion	LEEUWARDEN [pl]	G
Leidschendam	A	NAM	RIJSWIJK [pl]	G
Metslawier	U	NAM	NOORD-FRIESLAND [pl]	G
Middenmeer	U	Vermillion	SLOOTDORP [pl]	G
Nijensleek	U	Vermillion	DRENTHE IIa [pl], STEENWIJK [pl]	G
Norg-Zuid	U	NAM	DRENTHE IIb [pl]	G
Oldelamer	T	Vermillion	GORREDIJK [pl], LEMSTERLAND [el]	G
Oldenzaal	U	NAM	ROSSUM-DE LUTTE [pl], TWENTHE [pl]	G
Pasop	U	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G
Pernis	U	NAM	RIJSWIJK [pl]	G

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Pieterzijl Oost	T	NAM	GRONINGEN [pl], TIETJERKSTERADEEL III [pl]	G
Roden	T	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G
Rossum-Weerselo	U	NAM	ROSSUM-DE LUTTE [pl], TWENTHE [pl]	G
Roswinkel	A	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	G
Sleen	A	NAM	DRENTHE IIb [pl]	G
Spijkenisse-West	T	NAM	BEIJERLAND [pl], BOTLEK II [pl]	G
Starnmeer	U	TAQA	BERGEN II [pl]	G
Suawoude	T	NAM	LEEUWARDEN [pl], TIETJERKSTERADEEL II [pl]	G
Tubbergen	U	NAM	TUBBERGEN [pl]	G
Tubbergen-Mander	U	NAM	TUBBERGEN [pl]	G
Weststellingwerf	U	Vermillion	GORREDIJK [pl]	G
Wimmenum-Egmond	A	NAM	MIDDELIE [pl]	G
Witterdiep	T	NAM	DRENTHE IIb [pl]	G
Zuid-Schermer	U	TAQA	BERGEN II [pl]	G
D15a-A104	U	Neptune	D15 [pl]	G
E18-A	U	Wintershall	E15a [pl], E15b [pl], E18a & E18c [pl]	G
F03-FA	A	SPIRIT	B18a [pl], F03a [pl]	G
F15a-B	U	Total	F15a [pl]	G
Halfweg	A	Petrogas	Q01-diep [pl], Q01a-ondiep & Q01b-ondiep [pl], Q02c [pl]	G
K05-G	U	Total	K04b & K05a [pl]	G
K06-N	U	Total	K06 & L07 [pl]	G
K06-T	U	Total	K06 & L07 [pl]	G
K07-FE	T	NAM	K07 [pl]	G
K09ab-C	T	Neptune	K09a & K09b [pl], K09c [pl]	G
K10-B (gas)	A	Wintershall	open	G
K10-C	A		open	G
K10-V	A		K07 [pl]	G
K11-FA	A	NAM	K08 & K11a [pl]	G
K11-FB	A	Neptune	K08 & K11a [pl], K12 [pl]	G
K11-FC	A	Neptune	K08 & K11a [pl]	G
K12-A	A	Neptune	K12 [pl]	G
K12-C	U	Neptune	K12 [pl]	G
K12-E	A	Neptune	K12 [pl], L10 & L11a [pl]	G
K12-K	T	Neptune	K12 [pl]	G
K12-S1	A	Neptune	K12 [pl]	G
K13-A	A		open	G
K13-B	A		open	G
K13-CF	A		open	G
K13-DE	A		open	G
K15-FQ	T	NAM	K15 [pl], L13 [pl]	G
L04-B	A	Total	K06 & L07 [pl], K09c [pl], L04a [pl]	G
L06d-S1	A		open	G

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
L07-A	A	Total	K06 & L07 [pl]	G
L07-B	U	Total	K06 & L07 [pl]	G
L07-C	U	Total	K06 & L07 [pl]	G
L07-G	U	Total	K06 & L07 [pl]	G
L07-H	U	Total	K06 & L07 [pl]	G
L07-H South-East	U	Total	K06 & L07 [pl]	G
L07-N	A	Total	K06 & L07 [pl]	G
L08-A	U	Wintershall	L08a [pl], L08b & L08d [pl]	G
L08-G	U	Wintershall	L08a [pl]	G
L08-H	U	Wintershall	L08a [pl]	G
L09-FC	U	NAM	L09 [pl]	G
L09-FI	T	NAM	L09 [pl]	G
L10-G	A	Neptune	L10 & L11a [pl]	G
L10-K	A	Neptune	K06 & L07 [pl], L10 & L11a [pl]	G
L10-S1	A	Neptune	L10 & L11a [pl]	G
L10-S2	U	Neptune	L10 & L11a [pl]	G
L10-S3	A	Neptune	L10 & L11a [pl]	G
L10-S4	U	Neptune	L10 & L11a [pl]	G
L11-Lark	A	Neptune	L10 & L11a [pl]	G
L11a-A	A	Neptune	L10 & L11a [pl]	G
L11b-A	U	ONE	L11b [pl]	G
L13-FB	U	NAM	L13 [pl]	G
L13-FG	T	NAM	L13 [pl]	G
L13-FH	A	NAM	L13 [pl]	G
L14-FA	A	TCDN	L10 & L11a [pl]	G
M07-A	T	ONE	M07 [pl]	G
P02-NE	A		open	G
P02-SE	A		open	G
P06-South	A	Wintershall	P06 [pl], P09c, P09e & P09f [pl]	G
P09-B	U	Wintershall	P09c, P09e & P09f [pl]	G
P11b-Van Nes	U	Dana Petroleum	P11b [pl]	G
P12-C	A	Wintershall	P12a [pl]	G
P12-SW	U	Wintershall	P12a [pl]	G
P14-A	A	Wintershall	P11a [pl]	G
P15-10	A	TAQA	P15c [pl]	G
P15-11	U	TAQA	P15a & P15b [pl]	G
P15-12	A	TAQA	P15a & P15b [pl]	G
P15-14	A	TAQA	P15c [pl]	G
P15-15	U	TAQA	P15a & P15b [pl]	G
P15-16	U	TAQA	P15a & P15b [pl]	G
P15-17	U	TAQA	P15a & P15b [pl]	G
P15-19	T	TAQA	P15a & P15b [pl]	G
Q05-A	A		open	G

Accumulation	Status**	Company	Licence name [Type]***	Gas/Oil
Q08-A	A	Wintershall	MIDDELIE [pl], Q08, Q10b & Q11 [el]	G
Q08-B	A	Wintershall	Q08, Q10b & Q11 [el]	G

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

*** el = exploration licence, pl = production licence, sl = storage licence.

A.2 Oil accumulations

Developed accumulations

Accumulation	Company	Licence name [Type]***	Gas/Oil
Oud-Beijerland Noord	NAM	BOTLEK II [pl]	O&G
Rotterdam	NAM	RIJSWIJK [pl]	O
Schoonebeek Olie	NAM	SCHOONEBEEK [pl]	O
F02a-Hanze	Dana Petroleum	F02a [pl]	O
Haven	Petrogas	Q01-diep [pl], Q01a-ondiep & Q01b-ondiep [pl]	O
Helder	Petrogas	Q01-diep [pl], Q01a-ondiep & Q01b-ondiep [pl]	O
Horizon	Petrogas	P09a, P09b & P09d [pl], P09c, P09e & P09f [pl]	O
P11b-De Ruyter	Dana Petroleum	P10a [pl], P11b [pl]	O
P11b-Van Ghent	Dana Petroleum	P11b [pl]	O&G
P15 Rijn	TAQA	P15a & P15b [pl]	O&G
Q13a-Amstel	Neptune	Q13a [pl]	O

Undeveloped accumulations

Accumulation	Company	Licence name [Type]***	Gas/Oil
Production start expected between 2019 and 2023			
F06b-Snellius	Dana Petroleum	F06b [el]	O
F17-NE (Rembrandt)	Wintershall	F17a-diep [pl], F17a-ondiep [el], F17c [pl]	O
F17-SW Culmination	Wintershall	F17a-diep [pl], F17a-ondiep [el], F17c [pl], L02 [pl]	O
P08-A Horizon-West	Petrogas	P08a [pl], P09a, P09b & P09d [pl]	O
Q01-Northwest	Petrogas	Q01-diep [pl]	O
Productie start onbekend			
Alblasserdam	NAM	RIJSWIJK [pl]	O
Denekamp	NAM	TUBBERGEN [pl]	O
Gieterveen	NAM	DRENTHE IIb [pl], GRONINGEN [pl]	O
Lekkerkerk/blg	NAM	RIJSWIJK [pl]	O
Noordwijk	NAM	RIJSWIJK [pl]	O
Ottoland	Vermillion	ANDEL Va [pl]	O&G
Stadskanaal	NAM	GRONINGEN [pl]	O&G
Wassenaar-Zee	NAM	RIJSWIJK [pl]	O
Woubrugge	NAM	RIJSWIJK [pl]	O
Zweelo	NAM	DRENTHE IIb [pl]	O
B18-FA	SPIRIT	B18a [pl], F03a [pl]	O
F03-FC	SPIRIT	F03a [pl]	O
F06b-Zulu North	Dana Petroleum	F03b [pl], F06b [el]	O
F14-FA		open	O
F17-Brigantijn (F17-FB)	ONE	F17a-diep [pl], F17a-ondiep [el]	O
F17-Korvet (F17-FA)	ONE	F17a-diep [pl], F17a-ondiep [el]	O
F18-Fregat (F18-FA)	ONE	F18a-ondiep [el]	O
K10-B (oil)		Open	O

Accumulation	Company	Licence name [Type]***	Gas/Oil
L01-FB		open	O
L05a-E	Neptune	L02 [pl], L04c [pl], L05a [pl]	O
P12-West (P12-3)	Wintershall	P12a [pl]	O
Q07-A		open	O
Q07-B	Tulip	Q07 & Q10a [pl]	O
Q07-C	Tulip	Q07 & Q10a [pl]	O&G
Q13-FB	NAM	Q16b & Q16c-diep [pl], RIJSWIJK [pl]	O

Production ceased

Accumulation	Status**	Company	License name [Type]***	Gas/Oil
Barendrecht	T	NAM	RIJSWIJK [pl]	O&G
Berkel	A	NAM	RIJSWIJK [pl]	O&G
IJsselmonde	A	NAM	RIJSWIJK [pl]	O&G
Moerkapelle	A	NAM	RIJSWIJK [pl]	O
Pijnacker	A	NAM	RIJSWIJK [pl]	O
Rijswijk	A	NAM	RIJSWIJK [pl]	O&G
Wassenaar	A	NAM	RIJSWIJK [pl]	O
Werkendam	A	NAM	RIJSWIJK [pl]	O
Zoetermeer	A	NAM	RIJSWIJK [pl]	O
Helm	U	Petrogas	Q01-diep [pl], Q01a-ondiep & Q01b-ondiep [pl]	O
Hoorn	U	Petrogas	Q01-diep [pl], Q01a-ondiep & Q01b-ondiep [pl]	O
Kotter	U	Wintershall	K18b [pl]	O
Logger	U	Wintershall	L16a [pl], Q01-diep [pl]	O

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

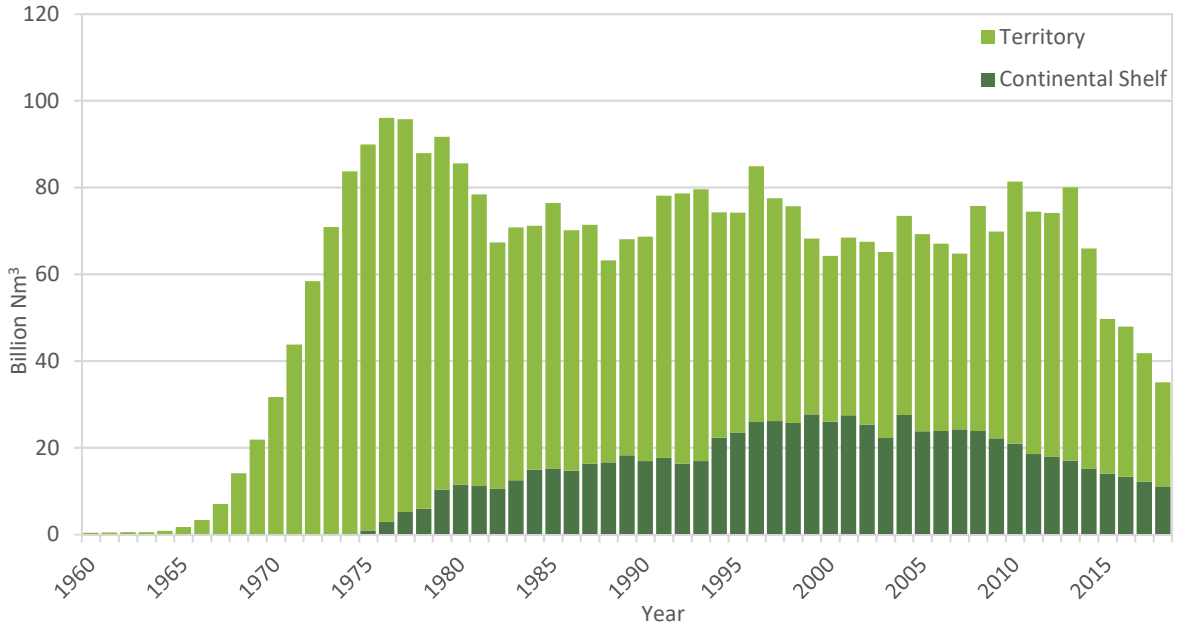
*** el = exploration licence, pl = production licence, sl = storage licence.

B. Production of natural gas (in million Nm^3)

Year	Territory	Continental shelf	Total
1960	363.8	-	363.8
1961	451.0	-	451.0
1962	509.8	-	509.8
1963	571.3	-	571.3
1964	830.0	-	830.0
1965	1,722.6	-	1,722.6
1966	3,376.9	-	3,376.9
1967	7,033.3	-	7,033.3
1968	14,107.3	-	14,107.3
1969	21,884.4	-	21,884.4
1970	31,663.6	7.5	31,671.0
1971	43,820.0	2.3	43,822.3
1972	58,423.8	1.3	58,425.1
1973	70,840.8	7.4	70,848.2
1974	83,720.2	13.8	83,734.0
1975	88,993.0	912.7	89,905.7
1976	93,145.9	2,930.3	96,076.2
1977	90,583.8	5,191.9	95,775.8
1978	81,935.1	5,967.8	87,902.9
1979	81,354.2	10,351.9	91,706.2
1980	74,103.0	11,466.6	85,569.7
1981	67,204.3	11,178.9	78,383.2
1982	56,853.8	10,492.0	67,345.7
1983	58,302.5	12,480.7	70,783.2
1984	56,236.0	14,958.5	71,194.5
1985	61,182.9	15,227.2	76,410.1
1986	55,409.8	14,732.7	70,142.5
1987	55,039.3	16,364.7	71,404.0
1988	46,514.7	16,667.7	63,182.3
1989	49,810.1	18,286.8	68,096.8
1990	51,719.3	16,918.6	68,637.8
1991	60,378.5	17,705.3	78,083.8
1992	62,252.6	16,371.9	78,624.5
1993	62,680.9	16,914.2	79,595.1
1994	51,982.7	22,301.2	74,283.9
1995	50,826.7	23,409.8	74,236.5
1996	59,024.5	25,914.7	84,939.2
1997	51,412.3	26,133.0	77,545.3
1998	49,993.9	25,716.1	75,710.0
1999	40,574.8	27,673.6	68,248.4
2000	38,203.4	26,031.5	64,234.9

Year	Territory	Continental shelf	Total
2001	40,951.7	27,518.3	68,470.0
2002	42,137.6	25,364.7	67,502.3
2003	42,881.1	22,273.8	65,154.9
2004	45,880.1	27,592.8	73,472.9
2005	45,498.2	23,779.6	69,277.8
2006	43,169.5	23,858.0	67,027.5
2007	40,464.5	24,259.0	64,723.5
2008	51,860.7	23,900.0	75,760.7
2009	47,696.4	22,165.0	69,861.4
2010	60,475.0	20,921.0	81,396.0
2011	55,881.7	18,551.2	74,432.9
2012	56,233.1	17,899.8	74,132.9
2013	63,043.5	17,004.1	80,047.5
2014	50,696.9	15,257.6	65,954.5
2015	35,640.0	14,049.0	49,689.0
2016	34,588.0	13,334.0	47,922.0
2017	29,661.0	12,179.0	41,840.0
2018	24,088.2	10,967.9	35,056.1
Total	2,745,883.9	773,207.1	3,519,019.1

Production of natural gas 1960 – 2018



C. Gas reserves and cumulative production in billion Nm^3

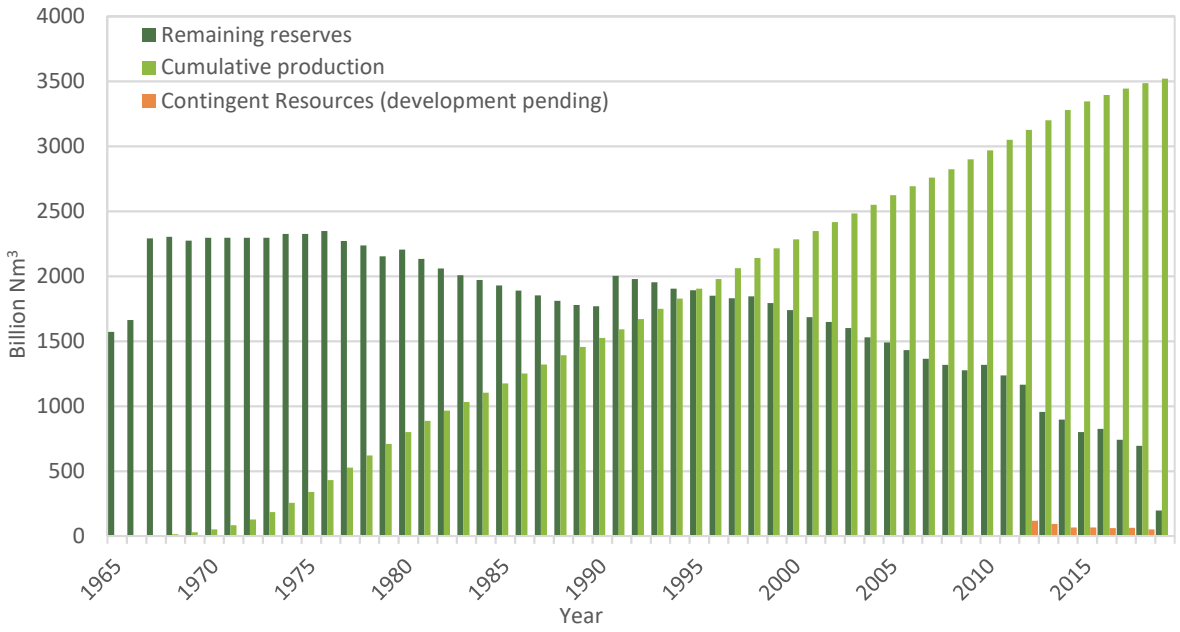
Year	Territory		Continental shelf		Total	
As at 1 Jan.	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
1974	2,125	256	200	-	2,325	256
1975	2,125	339	200	-	2,325	339
1976	2,025	428	322	1	2,347	429
1977	1,923	521	348	4	2,271	525
1978	1,891	612	344	9	2,235	621
1979	1,827	694	325	15	2,152	709
1980	1,917	775	288	25	2,205	801
1981	1,850	849	282	37	2,133	886
1982	1,799	917	261	48	2,060	965
1983	1,748	973	258	59	2,006	1,032
1984	1,714	1,032	257	71	1,971	1,103
1985	1,662	1,088	266	86	1,928	1,174
1986	1,615	1,149	275	101	1,889	1,250
1987	1,568	1,205	284	116	1,852	1,321
1988	1,523	1,260	287	132	1,810	1,392
1989	1,475	1,306	303	149	1,778	1,455
1990	1,444	1,356	323	167	1,767	1,523
1991	1,687	1,408	316	184	2,002	1,592
1992	1,648	1,468	329	202	1,976	1,670
1993	1,615	1,530	337	218	1,953	1,749
1994	1,571	1,593	334	235	1,904	1,828
1995	1,576	1,645	316	257	1,892	1,902
1996	1,545	1,696	304	281	1,850	1,977
1997	1,504	1,755	325	307	1,829	2,062
1998	1,491	1,806	353	333	1,845	2,139
1999	1,453	1,856	341	359	1,794	2,215
2000	1,420	1,897	319	386	1,740	2,283
2001	1,371	1,935	313	412	1,684	2,347
2002	1,332	1,976	316	440	1,648	2,416
2003	1,290	2,018	310	465	1,600	2,483
2004	1,286	2,061	244	487	1,530	2,548
2005	1,236	2,107	253	515	1,489	2,622
2006	1,218	2,152	213	539	1,431	2,691
2007	1,168	2,196	195	563	1,363	2,758
2008	1,129	2,236	188	587	1,317	2,823
2009	1,101	2,288	173	611	1,274	2,899
2010	1,143	2,336	174	633	1,317	2,969
2011	1,080	2,396	155	654	1,236	3,050
2012	1,012	2,452	153	673	1,165	3,124

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	Territory			Continental shelf			Total		
as at 1 Jan.	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod
2013	850	67	2,508	105	49	690	955	117	3,199
2014	805	60	2,571	92	32	707	897	92	3,279
2015	705	41	2,622	94	24	723	799	65	3,345
2016	734	40	2,658	92	25	737	825	66	3,394
2017	653	41	2,692	87	21	750	740	62	3,442
2018	620	39	2,722	75	24	762	664	62	3,484
2019	125	18	2,746	71	32	773	196	50	3,519

Gas reserves and cumulative production (1 januari 2019), 1965 – 2019

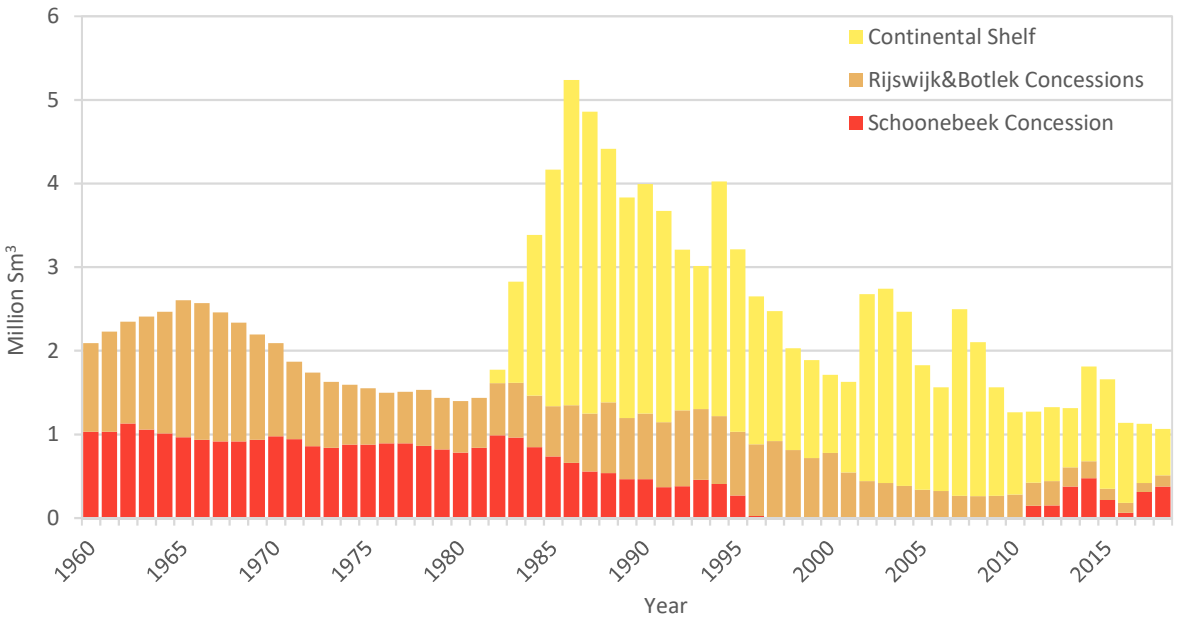


D. Oil production in 1000 Sm^3

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Continental shelf	Total
to 1959	11.749	-	-	11.749
1960	1.031	1.058	-	2.089
1961	1.030	1.197	-	2.227
1962	1.129	1.217	-	2.346
1963	1.057	1.350	-	2.407
1964	1.011	1.454	-	2.465
1965	0.963	1.638	-	2.601
1966	0.932	1.636	-	2.568
1967	0.913	1.545	-	2.458
1968	0.914	1.419	-	2.333
1969	0.933	1.262	-	2.195
1970	0.976	1.112	-	2.088
1971	0.941	0.927	-	1.868
1972	0.856	0.883	-	1.739
1973	0.838	0.787	-	1.626
1974	0.878	0.716	-	1.594
1975	0.877	0.672	-	1.549
1976	0.892	0.605	-	1.497
1977	0.891	0.618	-	1.509
1978	0.862	0.668	-	1.530
1979	0.820	0.616	-	1.436
1980	0.779	0.618	-	1.397
1981	0.839	0.597	-	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	-	0.918	1.557	2.474
1998	-	0.810	1.219	2.029
1999	-	0.715	1.173	1.888

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Continental shelf	Total
2000	-	0.776	0.936	1.713
2001	-	0.542	1.085	1.628
2002	-	0.439	2.236	2.675
2003	-	0.416	2.325	2.741
2004	-	0.381	2.082	2.463
2005	-	0.335	1.490	1.825
2006	-	0.322	1.238	1.561
2007	-	0.264	2.233	2.497
2008	-	0.261	1.841	2.102
2009	-	0.264	1.296	1.560
2010	-	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
2017	0.310	0.099	0.705	1.114
2018	0.375	0.133	0.556	1.064
Total	42.320	42.016	63.730	148.066

Oil production 1960 – 2018



E. Oil reserves and cumulative production in million Sm^3

Year	Territory		Continental shelf		Total	
as at 1 January	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
1970	36.0	35.4	-	-	36.0	35.4
1971	34.0	37.5	-	-	34.0	37.5
1972	32.0	39.4	-	-	32.0	39.4
1973	29.0	41.1	-	-	29.0	41.1
1974	27.0	42.8	-	-	27.0	42.8
1975	40.0	44.4	14.0	-	54.0	44.4
1976	51.0	45.9	14.0	-	65.0	45.9
1977	49.0	47.4	16.0	-	65.0	47.4
1978	46.0	48.9	7.0	-	53.0	48.9
1979	44.0	50.4	9.0	-	53.0	50.4
1980	43.0	51.9	11.0	-	54.0	51.9
1981	41.0	53.3	14.0	-	55.0	53.3
1982	39.0	54.7	20.0	-	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

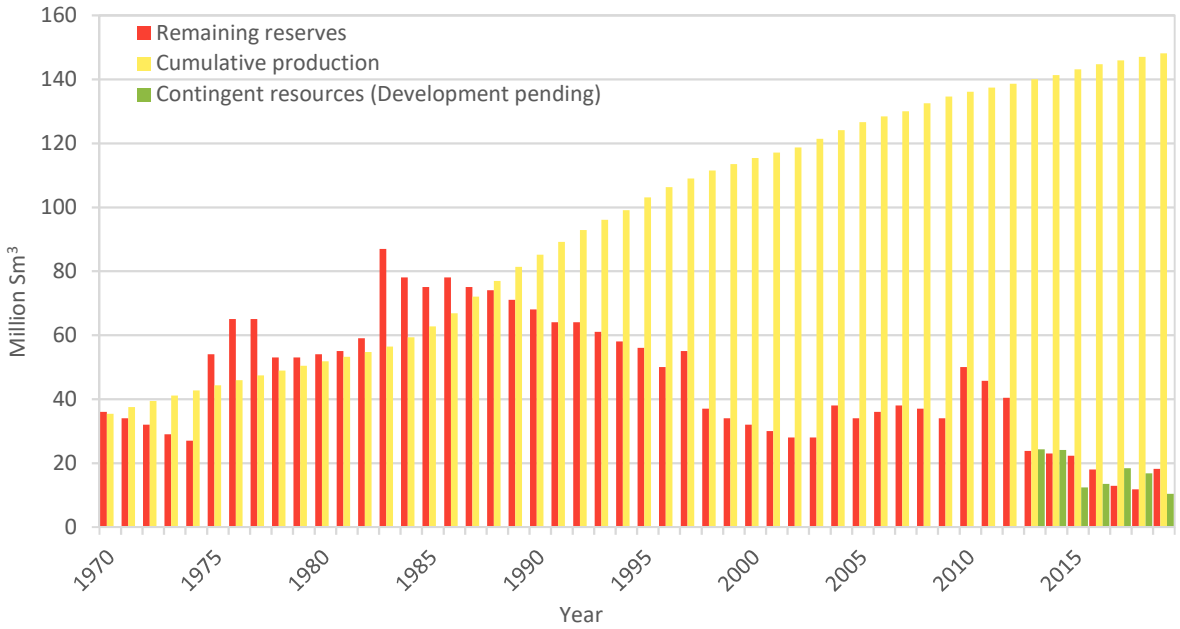
Year	Territory		Continental shelf		Total	
as at 1 January	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
2009	25.0	80.2	9.0	54.4	34.0	134.5
2010	37.0	80.5	13.0	55.6	50.0	136.1
2011	33.7	80.7	12.0	56.6	45.7	137.4
2012	28.6	81.2	11.8	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	Territory			Continental shelf			Total		
as at 1 January	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod	Rem Res	Cont Res	Cum prod
2013	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
2018	8.2	8.9	83.8	3.6	7.9	63.2	11.8	16.8	147.0
2019	7.9	8.9	84.3	10.3	1.5	63.7	18.2	10.4	148.1

Oil reserves and cumulative production in million Sm^3 1970 – 2019



F. Natural gas revenues

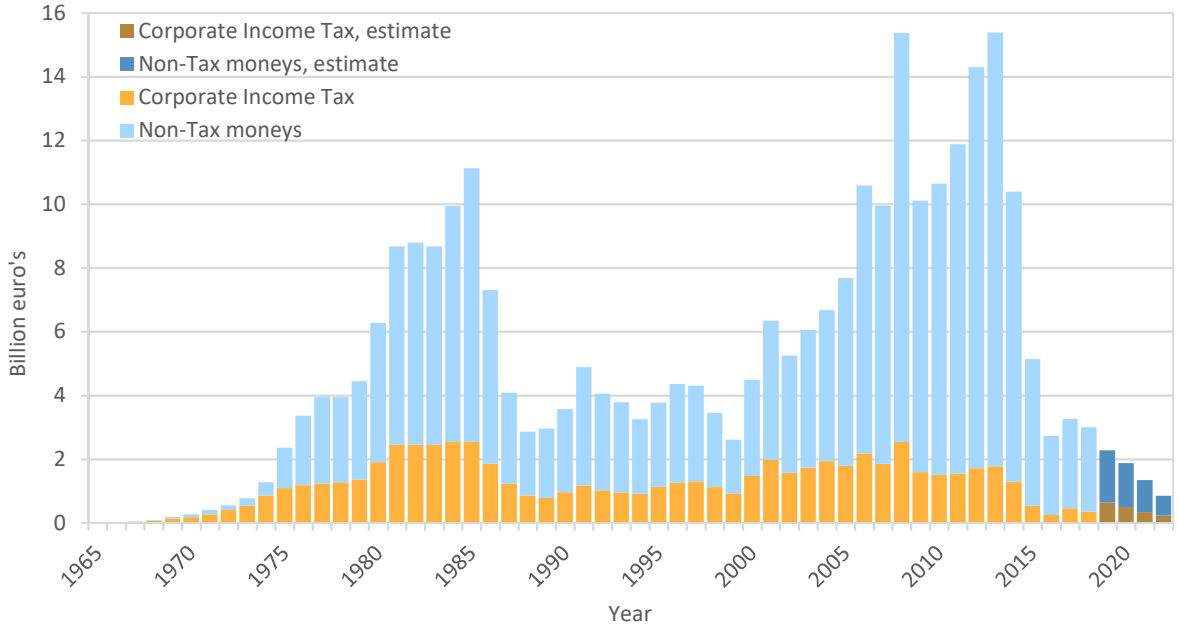
Year	Non-tax revenu (€10^9)	Corporation taks (€10^9)	Total (€10^9)
1965	-	-	-
1966	-	0.01	0.01
1967	0.01	0.04	0.05
1968	0.02	0.07	0.09
1969	0.05	0.14	0.19
1970	0.09	0.18	0.27
1971	0.14	0.27	0.41
1972	0.14	0.41	0.55
1973	0.23	0.54	0.77
1974	0.41	0.86	1.27
1975	1.27	1.09	2.36
1976	2.18	1.18	3.36
1977	2.72	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	8.80
1983	6.22	2.45	8.67
1984	7.40	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	3.10	1.26	4.36
1997	3.01	1.30	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	1.80	7.68

Year	Non-tax revenu (€10^9)	Corporation taks (€10^9)	Total (€10^9)
2006	8.40	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	14.30
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	2.80	0.46	3.26
2018	2.65	0.35	3.00
Prognosis			
2019	*1.64*	*0.64*	*2.28*
2020	*1.38*	*0.50*	*1.88*
2021	*1.00*	*0.34*	*1.34*
2022	*0.62*	*0.23*	*0.85*

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 2019 until the end of 2022 is anticipated based on the expected price at gas trading hubs such as TTF. The TTF price per Sm^3 gas used to calculate the estimates is expected to be from 17 to 20 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



G. Exploration licences for hydrocarbons, Netherlands territory as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
1	Tulip Oil Netherlands B.V.	Schagen	355	20-06-2009	31-08-2022	118
	Petrogas E&P UK Ltd.					
2	Tulip Oil Netherlands B.V.	Terschelling-Noord *	23	30-07-2013	-	22 215
3	Vermilion Energy Netherlands B.V.	Akkrum *	210	14-03-2013	-	10 461
4	Vermilion Energy Netherlands B.V.	Engelen **	97	14-10-2009	23-11-2018	16 878
5	Vermilion Energy Netherlands B.V.	Follega	3	15-06-2010	30-06-2025	9 426
	Vermilion Energy Netherlands Non-Op B.V.					
6	Vermilion Energy Netherlands B.V.	Hemelum	450	17-01-2012	31-01-2023	1 490
7	Vermilion Energy Netherlands B.V.	IJsselmuiden **	447	17-01-2014	27-02-2018	1 958
8	Vermilion Energy Netherlands B.V.	Lemsterland	111	15-06-2010	30-06-2025	9 427
	Vermilion Energy Netherlands Non-Op B.V.					
9	Vermilion Energy Netherlands B.V.	Oosterwolde **	127	20-04-2007	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 **	1,144	26-04-2007	23-11-2018	85
		Total	3,197			

* Applied for a production licence.

** Applied for extension.

H. Production licences for hydrocarbons, Netherlands territory as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
1	Nederlandse Aardolie Maatschappij B.V.	Beijerland	140	14-02-1997	14-02-2027	243
2	Nederlandse Aardolie Maatschappij B.V.	Botlek II	232	04-03-2014	19-07-2026	7 445
3	Nederlandse Aardolie Maatschappij B.V.	De Marne	7	04-10-1994	04-10-2034	189
	ExxonMobil Producing Netherlands B.V.					
4	Nederlandse Aardolie Maatschappij B.V.	Drenthe IIB	1881	17-03-2012		6 883
5	Nederlandse Aardolie Maatschappij B.V.	Groningen	2970	30-05-1963		126
6	Nederlandse Aardolie Maatschappij B.V.	Hardenberg	161	22-10-1990	22-10-2035	149
7	Nederlandse Aardolie Maatschappij B.V.	Middelie	946	12-05-1969		94
8	Nederlandse Aardolie Maatschappij B.V.	Noord-Friesland	1593	27-02-1969		47
	ExxonMobil Producing Netherlands B.V.					
9	Nederlandse Aardolie Maatschappij B.V.	Rijswijk	2090	03-01-1955		21
10	Nederlandse Aardolie Maatschappij B.V.	Rossum-de Lutte	46	12-05-1961		116
11	Nederlandse Aardolie Maatschappij B.V.	Schoonebeek	930	03-05-1948		110
12	Nederlandse Aardolie Maatschappij B.V.	Tietjerksteradeel III	168	25-01-2018		5 149
13	Nederlandse Aardolie Maatschappij B.V.	Tubbergen	177	11-03-1953		80
14	Nederlandse Aardolie Maatschappij B.V.	Twenthe	276	01-04-1977		26
15	Oranje-Nassau Energie B.V.	Botlek-maas	3	04-03-2014	19-07-2026	7 445
	TAQA Offshore B.V.					
16	TAQA Onshore B.V.	Bergen II	221	23-12-2006		232
	Dana Petroleum Netherlands B.V.					
	RockRose (NL) CS1 B.V.					
17	TAQA Onshore B.V.	Bergermeer	19	23-12-2006		232
18	TAQA Piek Gas B.V.	Alkmaar	12	23-12-2006		232
	Dana Petroleum Netherlands B.V.					
	RockRose (NL) CS1 B.V.					
19	Tulip Oil Netherlands B.V.	Akkrum 11	6	26-07-2012	04-04-2025	6 909
20	Tulip Oil Netherlands B.V.	Donkerbroek	22	04-04-1995	04-04-2025	66
21	Tulip Oil Netherlands B.V.	Donkerbroek-west	2	16-03-2011	04-04-2025	4 902
22	Tulip Oil Netherlands B.V.	Marknesse	19	26-01-2010	09-03-2030	1 446
23	Vermilion Energy Netherlands B.V.	Andel Va	61	05-08-2015	29-12-2038	29 954
	Parkmead (E&P) Ltd.					
24	Vermilion Energy Netherlands B.V.	Andel Vb	164	05-08-2015	29-12-2038	29 954
	Parkmead (E&P) Ltd.					
25	Vermilion Energy Netherlands B.V.	Drenthe IIA	7	17-03-2012		6 883
26	Vermilion Energy Netherlands B.V.	Drenthe IIIA	1	17-03-2012		6 885
27	Vermilion Energy Netherlands B.V.	Drenthe IV	7	18-07-2007		140
	Parkmead (E&P) Ltd.					
28	Vermilion Energy Netherlands B.V.	Drenthe V	25	20-06-2015		18 037
	Parkmead (E&P) Ltd.					

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
29	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe VI	363	20-06-2015		18 037
30	Vermilion Energy Netherlands B.V. Vermilion Energy Netherlands Non-Op B.V.	Gorredijk	629	29-07-1989	29-07-2024	145
31	Vermilion Energy Netherlands B.V. Vermilion Energy Netherlands Non-Op B.V.	Leeuwarden	614	27-02-1969		46
32	Vermilion Energy Netherlands B.V. Vermilion Energy Netherlands Non-Op B.V.	Oosterend	92	05-09-1985		84
33	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Papekop	63	08-06-2006	19-07-2031	113
34	Vermilion Energy Netherlands B.V. Vermilion Energy Netherlands Non-Op B.V.	Slootdorp	162	01-05-1969		94
35	Vermilion Energy Netherlands B.V.	Steenwijk	99	16-09-1994	16-09-2029	177
36	Vermilion Energy Netherlands B.V.	Tietjerksteradeel II	251	25-01-2018		5 149
37	Vermilion Energy Netherlands B.V.	Waalwijk	186	17-08-1989	17-08-2024	154
38	Vermilion Energy Netherlands B.V.	Zuid-Friesland III	105	09-03-2010	19-04-2030	4 016
39	Vermilion Energy Netherlands B.V. Vermilion Energy Netherlands Non-Op B.V.	Zuidwal	74	07-11-1984		190
		Total	14,822			

I. Subsurface storage licences, Netherlands territory as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant	Substance
1	Akzo Nobel Salt B.V.	Twenthe-Rijn de Marssteden	2	02-10-2010	12-11-2040	15 650	Gasoil
2	Akzo Nobel Salt B.V.	Winschoten III	28	15-11-2010	13-05-2079	18 321	Nitrogen
3	EnergyStock B.V.	Zuidwending	1	11-04-2006	11-04-2036	77	Gas
	Akzo Nobel Salt B.V.						
4	Gasunie Transport Services B.V.	Winschoten II	<1	15-11-2010	13-05-2079	18 321	Nitrogen
5	Nederlandse Aardolie Maatschappij B.V.	Grijpskerk	27	01-04-2003		67	Gas
6	Nederlandse Aardolie Maatschappij B.V.	Norg	81	01-04-2003		68	Gas
7	TAQA Onshore B.V.	Bergermeer	19	08-01-2007	30-06-2050	7	Gas
8	TAQA Piek Gas B.V.	Alkmaar	12	01-04-2003		68	Gas
	Dana Petroleum Netherlands B.V.						
	RockRose (NL) CS1 B.V.						
		Total	171				

J. Exploration licences for geothermal energy, Netherlands territory as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
1	A-ware Production B.V.	Heerenveen	46	28-10-2014	20-05-2021	31 141
2	Grondexploitatiemaatschappij Californië B.V. **	Californië VI	63	01-10-2015	30-12-2018	34 771
3	DDH Energy B.V.	Drachten	19	12-09-2017	23-10-2021	52 546
4	DDH Energy B.V.	Leeuwarden 2	14	01-04-2015	12-05-2019	10 222
5	ECW Geoholding B.V. *	Andijk	12	05-03-2010		3 831
6	ECW Geoholding B.V. *	Middenmeer	5	16-07-2009		11 070
7	ECW Geoholding B.V.	Middenmeer 2	15	13-10-2009	30-12-2022	15 999
8	ECW Geoholding B.V.	Middenmeer 4	62	17-02-2018	30-03-2024	12 045
9	Ekowarmte B.V.	Velden	21	09-02-2016	21-03-2020	9 270
10	Energie Transitie Partners B.V.	Maasdijk	6	21-10-2009	31-05-2020	16 041
11	Energie Transitie Partners B.V.	Monster 2	9	26-10-2018	06-12-2022	65 345
	J.C.P. van den Ende					
	M.G.W. van den Ende					
	S.P.C. van den Ende					
	T.J.M. van den Ende					
12	EnergieWende B.V.	De Lier 3II	10	01-05-2015	19-01-2019	13 276
	De Bruijn Geothermie B.V.					
13	FrieslandCampina Consumer Products International B.V.	Leeuwarden 5	158	14-03-2018	24-04-2023	15 509
14	Gedeputeerde Staten van Overijssel	Koekoekspolder IIa	28	21-03-2014	30-12-2019	9 051
15	Gemeente Zwolle	Zwolle	74	23-12-2017	02-02-2021	2018/202
16	Gipmans Verhuur B.V.	Venlo	24	09-02-2016	21-03-2020	9268
17	AC Hartman Beheer B.V.	Sexbierum	11	17-07-2009	29-02-2020	11 805
	Gemeente Franekeradeel					
18	Hoogweg Aardwarmte B.V. *	Luttelgeest II	59	08-04-2017		25 792
19	N.V. HVC	Alkmaar	192	17-10-2018	27-11-2022	65 375
20	N.V. HVC	Den Helder	100	14-11-2018	27-12-2022	65 384
21	N.V. HVC	Lelystad	102	14-11-2018	27-12-2022	67 020
22	N.V. HVC	Velsen	40	18-12-2018	28-01-2023	73447
23	Hydreco GeoMEC B.V.	Brielle 2	25	13-10-2009	30-12-2021	15 990
	GeoMEC-4P Realisatie & Exploitatie B.V.					
24	Hydreco GeoMEC B.V.	Den Haag	10	03-04-2009	31-07-2019	69
	Haagse Aardwarmte Leyweg B.V.					
25	Hydreco GeoMEC B.V.	Helmond 2	71	26-08-2015	06-10-2019	30 252
26	Hydreco GeoMEC B.V.	Oostvoorne	17	09-03-2010	30-12-2019	4 013
	Duurzaam Voorne Holding B.V.					
27	Hydreco GeoMEC B.V.	Pijnacker-Nootdorp 6a	9	26-08-2015	30-06-2019	30 241
28	Hydreco GeoMEC B.V.	Rotterdam 4	20	18-12-2012	30-06-2020	208

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
29	Hydreco GeoMEC B.V.	Tilburg-Geertruidenberg	325	10-07-2015	20-08-2019	21 858
30	Hydreco GeoMEC B.V.	Vierpolders	5	10-02-2010	30-12-2021	2 211
	GeoMEC-4P Realisatie & Exploitatie B.V.					
31	Geothermie De Kievit B.V.	Peel En Maas	48	19-12-2014	31-07-2020	243
32	Geocombinatie Leeuwarden B.V.	Leeuwarden	30	28-10-2014	8-12-2021	31 137
	Ennatuurlijk B.V.					
33	Nature's Heat B.V. *	Kwintsheul II	7	01-05-2015		13 276
34	Vereniging van Eigenaren Oude Campspolder **	Maasland 2	5	15-10-2010	31-12-2018	16 611
35	Provincie Drenthe	Erica	72	27-10-2010	06-12-2020	17 250
	Gemeente Emmen					
36	Provincie Drenthe	Klazienaveen	61	27-10-2010	30-11-2020	17 245
	Gemeente Emmen					
37	J.W.M. Scheffers *	Honselersdijk	5	20-06-2009		118
	G. Verkade B.V.					
38	Trias Westland B.V. *	De Lier IV	2	01-07-2015		21 833
39	Trias Westland B.V. *	Naaldwijk 2II	4	01-05-2015		13 276
40	Trias Westland B.V. *	Naaldwijk 3	10	15-04-2016		20 814
41	Uniper Benelux N.V.	Rotterdam 5	39	18-12-2012	30-06-2020	733
42	Vermilion Energy Netherlands B.V.	Middenmeer 3	98	24-02-2018	06-04-2022	12 042
43	Visser en Smit Hanab B.V. *	Zevenbergen II	4	06-07-2017		39 858
	GeoBrothers B.V.					
44	Visser en Smit Hanab B.V.	Zevenbergen III	39	06-07-2017	30-10-2019	39 858
45	WarmteStad B.V. **	Groningen 2	18	16-04-2011	30-12-2018	7 134
46	Wayland Developments B.V.	Waddinxveen 2	7	05-03-2010	31-12-2019	3 829
47	Wayland Energy B.V.	Lansingerland 4	6	27-09-2014	30-09-2020	28 237
48	Wayland Energy B.V.	Zuidplas	46	22-08-2018	02-10-2022	48 156
49	Wayland Energy Bergschenhoek *	Lansingerland	7	04-12-2008		240
50	Kwekerij de Westhoek B.V. *	Maasland	9	18-12-2009		79
	Van Geest Groep B.V.					
51	Californië Wijnen Geothermie B.V.	Californië IV	6	01-10-2015	30-12-2020	34 771
		Total	2,076			

* Applied for a production licence.

** Applied for extention.

K. Production licences for geothermal energy, Netherlands territory as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
1	Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4	4	24-12-2016	03-02-2052	3 132
2	A en G van den Bosch B.V.	Bleiswijk	4	28-11-2008	08-01-2039	237
3	A en G van den Bosch B.V.	Bleiswijk 1b	2	20-03-2015	30-04-2032	8 784
4	Ce-Ren Beheer B.V.	Heemskerk	3	15-04-2016	26-05-2046	20 802
5	Gebroeders Duijvestijn Energie B.V.	Pijnacker-Nootdorp 5	5	24-12-2016	03-02-2052	3 136
6	EnergieWende B.V.	De Lier	6	14-07-2016	24-08-2051	38 394
	De Bruijn Geothermie B.V.					
7	Gemeente Heerlen	Heerlen	41	13-10-2009	23-11-2044	15 963
8	Hydreco GeoMEC B.V.	Vierpolders	6	21-06-2017	01-08-2052	36 194
	GeoMEC-4P Realisatie & Exploitatie B.V.					
9	Aardwarmtecluster I KKP B.V.	Kampen	5	27-09-2014	07-11-2044	28 239
10	Californië Lipzig Gielen Geothermie B.V.	Californië V	5	06-07-2017	16-08-2052	39 833
11	Aardwarmte Vogelaer B.V.	Poeldijk	5	31-08-2017	11-10-2052	52 090
12	Californië Wijnen Geothermie B.V.	Californië IV	4	06-07-2017	16-08-2052	39 843
	GeoWeb B.V.					
		Total	91			

L. Exploration licences for rock salt, Netherlands territory as at 1 January 2019

No ongoing exploration licences as at 1 January 2019.

M. Production licences for rock salt, Netherlands territory as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective from	Staatscourant
1	Akzo Nobel Salt B.V.	Adolf van Nassau III	28	16-11-2010	-	18 324
2	Akzo Nobel Salt B.V.	Buurse	30	18-06-1918	-	Staatsblad 421
3	Akzo Nobel Salt B.V.	Isidorushoeve	20	08-06-2012	19-07-2052	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	09-12-2048	216
6	Akzo Nobel Salt B.V.	Twenthe-Rijn Oude Maten	1	01-06-2013	12-07-2053	18 332
7	Akzo Nobel Salt B.V.	Uitbreiding Adolf van Nassau II	1	21-12-2009	-	81
	EnergyStock B.V.					
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	01-12-1994	-	249
10	Akzo Nobel Salt B.V.	Weerselo	80	13-03-1967	-	76
11	Frisia Zout B.V.	Barradeel	3	22-08-1998	22-08-2054	157
12	Frisia Zout B.V.	Barradeel II	17	12-06-2004	26-04-2062	110
13	Frisia Zout B.V.	Havenmond	32	03-01-2012	13-02-2052	405
14	Gasunie Transport Services B.V.	Adolf Van Nassau II	<1	16-11-2010	-	18 324
15	Nedmag B.V.	Veendam	171	01-08-1980	-	148
16	Salzgewinnungsgesellschaft Westfalen mbH & Co KG	Zuidoost-Enschede	6	07-03-2014	17-04-2064	7 304
		Total	526			

N. Production licence for coal, Netherlands territory as at 1 January 2019

	Licence	Licence holder	Effective from	Area (km²)
P1	Staatsmijn Beatrix	Koninklijke DSM N.V.	27-09-1920	130
P2	Staatsmijn Emma	Koninklijke DSM N.V.	26-10-1906	73
P3	Staatsmijn Hendrik	Koninklijke DSM N.V.	08-08-1910	24
P4	Staatsmijn Maurits	Koninklijke DSM N.V.	12-03-1915	51
P5	Staatsmijn Wilhelmina	Koninklijke DSM N.V.	08-01-1903	6
			Total	284

O. Exploration licences for hydrocarbons, Netherlands continental shelf as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
1	Dana Petroleum Netherlands B.V. *	F06b	260	07-04-2009		70
	Oranje-Nassau Energie B.V.					
2	Jetex Petroleum Ltd	P04, P07 & P08b	785	07-10-2016	18-11-2020	52 818
3	Jetex Petroleum Ltd	P10c	249	21-07-2016	02-09-2020	38 277
4	Neptune Energy Netherlands B.V.	D09 & E07	548	04-09-2015	16-10-2020	27 592
5	Neptune Energy Netherlands B.V.	E10	401	16-01-2008	30-06-2019	13
	HALO Exploration & Production Netherlands B.V.					
6	Neptune Energy Netherlands B.V.	E11	401	22-04-2009	30-06-2019	84
	HALO Exploration & Production Netherlands B.V.					
7	Neptune Energy Netherlands B.V.	E15c	283	22-04-2008	30-06-2019	78
	Gas Plus Netherlands B.V.					
	HALO Exploration & Production Netherlands B.V.					
8	Neptune Energy Netherlands B.V.	K01c	274	22-11-2011	03-01-2020	21 372
9	Neptune Energy Netherlands B.V.	L03	406	13-05-2016	23-06-2022	24 426
	Nederlandse Aardolie Maatschappij B.V.					
10	Nederlandse Aardolie Maatschappij B.V.	J09	18	11-04-2014	31-12-2019	10 508
	Oranje-Nassau Energie B.V.					
	HALO Exploration & Production Netherlands B.V.					
	Wintershall Noordzee B.V.					
11	Oranje-Nassau Energie B.V.	G18	405	18-09-2012	31-12-2022	23 464
	Hansa Hydrocarbons Limited					
12	Oranje-Nassau Energie B.V.	H16	73	18-09-2012	31-12-2022	23 463
	Hansa Hydrocarbons Limited					
13	Oranje-Nassau Energie B.V.	M02a	134	22-11-2011	02-01-2020	1 486
14	Oranje-Nassau Energie B.V.	M03	406	18-09-2012	31-12-2022	23 462
	Hansa Hydrocarbons Limited					
15	Oranje-Nassau Energie B.V.	M04a	209	21-09-2010	02-01-2020	14 900
16	Oranje-Nassau Energie B.V.	N01	217	18-09-2012	31-12-2022	23 460
	Hansa Hydrocarbons Limited					
17	Oranje-Nassau Energie B.V.	N04	381	14-03-2015	17-04-2020	6 003
	Hansa Hydrocarbons Limited					
18	Oranje-Nassau Energie B.V.	N05	14	14-03-2015	17-04-2020	6 003
	Hansa Hydrocarbons Limited					
19	Oranje-Nassau Energie B.V.	N08	34	14-03-2015	17-04-2020	6 003
	Hansa Hydrocarbons Limited					
20	Oranje-Nassau Energie B.V.	S03b	337	07-09-2016	18-10-2020	46 557
	TAQA Offshore B.V.					
21	Oranje-Nassau Energie Resources B.V.	F17a-ondiep	386	30-12-2009	31-12-2020	154
	Petro Ventures Netherlands B.V.					

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
22	Oranje-Nassau Energie Resources B.V. Petro Ventures Netherlands B.V.	F18a-ondiep	170	30-12-2009	31-12-2020	152
23	Petrogas E&P Netherlands B.V. * RockRose (NL) CS1 B.V. TAQA Offshore B.V.	A12b & B10a	79	16-04-2005		77
24	Petrogas E&P Netherlands B.V. * RockRose (NL) CS1 B.V. TAQA Offshore B.V.	B16a	67	11-05-1987		70
25	Tulip Oil Netherlands B.V.	M10a & M11	110	28-07-2007	30-06-2022	152
26	Tulip Oil Netherlands Offshore B.V.	Q08, Q10b & Q11	758	29-09-2018	09-11-2022	56 679
27	Wintershall Noordzee B.V. Neptune Energy Netherlands B.V. TAQA Offshore B.V. Rosewood Exploration Ltd.	F10	401	19-12-2014	30-01-2019	36 868
28	Wintershall Noordzee B.V. Neptune Energy Netherlands B.V. TAQA Offshore B.V. Rosewood Exploration Ltd.	F11a	80	19-12-2014	30-01-2019	36 868
29	Wintershall Noordzee B.V. Neptune Energy Netherlands B.V. Rosewood Exploration Ltd.	F18b-diep	31	30-12-2009	31-03-2019	152
		Total	7,920			

* Applied for a production licence.

P. Production licences for hydrocarbons, Netherlands continental shelf as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
1	Dana Petroleum Netherlands B.V.	F02a	307	24-08-1982	24-08-2022	139
	Oranje-Nassau Energie B.V.					
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
2	Dana Petroleum Netherlands B.V.	P10a	5	31-05-2005	31-12-2027	102
3	Dana Petroleum Netherlands B.V.	P10b	100	07-04-2009	31-12-2027	70
4	Dana Petroleum Netherlands B.V.	P11b	210	03-04-2004	31-12-2027	67
5	Nederlandse Aardolie Maatschappij B.V.	F17c	18	04-12-1996	04-12-2024	207
6	Nederlandse Aardolie Maatschappij B.V.	K07	408	08-07-1981	31-12-2030	120
7	Nederlandse Aardolie Maatschappij B.V.	K08 & K11a	737	26-10-1977	31-12-2030	197
	Oranje-Nassau Energie B.V.					
	HALO Exploration & Production Netherlands B.V.					
	Wintershall Noordzee B.V.					
8	Nederlandse Aardolie Maatschappij B.V.	K14a	237	16-01-1975	31-12-2030	6
9	Nederlandse Aardolie Maatschappij B.V.	K15	412	14-10-1977	31-12-2030	197
10	Nederlandse Aardolie Maatschappij B.V.	K17	414	19-01-1989	19-01-2029	12
11	Nederlandse Aardolie Maatschappij B.V.	K18a	36	15-03-2007	09-05-2023	57
	Wintershall Noordzee B.V.					
12	Nederlandse Aardolie Maatschappij B.V.	L02	406	15-03-1991	15-03-2031	55
13	Nederlandse Aardolie Maatschappij B.V.	L09	409	18-09-2010	09-05-2035	14 911
14	Nederlandse Aardolie Maatschappij B.V.	L13	413	26-10-1977	31-12-2030	197
	Oranje-Nassau Energie B.V.					
	HALO Exploration & Production Netherlands B.V.					
	Wintershall Noordzee B.V.					
15	Nederlandse Aardolie Maatschappij B.V.	M09a	213	10-04-1990	10-04-2030	56
	ExxonMobil Producing Netherlands B.V.					
16	Nederlandse Aardolie Maatschappij B.V.	N07a	141	23-12-2003	10-03-2034	252
17	Neptune Energy Netherlands B.V.	D15	247	06-09-1996	06-09-2021	138
	Faroe Petroleum (UK) Ltd.					
	Wintershall Noordzee B.V.					
18	Neptune Energy Netherlands B.V.	D18a	58	29-08-2012	09-10-2032	19 757
	Faroe Petroleum (UK) Ltd.					
	Wintershall Noordzee B.V.					
19	Neptune Energy Netherlands B.V.	E16a	29	29-06-2007	09-08-2021	128
	Vermilion Energy Netherlands Non-Op B.V.					
	Total E&P Nederland B.V.					
20	Neptune Energy Netherlands B.V.	E17a & E17b	114	28-06-2007	08-08-2021	128
	Vermilion Energy Netherlands Non-Op B.V.					

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
	Total E&P Nederland B.V.					
21	Neptune Energy Netherlands B.V.	F03b	335	13-12-2007	09-09-2022	245
	TAQA Offshore B.V.					
22	Neptune Energy Netherlands B.V.	G14 & G17b	441	15-12-2006	14-12-2019	248
	Nederlandse Aardolie Maatschappij B.V.					
	TAQA Offshore B.V.					
23	Neptune Energy Netherlands B.V.	G16a	224	06-01-1992	06-01-2032	245
24	Neptune Energy Netherlands B.V.	G16b	5	11-10-2003	06-01-2032	198
25	Neptune Energy Netherlands B.V.	G17a	237	19-07-2006	14-12-2019	143
26	Neptune Energy Netherlands B.V.	G17c & G17d	130	10-11-2000	10-11-2025	188
	Wintershall Noordzee B.V.					
27	Neptune Energy Netherlands B.V.	K02b	110	20-01-2004	24-08-2023	16
28	Neptune Energy Netherlands B.V.	K03a	83	24-08-1998	24-08-2023	122
29	Neptune Energy Netherlands B.V.	K03c	32	26-11-2005	06-01-2021	233
30	Neptune Energy Netherlands B.V.	K09a & K09b	211	11-08-1986	11-08-2026	129
	Oranje-Nassau Energie B.V.					
	Rosewood Exploration Ltd.					
	XTO Netherlands Ltd.					
31	Neptune Energy Netherlands B.V.	K09c	199	18-12-1987	18-12-2027	229
	Oranje-Nassau Energie B.V.					
	Rosewood Exploration Ltd.					
	XTO Netherlands Ltd.					
32	Neptune Energy Netherlands B.V.	K12	411	18-02-1983	18-02-2023	11
	Oranje-Nassau Energie B.V.					
	Production North Sea Netherlands Ltd.					
	Rosewood Exploration Ltd.					
	XTO Netherlands Ltd.					
33	Neptune Energy Netherlands B.V.	L04c	12	07-01-1994	07-01-2034	2
34	Neptune Energy Netherlands B.V.	L05a	163	15-03-1991	15-03-2031	55
35	Neptune Energy Netherlands B.V.	L10 & L11a	596	13-01-1971	01-01-2025	4
	Neptune Energy Participation Netherlands B.V.					
	Oranje-Nassau Energie B.V.					
	Rosewood Exploration Ltd.					
	XTO Netherlands Ltd.					
36	Neptune Energy Netherlands B.V.	L12a	119	25-09-2008	14-03-2030	189
	Delta Hydrocarbons B.V.					
	Oranje-Nassau Energie B.V.					
	Wintershall Noordzee B.V.					
37	Neptune Energy Netherlands B.V.	L12b & L15b	92	06-08-2008	12-03-2030	155
	Delta Hydrocarbons B.V.					
	Wintershall Noordzee B.V.					
38	Neptune Energy Netherlands B.V.	L15c	4	07-09-1990	07-09-2030	172
39	Neptune Energy Netherlands B.V.	N07b	87	14-2-2015	09-03-2034	5 845

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
	Rosewood Exploration Ltd.					
	XTO Netherlands Ltd.					
40	Neptune Energy Netherlands B.V.	Q13a	30	28-11-2006	28-12-2021	231
	Aceiro Energy B.V.					
	TAQA Offshore B.V.					
41	Oranje-Nassau Energie B.V.	L11b	47	15-06-1984	15-06-2024	110
42	Oranje-Nassau Energie B.V.	L11c	7	21-12-2018	24-08-2031	143
43	Oranje-Nassau Energie B.V.	L11d	172	21-12-2018	24-08-2031	143
	Neptune Energy Netherlands B.V.					
44	Oranje-Nassau Energie B.V.	L12c	30	06-08-2008	12-03-2030	155
	Delta Hydrocarbons B.V.					
	Wintershall Noordzee B.V.					
45	Oranje-Nassau Energie B.V.	L12d	225	25-09-2008	14-03-2030	189
	Delta Hydrocarbons B.V.					
	Wintershall Noordzee B.V.					
46	Oranje-Nassau Energie B.V.	L15d	62	06-08-2008	12-03-2030	155
	Delta Hydrocarbons B.V.					
	Wintershall Noordzee B.V.					
47	Oranje-Nassau Energie B.V.	M01a	213	28-06-2007	08-08-2022	128
48	Oranje-Nassau Energie B.V.	M07	409	22-03-2001	22-03-2021	19
	TAQA Offshore B.V.					
49	Oranje-Nassau Energie B.V.	N07c	87	14-02-2015	09-03-2034	5 845
	Hansa Hydrocarbons Limited					
50	Oranje-Nassau Energie B.V.	P11a	210	23-09-2015	03-11-2025	45 676
	TAQA Offshore B.V.					
51	Oranje-Nassau Energie B.V.	P18b	311	14-07-2017	24-08-2030	41 916
	TAQA Offshore B.V.					
52	Oranje-Nassau Energie B.V.	P18d	2	20-09-2012	31-10-2027	23 457
	TAQA Offshore B.V.					
53	Oranje-Nassau Energie B.V.	Q16a	85	29-12-1992	29-12-2032	227
	Vermilion Energy Netherlands Non-Op B.V.					
	Total E&P Nederland B.V.					
54	Oranje-Nassau Energie B.V.	Q16b & Q16c-diep	80	20-09-2012	31-10-2027	23 465
	TAQA Offshore B.V.					
55	Oranje-Nassau Energie B.V.	S03a	2	20-09-2012	31-10-2027	23 466
	TAQA Offshore B.V.					
56	Oranje-Nassau Energie B.V.	T01	1	20-09-2012	31-10-2027	23 467
	TAQA Offshore B.V.					
57	Petrogas E&P Netherlands B.V.	A12a	195	01-07-2005	11-08-2025	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
58	Petrogas E&P Netherlands B.V.	A12d	33	01-07-2005	11-08-2025	129

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
59	Petrogas E&P Netherlands B.V.	A15a	67	27-12-2011	03-02-2027	746
	Dana Petroleum Netherlands B.V.					
	RockRose (NL) CS1 B.V.					
60	Petrogas E&P Netherlands B.V.	A18a	229	01-07-2005	11-08-2025	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
61	Petrogas E&P Netherlands B.V.	A18c	47	01-07-2005	11-08-2025	125
	RockRose (NL) CS1 B.V.					
62	Petrogas E&P Netherlands B.V.	B10c & B13a	252	01-07-2005	11-08-2025	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
63	Petrogas E&P Netherlands B.V.	P08a	26	07-12-2018	17-01-2027	70 806
64	Petrogas E&P Netherlands B.V.	P09a, P09b & P09d	90	16-08-1993	16-08-2033	127
	Aceiro Energy B.V.					
	RockRose (NL) CS1 B.V.					
	Wintershall Noordzee B.V.					
65	Petrogas E&P Netherlands B.V.	P09c, P09e & P09f	101	16-08-1993	16-08-2033	126
	RockRose (NL) CS1 B.V.					
	Wintershall Noordzee B.V.					
66	Petrogas E&P Netherlands B.V.	Q01a-ondiep & Q01b-ondiep	43	23-12-2017	11-07-2020	193
67	Petrogas E&P Netherlands B.V.	Q02c	32	14-07-1994	14-07-2034	18
	RockRose (NL) CS1 B.V.					
68	Spirit Energy Nederland B.V.	B18a	8	10-10-1985	10-10-2025	182
69	Spirit Energy Nederland B.V.	F03a	18	13-12-2007	09-09-2022	245
70	Spirit Energy Nederland B.V.	J03b & J06	98	06-11-1992	06-11-2032	219
	RockRose (NL) CS1 B.V.					
	Total E&P Nederland B.V.					
71	TAQA Offshore B.V.	P15a & P15b	220	12-07-1984	12-07-2024	110
	Dana Petroleum Netherlands B.V.					
	Oranje-Nassau Energie B.V.					
	RockRose (NL) CS1 B.V.					
	Wintershall Noordzee B.V.					
72	TAQA Offshore B.V.	P15c	203	07-05-1992	07-05-2032	114
	Dana Petroleum Netherlands B.V.					
	Oranje-Nassau Energie B.V.					
	RockRose (NL) CS1 B.V.					
	Wintershall Noordzee B.V.					
73	TAQA Offshore B.V.	P18a	105	30-04-1992	30-04-2032	99
74	TAQA Offshore B.V.	P18c	6	02-06-1992	02-06-2032	99

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
	Dana Petroleum Netherlands B.V.					
	RockRose (NL) CS1 B.V.					
75	Total E&P Nederland B.V.	F06a	8	09-09-1982	09-09-2022	139
	Vermilion Energy Netherlands Non-Op B.V.					
	TAQA Offshore B.V.					
76	Total E&P Nederland B.V.	F15a	233	06-05-1991	06-05-2031	52
	First Oil Expro Ltd.					
	Vermilion Energy Netherlands Non-Op B.V.					
	RockRose (NL) CS1 B.V.					
77	Total E&P Nederland B.V.	F15d	4	15-6-1992	15-06-2032	97
	First Oil Expro Ltd.					
	Vermilion Energy Netherlands Non-Op B.V.					
	RockRose (NL) CS1 B.V.					
78	Total E&P Nederland B.V.	J03a	72	12-01-1996	12-01-2036	22
	Nederlandse Aardolie Maatschappij B.V.					
79	Total E&P Nederland B.V.	K01a	83	10-02-1997	10-02-2022	46
	Nederlandse Aardolie Maatschappij B.V.					
80	Total E&P Nederland B.V.	K01b & K02a	75	20-06-2009	31-07-2022	11 801
81	Total E&P Nederland B.V.	K02c	46	21-01-2004	07-11-2021	16
82	Total E&P Nederland B.V.	K03b	7	30-01-2001	30-01-2021	19
	Vermilion Energy Netherlands Non-Op B.V.					
83	Total E&P Nederland B.V.	K03d	26	01-04-1999	01-04-2024	58
	Vermilion Energy Netherlands Non-Op B.V.					
84	Total E&P Nederland B.V.	K04a	307	29-12-1993	29-12-2033	220
85	Total E&P Nederland B.V.	K04b & K05a	305	01-06-1993	01-06-2033	87
	Vermilion Energy Netherlands Non-Op B.V.					
	RockRose (NL) CS1 B.V.					
86	Total E&P Nederland B.V.	K05b	204	07-11-1996	7-11-2021	207
87	Total E&P Nederland B.V.	K06 & L07	817	20-06-1975	19-06-2020	112
	Vermilion Energy Netherlands Non-Op B.V.					
88	Total E&P Nederland B.V.	L01a	31	12-09-1996	31-12-2023	135
	Van Dyke Netherlands Inc.					
89	Total E&P Nederland B.V.	L01d	7	13-11-1996	31-12-2023	207
90	Total E&P Nederland B.V.	L01e	12	13-11-1996	31-12-2027	207
	Vermilion Energy Netherlands Non-Op B.V.					
91	Total E&P Nederland B.V.	L01f	17	14-01-2003	14-01-2033	235
	Vermilion Energy Netherlands Non-Op B.V.					
92	Total E&P Nederland B.V.	L04a	313	30-12-1981	30-12-2021	230
	Vermilion Energy Netherlands Non-Op B.V.					
93	Tulip Oil Netherlands Offshore B.V.	Q07 & Q10a	472	14-07-2017	24-08-2042	41 910
94	Wintershall Noordzee B.V.	D12a	214	06-09-1996	06-09-2021	138
	Neptune Energy Participation Netherlands B.V.					
95	Wintershall Noordzee B.V.	D12b	41	03-06-2017	14-07-2037	32 476

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
	Neptune Energy Netherlands B.V.					
	GAZPROM International UK Ltd.					
	Oranje-Nassau Energie B.V.					
96	Wintershall Noordzee B.V.	E15a	39	04-10-2002	21-10-2032	175
	Dana Petroleum Netherlands B.V.					
	Neptune Energy Netherlands B.V.					
	HALO Exploration & Production Netherlands B.V.					
97	Wintershall Noordzee B.V.	E15b	21	20-2-2008	1-4-2033	38
	Dana Petroleum Netherlands B.V.					
	HALO Exploration & Production Netherlands B.V.					
98	Wintershall Noordzee B.V.	E18a & E18c	76	04-10-2002	21-10-2032	175
	Dana Petroleum Netherlands B.V.					
	Neptune Energy Netherlands B.V.					
	HALO Exploration & Production Netherlands B.V.					
99	Wintershall Noordzee B.V.	F13a	4	04-10-2002	21-10-2032	175
	Dana Petroleum Netherlands B.V.					
	Neptune Energy Netherlands B.V.					
	HALO Exploration & Production Netherlands B.V.					
100	Wintershall Noordzee B.V.	F16a & F16b	180	04-10-2002	21-10-2032	175
	Neptune Energy Netherlands B.V.					
101	Wintershall Noordzee B.V.	F17a-diep	386	14-05-2016	24-06-2033	43 400
	Neptune Energy Netherlands B.V.					
	Rosewood Exploration Ltd.					
	TAQA Offshore B.V.					
102	Wintershall Noordzee B.V.	K18b	155	15-03-2007	09-05-2023	57
	Nederlandse Aardolie Maatschappij B.V.					
	RockRose (NL) CS1 B.V.					
103	Wintershall Noordzee B.V.	L05b	237	28-06-2003	09-08-2038	134
	Dana Petroleum Netherlands B.V.					
104	Wintershall Noordzee B.V.	L05c	8	03-12-1996	31-12-2028	209
	Dana Petroleum Netherlands B.V.					
105	Wintershall Noordzee B.V.	L06a	332	24-11-2010	04-01-2031	18 910
	Dana Petroleum Netherlands B.V.					
106	Wintershall Noordzee B.V.	L06b	60	01-07-2003	11-08-2038	134
	Dana Petroleum Netherlands B.V.					
107	Wintershall Noordzee B.V.	L08a	213	18-08-1988	18-08-2028	146
	Oranje-Nassau Energie B.V.					
108	Wintershall Noordzee B.V.	L08b & L08d	83	17-05-1993	17-05-2033	78
	Dana Petroleum Netherlands B.V.					
	Oranje-Nassau Energie B.V.					
109	Wintershall Noordzee B.V.	L16a	238	12-06-1984	12-06-2024	84

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant
	Nederlandse Aardolie Maatschappij B.V.					
	RockRose (NL) CS1 B.V.					
110	Wintershall Noordzee B.V.	P06	417	14-04-1982	14-04-2022	54
	Gas-Union GmbH					
	RockRose (NL) CS1 B.V.					
111	Wintershall Noordzee B.V.	P12a	96	08-03-1990	08-03-2030	27
	RockRose (NL) CS1 B.V.					
	Vermilion Energy Netherlands B.V.					
112	Wintershall Noordzee B.V.	Q01-diep	416	23-12-2017	11-07-2020	193
	TAQA Offshore B.V.					
113	Wintershall Noordzee B.V.	Q04	417	02-12-1999	02-12-2019	228
	Delta Hydrocarbons B.V.					
	RockRose (NL) CS1 B.V.					
114	Wintershall Noordzee B.V.	Q05d	20	15-02-2001	15-02-2021	19
	Delta Hydrocarbons B.V.					
	RockRose (NL) CS1 B.V.					
		Total	18,844			

Q. Subsurface storage licences, Netherlands continental shelf as at 1 January 2019

	Licence holder	Licence	km²	Effective from	Effective till	Staatscourant	Storage of
1	TAQA Offshore B.V. *	P18-4	11	01-01-2020	31-12-2026	21 233	Carbon dioxide

* Storage not yet started in 2018.

R. Blocks and operators, Netherlands continental shelf as at 1 January 2019

Block (part of)	Open area (km²)	Operator	Licence (km²)	
			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		Neptune	149	
D12a		Wintershall		214

Block (part of)	Open area (km²)	Operator	Licence (km²) Exploration	Production
D12b		Wintershall		41
D15		Neptune		247
D18a		Neptune		58
D18b	139			
E01	374			
E02	396			
E03	396			
E04	398			
E05	398			
E06	398			
E07		Neptune	400	
E08	400			
E09	400			
E10		Neptune	401	
E11		Neptune	401	
E12	401			
E13	403			
E14	403			
E15a		Wintershall		39
E15b		Wintershall		21
E15c		Neptune	283	
E15d	60			
E16a		Neptune		29
E16b	375			
E17a		Neptune		87
E17b		Neptune		27
E17c	290			
E18a		Wintershall		68
E18b	328			
E18c		Wintershall		8
F01	396			
F02a		Dana NL		307
F02b	89			
F03a		Spirit		18
F03b		Neptune		335
F03c	44			
F04	398			
F05	398			
F06a		TOTAL		8
F06b		Dana NL	260	

Block (part of)	Open area (km²)	Operator	Licence (km²) Exploration	Production
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			
F14	403			
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
F18a	(diep) 138	Oranje-Nassau	170	
F18b		Oranje-Nassau / Wintershall	31	
F18c	235			
G07	120			
G10	396			
G11	169			
G13	403			
G14		Neptune		403
G15	226			
G16a		Neptune		224
G16b		Neptune		5
G16c	176			
G17a		Neptune		237
G17b		Neptune		38
G17c		Neptune		34
G17d		Neptune		96
G18		Oranje-Nassau	405	
H13	1			
H16		Oranje-Nassau	73	

Block (part of)	Open area (km²)	Operator	Licence (km²)	
			Exploration	Production
J03a		TOTAL		72
J03b		Spirit		14
J03c	30			
J03d	28			
J06		Spirit		83
J09		NAM	18	
K01a		TOTAL		83
K01b		TOTAL		50
K01c		Neptune	274	
K02a		TOTAL		25
K02b		Neptune		110
K02c		TOTAL		46
K02d	225			
K03a		Neptune		83
K03b		TOTAL		7
K03c		Neptune		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		Neptune		150
K09b		Neptune		61
K09c		Neptune		199
K10	374			
K11a		NAM		328
K11b	83			
K12		Neptune		411
K13	324			
K14a		NAM		237
K14b	175			
K15		NAM		412
K16	267			
K17		NAM		414
K18a		NAM		36
K18b		Wintershall		155

Block (part of)	Open area (km²)	Operator	Licence (km²)	
			Exploration	Production
K18c	223			
L01a		TOTAL		31
L01b	339			
L01d		TOTAL		7
L01e		TOTAL		12
L01f		TOTAL		17
L02		NAM		406
L03		Neptune	406	
L04a		TOTAL		313
L04b	82			
L04c		Neptune		12
L05a		Neptune		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		NEPTUNE		411
L11a		NEPTUNE		185
L11b		Oranje-Nassau		47
L11c		Oranje-Nassau		7
L11d		Oranje-Nassau		172
L12a		Neptune		119
L12b		Neptune		37
L12c		Oranje-Nassau		30
L12d		Oranje-Nassau		225
L13		NAM		413
L14	413			
L15a	81			
L15b		Neptune		55
L15c		Neptune		4
L15d		Oranje-Nassau		62
L16a		Wintershall		238
L16b	176			
L17	388			

Block (part of)	Open area (km²)	Operator	Licence (km²) Exploration	Production
L18	13			
M01a		Oranje-Nassau		213
M01b	193			
M02a		Oranje-Nassau	134	
M02b	273			
M03		Oranje-Nassau	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		Oranje-Nassau	217	
N04		Oranje-Nassau	381	
N05		Oranje-Nassau	14	
N07a		NAM		141
N07b		Neptune		87
N07c		Oranje-Nassau		87
N08		Oranje-Nassau	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		Petrogas		26
P08b		Jetex	393	
P09a		Petrogas		17

Block (part of)	Open area (km²)	Operator	Licence (km²) Exploration	Production
P09b		Petrogas		62
P09c		Petrogas		18
P09d		Petrogas		11
P09e		Petrogas		80
P09f		Petrogas		3
P09g	228			
P10a		Dana NL		5
P10b		Dana NL		100
P10c		Jetex	249	
P11a		Oranje-Nassau		210
P11b		Dana NL		210
P12a		Wintershall		96
P12b	325			
P13	422			
P14	422			
P15a		TAQA		203
P15b		TAQA		17
P15c		TAQA		203
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		TULIP	244	
Q10a		TULIP		53
Q10b		TULIP	367	
Q11		TULIP	147	
Q13a		Neptune		30
Q13b	367			
Q14	24			

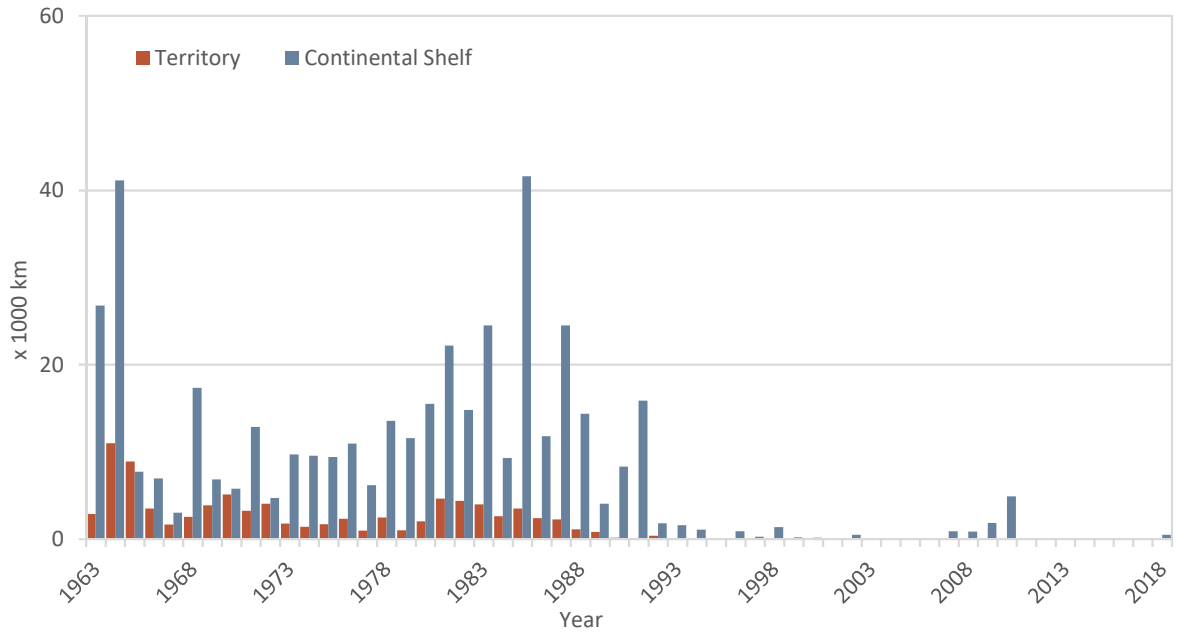
			Licence (km²)	
Block (part of)	**Open area (km²)**	**Operator**	**Exploration**	**Production**
Q16a		Oranje-Nassau		85
Q16b	(ondiep) 59	Oranje-Nassau		59
Q16c	(ondiep) 21	Oranje-Nassau		21
R02	103			
R03	425			
R05	7			
R06	311			
R09	28			
S01	425			
S02	425			
S03a		Oranje-Nassau		2
S03b		Oranje-Nassau	337	
S04	427			
S05	349			
S06	10			
S07	360			
S08	95			
S10	36			
S11	0			
T01		Oranje-Nassau		1
Total	30,883		7,920	18,844

S. Seismic surveys

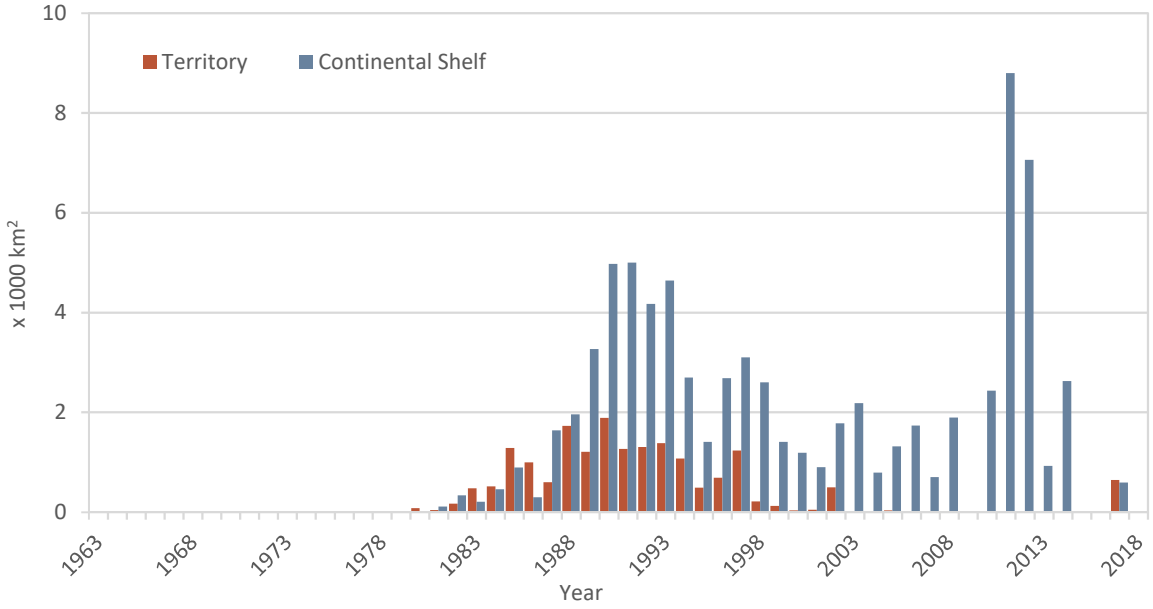
Year	Territory		Continental shelf	
	2D (km)	3D (km²)	2D (km)	3D (km²)
1963	2,860	-	26,778	-
1964	10,992	-	41,136	-
1965	8,885	-	7,707	-
1966	3,510	-	6,939	-
1967	1,673	-	3,034	-
1968	2,541	-	17,349	-
1969	3,857	-	6,846	-
1970	5,113	-	5,780	-
1971	3,252	-	12,849	-
1972	4,034	-	4,716	-
1973	1,783	-	9,708	-
1974	1,422	-	9,536	-
1975	1,706	-	9,413	-
1976	2,318	-	10,963	-
1977	948	-	6,184	-
1978	2,466	-	13,568	-
1979	986	-	11,575	-
1980	2,017	76	15,497	-
1981	4,627	37	22,192	110
1982	4,363	170	14,791	337
1983	3,980	478	24,498	208
1984	2,616	512	9,314	455
1985	3,480	1,282	41,593	892
1986	2,386	993	11,795	296
1987	2,243	601	24,492	1,637
1988	1,103	1,726	14,356	1,958
1989	828	1,206	4,033	3,264
1990	160	1,889	8,288	4,972
1991	-	1,268	15,853	5,002
1992	388	1,307	1,799	4,173
1993	-	1,382	1,591	4,637
1994	-	1,074	1,089	2,694
1995	-	491	-	1,408
1996	-	689	892	2,686
1997	-	1,236	260	3,101
1998	-	214	1,380	2,603
1999	43	124	181	1,409
2000	-	33	160	1,189
2001	5	47	-	898
2002	-	495	490	1,778

Year	Territory		Continental shelf	
	2D (km)	3D (km²)	2D (km)	3D (km²)
2003	-	-	-	2,185
2004	-	-	34	790
2005	-	32	-	1,314
2006	-	-	53	1,732
2007	-	-	886	700
2008	-	-	838	1,893
2009	-	-	1,849	-
2010	-	-	4,898	2,431
2011	14	-	-	8,800
2012	-	-	37	7,060
2013	-	-	-	925
2014	-	-	-	2,624
2015	-	-	-	-
2016	-	-	-	-
2017	94	640	-	593
2018	-	15	480	-

2D seismic surveys 1963 – 2018



3D seismic surveys 1963 – 2018



T. 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
1946	-	-	-	1	1	-	-	-	-	-	19
1947	-	-	-	3	3	-	-	-	-	-	17
1948	-	1	-	8	9	-	-	-	-	-	42
1949	1	1	-	14	16	-	-	-	-	-	21
1950	-	1	-	7	8	-	-	-	-	-	26
1951	-	5	-	9	14	-	-	-	-	-	38
1952	1	2	2	6	11	-	2	-	-	2	44
1953	4	1	-	5	10	1	-	-	-	1	58
1954	4	1	-	12	17	-	-	-	-	-	45
1955	2	2	-	4	8	-	-	-	-	-	17
1956	1	3	1	3	8	-	-	-	1	1	14
1957	1	2	-	1	4	1	-	-	-	1	60
1958	3	1	-	4	8	-	-	-	1	1	35
1959	1	2	-	7	10	-	-	-	-	-	30
1960	-	1	-	1	2	-	1	-	-	1	48
1961	1	2	-	2	5	-	-	-	-	-	22
1962	2	-	-	-	2	-	1	-	-	1	27
1963	-	2	-	-	2	-	1	-	-	1	32
1964	-	6	-	17	23	-	1	-	-	1	26
1965	2	13	-	17	32	-	6	-	4	10	36
1966	1	1	-	6	8	-	4	-	1	5	42
1967	-	4	-	-	4	-	1	1	-	2	44
1968	-	6	-	6	12	-	1	-	1	2	21
1969	-	4	-	11	15	-	2	-	3	5	13
1970	-	5	-	10	15	-	6	-	1	7	19
1971	-	4	1	9	14	-	7	-	2	9	47
1972	-	5	-	6	11	-	5	-	1	6	55
1973	-	3	-	3	6	-	10	-	1	11	37
1974	-	1	-	1	2	1	4	-	-	5	46
1975	-	5	-	3	8	-	9	-	2	11	45
1976	1	2	-	2	5	-	9	-	1	10	47
1977	-	4	-	3	7	3	12	-	1	16	28
1978	-	2	-	3	5	-	22	-	-	22	45
1979	-	4	-	2	6	5	10	-	2	17	58
1980	1	2	-	3	6	3	18	-	4	25	67
1981	1	2	1	11	15	3	7	-	2	12	49
1982	-	6	1	5	12	-	17	-	-	17	26
1983	1	8	-	3	12	-	13	-	1	14	17

Year	Exploration					Appraisal					Production
	O	G	G&O	D	∑	O	G	G&O	D	∑	∑
1984	2	6	-	6	14	5	8	-	2	15	18
1985	1	3	1	6	11	2	10	-	-	12	36
1986	-	4	1	6	11	-	3	-	-	3	16
1987	-	2	2	6	10	-	2	-	-	2	22
1988	-	5	1	1	7	1	3	-	-	4	17
1989	-	2	1	6	9	2	5	-	-	7	11
1990	-	1	3	3	7	-	3	1	1	5	20
1991	-	7	1	2	10	-	3	-	1	4	11
1992	-	6	1	4	11	-	1	-	-	1	12
1993	-	9	-	1	10	-	-	-	-	-	11
1994	-	4	-	1	5	2	1	1	-	4	4
1995	-	7	-	5	12	-	2	-	-	2	10
1996	-	2	1	2	5	-	3	-	3	6	24
1997	-	9	-	2	11	-	4	-	-	4	14
1998	-	6	-	4	10	-	7	-	1	8	7
1999	-	3	-	1	4	-	4	-	-	4	7
2000	-	2	-	-	2	-	-	-	-	-	4
2001	-	2	-	1	3	-	-	-	-	-	6
2002	-	2	-	3	5	-	-	-	-	-	5
2003	-	2	-	1	3	-	-	-	-	-	8
2004	-	1	-	-	1	-	1	-	-	1	1
2005	-	2	-	-	2	-	-	-	-	-	6
2006	-	3	-	1	4	-	2	-	-	2	5
2007	-	2	-	-	2	1	-	-	-	1	8
2008	-	1	-	-	1	-	1	-	-	1	1
2009	1	1	-	-	2	-	3	-	-	3	24
2010	-	3	-	-	3	-	-	-	-	-	34
2011	-	5	1	2	8	-	1	-	-	1	22
2012	-	3	-	1	4	-	3	-	-	3	7
2013	-	2	-	-	2	-	2	-	-	2	8
2014	-	5	-	3	8	-	2	-	-	2	7
2015	-	2	-	-	2	-	2	-	-	2	5
2016	-	1	-	-	1	-	-	-	-	-	12
2017	-	2	-	-	2	-	-	-	-	-	1
2018	-	-	-	-	-	-	-	-	-	-	1
Total	35	231	19	329	614	30	245	3	37	315	1,773

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

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

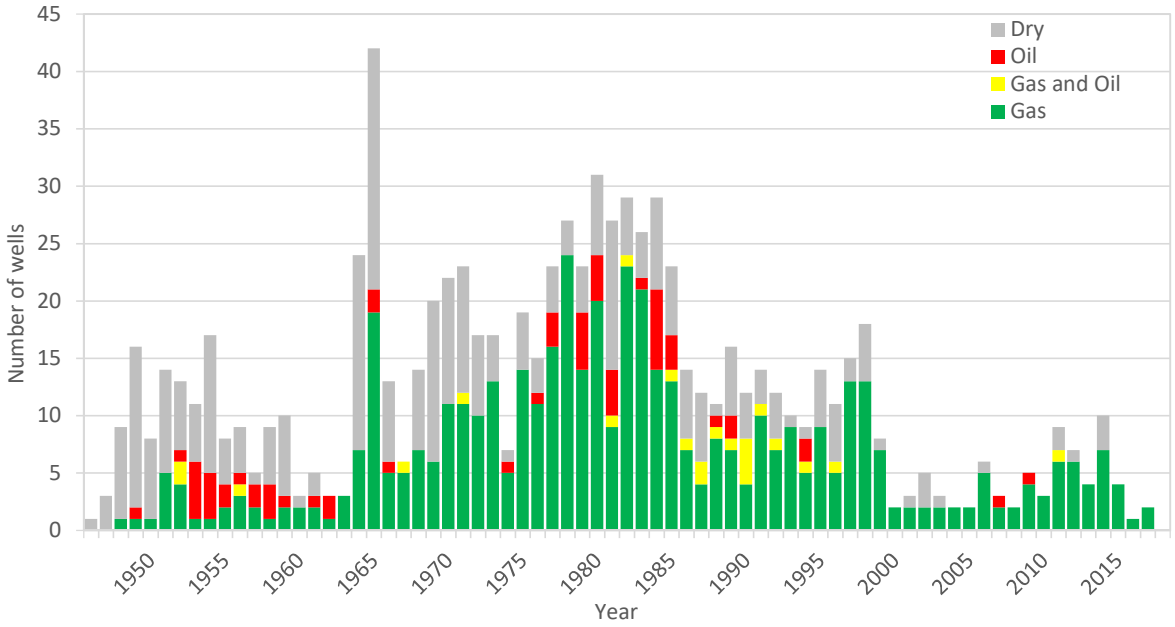
Year	Exploration					Appraisal					Production
	O	G	G&O	D	Σ	O	G	G&O	D	Σ	Σ
1962	-	1	1	1	3	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	1	1	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-
1968	-	2	-	5	7	-	-	-	-	-	-
1969	1	8	-	8	17	-	-	-	-	-	-
1970	1	7	-	5	13	-	-	-	-	-	-
1971	1	5	1	12	19	-	-	-	-	-	-
1972	-	11	1	6	18	-	-	-	-	-	-
1973	-	7	-	11	18	-	1	-	-	1	2
1974	-	8	2	6	16	-	1	-	-	1	4
1975	-	7	-	8	15	-	2	-	3	5	11
1976	-	6	1	10	17	-	5	-	2	7	12
1977	-	5	-	18	23	-	6	1	-	7	14
1978	-	7	-	13	20	-	-	-	1	1	17
1979	1	7	-	9	17	-	5	-	1	6	9
1980	6	9	-	10	25	2	2	-	1	5	5
1981	1	2	-	14	17	7	6	-	1	14	7
1982	8	5	2	18	33	1	6	1	4	12	21
1983	3	3	1	24	31	4	3	-	2	9	19
1984	4	5	1	16	26	3	1	-	3	7	27
1985	4	8	-	14	26	2	3	-	1	6	29
1986	2	11	-	11	24	2	2	-	1	5	34
1987	5	10	1	9	25	1	3	-	1	5	8
1988	-	15	2	4	21	-	4	1	1	6	20
1989	1	14	-	12	27	-	6	-	-	6	17
1990	-	13	1	14	28	-	6	-	-	6	14
1991	4	17	1	19	41	-	2	-	-	2	13
1992	-	10	1	7	18	-	-	-	1	1	14
1993	1	5	-	7	13	-	1	-	-	1	19
1994	1	3	-	3	7	1	1	-	-	2	9
1995	-	3	-	4	7	-	2	-	-	2	17
1996	1	14	1	8	24	-	5	-	-	5	6
1997	1	11	1	7	20	1	7	-	-	8	11
1998	1	11	-	7	19	-	-	-	1	1	11
1999	-	7	-	4	11	-	2	-	2	4	7
2000	-	4	-	2	6	-	3	-	-	3	9

Year	Exploration					Appraisal					Production
	O	G	G&O	D	∑	O	G	G&O	D	∑	∑
2001	-	10	-	4	14	-	3	-	-	3	13
2002	-	9	-	8	17	-	1	-	1	2	13
2003	-	6	-	1	7	-	3	-	-	3	16
2004	-	8	-	3	11	-	1	-	1	2	6
2005	-	4	-	1	5	-	-	-	-	-	10
2006	-	3	-	6	9	1	2	-	-	3	15
2007	-	3	-	2	5	-	2	-	-	2	12
2008	-	7	1	2	10	-	1	-	-	1	14
2009	-	5	-	2	7	-	4	-	-	4	10
2010	-	6	-	1	7	-	2	-	-	2	12
2011	1	2	1	2	6	1	2	-	-	3	14
2012	1	5	-	1	7	1	1	-	-	2	11
2013	1	-	2	2	5	2	-	-	-	2	10
2014	3	3	1	3	10	2	3	-	-	5	12
2015	-	6	-	3	9	1	2	-	-	3	11
2016	-	2	-	1	3	-	1	-	-	1	9
2017	-	3	-	1	4	-	1	-	-	1	6
2018	1	3	-	1	5	-	-	-	-	-	6
Total	54	346	23	371	794	32	114	3	28	177	586

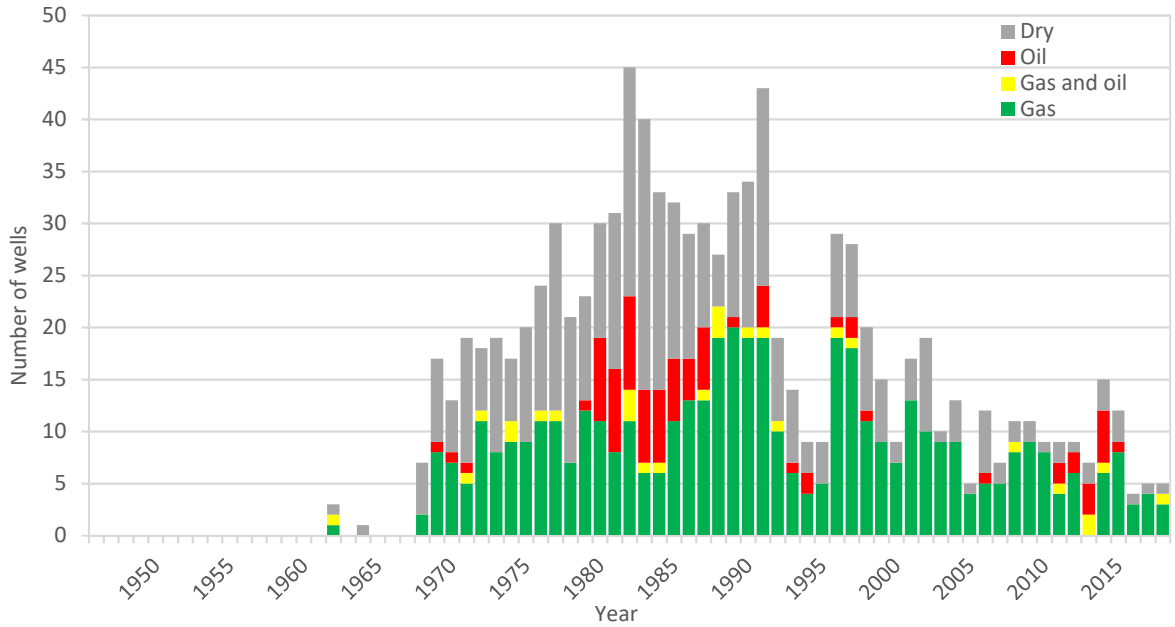
O = Oil; G = Gas; G&O = Gas and oil; D = Dry; ∑ = Total.

V. Number of wells: Netherlands territory and Netherlands continental shelf since 1946

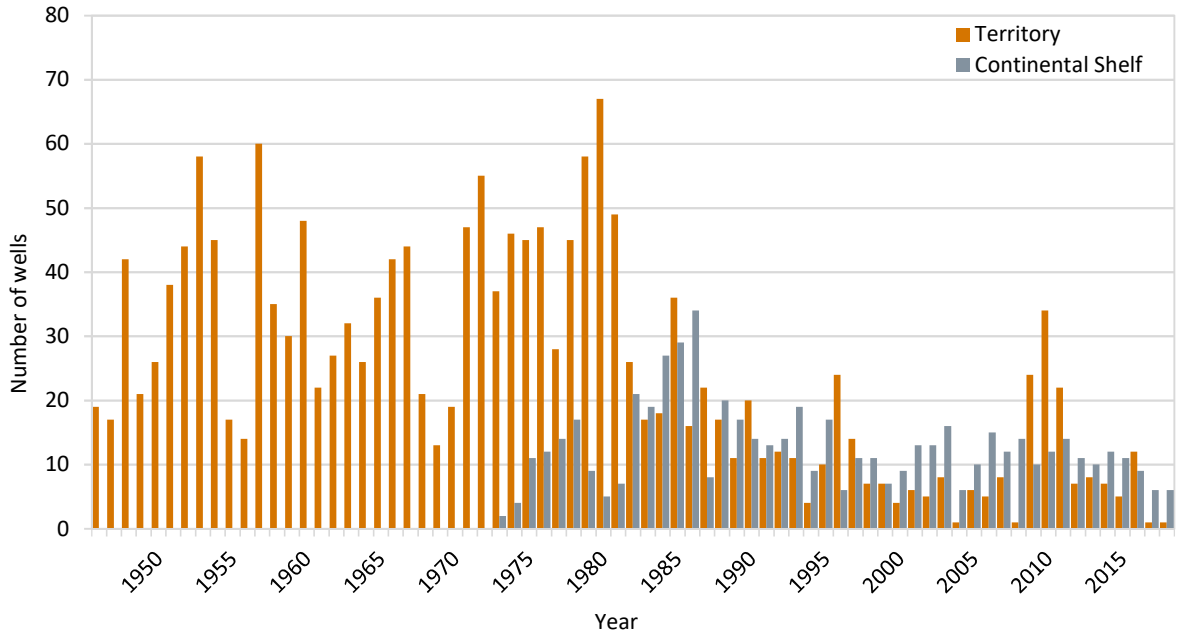
Exploration and appraisal wells, Netherlands territory



Exploration and appraisal wells, continental shelf



Production wells



W. Platforms, Netherlands continental shelf as at 1 January 2019

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

Platform	Operator	Year installed	No. legs	Gas/Oil	Function
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
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

Platform	Operator	Year installed	No. legs	Gas/Oil	Function
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
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

Platform	Operator	Year installed	No. legs	Gas/Oil	Function
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

Platform	Operator	Year installed	No. legs	Gas/Oil	Function
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
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
Q10-A	Tulip	2018	4	G	satellite

GBS = Gravity Based Structure.

X. Pipelines, Netherlands continental shelf as at 1 January 2019

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.

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

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

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

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
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 NGT-pipe (s)	12	2005	2.8	
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

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
ENGIE	Minke (UK)	D15-FA-1	8 , 90.6 mm	2006	15.1	g + c
Grove	Grove (UK)	J6-CT	10 * 2	2006	13.4	g + m
NAM	K17-FA-1	K14-FB-1	16 * 2	2006	14.4	g + m
Petro-Canada	P11-B-Ruyter	P11-B-TMLS	16	2006	1.5	o
Petro-Canada	P11-B-Ruyter	P12-SW	8	2006	29.0	g
Total	L4G	L4-PA	6 , 92 mm	2006	10.6	g + c
Wintershall	L5-C	L8-P4	10 , 82 mm	2006	8.1	g + c
Chevron	A12 CCP	B10 NOGAT	16	2007	16.0	g
ENGIE	G14-B	G17-D-AP	12	2007	13.4	g + m
Venture	Stamfort (UK)	J6-CT	6	2008	7.0	g
Total	L4PN	L4A	10	2008	11.4	g
NAM	L9FA	via L9FB-1» L9FF-1	16 and 2x2	2008	20.0	g + gl + gi
Total	K5-F	K6N	8	2008	10.0	g
ENGIE	G14-B	G17-D-AP	12 + 2	2008	13.4	g + m
ENGIE	K12-K	K12-BP	14+ 2	2008	10.3	g + m
ENGIE	E17-A	NGT	12	2009	2.0	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	12.0	g+c
Wintershall	Wingate (UK)	D15-A	12 + 2	2010	20.6	g
Chevron	B13-A	A12-CPP	16	2011	22.0	g
ENGIE	G16a-B	G17d-AP	14	2011	14.0	g
NAM	K18-G1	K15-FA-1	8	2011	10.0	g+c
Dana	P11-B-Nes	P11-B-De Ruyter	8	2011	8.0	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	17.0	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	33.0	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
NAM	L13-FI-1	K15-FA-1	12	2018	6.5	g

Operator	From	To	Diameter (inches)	Laid (year)	Length (km)	Carries
Tulip	Q10-A	P15-D	14	2018	42.5	g

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

Y. Authorities involved in mining

Ministry of Economic Affairs and Climate Policy

Directorate - General of Climate and Energy

Address:	Bezuidenhoutseweg 73	P.O. Box 20411
	2594 AC The Hague	2500 EK The Hague
	Telephone:	070 379 89 11
	www.rijksoverheid.nl	

TNO – Advisory Group for 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

Address:	Henri Faasdreef 312	P.O. Box 24037
	2492 JP The Hague	2490 AA The Hague
	Telephone:	070 379 84 00
	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 Policy.

Z. Definition of selected terms

Territory/ Netherlands territory:
In this review, territory and Netherlands territory refer to the Dutch 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 yet unproven plays
Volume of gas expected to be present in valid plays that have not yet been proven in the Netherlands.

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

In the definitions above, the term 'expected' is used in the statistical sense and thus the figure given represents the expected value (or expectation). The following explanation may be helpful. All data used for the purpose of calculating volumes have an intrinsic uncertainty. By processing these uncertainties statistically, an expectation curve can be determined for each accumulation. This is a cumulative probability distribution curve, i.e. a graph in which reserve values are plotted against the associated probabilities that they will be achieved or exceeded. As production from a hydrocarbon reservoir progresses, various uncertainties decrease and the expected value will deviate less and less from the 50% value on the cumulative probability distribution curve.
In practice, the stated reserves of a given field are the expected values. This is the most realistic estimate of the volume of hydrocarbons present in a reservoir. The recoverability of hydrocarbons from an accumulation is determined by the geological and reservoir characteristics of that accumulation, the recovery techniques available at the time of reporting and the economic conditions prevailing at that time.

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

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

LUTGERT, J., MIJNLIEFF, H. & BREUNESE, J. 2005. Predicting gas production from future gas discoveries in the Netherlands: quantity, location, timing, quality. In: DORE, A. G. & VINING, B. A. (eds) Petroleum Geology: North-West Europe and Global Perspectives—Proceedings of the 6th Petroleum Geology Conference, 77–84. q Petroleum Geology Conferences Ltd. Published by the Geological Society, London.

Units:

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

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

Groningen gas equivalent:
In order to be able to incorporate volumes of natural gas of different qualities in calculations, they have been converted to Groningen gas equivalents (Geq). This is achieved by converting the volume of gas that differs in quality from the gas in the Groningen field to a volume of gas that is hypothetically of the same quality as the gas in the Groningen field (which is 35.17 Mega joules upper value per m^3 of 0 °C and 101.325 kPa. or 1.01325 bar).
One Nm^3 gas with a calorific value of 36.5 MJ is equivalent to 36.5/35.17 Nm^3 Geq.

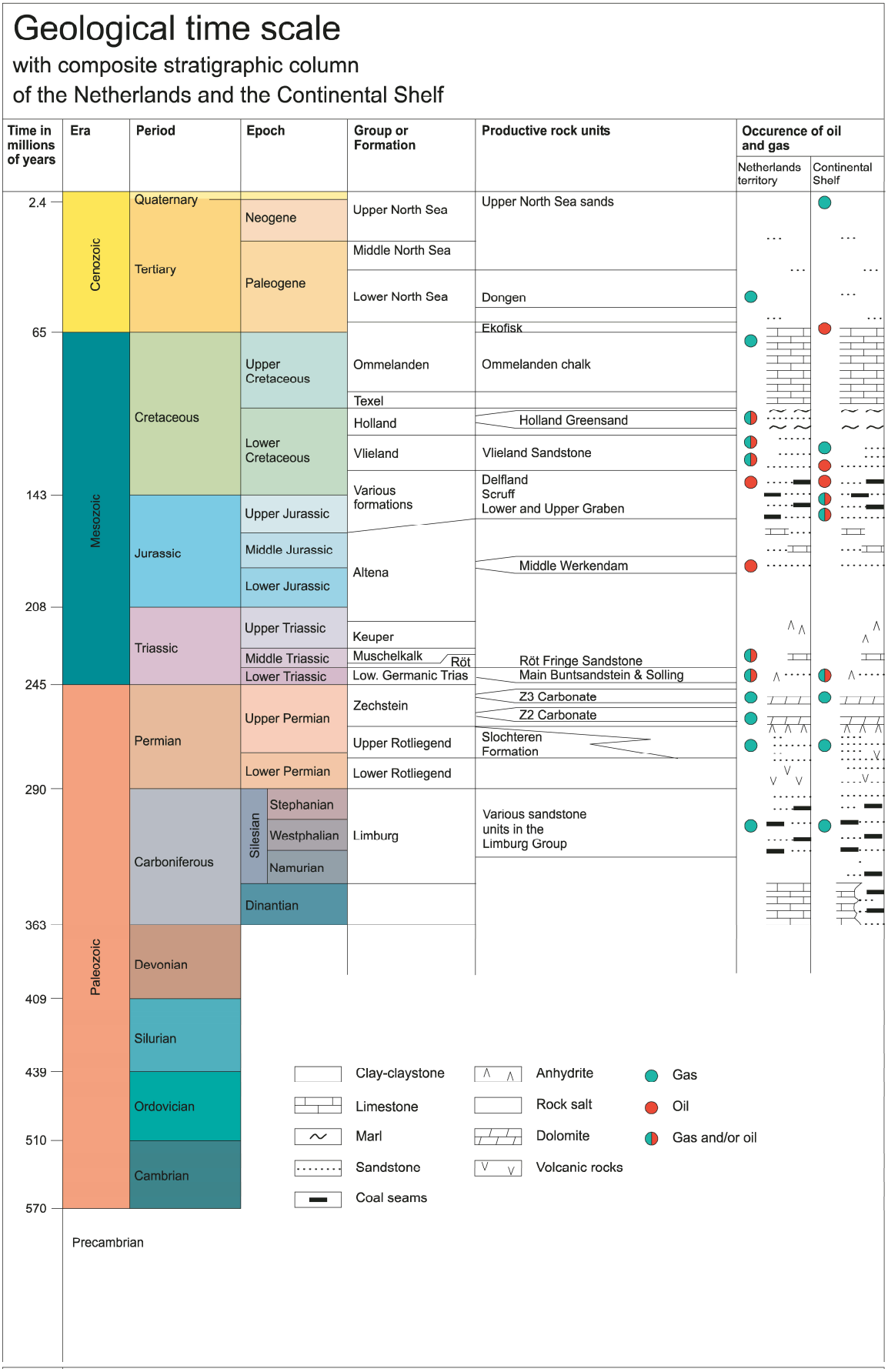
The Groningen gas equivalent is commonly used in the Netherlands, including by N.V. Netherlands Gasunie.

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).

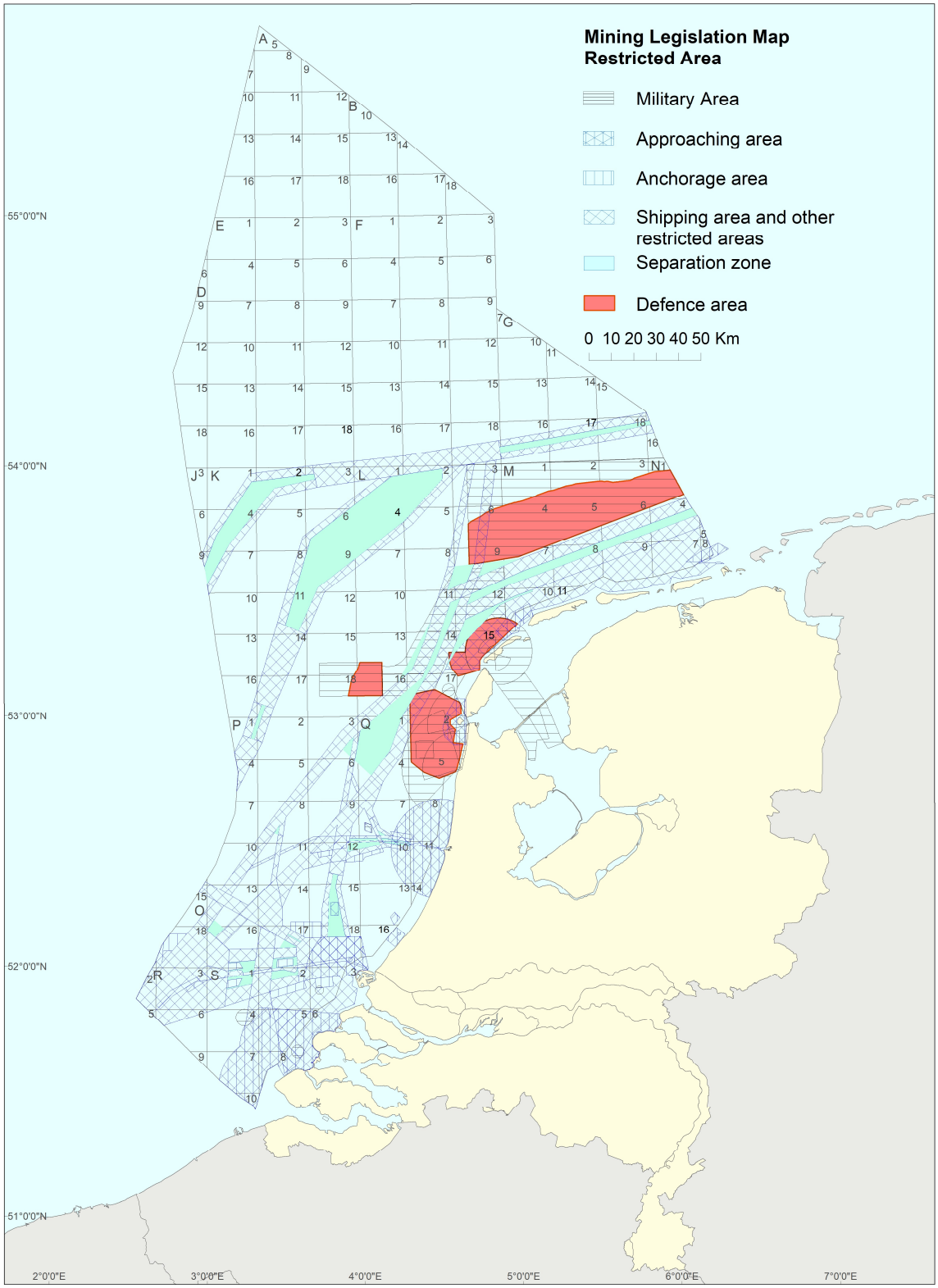
Fuel	Unit	Giga joule	Giga calorie	Oil equiv. tonnes	Oil equiv. barrels	Coal equiv. tonnes	Gas equiv. 1000 m^3
Fuelwood (dry)	tonnes	13.51	3.23	0.32	2.36	0.46	0.43
Coal	tonnes	29.30	7.00	0.70	5.11	1.00	0.93
Lignite	tonnes	17.00	4.06	0.41	2.96	0.58	0.54
Coke	tonnes	28.50	6.81	0.68	4.97	0.97	0.90
Coke-oven 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 time scale



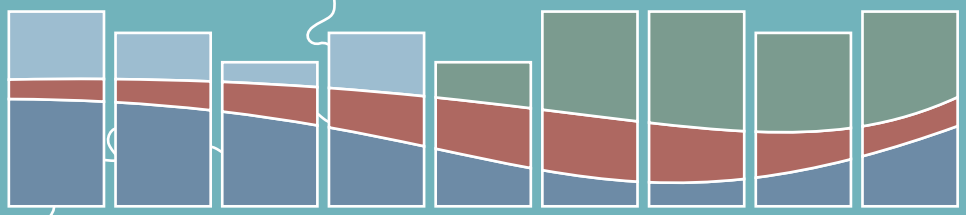
2. Appendix – Mining legislation map



Ministry of Economic Affairs and Climate Policy
Directorate-General Climate and Energy
July 2019

For more information:
www.nlog.nl

Ministry of Economic Affairs and Climate Policy



Addendum annual review 2018
Natural resources and geothermal energy in the Netherlands

Annual review 2018

Clarification on substantial changes in the classification of the Groningen gas field natural gas resources based on the Petroleum Resources Management System (PRMS).

This clarification aims to elucidate the rationale of the substantial changes in the classification of the natural gas resources of the Groningen field as reported in the Annual Report of Natural Resources and Geothermal Energy of 2018. This Annual Report accounts for the status of natural resources in the Netherlands as at 1 January 2019, i.e. integrating changes occurred in 2018.

Resource classification

Since 2012 TNO uses the Petroleum Resources Managements System (PRMS) based on economical (sub)classes to classify the oil and natural gas resources (see Appendix for definitions). TNO receives the resource figures from the operators in PRMS format as required by Art. 113 of the Mining Decree (www.nlog.nl). TNO audits the data to ensure the validity and consistent interpretation of PRMS guidelines by all operators. The most certain resources to be developed, classified as “reserves”, and the less firm subclass “development pending” (contingent resources class), are included in the Annual Report (see Figure 1). The volumes in the lower contingent resource subclasses “development on hold”, “development unclarified” and “development not viable” have never been included, since the implementation of PRMS, in the annual report due to the large level of uncertainty on whether these volumes may become available as reserves (see appendix PRMS for definitions).

As at 1 January 2019 the operator (NAM) of the Groningen gas field, reported substantially lower volumes as compared to the previous year. The difference is the significant reduction of “reserves” by 471 billion cubic meters and of “development pending” by 5 billion cubic meters. The reason for the declassification of these volumes, to a subclass lower than “development Pending”, is the official decision by the Dutch government to reduce the Groningen production (letter to House of Representatives, DGETM-EI / 18057375, March 29th 2018), therefore the development of the deducted volumes is now primarily subject to the decisions of others over which the developers (operator) have little or no direct influence. Hence these volumes are declassed from reserves to contingent resources and not included in this year’s annual report.

September 2019

Appendix

Contingent resource classification definition

TNO uses the PRMS resource classification as published by the SPE (https://www.spe.org/notes/wp-content/uploads/2010/12/ADS_Final.pdf). For the contingent resources the following definitions are therefore used (see also Figure 1):

Development pending: is limited to those projects that are actively subject to project-specific technical activities, such as appraisal drilling or detailed evaluation that is designed to confirm commerciality and/or to determine the optimum development scenario. In addition, it may include projects that have nontechnical contingencies, provided these contingencies are currently being actively pursued by the developers and are expected to be resolved positively within a reasonable time frame. Such projects would be expected to have a high probability of becoming a commercial development (i.e., a high chance of commerciality).

Development on hold: the primary nontechnical contingencies are subject to the decisions of others over which the developers have little or no direct influence and both the outcome and the timing of those decisions is subject to significant uncertainty.

Development unclarified: the project is under evaluation, further appraisal activities are required or the contingencies have yet to be fully defined. In such cases, the chance of commerciality may be difficult to assess with any confidence.

Development not viable: a technically viable project, but assessed as being of insufficient potential to warrant any further appraisal activities or any direct effort to remove commercial contingencies.

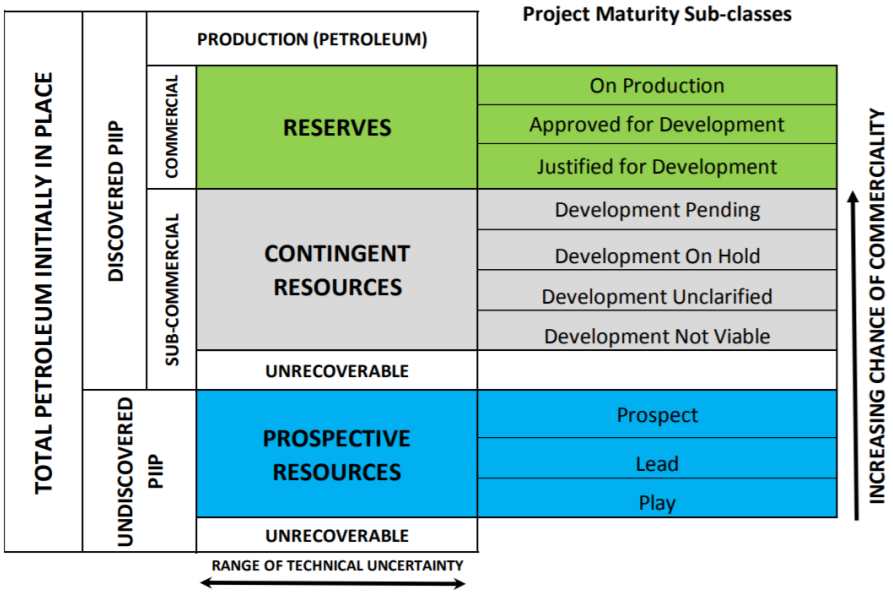


Figure 1 Resource classes and subclasses; Note the Development On Hold Sub-class has a lower chance of commerciality than the Development Pending Sub-class.