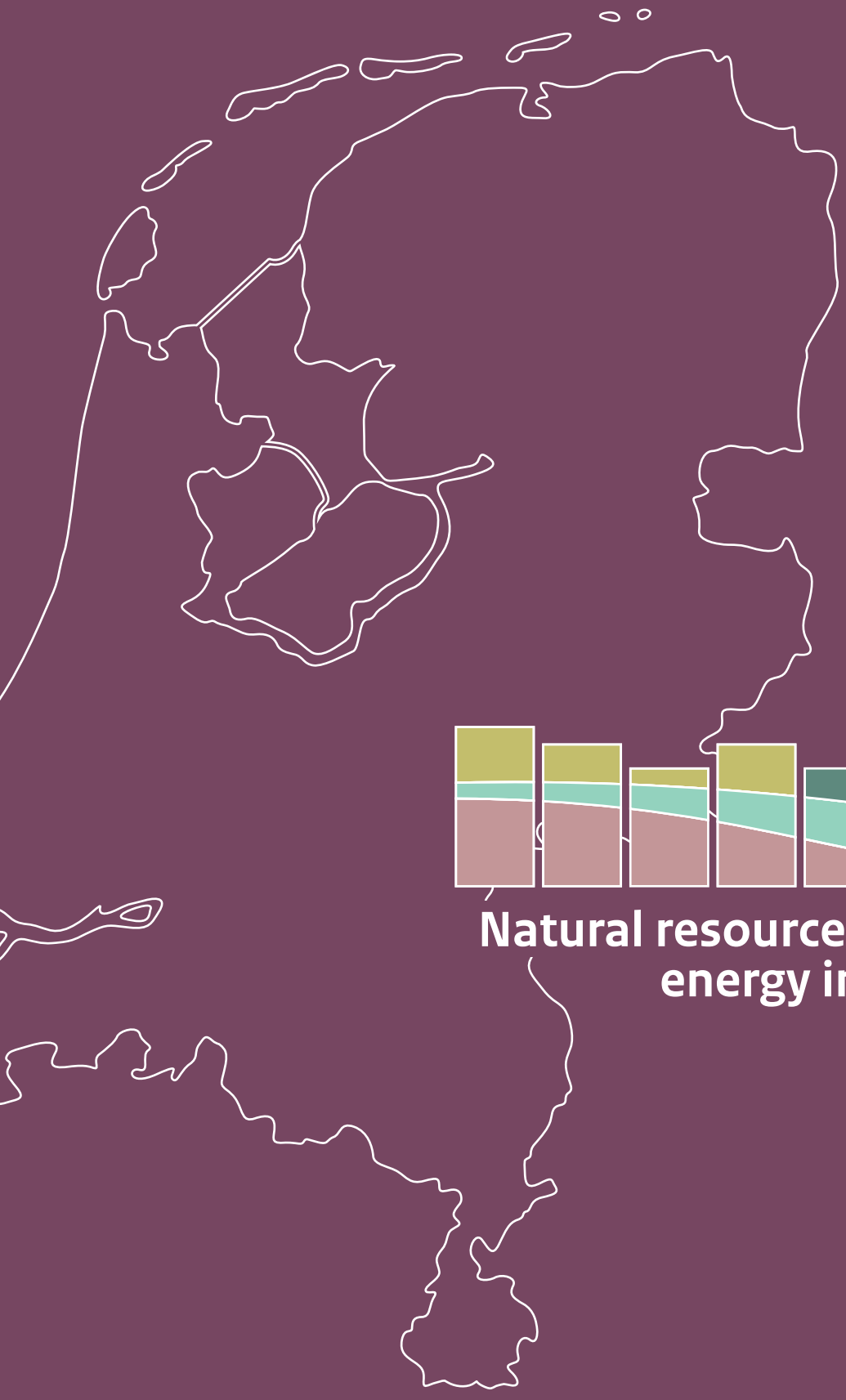
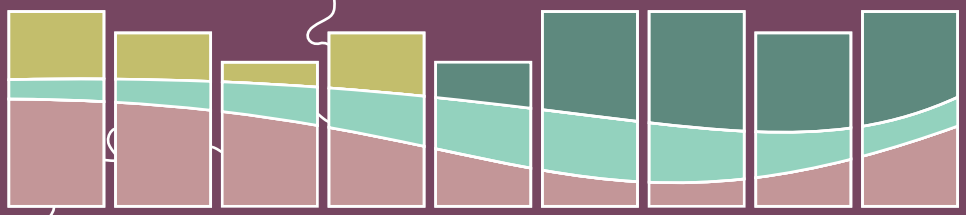
Ministry of Climate Policy and Green Growth





Natural resources and geothermal energy in the Netherlands

Annual review 2023

NATURAL RESOURCES AND GEOTHERMAL ENERGY IN THE NETHERLANDS

Annual review 2023

An overview of exploration, production and subsurface storage.

Preface

This annual review entitled 'Natural Resources and Geothermal Energy in the Netherlands' reports on the exploration and production of hydrocarbons, rock salt and geothermal energy in the Netherlands. As well as on the subsurface temporary storage (natural gas, oil, nitrogen) and permanent storage (brine and CO_2). In so doing it covers all the exploration, production and storage activities in the Netherlands on land and at sea that fall under the Mining Act.

The first section of this annual review deals with developments during the year 2023. The second part of this report comprises annexes giving an overview of the situation as at 1 January 2024, and the developments during preceding decades.

Chapters 1 and 2 review the changes in the estimates of natural gas and oil resources in 2023 and the resulting situation as at 1 January 2024. The remaining volumes of natural gas and oil are reported in accordance with the Petroleum Resource Management System (PRMS). These chapters also present a prognosis for the gas (small fields) and oil production for the next 25 years. In view of the recent changing circumstances surrounding gas production, both a low and a high scenario have been included in this year's prognosis. This year, for the first time, an explicit reduction in the number of exploration wells is included in the scenarios.

Chapter 3 provides 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, salt and coal respectively. Chapters 8, 9 and 10 contain information on developments relating licensing on land and at sea and company changes. Chapter 11 provides an overview of the existing and newly shot seismic data in 2023. Chapter 12 provides an overview of all wells that have been drilled in 2023. This means that in addition to the oil and gas wells, also geothermal and salt production wells will be presented in this chapter. In Chapter 13 changes regarding mining installation (e.g. platforms) are presented.

This report has been compiled by TNO – Advisory Group for Economic Affairs, at the request of the Directorate General of Groningen and Subsurface of the Dutch Ministry of Climate Policy and Green Growth. It includes data that the Minister of Climate Policy and Green Growth is required to supply to both Chambers of the Dutch Parliament in accordance with article 125 of the Mining Law. The digital version of this review can be found on: www.nlog.nl.

This annual report is compiled based on data received from the operators of permits under the Mining Law. 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. In this annual report, numbers are rounded off, which may result in differences when summed.

The Hague, August 2024.

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 total natural gas resources as at 1 January 2024 are estimated at 74.1 billion Nm^3. The small fields on land contain 31.5 billion Nm^3 natural gas in reserves and contingent resources; those at sea contain 42.6 billion Nm^3 natural gas in reserves and contingent resources.
Compared to 1 January 2023 the natural gas resources have decreased by 24.2 billion Nm^3 due to production (10.2 billion Nm^3) and to re-evaluations of some gas fields (14.0 billion Nm^3).

The total oil resources as at 1 January 2024 were 14.3 million Sm^3, of which 8.4 million Sm^3 are reserves and contingent resources in oil fields on land and 5.9 million Sm^3 reserves and contingent resources in oil fields at sea.

Natural gas production

In 2023 the volume of natural gas produced from Dutch gas fields was 10.2 billion Nm^3. Gas fields on land accounted for 4.3 billion Nm^3. Small fields accounted for 2.9 billion Nm^3 and 1.5 billion Nm^3 came from the Groningen gas field. The gas fields at sea produced 5.9 billion Nm^3. As a result, total production in 2023 dropped by 33.1 % compared to 2022. For details, see Chapter 3.

Oil production

In 2023 a total of 0.39 million Sm^3 oil was produced, which is a decrease of 15.0 % compared to 2022. Fields on land accounted for 0.12 million Sm^3, which is a decrease of 16.7 % compared to 2022. Production at sea was 0.27 million Sm^3, a decrease of 14.3 %. For details, see Chapter 3.

Subsurface storage

In 2023 two exploration licences for the permanent storage of CO_2 at sea were pending. In addition, two offshore storage licences were applied for in 2023 and 1 is still pending for the permanent storage of CO_2. For details, see chapter 4.

Geothermal energy

In 2023 six new geothermal installations have been completed. As at 1 January 2024 there are 32 production installations, of which 20 are currently operational. The cumulative reported annual production in 2023 was 6.88 PJ. For details, see Chapter 5.

Salt

As at 1 January 2024 there were 16 production licences and no exploration licences in force. One application for a production licence submitted previously is in procedure. The production of rock salt in 2023 was 4.9 million tonnes. For details, see Chapter 6.

Coal

There are no developments to report for 2023. There are still five coal production licences in force. For details, see Chapter 7.

Hydrocarbon licences

In 2023 three exploration licences and one production licences since earlier years are pending on land. One exploration licence is refused and one production licence is split. No new exploration or production licences have been awarded on land.

At sea two applications for exploration licences and two production licences were pending in 2023. In 2023, three exploration and three production licences at sea were granted. In addition, prolongation for an exploration licence was granted four times and refused four times.
Four exploration licences and three production licences were reduced in size. Seven exploration licences and one production licence were ended or relinquished. For details, see Chapters 8 and 9.

Geothermal licences

In 2023, the new Mining Law came into effect on 1 July, which also introduced the new licencing system for geothermal energy. On 30 June, 3 applications for exploration licences were being processed and 85 were in force. Furthermore, on that date, 3 applications for a geothermal production licence were being processed and 36 were in force.

In the second half of 2023, 1 application for an allocation of search area was withdrawn, 2 applications were published and 2 allocations for a search area were granted. Furthermore, 4 allocations for a search area expired or were relinquished and 11 were extended. On the first of January 2024, 2 allocations for a search area were in application and 83 allocations for a search area were in force.

Two geothermal start-up licences have been extended in the second half of 2023. In total 3 geothermal start-up licences are in application, 18 are in force and 18 follow-up licences are in force on the first of January 2024.

In 2023, 4 research and central policy licences were applied for, 4 were granted and 1 licence was withdrawn. In total, 4 research and central policy licences are in force on January 1st 2024 and 2 are in application. See Chapter 8 for details.

Wells completed in 2023

In total, 9 wells were drilled for oil and gas in 2023, of which 6 wells at sea and 3 on land. That is one less than in 2022. Three of the five exploration wells have found gas and two were dry. In addition, two evaluation and two production wells have been drilled. In addition, 13 geothermal wells were drilled, of which 1 exploration and 12 evaluation wells. That are 6 more wells than in 2023. No salt wells were drilled in 2023. 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 the Dutch part of the North Sea. It presents the estimates of the natural gas resources as of January 1st 2024 and the changes compared to the resources of last year. The prognoses for the expected Dutch annual natural gas production are also reported for the next 25 years.

Figures

Based on the Mining Act (article 113, Mining Decree), the operators of production licences report every year their estimates of the remaining resources and expected annual production per accumulation. These data are used to estimate the total annual domestic resources and future production of natural gas in The Netherlands. The data on the natural gas resources are provided in accordance with the Petroleum Resource Management System (PRMS) as published in the 2018 version, allowing for a uniform classification and aggregation of all resources (See Appendix 3 for further explanation).

The gas resources are divided along the vertical axis of the PRMS into three main classes: reserves, contingent resources and prospective resources (Figure 1.1). Each of the main classes is further subdivided into several subclasses. In this annual review, only the reserves are considered (in a single class) and the first subclass of the contingent resources (Development pending). Contingent resources classified in the subclasses ‘unclarified’, ‘on hold’ and ‘development not viable’ are not reported here due to the high uncertainty of the associated projects that need to be undertaken. For the same reason, only the first class of prospective resources, i.e. prospects, is considered.

Since oil and natural gas are physically located underground at great depths, hydrocarbon resources are estimated by evaluating the subsurface data on the actual amounts. Therefore, all resource estimates have an inherent degree of uncertainty, which is indicated along the horizontal axis of the PRMS (Figure 1.1). The main class reserves and the subclasses ‘development pending’ and ‘prospects’ in this report are median values, and shown as 2P, 2C and 2U respectively.

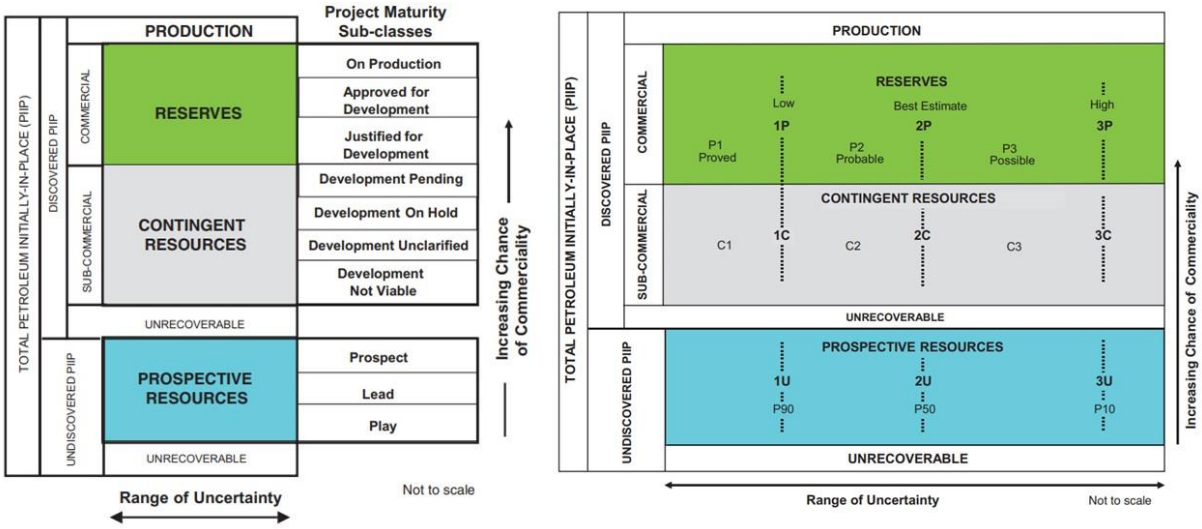


Figure 3.1 Schematic representation of the PRMS[1] classification (see also Appendix 3).

1.2 Natural gas accumulations

As of January 1st 2024, 507 natural gas accumulations have been discovered in the Netherlands (Table 1.1). Nearly half of them (210) are currently in production. This is 2 less than last year. Four gas accumulations are used for underground gas storage, plus one gas storage in a cluster of salt caverns. A total of 118 accumulations have not yet been developed. While 32 of these accumulations are expected to come into production within the next five years, there is significant uncertainty as to whether the remaining 86 will be developed. There are currently 174 natural gas accumulations that have produced in the past but have now stopped (temporarily) producing. A complete list of all accumulations grouped by status and indicating the operator and licence is included in the Annex A.1.

Table 3.1 Proven natural gas accumulations as of January 1st 2024 classified by status.

Status of natural gas accumulations	On land	At sea	Total
I. Developed			
a. In production	91	119	210
b. Natural gas underground storage*	5	0	5
II. Undeveloped			
a. Production expected within 5 years	8	24	32
b. Production not expected within the next 5 years	36	50	86
III. Production ceased			
a. Temporarily ceased	16	14	30
b. Ceased	56	88	144
Total	212	295	507

*Including underground gas storage in one salt cavern cluster.

1.3 Resource estimates

Gas resources as of January 1, 2024

As of January 1st 2024, the total gas resources discovered, both in developed and undeveloped accumulations, amount to 74.1 billion Nm^3 (Table 1.2).

Reserves and contingent resources

As of January 1st 2024, no more reserves have been reported in the Groningen field. The 64.2 billion Nm^3 remaining natural gas reserves are only present in the small fields. Sixty-three percent of the reserves are located offshore. The contingent reserve, awaiting commercial development, amounts to 9.9 billion Nm^3. Onshore, 7.5 billion Nm^3 and offshore 2.4 billion Nm^3. Unlike the reserves, 75% of the contingent reserve is present onshore. Groningen has no contingent reserves (Table 1.2).

Table 3.2 Netherlands natural gas resources as of January 1st 2024 in billion Nm^3.

Area	Reserves	Contingent resources (development pending)	Total
Groningen	-	-	-
On land	24.0	7.5	31.5
At sea	40.2	2.4	42.6
Total	64.2	9.9	74.1

In order to calculate and sum volumes of natural gas of different qualities, all volumes are converted into Groningen natural gas equivalents (Geq), using their respective calorific values (Table 1.3). The reference calorific value used for the Groningen natural gas equivalent is the original value of 35.17 MJ/Nm^3.

Table 3.3 Netherlands natural gas resources as of January 1st 2024 in billion m^3 Geq.

Accumulations	Reserves	Contingent resources (development pending)	Total
Groningen	-	-	-
On land	25.4	8.2	33.7
At sea	45.3	2.5	47.8
Total	70.8	10.7	81.5

Revision of the natural gas resources compared to January 1st 2023

Table 1.4 shows the total adjustment in the Dutch natural gas resources as a result of:

- Re-evaluation of previously proven accumulations and new discoveries.
- Production during last year.

Table 3.4 Revision of the natural gas resources compared to January 1st 2023 in billion Nm^3. The sum of the revaluation and production is the revision.

Area	Resources at January 1st 2023	Re-evaluation	Production	Revision	Resources at January 1st 2024
Groningen	1.7	-0.3	-1.5	-1.7	0.0
On land	44.4	-10.0	-2.9	-12.9	31.5
At sea	52.2	-3.7	-5.9	-9.6	42.6
Total	98.3	-14.0	-10.2	-24.2	74.1

The net result is a decrease of the resources by 24.2 billion Nm^3 compared to January 1st 2023. The production in the year 2023 is explained in more detail in Chapter 3.

Re-evaluation

The operators periodically re-evaluate natural gas fields from a technical and economic point of view. New developments or insights may lead to a revision of the resource estimate. This revision is based on, among other things, commercial considerations, production performance and the implementation of technical adjustments. These adjustments relate to, among other things, the drilling of new wells and the application of techniques to extend the production period. Despite the drilling of new accumulations, the resource estimates have been revised by -14.0 billion Nm^3 in the course of 2023 due to re-evaluation of both producing and non-producing natural gas fields. A large part of the revision concerns onshore natural gas fields. An overview of the revision of the natural gas resources is shown in Table 1.4.

Compared to January 1st 2023, the number of natural gas accumulations has increased by two: LDS-A and L11-Elliot (Table 1.5). The locations of these new accumulations are indicated with a star in Figure 1.2.

Table 3.5 Natural gas accumulations discovered in 2023.

Accumulation	Discovery well	Licence [Type]	Operator
LDS-A	LDS-01	Drenthe VI [pl]	Vermilion Energy Netherlands B.V.
L11-Elliot	L11-16	L11d [pl]	ONE-Dyas B.V.

pl: production licence

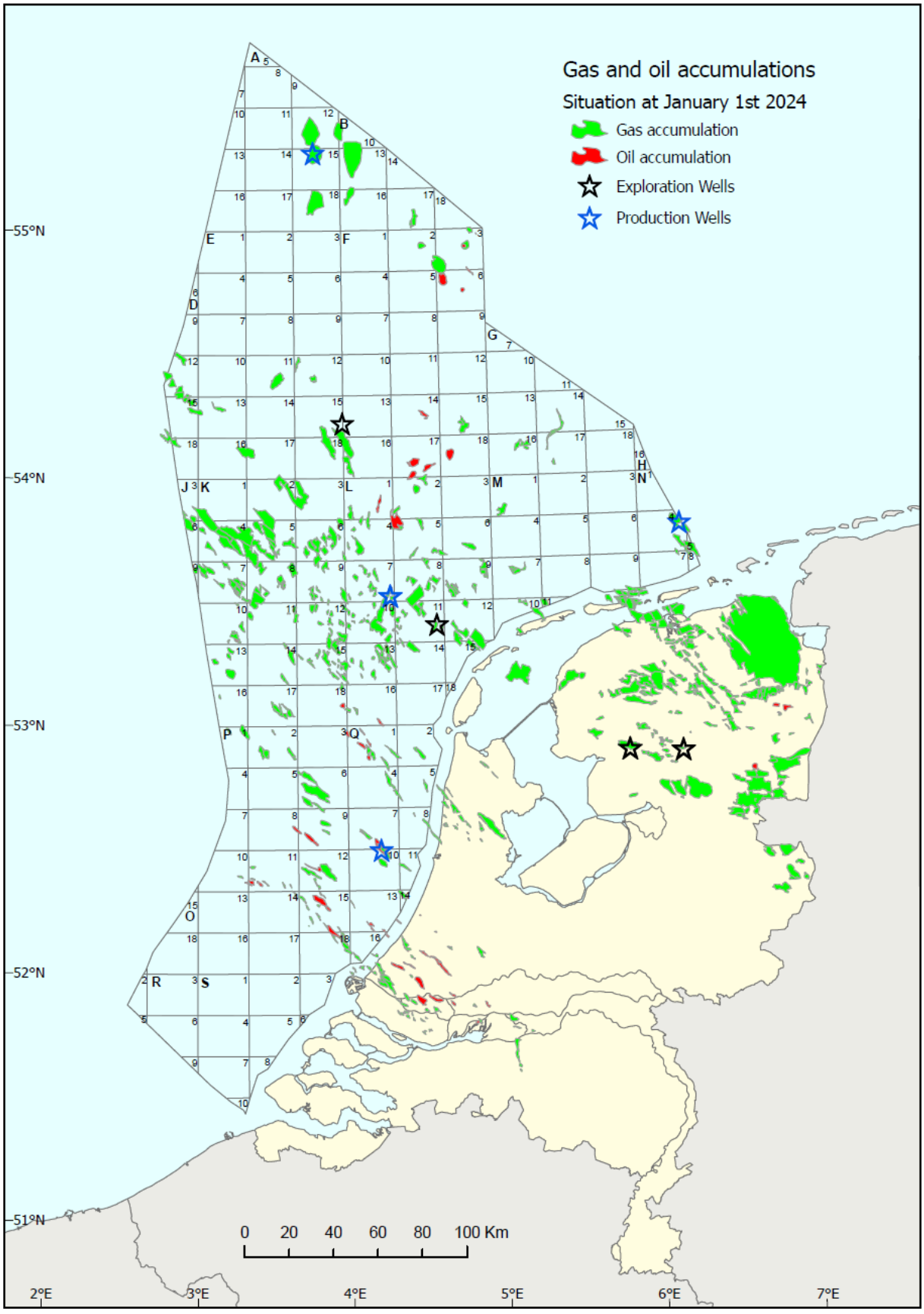


Figure 3.2 Map showing oil and gas accumulations in the Netherlands as at 1 January 2024. All gas wells, including the production wells are assigned with an asterisk.

1.4 Expected production of natural gas

Policy

In recent years, domestic gas production from the Groningen field and the small fields has decreased. The policy of the Dutch government is aimed at slowing down the decline in domestic gas production in the North Sea. Gas from the Netherlands contributes to energy security of the country by reducing dependence on imports and it has a lower carbon dioxide footprint than imported gas. Gas from the North Sea has a lower impact on society than onshore gas extraction. However, at sea other interests must be considered, such as wind parks, shipping lanes, nature and fisheries. The time pressure caused by the decommission or conversion of the existing gas infrastructure must also be taken into account. Due to the cessation of production from an increasing number of gas fields, the existing infrastructure is gradually being abandoned and removed or possibly reused for transport of CO_2 to underground storages in depleted gas fields. Future developments such as transporting hydrogen from wind farms to the coast could also pose a rivalling interest. Potential decommissioning resulting in a lack of a gas infrastructure makes it more difficult to connect new gas projects and possibly (much) less economically attractive because the costs of the infrastructure can be shared with fewer fields.

In order to make the investment climate for gas development more financially attractive, the tax deduction for investments in gas in the North Sea has been extended to 40% in 2020, and now applies to all investments in gas exploration and production activities. In 2022 the need for gas production from the Netherlands has been emphasized by the acceleration plan[1] in which the policy was announced to delay the decline in gas production from small fields as much as possible. Simultaneously a temporary rise in taxes on (extreme) profits on gas production was implemented due to the extremely high gas price and to provide funds for mitigating price rises for gas consumers. Licence duration are now explicitly linked to the expected decrease in need for gas production towards the climate neutral goal in 20250.

The following paragraphs successively deal with gas production from the Groningen field and production from the other (small) gas fields, subdivided into land and sea. This subdivision arises from the specific dynamics that characterize these areas. The plans for phasing out production from the Groningen field are based on the government's intention of 29 March 2018 (letter to the House of Representatives, DGETM-EI / 18057375). The reporting on the small fields is largely composed of data from gas producers. The reference date for the report is 1 January 2024.

Groningen gas field

As the consequences of gas extraction in Groningen were no longer socially acceptable, in 2018 the government decided to phase out gas production completely as soon as possible. Hereby minimizing the earthquake risk by removing the cause. To this end, the Mining Act has been amended, so that no more gas is extracted from the Groningen field than is necessary for security of supply.
This is realised by, amongst others, the reduction in demand for natural gas, partly the result of structural energy-saving adjustments nationwide in response to high gas prices and climate policy, and the extensive conversion programs in Germany, France and Belgium from low to high-calorific gas. Additionally, the construction of the nitrogen installation in Zuidbroek has been completed and the Grijpskerk gas storage facility has been converted from a storage facility for high-calorific gas to a storage facility for low-calorific gas. Partly due to these measures, the required amount of gas from the Groningen field decreased slowly

[1] https://www.rijksoverheid.nl/documenten/kamerstukken/2022/07/15/versnellingsplan-gaswinning-noordzee

every year. Since 2019, the amount of gas extraction has been determined annually by a formal decision by parliament.

From the gas year 2023-2024 (running from October 1 to September 30), the use of the Groningen field has only been available as a backup in exceptional situations of gas shortage. Only in very exceptional cases (an average effective daily temperature of -6.5 degrees Celsius or lower within a time horizon of three days) was production brought to the pilot light level. This was to allow for a quick response if a major production resource such as Norg gas storage failed under these circumstances. The latter did not occur. However, in January 2024, there was an average effective daily temperature of less than -6.5 degrees Celsius, which is why two production locations produced at pilot flame level for approximately two days. Since then production has been definitively halted.

The small fields

The small fields include all Dutch gas fields, except the Groningen gas field (which is approximately 40 times larger than the second largest gas field).

Technical and economic subdivision

TNO calculates the expected annual gas production based on the data supplied by gas producers (ex Article 113 of the Mining Decree). As previously described, the gas supply is divided into three main classes in accordance with the Petroleum Resource Management System (PRMS); reserves, contingent resources and prospective resources. The numbers mentioned are based on the expected values, the low and high estimates are disregarded:

a. Reserves; the part of which production is ongoing or where the (investment) decision to start production has been taken.
b. Contingent resources (development pending): the less certain part of resources in proven occurrences. This requires greater certainty regarding the technical, economic and / or legal conditions before investing in gas production. Contingent resources in subclasses of which the development is still uncertain, on hold or currently considered unviable according to PRMS, are not included in the profiling. This is due to the great uncertainty whether they will ever put into production.
c. Prospective resources: resources that have not yet been proven, but which are expected to be present and to be considered economically viable on the basis of technical data. Actual production can only be started if these expectations have been positively proven by an exploration well. TNO has calculated an exploration scenario based on the expected gas resources as supplied by the operators (see box).

Resources in the Gas Storage Facilities

These resources are not yet part of the production profile of the small fields. The resources from all gas storage facilities (~36 billion Nm^3 of that was present in the reservoir when converted to gas storage) will still be produces when the storage activities are terminated. This is mainly cushion gas which provides the necessary pressure for the system to function as a storage site.

Factors for successful production

In addition to the usual technical and economic factors, the probability of successful gas production is also determined by a number of other factors:

a. Upcoming policy. Amongst others decreasing the duration of licensing, a potential new role for EBN and releasing new subsurface data may accelerate new plans for hydrocarbon projects.
b. The current higher (expected) gas price will allow a higher number of projects to be economically attractive.
c. The embargo on new onshore exploration licences limits the prospective resources. Additionally, the proposed Wadden Sea embargo will also influence the number of options.
d. Embargo on investments in fossil fuels may lead to a decrease in financial investment space for operators
e. Resistance of the local population to (re)development of gas fields leads to greater uncertainties regarding feasibility, and also to a delay in activities due to longer (licence) procedures. This effects is also noticeable in developments at sea.
f. Licence duration is limited towards expected reduction of gas production in relationship to the climate goals[2]

Scenarios for gas production in the next 25 years

Dutch gas production from small fields has been in decline since 2005 due to natural depletion and limited replenishment from new gas fields. Due to the stop of production in the Groningen gas field and decrease in import of Russian Gas the importance of gas production from the Netherlands has increased. In order to stimulate domestic production, new policy measures are currently being formulated. In addition, the higher gas price improves the economic attractivity. The influence of these developments in combination with, amongst others, procedural objections, make any prognosis made highly uncertain. To meet this uncertainty TNO presents three scenarios generated for the gas production prognosis, a high, middle and a low production scenario.

Low Scenario

In the Low Scenario it is assumed that there is a negligible amount of new reserves added to the resources in the Netherlands. This scenario assumes 1 exploration well per year for both land and sea. This number decreases linearly to 0 in 2028 and 2035, respectively. For all significant purposes this means that the current reserves are produced with negligible other new resources. NB; this scenario gives a much lower estimate than presented in previous annual reports.

Middle Scenario

The middle scenario assumes a short period of limited activity by continuation and some minor uplift of the investment level. In addition to the investment in exploration the contingent resource class 'awaiting production' is taken into account as these projects have a reasonable chance of actually being developed. For the prospective resources a drilling intensity representative for the past 10 years is assumed (1 exploration wells per year on land, 3 at sea). The drilling intensity decreases to 0 in 2035.

High Scenario

Scenario High assumes a strong effect of new policy measures and/or by the increasingly attractive conditions for operators to develop gas projects. In this scenario high-risk projects are also taken into account. As far as the prospective resources are concerned a higher portion is developed by an increase in exploration to 6 wells per year (of which 1 on land and 5 at sea). TNO expects a low chance for increasing

[2] Omwonenden beter betrokken bij mijnbouw | Nieuwsbericht | Rijksoverheid.nl

the number of wells onshore, which is consistent with intended policy. The drilling intensity for onshore wells decreases to 0 in 2035.

Relative chances scenarios
In recent years, there has been a structural decline in production, the number of (planned) wells and the reserves. Based on current regulations and developments, TNO expects that this trend will not change in the future. Based on this, TNO estimates a low chance for the high scenario, with a significant increase in investments, to mature.

TNO currently considers the scenarios medium, with a limited investment level, and low, where hardly any investments are made, to be more likely.

Table 1.6 Description of the used scenarios.

Scenario	*Reserves*	*Contingent resources*	*Prospective resources*
LOW	Production of entire reserve category , as per delivered by gas production companies	No projects taken into account	1 exploration well at sea, decreasing to 0 in 2035 1 exploration well on land decreasing to 0 in 2028
MIDDLE		Production of contingent resources, subcategory "awaiting production"	3 exploration wells at sea 1 exploration well on land Both decreasing to 0 in 2035
HIGH		Production of contingent resources, subcategory "awaiting production" Including a part of the projects which are categorized in a lower certainty class. These are only resources in the subcategories "Development on hold" and "Development unclarified". The prognosis takes into account the lead time preceding production.	Average of 5 exploration wells at sea 1 exploration well on land Both decreasing to 0 in 2035

NB; Due to the providing scenarios, the reserves and contingent inventories presented in Section 1.1-1.3 are not completely the same as the profiles provided in the prognosis.

Expected gas production from small fields on land

In 2024, the production of the reserves from the currently producing small fields on land (green in Figure 1.3) is expected to be 2.8 billion m^3 Geq per year. A cumulative production from reserves of 14 billion m^3 Geq from the small fields on land will be realised in 2035.
The contingent resources are expected to gradually come into production (yellow), which will compensate for the decrease in production from the reserves for some time. The profile initially shows a flat development with production around 2 billion m^3 Geq. However, after an initial increase the annual production from the contingent resources production shows a gradual decline from 2031 with a very limited production of 1 billion m^3 Geq in 2033. Ultimately 5 billion m^3 Geq will be produced from the contingent resources.
In view of the previously described factors such as the current economic conditions and social acceptance, it is questionable whether the known prospective resources will actually be developed. Based on the scenario calculations (see box), it is expected that with an average of 1 exploration well will be drilled until 2028 and subsequent field development on land for the next 25 years, a total production of 2 billion m^3 Geq from prospective resources can be achieved. Long term expectations for the prospective resources are very uncertain as the boundary conditions may change.

Figure 3.3 Actual production in 2023 and expected production of natural gas from the small fields on land from 2024 to 2048. Production from the Groningen field is excluded. The data underlying this profile are given in Annex B and C. Long term expectations for the prospective resources are very uncertain as the boundary conditions may change. Therefore, they are indicated in dotted lines. NB: this figure only shows the Middle Scenario.

Expected gas production from small fields at sea

In 2024 the annual production of reserves from the producing small fields at sea (green in Figure 1.4) is estimated to be 6 billion m^3 Geq decreasing to less than 1 billion m^3 Geq in 2036. In total, 45 billion m^3 Geq of reserves are expected to remain.

As usual, the contingent resources will come into production with a slight delay (yellow). This production compensates the decrease in production form the reserves. However, these resources also show a gradual decrease from 2031 onwards. In total, production from the contingent resources amount to 2 billion m^3 Geq. Consequently, from 2035 onwards, gas production at sea will have to come predominantly from gas fields that have not yet been discovered (light yellow). In total there is a potential of economically attractive resources of 80 billion m^3 Geq. Based on a scenario with four exploration wells per year and, in case of success, subsequent field development, a total production of 23 billion m^3 Geq may be realised in the next 25 years. Long term expectations for the prospective resources are very uncertain as the boundary conditions may change.

Figure 3.4 Actual production in 2023 and expected production of natural gas from the small fields at sea from 2024 to 2048. The data underlying this profile are given in Annex B and C. Long term expectations for the prospective resources are very uncertain as the boundary conditions may change. NB: this figure only shows the Middle Scenario.

Expected total gas production from the small fields

Figure 1.5 shows the cumulative forecast of gas production from the small fields for land and sea together for the Middle scenario with each resource class shown separately. Figure 1.6 shows the expected cumulative gas production for Scenarios Low, Middle and High.

A very substantial effort is required to realize the High Scenario, in particular a marked increase in number of wells compared to the average of the past 5 years. In contrast to previous versions of the annual report a decreasing number of exploration wells is explicitly modelled.

Additionally, a number of previously discovered but as of yet undeveloped fields are taken into account in the High Scenario. The latter has had a particularly large effect, as a large proportion of the most promising projects were downgraded to lower classes (see chapter 1.3).

Notes on the long term prognosis

Currently there are several developments which have a decreasing effect on the long term gas production expectations. These include:

(1) The lead time in granting licences for gas projects is unpredictable. Given the considerable a priori investment costs required for gas projects, this puts a great deal of pressure on the economic attractiveness of these projects.

(2) The energy transition; The intended government policy is to limit the production in the Netherlands to match the domestic gas consumption. If this is implemented within policy, it may result in long term investments decisions being declined due to a higher uncertainty in economically viable (tail end) production.

(3) Gas production and development on land will be subject of a formal public debate; in case production or new developments will have to stop it means a part of the current resources will remain unproduced.

(4) Overlapping use of the North Sea; Currently many different and space consuming activities are being developed and planned on the North Sea such as wind parks and CO_2 storage sites. These activities might hinder access to new gas development projects.

Due to these highly dynamic developments the scenarios presented in this chapter are very uncertain. The Middle Scenario should be interpreted as a prognosis for a case where the boundary conditions remain relatively stable. However the number of exploration wells and maturation rate of conditional projects is higher than in the past 5 years (see also overview N3). The High Scenario is optimistic as it requires a structural higher sustained level of investment than has been seen in the past 10 years.

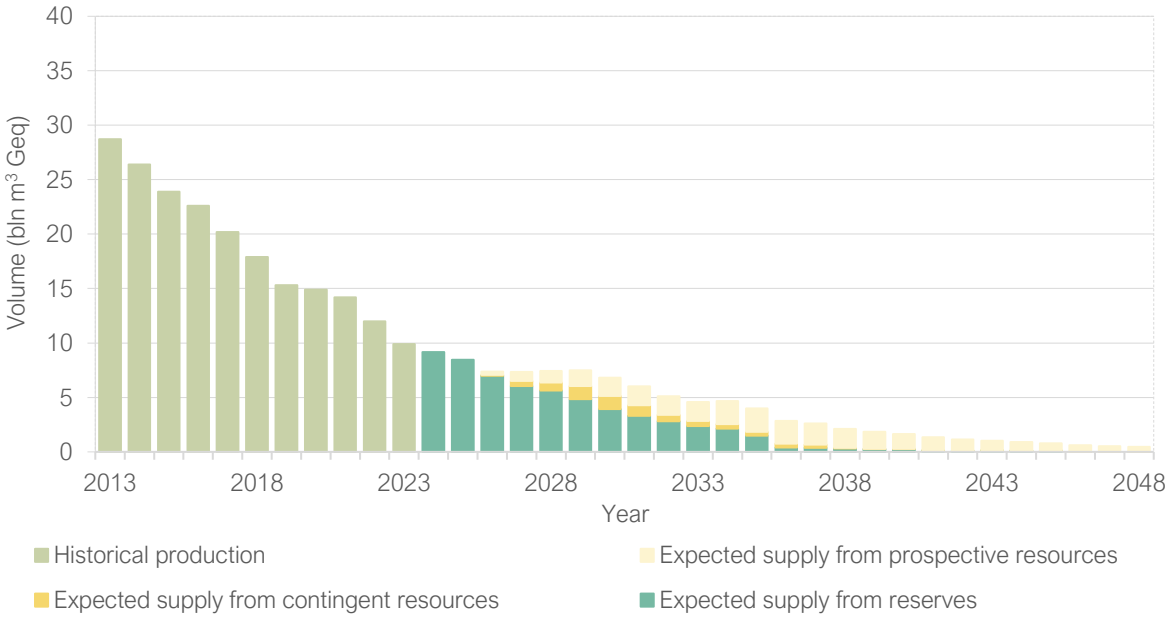


Figure 3.5 Actual production (2013 – 2023) and expected production of natural gas from the small fields (both land and sea) presented using the Middle scenario (excluding the Groningen field) from 2024 to 2048. The Groningen field has not been taken into account here. For the conversion from volume to energy unit, 1 billion m^3 Geq is equal to approximately 10 TWh and 35 PJ. The values underlying this profile are given in Annex B and C.

Figure 3.6 Expected production from the small fields. Realized production (2013 – 2023) and expected production (2024 – 2048) of natural gas of both land and sea. Per scenario only the cumulative is given as dotted/dashed lines. For the conversion from volume to energy unit, 1 billion m^3 Geq is equal to approximately 10 TWh and 35 PJ. The values underlying this profile are given in Annex B and C.

1.5 Evaluation of demand and production of fossil fuels

Background

In a letter to the House of Representatives dated 16 June 2023[3], the former State Secretary for Mining promised to have an annual assessment carried out to gain insight into whether the expected demand development and the forecast of oil and gas production in the Netherlands are in line with the climate ambitions. This will enable the cabinet to monitor whether the phase-out path of oil and gas production fits within the climate ambition. This sub chapter follows up on this by presenting the forecasts of Dutch gas consumption and gas production for the next 25 years. Dutch oil production (see Chapter 2) currently provides for ~1% of domestic demand[4]. As the chance that oil production will exceed demand is negligible, this evaluation is not explicitly provided.

Gas production forecast

The gas production forecast is based on the evaluation and the scenarios from this annual report in paragraph 1.4. Due to the recent developments in the Dutch gas sector, production will decrease significantly until 2050. Even a very ambitious scenario (High) will only lead to a limited increase of production, followed by a lower production forecast than in the 2022 annual report. The scenarios do not take into account the chance that the offshore infrastructure will become unprofitable within a very short period of time due to the high costs and decline in production. This effect might lead to an even steeper decline in gas production.

[3] Gaswinning | Tweede Kamer der Staten-Generaal

[4] Aardoliegrondstoffen- en aardolieproductenbalans; aanbod en verbruik | CBS

In addition, a minimum scenario is assumed based on the reserves as currently known. In recent years, the reserves have not always been produced, so if the current reserves are written off by the operators, this will have an additional negative effect on the production forecasts.

In conclusion, we consider the chance of higher gas production than in the High scenario to be unlikely. Lower gas production than in the Low scenario is not inconceivable.

Gas demand development

Since no explicit targets have been set for gas demand, it is estimated on the basis of (announced) policy and energy system analyses. The upper limit for gas demand is the estimate based on established and proposed policy from the Climate and Energy Outlook (KEV)[5] from 2022.

The last KEV (2023) was not a complete calculation and therefore did not yield an expected gas demand prognosis. That is why the results from the previous KEV from 2022 were used. Although this makes the bandwidth of the uncertainty slightly narrower, this does not affect the conclusion of the analysis in this chapter. Since the KEV2022 estimates do not lead to the net zero in 2050 target, an energy system scenario has been added to the analysis. This is the TRANSFORM scenario from the TNO scenario studies[6] from 2024, in which gas demand falls most rapidly. Gas demand also falls in other scenarios in this study, but at a slower rate. The TRANSFORM scenario can therefore be considered as a lower limit for gas demand development.

The gas demand development excludes biogas. Biogas is modelled as a separate energy carrier. Although biogas can in principle be mixed into the current natural gas system, this has been taken into account in the model.

The KEV estimates the effects of energy and climate policy on energy use and greenhouse gas emissions. The aim of the policy is to realize the climate and energy ambitions. Based on the estimates of greenhouse gas emissions, the Netherlands did not reach the targets in 2022. This picture improved in 2023, provided that the agreed measures are implemented expeditiously. Furthermore, the KEV has so far mainly focused on the year 2030, in accordance with the climate target for 2030. This will gradually shift, with the PBL also looking at the period after 2030 and beyond. Possible alternative policies in the future may influence the expected gas demand. To overcome this, the TNO TRANSFORM scenario has been included in the comparison below as a lower limit for gas demand development.

[5] Klimaat- en Energieverkenning (KEV) | Planbureau voor de Leefomgeving (pbl.nl)
[6] https://energyscenarios.tno.nl/

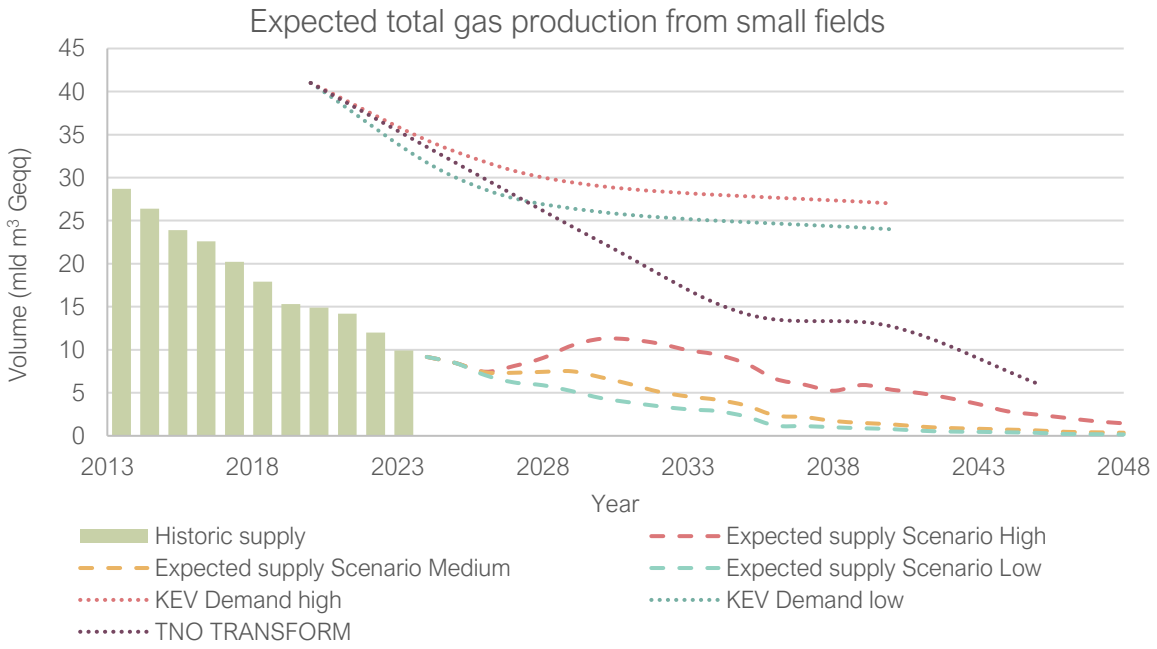


Figure 1.7 The Dutch natural gas demand and expected gas supply from domestic production for the next 25 years. The gas demand is presented conform policy decisions (KEV 2022). The KEV high and low scenarios concerns the top and bottom of the bandwidth of the gas estimate, based on established and proposed policy. The TNO TRANSFORM scenario was added as this scenario meets the net-zero emissions objective of 2050. The demand for natural gas decreases the fastest in the TNO TRANSFORM scenario compared to other TNO scenarios which also meet the net-zero emissions target.

Comparison and uncertainties of climate ambition for gas production

Figure 1.7 shows three scenarios for gas production and gas demand from 2024 to 2048. Based on the current comparison, the amount of gas produced in the Netherlands will not exceed demand in that period. In the event of changes in policy and/or circumstances, gas demand could of course decrease, but it is expected that this will not fall below gas production.

In addition, there is the question of the extent to which low gas production in the Netherlands contributes to the climate ambition. With low gas production, imports of LNG will have to fill the gap between demand and production. LNG has a much higher CO_2 (equivalent) emission in the chain than natural gas produced in the Netherlands. This means that greater import dependency will lead to greater CO_2 equivalent emissions on a global scale. Within the Netherlands, greenhouse gas emissions will also increase compared to domestic natural gas, but the effect will remain limited to the effect of the energy input for the gasification of LNG.

Evaluation of gas demand and supply in lincences

The Ministry of Climate Policy and Green Growth has requested an evaluation of the existing permits for oil and gas extraction and the extent to which they fit within the intended fossil fuels reduction path. This creates the possibility of adaptive intervention via the permits for oil and gas production, this can be done for example if the demand for gas continues to fall. It is expected that the share of gas produced will mainly come from extraction permits that have already been granted. This applies to all scenarios, although this share will be lower with higher gas production, in which case exploration in exploration permits and open areas is also necessary.

Based on the comparison of gas production and gas demand (Figure 1.7), all current forecasts of gas production from the licensed activities, including exploration activities, fit well within the bandwidth of gas demand. As mentioned earlier, oil production is so limited that it can reasonably be assumed that oil production fits within oil demand.

2.
Oil resources

As of January 1st 2024, there are 53 proven oil accumulations in the Netherlands (see Table 2.1). Five of them are in production and three are expected to be put into production within the next five years. The remaining accumulations are not expected to be put into production within the next five years or their production was ceased. All oil accumulations are listed and classified in the overview A.2 (Appendix) by status with their corresponding licence and name of the current or last operator.

Table 2.6 Number of proven oil accumulations as of January 1st 2024.

Status of oil accumulations	Land	Sea	Total
I. Developed			
In production	1	4	5
II. Undeveloped			
a. Production expected within 5 years	0	3	3
b. Production not expected within the next 5 years	10	18	28
III. Production ceased			
a. Temporarily ceased	1	0	1
b. Ceased	8	8	16
Total	20	33	53

Oil resources as at 1 January 2024

The resource estimates are based on data and information submitted by the operators, following the Petroleum Resource Management System, as requested by the Mining Act. (see Annex 3 for further details). Table 2.2 shows the reserves and contingent resources as of January 1st 2024. Reserves are defined as part of the resources that can be produced commercially. The contingent resources are those for which not all conditions have yet been met to be considered commercially viable. The part of the contingent resources with the least uncertainty belongs to the subclass "development pending". The rest of subclasses (on hold, unclarified or not viable) have a much greater uncertainty and are not included in Table 2.2. Because the resource classification is based on the project-based development of an accumulation, and multiple projects can be present within the development of one accumulation, one accumulation can have both reserves and contingent resources.

The total Dutch oil reserves amount to 14.3 million Sm^3 as of January 1st 2024, consisting of 1.7 million Sm^3 of oil reserves and 12.6 million Sm^3 of contingent resources (development pending).

Table 2.7 Oil resources in million Sm^3 as of January 1st 2024 in million Sm^3.

Area	Reserves	Contingent resources (development pending)	Total
Land	0.8	7.6	8.4
Sea	0.9	5.0	5.9
Total	1.7	12.6	14.3

Revised estimates of the oil resources compared to January 1st 2023

Table 2.3 shows the revised estimates of the Dutch oil resources as a result of:

- Re-evaluation of previously proven accumulations.
- Production during the previous year.

The total revision leads to a decrease of the oil resources down to 14.3 million Sm^3. Production in 2023 (0.4 million Sm^3) only explains a small part of the total 2.0 million Sm^3 decline, as the main cause is the revision of the resources from onshore oil fields.

Table 2.8 Revised estimates of oil reserves compared to January 1st 2023, in million Sm^3.

Area	Oil resources as of January 1st 2023	Re-evaluation	Production	Revision	Oil resources as of January 1st 2024
Land	10.6	-2.1	-0.1	-2.2	8.4
Sea	5.7	0.5	-0.3	0.2	5.9
Total	16.3	-1.6	-0.4	-2.0	14.3

Figure 2.1 shows historical oil production from 2013 until present, and the forecast for the next 16 years. The underlying data of this figure and the distribution of production between onshore and offshore are available in the overviews D and E in the appendix. The forecast is based on the annual reports of the operators as of January 1st 2024. Compared to last year's forecast (0.6 million Sm^3), actual production (0.4 million Sm3) fell short of expectations and was down by -33 %. This is mainly due to the fact that the Schoonebeek oil field did not produce in 2023. Based on the increased uncertainty surrounding oil production from the Schoonebeek field and the decline in oil production from other producing fields, the total oil production is expected to continue to decline. From 2036 onwards, all expected oil production will come primarily from what is now classified as contingent resources. The limited number of oil projects and a large dependency on a few large project lead to increased uncertainty in the forecasts, especially from 2039 onwards. This is why the forecast is limited to year 2038 in the figure and in the appendix.

In 2023, no new oil accumulation was discovered (Table 2.4).

Table 2.9 Oil accumulation discovered in 2023.

Accumulation	Appraisal well	Licence area [Type]	Operator
-	-	-	-

Figure 2.1 Historical and expected oil production. Realised (2013 - 2023) and expected (2024 - 2039) oil production as cumulative for both land and sea (in million Sm^3).

3.
Production of natural gas, oil and condensate

During the year 2023, two fields were put into production and no fields were taken out of production (see Table 3.1 and 3.2).

Table 3.1 Fields brought into production in 2023

Field name	In production	Discovery year	Natural resource
Nieuwehorne	January	2011	Gas
LDS-A	March	2023	Gas

Table 3.2 Fields taken out of production in 2023

Field name	Out of production	Discovery year	Natural resource
-	-	-	-

The tables below show the aggregated production figures for natural gas, oil and condensate in 2023. Condensate is considered a by-product of oil and gas production. The changes compared to 2022 are shown both in absolute and percentage terms. The tables are based on production data provided by the operators and published on NLOG.

The total decrease in natural gas production of 33.1% compared to 2022 is again largely due to the reduction in production from the Groningen gas field (68.0%). Excluding the Groningen gas field, the decrease in gas production in the small fields is 11.2% on land and 21.3% at sea (Table 3.3).

A similar situation is observed in oil production. The total decrease compared to 2022 is 15.0% and is mainly caused by a decrease in oil production on land, in the Rotterdam oil field (16.7%). At sea the decrease is 14.3% (Table 3.4).

Overview of production in 2023 and changes compared to 2022

Table 3.3 Natural gas production* in 2023 and changes compared to 2022 (in billion Nm^3)

Field location	Production 2022	Production 2023	Changes compared to 2022	%
Groningen	4.6	1.5	-3.1	-68.0
On land (other fields)	3.2	2.9	-0.4	-11.2
On land (subtotal)	7.8	4.3	-3.5	-44.5
At sea	7.5	5.9	-1.6	-21.3
Total	15.3	10.2	-5.1	-33.1

* Excluding coproduced natural gas from geothermal energy production licences.

Table 3.4 Oil production in 2023 and changes compared to 2022 (in 1000 Sm^3)

Field location	Production 2022	Production 2023	Changes compared to 2022	%
On land	140.2	116.8	-23.5	-16.7
At sea	313.0	268.3	-44.7	-14.3
Total	453.3	385.1	-68.2	-15.0
Production per day*	1.242	1.055	-0.187	

* Total annual oil production divided by 365 days.

Table 3.5 Condensate production* in 2023 and changes compared to 2022 (in 1000 Sm^3)

Field location	Production 2022	Production 2023	Changes compared to 2022	%
On land **	64.8	60.9	-4.0	-6.1
At sea	56.6	49.9	-6.7	-11.8
Total	121.4	110.7	-10.7	-8.8

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

** Excluding coproduced condensate from geothermal energy production licences and excluding condensate produced from the Alkmaar, Bergermeer, Grijpskerk and Norg storage fields (see Chapter 4).

3.1 Natural gas production on land in 2023

The table below shows the monthly production figures per production licence on land. The production per licence is the field production, divided in proportion to the field surface area in the licence. Due to rounding of the production per month, small differences with the totals per year may occur.

Annex B gives a long-term overview of the annual production of natural gas.

Table 3.6 Natural gas production on land per licence in 2023 (in million Nm^3)

Licence *	Operator	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
Andel Va	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Beijerland	NAM	4.1	3.3	2.7	2.2	2.4	0.7	2.3	2.2	2.4	2.1	2.0	1.3	27.8
Bergen II	TAQA Off	6.0	5.2	5.6	5.3	3.1	3.4	5.6	4.7	1.1	3.0	5.1	2.4	50.6
Botlek IV	NAM	6.8	6.7	7.4	5.8	3.0	1.5	2.0	4.0	1.8	2.2	5.5	4.6	51.2
Botlek Maasmond	ONE-Dyas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
De Marne	NAM	0.1	0.1	0.2	0.0	0.1	0.2	0.2	0.1	0.1	0.1	0.1	0.1	1.4
Drenthe IIa	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Drenthe IIb	NAM	4.8	4.2	5.5	4.9	4.6	4.8	4.5	4.5	3.3	1.5	4.0	4.6	51.2
Drenthe IIIa	Vermilion	0.5	0.3	0.7	0.4	0.3	0.2	0.2	0.2	0.2	0.2	0.2	0.3	3.7
Drenthe IV	Vermilion	0.3	0.2	0.3	0.3	0.3	0.3	0.2	0.1	0.1	0.0	0.4	0.3	2.8
Drenthe V	Vermilion	1.3	0.9	1.0	0.3	1.1	0.9	0.5	1.1	1.2	1.8	1.4	1.5	13.0
Drenthe VI	Vermilion	14.9	12.5	13.8	15.6	15.7	14.7	16.1	14.7	13.7	16.4	25.3	25.6	198.9
Gorredijk	Vermilion	6.2	8.7	7.1	5.4	4.9	4.0	3.9	3.9	2.4	4.0	2.7	3.4	56.6
Groningen	NAM	434.9	381.6	413.4	85.3	77.0	95.7	104.8	112.2	106.7	44.1	41.5	44.4	1941.6
Hardenberg	NAM	2.7	1.9	1.9	2.0	2.0	1.6	1.9	1.7	1.7	1.8	1.8	1.5	22.5
Leeuwarden	Vermilion	1.4	1.7	2.5	2.2	2.3	2.2	2.9	3.0	0.4	2.6	2.7	2.8	26.6
Middelie	NAM	21.8	19.2	21.2	19.6	17.9	19.4	16.8	19.6	8.5	20.1	23.3	20.9	228.4
Noord-Friesland	NAM	92.4	86.3	99.2	93.6	98.3	96.7	95.9	94.8	88.9	81.4	84.6	81.9	1094.1
Oosterend	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Rijswijk	NAM	14.4	11.9	20.6	13.2	6.7	7.8	3.5	12.3	5.8	6.0	18.8	19.0	139.7
Schoonebeek	NAM	22.8	19.6	22.0	20.5	21.3	18.3	19.9	20.4	17.7	19.6	18.2	19.1	239.3
Slootdorp	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Steenwijk	Vermilion	1.6	1.3	1.4	1.4	1.6	1.5	1.5	1.4	0.9	1.4	1.2	1.2	16.5
Tietjerksteradeel II	Vermilion	6.8	6.0	6.6	5.7	5.8	5.4	5.9	6.2	5.8	6.0	6.0	6.3	72.6
Tietjerksteradeel III	NAM	5.8	5.1	5.6	3.0	3.4	6.5	5.1	5.3	5.0	3.8	4.0	4.3	56.9
Waalwijk	Vermilion	1.4	1.2	1.2	1.1	1.0	0.7	1.2	1.0	0.5	1.1	0.8	1.1	12.5
Zuidwal	Vermilion	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		650.9	577.9	639.7	288.0	272.7	286.6	294.9	313.6	268.1	219.4	249.4	246.7	4308.0

* Excluding coproduced gas from geothermal energy production licences.

Production on land per stratigraphic reservoir

Figures 3.1 and 3.2 show the contribution to the total natural gas production from the small fields on land per stratigraphic reservoir level. Production from fields with multiple reservoirs are shown in hatched colours. The Groningen field production, not included here, is produced from a Rotliegend reservoir.

Figure 3.1 shows that the largest contribution to gas production from the small fields comes from the Rotliegend and Triassic reservoirs. The sharply declining trend in total production of approximately 10% per year over the period 2003 - 2006 is interrupted in 2007, mainly due to the start of gas extraction from under the Wadden Sea. From 2008 onwards, the downward trend continues by approximately 6% per year. In 2013, this trend is interrupted again with a slight increase in production. After 2013, the downward trend continues again. A downward trend has been calculated in the period from 2017 to 2023 (with decreases of 11 to 22%) with a short interruption in 2020 and 2021 in which a less strong decrease is observed.

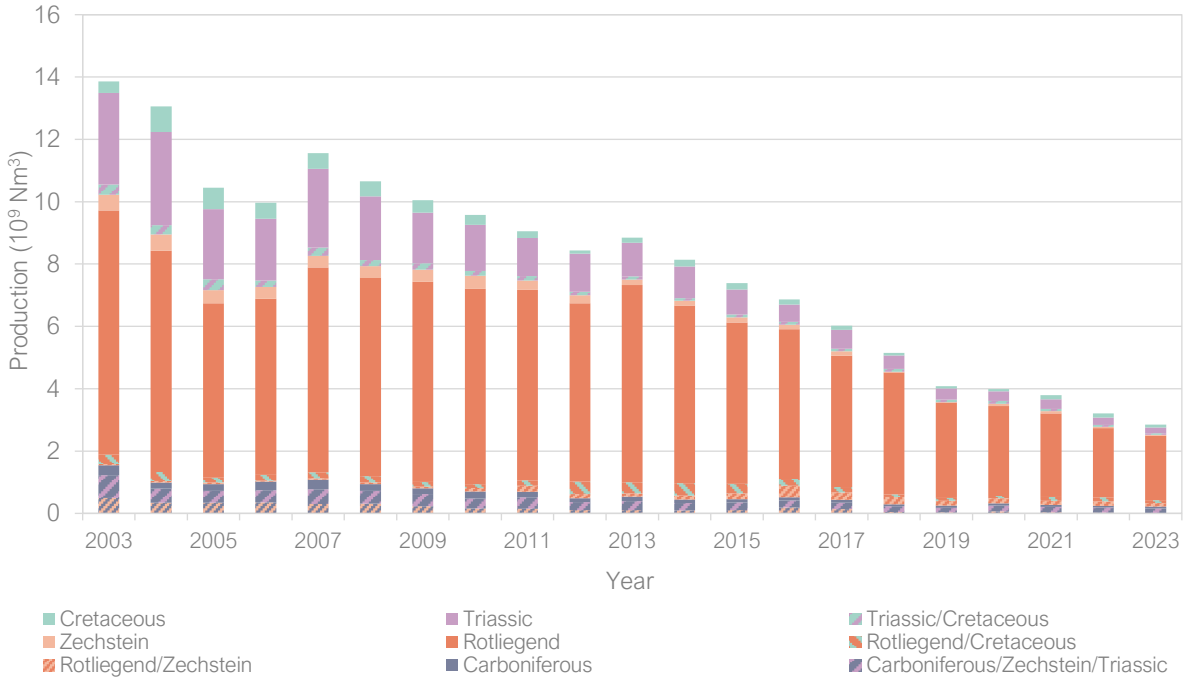


Figure 3.1 Natural gas production on land per reservoir (excluding the Groningen gas field).

In Figure 3.2, the contributions of Rotliegend and Triassic reservoirs are not included. This makes the contributions to natural gas production from Cretaceous, Zechstein and Carboniferous reservoirs more clearly visible. It should also be noted that there is no production from Jurassic reservoirs on the mainland. Production from this group of reservoirs generally shows a downward trend, but from 2012 to 2016 production was reasonably stable. This was mainly due to the increase in production from the Rotliegend/Cretaceous reservoir (Vinkega) while production from the Cretaceous and Zechstein reservoirs actually decreased. The increase in production from the Rotliegend/Zechstein reservoirs in 2016 was caused by an increase in production from Middelie from 29 to 161 million Nm^3 and the reclassification of Slootdorp due to the start of production from the Rotliegend (was only Zechstein). From 2017, natural gas production again shows a sharp, downward trend due to pressure reduction of the existing fields. The production increase of the Zechstein, Carboniferous/Zechstein and Carboniferous/Zechstein/Triassic reservoirs temporarily interrupted the downward trend in 2020, but the downward trend has been strengthened in subsequent years.

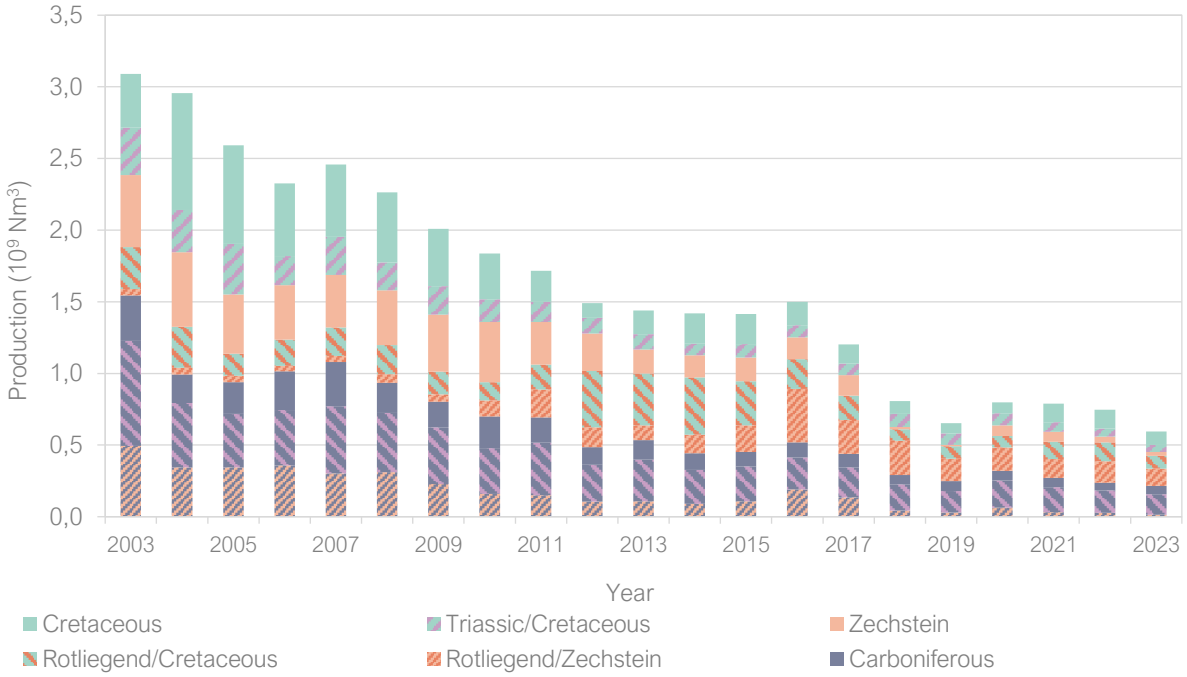


Figure 3.2 Natural gas production on land per reservoir (excluding gas field Groningen, Rotliegend and Triassic reservoirs).

3.2 Natural gas production at sea in 2023

The table below shows the monthly production figures of natural gas in offshore and per production licence. The production per licence is the field production, divided in proportion to the field surface area in the licence. Due to rounding of the production per month, small differences with the totals per year may occur. A long-term overview of the annual production of natural gas is given in the annex B.

Table 3.7 Natural gas production at sea in 2023 (in million Nm^3)

Licence	Operator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
A12a	Petrogas	28.6	25.1	25.7	25.3	18.7	21.2	23.6	23.0	2.5	22.2	23.3	20.9	260.1
A12d	Petrogas	4.2	3.7	3.8	3.7	2.8	3.1	3.5	3.4	0.4	3.3	3.4	3.1	38.3
A18a	Petrogas	23.3	21.9	22.3	21.7	16.4	18.8	20.9	20.0	1.9	18.0	18.8	18.1	221.9
A18c	Petrogas	12.0	11.3	11.5	11.2	8.4	9.7	10.8	10.3	1.0	9.3	9.7	9.3	114.3
B10c & B13a	Petrogas	13.1	11.6	11.7	11.3	7.8	10.3	11.0	10.8	0.6	9.4	8.3	9.6	115.4
D12a	Wintershall	13.0	17.9	19.1	17.1	16.3	9.2	15.1	13.4	2.9	13.0	9.7	11.7	158.5
D15a	Neptune	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
E16a	Neptune	9.8	8.5	9.7	9.4	8.2	7.7	6.4	5.9	6.3	4.6	2.1	1.3	79.8
E17a & E17b	Neptune	10.0	8.7	9.9	9.6	8.4	7.9	6.6	6.1	6.5	4.7	2.2	1.4	82.0
F02a	Dana NL	2.9	3.0	3.2	3.4	3.7	2.9	2.5	2.5	2.3	2.2	1.0	2.4	32.1
F03b	Neptune	4.4	5.1	4.9	6.0	7.0	4.6	4.8	3.6	5.5	3.0	0.0	3.6	52.7
F06a	ONE-Dyas	0.8	0.9	0.9	1.1	1.2	0.8	0.8	0.6	1.0	0.5	0.0	0.6	9.3
F15a	Total Energies	5.2	4.9	2.2	5.2	4.7	5.0	4.5	0.3	0.2	2.0	5.3	3.7	43.1
F17c	NAM	3.4	3.0	2.7	1.1	3.4	3.2	3.0	3.2	2.7	3.4	3.1	3.2	35.5
G14a & G17b	Neptune	19.9	17.7	18.8	18.5	8.5	18.3	18.4	18.6	17.7	18.0	14.7	17.7	206.7
G16a	Neptune	13.3	13.9	16.6	15.9	7.5	11.0	15.0	12.9	12.5	12.5	10.3	13.0	154.3
G17a	Neptune	0.2	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.0	0.0	0.3
G17c & G17d	Neptune	2.9	2.6	3.0	2.9	1.3	2.9	2.9	3.0	2.8	3.0	2.4	0.0	29.9
J03a	Total Energies	0.6	0.6	1.0	3.8	3.3	1.3	4.0	2.3	0.0	0.0	0.1	0.6	17.6
J03b & J06a	SPIRIT	0.1	0.0	0.1	0.8	0.7	0.3	0.9	0.5	0.0	0.0	0.0	0.0	3.5
K01a	Total Energies	2.9	5.2	3.8	5.4	4.7	2.1	6.2	3.6	0.0	0.0	0.8	5.3	39.8
K02b	Neptune	5.6	5.7	5.5	5.5	4.9	3.0	3.5	3.3	3.1	1.9	2.9	3.2	48.1
K02c	Total Energies	2.7	2.1	2.1	2.3	2.4	1.0	2.5	1.4	1.8	2.4	2.2	2.4	25.3
K03a	Neptune	13.9	14.1	13.6	13.6	12.0	7.3	8.6	8.1	7.6	4.6	7.0	7.8	118.3
K03b	Total Energies	0.1	0.0	0.0	0.2	0.0	0.0	0.0	0.0	0.0	0.2	0.2	0.1	0.9
K03c	Neptune	0.2	0.2	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.3
K04a	Total Energies	15.0	14.2	11.8	16.7	16.0	6.3	15.3	9.2	5.5	7.7	9.6	11.7	139.0
K04b & K05a	Total Energies	39.7	35.2	33.5	39.1	37.9	15.8	40.8	22.4	27.8	40.1	36.2	31.4	400.0
K05b	Total Energies	9.4	6.4	6.6	7.3	7.9	3.2	8.6	4.7	5.4	7.7	7.1	6.1	80.5
K06a, K06b, L07a, L07b & L07c	Total Energies	14.8	14.4	13.9	11.4	14.2	14.6	13.8	13.9	11.4	12.0	9.7	14.7	158.9
K07	NAM	3.6	4.9	4.7	3.6	3.0	2.3	4.0	1.5	3.1	3.4	3.1	1.9	39.2

Licence	Operator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
K08 & K11a	NAM	20.1	15.1	19.3	21.6	21.4	14.9	17.4	11.5	15.3	22.0	20.1	12.6	211.4
K09a & K09b	Neptune	4.3	3.5	2.4	3.6	3.3	2.8	1.5	2.1	2.5	2.4	2.3	1.9	32.5
K09c & K09d	Neptune	0.4	0.5	0.5	0.3	0.4	0.4	0.4	0.5	0.3	0.4	0.3	0.7	5.1
K12a	Neptune	17.6	16.9	17.2	11.6	11.2	16.2	13.6	15.9	11.5	12.5	13.9	14.4	172.6
K14a	NAM	1.7	1.3	1.6	2.0	2.2	1.2	1.4	0.6	0.2	0.7	0.5	0.6	14.0
K15	NAM	28.6	25.4	27.1	30.4	30.3	27.1	27.3	24.1	19.3	29.1	25.9	23.6	318.2
K17a	NAM	9.1	7.7	8.1	7.4	6.7	4.8	7.6	4.1	0.0	2.7	8.5	6.9	73.5
K18b	Wintershall	12.0	10.3	11.3	10.2	2.0	1.5	2.0	0.6	9.4	9.7	3.2	11.2	83.4
L01a	Total Energies	1.5	1.6	1.7	1.4	1.6	1.2	0.0	0.0	0.0	1.7	1.6	1.8	14.0
L01d	Total Energies	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.2	1.1
L01e	Total Energies	0.2	0.3	0.3	0.2	0.3	0.2	0.3	0.2	0.2	0.3	0.2	0.2	2.9
L01f	Total Energies	1.1	1.0	1.1	0.8	1.0	1.0	1.1	0.5	0.6	1.1	0.9	1.0	11.2
L02	NAM	18.5	15.9	15.1	7.2	18.6	16.8	17.2	17.5	14.1	18.6	16.9	17.5	193.8
L04a & L04b	Total Energies	7.1	5.9	6.3	5.6	4.9	5.0	8.7	5.0	3.7	8.4	5.6	7.1	73.4
L04c	Neptune	0.4	0.2	0.4	0.4	0.4	0.4	0.5	0.4	0.1	0.4	0.4	0.4	4.6
L05a	Neptune	35.4	20.3	35.5	31.6	27.0	2.8	33.2	28.1	6.1	32.5	30.5	30.8	313.8
L05b	Wintershall	1.2	1.0	1.2	0.9	1.1	1.2	1.1	1.1	1.0	1.0	0.7	0.6	12.2
L05c	Wintershall	0.4	0.4	0.4	0.3	0.4	0.4	0.4	0.4	0.3	0.3	0.1	0.4	4.1
L06a	Wintershall	0.4	2.7	2.5	2.7	2.6	2.7	2.6	2.4	2.7	2.2	1.6	2.6	27.7
L06b	Wintershall	0.5	0.4	0.5	0.4	0.5	0.5	0.5	0.4	0.4	0.4	0.3	0.3	5.0
L08a & L08c	Wintershall	3.8	3.4	3.4	3.9	3.5	0.8	2.9	5.1	4.3	4.1	1.8	4.3	41.3
L08b, L08d & L08e	Wintershall	4.3	3.8	4.4	3.5	3.3	3.5	2.8	2.9	3.0	3.5	1.9	3.9	40.8
L09	NAM	11.9	8.5	10.7	11.6	11.7	11.9	13.3	13.3	6.3	8.2	14.4	17.1	138.8
L10 & L11a	Neptune	24.7	24.4	22.0	13.2	14.0	21.4	21.0	24.3	21.3	21.0	21.4	22.2	251.0
L11b	ONE-Dyas	1.9	1.5	2.1	2.6	2.5	1.6	2.1	2.8	2.5	2.3	1.7	2.4	26.0
L11c	ONE-Dyas	2.9	2.3	2.9	3.1	1.3	0.0	1.8	3.2	3.1	2.6	0.6	3.2	27.1
L12a	NAM	2.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2	4.5	2.8	3.1	13.2
L12b & L15b	Neptune	12.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	1.3	17.2	12.9	15.1	59.0
L13	NAM	28.7	19.9	20.3	18.3	20.6	16.3	22.4	13.4	21.4	21.0	21.2	19.9	243.5
L15c	Neptune	0.2	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.4	0.2	0.3	1.1
M07a	ONE-Dyas	10.7	7.3	8.9	9.4	9.7	9.2	9.9	9.5	4.1	5.5	9.0	8.6	101.7
N07a	NAM	1.3	1.2	1.2	1.2	1.2	1.2	1.2	1.2	1.1	1.1	1.1	1.0	14.2
P09a	Petrogas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P09c	Petrogas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P10a	Dana NL	0.2	0.2	0.2	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.2	0.1	1.7
P11b	Dana NL	7.8	8.2	11.0	12.0	12.1	5.6	7.1	3.4	9.0	12.6	11.7	12.8	113.3
P15a, P15b, P15d, P15e & P15f	TAQA Off	3.4	2.3	3.0	3.0	3.3	1.4	1.3	0.7	2.2	2.6	3.7	4.0	30.8
P15c, P15g, P15h, P15i & P15j	TAQA Off	0.1	0.1	0.9	0.4	0.2	0.1	0.0	0.2	0.4	0.3	0.1	0.4	3.1

Licence	Operator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
P18a	TAQA Off	6.2	5.3	5.4	5.4	5.6	2.3	0.0	1.1	4.1	5.7	6.1	6.3	53.6
P18c	TAQA Off	0.5	0.3	0.4	0.4	0.5	0.2	0.0	0.1	0.2	0.4	0.3	0.4	3.7
Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep	Petrogas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Q01c-diep	Wintershall	16.9	16.9	20.0	13.6	2.7	7.0	9.1	19.8	17.9	18.3	16.7	17.5	176.4
Q04a	Wintershall	1.5	1.7	1.9	1.6	0.3	0.9	0.9	2.0	2.0	2.0	2.1	1.8	18.7
Q07 & Q10a	Kistos2	28.7	23.9	26.8	24.9	25.3	9.2	7.4	4.3	19.1	26.2	22.5	23.2	241.5
Q13a	Neptune	0.5	0.4	0.5	0.4	0.4	0.1	0.3	0.4	0.3	0.4	0.5	0.5	4.7
Q16a	ONE-Dyas	2.1	1.9	2.3	1.9	2.1	1.0	1.6	0.8	2.5	2.5	2.1	2.2	23.0
Q16c-diep	ONE-Dyas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		609.6	526.7	563.3	542.2	488.2	388.8	500.8	432.7	346.6	518.1	482.0	510.3	5909.3

Production at sea per stratigraphic reservoir

Figure 3.3 and 3.4 show the contribution per stratigraphic reservoir to the total natural gas production from the small fields at sea. Production from fields with multiple reservoirs is shown with hatched colours.

Figure 3.3 shows all producing reservoir groups. This shows that, as on land, the contribution of the Rotliegend and Triassic reservoirs is dominant. From 2003 to 2007, production still grew slightly, but from 2008 onwards it steadily declined. The sharply declining trend in production (decrease of approx. 9% per year) over the period 2014-2019 is slowed down in 2020, mainly by the start of natural gas extraction from the D12-B gas field (Carboniferous). The disappointing production from the Rotliegend and Zechstein gas fields last year caused a similar decline that was already visible in the previous period.

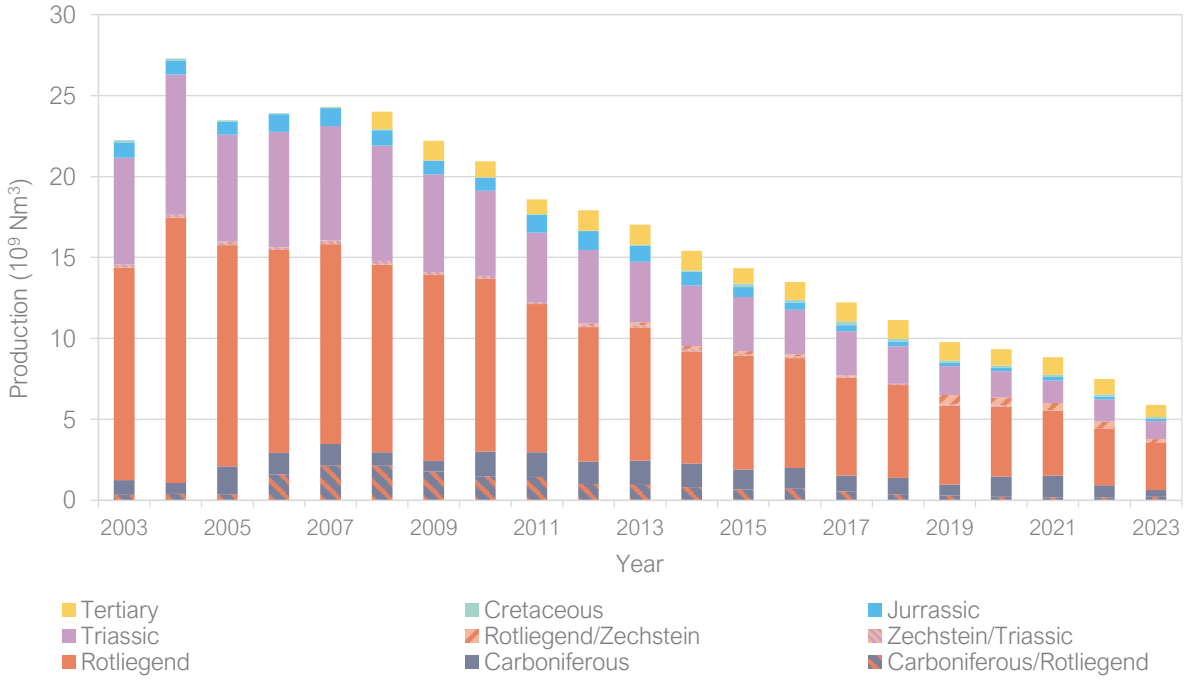


Figure 3.3 Natural gas production at sea per reservoir.

In Figure 3.4 the contributions of the Rotliegend and Triassic reservoirs are not included, which makes the contributions from other reservoirs to the gas production more visible. Over the period 2005 - 2007 the contribution from fields with combined Carboniferous–Rotliegend reservoir almost tripled, since 2008 the production from this reservoir gradually decreased again. Striking is the start of the production from the so-called 'shallow gas' reservoirs (Tertiary) in the northern offshore in 2008. Production from the Tertiary remains reasonably stable because the B13-A field came into production in 2015. The production start of Q10-A (Rotliegend/Zechstein) in 2019 and D12-B (Carboniferous) in 2020 reversed the downward trend over the period 2016 to 2018. Production in 2021 increased again compared to last year due to good production of A12-FA, D12-B and D. This trend has not continued from 2022 onwards due to the rapid decline in production from the previously mentioned gas fields.

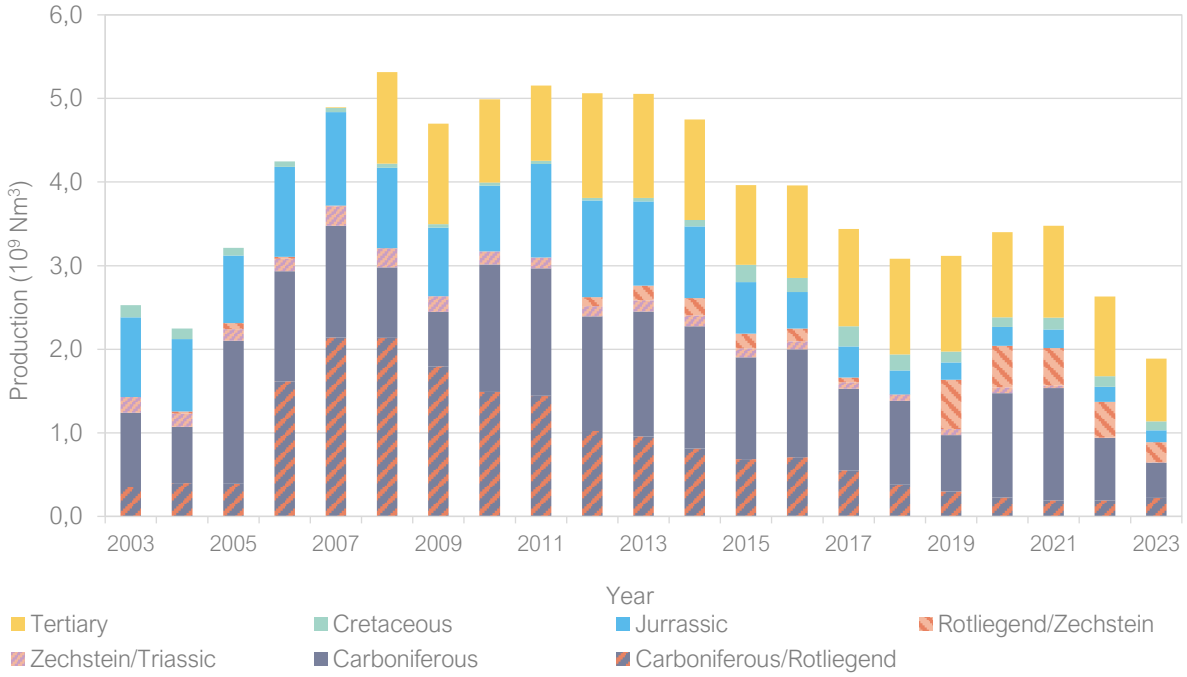


Figure 3.4 Natural gas production at sea per reservoir (excluding Rotliegend and Triassic reservoirs).

3.3 Oil and condensate production in 2023

The tables below show the monthly production figures of crude oil and condensate per production licence. The production per licence is a sum of the field production, divided in proportion to the field surface area in the licence. Due to rounding of the production per month, small differences with the totals per year may occur.

A long-term overview of the annual production of oil is given in the annex D.

Table 3.8 Oil production in 2023 per licence (in 1000 Sm^3)

Licence *	Operator	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Rijswijk	NAM	10.1	10.9	11.0	10.3	12.2	12.1	12.1	12.2	11.3	0.0	4.9	9.8	116.8
Schoonebeek	NAM	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
F02a	Dana NL	9.0	9.3	9.6	9.8	9.9	10.4	5.7	9.8	1.7	10.2	9.7	8.8	104.0
F03b	Neptune	1.1	1.1	1.0	1.4	1.7	1.7	1.0	0.8	1.1	0.7	0.0	0.5	12.2
F06a	ONE-Dyas	0.2	0.2	0.2	0.2	0.3	0.3	0.2	0.1	0.2	0.1	0.0	0.1	2.1
P09a	Petrogas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P09c	Petrogas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
P10a	Dana NL	0.9	0.8	0.7	0.8	0.8	0.3	0.9	0.9	0.8	0.6	0.8	0.9	9.1
P11b	Dana NL	5.2	4.8	4.4	5.0	5.2	1.8	5.1	5.1	5.1	3.9	5.0	5.3	56.1
P15a, P15b, P15d, P15e & P15f	TAQA Off	2.1	1.9	2.3	2.4	2.3	1.1	2.4	2.3	1.9	1.9	1.5	2.2	24.2
P15c, P15g, P15h, P15i & P15j	TAQA Off	0.3	0.2	0.3	0.3	0.3	0.1	0.3	0.3	0.2	0.2	0.2	0.3	3.0
Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep	Petrogas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Q13a	Neptune	5.9	0.5	5.8	5.5	5.5	5.5	3.9	5.2	4.2	5.2	5.1	5.4	57.7
Q16c-diep	ONE-Dyas	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total		34.8	29.8	35.2	35.8	38.2	33.2	31.5	36.8	26.6	22.8	27.2	33.2	385.1

* Excluding coproduced oil from production licences for geothermal energy.

Table 3.9 Condensate* production in 2023 (in 1000 Sm^3)

Licence	Jan	Feb	Mar	Apr	May	June	July	Aug	Sept	Oct	Nov	Dec	Total
On land **	6.4	5.2	6.5	4.9	3.0	4.2	4.4	3.9	4.5	4.5	6.8	6.5	60.8
At sea	4.9	4.4	4.8	4.9	4.7	2.9	3.6	4.2	3.1	3.6	4.1	4.8	49.9
Total	11.3	9.6	11.3	9.8	7.6	7.1	7.9	8.1	7.6	8.2	10.9	11.3	110.7

* Condensate is also referred to as natural gasoline or natural gas liquids (NGL).
** Excluding coproduced condensate from geothermal energy production licences and excluding coproduced condensate from the Alkmaar, Bergermeer, Grijpskerk and Norg storage fields (see Chapter 4).

4.
Subsurface storage

4.1 Introduction

Subsurface storage is an exceptionally space-effective method for storing very large quantities of substances. Various forms of storage are possible in the Dutch subsurface. For example, storage in porous layers, such as the space between sand grains in depleted gas fields or in aquifers, or in constructed cavities, such as caverns in rock salt or mining galleries in former coal seams.

These storage systems can be used as a temporary stock or buffer (such as for natural gas, nitrogen gas and potentially hydrogen and energy), but they can also be used for the permanent storage of substances (such as CO_2 and saline water).

According to the Mining Act, the storage of substances in the subsurface (at depths of more than 100 m) requires a storage licence and the licence holder must have an approved storage plan. The storage plans provide information about the geological setting and the process of storage. In certain cases, the injection of substances does not legally fall under the storage of substances as referred to in the Mining Act: for example the injection of nitrogen to prevent subsidence (De Wijk gas field) is part of the production plan and re-injection of formation/process water as unavoidable co-produced substance falls under environmental legislation.

In order to obtain a licence for the permanent storage of CO_2, a storage plan consisting of a risk management, corrective measures, monitoring and closure plan must be submitted with the licence application. The plans should be finalised shortly before the start of injection. For this reason, these storage licences are awarded, but do not take effect until all related plans have been approved. For CO_2 storage, only offshore storage options are being looked at.

In addition to the existing storage sites, the Dutch subsurface provides enough potential for the storage of various new forms of sustainable energy carriers. Future energy scenarios foresee an increasing demand for large-scale subsurface storage to buffer energy in order to match supply and demand. The most concrete developments are in: hydrogen storage, compressed air storage (CAES) and high temperature heat storage (HT-ATES). Studies on the storage of hydrogen in salt caverns in the Zuidwending storage licence area are ongoing.

4.2 Overview licences

In 2023 no new storage licences were applied for on land. Two new storage licences for CO_2 storage have been applied for at sea in 2023. From previous years, one storage licence and two exploration licences for CO_2 storage are pending.
As of 1 January 2024 nine storage licences were in force. The CO_2 storage licences P18-2 and P18-4 have been granted but are not in force yet. An overview of all storage licences can be found in Table 4.1 and Annex H. Figure 4.1 shows their locations on the map.

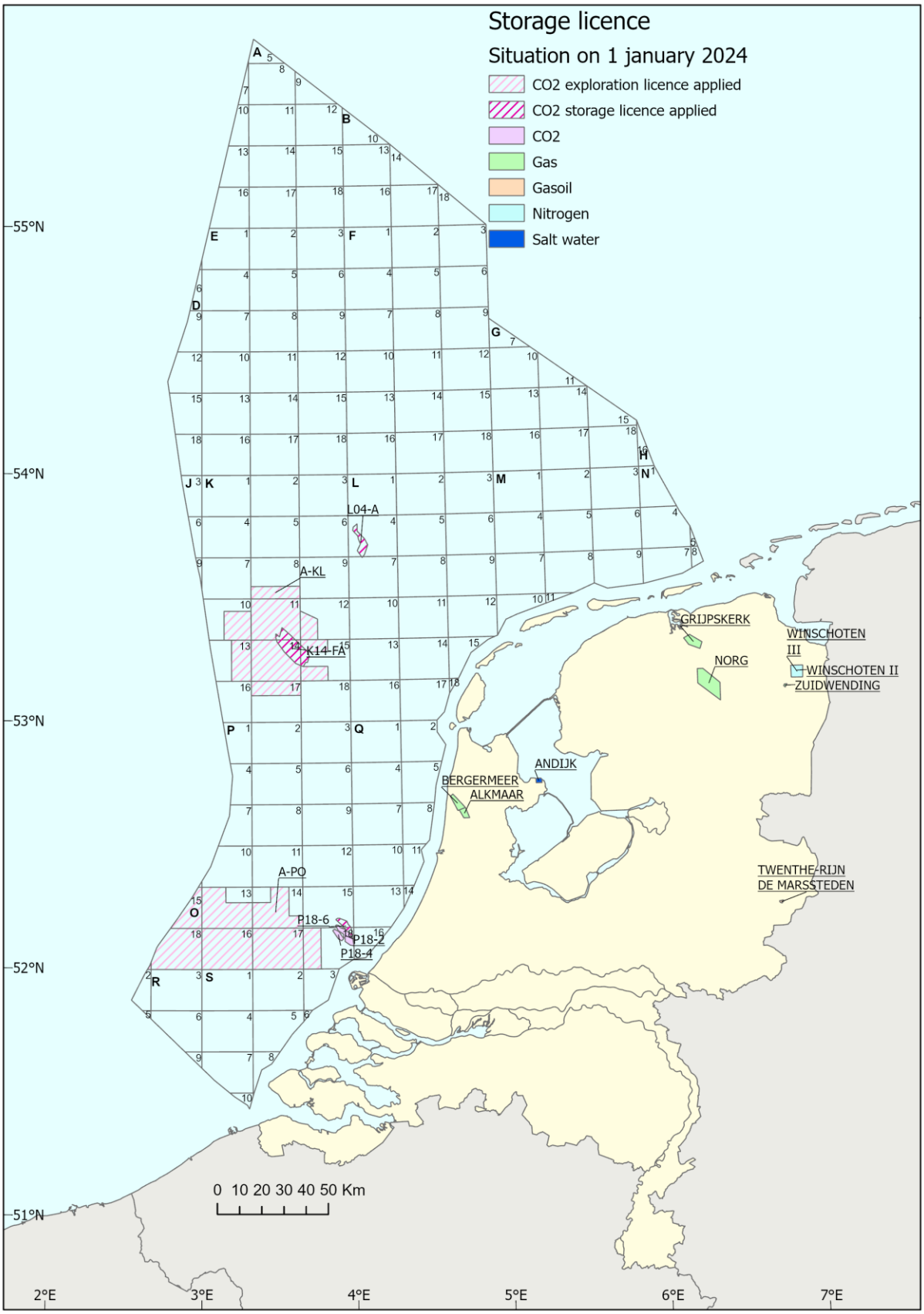


Figure 4.1 Storage licences as of 1 January 2024.

Table 4.1 Storage licences, onshore and offshore the Netherlands.

Licence	Awarded	Operator	Product	Status
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	Nobian Salt B.V.	Oil	Effective
Winschoten II	15-11-2010	Gasunie (GTS)	Nitrogen	Effective
Winschoten III	15-11-2010	Nobian Salt B.V.	Nitrogen	Effective
Andijk	12-12-2019	PWN	Saline water	Effective
P18-4	20-07-2013	TAQA	Carbon dioxide	Awarded
P18-2	13-07-2022	TAQA	Carbon dioxide	Awarded

Temporary storage

Gas storage

The seasonal variation in natural gas demand (winter/summer) has long been balanced by varying the production from the Groningen field. An important reason for this was that in doing so the small fields could be produced without being disturbed (as part of the small fields policy). As production from the Groningen field progressed, the pressure and thus the flexibility in the production rate of the Groningen field declined accordingly. In order to maintain sufficient flexibility to meet fluctuations in gas demand to guarantee the security of gas supply, four underground gas storage facilities have been put into operation since 1997.

Gas storage facilities at Norg (low-calorific gas/pseudo-Groningen gas) and Grijpskerk (high-calorific gas until 2022, after that low-calorific gas) have served as a buffer to cope with seasonal fluctuations in gas demand. When demand increases, particularly in winter, extra natural gas is supplied from Norg and Grijpskerk. The storage facilities in Alkmaar and in Zuidwending are primarily used to accommodate peak demands of one or more days. Together with the Bergermeer storage facility, which is primarily aimed at gas trading and operates on the gas market on its own initiative, five natural gas storage facilities (Underground Gas Storage - UGS) are currently operational in the Netherlands. Except for the Zuidwending facilities, where storage takes place in salt caverns, all storages are (former) gas fields.

Figure 4.2 and Figure 4.3 respectively show the volume of natural gas stored and withdrawn from the five natural gas storage facilities from 2003 to and including 2023. From 2015 onwards, the capacity used by the storage facility in Norg has risen sharply, by increasing the maximum operational pressure. The working volume in the storage plan was increased that way from 3 to 7 billion Nm^3 (adjusted to 6 billion Nm^3 in 2019). Also, the Bergermeer storage facility discharged more gas from 2016 onwards after years of predominantly filling.
The discrepancy of Grijpskerk in particular exists in 2021 due to the low filling rate combined with a relatively high withdrawal of natural gas. This was necessary for the transition from high-calorific to low-calorific gas storage at Grijpskerk. In 2022, the war in Ukraine and volatile gas prices had the effect that a lot of gas was stored in Norg, Alkmaar and Bergermeer, in particular, because filling levels had to be maintained, but less

was withdrawn, due to the warm winter. In 2023, less was stored in Norg, in particular, than in previous years, because less storage was used during the winter months.

Increased gas demand on for instance very cold winter days, can to a certain extent also be solved via international pipelines and LNG terminals. On the Maasvlakte, there is a terminal where liquefied natural gas (LNG) is stored in tanks at surface (this is considerably smaller than underground storage). In the Eemshaven there is a temporary floating LNG terminal.

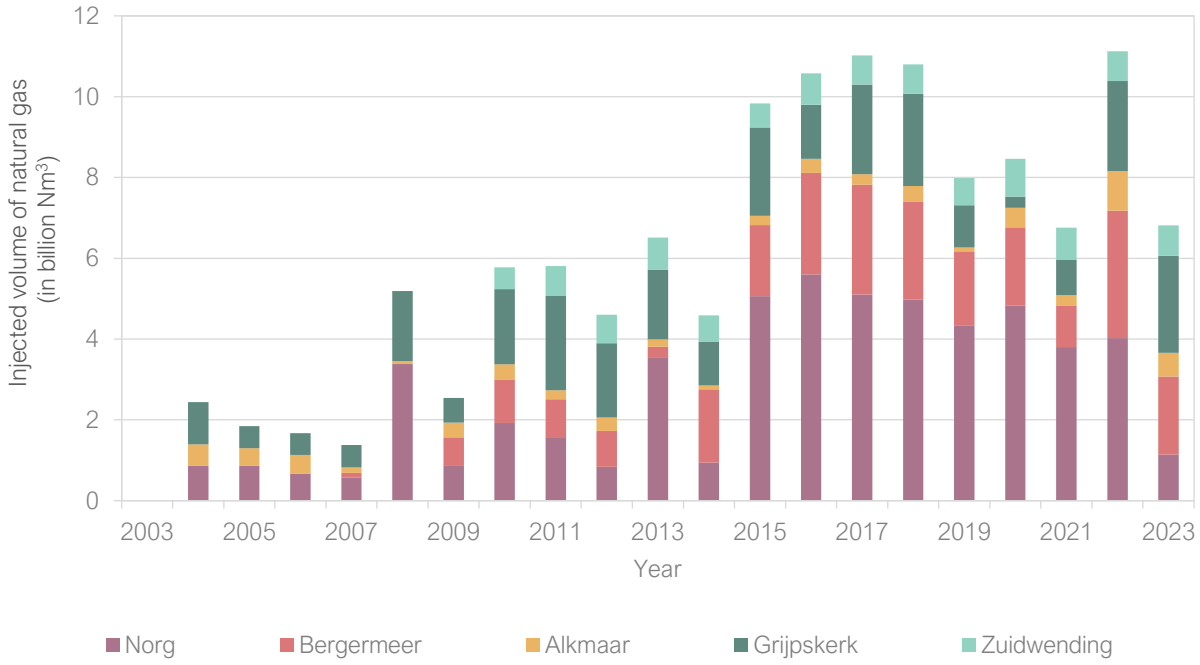


Figure 4.2 Injected volume of natural gas per UGS from 2003 to 2023.

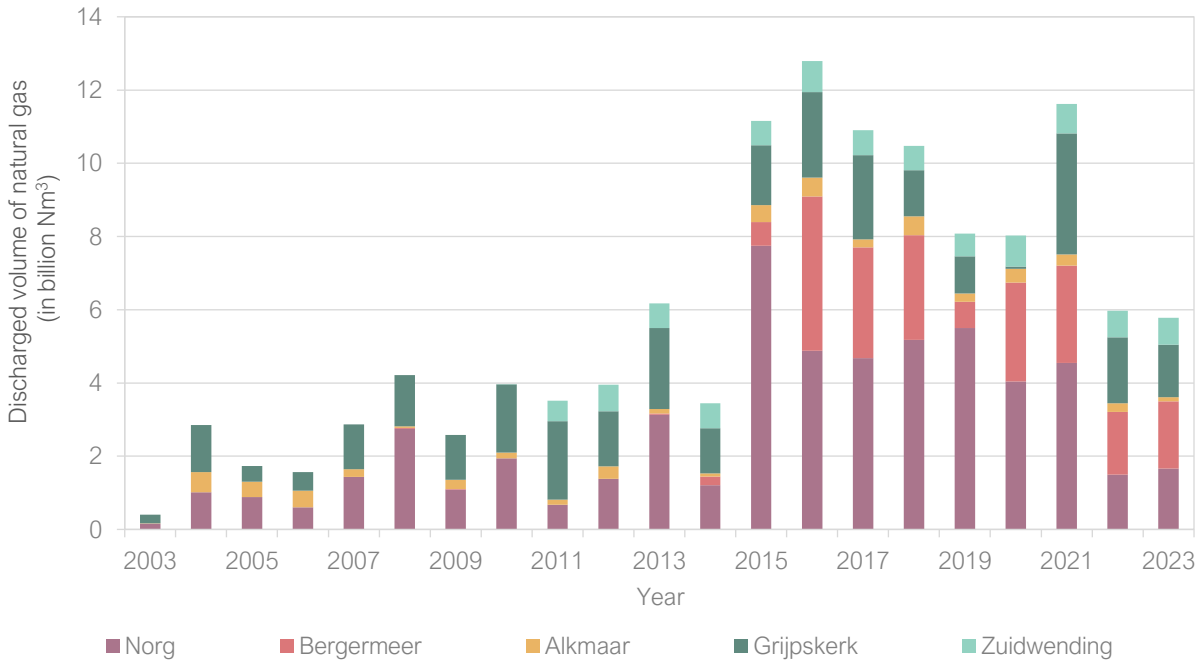


Figure 4.3 Discharged volume of natural gas per UGS from 2003 to 2023.

Storage of nitrogen and oil

In the Netherlands, the subsurface is used for the temporary storage of other substances as well. This concerns, for example, salt caverns that are used for the storage of nitrogen and oil. In Twente (Twenthe-Rijn de Marssteden storage licence) a strategic oil supply is stored in one of the salt caverns, while in Winschoten (Heiligerlee) a salt cavern is used to store nitrogen for the conversion of high-calorific gas into low-calorific quality gas to replace the decreased pseudo-Groningen gas production.

Permanent storage

CO2 storage

There are advanced plans to use depleted offshore natural gas fields to provide significant capacity for the permanent storage of CO_2 in the coming years. A storage licence for this purpose was granted back in 2013 for the depleted P18-4 gas field, part of the Porthos project, located just off the coast of South Holland, but it is not yet in force. On 13 July 2022, the licence was amended for an integral approach with the storage at P18-2. The plan is to store up to 8 Mton of CO_2 in the depleted gas field P18-4 and 32 Mton in the adjacent gas field P18-2 by 2041. Applications were also submitted in 2022 and 2023 for CO2 storage in the K14-FA and L04-A depleted gas fields, both part of the Aramis project.
To encourage the development of CO2 storage projects, these projects are also eligible for the "Stimulation of sustainable energy production and climate transition" (SDE++). This programme provides subsidies to companies and non-profit organisations that generate renewable energy or reduce CO_2 emissions on a large scale. A total budget of 8 billion euros was available in 2023, most of which was applied for by CO_2 storage projects.

Storage of saline water

The Andijk storage licence is intended for the permanent storage of the filter residue formed during the purification of saline groundwater to produce drinking water. This concentrated salt water is injected into a groundwater package at a depth of 100 to 500 metres. Because this aquifer is deeper than 100 meters, this activity requires a storage licence under the Mining Act.

4.3 Subsurface storage in 2023

The monthly quantities of natural gas and nitrogen that were stored and discharged in the subsurface in 2023, are listed per licence in Table 4.2 to Table 4.5. The information has been provided by the licence holders.

Table 4.2 Stored natural gas (in million Nm^3).

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alkmaar	TAQA	591	0	0	0	0	476	29	86	0	0	0	0	0
Bergermeer	TAQA	1931	16	19	118	237	3	387	520	458	4	151	16	0
Grijpskerk	NAM	2398	0	0	32	323	417	366	373	368	301	218	0	0
Norg	NAM	1140	0	0	0	0	11	656	293	165	14	0	0	0
Zuidwending	Energy stock	758	26	16	66	68	90	43	73	65	45	105	74	86
Total		6816	42	35	216	629	997	1481	1344	1057	49	474	90	87

Table 4.3 Discharged natural gas (in million Nm^3).

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Alkmaar	TAQA	116	0	0	108	0	0	0	0	0	0	0	8	0
Bergermeer	TAQA	1831	489	356	131	0	0	0	0	0	73	25	372	384
Grijpskerk	NAM	1436	275	227	272	0	0	0	0	0	0	0	61	601
Norg	NAM	1664	262	99	153	142	7	0	0	0	0	3	194	803
Zuidwending	Energy stock	733	93	63	66	52	44	62	35	68	56	39	105	50
Total		5780	1119	744	599	194	51	62	35	68	129	68	741	1838

Table 4.4 Stored nitrogen (in million Nm^3).

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Winschoten II	Gasunie	49.1	4.1	3.6	5.1	2.1	8.6	5.6	5.3	2.3	1.2	2.5	5.9	2.9

Table 4.5 Discharged nitrogen (in million Nm^3).

Licence	Operator	Total	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Winschoten II	Gasunie	50.0	4.1	4.0	5.5	18.6	0.4	1.4	0.8	2.7	1.2	3.1	7.7	0.5

5.
Geothermal Energy

This chapter reports on developments regarding the exploration and production of geothermal energy in the Netherlands during the past year. In this chapter changes in geothermal licences in 2023 are presented. Furthermore, the drilled geothermal wells are discussed and an overview is given of the newly realised geothermal energy production installations. The final part of this chapter provides an overview of geothermal energy production in 2023.

5.1 Changes in geothermal energy licences

The tables below summarize the changes in geothermal energy licences presented in sections 8.5, 8.6 and 8.7 of chapter 8 and overview I.
On July 1, 2023, the Mining Act was amended and a new licensing system for geothermal energy was introduced. With effect from this change, all former exploration licences for geothermal energy have been converted into search area allocations for geothermal energy. In contrast to the former exploration licences, a holder of a search area allocation is not entitled to explore geothermal energy by using a borehole. However, if before July 1, 2023, both a temporary production plan and a temporary production licence application were being processed for a geothermal project to be developed in an exploration licence area, then that exploration licence is converted into a search area allocation with the right to explore geothermal energy by using a borehole.

Temporary production licences for geothermal energy without an approved production plan at July 1, 2023, were automatically converted into a starting licence for geothermal energy with an official restriction, effective from July 1, 2023. This is because the subsurface effects of any production within these production licences have not (yet) been assessed, or have been assessed negatively. Production within these starting licences can only take place if a positive decision is granted on an amendment to these starting licences, in which the effects of production on the subsurface have been assessed.

Furthermore, temporary production licences for geothermal energy with an approved temporary production plan have been converted into a starting licence for geothermal energy. The production licences with an approved production plan are converted into a follow-up licence for geothermal energy.

Tables 5.1, 5.2, 5.3 and 5.4 provide an overview of the changes in geothermal licences that took place in 2023. This includes the conversion to the new licensing system. Licences that are fully competitive with previous applications are not published in the Government Gazette and therefore do not appear in the table with applied licences in Chapter 8.5.

Table 4.6 Changes in licences for scientific research and central policy in 2023.

Status date	Number	Description
01-01-2023	3	Licence for scientific research and central policy in the process of application
Changes in 2023	4	Licence for scientific research and central policy applied for
	4	Licence for scientific research and central policy awarded
	1	Licence for scientific research and central policy withdrawn
01-01-2024	4	Licence for scientific research and central policy effective
	2	Licence for scientific research and central policy in the process of application

Table 4.7 Changes in exploration licence applications and changes in applications for search area allocations for geothermal energy in 2023.

Status date	Number	Description	Remarks
01-01-2023	12	Geothermal exploration licences in the process of application*[1]	Out of 12 , 1 was in full competition*[2]
Changes in 2023	12	Geothermal exploration licences awarded	-
	3	Geothermal exploration licences published	-
	3	Geothermal exploration licences in the process of application	-
		1 July 2023, new Mining Act	
	3	Search area allocations in the process of application	-
	1	Application for a search area allocations withdrawn	-
	2	Applications for an search area allocations published	-
	2	Search area allocation awarded	-
01-01-2024	2	Search area allocations in the process of application	

*[1] These were 13 exploration licences for geothermal energy, of which 1 was a licence for scientific research and policy. The licences for scientific research and policy are now presented in table 5.1.

*[2] Applications for licences that are in full competition are not published in the Government Gazette and are therefore not published in the Annual Report. However, these are included in the statistics.

Table 4.8 Changes in licensed exploration licences for geothermal energy and licensed search area allocation for geothermal energy in 2023.

Status date	Number	Description
01-01-2023	80	Geothermal energy exploration licences effective
Changes in 2023	12	Geothermal exploration licences awarded
	6	Geothermal exploration licences converted into production licences for geothermal energy
	2 -> 1	2 geothermal exploration licences merged into 1
	14	Geothermal exploration licences were extended
	6	Geothermal exploration licences were spatially restricted
	85	Geothermal energy exploration licences effective
		1 July 2023, new Mining Act
	85	Search area allocations effective
	2	Search area allocations awarded
	4	Search area allocations expired, withdrawn or relinquished
	11	Search area allocations extended
01-01-2024	83	Search area allocations effective

Table 5.4 Changes in geothermal production licences in 2023 before the new Mining Act.

Status date	Number	Description
01-01-2023	32	Production licences effective
	5	Production licences in the process of application
Changes in 2023 before the new Mining Act	3	Production licences applied for
	5	Production licences awarded
	2 -> 1	2 Production licences merged into 1
	3	Production licences extended
30-06-2023	36	Production licences for geothermal energy effective
	3	Production licences in the process of application
01-07-2023		**1 July 2023, new Mining Act**
	18	Start licences for geothermal energy effective
	3	Start licences for geothermal energy in the process of application
	18	Follow-up licences for geothermal energy effective

Table 5.5 Changes in licensed start licences for geothermal energy in 2023 after the new Mining Act.

Status date	Number	Description
01-07-2023	18	Start licences for geothermal energy effective
	3	Start licences for geothermal energy applied for
Changes in 2023 after the new Mining Act	2	Start licences for geothermal energy extended
	8	Changed: production not yet allowed
	2	Changed: approval of amended production plan
01-01-2024	3	Start licences for geothermal energy applied for
	18	Start licences for geothermal energy effective

Table 5.6 Changes in licensed follow-up licences for geothermal energy in 2023 after the new Mining Act.

Status date	Number	Description
01-07-2023	18	Follow-up licences for geothermal energy effective
	0	Follow-up licences for geothermal energy applied for
Changes in 2023 after the new Mining Act	1	Changed: approval of amended production plan
01-01-2024	0	Follow-up licences for geothermal energy applied for
	18	Follow-up licences for geothermal energy effective

Changes in the licence status in 2023 of geothermal search area allocations, starting licences and follow-up licences are listed in the tables of Chapter 8. Figure 5.1 shows the evolution of the geothermal licences, whereby the number of licences with status “in application” at status date January 1, 2024, is presented as well.

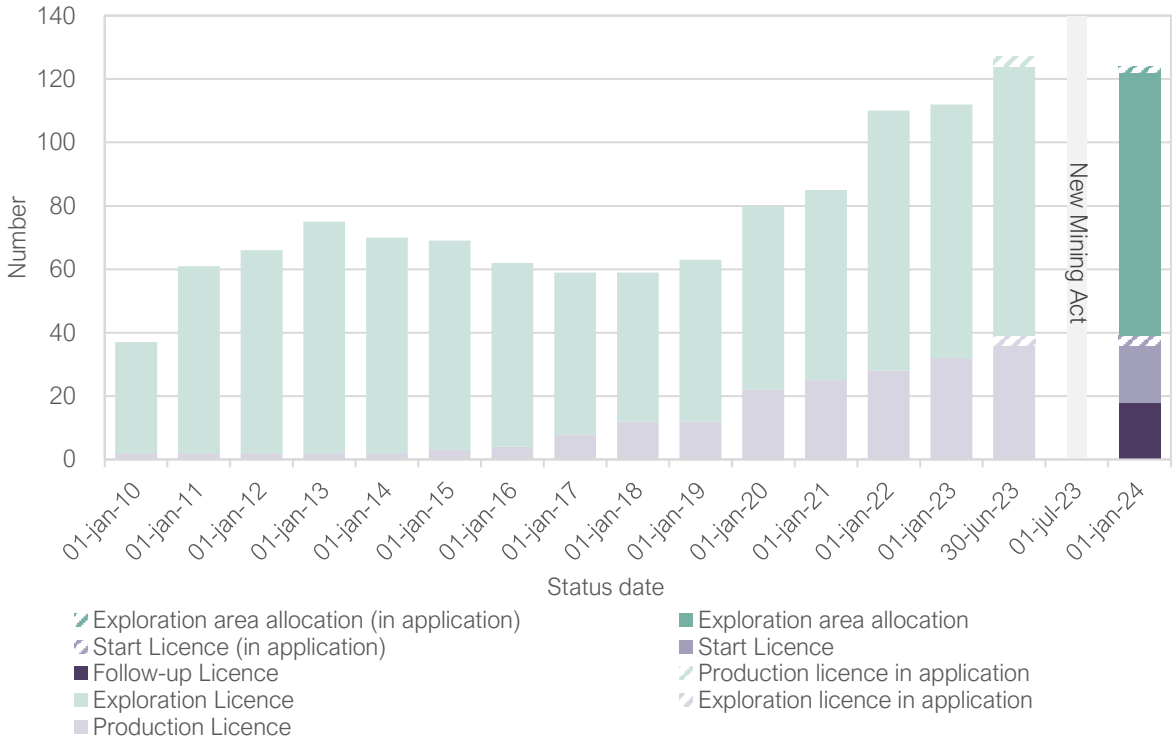


Figure 4.4 Number of effective geothermal energy licences per year. For the year 2023 the number of applications is presented as well, before and after the change of the Mining Act (July 1, 2023).

5.2 Geothermal wells and production installations as of January 1, 2024

In 2023, 13 geothermal wells have been completed (see Chapter 12 and Figure 5.2). These concern wells within the licence areas Monster I, Maasdijk I, Delft I and Middenmeer III. With these wells 6 new geothermal energy production installations[7] have been realised.

As of January 1, 2024, the total of geothermal energy production installations amounts to 33, of which the Mijnwater Energiecentrale Heerlen installation is actually a heat/cold storage (WKO) facility and as such will not be included in the following overview. The other 32 geothermal installations produce heat from the deep subsurface, or intend to do so in the near future. Of these 32 geothermal energy production installations, 20 were operational or partially operational in 2023, in the sense that heat production is reported in accordance with art. 111 and 119 of the Mining Decree. All operational installations have a starting- or follow-up licence (as of January 1, 2024).

[7] A geothermal energy production installation consists of 2 or more wells where there is at least one injection and one production well. The wells are part of a closed primary production loop at surface, in which the geothermal formation water (brine) runs through the heat exchanger. In such installations, the mass volume of produced water is equal to the mass volume of injected water into the lateral continuous and connective subsurface geothermal reservoir.

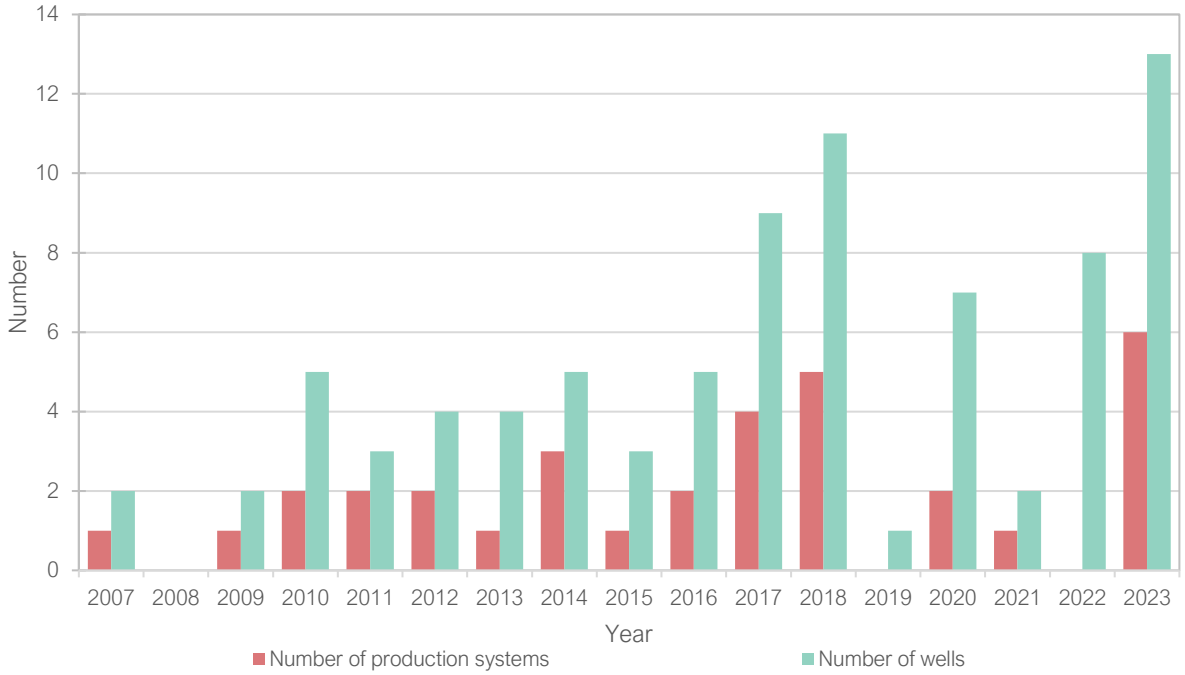


Figure 4.5 Number of successfully completed geothermal wells per calendar year and the annual number of realised geothermal energy production installations since 2007.

Geothermal heat is produced from layers of different geological units at depths between 700 and 2800 meters below N.A.P. (Figure 5.3a & b). The mid depth of the producing zone is displayed in Figure 5.3b. The majority of geothermal installations produce heat from the Upper-Jurassic and Lower-Cretaceous strata, in the Southwest of the Netherlands. Two installations in the Southwest of the Netherlands produce heat from strata of Triassic age. Ten production installations in the provinces of Noord-Holland, Overijssel and Flevoland produce from Rotliegend strata, whereas two installations in the north of the province of Limburg produced heat from Lower Carboniferous to Devonian strata. One geothermal energy production installation in the province of Noord-Brabant produces water from an aquifer pertaining to the Lower North Sea Group.

The heat produced in all but four installations is primarily used for heating commercial greenhouses. One project supplies heat to both the built environment and greenhouses and one project aims to do so. Two projects supply (or intend to supply) only heat to the built environment (Figure 5.3 c).

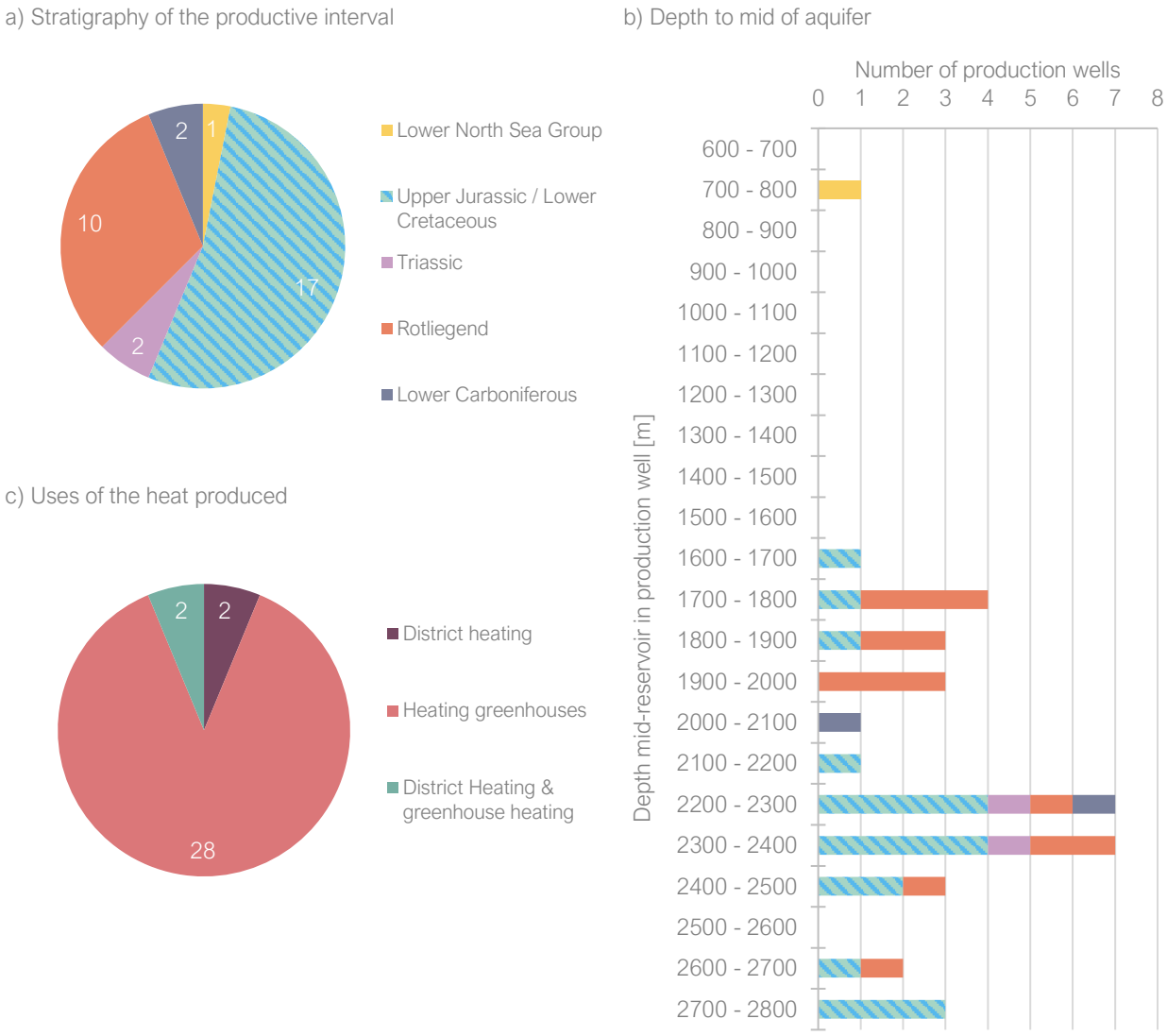


Figure 4.6. a) Stratigraphy of the productive interval, b) Depth to mid of aquifer (certain geothermal production installations have multiple production wells), c) (intended) use of the heat produced.

5.3 Production of geothermal energy in 2023

In 2023, 20 of the 32 geothermal installations (Mijnwater Energiecentrale Heerlen excluded) were operational (Table 5.5). The operational installations have submitted the obligatory monthly production figures. Of the 12 non-operational installations, 4 installations are temporarily closed-in and 6 are in the start-up phase. The remaining 2 non-operational geothermal energy production installations have been shut down in 2018 as a consequence of agreements and safety policy in force. In the course of 2023 one installation was shut down.

Table 4.7 Geothermal installations.

	Name geothermal energy installation	Wells	Geothermal energy licence	Operational in 2023
1	Californië Geothermie	CAL-GT-1,2&3	Californië IV	No
2	De Lier Geothermie	LIR-GT-1&2	De Lier	Yes
3	Honselersdijk Geothermie	HON-GT-1&2	Honselersdijk	No
4	Installatie Berkel en Rodenrijs	VDB-GT-3&4	Bleiswijk-1b	No
5	Installatie Bleiswijk	VDB-GT-1&2	Bleiswijk	No
6	Koekoekspolder Geothermie	KKP-GT-1&2	Kampen	Yes
7	Mijnwater energiecentrale Heerlen	HLH-GT-1&2	Heerlen	Yes, WKO
8	Pijnacker-Nootdorp Geothermie	PNA-GT-5&6	Pijnacker-Nootdorp-4	Yes
9	Pijnacker-Nootdorp Zuid Geothermie	PNA-GT-3&4	Pijnacker-Nootdorp-5	Yes
10	Den Haag Geothermie	HAG-GT-1&2	Den Haag	Yes
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 Geothermie	BRI-GT-1&2	Vierpolders	Yes
15	Californië Lipzig Gielen	CAL-GT-4&5	Californië-V	No
16	Poeldijk Geothermie	PLD-GT-1&2	Poeldijk	Yes
17	Kwintsheul Geothermie	KHL-GT-1&2	Kwintsheul	Yes
18	Lansingerland Geothermie	LSL-GT-1&2	Lansingerland	Yes
19	MDM-GT-06 / MDM-GT-01	MDM-GT-6&1	Middenmeer I	Yes
20	Maasland Geothermie	MLD-GT-1&2	Maasland	Yes
21	Naaldwijk Geothermie	NLW-GT-1,2,3&4	Naaldwijk & Naaldwijk II	Yes
22	Zevenbergen Geothermie	ZVB-GT-1&2	Zevenbergen	No
23	Andijk-GT-01/02	ADK-GT-1&2	Andijk	Yes
24	Andijk-GT-03/04	ADK-GT-3&4	Andijk	Yes
25	Luttelgeest Geothermie 1	LTG-GT-1,2,3,7,8,9,10,11	Luttelgeest	Yes
26	Luttelgeest Geothermie 2	LTG-GT-4,5&6	Luttelgeest II	Yes
27	Tinte Geothermie	TNT-GT-1&2	Oostvoorne	Yes
28	-	MDM-GT-8 & 9	Middenmeer III	No
29	-	MON-GT-1 & 2	Monster I	No
30	-	DEL-GT-1 & 2	Delft I	No
31	-	MSD-GT-1 & 2	Maasdijk I	No
32	-	MSD-GT-3 & 4	Maasdijk I	No
33	-	MSD-GT-5 & 6	Maasdijk I	No

Figure 5.4 shows the aggregated production figures of geothermal energy production 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 6.875 PJ (1 PJ = 10^{15} J) in 2023 (Figure 5.5).

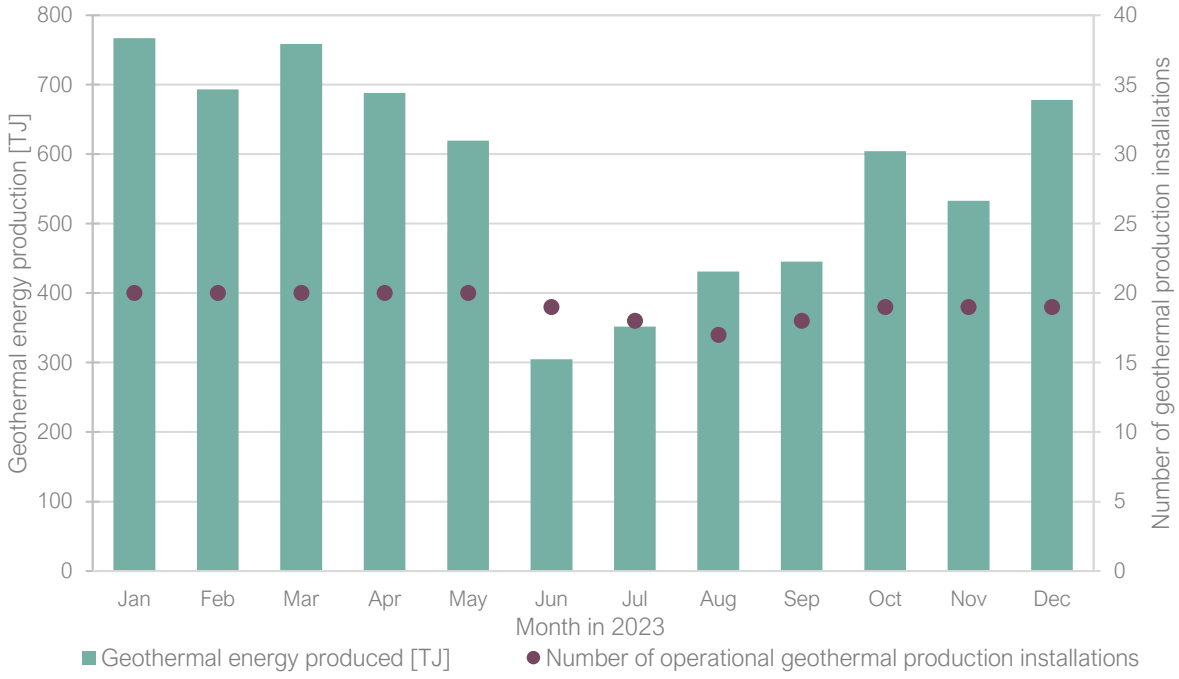


Figure 4.7 Monthly production of geothermal energy in terajoules and the number of geothermal energy production installations contributing to the reported production (Mijnwater Energiecentrale Heerlen excluded).

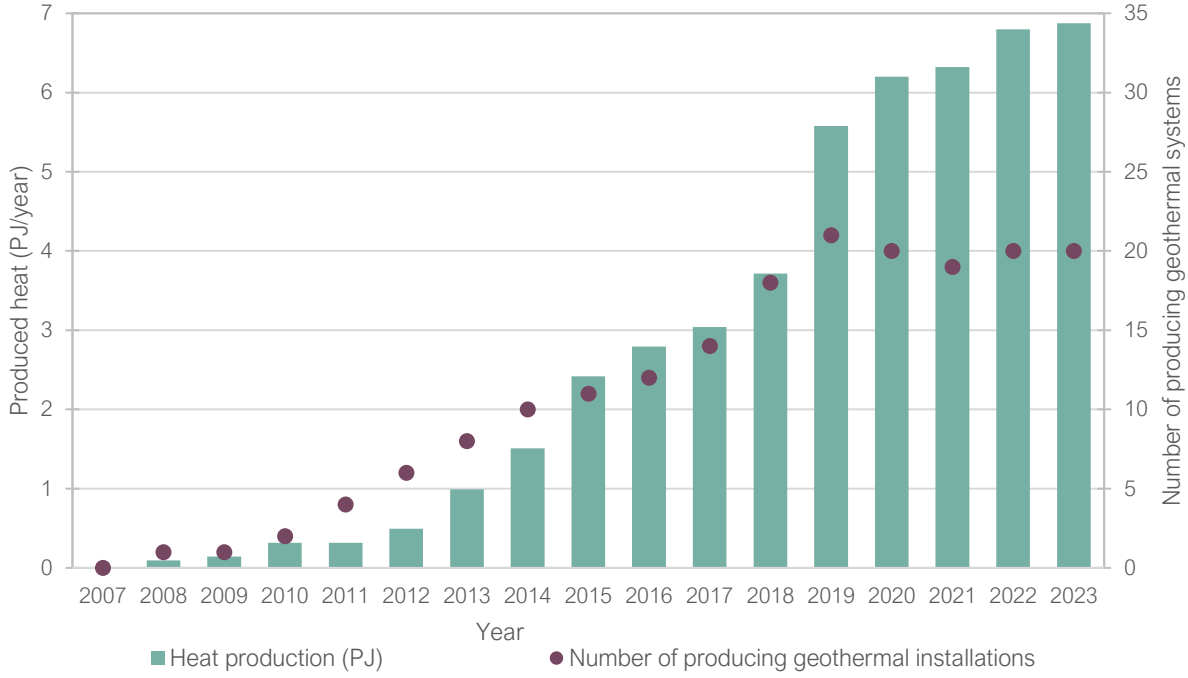


Figure 4.8 Annual production of geothermal energy (PJ/year) and number of operating geothermal installations. Data from 2007 up and including 2013 originating from: Hernieuwbare energie in Nederland 2013. Centraal Bureau voor de Statistiek, Den Haag, 2014. ISBN: 978-90-357-1857-9.

Small amounts of natural gas are co-produced with the geothermal energy production (Figure 5.6). Under subsurface reservoir conditions (elevated pressure and temperature) gas is dissolved in the formation water and is released when the pressure of the produced formation water in the production installation falls below the 'bubble point'. Table 5.8 provides an overview of the produced geothermal energy, co-produced gas and co-produced oil per year since 2008. Only in one installation oil was co-produced until March 2017.

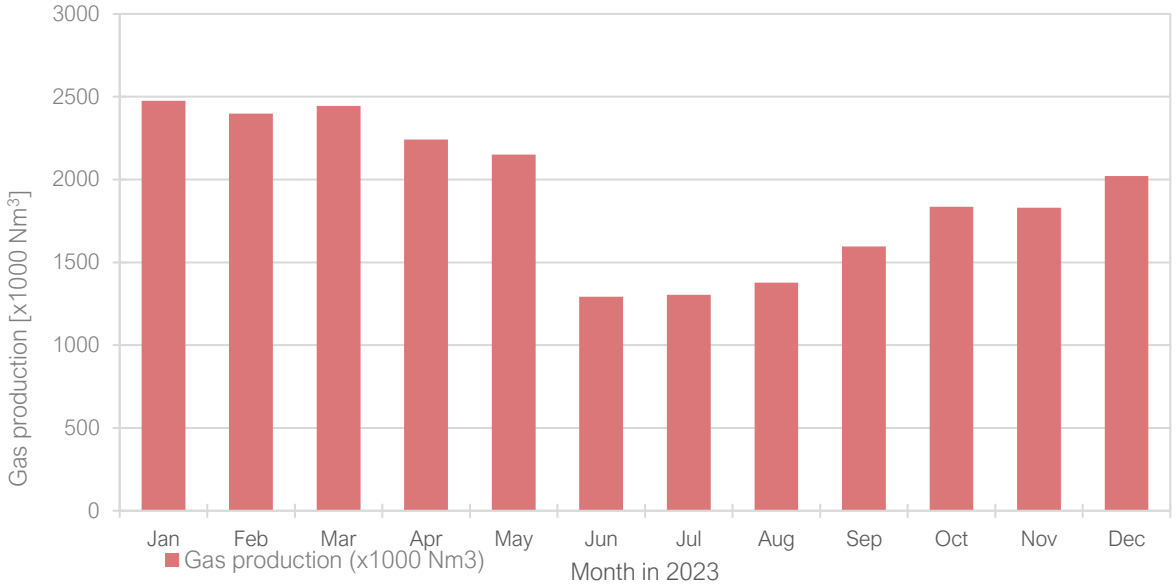


Figure 4.9 Volumes of hydrocarbons co-produced with geothermal energy. Gas in 1000 Nm^3.

Table 4.8 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	*** 12,367	0
2019	5,578	*** 19,914	0
2020	6,199	*** 22,617	0
2021	6,321	22,394	0
2022	6,797	24,596	0
2023	6,875	22,970	0

* 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.

*** Correction of co-produced gas compared to previous annual reports.

6.
Salt

On 1 January 2024 sixteen production and no exploration licences were in force. In 2023 no new licence applications were submitted. However, one application for a production licence from a previous year is still pending (see Figure 6.2). A complete list of all production licences is to be found in Annex J.
The licence areas for rock salt are all located in the north and east of the country because in this area salts from Zechstein and Triassic age are present in the underground.

6.1 Salt production in 2023

The table below shows the production data of salt per licence during 2023, the production data is based on information supplied by the operators. Monthly production during 2023 varied between 321 and 479 thousand tons. Rock salt (also called halite) is produced from almost all salt production licences, only from the Veendam production licence another type of salt is extracted, namely magnesium salt.

Salt production in 2023 (in 1000 ton)

Licence	Operator	Jan	Feb	Mar	Apr	Mei	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Total
Havenmond	Frisia	90	89	96	15	83	89	100	99	92	93	67	107	1,020
Twenthe-Rijn	Nobian	84	87	94	90	77	100	127	108	107	128	129	96	1,226
Twenthe-Rijn Helmerzijde	Nobian	0	0	0	0	0	2	0	0	0	0	0	0	2
Twenthe-Rijn Oude Maten	Nobian	15	13	10	4	5	0	6	4	5	9	17	22	110
Uitbr. Twenthe-Rijn	Nobian	27	22	17	16	23	32	49	30	10	28	25	36	313
Adolf van Nassau III	Nobian	90	72	65	66	97	103	112	101	108	108	80	83	1,087
Uitbr. Adolf van Nassau III	Nobian	55	110	114	116	146	62	0	2	1	42	148	138	935
Veendam	Nedmag	16	16	15	14	16	15	16	16	18	17	16	15	190
	Total	376	408	410	321	447	404	410	360	342	425	482	497	4,883

Figure 6.1 shows the production of rock salt from 2007 to 2023. During this period, the salt production is fairly constant, between 6 and 7 million tons per year. However, in 2023, total salt production is lower with a total production of 4.9 million tons. Particularly due to lower production from Adolf van Nassau and Twenthe-Rijn, according to Nobian caused by a lower demand for chlorine.

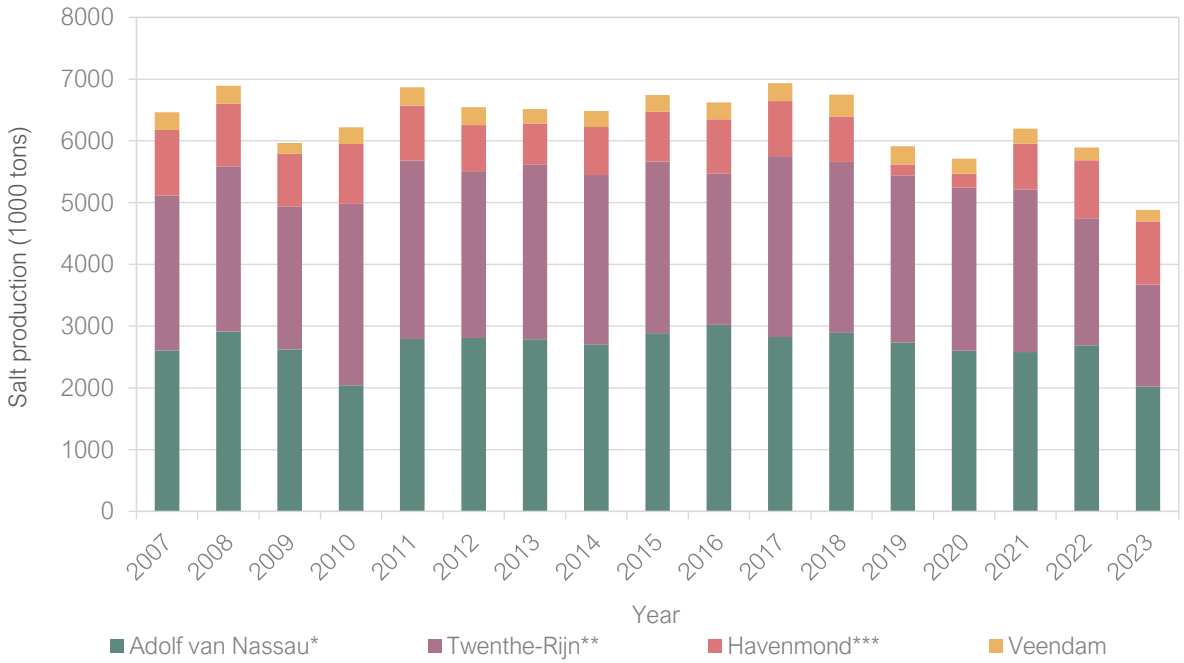


Figure 4.10 Salt production 2007 – 2023, the production data is based on information supplied by the operators. *Including Adolf van Nassau III. **Including Uitbreiding Twenthe-Rijn, Twenthe-Rijn Helmerzijde en Twenthe-Rijn Oude Maten. ***Including Barradeel I (last production in 2020) and Barradeel II (last production in 2021). Start production Havenmond 2021.

6.2 Storage in salt caverns

Storage caverns 'Aardgasbuffer Zuidwending'

Since 2007 Nobian leaches storage caverns in the municipality of Veendam for the "Aardgasbuffer Zuidwending".

The production from the storage caverns belongs to the production licence 'Uitbreiding Adolf van Nassau II'. Currently six salt caverns are in operation for the storage natural gas. Since 2021 a pilot project is carried out by HyStock to study the storage of hydrogen in salt caverns. In addition, Nobian leached a seventh cavern in 2021. This cavern will be used for the storage of hydrogen.
For more information about storage see Chapter 4.

6.3 Licences for salt

Names of rock salt production licences on the Netherlands territory, as indicated on the map in Figure 6.2.

	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

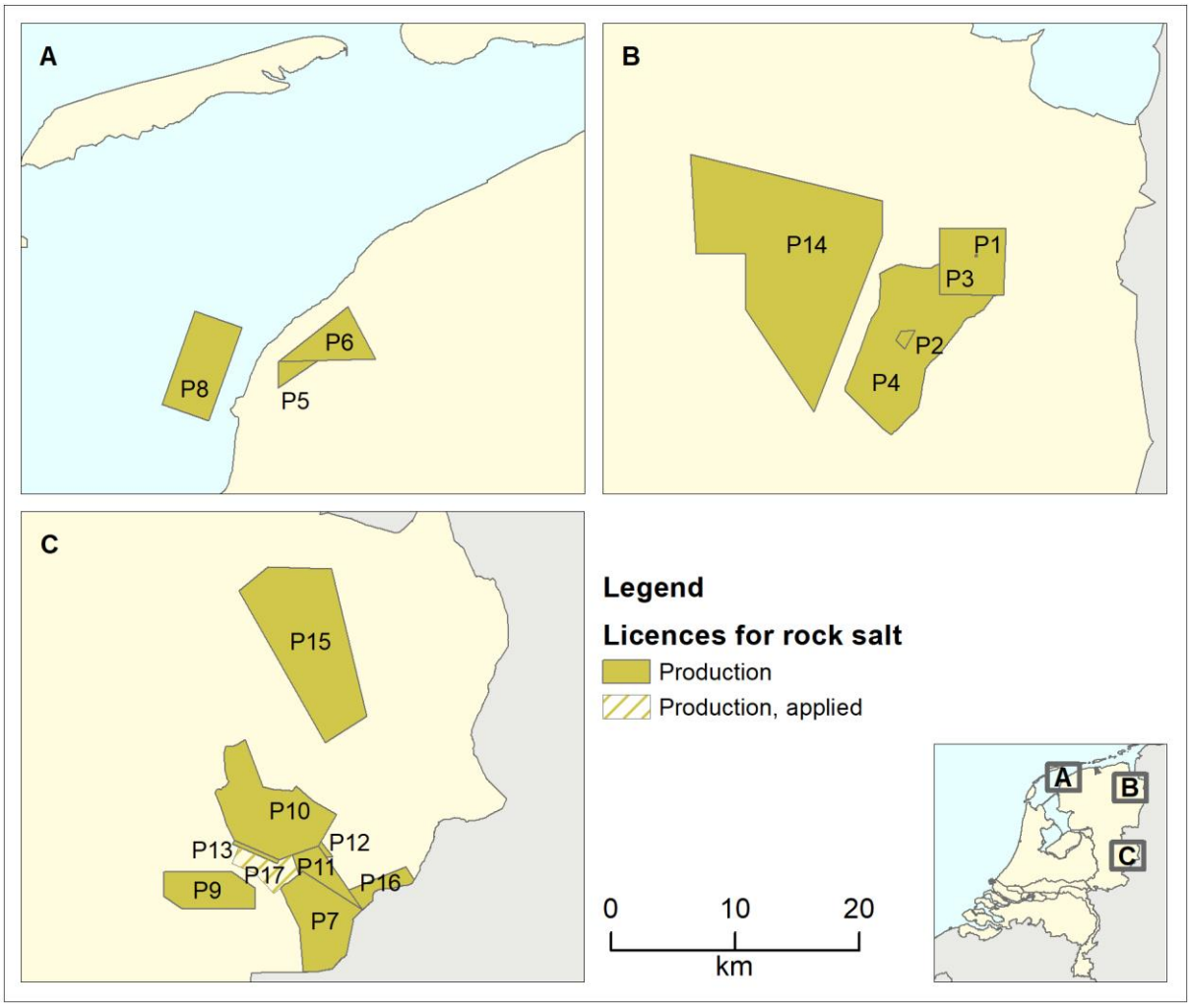


Figure 4.11 Licence for rock salt production as at 1 January 2024.

7.
Coal

On 1 January 2024 there were five production licences for coal in force. In 2023 there were no mining activities in the licence areas.

7.1 Production licences for Coal

Production licences, Land as at 1 January 2024

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

7.2 Licences for Coal

Names production licences for coal on land as show in Figure 7.1.:

Production licences for coal					
P1	Staatsmijn Beatrix	P3	Staatsmijn Hendrik	P5	Staatsmijn Wilhelmina
P2	Staatsmijn Emma	P4	Staatsmijn Maurits		

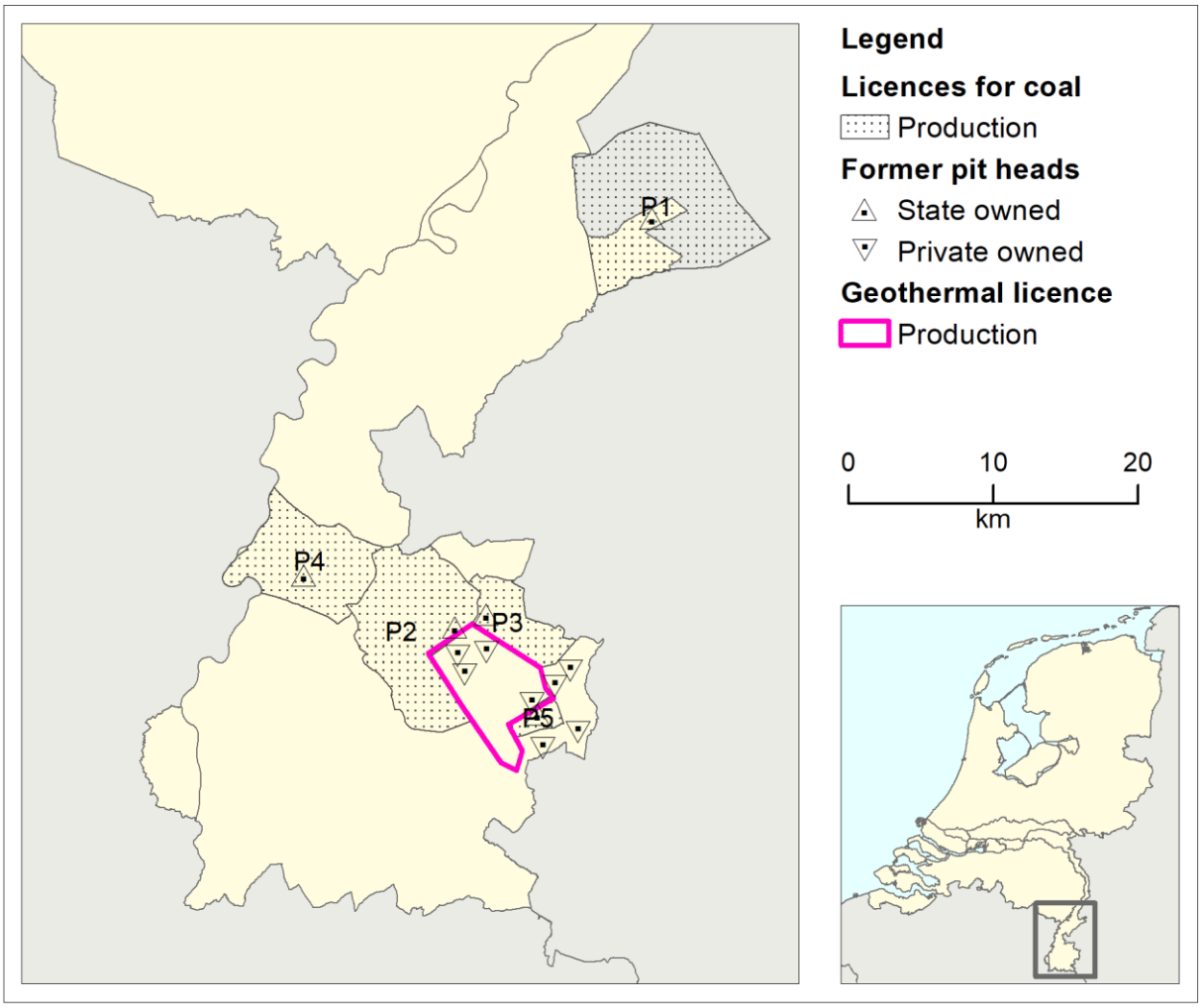


Figure 4.12 Licences for coal as at 1 January 2024.

8.
Licences, changes in 2023, Land

Changes in the onshore licences for hydrocarbon exploration and production, which took place during 2023, are listed in the tables below. This also includes all pending applications for licences.

8.1 Exploration licences hydrocarbons

Applied for

Licence	Official Journal of the EU	Date	Closing date	Gov. gazette	Applicant(s)
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	ONE-Dyas cs; Vermilion

* Application ongoing, published in an earlier annual review.

Extended

Licence holder	Licence	Effective from	Effective till
Vermilion Energy Netherlands B.V.	Schagen *	02-08-2022	Refused

* Decision on objection of 7-9-2022 on the subject of the refusal of extension in the decision of 1-8-2022: Objection is unfounded and contested decision stays enforced (WJZ/ 27590334, WJZ/ 27590334, Directorate of Legislation and Legal Affairs)

8.2 Production licences hydrocarbons

Applied for

Licence	Publication	Date	Closing date	Applicant(s)
Akkrum *	-	02-06-2016	-	Vermilion

* Application ongoing, published in an earlier annual review.

Split

Licence holder	Licence	Effective from	km^2
Original			
Nederlandse Aardolie Maatschappij B.V.	Botlek III *		228
After split			
Nederlandse Aardolie Maatschappij B.V.	Botlek IV	23-12-2022	219
Nederlandse Aardolie Maatschappij B.V.	Botlek Breeddiep	23-12-2022	9

* Concerns a correction (15-08-2023) of the decision of 22 December 2022.

Area

Total area land	Under licence for hydrocarbons
42,203 km^2	16,010 km^2 (37.9%)

8.3 Subsurface storage licences

No changes.

8.4 Exploration, production and storage licences for hydrocarbons

Names of exploration, production and storage licences for hydrocarbons onshore Netherlands as shown in Figure 8.1.

Exploration licence					
E1	Akkrum	E4	Hemelum	E7	Oosterwolde
E2	Engelen	E5	IJsselmuiden	E8	Opmeer
E3	Follega	E6	Lemsterland	E9	Utrecht

Exploration licence applied for					
E10	Brielle	E11	Slootdorp-Oost	E12	Waskemeer

Production licences					
P1	Akkrum 11	P15	Drenthe IIa	P29	Papekop
P2	Alkmaar	P16	Drenthe IIb	P30	Rijswijk
P3	Andel Va	P17	Drenthe IIIa	P31	Rossum-De Lutte
P4	Andel Vb	P18	Drenthe IV	P32	Schoonebeek
P5	Beijerland	P19	Drenthe V	P33	Slootdorp
P6	Bergen II	P20	Drenthe VI	P34	Steenwijk
P7	Bergermeer	P21	Gorredijk	P35	Tietjerksteradeel II
P8	Botlek IV	P22	Groningen	P36	Tietjerksteradeel III
P9	Botlek Breeddiep	P23	Hardenberg	P37	Tubbergen
P10	Botlek Maasmond	P24	Leeuwarden	P38	Twenthe
P11	Botlek-Maas	P25	Marknesse	P39	Waalwijk
P12	De Marne	P26	Middelie	P40	Zuid-Friesland III
P13	Donkerbroek	P27	Noord-Friesland	P41	Zuidwal
P14	Donkerbroek-West	P28	Oosterend		

Production licences applied for	
P42	Akkrum

Storage licences					
S1	Alkmaar	S3	Grijpskerk	S5	Twenthe-Rijn De Marssteden
S2	Bergermeer	S4	Norg	S6	Zuidwending

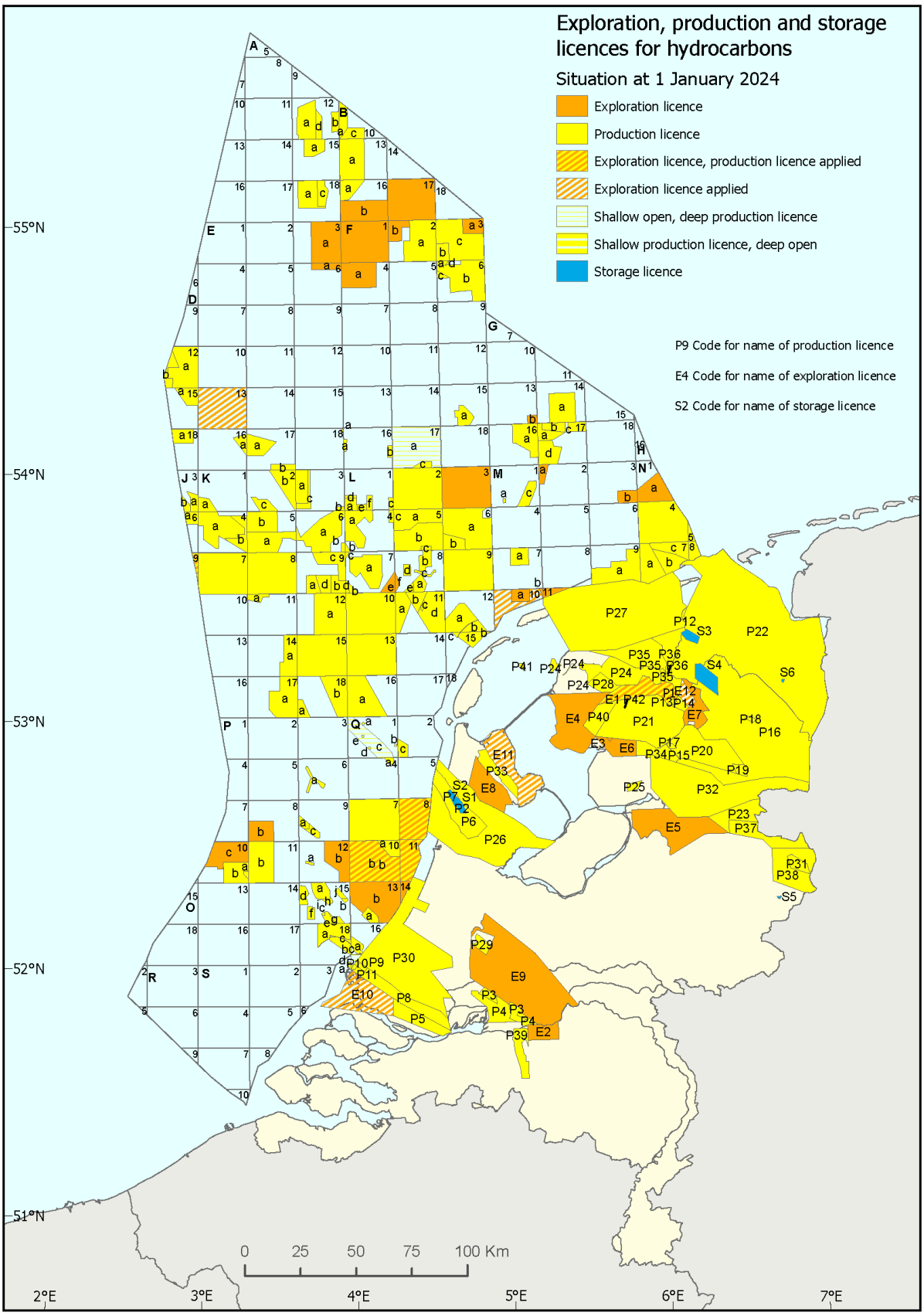


Figure 8.1 Exploration, production and storage licences for hydrocarbons as at 1 January 2024.

8.5 Scientific research and central policy licences for geothermal energy

Applied for

Licence	Gov. gazette	Date	Closing date	Applicant(s)
West-Brabant Noord 2 *	-	23-12-2022	-	EBN B.V.
Ede-Veenendaal 1	-	29-08-2023	-	EBN B.V.
Eindhoven 3	-	16-10-2023	-	EBN B.V.

* Application withdrawn as at 30 May 2023

Start licences awarded

Licence holder	Licence	Effective from	km²
EBN B.V.	Amstelland 1	24-05-2023	14
EBN B.V.	West-Brabant Noord 1	29-11-2023	2
EBN B.V.	Oss 2	23-12-2023	5
EBN B.V.	Haarlem Amsterdam-West 1	28-12-2023	8
		Total	29

Assigned operator

Licence	Operator	Effective from
Amstelland 1	EBN B.V.	14-10-2023
West-Brabant Noord 1	EBN B.V.	29-11-2023
Oss 2	EBN B.V.	23-12-2023
Haarlem Amsterdam-West 1	EBN B.V.	28-12-2023

8.6 Search area allocated for geothermal energy

Applied for

Licence	Gov. gazette	Date	Closing date	Applicant(s)
Het Bildt *	17 274	22-06-2023	21-09-2023	Yeager Energy B.V.
Kerkrade 1	26 684	27-09-2023	20-12-2023	Mijnwater Energy B.V.
Veenendaal-Scherpenzeel 1	29 626	27-10-2023	19-01-2024	

* Application withdrawn as at 21 July 2023.

Awarded

Licence holder	Licence	Effective from	km²
Eavor Europe B.V.	Almere 1	14-01-2023	63
N.V. HVC cs	Almere-Diemen 1	14-01-2023	272
Vattenfall Power Generation Netherlands B.V. cs	Amsterdam-Amstelveen 1	14-01-2023	336
Tullip Energy Exploration & Development B.V. cs	Amstelveen-Haarlemmermeer 1	14-01-2023	33
IPS Geothermal B.V.	Westeinder 1	14-01-2023	62
Tullip Energy Exploration & Development B.V. cs	Kudelstaart 1	14-01-2023	97
Tullip Energy Exploration & Development B.V. cs	Uithoorn 1	14-01-2023	12
N.V. HVC cs	Edam-Volendam 1	25-01-2023	44
ECW Geo Andijk B.V.	Andijk 2	22-02-2023	121
Tullip Energy Exploration & Development B.V. cs	De Ronde Venen 1	25-03-2023	82
Gemeente Tilburg	Tilburg-Zuid 1	14-06-2023	34
Eavor Europe B.V. cs	Tilburg 1	29-06-2023	59
Green Well Westland B.V.	Honselersdijk 5	15-12-2023	1
Nature's Heat B.V.	Honselersdijk 6	15-12-2023	4
		Total	1,220

Merged

Licence holder	Licence	Effective from	km²
Original			
EnergieWende B.V. cs	De Lier VI		10
EnergieWende B.V. cs	De Lier 8		10
After Merge			
EnergieWende B.V. cs	De Lier 9	27-04-2023	20

Reduced

Licence holder	Licence	Effective from	km²
N.V. HVC	Velsen	26-01-2023	31
HVC Aardwarmte Maasdijk B.V.	Maasdijk 4	01-03-2023	5*[1]
HVC Aardwarmte Maasdijk B.V.	Maasdijk 2	25-03-2023	4*[2]
HVC Aardwarmte Maasdijk B.V.	Westland-Zuidwest 1a	25-03-2023	45*[3]
HVC Aardwarmte Maasdijk B.V.	Westland-Zuidwest 1a	04-04-2023	36
Aardyn B.V. cs	West-Brabant	10-05-2023	284

*[1] Area outside of applied production licence has expired.
*[2] Part of licence vertically reduced after production licence has been awarded.
*[3] Remaining part after production licence has been awarded.

Extended

Licence holder	Licence	Effective from	Effective till
N.V. HVC	Velsen	26-01-2023	27-01-2027
GeoPower Exploitatie B.V.	Maasland 8	18-02-2023	27-02-2025
GeoPower Exploitatie B.V.	Maasland 6	18-02-2023	29-05-2025
HVC Aardwarmte Maasdijk B.V.	Westland-Zuidwest 1a	04-04-2023	10-04-2026
EnergieWende B.V. cs	De Lier 9	27-04-2023	03-09-2026
Aardyn B.V. cs	West-Brabant	10-05-2023	Denied
Aardyn B.V. cs	Den Haag 6a	09-06-2023	29-10-2027
Geothermie Plukmade B.V.	Made 2	09-06-2023	07-07-2024
Equans Energy Solutions B.V. cs	Rotterdam-Bar	16-06-2023	05-11-2028
Shell Geothermal B.V. cs	Rotterdam 7	16-06-2023	05-11-2028
Shell Geothermal B.V. cs	Rotterdam-Haven	16-06-2023	30-09-2028
Aardyn B.V. cs	Nootdorp-Oost 2	16-06-2023	15-10-2027
Aardyn B.V. cs	Den Haag 4a	16-06-2023	11-11-2027
Aardyn B.V. cs	Ypenburg 1a	28-06-2023	15-10-2027
Geothermie Delft B.V.	Pijnacker-Nootdorp 6b	30-06-2023	29-06-2024
Tullip Energy Exploration & Development B.V. cs	Amersfoort	01-07-2023	22-10-2026
Larderel Energy B.V.	Eemland	27-09-2023	21-10-2024
Wayland Energy B.V.	Zoetermeer *	30-10-2021	30-05-2027
IPS Geothermal Energy B.V.	Zoetermeer 2 *	30-10-2021	30-05-2027
HVC Aardwarmte Wippolderlaan B.V.	Wateringen 1	14-10-2023	11-11-2024
HVC Aardwarmte Wippolderlaan B.V.	Wateringen 2	14-10-2023	29-10-2024
Equans Energy Solutions B.V.	Utrecht	20-10-2023	09-12-2024
Provincie Drenthe cs	Erica	06-12-2023	06-12-2024
Aardwarmte Klazienaveen B.V.	Klazienaveen	16-12-2023	31-12-2024
Aardwarmte Klazienaveen B.V.	Klazienaveen 2	16-12-2023	31-12-2024
Aardwarmtecluster I KKP B.V.	Kampen 2	29-12-2023	31-12-2024

* Irrevocable decision on objection as of 30-5-2023

Assigned operator

Licence	Operator	Effective from
Pijnacker-Nootdorp 6b	Geothermie Delft B.V.	21-09-2023
Poeldijk 2	Aardwarmte Vogelaer B.V.	21-09-2023

Expired/Relinquished

Licence holder	Licence	Effective from	km²
WarmteStad B.V.	Groningen 2 *	31-07-2020	18
GeoPower Exploitatie B.V.	Maasland 9	01-12-2023	1
HVC Aardwarmte Maasdijk B.V.	Maasdijk 3	01-12-2023	5
Gedeputeerde Staten van Overijssel	Koekoekspolder 2	01-01-2024	23
		Total	47

* Exploration licence has expired by operation of law as of 31st of July 2020 (message from Ministry of Climate policy and Green Growth, 27 June 2023)

8.7 Start licences for geothermal energy

Applied for

Licence	Gov. gazette	Date	Closing date	Applicant(s)
Delft I *	-	11-11-2021	-	Geothermie Delft B.V.
Poeldijk II *	-	12-07-2022	-	Aardwarmte Vogelaer B.V.
Zoetermeer I	-	23-06-2023	-	IPS Geothermal Energy B.V.

* Application ongoing, published in an earlier annual review.

Awarded

Licence holder	Licence	Effective from	km²
Original			
HVC Aardwarmte Polanen B.V.	Monster 2 (exploration licence)		9
HVC Aardwarmte Polanen B.V.	Naaldwijk 5 (exploration licence)		1
-	Open area		1
HVC Aardwarmte Maasdijk B.V.	Maasdijk 3 (vertical part of part exploration licence)		5
HVC Aardwarmte Maasdijk B.V.	Maasdijk 2 (vertical part of part exploration licence)		4
HVC Aardwarmte Maasdijk B.V.	Maasdijk 4 (exploration licence)		5
HVC Aardwarmte Maasdijk B.V.	Westland-Zuidwest 1a (part exploration licence)		6
Wayland Energy B.V.	Bleiswijk 6 (exploration licence)		11
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4b (exploration licence)		<1
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4c (opsporingsvergunning)		1

Licence holder	Licence	Effective from	km²
After awarding			
HVC Aardwarmte Polanen B.V.	Monster I	27-01-2023	11
HVC Aardwarmte Maasdijk B.V.	Maasdijk I	25-03-2023	19
Wayland Energy B.V.	Lansingerland III	30-06-2023	11
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4b	30-06-2023	<1
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4c	30-06-2023	1
		Total	42

Merged

Licence holder	Licence	Effective from	km²
Original			
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4b		<1
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4c		1
After merge			
Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4d	30-06-2023	1

Extended

Licence holder	Licence	Effective from	Effective till
Trias Westland B.V.	Naaldwijk II	28-03-2023	07-05-2024
Aardyn B.V. cs	Den Haag	04-04-2023	27-05-2024
Geocombinatie Leeuwarden B.V.	Leeuwarden I	04-04-2023	31-05-2024
Aardwarmte Combinatie Luttelgeest B.V.	Luttelgeest II	18-08-2023	22-10-2024
Wayland Energy B.V.	Lansingerland II	08-09-2023	24-10-2024

Revised

Licence	Change	Effective from
Middenmeer III	no production allowed (yet)	22-09-2023
Bleiswijk	no production allowed (yet)	22-09-2023
Bleiswijk 1b	no production allowed (yet)	22-09-2023
Californie IV	no production allowed (yet)	22-09-2023
Californie V	no production allowed (yet)	22-09-2023
Monster I	no production allowed (yet)	22-09-2023
Nootdorp-Oost I	no production allowed (yet)	22-09-2023
Nootdorp-Oost II	no production allowed (yet)	22-09-2023
Leeuwarden I	Agreement with revised production plan	08-11-2023
Luttelgeest II	Agreement with revised production plan	08-12-2023

Assigned operator

Licence	Operator	Effective from
Bleiswijk	IPS Geothermal Energy B.V.	29-09-2023
Bleiswijk 1b	IPS Geothermal Energy B.V.	29-09-2023
Californie IV	Californië Wijnen Geothermie B.V.	29-09-2023
Californie V	Nappa B.V.	29-09-2023
Den Haag	Aardyn B.V.	29-09-2023
Lansingerland II	Wayland Energy B.V.	29-09-2023
Lansingerland III	Wayland Energy B.V.	29-09-2023
Leeuwarden I	Geocombinatie Leeuwarden B.V.	29-09-2023
Luttelgeest II	Aardwarmte Combinatie Luttelgeest B.V.	29-09-2023
Luttelgeest III	Hoogweg Aardwarmte B.V.	29-09-2023
Maasdijk I	HVC Aardwarmte Maasdijk B.V.	29-09-2023
Middenmeer III	Ennatuurlijk Aardwarmte Middenmeer B.V.	29-09-2023
Monster I	HVC Aardwarmte Polanen B.V.	29-09-2023
Naaldwijk II	Trias Westland B.V.	29-09-2023
Nootdorp-Oost I	Wayland Energy B.V.	29-09-2023
Nootdorp-Oost II	Wayland Energy B.V.	29-09-2023
Oostvoorne	Aardyn B.V.	29-09-2023
Pijnacker-Nootdorp 4d	Ammerlaan Geothermie B.V.	29-09-2023

8.8 Follow-up licence for geothermal energy

Revised

Licence	Change	Effective from
Pijnacker-Nootdorp 4	Agreement with revised production plan	15-12-2023

Assigned operator

Licence	Operator	Effective from
Andijk	ECW Geo Andijk B.V.	29-09-2023
De Lier	EnergieWende B.V.	29-09-2023
Heemskerk	Ce-Ren Beheer B.V.	29-09-2023
Heerlen	Mijnwater Energy B.V.	29-09-2023
Honselersdijk	Green Well Westland B.V.	29-09-2023
Kampen	Aardwarmtecluster I KKP B.V.	29-09-2023
Kwintsheul	Nature's Heat B.V.	29-09-2023
Licence	**Operator**	**Effective from**
Lansingerland	Wayland Energy Bergschenhoek B.V.	29-09-2023
Luttelgeest	Hoogweg Aardwarmte B.V.	29-09-2023
Maasland	GeoPower Exploitatie B.V.	29-09-2023
Middenmeer I	Ennatuurlijk Aardwarmte Middenmeer B.V.	29-09-2023
Middenmeer II	Ennatuurlijk Aardwarmte Middenmeer B.V.	29-09-2023
Naaldwijk	Trias Westland B.V.	29-09-2023
Pijnacker-Nootdorp 4	Ammerlaan Geothermie B.V.	29-09-2023
Pijnacker-Nootdorp 5	Gebroeders Duijvestijn Energie B.V.	29-09-2023
Poeldijk	Aardwarmte Vogelaer B.V.	29-09-2023
Vierpolders	Aardyn B.V.	29-09-2023
Zevenbergen	Visser & Smit Hanab B.V.	29-09-2023

8.9 Exploration and production licences for geothermal energy

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

Start licences for scientific research and central policy					
O1	Amstelland 1	O3	Oss 2	O4	West-Brabant Noord 1
O2	Haarlem Amsterdam-West 1				

Applied Start licences for scientific research and central policy			
O5	Ede-Veenendaal 1	O6	Eindhoven 3

Search area allocations					
Z1	Alkmaar	Z29	Honselersdijk 6	Z57	Rijnland
Z2	Almere 1	Z30	Hoorn	Z58	Rotterdam 4
Z3	Almere-Diemen 1	Z31	Kampen 2	Z59	Rotterdam 7
Z4	Amersfoort	Z32	Klazienaveen	Z60	Rotterdam Prins Alexander
Z5	Amstelveen-Haarlemmermeer 1	Z33	Klazienaveen 2		
Z6	Amsterdam- Amstelveen 1	Z34	Kudelstaart 1	Z61	Rotterdam-Bar
Z7	Andijk 2	Z35	Kwintsheul 2	Z62	Rotterdam-Haven
Z8	Bommelerwaard 2	Z36	Leeuwarden	Z63	Rotterdam-Stad
Z9	Brakel-Zuidoost	Z37	Leeuwarden 5	Z64	Sneek
Z10	Breda-Moerdijk	Z38	Leiden 2	Z65	Someren
Z11	Brielle 2	Z39	Leiden 3	Z66	Terheijden 2
Z12	Capelle aan den IJssel	Z40	Lelystad	Z67	Tilburg 1
Z13	De Lier 9	Z41	Maasdijk 2	Z68	Tilburg-Zuid 1
Z14	De Ronde Venen 1	Z42	Maasland 6	Z69	Uithoorn 1
Z15	Delft-Abtswoude	Z43	Maasland 8	Z70	Utrecht
Z16	Den Haag 4a	Z44	Made 2	Z71	Velsen
Z17	Den Haag 6a	Z45	Middenmeer 4	Z72	Vierpolders
Z18	Den Helder	Z46	Nijmegen	Z73	Wateringen 1
Z19	Den Hoorn	Z47	Nissewaard	Z74	Wateringen 2
Z20	Drachten 3	Z48	Nissewaard 2	Z75	Wellerlooi
Z21	Drechtsteden	Z49	Nootdorp-Oost 2	Z76	West-Brabant
Z22	Edam-Volendam 1	Z50	Oss	Z77	Westeinder 1
Z23	Ede	Z51	Oude Rijn	Z78	Westland-Zuidwest 1a
Z24	Eemland	Z52	Pijnacker-Nootdorp 6b	Z79	Ypenburg 1a
Z25	Eindhoven 2	Z53	Poeldijk 2	Z80	Zoetermeer
Z26	Erica	Z54	Purmerend 2	Z81	Zoetermeer 2
Z27	Haarlem-Schalkwijk	Z55	Purmerend 3	Z82	Zuidplas 2
Z28	Honselersdijk 5	Z56	Renkum	Z83	Zwolle

Applied search area allocations

Z84	Kerkrade 1	Z85	Veenendaal-Scherpenzeel 1

Start licences

S1	Bleiswijk	S7	Lansingerland III	S13	Monster I
S2	Bleiswijk 1b	S8	Leeuwarden I	S14	Naaldwijk II
S3	Californië IV	S9	Luttelgeest II	S15	Nootdorp-Oost I
S4	Californië V	S10	Luttelgeest III	S16	Nootdorp-Oost II
S5	Den Haag	S11	Maasdijk I	S17	Oostvoorne
S6	Lansingerland II	S12	Middenmeer III	S18	Pijnacker-Nootdorp 4d

Applied start licences

S19	Delft I	S20	Poeldijk II	S21	Zoetermeer I

Follow-up licences

V1	Andijk	V7	Kwintsheul	V13	Naaldwijk
V2	De Lier	V8	Lansingerland	V14	Pijnacker-Nootdorp 4
V3	Heemskerk	V9	Luttelgeest	V15	Pijnacker-Nootdorp 5
V4	Heerlen	V10	Maasland	V16	Poeldijk
V5	Honselersdijk	V11	Middenmeer I	V17	Vierpolders
V6	Kampen	V12	Middenmeer II	V18	Zevenbergen

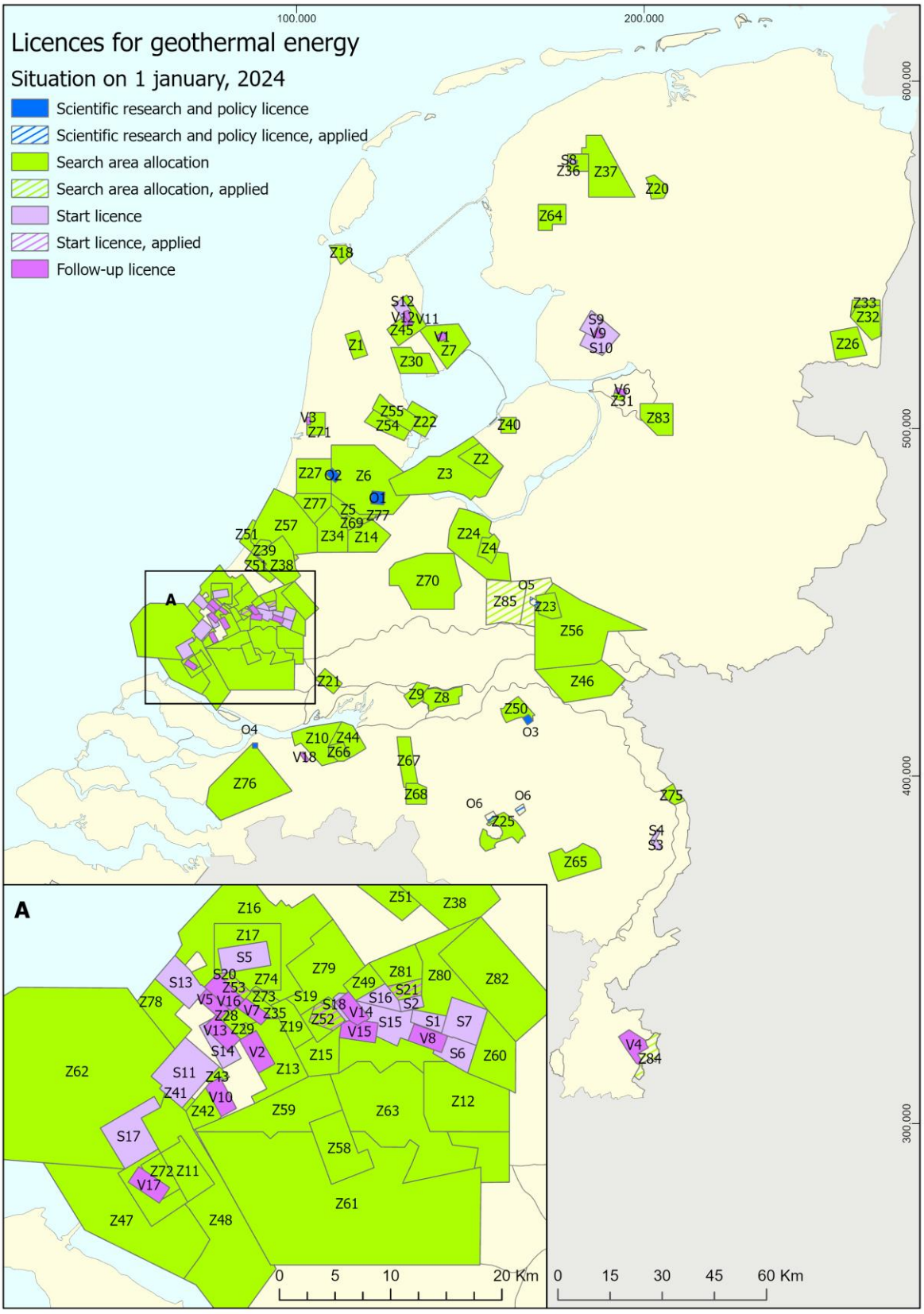


Figure 8.1 Licences for geothermal energy as at 1 January 2024.

8.10 Production licences rock salt

Applied for

Licence	Gov. gazette	Date	Closing date	Applicant(s)
Twenthe-Rijn Welen Mos *	-	10-07-2018	-	Nobian

* Application ongoing, published in an earlier annual review.

8.11 Production licences coal

No changes.

9.
Licences, changes in 2023, Sea

Changes in the offshore licences for hydrocarbon exploration and production, which took place during 2023, 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	Gov. Gazette	Applicant(s)
M10 & M11 *	C450/8	28-11-2022	27-02-2023	33 041	Kistos NL1 B.V.
E13	C/2023/721	09-11-2023	08-02-2024	31 595	

* Decision on objection against refusal of extension of exploration licence M10a & M11 was made simultaneously (decision 18 July 2023, WJZ / 26154405)

Awarded

Licence holder	Licence	Effective from	km²
Kistos NL2 B.V.	P12b	21-01-2023	161
Kistos NL2 B.V.	Q13b & Q14	21-01-2023	346
ONE-Dyas B.V.	F3a	19-12-2023	62
		Total	569

Extended

Licence holder	Licence	Effective from	Effective till
Nederlandse Aardolie Maatschappij B.V.	B16b, B17, E3a, E6a, F1 & F2b	11-07-2023	02-09-2027
Nederlandse Aardolie Maatschappij B.V.	F4a	14-07-2023	02-09-2028*[1]
Kistos NL1 B.V.	M10a & M11	19-07-2023	29-08-2028 *[2]
ONE-Dyas B.V.	M2a	19-07-2023	29-08-2025 *[3]
ONE-Dyas B.V.	M4a	19-07-2023	Denied*[4]
Wintershall Noordzee B.V. cs	F18b-diep	17-10-2023	Denied
Wintershall Noordzee B.V. cs	F11a	17-10-2023	Denied
Wintershall Noordzee B.V. csfs	F10	17-10-2023	Denied

*[1] Conditional extension: Applies when a well has been put in place within exploration licence "B16b, B17, E3a, E6a, F1 & F2b" before the 3th of September 2026.

*[2] Decision on objection against decision dated 29-6-2022 (refusal of extension); (WJZ/26154405, DWJZ)

*[3] Decision on objection against decision dated 9-11-2022 (refusal of extension); (WJZ/27283255, DWJZ)

*[4] Decision on objection against decision dated 9-11-2022 (refusal of extension); (WJZ/27285366, DWJZ)

Reduced

Licence holder	Licence	Effective from	km²
Kistos NL1 B.V.	M10a & M11	19-07-2023	76
ONE-Dyas B.V.	M2a	27-10-2023	28
Jetex Petroleum Ltd	P10c	29-11-2023	175
Nederlandse Aardolie Maatschappij B.V.	B16b, B17, E3a, E6a, F1 & F2b	09-12-2023	1,344

Relinquished / expired

Licence holder	Licence	Effective from	km²
ONE-Dyas B.V.	M4a	03-01-2023	121
ONE-Dyas B.V.	F6c & F6d	01-10-2023	129
Neptune Energy Netherlands B.V. cs	E15c	18-10-2023	113
Neptune Energy Netherlands B.V.	E7	17-10-2023	400
Wintershall Noordzee B.V. cs	F10	31-12-2023	401
Wintershall Noordzee B.V. cs	F11a	31-12-2023	60
Wintershall Noordzee B.V. cs	F18b-diep	31-12-2023	31
		Total	1,255

9.2 Production licences hydrocarbons

Applied for

Licence	Publication	Date	Closing date	Applicant(s)
Q8, Q10b & Q11	-	20-12-2019	-	Kristos
J9 *	-	27-10-2022	-	NAM cs

* Application ongoing, published in an earlier annual review.

Awarded

Licence holder	Licence	Effective from	km²
Petrogas E&P Netherlands B.V. cs	B16a	04-07-2023	67
ONE-Dyas B.V. cs	F6b	14-11-2023	260
ONE-Dyas B.V. cs	F6c & F6d	14-11-2023	11
		Total	338

Extended

Licence holder	Licence	Effective from	Effective till
Dana Petroleum Netherlands B.V. cs	F3c	08-02-2023	08-03-2026
Neptune Energy Netherlands B.V. cs	K12a	09-02-2023	31-12-2044
Nederlandse Aardolie Maatschappij B.V.	F17c	18-02-2023	31-12-2035
Wintershall Noordzee B.V. cs	K18b	21-02-2023	31-12-2040
Wintershall Noordzee B.V. cs	L16a	02-03-2023	11-06-2028
Nederlandse Aardolie Maatschappij B.V. cs	K18a	27-04-2023	08-05-2026
Neptune Energy Netherlands B.V.	K2b	14-07-2023	31-07-2039
Neptune Energy Netherlands B.V.	K3a	14-07-2023	31-07-2039
TotalEnergies EP Nederland B.V. cs	L1a	16-08-2023	31-12-2034
TotalEnergies EP Nederland B.V.	L1d	16-08-2023	31-12-2028
TotalEnergies EP Nederland B.V.	K5b	01-09-2023	31-12-2041
Petrogas E&P Netherlands B.V.	Q1a-ondiep, Q1b-ondiep, Q1d-ondiep & Q1e-ondiep	15-12-2023	31-12-2029

Reduced

Licence holder	Licence	Effective from	km^2
Nederlandse Aardolie Maatschappij B.V. cs	K18a	27-04-2023	31
TotalEnergies EP Nederland B.V.	K5b	01-09-2023	126
Petrogas E&P Netherlands B.V.	Q1a-ondiep, Q1b-ondiep, Q1d-ondiep & Q1e-ondiep	15-12-2023	4

Relinquished / expired

Licence holder	Licence	Effective from	km^2
ONE-Dyas B.V. cs	P11a	08-12-2023	6
		Total	6

Area

Total area sea	In licence for hydrocarbons
56,396 km^2	16,729 km^2 (29.7%)

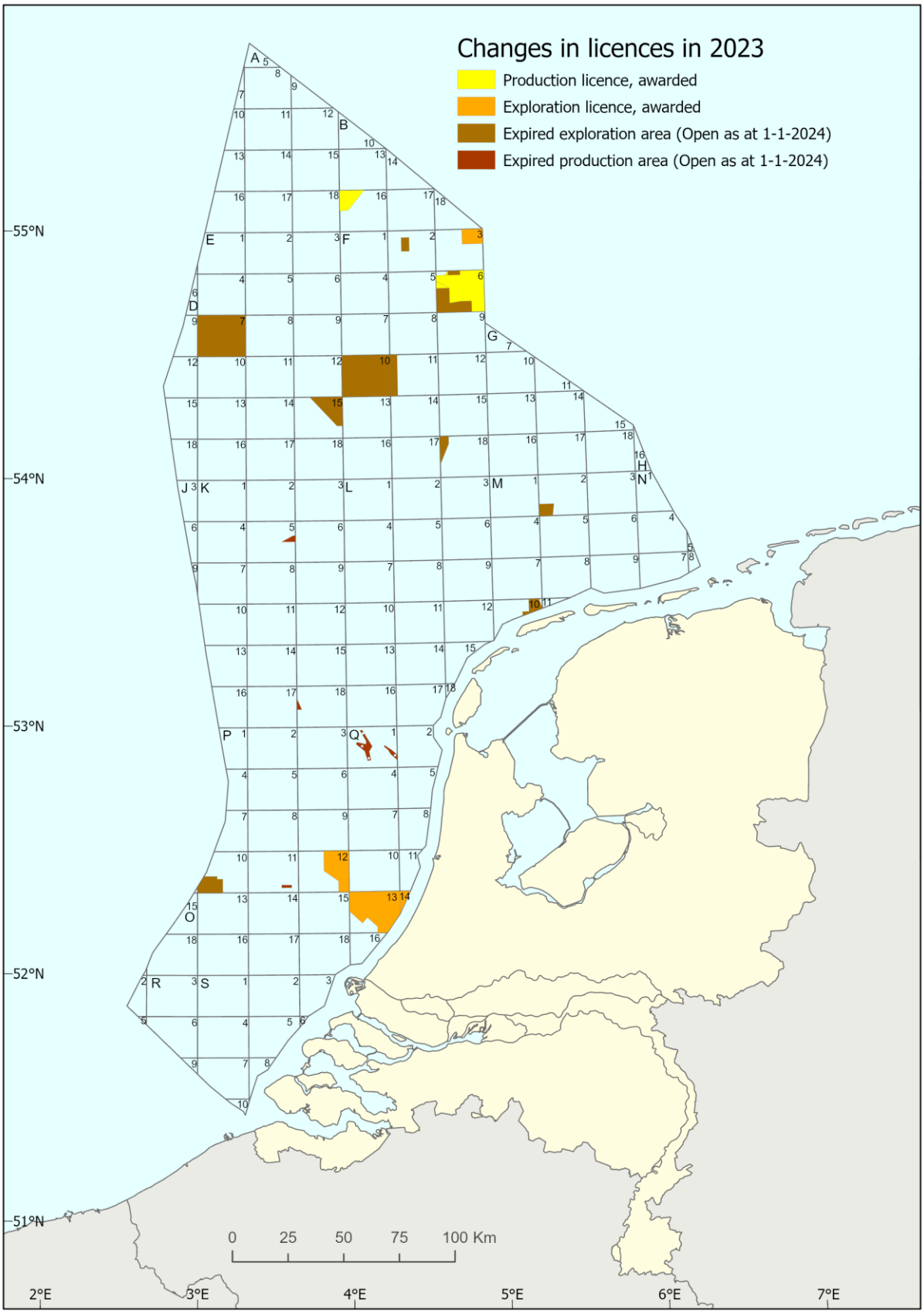


Figure 9.1 Changes in hydrocarbon licences during the year 2023.

9.3 Exploration licences for storage

Changes regarding exploration licences for storage at sea during 2023 are listed in the table below. This table also includes all current applications for exploration licences.

Applied for

Licence	Gov. gazette	Date	Closing date	Applicant(s)
K8a, K10a, K11a, K12a, K13a, K14a, K14b, K15a, K15b & K17a *	29 036	28-10-2022	27-01-2023	Shell Gas & Power Development B.V.
O15, O17, O18, P13a, P14a, P16, P17 & P18a *	29 037	28-10-2022	27-01-2023	Shell Gas & Power Development B.V.

* Application ongoing, published in an earlier annual review.

Storage licences

Changes regarding storage licences at sea during 2023 are listed in the table below. This table also includes all current applications for storage licences.

Applied for

Licence	Gov. gazette	Date	Closing date	Applicant(s)
K14-FA *	33 008	01-12-2022	02-03-2023	Shell Gas &Power Development B.V.
L4-A	20 982	25-07-2023	25-10-2023	TotalEnergies E&P Nederland B.V.
P18-6	20 984	25-07-2023	25-10-2023	TAQA Offshore B.V. cs

* Application ongoing, published in an earlier annual review.

10.
Licences, company- and name changes in 2023

The tables below list changes in chronological order which took place during 2023, 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	In/Out	Company	Permission	Gov. gazette	Effective from
F4a	In	-	18-02-2023	6 232	11-04-2023
	Out	Neptune Energy Netherlands B.V.			
L3	In	-	18-02-2023	6 231	03-04-2023
	Out	Nederlandse Aardolie Maatschappij B.V.			
B16b, B17, E3a, E6a, F1 & F2b	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
F4a	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
J9	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			

* New operator.

Company changes in production licences

Licence	In/Out	Company	Permission	Gov. gazette	Effective from
Bergen II	In	TAQA Offshore B.V. *	13-09-2022	24 672	08-09-2023
	Out	TAQA Onshore B.V.			
Botlek Breeddiep	In	ONE-Dyas B.V. *	23-12-2022	35 375	20-01-2023
	Out	Nederlandse Aardolie Maatschappij B.V.			
F17c	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K7	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K8 & K11a	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K14a	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K15	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K17a	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K18a	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
L2	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
L9	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
L13	In	NAM Offshore B.V. *	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
G14a & G17b	In	NAM Offshore B.V.	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			

Licence	In/Out	Company	Permission	Gov. gazette	Effective from
J3a	In	NAM Offshore B.V.	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K1a	In	NAM Offshore B.V.	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
K18b	In	NAM Offshore B.V.	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
L16a	In	NAM Offshore B.V.	05-05-2023	15 132	
	Out	Nederlandse Aardolie Maatschappij B.V.			
F6a *	In	-	20-10-2023	29 311	11-2023
	Out	TotalEnergies EP Nederland B.V.			

* New operator.

Name changes

Previous company name	New company name
Rosewood Exploration Ltd.	Tenaz Energy Netherlands Offshore S.A.R.L.
XTO Netherlands Ltd.	Tenaz Energy Netherlands Offshore II S.A.R.L.

10.2 Storage

Company changes in storage licences

No changes.

Name changes

No changes.

10.3 Geothermal energy

Company changes in search area allocations

Licences	In/Out	Company	Permission	Gov. gazette	Effective from
Erica	In	Geothermie Groep Nederland B.V. *	18-03-2023	8 943	07-12-2023
	Out	Provincie Drenthe			
		Gemeente Emmen			
Oss	In	-	10-05-2023	13 964	01-06-2023
	Out	Provenance Exploration Consultancy B.V.			
Breda-Moerdijk 1	In	Ennatuurlijk Aardwarmte Moerdijk B.V.	n.v.t.	28 308	10-10-2023

* New operator.

Company changes in start licences

Licences	In/Out	Company	Permission	Gov. gazette	Effective from
Californië V	In	Nappa B.V. *	25-03-2023	9 846	11-07-2023
	Out	Californië Lipzig Gielen Geothermie B.V.			
Middenmeer III	In	ECW Geo Middenmeer B.V. *	03-08-2022	25 904	05-08-2022
	Out	ECW Geoholding B.V.			

* New operator.

Name changes

Previous company name	New company name
ENGIE Energy Solutions B.V.	Equans Energy Solutions B.V.
ECW Geoholding B.V.	Ennatuurlijk Aardwarmte Holding B.V.
ECW Geo Middenmeer B.V.	Ennatuurlijk Aardwarmte Middenmeer B.V.
Tullip Energy Exploration & Development B.V.	Gaia Energy B.V.

10.4 Rock salt

No changes.

10.5 Coal

No changes.

11.
Seismic surveys

During 2023, no 2D seismic surveys were recorded on the Dutch part of the North Sea. However, in 2022 one offshore 3D seismic survey started as a joint project between Nederlandse Aardolie Maatschappij (NAM) and Wintershall Noordzee. This 3D survey concluded in 2023 and was carried out in blocks K15/L13 and K18b/L16a with an area of approximately 372 km^2 (see figure 11.1). For 2023, no 3D seismic surveys were recorded on land. During 2023 10 2D seismic lines were recorded on land with a cumulative length of approximately 67 km. Hereof, all 2D seismic lines are recorded as part of the programme "Seismische Campagne Aardwarmte Nederland" (SCAN) directed by EBN (see figure 11.1).

For a long-term overview of seismic acquisitions through the years see Annex M.

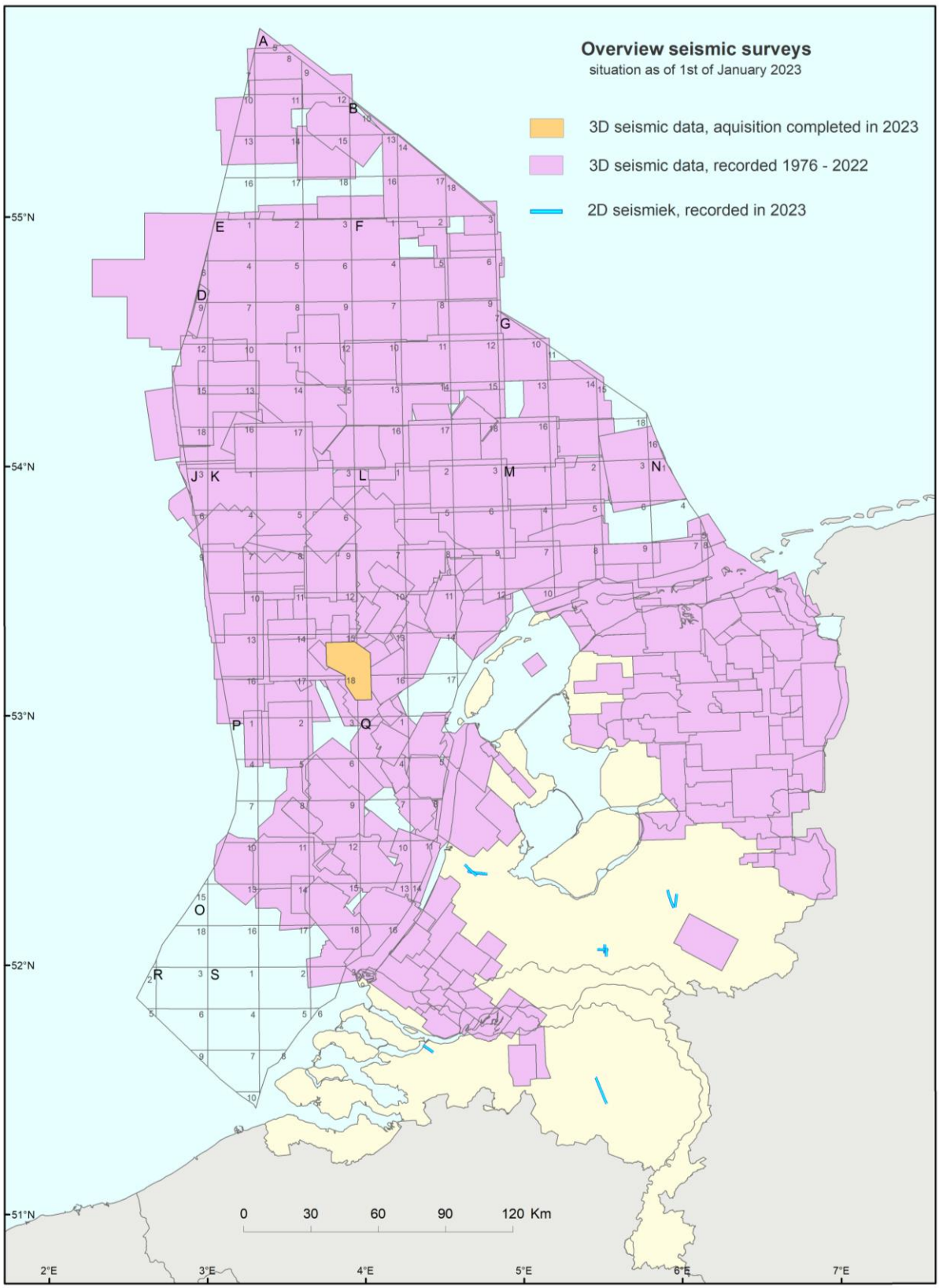


Figure 11.1 Overview of 3D seismic surveys as of 1 January 2024 and 2D seismic lines acquired in 2023.

12.
Wells completed in 2023

This overview of wells completed in 2023 has been grouped in three categories: hydrocarbons, geothermal and salt. Only the hydrocarbon wells have been classified on its location, onshore or offshore. All categories are sorted in the type of well: exploration or development, but also appraisal for hydrocarbon wells. For each category an aggregated overview of all drilling activities of 2023 is presented in a table.

12.1 Hydrocarbons

In 2023 a total of 5 explorations wells were drilled, 3 on land and 2 offshore. Onshore this resulted in 2 gas discoveries and 1 resulted in a dry well. Offshore 1 exploration well found gas, another 1 was a dry well. Together this means a success-ratio of 60%. The number of exploration wells has increased with 1 when compared with last year.

Offshore two appraisal wells were drilled in 2023, of which both confirmed earlier gas discoveries. No onshore appraisal wells were drilled in 2023. The number of appraisal wells drilled in 2023 is 1 less when compared with last year. In total 2 development wells were drilled in 2023, a decrease of 1 when compared with 2022. Both development wells were drilled offshore. The wells E15-01 and L07-17-S1 were drilled in exploration licences. All other wells were drilled in production licences.

Onshore

Exploration wells

	Name	Licence	Operator	Result
1	LDS-01	Drenthe VI	Vermilion	Gas
2	LDS-02	Drenthe VI	Vermilion	Dry
3	OLR-02-S2	Gorredijk	Vermilion	Gas

Offshore

Exploration wells

	Name	Licence	Operator	Result
1	E15-01	E15c	Neptune	Dry
2	L11-16	L11d	ONE-Dyas	Gas

Appraisal wells

	Name	Licence	Operator	Result
1	L07-17-S1	L07e	Neptune	Gas
2	N04-04-S1	N04	ONE-Dyas	Gas

Development wells

	Name	Licence	Operator	Result
1	A15-A-02	A15a	Petrogas	Gas
2	Q10-A-01-S1	Q10a	Kistos	Gas

Summary

Hydrocarbon wells completed in 2023

Area	Type	Result							Total
		Gas	Gas shows	Oil	Oil shows	Oil&Gas	Dry	Other	
Onshore	Exploration	2	-	-	-	-	1	-	3
	Appraisal	-	-	-	-	-	-	-	-
	Development	-	-	-	-	-	-	-	-
Offshore	Exploration	1	-	-	-	-	1	-	2
	Appraisal	2	-	-	-	-	-	-	2
	Development	2	-	-	-	-	-	-	2
	Total	7	-	-	-	-	2	-	9

12.2 Geothermal

Last year 13 geothermal wells were drilled, of which 1 is an exploration well. This well has been drilled in the licence type "Scientific research and central policy licence" and has indicated a potential aquifer for geothermal exploitation.

In total 12 development wells were drilled in 2023, 5 more when compared with 2022. The 2 Delft wells were drilled in the "Search area allocation" licence Pijnacker-Nootdorp 6b. Since the update of the Mining Law on 1 July 2023, the exploration licence has been changed to this new licence type. In the right of transfer, the operator has maintained the right to explore using a well (for further explanation on this topic please check chapter 5).

Furthermore 8 wells have been drilled in the Start licences Middenmeer III, Monster I and Maasdijk I. This has resulted in 5 new geothermal systems. In the "Follow-Up" licence Vierpolders a sidetrack has been drilled from the well BRI-GT-01 to replace the original hole. The well HLH-GT-03 is an expansion on the current geothermal system of Mijnwater Energiecentrale Heerlen, located in the "Follow-Up" licence Heerlen.

Exploration wells

	Name	Licence	Operator	Result
1	AMS-01	Amstelland 1	EBN	Water

Development wells

	Name	Licence	Operator	Result
1	BRI-GT-01-S1	Vierpolders	Aardyn	Water
2	DEL-GT-01	Pijnacker-Nootdorp 6b	Aardyn	Water
3	DEL-GT-02-S2	Pijnacker-Nootdorp 6b	Aardyn	Water
4	HLH-GT-03	Heerlen	Mijnwater Energy	Water
5	MDM-GT-08	Middenmeer III	ECW	Water
6	MDM-GT-09	Middenmeer III	ECW	Water
7	MON-GT-01	Monster I	HVC	Water
8	MON-GT-02	Monster I	HVC	Water
9	MSD-GT-01	Maasdijk I	HVC	Water
10	MSD-GT-02	Maasdijk I	HVC	Water
11	MSD-GT-05	Maasdijk I	HVC	Water
12	MSD-GT-06-S1	Maasdijk I	HVC	Water

12.3 Salt

In 2023 no salt wells have been drilled during 2023. This is 2 less when compared with 2022.

Figure 12.1 Wells drilled in 2023.

13.
Platforms and pipelines, Sea

No offshore platforms, subsea installations or pipelines were installed in 2023. In 2023 seven platforms were removed.

For a complete list of platforms see Annex Q. The platform and pipeline data were supplied by NexStep (National Platform for Re-use and Decommissioning).

Platforms, removed in 2023

Platform	Operator	Installed	No. legs	Gas/Oil
Q01-Haven-A	Petrogas	1989	1	Olie
Q01-Hoorn-AP/-AW	Petrogas	1983	4 / 6	Olie
L08-A	Wintershall	1988	4	Gas
L08-H	Wintershall	1988	4	Gas
P06-B	Wintershall	1985	4	Gas
P06-D	Wintershall	2000	4	Gas
P11-E	ONE-Dyas	2016	4	Gas

Annexes

A. Natural gas and oil accumulations

A.1. Gas accumulations

Developed accumulations

a. In production

Accumulation	Company	Licence name [Type]*	Gas/Oil
's-Gravenzande	NAM	Rijswijk [pl]	G
Ameland-Oost	NAM	Noord-Friesland [pl]	G
Ameland-Westgat	NAM	Noord-Friesland [pl]	G
Anjum	NAM	Noord-Friesland [pl]	G
Assen	NAM	Drenthe IIb [pl]	G
Bedum	NAM	Groningen [pl]	G
Bergen	TAQA Offshore	Bergen II [pl]	G
Blesdijke	Vermilion	Gorredijk [pl], Steenwijk [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
Botlek	NAM	Botlek IV [pl], Rijswijk [pl]	G
Brakel	Vermilion	Andel Va [pl]	G&O
Coevorden	NAM	Hardenberg [pl], Schoonebeek [pl]	G
Collendoorn	NAM	Hardenberg [pl], Schoonebeek [pl]	G
De Blesse	Vermilion	Gorredijk [pl], Steenwijk [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	Vermilion	Drenthe VI [pl]	G
Eesveen	Vermilion	Drenthe VI [pl], Steenwijk [pl]	G
Eleveld	NAM	Drenthe IIb [pl]	G
Ezumazijl	NAM	Noord-Friesland [pl]	G
Faan	NAM	Groningen [pl]	G
Feerwerd	NAM	Groningen [pl]	G
Gaag	NAM	Rijswijk [pl]	G
Geesbrug	Vermilion	Drenthe V [pl]	G
Groet	TAQA Offshore	Bergen II [pl]	G
Grolloo	Vermilion	Drenthe IV [pl]	G
Groningen	NAM	Groningen [pl]	G

Accumulation	Company	Licence name [Type]*	Gas/Oil
Grootegast	NAM	Groningen [pl], Tietjerksteradeel III [pl]	G
Hardenberg	NAM	Hardenberg [pl], Schoonebeek [pl]	G
Hardenberg-Oost	NAM	Hardenberg [pl], Schoonebeek [pl]	G
Harkema	NAM	Tietjerksteradeel III [pl]	G
Heinenoord	NAM	Botlek IV [pl]	G
Hekelingen	NAM	Beijerland [pl], Botlek IV [pl]	G
Kollum	NAM	Tietjerksteradeel III [pl]	G
Kollum-Noord	NAM	Noord-Friesland [pl], Tietjerksteradeel III [pl]	G
Kommerzijl	NAM	Groningen [pl], Tietjerksteradeel III [pl]	G
Langezwaag	Vermilion	Gorredijk [pl]	G
Lauwersoog	NAM	Noord-Friesland [pl]	G
LDS-A	Vermilion	Drenthe VI [pl]	G
Leens	NAM	Groningen [pl]	G
Leeuwarden-Nijega	Vermilion	Leeuwarden [pl], Tietjerksteradeel II [pl]	G
Loon op Zand	Vermilion	Waalwijk [pl]	G
Loon op Zand-Zuid	Vermilion	Waalwijk [pl]	G
Maasdijk	NAM	Rijswijk [pl]	G
Marum	NAM	Groningen [pl], Tietjerksteradeel III [pl]	G
Middelburen	Vermilion	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
Nieuwehorne	Vermilion	Gorredijk [pl]	G
N07-FA	NAM	N07a [pl], Noord-Friesland [pl]	G
Noordwolde	Vermilion	Gorredijk [pl]	G
Oostrum	NAM	Noord-Friesland [pl]	G
Opeinde	Vermilion	Leeuwarden [pl], Tietjerksteradeel II [pl]	G
Opeinde-Zuid	Vermilion	Akkrum [el], Leeuwarden [pl]	G
Opende-Oost	NAM	Groningen [pl]	G
Oud-Beijerland Noord	NAM	Botlek IV [pl]	G
Oude Pekela	NAM	Groningen [pl]	G
Oudeland	NAM	Beijerland [pl]	G
Pernis	NAM	Rijswijk [pl]	G
Pernis-West	NAM	Rijswijk [pl]	G
Pieterzijl Oost	NAM	Groningen [pl], Tietjerksteradeel III [pl]	G
Reedijk	NAM	Botlek IV [pl]	G

Accumulation	Company	Licence name [Type]*	Gas/Oil
Rustenburg	NAM	Middelie [pl]	G
Saaksum	NAM	Groningen [pl]	G
Schermer	TAQA Offshore	Bergen II [pl]	G
Schoonebeek Gas	NAM	Schoonebeek [pl]	G
Sonnega-Weststellingwerf	Vermilion	Steenwijk [pl]	G
Spijkenisse-Intra	NAM	Botlek IV [pl]	G
Spijkenisse-Oost	NAM	Botlek IV [pl]	G
Spijkenisse-West	NAM	Beijerland [pl], Botlek IV [pl]	G
Sprang	Vermilion	Waalwijk [pl]	G
Surhuisterveen	NAM	Groningen [pl], Tietjerksteradeel III [pl]	G
Tietjerksteradeel	Vermilion	Tietjerksteradeel II [pl]	G
Vinkega	Vermilion	Drenthe IIa [pl], Drenthe IIIa [pl], Gorredijk [pl]	G
Vries	NAM	Drenthe IIb [pl]	G
Waalwijk-Noord	Vermilion	Waalwijk [pl]	G
Wanneperveen	NAM	Schoonebeek [pl]	G
Warffum	NAM	Groningen [pl]	G
Warga-Wartena	Vermilion	Leeuwarden [pl], Tietjerksteradeel II [pl]	G
Westbeemster	NAM	Bergen II [pl], Middelie [pl]	G
Weststellingwerf	Vermilion	Gorredijk [pl]	G
Wieringa	NAM	Groningen [pl], Noord-Friesland [pl], Tietjerksteradeel III [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-B	Wintershall	D12a [pl], D12b [pl]	G
D12-D	Wintershall	D12a [pl]	G
E17a-A	Neptune	E16a [pl], E17a & E17b [pl]	G
F02a Hanze Pliocene	Dana Petroleum	F02a [pl]	G
F03-FB	Neptune	F02a [pl], F03b [pl], F06a [pl]	G&O
F15a-A	TotalEnergies	F15a [pl]	G
F15a-B	TotalEnergies	F15a [pl]	G
G14-A&B	Neptune	G14a & G17b [pl], G17a [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]	G
G17cd-A	Neptune	G17c & G17d [pl]	G

Accumulation	Company	Licence name [Type]*	Gas/Oil
J03-C Unit	TotalEnergies	J03a [pl], J03b & J06a [pl]	G
K01-A Unit	TotalEnergies	J03a [pl], K01a [pl], K04a [pl]	G
K02b-A	Neptune	K02b [pl], K03a [pl], K03c [pl]	G
K04-A	TotalEnergies	K04a [pl], K04b & K05a [pl], K05b [pl]	G
K04a-B	TotalEnergies	K04a [pl]	G
K04a-D	TotalEnergies	J03b & J06a [pl], K04a [pl]	G
K04a-Z	TotalEnergies	K04a [pl]	G
K04-E	TotalEnergies	K04a [pl], K04b & K05a [pl]	G
K04-N	TotalEnergies	K04a [pl], K04b & K05a [pl]	G
K05a-A	TotalEnergies	K04a [pl], K04b & K05a [pl], K08 & K11a [pl]	G
K05a-B	TotalEnergies	K04b & K05a [pl], K05b [pl]	G
K05a-D	TotalEnergies	K04b & K05a [pl]	G
K05a-En	TotalEnergies	K04b & K05a [pl], K05b [pl]	G
K05-C North	TotalEnergies	K05b [pl]	G
K05-C Unit	TotalEnergies	K04b & K05a [pl], K05b [pl]	G
K05-U	TotalEnergies	K02c [pl], K05b [pl]	G
K06-A	TotalEnergies	K03b [pl], K06a, K06b, L07a, L07b & L07c [pl]	G
K06-C	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
K06-D	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl], K09c & K09d [pl]	G
K06-DN	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
K06-G	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
K07-FA	NAM	K07 [pl]	G
K07-FB	NAM	J09 [el], K07 [pl]	G
K07-FC	NAM	K07 [pl], K08 & K11a [pl]	G
K07-FE	NAM	K07 [pl]	G
K08-FA	NAM	K08 & K11a [pl]	G
K08-FC	NAM	K08 & K11a [pl]	G
K09ab-B	Neptune	K09a & K09b [pl]	G
K12-B	Neptune	K12a [pl], K15 [pl]	G
K12-B9	Neptune	K12a [pl], K15 [pl]	G
K12-D	Neptune	K12a [pl]	G
K12-G	Neptune	K12a [pl], L10 & L11a [pl]	G
K12-S3	Neptune	K12a [pl]	G
K14-FA	NAM	K14a [pl]	G
K14-FB	NAM	K14a [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

Accumulation	Company	Licence name [Type]*	Gas/Oil
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-FK	NAM	K15 [pl]	G
K15-FL	NAM	K12a [pl], K15 [pl]	G
K15-FM	NAM	K15 [pl]	G
K15-FN	NAM	K15 [pl]	G
K17-FA	NAM	K17a [pl]	G
K18-Golf	Wintershall	K15 [pl], K18b [pl]	G
L01-A	TotalEnergies	L01a [pl], L01d [pl], L04a & L04b [pl]	G
L02-FA	NAM	L02 [pl]	G
L02-FB	NAM	F17c [pl], L02 [pl]	G
L04-A	TotalEnergies	L04a & L04b [pl]	G
L04-F	TotalEnergies	L01e [pl], L04a & L04b [pl]	G
L04-G	TotalEnergies	L01f [pl], L04a & L04b [pl]	G
L04-I	TotalEnergies	L04a & L04b [pl]	G
L05a-A	Neptune	L02 [pl], L04c [pl], L05a [pl]	G
L05a-D	Neptune	L02 [pl], L05a [pl]	G
L05-C	Wintershall	L05b [pl], L06b [pl]	G
L06-B	Wintershall	L06a [pl]	G
L08-A-West	Wintershall	L08b, L08d & L08e [pl]	G
L08-D	ONE-Dyas	L08a & L08c [pl], L08b, L08d & L08e [pl], L11b [pl]	G
L08-P	Wintershall	L05c [pl], L08b, L08d & L08e [pl]	G
L09-FA	NAM	L09 [pl]	G
L09-FB	NAM	L09 [pl]	G
L09-FD	NAM	L09 [pl]	G
L09-FF	NAM	L09 [pl]	G
L09-FG	NAM	L09 [pl]	G
L09-FH	NAM	L09 [pl]	G
L09-FI	NAM	L09 [pl]	G
L09-FJ	NAM	L09 [pl]	G
L09-FK	NAM	L09 [pl]	G
L09-FL	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	L10 & L11a [pl]	G
L10-P	Neptune	L10 & L11a [pl]	G

Accumulation	Company	Licence name [Type]*	Gas/Oil
L11b-A	ONE-Dyas	L11b [pl]	G
L11-Gillian	ONE-Dyas	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-FG	NAM	L13 [pl]	G
L13-FI	NAM	L13 [pl]	G
L15b-A	Neptune	L12b & L15b [pl]	G
M07-A	ONE-Dyas	M07a [pl]	G
M07-B	ONE-Dyas	M07a [pl]	G
P10a De Ruyter Western Extension	Dana Petroleum	P10a [pl]	G
P11b Van Ghent East	Dana Petroleum	P11b [pl]	G
P11b Witte de With	Dana Petroleum	P11b [pl]	G
P15-11	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
P18-2	TAQA Offshore	P18a [pl], P18c [pl]	G
P18-4	TAQA Offshore	P18a [pl]	G
P18-6	TAQA Offshore	P15c, P15g, P15h, P15i & P15j [pl], P18a [pl]	G
Q01-B	Wintershall	Q01c-diep [pl], Q04a [pl]	G
Q01-D	Wintershall	Q01c-diep [pl]	G
Q10-A	Kistos NL2	Q07 & Q10a [pl]	G
Q16-FA	ONE-Dyas	Q16a [pl]	G

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

b. Natural gas underground storage

Accumulation	Company	Licence name [Type]*	Gas/Oil
Aardgasbuffer Zuidwending	EnergyStock	Zuidwending [sl]	G
Alkmaar	TAQA Piek Gas	Alkmaar [sl]	G
Bergermeer	TAQA Onshore	Bergermeer [sl]	G
Grijpskerk	NAM	Grijpskerk [sl]	G
Norg	NAM	Norg [sl]	G

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

Undeveloped accumulations

a. Production expected within 5 years

Accumulation	Company	Licence name [Type]*	Gas/Oil
Assen-Zuid	NAM	Drenthe IIb [pl]	G
Blesdijke-East	Vermilion	Gorredijk [pl], Steenwijk [pl]	G
Marumerlage	NAM	Groningen [pl]	G
Oppenhuizen	Vermilion	Zuid-Friesland III [pl]	G
Papekop	Vermilion	Papekop [pl]	G&O
Rodewolt	NAM	Groningen [pl]	G
Ternaard	NAM	Noord-Friesland [pl]	G
Usquert	NAM	Groningen [pl]	G
A15-A	Petrogas	A12a [pl], A12d [pl], A15a [pl]	G
B10-FA	Petrogas	A12b & B10a [pl]	G
B16-FA	Petrogas	B10c & B13a [pl], B16a [pl]	G
D15 Tourmaline	Neptune	D15a [pl]	G
F16-P	Wintershall	F16a & F16b [pl]	G
K09c-B	Neptune	K09c & K09d [pl]	G
K18-FB	Wintershall	K18b [pl]	G
L07-F	Neptune	L07e & L08f [el]	G
L10-19	Neptune	L10 & L11a [pl]	G
L11-7	Neptune	L10 & L11a [pl]	G
L11-Clover	ONE-Dyas	L11d [pl]	G
L12a-A	Neptune	L12a [pl], L12b & L15b [pl]	G
L16-Alpha	Wintershall	L16a [pl]	G
M09-FA	NAM	M09a [pl], Noord-Friesland [pl]	G
M10-FA	Kistos NL1	M10a, M10b & M11 [el]	G
M11-FA	Kistos NL1	M10a, M10b & M11 [el], Noord-Friesland [pl]	G
N04-A	ONE-Dyas	N04, N05 & N08 [pl]	G
N04-C	ONE-Dyas	N04, N05 & N08 [pl]	G
N05-A	ONE-Dyas	N04, N05 & N08 [pl]	G
N07-B	ONE-Dyas	N04, N05 & N08 [pl], N07c [pl]	G
P10b Van Brakel	Dana Petroleum	P10b [pl]	G
Q07-C	Kistos NL2	Q07 & Q10a [pl]	G
Q10-Beta	Kistos NL2	Q08, Q10b & Q11 [el]	G
Q11-Beta	Kistos NL2	Q07 & Q10a [pl], Q08, Q10b & Q11 [el]	G

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

b. Production not expected within the next 5 years

Accumulation	Company	Licence name [Type]*	Gas/Oil
Allardsoog	NAM	Drenthe IIb [pl], Groningen [pl], Oosterwolde [el]	G
Beerta	NAM	Groningen [pl]	G
Boskoop	-	Open	G
Buma	NAM	Drenthe IIb [pl]	G
Burum	NAM	Tietjerksteradeel III [pl]	G
Deurningen	NAM	Twenthe [pl]	G
Egmond-Binnen	NAM	Middelie [pl]	G
Exloo	NAM	Drenthe IIb [pl]	G
Ezumazijl-South	NAM	Noord-Friesland [pl]	G
Haakswold	NAM	Schoonebeek [pl]	G
Heiloo	TAQA Offshore	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 Maasmond [pl], Q16c-diep [pl]	G
Marknesse	Vermilion	Marknesse [pl]	G
Midlaren	NAM	Drenthe IIb [pl], Groningen [pl]	G&O
Molenaarsgraaf	-	Andel Vb [pl]	G
Nes-Noord	NAM	Noord-Friesland [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	-	Open	G
Terschelling-West	-	Open	G
Valthermond	NAM	Drenthe IIb [pl]	G
Vlagtwedde	NAM	Groningen [pl]	G
Wassenaar-Diep	NAM	Rijswijk [pl]	G
Werkendam-Diep	-	Open	G
Witten	NAM	Drenthe IIb [pl]	G
Woudsend	Vermilion	Zuid-Friesland III [pl]	G
Zevenhuizen-West	NAM	Groningen [pl]	G
Zuidwijk	TAQA Offshore	Bergen II [pl], Middelie [pl]	G
B17-A	-	B16b, B17, E03a, E06a, F01 & F02b [el]	G
D12 Ilmenite	Wintershall	D12a [pl]	G

Accumulation	Company	Licence name [Type]*	Gas/Oil
E11-Vincent	-	Open	G
E12 Lelie	-	Open	G
E12 Tulp East	-	Open	G
E13 Epidoot	-	Open	G
E17-3	Neptune	E17a & E17b [pl], K02b [pl]	G
F03c Anteater	Dana Petroleum	F03a [el], F03c [pl]	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]	G
K08-FF	NAM	K08 & K11a [pl]	G
K14-FC	NAM	K14a [pl]	G
K15-FF	NAM	K15 [pl]	G
K16-5	-	Open	G
K17-FB	NAM	K17a [pl]	G
K17-Zechstein	NAM	K17a [pl]	G
K6-GT4	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
L02-FC	NAM	L01c [pl], L02 [pl]	G
L05b-A	Wintershall	L05b [pl]	G
L07-D	-	Open	G
L08-I	-	Open	G
L10-11	Neptune	L10 & L11a [pl]	G
L10-21	Neptune	L10 & L11a [pl]	G
L10-6	Neptune	L10 & L11a [pl]	G
L11-1	Neptune	L10 & L11a [pl]	G
L11-Elliot	ONE-Dyas	L11d [pl]	G
L11a-B	Neptune	L10 & L11a [pl]	G
L12-FD	-	L09 [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-Bravo	Wintershall	L16a [pl]	G
L16-FA	Wintershall	K18b [pl], L16a [pl]	G
M01-A	-	M01a & M01c [pl]	G
M09-FB	NAM	M09a [pl], N07a [pl], Noord-Friesland [pl]	G
N04-B	ONE-Dyas	N04, N05 & N08 [pl], N07c [pl]	G
P01-FA	-	Open	G
P01-FB	-	Open	G

Accumulation	Company	Licence name [Type]*	Gas/Oil
P02-Delta	-	Open	G
P02-E	-	Open	G
P06-Northwest	Wintershall	P06a [pl]	G
P12-F (P12-14)	Wintershall	Open	G
P15-S	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
P18-7	ONE-Dyas	P18b [pl], P18c [pl], Q16a [pl], Q16c-diep [pl]	G
Q02-A	-	Open	G
Q13-FC	-	Q13b & Q14 [el]	G
Q14-A	-	Q08, Q10b & Q11 [el], Q13b & Q14 [el]	G

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

** T = production temporary ceased, U = production ceased, A = abandoned.

Production (temporarily) 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
Ameland-Noord	T	NAM	M09a [pl], Noord-Friesland [pl]	G
Andel-6 (Wijk & Aalburg)	T	Vermilion	Andel Va [pl]	G
Annerveen	U	NAM	Drenthe IIb [pl], Groningen [pl]	G&O
Appelscha	U	NAM	Drenthe IIb [pl]	G
Barendrecht	T	NAM	Rijswijk [pl]	G&O
Barendrecht-Ziedewij	U	NAM	Rijswijk [pl]	G
Boekel	U	TAQA Offshore	Bergen II [pl]	G
Boerakker	U	NAM	Groningen [pl]	G
Bozum	U	Vermilion	Oosterend [pl]	G
Burum-Oost	U	NAM	Tietjerksteradeel III [pl]	G
Castricum-Zee	A	Wintershall	Middelie [pl]	G
Collendoornerveen	U	NAM	Schoonebeek [pl]	G
Dalen	T	NAM	Drenthe IIb [pl], Drenthe V [pl], Schoonebeek [pl]	G
De Hoeve	T	Vermilion	Gorredijk [pl]	G
De Klem	U	NAM	Beijerland [pl]	G
De Lutte	U	NAM	Rossum-De Lutte [pl], Twenthe [pl]	G
Donkerbroek-Main	A	Kistos NL1	Donkerbroek [pl], Donkerbroek-West [pl]	G
Donkerbroek-West	A	Kistos NL1	Donkerbroek [pl], Donkerbroek-West [pl]	G
Een	T	NAM	Drenthe IIb [pl], Groningen [pl]	G
Eernewoude	T	Vermilion	Leeuwarden [pl]	G
Emmen	A	NAM	Drenthe IIb [pl]	G

Accumulation	Status**	Company	Licence name [Type]*	Gas/Oil
Emmen-Nieuw Amsterdam	T	NAM	Drenthe IIb [pl], Schoonebeek [pl]	G
Emshoern	A	NAM	Groningen [pl]	G
Engwierum	U	NAM	Noord-Friesland [pl]	G
Franeker	U	Vermilion	Leeuwarden [pl]	G
Gasselternijveen	U	NAM	Drenthe IIb [pl]	G
Geestvaartpolder	U	NAM	Rijswijk [pl]	G
Groet Oost	U	TAQA Offshore	Middelie [pl]	G
Grouw-Rauwerd	T	Vermilion	Leeuwarden [pl], Oosterend [pl]	G
Harlingen Lower Cretaceous	U	Vermilion	Leeuwarden [pl]	G
Harlingen Upper Cretaceous	U	Vermilion	Leeuwarden [pl]	G
Hemrik (Akkrum 11)	A	Kistos NL1	Akkrum 11 [pl]	G
Hoogenweg	A	NAM	Hardenberg [pl]	G
Houwerzijl	U	NAM	Groningen [pl]	G
Kiel-Windeweer	U	NAM	Drenthe IIb [pl], Groningen [pl]	G
Kollumerland	U	NAM	Tietjerksteradeel III [pl]	G
Leeuwarden 101 Rotliegend	A	Vermilion	Leeuwarden [pl]	G
Leidschendam	A	NAM	Rijswijk [pl]	G
Metslawier	T	NAM	Noord-Friesland [pl]	G
Metslawier-Zuid	T	NAM	Noord-Friesland [pl]	G
Middenmeer	U	Vermilion	Slootdorp [pl]	G
Nijensleek	U	Vermilion	Drenthe IIa [pl], Steenwijk [pl]	G
Noorderdam	U	NAM	Rijswijk [pl]	G
Norg-Zuid	U	NAM	Drenthe IIb [pl]	G
Oldelamer	U	Vermilion	Gorredijk [pl], Lemsterland [el]	G
Oldenzaal	U	NAM	Rossum-De Lutte [pl], Twenthe [pl]	G
Oosterhesselen	T	NAM	Drenthe IIb [pl]	G
Oud-Beijerland Zuid	T	NAM	Beijerland [pl], Botlek IV [pl]	G
Oudendijk	T	NAM	Beijerland [pl]	G
Pasop	U	NAM	Drenthe IIb [pl], Groningen [pl]	G
Ried	U	Vermilion	Leeuwarden [pl]	G
Roden	U	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
Sebaldeburen	T	NAM	Groningen [pl]	G
Sleen	A	NAM	Drenthe IIb [pl]	G
Slootdorp	U	Vermilion	Slootdorp [pl]	G
Starnmeer	U	TAQA Offshore	Bergen II [pl]	G

Accumulation	Status**	Company	Licence name [Type]*	Gas/Oil
Suawoude	U	Vermilion	Leeuwarden [pl], Tietjerksteradeel II [pl]	G
Tubbergen	U	NAM	Tubbergen [pl]	G
Tubbergen-Mander	U	NAM	Tubbergen [pl]	G
Ureterp	U	NAM	Groningen [pl], Tietjerksteradeel II [pl], Tietjerksteradeel III [pl]	G
Vierhuizen	T	NAM	De Marne [pl], Groningen [pl], Noord-Friesland [pl]	G
Wimmenum-Egmond	A	NAM	Middelie [pl]	G
Witterdiep	U	NAM	Drenthe IIb [pl]	G
Zevenhuizen	U	NAM	Groningen [pl]	G
Zuid-Schermer	U	TAQA Offshore	Bergen II [pl]	G
Zuidwal	U	Vermilion	Zuidwal [pl]	G
D12-A	U	Wintershall	D12a [pl], D15a [pl]	G
D12-C	U	Wintershall	D12a [pl]	G
D15a-A	T	Neptune	D12a [pl], D15a [pl]	G
D15a-A104	U	Neptune	D15a [pl]	G
D18a-A	A	Neptune	D18a [pl]	G
E18-A	A	Wintershall	Open	G
F03-FA	A	Spirit	F03a [el]	G
F16-E	A	Wintershall	E18a [pl], F16a & F16b [pl]	G
G14-C	A	Neptune	G14a & G17b [pl]	G
Halfweg	A	Petrogas	Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep [pl], Q02c [pl]	G
K05a-Es	U	TotalEnergies	K04b & K05a [pl]	G
K05-F	U	TotalEnergies	K04b & K05a [pl], K06a, K06b, L07a, L07b & L07c [pl]	G
K05-G	U	TotalEnergies	K04b & K05a [pl]	G
K06-N	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
K06-T	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
K07-FD	T	NAM	K07 [pl]	G
K09ab-A	U	Neptune	K09a & K09b [pl], K09c & K09d [pl], L07d [pl], L10 & L11a [pl]	G
K09ab-C	T	Neptune	K09a & K09b [pl], K09c & K09d [pl]	G
K09ab-D	T	Neptune	K09a & K09b [pl]	G
K09c-A	A	Neptune	K06a, K06b, L07a, L07b & L07c [pl], K09c & K09d [pl]	G
K09c-C	A	Neptune	K09c & K09d [pl]	G
K10-B (gas)	A	Wintershall	Open	G
K10-C	A	Wintershall	Open	G
K10-V	A	Wintershall	K07 [pl]	G
K11-FA	A	NAM	Open	G
K11-FB	A	GDF Production	Open	G
K11-FC	A	GDF Production	Open	G

Accumulation	Status**	Company	Licence name [Type]*	Gas/Oil
K12-A	A	GDF Production	K12a [pl]	G
K12-C	U	Neptune	K12a [pl]	G
K12-E	A	GDF Production	K09a & K09b [pl], K12a [pl], L10 & L11a [pl]	G
K12-H (K12-S2 & K12-D5)	T	Neptune	K12a [pl]	G
K12-K	U	Neptune	K12a [pl]	G
K12-L	U	Neptune	K09c & K09d [pl], K12a [pl]	G
K12-M	U	Neptune	K12a [pl]	G
K12-S1	A	GDF Production	K12a [pl]	G
K13-A	A	Wintershall	Open	G
K13-B	A	Wintershall	Open	G
K13-CF	A	Wintershall	Open	G
K13-DE	A	Wintershall	Open	G
K15-FJ	T	NAM	K15 [pl]	G
K15-FO	T	NAM	K15 [pl]	G
K15-FP	U	NAM	K15 [pl]	G
K15-FQ	T	NAM	K15 [pl], L13 [pl]	G
L04-B	A	Total	K06a, K06b, L07a, L07b & L07c [pl], L04a & L04b [pl]	G
L04-D	U	TotalEnergies	L04a & L04b [pl]	G
L05-B	U	Wintershall	L05b [pl]	G
L06d-S1	A	ONE	Open	G
L07-A	A	Total	K06a, K06b, L07a, L07b & L07c [pl]	G
L07-B	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
L07-C	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
L07-G	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
L07-H	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
L07-H South-East	U	TotalEnergies	K06a, K06b, L07a, L07b & L07c [pl]	G
L07-N	A	Total	K06a, K06b, L07a, L07b & L07c [pl]	G
L08-A	A	Wintershall	L08a & L08c [pl], L08b, L08d & L08e [pl]	G
L08-G	A	Wintershall	L08a & L08c [pl]	G
L08-H	A	Wintershall	L08a & L08c [pl]	G
L09-FC	U	NAM	L09 [pl]	G
L09-FE	T	NAM	L09 [pl]	G
L09-FM	T	NAM	L09 [pl]	G
L10-G	A	Neptune	L10 & L11a [pl]	G
L10-K	A	GDF Production	L07e & L08f [el], L10 & L11a [pl]	G
L10-Q	T	Neptune	L10 & L11a [pl]	G
L10-S1	A	PLACID	L10 & L11a [pl]	G
L10-S2	U	Neptune	L10 & L11a [pl]	G
L10-S3	A	GDF Production	L10 & L11a [pl]	G

Accumulation	Status**	Company	Licence name [Type]*	Gas/Oil
L10-S4	U	Neptune	L10 & L11a [pl]	G
L11a-A	A	GDF Production	L10 & L11a [pl]	G
L11-Lark	A	GDF Production	L10 & L11a [pl]	G
L13-FB	T	NAM	L13 [pl]	G
L13-FH	A	NAM	L13 [pl]	G
L14-FA	A	Transcanada Int.	Open	G
Markham	U	Spirit	J03a [pl], J03b & J06a [pl]	G
P02-NE	A	Wintershall	Open	G
P02-SE	A	Wintershall	Open	G
P06-D	A	Wintershall	P06a [pl]	G
P06-Main	A	Wintershall	P06a [pl]	G
P06-South	A	Wintershall	Open	G
P09-A	A	Wintershall	Open	G
P09-B	A	Wintershall	Open	G
P11-12	A	ONE-Dyas	Open	G
P11a-E	A	ONE-Dyas	Open	G
P11b Van Nes	U	Dana Petroleum	P11b [pl]	G
P12-C	A	Wintershall	P12b [el]	G
P12-SW	A	Wintershall	P12a [pl]	G
P14-A	A	Wintershall	Open	G
P15-09	U	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl], P15c, P15g, P15h, P15i & P15j [pl], P18a [pl]	G
P15-10	A	TAQA	P15c, P15g, P15h, P15i & P15j [pl]	G
P15-12	A	TAQA	Open	G
P15-13	U	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
P15-14	A	TAQA	Open	G
P15-15	U	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
P15-16	A	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
P15-17	U	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
P15-19	T	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl]	G
Q04-A	A	Wintershall	Open	G
Q04-B	A	Wintershall	Open	G
Q05-A	A	Wintershall	Open	G
Q08-A	A	Wintershall	Middelie [pl], Q08, Q10b & Q11 [el]	G
Q08-B	A	Wintershall	Q08, Q10b & Q11 [el]	G
Q16-Maas	U	ONE-Dyas	Botlek-Maas [pl], P18d [pl], Q16c-diep [pl], T01 [pl]	G
Q16-Maasmond	T	ONE-Dyas	Botlek Maasmond [pl], Q16c-diep [pl]	G

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

** T = production temporary ceased, U = production ceased, A = abandoned.

A.2. Oil accumulations

Developed accumulations

a. In production

Accumulation	Company	Licence name [Type]*	Gas/Oil
Rotterdam	NAM	Rijswijk [pl]	O
F02a Hanze	Dana Petroleum	F02a [pl]	O
P11b De Ruyter	Dana Petroleum	P10a [pl], P11b [pl]	O
P15 Rijn	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl], P15c, P15g, P15h, P15i & P15j [pl]	O
Q13a-Amstel	Neptune	Q13a [pl]	O

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

Undeveloped accumulations

a. Production start expected within 5 years

Accumulation	Company	Licence name [Type] *	Gas/Oil
F06-IJssel	ONE-Dyas	F06a [pl], F06b [pl], F06c & F06d [pl]	O
Orion	Kistos NL2	Q07 & Q10a [pl]	O
P15/P18 Waal	TAQA Offshore	P15a, P15b, P15d, P15e & P15f [pl], P15c, P15g, P15h, P15i & P15j [pl], P18a [pl]	O

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

b. Production not expected within the next 5 years

Accumulation	Company	Licence name [Type]*	Gas/Oil
Alblasserdam	-	Open	O
Denekamp	NAM	Tubbergen [pl]	O
Gieterveen	NAM	Drenthe IIb [pl], Groningen [pl]	O
Lekkerkerk/blg	-	Open	O
Noordwijk	NAM	Rijswijk [pl]	O
Ottoland	Vermilion	Andel Va [pl]	O
Stadskanaal	NAM	Groningen [pl]	O&G
Wassenaar-Zee	NAM	Q13b & Q14 [el], Rijswijk [pl]	O
Woubrugge	-	Open	O
Zweelo	NAM	Drenthe IIb [pl]	O
B18-FA	-	F03a [el]	O
F03-FC	-	F03a [el]	O
F03c Bokje	Dana Petroleum	F03c [pl]	O
F06b Snellius	ONE-Dyas	F06b [el]	O
F06b Zulu North	Dana Petroleum	F03c [pl], F06b [pl]	O
F14-FA	-	Open	O
F17-FA (Korvet)	-	Open	O
F17-FB (Brigantijn)	-	Open	O

Accumulation	Company	Licence name [Type]*	Gas/Oil
F17-NE (Rembrandt)	Wintershall	F17a-diep [pl], F17c [pl]	O
F17-SW (Vermeer)	Wintershall	F17a-diep [pl], F17c [pl], L02 [pl]	O
F18-FA (Fregat)	-	Open	O
K10-B (oil)	-	Open	O
L01-FB	-	Open	O
L05a-E	Neptune	L01c [pl], L02 [pl], L04c [pl], L05a [pl]	O
P08-A Horizon-West	-	P09a [pl]	O
P12-West (P12-3)	Wintershall	Open	O&G
Q01-Northwest	-	Open	O
Q13-FB	NAM	Q13b & Q14 [el], Rijswijk [pl]	O

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

Production (temporarily) ceased

Accumulation	Status**	Company	Licence name [Type]*	Gas/Oil
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	Open	O
Zoetermeer	A	NAM	Rijswijk [pl]	O
Schoonebeek Olie	T	NAM	Schoonebeek [pl]	O
Haven	A	Petrogas	Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep [pl]	O
Helder	A	Petrogas	Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep [pl]	O
Helm	U	Petrogas	Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep [pl]	O
Hoorn	A	Petrogas	Open	O
Horizon	A	Petrogas	P09a [pl], P09c [pl]	O
Kotter	A	Wintershall	K18b [pl]	O
Logger	A	Wintershall	L16a [pl]	O
P11b Van Ghent	U	Dana Petroleum	P11b [pl]	O

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

** T = production temporary ceased, U = production ceased, A = abandoned.

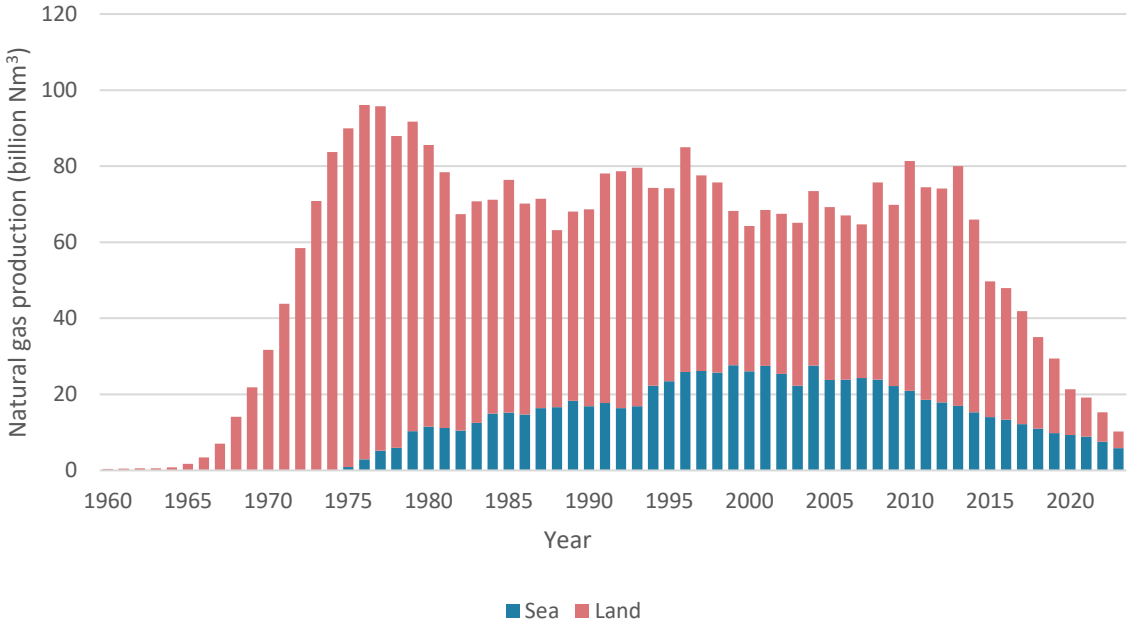
B. Production of natural gas in million Nm^3

Year	* Land	Sea	Total
1960	363.8	0.0	363.8
1961	451.0	0.0	451.0
1962	509.8	0.0	509.8
1963	571.3	0.0	571.3
1964	830.0	0.0	830.0
1965	1,722.6	0.0	1,722.6
1966	3,376.9	0.0	3,376.9
1967	7,033.3	0.0	7,033.3
1968	14,107.3	0.0	14,107.3
1969	21,884.4	0.0	21,884.4
1970	31,663.6	7.5	31,671.1
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	95,775.7
1978	81,935.1	5,967.8	87,902.9
1979	81,354.2	10,351.9	91,706.1
1980	74,103.0	11,466.6	85,569.6
1981	67,204.3	11,178.9	78,383.2
1982	56,853.8	10,492.0	67,345.8
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	63,182.4
1989	49,810.1	18,286.8	68,096.9
1990	51,719.3	16,918.6	68,637.9
1991	60,378.5	17,705.3	78,083.8
1992	62,252.6	16,371.9	78,624.5

Year	* Land	Sea	Total
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
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	40,463.3	24,283.3	64,746.6
2008	51,861.0	24,012.5	75,873.5
2009	47,719.2	22,202.5	69,921.7
2010	60,503.4	20,948.8	81,452.2
2011	55,763.9	18,709.6	74,473.5
2012	56,103.0	18,035.7	74,138.8
2013	62,911.2	17,159.3	80,070.5
2014	50,454.2	15,521.3	65,975.5
2015	35,422.3	14,435.5	49,857.8
2016	34,385.3	13,574.2	47,959.5
2017	29,551.7	12,295.3	41,847.0
2018	23,927.1	11,138.6	35,065.7
2019	19,595.0	9,844.0	29,439.1
2020	11,903.8	9,398.0	21,301.8
2021	10,231.3	8,904.0	19,135.3
2022	7,779.4	7,498.3	15,278.7
2023	4,322.1	5,895.1	10,217.2
Total	2,798,452.2	816,575.8	3,615,029.5

* Excluding the production of natural gas ('co-produced gas') produced within production licences for geothermal energy.

Production of natural gas 1960 – 2023



C. Natural gas reserves and cumulative production in billion Nm^3

Year	Land		Sea		Total	
as at 1 Jan.	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
1974	2,125	256	200	0	2,325	256
1975	2,125	339	200	0	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

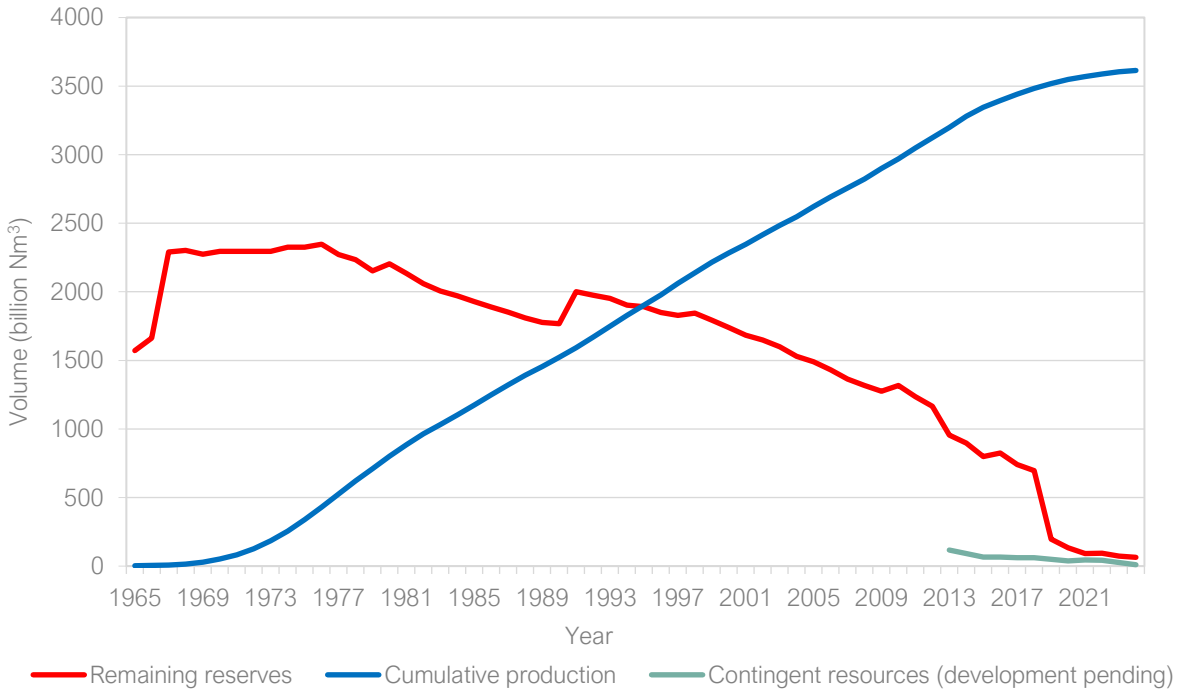
Year	Land		Sea		Total	
as at 1 Jan.	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
2006	1,218	2,152	213	539	1,431	2,691
2007	1,168	2,196	195	563	1,363	2,758
2008	1,129	2,236	188	587	1,317	2,823
2009	1,101	2,288	173	611	1,274	2,899
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	Land			Sea			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	695	62	3,484
2019	125	18	2,746	71	32	773	196	50	3,519
2020	66	21	2,766	66	19	783	133	39	3,549
2021	35	33	2,777	57	13	792	92	46	3,569
2022	38	19	2,787	54	24	801	93	43	3,588
2023	27	19	2,794	45	7	810	72	26	3,604
2024	24	8	2,798	40	2	816	64	10	3,614

Natural gas reserves and cumulative production (1 January 2023), 1965 – 2024



Historical production 2012 – 2022 and supply of natural gas (Base Scenario) from the small fields 2024 – 2048, in billion m^3 Geq.

Year	Past production	Expected supply from reserves onshore	Expected supply from reserves offshore	Expected supply from contingent resources onshore	Expected supply from contingent resources offshore	Expected supply from undiscovered accumulations onshore	Expected supply from undiscovered accumulations offshore
2012	29.3	-	-	-	-	-	-
2013	28.7	-	-	-	-	-	-
2014	26.4	-	-	-	-	-	-
2015	23.9	-	-	-	-	-	-
2016	22.6	-	-	-	-	-	-
2017	20.2	-	-	-	-	-	-
2018	17.9	-	-	-	-	-	-
2019	15.3	-	-	-	-	-	-
2020	14.9	-	-	-	-	-	-
2021	14.2	-	-	-	-	-	-
2022	12.0	-	-	-	-	-	-
2023	9.9	-	-	-	-	-	-
2024	-	2.8	6.4	0.0	0.0	0.0	0.0
2025	-	2.3	6.1	0.0	0.0	0.0	0.0
2026	-	1.9	5.1	0.0	0.1	0.1	0.2

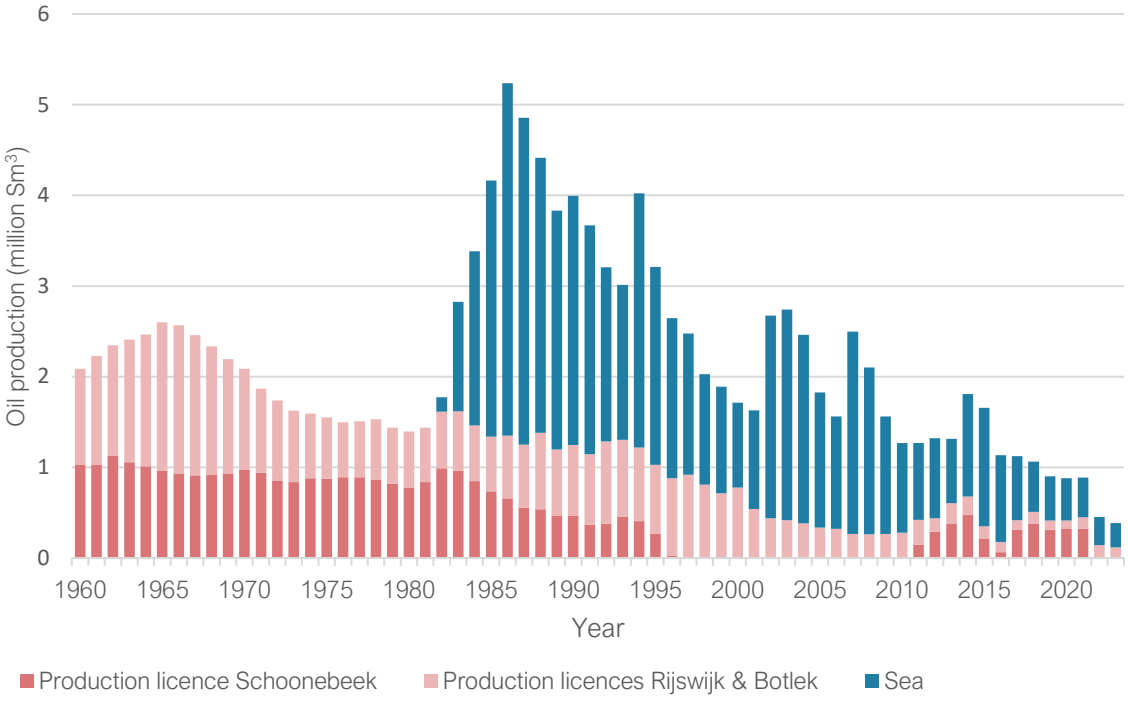
Year	Past production	Expected supply from reserves onshore	Expected supply from reserves offshore	Expected supply from contingent resources onshore	Expected supply from contingent resources offshore	Expected supply from undiscovered accumulations onshore	Expected supply from undiscovered accumulations offshore
2027	-	1.4	4.7	0.4	0.0	0.2	0.6
2028	-	1.1	4.5	0.7	0.0	0.2	0.8
2029	-	1.1	3.8	0.9	0.4	0.3	1.2
2030	-	0.8	3.1	0.8	0.5	0.2	1.4
2031	-	0.7	2.7	0.6	0.4	0.2	1.6
2032	-	0.6	2.2	0.4	0.2	0.2	1.5
2033	-	0.5	1.9	0.3	0.2	0.1	1.6
2034	-	0.5	1.6	0.3	0.1	0.1	1.5
2035	-	0.5	1.0	0.3	0.1	0.1	1.6
2036	-	0.0	0.4	0.3	0.1	0.1	1.5
2037	-	0.0	0.4	0.2	0.1	0.1	1.4
2038	-	0.0	0.3	0.0	0.1	0.1	1.3
2039	-	0.0	0.3	0.0	0.0	0.1	1.1
2040	-	0.0	0.3	0.0	0.0	0.1	1.0
2041	-	0.0	0.1	0.0	0.0	0.0	0.9
2042	-	0.0	0.1	0.0	0.0	0.0	0.7
2043	-	0.0	0.1	0.0	0.0	0.0	0.6
2044	-	0.0	0.1	0.0	0.0	0.0	0.6
2045	-	0.0	0.1	0.0	0.0	0.0	0.5
2046	-	0.0	0.0	0.0	0.0	0.0	0.4
2047	-	0.0	0.0	0.0	0.0	0.0	0.4
2048	-	0.0	0.0	0.0	0.0	0.0	0.3
Total	-	14.1	45.3	5.1	2.2	2.3	22.9

D. Oil production in million Sm^3

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Sea	Total
to 1959	11.749	0.000	0.000	11.749
1960	1.031	1.058	0.000	2.089
1961	1.030	1.197	0.000	2.227
1962	1.129	1.217	0.000	2.346
1963	1.057	1.350	0.000	2.407
1964	1.011	1.454	0.000	2.465
1965	0.963	1.638	0.000	2.601
1966	0.932	1.636	0.000	2.568
1967	0.913	1.545	0.000	2.458
1968	0.914	1.419	0.000	2.333
1969	0.933	1.262	0.000	2.195
1970	0.976	1.112	0.000	2.088
1971	0.941	0.927	0.000	1.868
1972	0.856	0.883	0.000	1.739
1973	0.838	0.787	0.000	1.626
1974	0.878	0.716	0.000	1.594
1975	0.877	0.672	0.000	1.549
1976	0.892	0.605	0.000	1.497
1977	0.891	0.618	0.000	1.509
1978	0.862	0.668	0.000	1.530
1979	0.820	0.616	0.000	1.436
1980	0.779	0.618	0.000	1.397
1981	0.839	0.597	0.000	1.436
1982	0.988	0.625	0.160	1.773
1983	0.960	0.656	1.209	2.825
1984	0.847	0.616	1.922	3.384
1985	0.735	0.603	2.825	4.163
1986	0.659	0.689	3.890	5.237
1987	0.556	0.693	3.608	4.857
1988	0.536	0.845	3.033	4.414
1989	0.464	0.732	2.635	3.830
1990	0.463	0.785	2.745	3.992
1991	0.366	0.777	2.528	3.671

Year	Schoonebeek production licence	Rijswijk & Botlek production licence	Sea	Total
1992	0.379	0.907	1.921	3.207
1993	0.454	0.849	1.710	3.013
1994	0.406	0.811	2.805	4.023
1995	0.268	0.761	2.182	3.211
1996	0.023	0.857	1.767	2.647
1997	0.000	0.918	1.557	2.474
1998	0.000	0.810	1.219	2.029
1999	0.000	0.715	1.173	1.888
2000	0.000	0.776	0.936	1.713
2001	0.000	0.542	1.085	1.628
2002	0.000	0.439	2.236	2.675
2003	0.000	0.416	2.325	2.741
2004	0.000	0.381	2.082	2.463
2005	0.000	0.335	1.490	1.825
2006	0.000	0.322	1.238	1.561
2007	0.000	0.264	2.233	2.497
2008	0.000	0.261	1.841	2.102
2009	0.000	0.264	1.296	1.560
2010	0.000	0.281	0.982	1.262
2011	0.144	0.277	0.848	1.270
2012	0.149	0.290	0.884	1.323
2013	0.374	0.230	0.710	1.314
2014	0.473	0.204	1.133	1.809
2015	0.214	0.135	1.307	1.656
2016	0.063	0.116	0.957	1.136
2017	0.310	0.109	0.705	1.124
2018	0.375	0.133	0.556	1.064
2019	0.311	0.102	0.487	0.901
2020	0.326	0.086	0.468	0.880
2021	0.322	0.127	0.437	0.885
2022	0.000	0.140	0.313	0.453
2023	0.000	0.117	0.268	0.385
Total	43.418	42.451	65.710	151.577

Oil production 1960 – 2023



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

Year	Land		Sea		Total	
as at 1 January	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
1970	36.0	35.4	-	0.0	36.0	35.4
1971	34.0	37.5	-	0.0	34.0	37.5
1972	32.0	39.4	-	0.0	32.0	39.4
1973	29.0	41.1	-	0.0	29.0	41.1
1974	27.0	42.8	-	0.0	27.0	42.8
1975	40.0	44.4	14.0	0.0	54.0	44.4
1976	51.0	45.9	14.0	0.0	65.0	45.9
1977	49.0	47.4	16.0	0.0	65.0	47.4
1978	46.0	48.9	7.0	0.0	53.0	48.9
1979	44.0	50.4	9.0	0.0	53.0	50.4
1980	43.0	51.9	11.0	0.0	54.0	51.9
1981	41.0	53.3	14.0	0.0	55.0	53.3
1982	39.0	54.7	20.0	0.0	59.0	54.7
1983	38.0	56.3	49.0	0.2	87.0	56.5
1984	37.0	57.9	41.0	1.4	78.0	59.3
1985	41.0	59.4	34.0	3.3	75.0	62.7
1986	42.0	60.7	36.0	6.1	78.0	66.8
1987	40.0	62.1	35.0	10.0	75.0	72.1
1988	41.0	63.3	33.0	13.6	74.0	76.9
1989	39.0	64.7	32.0	16.6	71.0	81.4
1990	41.0	65.9	27.0	19.3	68.0	85.2
1991	40.0	67.2	24.0	22.0	64.0	89.2
1992	38.0	68.3	26.0	24.6	64.0	92.9
1993	37.0	69.6	24.0	26.5	61.0	96.1
1994	35.0	70.9	23.0	28.2	58.0	99.1
1995	34.0	72.1	22.0	31.0	56.0	103.1
1996	33.0	73.1	17.0	33.2	50.0	106.3
1997	33.0	74.0	22.0	34.9	55.0	109.0
1998	12.0	74.9	25.0	36.5	37.0	111.4
1999	8.0	75.7	26.0	37.7	34.0	113.5

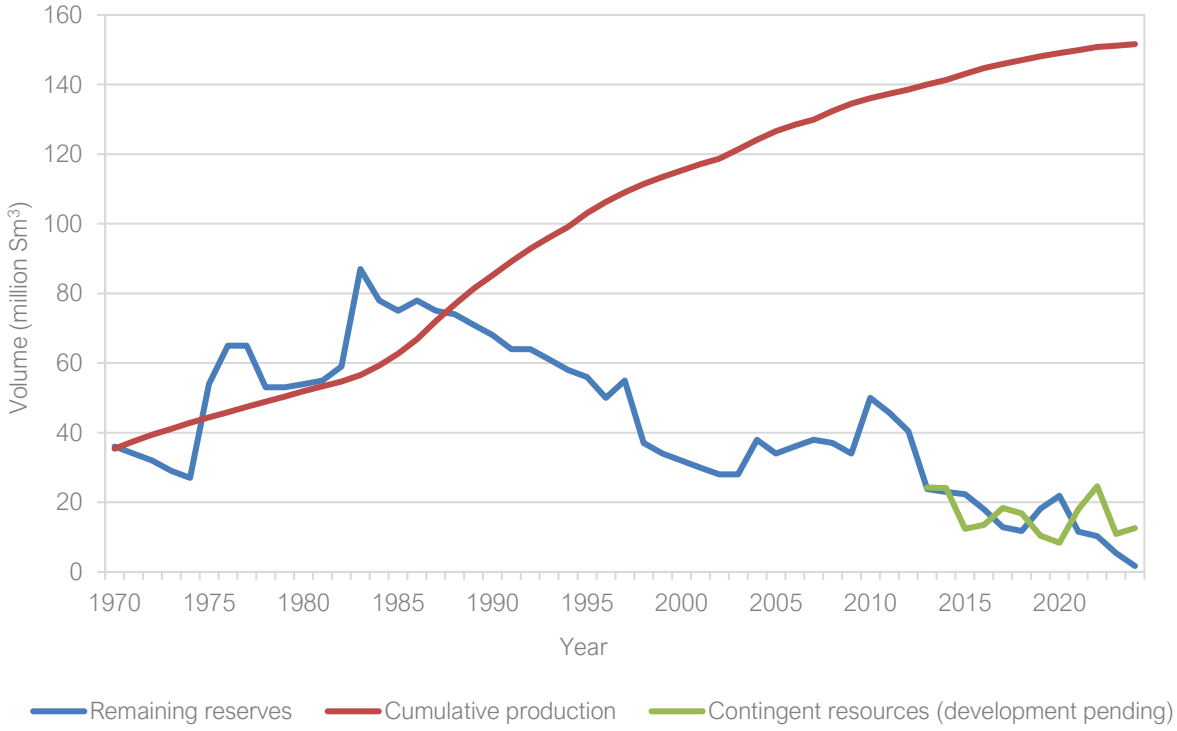
Year	Land		Sea		Total	
as at 1 January	Expected reserves	Cumulative production	Expected reserves	Cumulative production	Expected reserves	Cumulative production
2000	7.0	76.5	25.0	38.9	32.0	115.3
2001	6.0	77.2	24.0	39.8	30.0	117.1
2002	5.0	77.8	23.0	40.9	28.0	118.7
2003	5.0	78.2	23.0	43.1	28.0	121.4
2004	21.0	78.6	17.0	45.5	38.0	124.1
2005	19.0	79.0	15.0	47.6	34.0	126.6
2006	23.0	79.3	13.0	49.0	36.0	128.4
2007	24.0	79.7	14.0	50.3	38.0	129.9
2008	24.0	79.9	13.0	52.5	37.0	132.4
2009	25.0	80.2	9.0	54.4	34.0	134.5
2010	37.0	80.5	13.0	55.6	50.0	136.1
2011	33.7	80.7	12.0	56.6	45.7	137.4
2012	28.6	81.2	11.8	57.5	40.4	138.6

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

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

Year	Land			Sea			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
2020	8.3	6.7	84.7	13.6	1.7	64.2	21.9	8.4	149.0
2021	9.2	5.0	85.2	2.5	13.0	64.7	11.6	18.0	149.9
2022	8.4	3.9	85.6	1.9	20.7	65.1	10.3	24.6	150.8
2023	4.1	6.5	85.8	1.3	4.4	65.4	5.4	10.9	151.2
2024	0.8	7.6	85.9	0.9	5.0	65.7	1.7	12.6	151.6

Oil reserves and cumulative production in million Sm^3 (1 January 2023), 1970 – 2024



Past production and supply of oil from reserves from small fields until 2039, in million Sm^3.

Year	Past production	Expected supply from reserves	Expected supply from contingent resources
2011	1.3	-	-
2012	1.3	-	-
2013	1.3	-	-
2014	1.3	-	-
2015	1.8	-	-
2016	1.7	-	-
2017	1.1	-	-
2018	1.1	-	-
2019	1.1	-	-
2020	0.9	-	-
2021	0.9	-	-
2022	0.5	-	-
2023	0.4	-	-
2024	-	0.4	0.0
2025	-	0.4	0.2
2026	-	0.3	0.5
2027	-	0.1	1.0
2028	-	0.1	1.3

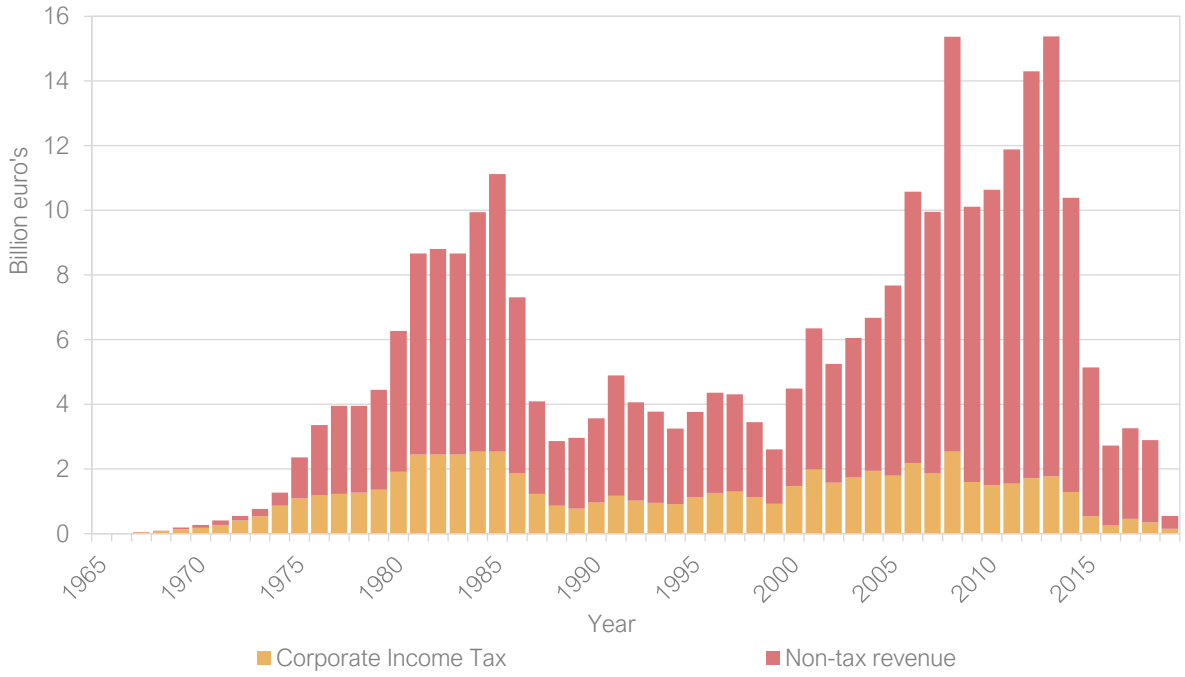
Year	Past production	Expected supply from reserves	Expected supply from contingent resources
2029	-	0.1	1.2
2030	-	0.1	1.0
2031	-	<0.1	1.0
2032	-	<0.1	1.0
2033	-	<0.1	0.9
2034	-	<0.1	0.8
2035	-	<0.1	0.7
2036	-	<0.1	0.7
2037	-	0.0	0.6
2038	-	0.0	0.6
2039	-	0.0	0.5
Total	-	1.7	11.8

F. Natural gas revenues

Year	Non-tax revenue (10^9 €)	Corporation tax (10^9 €)	Total (10^9 €)
1965	0.00	0.00	0.00
1966	0.00	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

Year	Non-tax revenue (10^9 €)	Corporation tax (10^9 €)	Total (10^9 €)
2005	5.88	1.80	7.68
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
2019	0.40	0.15	0.56

Natural gas revenues (in billion euros), 1965 – 2019



The revenues as presented above are directly provided by the Ministry of Climate Policy and Green Growth. The revenues presented here are based on a so-called transaction basis. This means they have been allocated to the year in which the production took place. By contrast, revenue recorded on a cash basis is recorded at the time the State receives the revenue, which is sometime later than the transaction-based revenue.

Non-taxable revenue consists of surface rights, royalties, the State profit shares, the special payments to the State on production from the Groningen field, the dividend payments from GasTerra and the dividend from EBN (the State participant in production).

From 2019 onwards, only an estimate is made of the non-taxable resources on a cash basis, which is why the historical data up to and including 2019 and the forecasts are shown separately. The table below shows the gas revenues for 2019 up to 2023 and an estimate for the years 2024 to 2029 in million euros. EBN's dividend in 2023 amounted to €2,159 million and Mining Act revenues in 2023 amounted to €2,429 million. The higher received dividend compared to 2022 is due to the high gas price in 2022 and consequently higher revenue in the following year 2023. GasTerra's dividend will go to zero from 2028 as GasTerra will be wound up.

Non-tax revenue (in million euros), 2019 – 2029 (based on estimates from February 2024)

Year	Dividend EBN	Dividend GasTerra	Mining Act	Total (10^6 €)
2019	141.8	3.6	432.4	557.8
2020	35.9	3.6	34.8	74.3
2021	2.8	3.6	25.8	32.2
2022	0	3.6	1,614.6	1,618.2
2023	2,159.0	3.6	2,429.0	4,591.6
Forecast				
2024	1,167	3.6	200	1,370.6
2025	572	3.6	40	615.6
2026	401	3.6	30	434.6
2027	255	3.6	30	288.6
2028	203	0	30	233.0
2029	142	0	30	172.0

Tax income estimates for the years 2024 to 2029 are based on price forecasts of the CPB (based on the gas trading hub prices as published by TTF). The current market conditions due to, among others, the situation in Ukraine, create high and volatile gas prices. The following gas prices in euro cents per cubic meter have been estimated:

Gas price forecasts in eurocent per cubic meter

Year	2024	2025	2026	2027	2028	2029
Gas price	31	33	30	27	27	27

G. Licences for hydrocarbons

As at 1 January 2024

G.1. Exploration licences for hydrocarbons, Land

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Vermilion Energy Netherlands B.V.	Akkrum*	210	14-03-2013		10 461
2	Vermilion Energy Netherlands B.V.	Engelen	97	14-10-2009	31-12-2025	16 878
3	Vermilion Energy Netherlands B.V.	Follega	3	15-06-2010	30-06-2025	9 426
4	Vermilion Energy Netherlands B.V.	Hemelum	450	17-01-2012	28-12-2028	1 490
5	Vermilion Energy Netherlands B.V.	IJsselmuiden	447	17-01-2014	16-01-2024	1 958
6	Vermilion Energy Netherlands B.V.	Lemsterland	111	15-06-2010	30-06-2025	9 427
7	Vermilion Energy Netherlands B.V.	Oosterwolde	127	20-04-2007	31-12-2025	83
8	Vermilion Energy Netherlands B.V.	Opmeer	229	19-12-2012	18-12-2024	205
9	Vermilion Energy Netherlands B.V.	Utrecht	1,144	26-04-2007	31-12-2025	85
		Total	2,818			

* Applied for production licence.

G.2. Production licences for hydrocarbons, Land

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Kistos NL1 B.V.	Akkrum 11	6	26-07-2012	04-04-2025	6 909
2	Kistos NL1 B.V.	Donkerbroek	22	04-04-1995	04-04-2025	66
3	Kistos NL1 B.V.	Donkerbroek-West	2	16-03-2011	04-04-2025	4 902
4	Nederlandse Aardolie Maatschappij B.V.	Beijerland	140	14-02-1997	14-02-2027	243
5	Nederlandse Aardolie Maatschappij B.V.	Botlek IV	219	23-12-2022	19-07-2026	35 375
6	Nederlandse Aardolie Maatschappij B.V. ExxonMobil Producing Netherlands B.V.	De Marne	7	04-10-1994	04-10-2034	189
7	Nederlandse Aardolie Maatschappij B.V.	Drenthe IIB	1,881	17-03-2012		6 883
8	Nederlandse Aardolie Maatschappij B.V.	Groningen	2,970	30-05-1963		126
9	Nederlandse Aardolie Maatschappij B.V.	Hardenberg	161	22-10-1990	22-10-2035	149
10	Nederlandse Aardolie Maatschappij B.V.	Middelie	946	12-05-1969		94
11	Nederlandse Aardolie Maatschappij B.V. ExxonMobil Producing Netherlands B.V.	Noord-Friesland	1,593	27-02-1969		47
12	Nederlandse Aardolie Maatschappij B.V.	Rijswijk	1,094	03-01-1955		21
13	Nederlandse Aardolie Maatschappij B.V.	Rossum-De Lutte	46	12-05-1961		116
14	Nederlandse Aardolie Maatschappij B.V.	Schoonebeek	930	03-05-1948		110
15	Nederlandse Aardolie Maatschappij B.V.	Tietjerksteradeel III	168	25-01-2018		5 149

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
16	Nederlandse Aardolie Maatschappij B.V.	Tubbergen	177	11-03-1953		80
17	Nederlandse Aardolie Maatschappij B.V.	Twenthe	276	01-04-1977		26
18	ONE-Dyas B.V. TAQA Offshore B.V.	Botlek-Maas	3	04-03-2014	19-07-2026	7 445
19	ONE-Dyas B.V.	Botlek Breeddiep	9	23-12-2022	19-07-2026	35 375
20	ONE-Dyas B.V.	Botlek Maasmond	3	10-07-2019	19-07-2026	39 438
21	TAQA Offshore B.V. Dana Petroleum Netherlands B.V. RockRose (NL) CS1 B.V.	Bergen II	221	23-12-2006		232
22	TAQA Onshore B.V.	Bergermeer	19	23-12-2006		232
23	TAQA Piek Gas B.V. Dana Petroleum Netherlands B.V. RockRose (NL) CS1 B.V.	Alkmaar	12	23-12-2006		232
24	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Andel VA	61	05-08-2015	29-12-2038	29 954
25	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Andel VB	142	05-08-2015	29-12-2038	29 954
26	Vermilion Energy Netherlands B.V.	Drenthe IIA	7	17-03-2012		6 883
27	Vermilion Energy Netherlands B.V.	Drenthe IIIA	1	17-03-2012		6 885
28	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe IV	7	18-07-2007		140
29	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe V	25	20-06-2015		18 037
30	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Drenthe VI	363	20-06-2015		18 037
31	Vermilion Energy Netherlands B.V.	Gorredijk	629	29-07-1989	31-12-2039	145
32	Vermilion Energy Netherlands B.V.	Leeuwarden	276	27-02-1969		46
33	Vermilion Energy Netherlands B.V.	Marknesse	19	26-01-2010	09-03-2030	1 446
34	Vermilion Energy Netherlands B.V.	Oosterend	69	05-09-1985		84
35	Vermilion Energy Netherlands B.V. Parkmead (E&P) Ltd.	Papekop	35	08-06-2006	19-07-2031	113
36	Vermilion Energy Netherlands B.V.	Slootdorp	99	01-05-1969		94
37	Vermilion Energy Netherlands B.V.	Steenwijk	99	16-09-1994	16-09-2029	177
38	Vermilion Energy Netherlands B.V.	Tietjerksteradeel II	251	25-01-2018		5 149
39	Vermilion Energy Netherlands B.V.	Waalwijk	101	17-08-1989	31-12-2035	154
40	Vermilion Energy Netherlands B.V.	Zuid-Friesland III	105	09-03-2010	19-04-2030	4 016
41	Vermilion Energy Netherlands B.V.	Zuidwal	6	07-11-1984		190
		Total	13,200			

G.3. Exploration licences for hydrocarbons, Sea

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Jetex Petroleum Ltd	P08b	105	07-10-2016	31-12-2024	52 818
2	Jetex Petroleum Ltd	P10c	175	21-7-2016	31-12-2024	38 277
3	Kistos NL1 B.V.	M10a, M10b & M11	76	28-7-2007	29-8-2028	152
4	Kistos NL2 B.V.	P12b	161	21-1-2023	03-03-2028	3 399
5	Kistos NL2 B.V.	Q08, Q10b & Q11*	758	29-9-2018		56 679
6	Kistos NL2 B.V.	Q13b & Q14	346	21-1-2023	03-03-2028	3 399
7	Nederlandse Aardolie Maatschappij B.V.	B16b, B17, E03a, E06a, F01 & F02b	1,344	23-7-2020	02-09-2027	40 590
8	Nederlandse Aardolie Maatschappij B.V. RockRose (NL) CS5 B.V.	F04a	178	24-2-2022	02-09-2026	6 678-n1
9	Nederlandse Aardolie Maatschappij B.V. ONE-Dyas B.V. RockRose (NL) CS5 B.V. Wintershall Noordzee B.V.	J09*	18	11-4-2014		10 508
10	Neptune Energy Netherlands B.V.	G13b	16	3-7-2019	22-08-2024	36 563n
11	Neptune Energy Netherlands B.V.	L03	406	13-5-2016	30-06-2024	24 426
12	Neptune Energy Netherlands B.V.	L07e & L08f	41	12-4-2022	23-05-2026	10 390
13	ONE-Dyas B.V.	F03a	62	19-12-2023	29-01-2028	35 208
14	ONE-Dyas B.V.	M02a	28	22-11-2011	29-08-2025	1 486
15	ONE-Dyas B.V. Hansa Hydrocarbons Limited	M03b & N01a	183	23-12-2022	31-12-2025	35 377
		Total	3,897			

* Applied for a production licence.

G.4. Production licences for hydrocarbons, Sea

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Dana Petroleum Netherlands B.V. ONE-Dyas B.V. RockRose (NL) CS1 B.V. TAQA Offshore B.V.	F02a	245	24-8-1982	31-12-2042	139
2	Dana Petroleum Netherlands B.V. Neptune Energy Netherlands B.V. TAQA Offshore B.V.	F03c	291	15-4-2020	08-03-2026	22 283-n1
3	Dana Petroleum Netherlands B.V.	P10a	5	31-5-2005	31-12-2027	102
4	Dana Petroleum Netherlands B.V.	P10b	100	07-04-2009	31-12-2027	70
5	Dana Petroleum Netherlands B.V.	P11b	210	03-04-2004	31-12-2027	67
6	Kistos NL2 B.V.	Q07 & Q10a	472	14-07-2017	24-08-2042	41 910
7	Nederlandse Aardolie Maatschappij B.V.	F17c	18	04-12-1996	31-12-2035	207

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
8	Nederlandse Aardolie Maatschappij B.V.	K07	408	08-07-1981	31-12-2030	120
9	Nederlandse Aardolie Maatschappij B.V. ONE-Dyas B.V. RockRose (NL) CS5 B.V. Wintershall Noordzee B.V.	K08 & K11a	435	26-10-1977	31-12-2030	197
10	Nederlandse Aardolie Maatschappij B.V.	K14a	125	16-01-1975	31-12-2030	6
11	Nederlandse Aardolie Maatschappij B.V.	K15	412	14-10-1977	31-12-2030	197
12	Nederlandse Aardolie Maatschappij B.V.	K17a	200	19-01-1989	19-01-2029	12
13	Nederlandse Aardolie Maatschappij B.V. Wintershall Noordzee B.V.	K18a	31	15-03-2007	08-05-2026	57
14	Nederlandse Aardolie Maatschappij B.V.	L02	406	15-03-1991	15-03-2031	55
15	Nederlandse Aardolie Maatschappij B.V.	L09	409	18-09-2010	09-05-2035	14 911
16	Nederlandse Aardolie Maatschappij B.V. ONE-Dyas B.V. RockRose (NL) CS5 B.V. Wintershall Noordzee B.V.	L13	413	26-10-1977	31-12-2030	197
17	Nederlandse Aardolie Maatschappij B.V. ExxonMobil Producing Netherlands B.V.	M09a	213	10-04-1990	10-04-2030	56
18	Nederlandse Aardolie Maatschappij B.V.	N07a	141	23-12-2003	10-03-2034	252
19	Neptune Energy Netherlands B.V. DNO North Sea (U.K.) limited Wintershall Noordzee B.V.	D15a	63	06-09-1996	05-09-2028	138
20	Neptune Energy Netherlands B.V. DNO North Sea (U.K.) limited Wintershall Noordzee B.V.	D18a	58	29-08-2012	09-10-2032	19 757
21	Neptune Energy Netherlands B.V. TotalEnergies EP Nederland B.V. Vermilion Energy Netherlands B.V.	E16a	29	29-06-2007	09-08-2032	128
22	Neptune Energy Netherlands B.V. TotalEnergies EP Nederland B.V. Vermilion Energy Netherlands B.V.	E17a & E17b	114	28-06-2007	08-08-2032	128
23	Neptune Energy Netherlands B.V. TAQA Offshore B.V.	F03b	44	15-04-2020	31-12-2047	22 283-n1
24	Neptune Energy Netherlands B.V. Nederlandse Aardolie Maatschappij B.V. TAQA Offshore B.V.	G14a & G17b	193	15-12-2006	31-12-2035	248
25	Neptune Energy Netherlands B.V.	G16a	133	06-01-1992	06-01-2032	245
26	Neptune Energy Netherlands B.V.	G17a	48	28-12-2020	14-12-2026	1 763

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
27	Neptune Energy Netherlands B.V.	G17c & G17d	130	10-11-2000	10-11-2025	188
	Wintershall Noordzee B.V.					
28	Neptune Energy Netherlands B.V.	K02b	110	20-01-2004	31-07-2039	16
29	Neptune Energy Netherlands B.V.	K03a	83	24-08-1998	31-07-2039	122
30	Neptune Energy Netherlands B.V.	K03c	32	26-11-2005	31-12-2025	233
31	Neptune Energy Netherlands B.V.	K09a & K09b	90	11-08-1986	11-08-2026	129
	ONE-Dyas B.V.					
	Tenaz Energy Netherlands Offshore S.A.R.L.					
	Tenaz Energy Netherlands Offshore II S.A.R.L.					
32	Neptune Energy Netherlands B.V.	K09c & K09d	147	18-12-1987	18-12-2027	229
	ONE-Dyas B.V.					
	Tenaz Energy Netherlands Offshore S.A.R.L.					
	Tenaz Energy Netherlands Offshore II S.A.R.L.					
33	Neptune Energy Netherlands B.V.	K12a	267	18-02-1983	31-12-2044	11
	ONE-Dyas B.V.					
	Production North Sea Netherlands Ltd.					
	Tenaz Energy Netherlands Offshore S.A.R.L.					
	Tenaz Energy Netherlands Offshore II S.A.R.L.					
34	Neptune Energy Netherlands B.V.	L01c	12	17-01-2020	14-03-2031	16 108
35	Neptune Energy Netherlands B.V.	L04c	12	07-01-1994	07-01-2034	2
36	Neptune Energy Netherlands B.V.	L05a	163	15-03-1991	15-03-2031	55
37	Neptune Energy Netherlands B.V.	L07d	6	17-02-2021	20-06-2033	8 975
38	Neptune Energy Netherlands B.V.	L10 & L11a	499	13-01-1971	01-01-2025	4
	Neptune Energy Participation Netherlands B.V.					
	ONE-Dyas B.V.					
	Tenaz Energy Netherlands Offshore S.A.R.L.					
	Tenaz Energy Netherlands Offshore II S.A.R.L.					
39	Neptune Energy Netherlands B.V.	L12a	119	25-09-2008	14-03-2030	189
	Mercuria Hydrocarbons B.V.					
	ONE-Dyas B.V.					
	Wintershall Noordzee B.V.					
40	Neptune Energy Netherlands B.V.	L12b & L15b	92	06-08-2008	12-03-2030	155
	Mercuria Hydrocarbons B.V.					
	Wintershall Noordzee B.V.					
41	Neptune Energy Netherlands B.V.	L15c	4	07-09-1990	07-09-2030	172
42	Neptune Energy Netherlands B.V.	N07b	87	14-02-2015	09-03-2034	5 845
	Tenaz Energy Netherlands Offshore S.A.R.L.					
	Tenaz Energy Netherlands Offshore II S.A.R.L.					

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
43	Neptune Energy Netherlands B.V.	Q13a	30	28-11-2006	31-12-2034	231
	Aceiro Energy B.V.					
	TAQA Offshore B.V.					
44	ONE-Dyas B.V.	F06a	8	09-09-1982	31-12-2042	139
	TAQA Offshore B.V.					
45	ONE-Dyas B.V.	F06b	260	14-11-2023	31-12-2043	31 772
	Dana Petroleum Netherlands B.V.					
46	ONE-Dyas B.V.	F06c & F6d	11	14-11-2023	31-12-2037	31 773
	Dana Petroleum Netherlands B.V.					
47	ONE-Dyas B.V.	L11b	47	15-06-1984	15-06-2024	110
48	ONE-Dyas B.V.	L11c	7	21-12-2018	24-08-2031	143
49	ONE-Dyas B.V.	L11d	172	21-12-2018	24-08-2031	143
	Neptune Energy Netherlands B.V.					
50	ONE-Dyas B.V.	M01a & M01c	54	28-06-2007	07-06-2025	128
51	ONE-Dyas B.V.	M07a	64	22-03-2001	31-12-2035	19
	TAQA Offshore B.V.					
52	ONE-Dyas B.V.	N04, N05 & N08	430	25-07-2019	04-09-2049	42 716
	Hansa Hydrocarbons Limited					
53	ONE-Dyas B.V.	N07c	87	14-02-2015	09-03-2034	5 845
	Hansa Hydrocarbons Limited					
54	ONE-Dyas B.V.	P18b	37	14-07-2017	24-08-2030	41 916
	TAQA Offshore B.V.					
55	ONE-Dyas B.V.	P18d	2	20-09-2012	31-10-2027	23 457
	TAQA Offshore B.V.					
56	ONE-Dyas B.V.	Q16a	28	29-12-1992	29-12-2032	227
	TotalEnergies EP Nederland B.V.					
57	ONE-Dyas B.V.	Q16c-diep	21	20-09-2012	31-10-2027	23 465
	TAQA Offshore B.V.					
58	ONE-Dyas B.V.	S03a	2	20-09-2012	31-10-2027	23 466
	TAQA Offshore B.V.					
59	ONE-Dyas B.V.	T01	1	20-09-2012	31-10-2027	23 467
	TAQA Offshore B.V.					
60	Petrogas E&P Netherlands B.V.	A12a	132	01-07-2005	31-12-2039	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
61	Petrogas E&P Netherlands B.V.	A12b & B10a	79	03-02-2022	16-03-2037	3 997
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
62	Petrogas E&P Netherlands B.V.	A12d	33	01-07-2005	31-12-2034	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
63	Petrogas E&P Netherlands B.V.	A15a	67	27-12-2011	31-12-2039	746
	RockRose (NL) CS1 B.V.					

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
64	Petrogas E&P Netherlands B.V.	A18a	110	01-07-2005	31-12-2039	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
65	Petrogas E&P Netherlands B.V.	A18c	47	01-07-2005	31-12-2034	125
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
66	Petrogas E&P Netherlands B.V.	B10c & B13a	252	01-07-2005	31-12-2039	129
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
67	Petrogas E&P Netherlands B.V.	B16a	67	04-07-2023	31-12-2039	19 400
	RockRose (NL) CS1 B.V.					
	TAQA Offshore B.V.					
68	Petrogas E&P Netherlands B.V.	P09a	17	16-08-1993	16-08-2033	127
	Aceiro Energy B.V.					
69	Petrogas E&P Netherlands B.V.	P09c	18	16-08-1993	16-08-2033	126
70	Petrogas E&P Netherlands B.V.	Q01a-ondiep, Q01b-ondiep, Q01d-ondiep & Q01e-ondiep	4	23-12-2017	31-12-2029	193
71	Petrogas E&P Netherlands B.V.	Q02c	32	14-07-1994	14-07-2034	18
	RockRose (NL) CS1 B.V.					
72	Spirit Energy Nederland B.V.	J03b & J06a	47	06-11-1992	06-11-2032	219
	RockRose (NL) CS1 B.V.					
	TotalEnergies EP Nederland B.V.					
73	TAQA Offshore B.V.	P15a, P15b, P15d, P15e & P15f	119	12-07-1984	12-07-2024	110
	Dana Petroleum Netherlands B.V.					
	ONE-Dyas B.V.					
	RockRose (NL) CS1 B.V.					
	Wintershall Noordzee B.V.					
74	TAQA Offshore B.V.	P15c, P15g, P15h, P15i & P15j	34	07-05-1992	07-05-2032	114
	Dana Petroleum Netherlands B.V.					
	ONE-Dyas B.V.					
	RockRose (NL) CS1 B.V.					
	Wintershall Noordzee B.V.					
75	TAQA Offshore B.V.	P18a	105	30-04-1992	30-04-2032	99
76	TAQA Offshore B.V.	P18c	6	02-06-1992	02-06-2032	99
	Dana Petroleum Netherlands B.V.					
	RockRose (NL) CS1 B.V.					
77	TotalEnergies EP Nederland B.V.	F15a	53	06-05-1991	06-05-2031	52
	RockRose (NL) CS1 B.V.					
	Vermilion Energy Netherlands B.V.					
78	TotalEnergies EP Nederland B.V.	J03a	30	12-01-1996	12-01-2036	22

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
	Nederlandse Aardolie Maatschappij B.V.					
79	TotalEnergies EP Nederland B.V.	K01a	40	10-02-1997	31-12-2034	46
	Nederlandse Aardolie Maatschappij B.V.					
80	TotalEnergies EP Nederland B.V.	K02c	42	21-01-2004	31-12-2036	16
81	TotalEnergies EP Nederland B.V.	K03b	7	30-01-2001	20-06-2033	19
	Vermilion Energy Netherlands B.V.					
82	TotalEnergies EP Nederland B.V.	K04a	209	29-12-1993	29-12-2033	220
83	TotalEnergies EP Nederland B.V.	K04b & K05a	229	01-06-1993	01-06-2033	87
	RockRose (NL) CS1 B.V.					
	Vermilion Energy Netherlands B.V.					
84	TotalEnergies EP Nederland B.V.	K05b	126	07-11-1996	31-12-2041	126
85	TotalEnergies EP Nederland B.V.	K06a, K06b, L07a, L07b & L07c	415	17-02-2021	20-06-2033	8 975
	Vermilion Energy Netherlands B.V.					
86	TotalEnergies EP Nederland B.V.	L01a	31	12-09-1996	31-12-2034	135
	SGPO Van Dyke B.V.					
87	TotalEnergies EP Nederland B.V.	L01d	7	13-11-1996	31-12-2028	207
88	TotalEnergies EP Nederland B.V.	L01e	12	13-11-1996	31-12-2027	207
	Vermilion Energy Netherlands B.V.					
89	TotalEnergies EP Nederland B.V.	L01f	17	14-01-2003	14-01-2033	235
	Vermilion Energy Netherlands B.V.					
90	TotalEnergies EP Nederland B.V.	L04a & L04b	141	30-12-1981	20-06-2033	230
	Vermilion Energy Netherlands B.V.					
91	Wintershall Noordzee B.V.	D12a	214	06-09-1996	31-12-2031	138
	Neptune Energy Participation Netherlands B.V.					
92	Wintershall Noordzee B.V.	D12b	41	03-06-2017	14-07-2037	32 476
	GAZPROM International UK Ltd.					
	Neptune Energy Netherlands B.V.					
	ONE-Dyas B.V.					
93	Wintershall Noordzee B.V.	E18a	1	04-10-2002	21-10-2032	175
	Dana Petroleum Netherlands B.V.					
	Neptune Energy Netherlands B.V.					
	RockRose (NL) CS5 B.V.					
94	Wintershall Noordzee B.V.	F16a & F16b	18	04-10-2002	21-10-2032	175
	Neptune Energy Netherlands B.V.					
95	Wintershall Noordzee B.V.	F17a-diep	386	14-05-2016	24-06-2033	43 400
	Neptune Energy Netherlands B.V.					
	TAQA Offshore B.V.					
	Tenaz Energy Netherlands Offshore S.A.R.L.					
96	Wintershall Noordzee B.V.	K18b	155	15-03-2007	31-12-2040	57
	Nederlandse Aardolie Maatschappij B.V.					

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
	RockRose (NL) CS1 B.V.					
97	Wintershall Noordzee B.V.	L05b	237	28-06-2003	09-08-2038	134
	Dana Petroleum Netherlands B.V.					
98	Wintershall Noordzee B.V.	L05c	8	03-12-1996	31-12-2028	209
	Dana Petroleum Netherlands B.V.					
99	Wintershall Noordzee B.V.	L06a	332	24-11-2010	04-01-2031	18 910
	Dana Petroleum Netherlands B.V.					
100	Wintershall Noordzee B.V.	L06b	60	01-07-2003	11-08-2038	134
	Dana Petroleum Netherlands B.V.					
101	Wintershall Noordzee B.V.	L08a & L08c	44	18-08-1988	18-08-2028	146
	ONE-Dyas B.V.					
102	Wintershall Noordzee B.V.	L08b, L08d & L08e	69	17-05-1993	17-05-2033	78
	Dana Petroleum Netherlands B.V.					
	ONE-Dyas B.V.					
103	Wintershall Noordzee B.V.	L16a	238	12-06-1984	11-06-2028	84
	Nederlandse Aardolie Maatschappij B.V.					
	RockRose (NL) CS1 B.V.					
104	Wintershall Noordzee B.V.	P06a	21	14-04-1982	31-12-2024	54
	RockRose (NL) CS1 B.V.					
105	Wintershall Noordzee B.V.	P12a	4	08-03-1990	08-03-2030	27
	RockRose (NL) CS1 B.V.					
	Vermilion Energy Netherlands B.V.					
106	Wintershall Noordzee B.V.	Q01c-diep	140	23-12-2017	31-12-2030	193
	TAQA Offshore B.V.					
107	Wintershall Noordzee B.V.	Q04a	9	02-12-1999	02-12-2030	228
	Mercuria Hydrocarbons B.V.					
	RockRose (NL) CS1 B.V.					
		Total	12,835			

H. Storage licences

As at 1 January 2024

H.1. Subsurface storage licences, Land

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette	Substance
1	EnergyStock B.V. Nobian Salt B.V.	Zuidwending	1	11-04-2006	11-04-2036	77	Natural gas
2	Gasunie Transport Services B.V.	Winschoten II	<1	15-11-2010	13-05-2079	18 321	Nitrogen
3	N.V. PWN Waterleidingbedrijf Noord-Holland	Andijk	5	12-12-2019	22-01-2040	69 014	Brine
4	Nederlandse Aardolie Maatschappij B.V.	Grijpskerk	27	01-04-2003		67	Natural gas
5	Nederlandse Aardolie Maatschappij B.V.	Norg	81	01-04-2003		68	Natural gas
6	Nobian Salt B.V.	Twenthe-Rijn de Marssteden	2	02-10-2010	12-11-2040	15 650	Oil
7	Nobian Salt B.V.	Winschoten III	28	15-11-2010	13-05-2079	18 321	Nitrogen
8	TAQA Onshore B.V.	Bergermeer	19	08-01-2007	30-06-2050	7	Natural gas
9	TAQA Piek Gas B.V. Dana Petroleum Netherlands B.V. RockRose (NL) CS1 B.V.	Alkmaar	12	01-04-2003		68	Natural gas
		Total	175				

H.2. Subsurface storage licences, Sea

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette	Substance
1	TAQA Offshore B.V. EBN CCS B.V.	P18-2	27	13-07-2022	31-12-2041	18 510	Carbon dioxide
2	TAQA Offshore B.V.	P18-4	11	01-01-2021	01-01-2041	21 233	Carbon dioxide
		Total	38				

I. Licences for Geothermal energy

As at 1 January 2024

I.1. Scientific research and central policy licences for geothermal energy

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	EBN B.V.	Amstelland 1	14	24-5-2023	31-12-2025	15 163
2	EBN B.V.	Haarlem Amsterdam-West 1	8	28-12-2023	31-12-2025	236
3	EBN B.V.	Oss 2	5	23-12-2023	31-12-2025	1 396
4	EBN B.V.	West-Brabant Noord 1	2	29-11-2023	31-12-2025	33 384
		Total	29			

I.2. Search Area allocations for geothermal energy

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Aardyn B.V.	Bommelerwaard 2	53	13-03-2021	23-04-2025	13 788
2	Aardyn B.V. GeoMEC-4P Realisatie & Exploitatie B.V.	Brielle 2	29	13-10-2009	30-11-2025	15 990
3	Aardyn B.V.	Delft-Abtswoude	12	10-06-2021	21-07-2025	33 918
4	Aardyn B.V. Haagse Aardwarmte Leyweg B.V.	Den Haag 4a	59	04-02-2021	11-11-2027	6 428
5	Aardyn B.V. Haagse Aardwarmte Leyweg B.V.	Den Haag 6a	23	04-02-2021	29-10-2027	6 426
6	Aardyn B.V. Haagse Aardwarmte Leyweg B.V. Eneco Warmte & Koude B.V.	Nootdorp-Oost 2	6	13-02-2020	15-10-2027	11 275
7	Aardyn B.V.	Rotterdam 4	20	18-12-2012	06-11-2024	2013/208
8	Aardyn B.V. Gemeente Rotterdam Shell Geothermal B.V.	Rotterdam-Stad	69	26-09-2020	06-11-2028	50 991
9	Aardyn B.V. Geothermie Brabant B.V.	Someren	105	18-07-2020	28-08-2024	39 740
10	Aardyn B.V. Izzy Projects B.V.	Terheijden 2	23	12-01-2021	22-02-2025	2 223
11	Aardyn B.V. GeoMEC-4P Realisatie & Exploitatie B.V.	Vierpolders	7	10-02-2010	30-12-2025	2 211
12	Aardyn B.V. Geothermie Brabant B.V.	West-Brabant	284	13-12-2019	23-01-2024	69 491
13	Aardyn B.V. Haagse Aardwarmte Leyweg B.V. Eneco Warmte & Koude B.V.	Ypenburg 1a	32	31-03-2022	15-10-2027	9 359
14	DDGeothermie Sneek B.V.	Sneek	53	16-01-2019	31-12-2027	3 279

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
15	Geothermie Delft B.V.	Pijnacker-Nootdorp 6b*	9	31-03-2022	29-06-2024	9 358
16	Eavor Europe B.V.	Almere 1	63	14-01-2023	24-02-2028	2 634
17	Eavor Europe B.V.	Leiden 2	96	18-08-2021	28-09-2024	39 080
18	Eavor Europe B.V.	Purmerend 2	49	09-11-2021	20-12-2024	46 524
19	Eavor Europe B.V. Ennatuurlijk B.V.	Tilburg 1	59	29-06-2023	09-08-2026	18 604
20	ECW Geo Andijk B.V.	Andijk 2	121	22-02-2023	04-04-2026	6 368
21	EnergieWende B.V. De Bruijn Geothermie B.V.	De Lier 9	20	27-04-2023	03-09-2026	12 957
22	Ennatuurlijk B.V. Ennatuurlijk Aardwarmte Moerdijk B.V.	Breda-Moerdijk 1	96	11-11-2022	22-12-2028	30 920
23	Ennatuurlijk B.V.	Eindhoven 2	66	19-10-2021	29-11-2024	44 559
24	Ennatuurlijk Aardwarmte Holding B.V.	Middenmeer 4	62	17-02-2018	30-03-2024	12 045
25	Equans Energy Solutions B.V. Gemeente Haarlem	Haarlem-Schalkwijk	100	17-05-2019	27-06-2024	28 683
26	Equans Energy Solutions B.V.	Rotterdam Prins Alexander	20	15-02-2021	26-03-2024	8 459
27	Equans Energy Solutions B.V. Shell Geothermal B.V.	Rotterdam-Bar	222	21-01-2021	05-11-2028	3 725
28	Equans Energy Solutions B.V.	Utrecht	263	30-10-2019	09-12-2024	59 865
29	Equans Energy Solutions B.V.	Wellerlooi	20	20-05-2021	30-06-2024	33 270
30	FrieslandCampina Consumer Products International B.V.	Leeuwarden 5	158	14-03-2018	21-03-2027	15 509
31	Gaia Energy B.V. Duurzaam Opwekken Amersfoort B.V.	Amersfoort	33	11-09-2020	22-10-2026	48 119
32	Gaia Energy B.V. Energie Transitie Support B.V.	Amstelveen-Haarlemmermeer 1	33	14-01-2023	24-02-2028	2 637
33	Gaia Energy B.V. IPS Geothermal Energy B.V.	De Ronde Venen 1	82	25-03-2023	05-05-2027	9 810
34	Gaia Energy B.V. MPD Groene Energie B.V.	Ede	40	05-06-2020	16-07-2024	31 394
35	Gaia Energy B.V. High Tree Energy B.V.	Kudelstaart 1	97	14-01-2023	24-02-2027	2 640
36	Gaia Energy B.V. Energie Transitie Support B.V.	Oss	41	14-06-2022	25-07-2026	16 167
37	Gaia Energy B.V. Energie Transitie Support B.V.	Uithoorn 1	12	14-01-2023	24-02-2028	2 641
38	Gemeente Tilburg	Tilburg-Zuid 1	34	14-6-2023	25-07-2027	17 053
39	Gemeente Zwolle	Zwolle	74	23-12-2017	02-02-2024	2018/202
40	GeoPower Exploitatie B.V.	Maasland 6	7	18-04-2020	29-05-2025	23 010
41	GeoPower Exploitatie B.V.	Maasland 8	1	03-02-2022	27-02-2025	9 879
42	Green Well Westland B.V.	Honselersdijk 5	1	15-12-2023	25-01-2028	35 218
43	N.V. HVC	Alkmaar	32	17-10-2018	27-11-2026	65 375
44	N.V. HVC Gemeente Almere Vattenfall Power Generation Netherlands B.V.	Almere-Diemen 1	272	14-01-2023	24-02-2028	2 635
45	N.V. HVC	Den Helder	21	14-11-2018	27-12-2026	65 384
46	N.V. HVC	Drechtsteden	27	05-02-2019	18-03-2027	11 074
47	N.V. HVC SVP Productie B.V.	Edam-Volendam 1	44	25-01-2023	07-03-2028	3 655
48	N.V. HVC	Hoorn	75	08-07-2021	18-08-2026	35 518

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
49	N.V. HVC	Lelystad	20	14-11-2018	27-12-2026	67 020
50	N.V. HVC	Velsen	31	18-12-2018	27-01-2027	73 447
51	HVC Aardwarmte Maasdijk B.V.	Maasdijk 2	4	25-10-2019	05-12-2024	59 321
52	HVC Aardwarmte Maasdijk B.V.	Westland-Zuidwest 1a	36	27-01-2021	10-04-2026	4 791
53	HVC Aardwarmte Wippolderlaan B.V.	Den Hoorn	8	21-01-2020	02-03-2024	4 906
54	HVC Aardwarmte Wippolderlaan B.V.	Kwintsheul 2	6	19-07-2019	31-05-2024	41 655
55	HVC Aardwarmte Wippolderlaan B.V.	Wateringen 1	1	04-02-2021	11-11-2024	6 428
56	HVC Aardwarmte Wippolderlaan B.V.	Wateringen 2	< 1	04-02-2021	29-10-2024	6 426
57	IPS Geothermal Energy B.V.	Westeinder 1	62	14-01-2023	24-02-2027	2 639
58	IPS Geothermal Energy B.V.	Zoetermeer 2*	15	30-10-2021	30-05-2027	45 551
59	Aardwarmtecluster I KKP B.V.	Kampen 2	5	06-10-2022	31-12-2024	27 241
60	Aardwarmte Klazienaveen B.V.	Klazienaveen	61	27-10-2010	31-12-2024	17 245
61	Aardwarmte Klazienaveen B.V.	Klazienaveen 2	15	01-02-2021	31-12-2024	5 543
62	Larderel Energy B.V.	Eemland	196	11-09-2020	21-10-2024	48 120
63	Geocombinatie Leeuwarden B.V.	Leeuwarden	27	28-10-2014	08-12-2026	31 137
64	Nature's Heat B.V.	Honselersdijk 6	4	15-12-2023	25-01-2028	35 214
65	Geothermie Groep Nederland B.V.	Erica	72	27-10-2010	06-12-2024	17 250
66	Geothermie Plukmade B.V.	Made 2	53	28-05-2019	07-07-2024	30 925
67	Shell Geothermal B.V. Eneco Warmte & Koude B.V.	Capelle Aan Den IJssel	40	09-02-2021	22-3-2026	7 578
68	Shell Geothermal B.V.	Drachten 3	28	27-10-2021	02-06-2024	45 234
69	Shell Geothermal B.V. D4 B.V.	Rijnland	235	25-08-2021	05-10-2027	39 442
70	Shell Geothermal B.V. Equans Energy Solutions B.V.	Rotterdam 7	70	21-01-2021	05-11-2028	3 720
71	Shell Geothermal B.V. Havenbedrijf Rotterdam N.V.	Rotterdam-Haven	245	10-01-2020	30-09-2028	2 717
72	Tellus Nijmegen B.V.	Nijmegen	193	14-04-2021	25-05-2026	19 746
73	Tellus Renkum B.V.	Renkum	433	14-07-2020	24-08-2025	38 613
74	Vattenfall Power Generation Netherlands B.V. Eneco Heat Production & Industrials B.V. Gemeente Amsterdam Provincie Noord-Holland	Amsterdam-Amstelveen 1	336	14-01-2023	24-02-2028	2 636
75	Visser & Smit Hanab B.V. Equans Energy Solutions B.V.	Brakel-Zuidoost	27	13-03-2021	23-04-2024	13 789
76	Aardwarmte Vogelaer B.V.	Poeldijk 2*	3	19-09-2019		52 379
77	Duurzaam Voorne Holding B.V.	Nissewaard 2	76	16-10-2021	26-11-2025	44 345
78	Wayland Energy B.V.	Leiden 3	31	18-08-2021	28-09-2025	39 081
79	Wayland Energy B.V.	Zoetermeer	23	30-10-2021	30-05-2027	45 549
80	Wayland Energy B.V.	Zuidplas 2	53	25-08-2021	20-08-2024	39 440
81	Yeager Energy B.V.	Nissewaard	68	16-10-2021	26-11-2025	44 344
82	Yeager Energy B.V.	Oude Rijn	89	18-08-2021	28-09-2025	39 083
83	Yeager Energy B.V.	Purmerend 3	55	09-11-2021	20-12-2025	46 526
		Total	5,747			

* Applied for a start licence

I.3. Start licences for geothermal energy

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Aardyn B.V. Haagse Aardwarmte Leyweg B.V.	Den Haag	10	16-04-2020	27-05-2024	22 460
2	Aardyn B.V. Duurzaam Voorne Holding B.V.	Oostvoorne	17	03-12-2020	12-01-2024	64 446
3	Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4D	1	30-06-2023	10-08-2025	18 758
4	Ennatuurlijk Aardwarmte Middenmeer B.V.	Middenmeer III	14	03-08-2022	13-09-2024	25 904
5	Hoogweg Aardwarmte B.V.	Luttelgeest III	53	13-01-2022	23-02-2024	1 730
6	HVC Aardwarmte Maasdijk B.V.	Maasdijk I	19	25-03-2023	05-05-2025	9 796
7	HVC Aardwarmte Polanen B.V.	Monster I	11	27-01-2023	09-03-2025	4 011
8	IPS Geothermal Energy B.V. 85 Degrees Renewables 1 & 2 B.V.	Bleiswijk	4	28-11-2008	08-01-2039	237
9	IPS Geothermal Energy B.V. Fänqié Noordeinde Vastgoed B.V.	Bleiswijk 1B	2	20-03-2015	30-04-2032	8 784
10	Geocombinatie Leeuwarden B.V.	Leeuwarden I	3	21-04-2021	31-05-2024	21 237
11	Aardwarmte Combinatie Luttelgeest B.V.	Luttelgeest II	25	03-12-2020	22-10-2024	64 901
12	Nappa B.V.	Californie V	5	06-07-2017	16-08-2052	39 833
13	Trias Westland B.V.	Naaldwijk II	5	05-03-2021	07-05-2024	12 014-n1
14	Wayland Energy B.V.	Lansingerland II	7	14-09-2021	24-10-2024	41 276
15	Wayland Energy B.V.	Lansingerland III	11	30-06-2023	10-08-2025	18 694
16	Wayland Energy B.V.	Nootdorp-Oost I	11	01-07-2022	11-08-2024	18 668
17	Wayland Energy B.V.	Nootdorp-Oost II	5	20-07-2022	30-08-2024	19 772
18	Californië Wijnen Geothermie B.V. GeoWeb B.V.	Californie IV	4	06-07-2017	16-08-2052	39 843
		Total	207			

I.4. Follow-up licences for geothermal energy

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Aardyn B.V. GeoMEC-4P Realisatie & Exploitatie B.V.	Vierpolders	6	21-06-2017	01-8-2052	36 194
2	Ammerlaan Geothermie B.V.	Pijnacker-Nootdorp 4	4	24-12-2016	03-02-2052	3 132
3	Ce-Ren Beheer B.V.	Heemskerk	3	15-04-2016	26-05-2046	20 802
4	Gebroeders Duijvestijn Energie B.V.	Pijnacker-Nootdorp 5	5	24-12-2016	03-02-2052	3 136
5	ECW Geo Andijk B.V.	Andijk	5	24-05-2019	04-07-2054	30 715
6	EnergieWende B.V. De Bruijn Geothermie B.V.	De Lier	6	14-07-2016	24-08-2051	38 394
7	Ennatuurlijk Aardwarmte Middenmeer B.V.	Middenmeer I	5	05-02-2019	18-03-2054	11 105
8	Ennatuurlijk Aardwarmte Middenmeer B.V.	Middenmeer II	3	05-02-2019	18-03-2054	13 570
9	GeoPower Exploitatie B.V.	Maasland	5	08-01-2019	18-02-2054	1 501
10	Green Well Westland B.V.	Honselersdijk	3	02-07-2019	12-08-2054	41 236
11	Hoogweg Aardwarmte B.V.	Luttelgeest	6	24-05-2019	04-07-2052	30 998
12	Aardwarmtecluster I KKP B.V.	Kampen	5	27-09-2014	07-11-2044	28 239
13	Mijnwater Energy B.V.	Heerlen	41	13-10-2009	23-11-2044	15 963
14	Nature's Heat B.V.	Kwintsheul	3	19-07-2019	29-08-2054	41 655
15	Trias Westland B.V.	Naaldwijk	5	20-12-2019	30-01-2050	70 986
16	Visser & Smit Hanab B.V. GeoBrothers B.V.	Zevenbergen	3	18-12-2019	28-01-2053	70 528
17	Aardwarmte Vogelaer B.V.	Poeldijk	5	31-08-2017	11-10-2052	52 090
18	Wayland Energy Bergschenhoek B.V.	Lansingerland	5	08-01-2019	18-02-2054	3 389
		Total	118			

J. Licences for rock salt

As at 1 January 2024

J.1. Exploration licences for rock salt, Land

No ongoing exploration licences as at 1 January 2024.

J.2. Production licences for rock salt, Land

	Licence holder	Licence	km²	Effective from	Effective till	Gov. gazette
1	Frisia Zout B.V.	Barradeel	3	22-08-1998	22-08-2054	157
2	Frisia Zout B.V.	Barradeel II	17	12-06-2004	26-04-2062	110
3	Frisia Zout B.V.	Havenmond	32	03-01-2012	13-02-2052	405
4	Gasunie Transport Services B.V.	Adolf van Nassau II	<1	16-11-2010		18 324
5	Nedmag B.V.	Veendam	171	01-08-1980		148
6	Nobian Salt B.V.	Adolf van Nassau III	28	16-11-2010		18 324
7	Nobian Salt B.V.	Buurse	30	18-06-1918		Staatsblad 421
8	Nobian Salt B.V.	Isidorushoeve	20	08-06-2012	19-07-2052	14 668
9	Nobian Salt B.V.	Twenthe-Rijn	48	20-10-1933		207
10	Nobian Salt B.V.	Twenthe-Rijn Helmerzijde	1	29-10-2008	09-12-2048	216
11	Nobian Salt B.V.	Twenthe-Rijn Oude Maten	1	01-06-2013	12-07-2053	18 332
12	Nobian Salt B.V. EnergyStock B.V.	Uitbreiding Adolf van Nassau II	1	21-12-2009		81
13	Nobian Salt B.V.	Uitbreiding Adolf van Nassau III	77	21-12-2009		81
14	Nobian Salt B.V.	Uitbreiding Twenthe-Rijn	9	01-12-1994		249
15	Nobian Salt B.V.	Weerselo	80	13-03-1967		76
16	Salzgewinnungsgesellschaft Westfalen mbH & Co KG	Zuidoost-Enschede	6	07-03-2014	17-04-2064	7 304
		Total	526			

K. Licence for coal

As at 1 January 2024

K.1. Production licence for coal, Land

	Licence holder	Licence	Effective from	km²	Gov. gazette
1	Koninklijke DSM N.V.	Staatsmijn Beatrix	27-09-1920	130	752
2	Koninklijke DSM N.V.	Staatsmijn Emma	26-10-1906	73	270
3	Koninklijke DSM N.V.	Staatsmijn Hendrik	08-08-1910	24	249
4	Koninklijke DSM N.V.	Staatsmijn Maurits	12-03-1915	51	146
5	Koninklijke DSM N.V.	Staatsmijn Wilhelmina	08-01-1903	6	4
			Total	284	

L. Blocks and operators, Sea

As at 1 January 2024

			Licence (km^2)	
Block(part)	Open area (km^2)	Operator	Exploration	Block(part)
A04	0			
A05	91			
A07	47			
A08	382			
A09	141			
A10	129			
A11	392			
A12a		Petrogas		132
A12b		Petrogas		31
A12c	194			
A12d		Petrogas		33
A13	211			
A14	393			
A15a		Petrogas		67
A15b	326			
A16	293			
A17	395			
A18a		Petrogas		110
A18b	238			
A18c		Petrogas		47
B10a		Petrogas		48
B10b	85			
B10c		Petrogas		46
B13a		Petrogas		206
B13b	187			
B14	198			
B15	0			
B16a		Petrogas		67
B16b		NAM	198	
B16c	130			
B17		NAM	395	
B18	199			
D03	2			
D06	60			
D09	149			
D12a		Wintershall		214
D12b		Wintershall		41

			Licence (km²)	
Block(part)	Open area (km²)	Operator	Exploration	Block(part)
D15a		Neptune		63
D15b	184			
D18a		Neptune		58
D18b	139			
E01	374			
E02	396			
E03a		NAM	248	
E03b	148			
E04	398			
E05	398			
E06a		NAM	41	
E06b	357			
E07	400			
E08	400			
E09	400			
E10	401			
E11	401			
E12	401			
E13	403			
E14	403			
E15	403			
E16a		Neptune		29
E16b	375			
E17a		Neptune		87
E17b		Neptune		27
E17c	290			
E18a		Wintershall		1
E18b	403			
F01		NAM	396	
F02a		Dana NL		245
F02b		NAM	67	
F02c	85			
F03a		ONE-Dyas	62	
F03b		Neptune		44
F03c		Dana NL		291
F04a		NAM	178	
F04b	220			
F05	398			
F06a		ONE-Dyas		8
F06b		ONE-Dyas		260
F06c		ONE-Dyas		10
F06d		ONE-Dyas		2
F06e	10			

			Licence (km²)	
Block(part)	Open area (km²)	Operator	Exploration	Block(part)
F06f	108			
F07	400			
F08	400			
F09	400			
F10	401			
F11	401			
F12	402			
F13	403			
F14	403			
F15a		Total		53
F15b	350			
F16a		Wintershall		7
F16b		Wintershall		12
F16c	386			
F17a	(ondiep) 386	Wintershall		(diep) 386
F17c		NAM		18
F18	405			
G07	122			
G10	397			
G11	174			
G13a	387			
G13b		Neptune	16	
G14a		Neptune		155
G14b	248			
G15	226			
G16a		Neptune		133
G16b	272			
G17a		Neptune		48
G17b		Neptune		38
G17c		Neptune		34
G17d		Neptune		96
G17e	189			
G18	405			
H13	1			
H16	73			
J03a		Total		30
J03b		Spirit		14
J03c	100			
J06a		Spirit		32
J06b	51			
J09		NAM	18	
K01a		Total		40
K01b	366			

			Licence (km^2)	
Block(part)	Open area (km^2)	Operator	Exploration	Block(part)
K02a	255			
K02b		Neptune		110
K02c		Total		42
K03a		Neptune		83
K03b		Total		7
K03c		Neptune		32
K03d	283			
K04a		Total		209
K04b		Total		69
K04c	25			
K04d	104			
K05a		Total		160
K05b		Total		126
K05c	44			
K05d	78			
K06a		Total		229
K06b		Total		7
K06c	99			
K06d	28			
K06e	45			
K07		NAM		408
K08		NAM		409
K09a		Neptune		44
K09b		Neptune		46
K09c		Neptune		101
K09d		Neptune		46
K09e	172			
K10	374			
K11a		NAM		26
K11b	385			
K12a		Neptune		267
K12b	144			
K13	324			
K14a		NAM		125
K14b	287			
K15		NAM		412
K16	267			
K17a		NAM		200
K17b	214			
K18a		NAM		31
K18b		Wintershall		155
K18c	228			
L01a		Total		31

			Licence (km²)	
Block(part)	Open area (km²)	Operator	Exploration	Block(part)
L01b	327			
L01c		Neptune		12
L01d		Total		7
L01e		Total		12
L01f		Total		17
L02		NAM		406
L03		Neptune	406	
L04a		Total		136
L04b		Total		5
L04c		Neptune		12
L04d	255			
L05a		Neptune		163
L05b		Wintershall		237
L05c		Wintershall		8
L06a		Wintershall		332
L06b		Wintershall		60
L06c	16			
L07a		Total		166
L07b		Total		10
L07c		Total		3
L07d		Neptune		6
L07e		Neptune	31	
L07f	194			
L08a		Wintershall		34
L08b		Wintershall		42
L08c		Wintershall		10
L08d		Wintershall		16
L08e		Wintershall		10
L08f		Neptune	10	
L08g	133			
L08h	153			
L09		NAM		409
L10		Neptune		411
L11a		Neptune		89
L11b		ONE-Dyas		47
L11c		ONE-Dyas		7
L11d		ONE-Dyas		172
L11e	96			
L12a		Neptune		119
L12b		Neptune		37
L12c	255			
L13		NAM		413
L14	413			

			Licence (km²)	
Block(part)	Open area (km²)	Operator	Exploration	Block(part)
L15a	133			
L15b		Neptune		55
L15c		Neptune		4
L16a		Wintershall		238
L16b	176			
L17	388			
L18	13			
M01a		ONE-Dyas		2
M01b	352			
M01c		ONE-Dyas		52
M02a		ONE-Dyas	28	
M02b	378			
M03a	358			
M03b		ONE-Dyas	49	
M04	408			
M05	408			
M06	408			
M07a		ONE-Dyas		64
M07b	346			
M08	391			
M09a		NAM		213
M09b	158			
M10a		Kistos	45	
M10b		Kistos	3	
M10c	147			
M11		Kistos	28	
N01a		ONE-Dyas	134	
N01b	83			
N04		ONE-Dyas		381
N05		ONE-Dyas		14
N07a		NAM		141
N07b		Neptune		87
N07c		ONE-Dyas		87
N08		ONE-Dyas		34
O12	2			
O15	142			
O17	3			
O18	367			
P01	209			
P02	416			
P03	416			
P04	170			
P05	417			

			Licence (km²)	
Block(part)	Open area (km²)	Operator	Exploration	Block(part)
P06a		Wintershall		21
P06b	396			
P07	222			
P08a	314			
P08b		Jetex	105	
P09a		Petrogas		17
P09b	384			
P09c		Petrogas		18
P10a		Dana NL		5
P10b		Dana NL		100
P10c		Jetex	175	
P10d	74			
P11a	210			
P11b		Dana NL		210
P12a		Wintershall		4
P12b		Kistos	161	
P12c	256			
P13	422			
P14	422			
P15a		TAQA		51
P15b		TAQA		3
P15c		TAQA		2
P15d		TAQA		29
P15e		TAQA		16
P15f		TAQA		20
P15g		TAQA		13
P15h		TAQA		8
P15i		TAQA		1
P15j		TAQA		11
P15k	269			
P16	423			
P17	424			
P18a		TAQA		105
P18b		ONE-Dyas		37
P18c		TAQA		6
P18d		ONE-Dyas		2
P18e	259			
Q01a		Petrogas		(ondiep) 1
Q01b		Petrogas		(ondiep) 1
Q01c		Wintershall		(diep) 140
Q01d		Petrogas		(ondiep) 1
Q01e		Petrogas		(ondiep) 1
Q01f	89			

			Licence (km²)	
Block(part)	Open area (km²)	Operator	Exploration	Block(part)
Q01g	184			
Q02a	304			
Q02c		Petrogas		32
Q04a		Wintershall		9
Q04b	408			
Q05	298			
Q07		Kistos		419
Q08		Kistos	244	
Q10a		Kistos		53
Q10b		Kistos	367	
Q11		Kistos	147	
Q13a		Neptune		30
Q13b		Kistos	321	
Q13c	46			
Q14		Kistos	24	
Q16a		ONE-Dyas		28
Q16b	119			
Q16c	(ondiep) 7	ONE-Dyas		(diep) 21
R02	103			
R03	425			
R05	7			
R06	311			
R09	28			
S01	425			
S02	425			
S03	224			
S03a		ONE-Dyas		2
S04	427			
S05	349			
S06	10			
S07	360			
S08	95			
S10	36			
S11	0			
T01		ONE-Dyas		1
Total	40,127		3,897	12,835

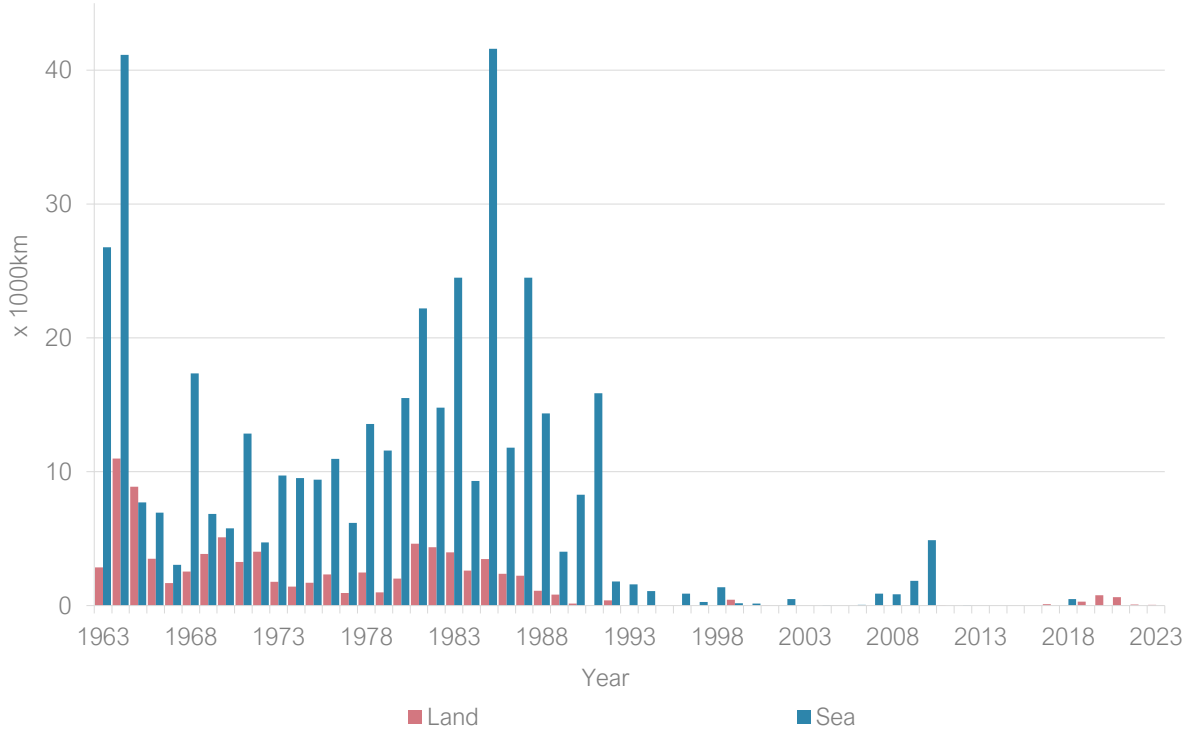
M. Seismic surveys

As at 1 January 2024

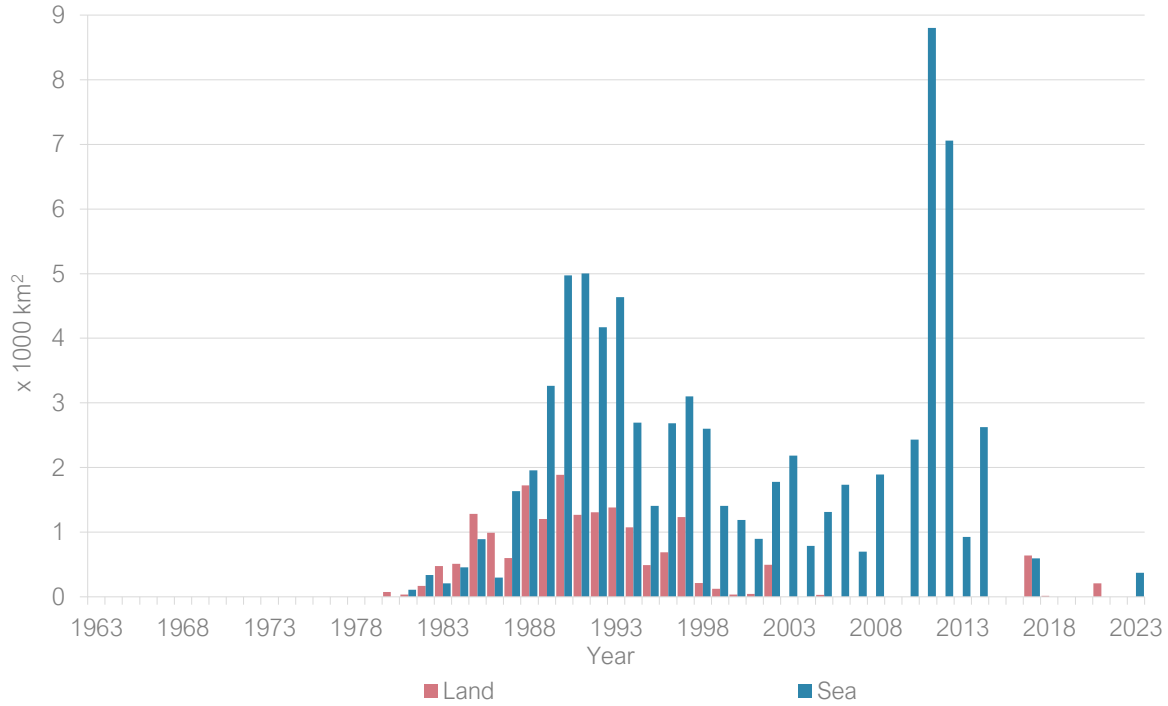
Year	Land		Sea	
	2D (km)	3D (km^2)	2D (km)	3D (km^2)
1963	2,860	-	26,778	-
1964	10,992	-	41,136	-
1965	8,885	-	7,707	-
1966	3,510	-	6,939	-
1967	1,673	-	3,034	-
1968	2,541	-	17,349	-
1969	3,857	-	6,846	-
1970	5,113	-	5,780	-
1971	3,252	-	12,849	-
1972	4,034	-	4,716	-
1973	1,783	-	9,708	-
1974	1,422	-	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
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	-
2019	302	-	-	-
2020	770	-	-	-
2021	636	207	-	-
2022	83	-	-	-
2023	67	-	-	372

2D seismic surveys 1963 – 2023



3D seismic surveys 1963 – 2023



N. Number of hydrocarbon wells since 1946

As at 1 January 2024

N.1. Number of oil and gas wells, Land

Year	Exploration					Appraisal					Production
	O	G	O&G	D	∑	O	G	O&G	D	∑	∑
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	O&G	D	∑	O	G	O&G	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
2019	-	2	-	-	2	-	-	-	-	-	-
2020	-	1	-	-	1	-	-	-	-	-	3
2021	-	-	-	-	-	-	2	-	-	2	1
2022	-	-	-	-	-	-	-	-	-	-	-
2023	-	2	-	1	3	-	-	-	-	-	-
Total	35	236	19	330	620	30	247	3	37	317	1,777

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

N.2. Number of oil and gas wells, Sea

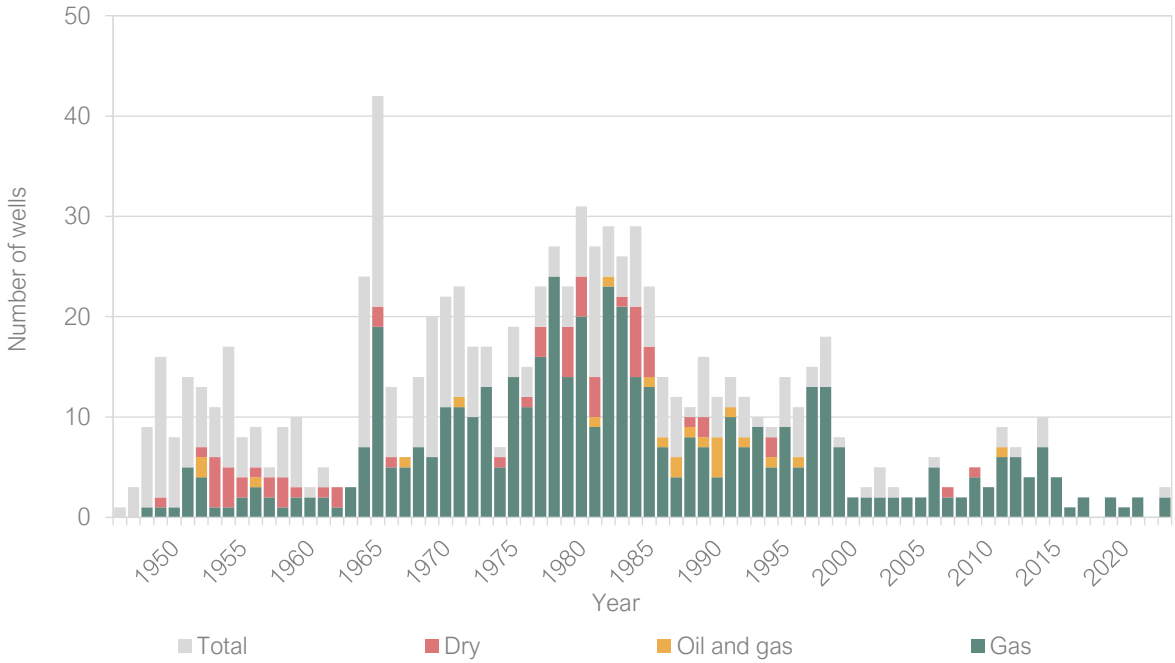
Year	Exploration					Appraisal					Production
	O	G	O&G	D	∑	O	G	O&G	D	∑	∑
1962	-	1	1	1	3	-	-	-	-	-	-
1963	-	-	-	-	-	-	-	-	-	-	-
1964	-	-	-	1	1	-	-	-	-	-	-
1965	-	-	-	-	-	-	-	-	-	-	-
1966	-	-	-	-	-	-	-	-	-	-	-
1967	-	-	-	-	-	-	-	-	-	-	-
1968	-	2	-	5	7	-	-	-	-	-	-
1969	1	8	-	8	17	-	-	-	-	-	-
1970	1	7	-	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
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

Year	Exploration					Appraisal					Production
	O	G	O&G	D	∑	O	G	O&G	D	∑	∑
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	-	3	1	1	5	-	-	-	-	-	6
2019	-	2	-	-	2	-	2	1	-	3	7
2020	-	2	-	-	2	-	-	-	-	-	6
2021	-	1	1	-	2	1	-	-	-	1	6
2022	-	2	1	1	4	2	1	-	-	3	2
2023	-	1	-	1	2	-	2	-	-	2	2
Total	53	354	26	373	806	35	119	4	28	186	609

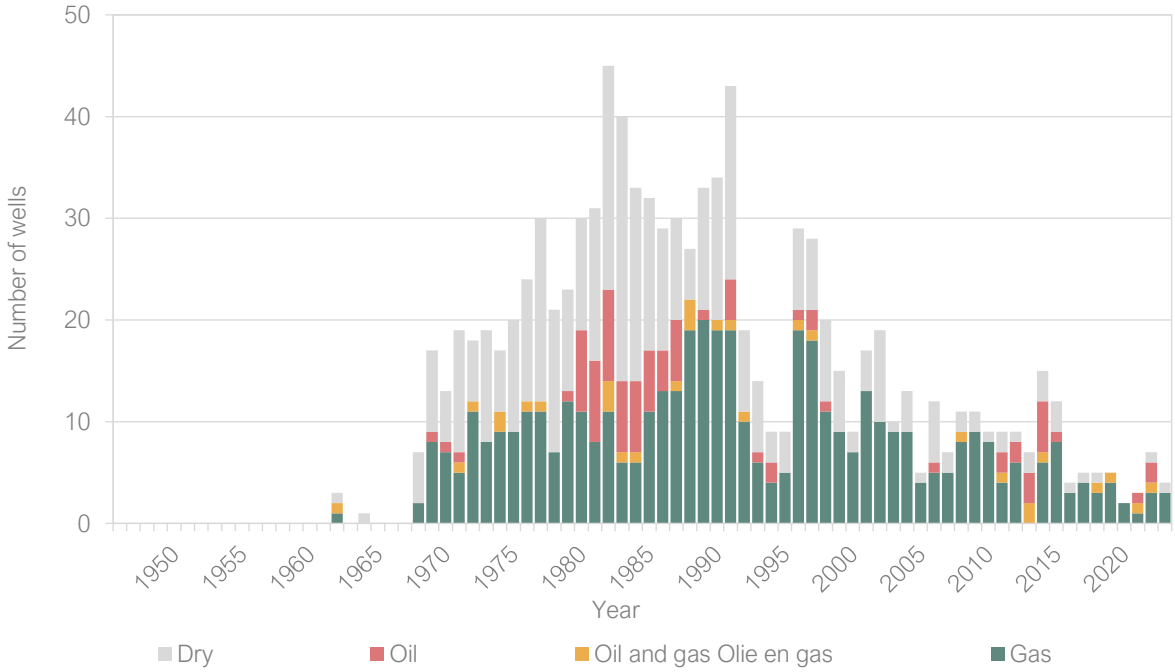
O = Oil; G = Gas; O&G = Oil and gas; D = Dry; ∑ = Total.

N.3. Number of wells, Land and Sea since 1946

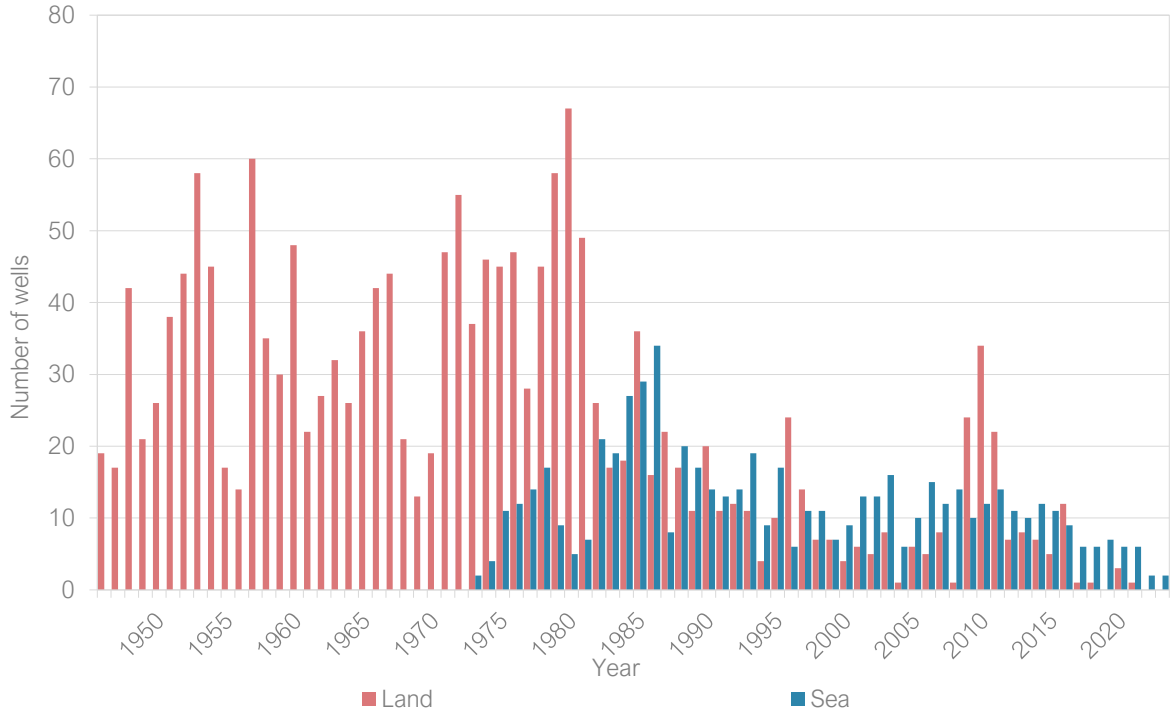
Exploration and appraisal wells, Land



Exploration and appraisal wells, Sea



Production wells



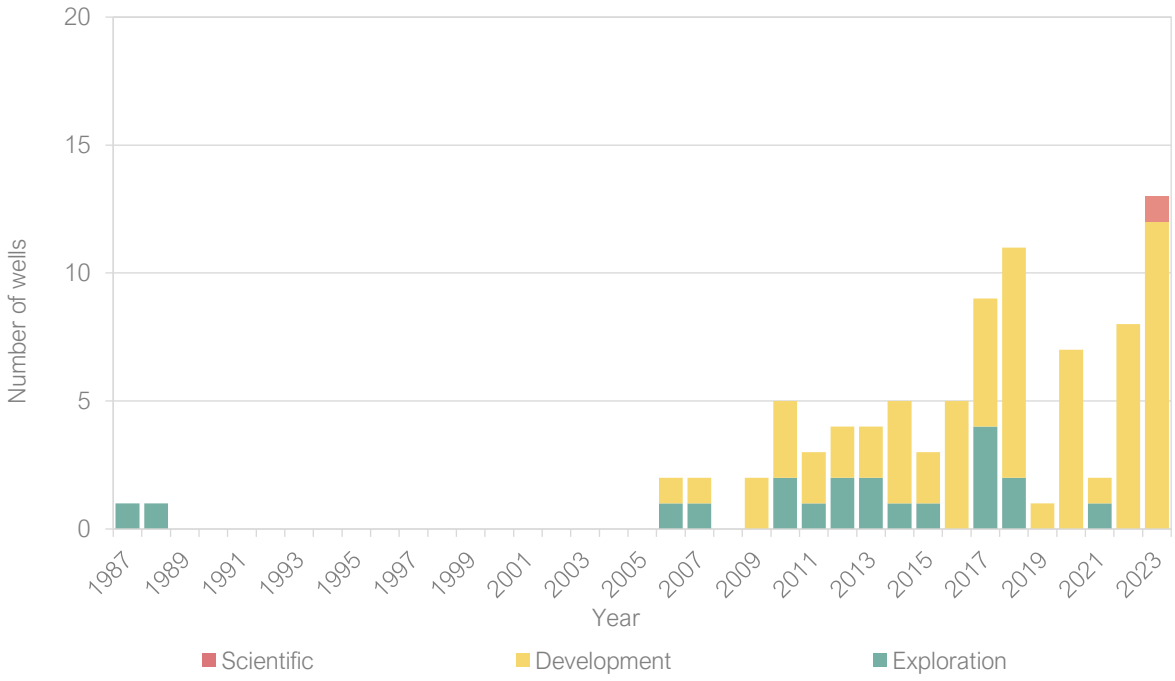
O. Number of geothermal wells since 1987

As at 1 January 2024

Scientific, Development and Exploration wells, Land

Year	Exploration	Development	Scientific	Total
1987	1	-	-	1
1988	1	-	-	1
1989	-	-	-	0
1990	-	-	-	0
1991	-	-	-	0
1992	-	-	-	0
1993	-	-	-	0
1994	-	-	-	0
1995	-	-	-	0
1996	-	-	-	0
1997	-	-	-	0
1998	-	-	-	0
1999	-	-	-	0
2000	-	-	-	0
2001	-	-	-	0
2002	-	-	-	0
2003	-	-	-	0
2004	-	-	-	0
2005	-	-	-	0
2006	1	1	-	2
2007	1	1	-	2
2008	-	-	-	0
2009	-	2	-	2
2010	2	3	-	5
2011	1	2	-	3
2012	2	2	-	4
2013	2	2	-	4
2014	1	4	-	5
2015	1	2	-	3
2016	-	5	-	5
2017	4	5	-	9
2018	2	9	-	11
2019	-	1	-	1
2020	-	7	-	7

Year	Exploration	Development	Scientific	Total
2021	1	1	-	2
2022	-	8	-	8
2023	-	12	1	13
Total	20	67	1	88



P. Number of salt wells since 1903

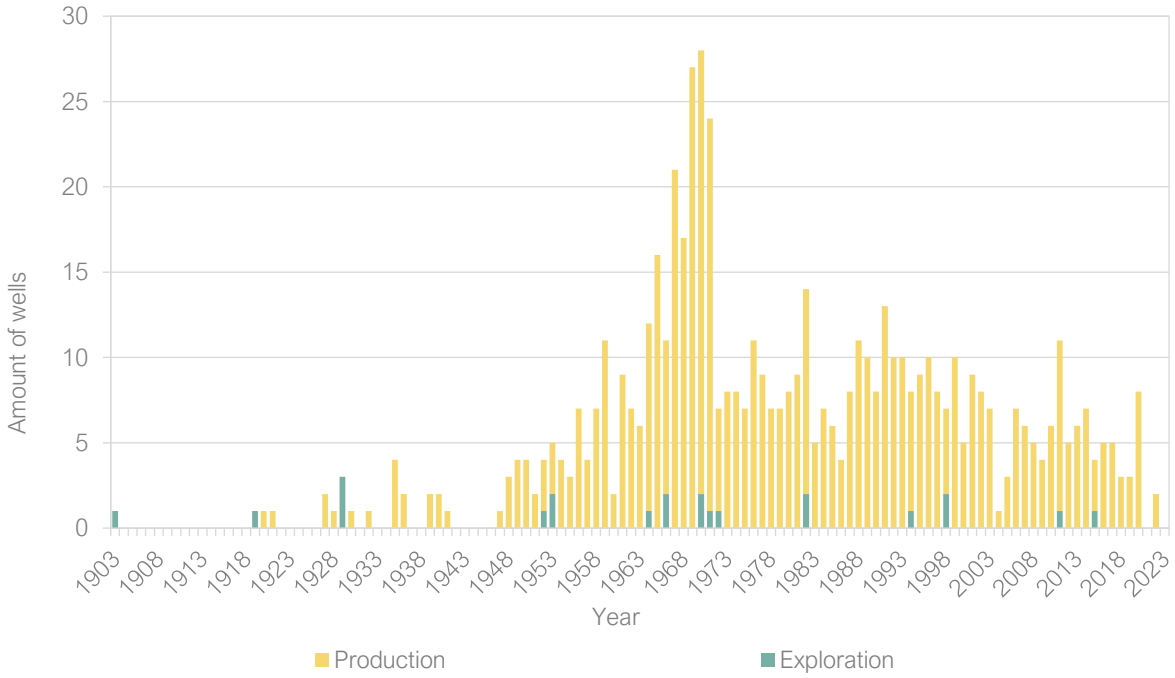
As at 1 January 2024

Production and Exploration wells, Land

Year	Exploration	Production	Total
t/m 1945	5	18	23
1946	-	-	0
1947	-	1	1
1948	-	3	3
1949	-	4	4
1950	-	4	4
1951	-	2	2
1952	1	3	4
1953	2	3	5
1954	-	4	4
1955	-	3	3
1956	-	7	7
1957	-	4	4
1958	-	7	7
1959	-	11	11
1960	-	2	2
1961	-	9	9
1962	-	7	7
1963	-	6	6
1964	1	11	12
1965	-	16	16
1966	2	9	11
1967	-	21	21
1968	-	17	17
1969	-	27	27
1970	2	26	28
1971	1	23	24
1972	1	6	7
1973	-	8	8
1974	-	8	8
1975	-	7	7
1976	-	11	11
1977	-	9	9
1978	-	7	7

Year	Exploration	Production	Total
1979	-	7	7
1980	-	8	8
1981	-	9	9
1982	2	12	14
1983	-	5	5
1984	-	7	7
1985	-	6	6
1986	-	4	4
1987	-	8	8
1988	-	11	11
1989	-	10	10
1990	-	8	8
1991	-	13	13
1992	-	10	10
1993	-	10	10
1994	1	7	8
1995	-	9	9
1996	-	10	10
1997	-	8	8
1998	2	5	7
1999	-	10	10
2000	-	5	5
2001	-	9	9
2002	-	8	8
2003	-	7	7
2004	-	1	1
2005	-	3	3
2006	-	7	7
2007	-	6	6
2008	-	5	5
2009	-	4	4
2010	-	6	6
2011	1	10	11
2012	-	5	5
2013	-	6	6
2014	-	7	7
2015	1	3	4
2016	-	5	5
2017	-	5	5
2018	-	3	3

Year	Exploration	Production	Total
2019	-	3	3
2020	-	8	8
2021	-	-	0
2022	-	2	2
2023	-	-	0
Total	22	599	621



Q. Platforms, Sea

As at 1 January 2024

Platforms

Platform	Operator	Status	Product	Installed	Removed	Function	Number of legs
AME-2	NAM	Operational	Gas	1983		Wellheads	4
AWG-1C	NAM	Operational	Gas	1994		Compression	4
AWG-1P	NAM	Operational	Gas	1985		Processing	6
AWG-1R	NAM	Operational	Gas	1984		Riser	3
AWG-1W	NAM	Operational	Gas	1983		Wellheads	4
K07-FA-1P	NAM	Operational	Gas	1982		Processing	6
K07-FA-1W	NAM	Operational	Gas	1980		Wellheads	4
K07-FB-1	NAM	Operational	Gas	2003		Wellheads	4
K07-FD-1	NAM	Operational	Gas	1998		Wellheads	4
K08-FA-1AP	NAM	Operational	Gas	2001		Accommodation or Office	4
K08-FA-1PP	NAM	Operational	Gas	1976		Processing	10
K08-FA-2	NAM	Operational	Gas	1977		Wellheads	4
K08-FA-3	NAM	Operational	Gas	1984		Wellheads	6
K14-FA-1C	NAM	Operational	Gas	1985		Compression	8
K14-FA-1P	NAM	Operational	Gas	1976		Processing	10
K14-FA-1V	NAM	Operational	Gas	1985		Vent Stack or Flare	2
K14-FB-1	NAM	Operational	Gas	1997		Wellheads	4
K15-FA-1	NAM	Operational	Gas	1976		Wellheads	10
K15-FA-1R	NAM	Operational	Gas	2012		Riser	1
K15-FB-1	NAM	Operational	Gas	1978		Wellheads	10
K15-FC-1	NAM	Operational	Gas	1989		Wellheads	4
K15-FG-1	NAM	Operational	Gas	1990		Wellheads	4
K15-FK-1	NAM	Operational	Gas	2002		Wellheads	4
K17-FA-1	NAM	Operational	Gas	2005		Wellheads	1
L02-FA-1	NAM	Operational	Gas	1990		Wellheads	6
L09-FA-1	NAM	Operational	Gas	2007		Wellheads	1
L09-FB-1	NAM	Operational	Gas	2007		Wellheads	1
L09-FF-1P	NAM	Operational	Gas	1997		Processing	6
L09-FF-1W	NAM	Operational	Gas	1996		Wellheads	6
L13-FC-1P	NAM	Operational	Gas	1986		Processing	6
L13-FC-1W	NAM	Operational	Gas	1985		Wellheads	4
L13-FD-1	NAM	Operational	Gas	1988		Wellheads	4
L13-FE-1	NAM	Operational	Gas	1989		Wellheads	4
L13-FI	NAM	Operational	Gas	2017		Wellheads	1
N07-FA-1	NAM	Temporarily suspended	Gas	1997		Wellheads	1
D15-FA-1	Neptune	Operational	Gas	1999		Processing	6

Platform	Operator	Status	Product	Installed	Removed	Function	Number of legs
D18a-A	Neptune	Decom. Prog.	Gas	2013		Processing	4
E17a-A	Neptune	Operational	Gas	2009		Processing	4
F03-FB OLT	Neptune	Operational	Oil	1993		Offloading	1
F03-FB-A	Neptune	Operational	Oil	1992		Accommodation or Office	3
F03-FB-F1	Neptune	Operational	Oil	1992		Processing	3
G14-A	Neptune	Operational	Gas	2005		Processing	4
G14-B	Neptune	Decom. Prog.	Gas	2007		Processing	4
G16a-A	Neptune	Operational	Gas	2005		Processing	4
G16a-B	Neptune	Operational	Gas	2011		Processing	4
G17d-A	Neptune	Operational	Gas	2001		Processing	4
G17d-AP	Neptune	Operational	Gas	2005		Processing	4
K02b-A	Neptune	Operational	Gas	2005		Processing	4
K09ab-A	Neptune	Decom. Prog.	Gas	1987		Processing	4
K09ab-B	Neptune	Operational	Gas	1999		Processing	4
K09c-A	Neptune	Decom. Prog.	Gas	1987		Processing	4
K12-A	Neptune	Decom. Prog.	Gas	1983		Manifold	4
K12-BD	Neptune	Operational	Gas	1985		Wellheads	4
K12-BP	Neptune	Operational	Gas	1987		Processing	8
K12-C	Neptune	Decom. Prog.	Gas	1984		Processing	4
K12-CC	Neptune	Decom. Prog.	Gas	1988		Compression	4
K12-D	Neptune	Operational	Gas	1985		Processing	4
K12-G	Neptune	Operational	Gas	2001		Processing	4
K12-K	Neptune	Operational	Gas	2007		Processing	4
L05a-D	Neptune	Operational	Gas	2013		Processing	4
L05-FA-1	Neptune	Operational	Gas	1992		Processing	6
L10-AD	Neptune	Operational	Gas	1974		Wellheads	10
L10-AP	Neptune	Operational	Gas	1975		Processing	8
L10-B	Neptune	Operational	Gas	1974		Processing	4
L10-BB	Neptune	Operational	Gas	1980		Wellheads	3
L10-E	Neptune	Operational	Gas	1977		Processing	4
L10-EE	Neptune	Operational	Gas	1984		Wellheads	3
L10-F	Neptune	Operational	Gas	1980		Processing	4
L10-L	Neptune	Operational	Gas	1988		Processing	4
L10-M	Neptune	Operational	Gas	1999		Processing	4
L15-FA-1	Neptune	Operational	Gas	1992		Processing	6
Q13a-A	Neptune	Operational	Oil	2013		Processing	4
D12-A	Wintershall	Permanently suspended	Gas	2004		Processing	4
D12-B	Wintershall	Operational	Gas	2019		Production	4
F16-A	Wintershall	Permanently suspended	Gas	2005		Processing	6
K13-AP	Wintershall	Operational	Gas	1974		Processing	8
K13-AW	Wintershall	Operational	Gas	1974		Riser	4
L05-B	Wintershall	Operational	Gas	2003		Processing	4

Platform	Operator	Status	Product	Installed	Removed	Function	Number of legs
L05-C	Wintershall	Operational	Gas	2006		Processing	4
L06-B	Wintershall	Operational	Gas	2014		Wellheads	1
L08-A	Wintershall	Decom.	Gas	1988	2023	Processing	4
L08-G	Wintershall	Permanently suspended	Gas	1988		Processing	6
L08-H	Wintershall	Decom.	Gas	1988	2023	Processing	4
L08-P	Wintershall	Permanently suspended	Gas	1994		Processing	4
L08-P4	Wintershall	Operational	Gas	1999		Processing	4
P06-A	Wintershall	Permanently suspended	Gas	1982		Processing	8
P06-B	Wintershall	Decom.	Gas	1985	2023	Processing	4
P06-D	Wintershall	Decom.	Gas	2000	2023	Processing	4
P12-SW	Wintershall	Permanently suspended	Gas	1990		Processing	4
Q01-D	Wintershall	Operational	Gas	2013		Processing	4
Q04-C	Wintershall	Operational	Gas	2002		Processing	4
Zuidwal	Vermilion	Decom. Prog.	Gas	1987		Processing	8
F15-A	Total	Operational	Gas	1991		Processing	6
K01-A	Total	Operational	Gas	2001		Wellheads	4
K04-A	Total	Operational	Gas	1998		Wellheads	4
K04-BE	Total	Operational	Gas	2000		Wellheads	4
K05-A	Total	Operational	Gas	1993		Wellheads	4
K05-B	Total	Operational	Gas	1995		Wellheads	1
K05-CU	Total	Operational	Gas	2010		Wellheads	4
K05-D	Total	Operational	Gas	1993		Wellheads	4
K05-EN/C	Total	Operational	Gas	1997		Wellheads	4
K05-P	Total	Operational	Gas	1994		Processing	4
K05-PK	Total	Operational	Gas	2002		Compression	4
K06-C	Total	Operational	Gas	1991		Wellheads	4
K06-D	Total	Operational	Gas	1992		Wellheads	4
K06-DN	Total	Operational	Gas	1991		Wellheads	4
K06-GT	Total	Operational	Gas	1998		Wellheads	4
K06-N	Total	Permanently suspended	Gas	1993		Wellheads	4
K06-P	Total	Operational	Gas	1991		Processing	4
L04-A	Total	Operational	Gas	1981		Processing	8
L04-B	Total	Permanently suspended	Gas	1984		Wellheads	4
L04-PN	Total	Operational	Gas	1999		Wellheads	4
L07-A	Total	Decom. Prog.	Gas	1984		Wellheads	4
L07-B	Total	Decom. Prog.	Gas	1976		Processing	4
L07-BB	Total	Decom. Prog.	Gas	1979		Wellheads	4
L07-C	Total	Decom. Prog.	Gas	1976		Wellheads	4
L07-H	Total	Decom. Prog.	Gas	1989		Wellheads	4
L07-N	Total	Decom. Prog.	Gas	1988		Wellheads	4
L07-P	Total	Decom. Prog.	Gas	1976		Processing	8

Platform	Operator	Status	Product	Installed	Removed	Function	Number of legs
L07-PK	Total	Decom. Prog.	Gas	1982		Compression	4
L07-Q	Total	Decom. Prog.	Gas	1976		Accommodation or Office	4
P15-A	TAQA	Operational	Oil	1985		Wellheads	4
P15-C	TAQA	Operational	Gas	1985		Wellheads	6
P15-D	TAQA	Operational	Gas	1993		Processing	6
P15-E	TAQA	Decom. Prog.	Gas	1993		Wellheads	4
P15-F	TAQA	Operational	Gas	1993		Wellheads	4
P15-G	TAQA	Decom. Prog.	Gas	1993		Wellheads	4
P18-A	TAQA	Operational	Gas	1993		Wellheads	4
A12-CPP	Petrogas	Operational	Gas	2007		Processing	4
A18	Petrogas	Operational	Gas	2015		Production	4
B13-A	Petrogas	Operational	Gas	2011		Production	4
P09-Horizon	Petrogas	Decom. Prog.	Oil	1993		Processing	4
Q01-Halfweg	Petrogas	Decom. Prog.	Gas	1995		Production	4
Q01-Haven-A	Petrogas	Decom.	Oil	1989	2023	Production	1
Q01-Helder-AP	Petrogas	Decom. Prog.	Oil	1982		Processing	4
Q01-Helder-AW	Petrogas	Decom. Prog.	Oil	1982		Production	6
Q01-Helm-AP	Petrogas	Decom. Prog.	Oil	1982		Processing	4
Q01-Helm-AW	Petrogas	Decom. Prog.	Oil	1981		Production	4
Q01-Hoorn-AP	Petrogas	Decom.	Oil	1983	2023	Processing	4
Q01-Hoorn-AW	Petrogas	Decom.	Oil	1983	2023	Production	6
L11b-PA	ONE-Dyas	Operational	Gas	1986		Processing	4
M07-A	ONE-Dyas	Operational	Gas	2009		Wellheads	1
P11-E	ONE-Dyas	Decom.	Gas	2016	2023	Wellheads	4
F02-A-Hanze	DANA	Operational	Oil	2000		Processing	6
P11-B-De Ruyter	DANA	Operational	Oil	2006		Processing	4
P11-Unity	DANA	Operational	Gas	2020		Wellheads	1
Q10-A	KISTOS	Operational	HiCal	2018		Production	4
J06-A-Markham	SPIRIT	Operational	Gas	1991		Processing	6
J06-C-Markham	SPIRIT	Operational	Gas	2006		Compression	4
L10-AC	NGT	Operational	Gas	1987		Compression	4
L10-AR	NGT	Operational	Gas	1975		Riser	4

Decom. = Decommissioned
Decom. Prog. = Decommissioning in progress
Source: NexStep, National Platform for Re-use & Decommissioning, www.nexstep.nl.

Subsea production installations

Subsea production installation	Operator	Status	Product	Installation	Decom.	Function
G17a-S1	Neptune	Operational	Gas	2005		Wellheads
K12-S2	Neptune	Decom.	Gas	2002	2023	Wellheads
K12-S3	Neptune	Operational	Gas	2003		Wellheads
L10-S2	Neptune	Decom.	Gas	1997	2023	Wellheads

L10-S4	Neptune	Operational	Gas	1996	Wellheads
K18-G1	Wintershall	Operational	Gas	2011	Wellheads
K18-G2	Wintershall	Operational	Gas	2014	Wellheads
K18-G4	Wintershall	Operational	Gas	2011	Wellheads
L08-A-West	Wintershall	Operational	Gas	2000	Wellheads
K04a-D	Total	Operational	Gas	1997	Wellheads
K04-Z	Total	Operational	Gas	2012	Wellheads
K05-F	Total	Temporarily suspended	Gas	2008	Wellheads
L04-G	Total	Operational	Gas	2005	Wellheads
Q16-FA-1	ONE-Dyas	Operational	Gas	1998	Wellheads
F02-A-Hanze TMLS	Dana	Permanently suspended	Oil	2000	Offloading
P11-B-De Ruyter TMLS	Dana	Operational	Oil	2006	Offloading
P11b-Van Ghent	Dana	Permanently suspended	Oil	2011	Wellheads
P11b-Van Nes	Dana	Permanently suspended	Gas	2012	Wellheads
P11-B-WYE Manifold	Dana	Operational	Gas	2011	Manifold

Decom. = Decommissioned
Decom. Prog. = Decommissioning in progress
Source: Nexstep, National Platform for Re-use & Decommissioning, www.nexstep.nl.

R. Authorities involved in mining

Ministry of Climate Policy and Green Growth

Directorate - General of Groningen and Subsurface

Address: Bezuidenhoutseweg 73, 2594 AC The Hague; P.O. Box 20411, 2500 EK The Hague

Telephone: 070 379 89 11

www.rijksoverheid.nl

TNO – Advisory Group for Economic Affairs

Address: Princetonlaan 6, 3584 CB Utrecht; Postbus 80015, 3508 EC Utrecht

Telephone: 088 866 42 56

www.tno.nl

State Supervision of Mines

Address: Henri Faasdreef 312, 2492 JP The Hague; P.O. Box 24037, 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 onshore and offshore the Netherlands, 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 Climate Policy and Green Growth.

S. Definition of selected terms

Land/onshore:

In this annual review, the terms land and onshore refer to the Dutch mainland and that part of the Netherlands territorial waters located on the landward side of the line referred to in the appendix of the Mining Act.

Sea/offshore:

In this annual review, the terms sea and offshore 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 the appendix of the Mining Act.

Exploration licence:

Licence to explore for the minerals stipulated therein (excluding geothermal energy).

Production licence:

Licence to produce the mineral resources specified in the licence, and to explore for these mineral resources (excluding geothermal energy).

Search Area allocation (Geothermal energy):

The search area allocation is only applicable in geothermal energy projects. It provides the exclusive right to search for geothermal energy in a specified area. In this phase of licensing, it is not allowed to drill wells in the area.

Start licence (Geothermal energy):

The start licence is only applicable in geothermal energy projects. Licence to explore for geothermal energy and produce geothermal energy within the time allocation of the licence.

Follow-up licence (Geothermal energy):

The follow-up licence is only applicable in geothermal energy projects. Licence to produce geothermal energy within the time allocation of the licence.

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 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 many 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 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. 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).

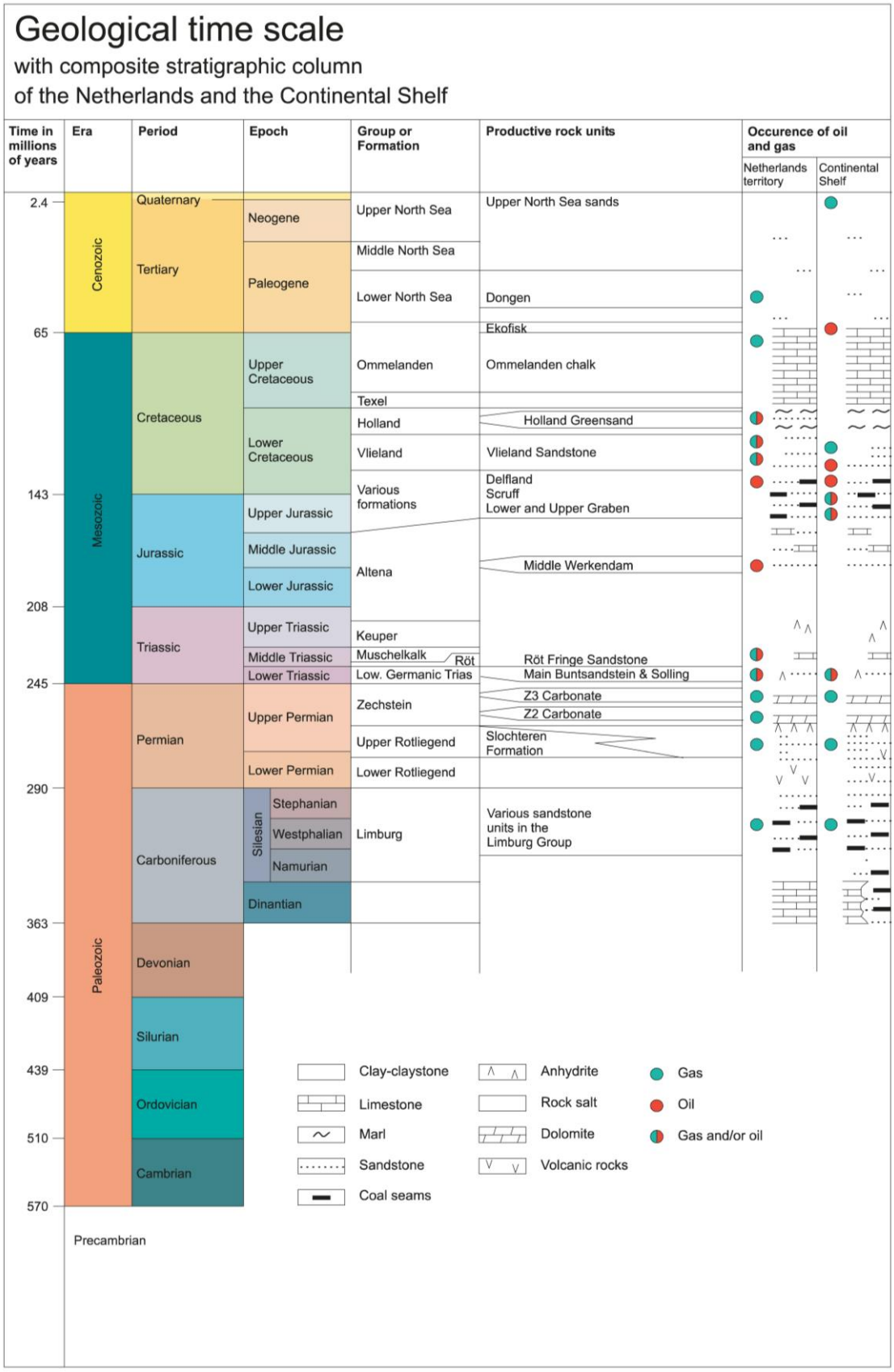
One Nm^3 gas with a calorific value of 36.5 MJ is equivalent to 36.5/35.17 Nm^3 Geq.

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).

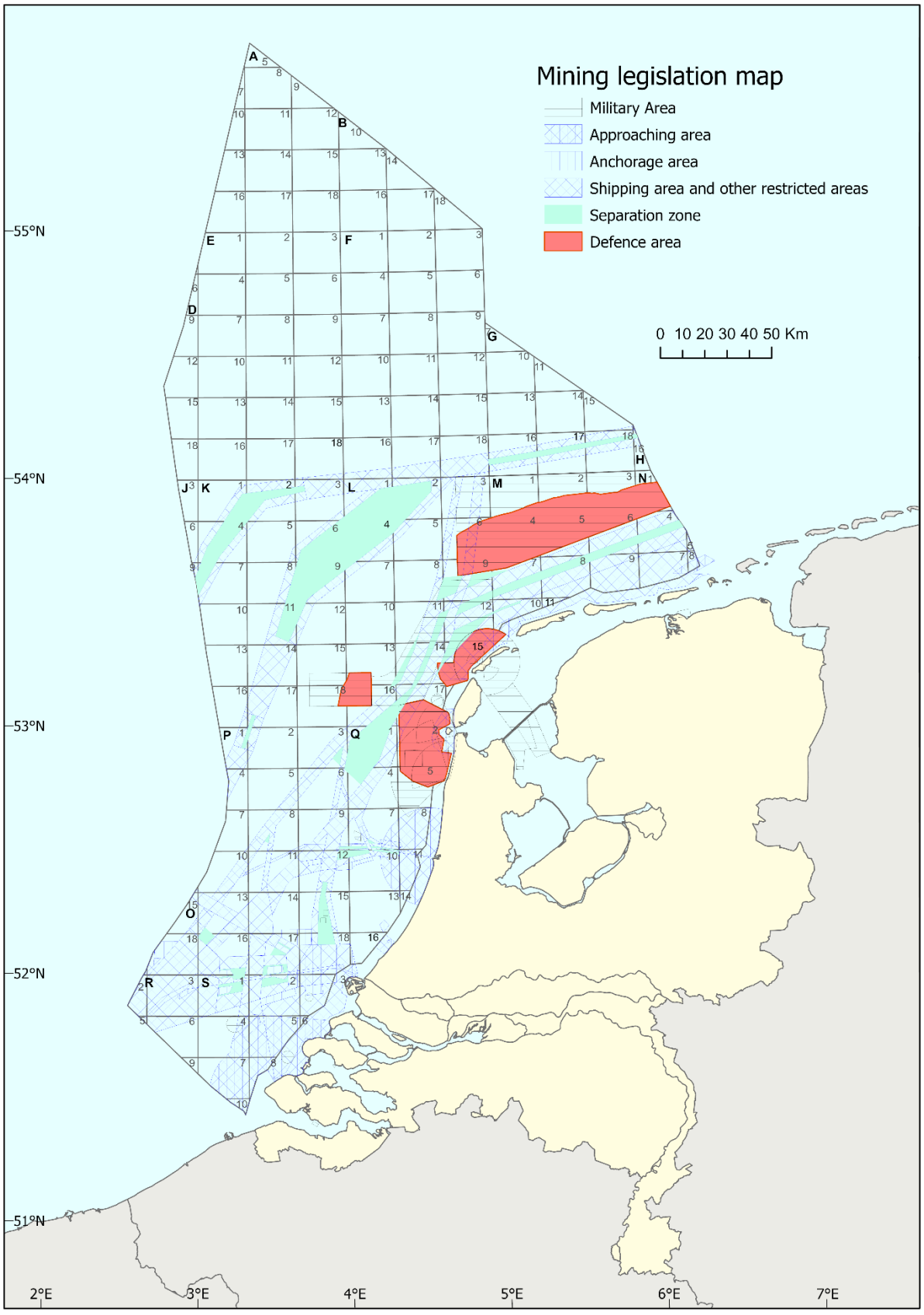
Fuel	Unit	Giga joule	Giga calorie	Oil equiv. tonnes	Oil equiv. barrels	Coal equiv. tonnes	Gas equiv. 1000 m^3
Fuelwood (dry)	tonnes	13.51	3.23	0.32	2.36	0.46	0.43
Coal	tonnes	29.30	7.00	0.70	5.11	1.00	0.93
Lignite	tonnes	17.00	4.06	0.41	2.96	0.58	0.54
Coke	tonnes	28.50	6.81	0.68	4.97	0.97	0.90
Coke-oven 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
Electricity*	MWh	3.60	0.86	0.09	0.63	0.12	0.11

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

Appendix 1. Geological time scale



Appendix 2. Mining legislation map



Appendix 3. 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 (infill) wells, 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.

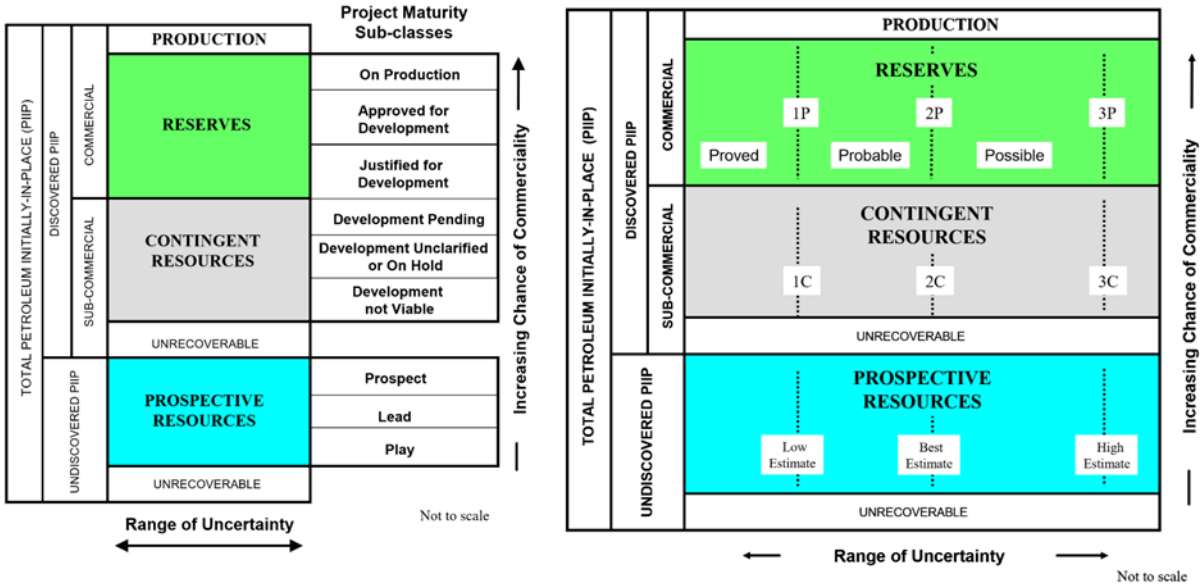


Figure Appendix 13.1 Schematic representation of the PRMS classification.

Status (chance of commercial realisation)

The gas resources associated with the individual projects are, based on their chance of maturation, allocated to the three main resource 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 main classes is shown in Figure Appendix 3.1.

Likelihood of recovery

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. This is expressed in a low, expected and high estimate as depicted along the horizontal axis (Figure Appendix 3.1).

1P (proved), 2P (probable) and 3P (possible) for the resources classified as reserves and 1C, 2C and 3C for the corresponding probabilities of the contingent resources.

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

Ministry of Climate Policy and Green Growth
Directorate-General Groningen and Subsurface
September 2024

For more information:
www.nlog.nl