

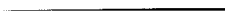
Natural Gas and Oil of the Netherlands 1982 Annual Review

A review of hydrocarbon exploration and production in the Netherlands and on the Netherlands sector of the North Sea continental shelf.

Ministry of Economic Affairs
The Hague, May 1983

(Photo)
the first offshore oil
production and land-
fall from block Q1 of
Union Oil Company of
The Netherlands c.s.

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ANNEXES

1.1 Onshore

On 1st January 1982, there were 17 licences in force for onshore exploratory drilling for oil and natural gas (see Annexes 14 and 20). During the year under review one new licence, namely the "Haulerwijk" drilling licence, was granted to Nederlandse Aardolie Maatschappij B.V. The existing "Centraal Nederland" drilling licence held by British Petroleum Exploratie Maatschappij Nederland B.V. and Gulf Oil Corporation was enlarged by over 24,000 ha. This enlargement had not yet taken effect on 1st January 1983. A one-year extension was granted to the term of the "Zuid-IJsselmeer" licence held by Amoco Netherlands Petroleum Company/Petroland B.V. c.s. and the "Gorredijk" licence held by Petroland B.V. The State was granted a drilling licence for the purpose of an inventory of coal reserves in South Limburg to be compiled by the Geological Survey of the Netherlands (RGD).

At the end of the year under review the number of current applications for drilling licences to explore for oil and gas totalled 11.

The number of hydrocarbon production concessions remained unchanged in 1982 (see Annexes 15 and 20). The Inspector-General of Mines, the Geological Survey of the Netherlands and the Provincial Authority of Friesland issued their recommendations with regard to the "Oosterend" concession applied for by Petroland B.V. c.s. No objections have been lodged against the concession application. It is expected that formal consideration of the application should be completed in the course of 1983.

No definitive decision has yet been taken on the "Zuidwal" concession application filed by the same group. In the course of 1982 the Council of State issued its recommendation on a draft Royal Decree refusing the application. The subsequent definitive decision on the application will be considered by the Council of Ministers.

1.2 Offshore

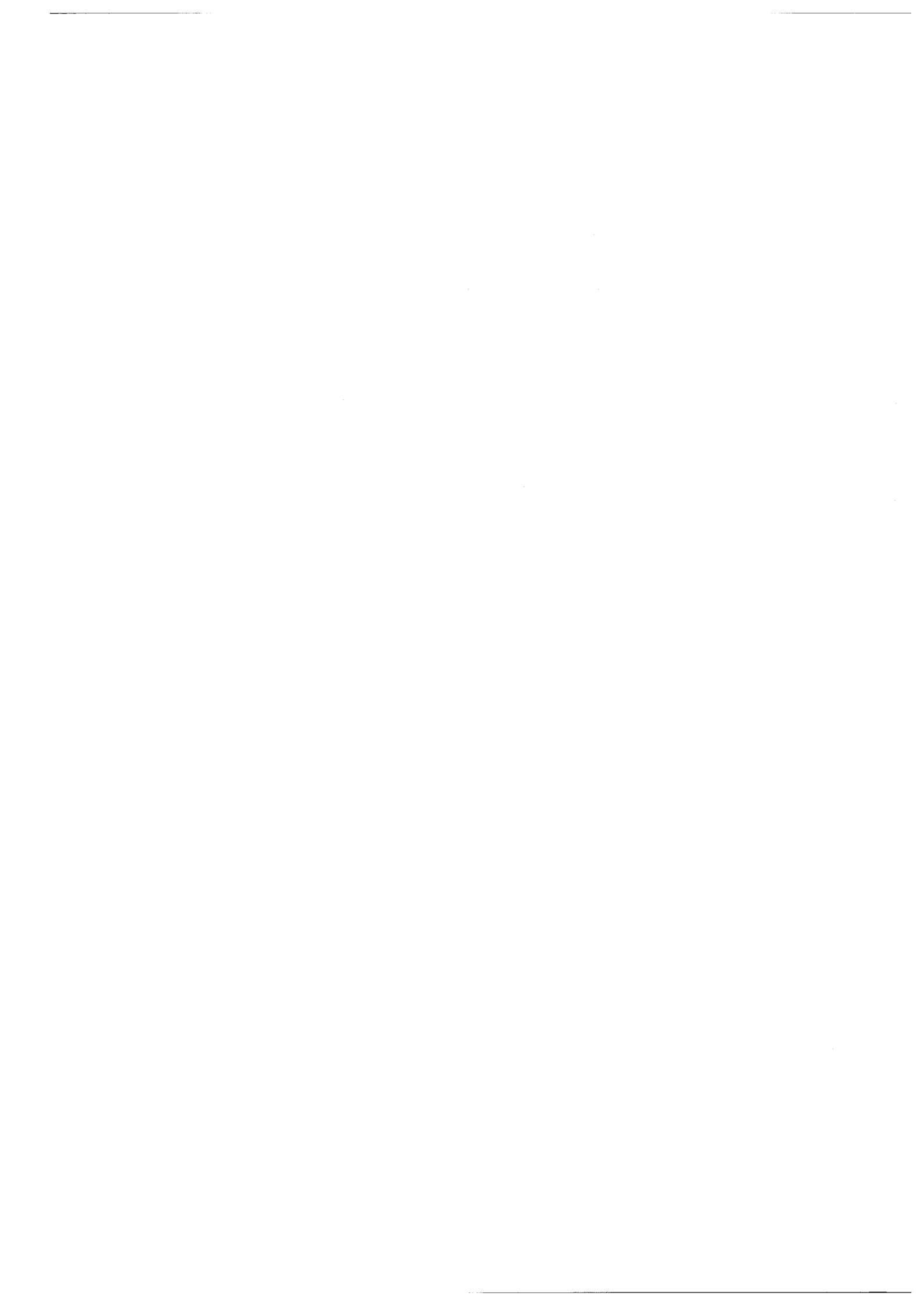
In the year under review five hydrocarbon exploration licences were granted to the following operators. The blocks and block segments to which the licences relate are shown on the map in Annex 18a.

Operator	blocks	effective	Off. Gazette
Placid International Oil Ltd.	L11-c	17-3-'82	67
British Petroleum Exploratie Maatschappij Nederland B.V./Gulf Oil Corporation	Q2-a, Q5-a,b	25-2-'82	48
Nederlandse Aardolie Maatschappij B.V	G18, H16	26-3-'82	74
Union Oil Company of the Netherlands/Nedlloyd Energy B.V.	L1-c	19-5-'82	110
Amoco Netherlands Petroleum Company - Exploratie- en Produktiemaatschappij Dyas B.V. - Veba Oil Nederland B.V.	L5-b, L8-b	26-5-'82	110

The total number of exploration licences effective as at 1st January 1983 was 80 (see also Annex 16), altogether covering an area of 36,535 sq.km. At the same date a further nine applications for exploration licences were under consideration.

Five production licences were granted in 1982, namely to Mobil Producing Netherlands Inc. c.s. for block P6 and to Union Oil Company of the Netherlands/Nedlloyd Energy B.V., Nederlandse Aardolie Maatschappij B.V. and Petroland B.V. c.s. for blocks F2a, F3 and F6 respectively.

One new production licence was applied for, namely for block segment L16a by Continental Netherlands Oil Company c.s. A list of the production licences granted and applied for is given in Annex 17. Annex 18 shows all the exploration and production licences currently in force.



2.1 Onshore

2.1.1 Geophysical exploration In the open areas, no seismic activities were undertaken during 1982 for oil and gas exploration purposes. On the other hand, in the priority areas of Roosendaal (Amoco), Eindhoven (BP), De Betuwe (Petroland), Kampen and IJsselmeer (both NAM) a total of 1503 km of regional two-dimensional (2-D) seismic surveying was carried out. In the drilling licence areas Overijssel Noord II and Noordoostpolder (both NAM), Gorredijk and Kolhorn (both Petroland), Centraal Nederland (BP) and Donkerbroek (Chevron) a total of 1047 km of 2-D seismic reflection profile was recorded. The greater part of the seismic surveys was undertaken in the concession areas, partly in support of production. In the Akkrum, Drenthe, Groningen, Middelie, Rijswijk, Schoonebeek, Tubbergen and Twente concession areas a total of 1813 km of seismic surveying took place.

Worthy of note is the increased application of the three-dimensional seismic acquisition method developed during the past few years and called 3-D for short. This modern, and also expensive, seismic acquisition method allows the geological structure of the sub-surface to be mapped three-dimensionally by computerized data processing.

3-D surveying finds application in more detailed investigation for the purpose of appraising and developing of hydrocarbon accumulations. This method is usually reported in terms of surface area covered (sq.km).

In the Drenthe, Groningen and Tietjerksteradeel concession areas a total of 172 sq.km was covered by the 3-D technique.

2.1.2 Exploration wells
(wildcats)

The number of wildcats drilled onshore, including Netherlands territorial waters since 1959, are summarised year by year in the table on the next page; the results are also stated.

Table 1: Exploration wells drilled on Dutch territory

year	number	result		
		oil	gas	dry
1959	9	-	2	7
1960	3	1	1	1
1961	3	-	1	2
1962	1	-	1	-
1963	2	-	2	-
1964	23	-	2	21
1965	38	-	16	22
1966	9	1	-	8
1967	1	-	1	-
1968	7	-	3	4
1969	13	-	2	11
1970	14	-	3	11
1971	12	-	3	9
1972	10	-	3	7
1973	4	-	2	2
1974	2	-	-	2
1975	8	-	3	5
1976	7	-	2	5
1977	7	-	3	4
1978	6	-	2	4
1979	6	-	4	2
1980	5	1	2	2
1981	15	2	2	11
1982	14	-	5	9
TOTAL	219	5	65	149

Table 1a following summarises in alphabetical order the exploration wells completed on Dutch territory, stating the operator concerned and the result achieved.

The number of exploration wells drilled in 1982 remained at the same level as in the preceding year. More than half of these wells were drilled for NAM's account. Of the eight NAM exploration wells, three (marked with an * in table 1a) had been completed in 1981, but were not actually tested before 1982. Accordingly, these wells are attributed to 1982. Conversely, the Monster 2 exploration well in NAM's "Rijswijk" concession, although it was completed before 31st December 1982, has not been included for 1982 because the definitive result is not yet known and the well will only be tested in the course of 1983. NAM drilled one of its eight exploration wells in a drilling licence area (indicated as "dla" in table 1a) and the other seven in its concessions.

Table 1a: Exploration wells on Dutch territory completed in 1982

No. *)	Name of well	Concession/ Drilling licence area	Operator	Result
1	Assen 1	Drenthe (conc.)	NAM	gas
2	Blaricum 1	Zuid-IJsselmeer (dla)	Petroland	dry
3	Bozum 1	Oosterend (dla)	Petroland	gas
4	Buinen 1*	Drenthe (conc.)	NAM	dry
5	Emmen 13	Drenthe (conc.)	NAM	dry
6	Gaag 2	Rijswijk (conc.)	NAM	gas
7	Heiloo 2	Bergen (conc.)	Amoco	gas
8	Kortgene 1	Zeeland (dla)	NAM	dry
9	Lekerveer 1	Kolhorn (dla)	Petroland	dry
10	De Lier 45	Rijswijk (conc.)	NAM	dry
11	Peins 1	Leeuwarden (conc.)	Petroland	dry
12	Rustenburg 2*	Middelie (conc.)	NAM	gas
13	Sloten 2	Zuid-Friesland II (dla)	Amoco	dry
14	Vledder 1*	Drenthe (conc.)	NAM	dry

*) Ref. annex 19.

Petroland B.V. completed four exploration wells, of which three were located in drilling licence areas. The two other non-NAM exploration wells were drilled with Amoco as operator. One of these wells was drilled in Amoco's "Bergen" concession. The other well, Sloten 2, was undertaken by Amoco in the "Zuid-Friesland II" drilling licence area of Chevron Oil Company of the Netherlands, Texaco Netherlands Inc. and NAM. This gave Amoco a 50% farm-in on this licence.

The proportion of exploration wells drilled in drilling licence areas in relation to the total number of exploration wells completed in 1982 within Netherlands territory rose slightly by comparison with the preceding year: five out of 14 compared with four out of 15 in 1981. Of the 14 exploration wells, five struck hydrocarbons. This took the success ratio back up from 27% to 36% (1980: 60%). All five wells struck natural gas, three drilling into new reservoirs: Assen 1, Gaag 2 and Rustenburg 2, all of which are in NAM concession areas (for their location see annex 19). The Heiloo 2 exploration well drilled by Amoco failed to find any hydrocarbons in the geological structure to be explored, but it did so in an overlying reservoir where the presence of gas had been previously confirmed. The hole was completed as a gas well for subsequent production at a later date. The Bozum 1 well drilled by Petroland struck gas in the same geological formation as that from which gas is produced in the adjacent "Leeuwarden" concession, and there are indications that the gas reservoir struck here in the "Oosterend" drilling licence area may communicate with at least a part of this "Leeuwarden" reservoir.

In 1982 no oil was struck by exploration wells drilled inside Netherlands territory. As regards the other exploration wells where the result was a dry hole, reference is made to table 1a and annex 19.

2.1.3 Appraisal wells

Table 2 lists the appraisal wells drilled since 1959 for the purpose of determining the reserves in accumulations where the presence of hydrocarbons had previously been confirmed. The table is constructed in

the same way as that showing the wildcats. It is noteworthy that during the past six years oil has played a more important role than previously, except for the year under review, in which not a single oil well was completed in this category as against five in 1981. The total number of appraisal wells declined slightly by comparison with the years immediately preceding, and by about 29% in relation to 1981 (in 1981 the relative decline was 36%).

Table 2 summarizes the appraisal wells undertaken and completed onshore, including territorial waters, stating the name, concession area, operator and the result. All wells drilled in this category are NAM wells in its concessions. Of the ten appraisal wells, two were dry holes, the other eight struck gas in gas-bearing geological structures or parts of reservoirs previously discovered. In further respects the table speaks for itself.

The Emmen 14, De Wijk 21 and De Wijk 22 wells were completed in 1982, but the definitive result is not yet known. These wells have not been included in the figures.

Table 2: Onshore appraisal wells

year	number	result		
		oil	gas	dry
1959	1	-	-	1
1960	1	-	1	-
1961	1	-	1	-
1962	-	-	-	-
1963	-	-	-	-
1964	2	-	1	1
1965	3	-	1	2
1966	1	-	1	-
1967	3	-	3	-
1968	4	-	2	2
1969	3	-	2	1
1970	1	-	1	-
1971	4	-	3	1
1972	2	-	-	2
1973	1	-	1	-
1974	5	-	4	1
1975	7	-	5	2
1976	12	-	12	-
1977	13	2	10	1
1978	20	-	20	-
1979	15	2	11	2
1980	22	2	16	4
1981	14	5	7	2
1982	10	-	8	2
TOTAL	145	11	110	24

Table 2a: Onshore appraisal wells completed in 1982

No. *)	Name of well	Concession	Operator	Result
15	Coevorden 25	Schoonebeek	NAM	gas
16	Coevorden 26	Schoonebeek	NAM	gas
17	Dalen 9	Drenthe	NAM	gas
18	Drouwenermond 1	Drenthe	NAM	gas
19	Emmen 15	Drenthe	NAM	dry
20	Emmen 16	Drenthe	NAM	gas
21	Heiligerlee 1	Groningen	NAM	gas
22	Oldenzaal 7	Twenthe	NAM	gas
23	Tietjerksteradeel 502	Tietjerksteradeel	NAM	gas
24	Ureterp 103	Tietjerksteradeel	NAM	dry

*) Ref. annex 19.

2.1.4 New reservoirs

In 1982 the number of oil and gas reservoirs proven onshore, including Netherlands territorial waters, rose by three to 83. All these new finds concerned gas-bearing geological structures drilled by NAM. At Maasdijk, the Gaag 2 exploration well struck gas in a geological formation where no hydrocarbons had yet been found in the "Rijswijk" concession. The Rustenburg 2 well struck gas in the De Schermer polder near the villages of Ursem and Schermerhorn. West of the provincial capital of Drenthe, at Kloosterveen, a gas-bearing structure was identified by the exploration well Assen, named after the capital.

In addition to isolated or adjacent reservoirs, the stated number of oil and gas reservoirs also includes

those reservoirs overlying each other and separated by impermeable rock layers.

The locations of the oil and gas reservoirs are shown on the map in annex 21.

2.2 Offshore

2.2.1 Geophysical exploration During the year under review, a total of 140 km of seismic reflection profiles was recorded in the exploration licence blocks L6 and M4 on behalf of Mobil and Petroland respectively. Western Geophysical Inc. initiated a regional seismic survey programme on a speculative basis, covering the entire Netherlands offshore area.

In exploration licence blocks some 7549 km of two-dimensional seismic exploration was conducted, 2270 km of which took place in blocks for which a production licence has been applied for. In addition, 40 km² (line length 1454 km) of three-dimensional seismic exploration was carried out in block K18, for which a production licence application by Conono c.s. is under consideration. The remaining exploration effort was focussed on the search for oil. In B,P,Q and F blocks a total of 2309 km of seismic survey was shot, and 2970 km of seismic profile line was recorded in the other blocks.

Particularly with a view to production, the greater part of the seismic exploration was carried out in blocks for which a production licence was held. Another noteworthy fact in offshore activities is the application of three-dimensional seismic exploration. The total area covered in 1982 using this modern surveying technique was 294 km² (line length 8131 km)

in blocks F3 and K14 of NAM and K10 and K13 of Pennzoil. In addition, 1963 km of conventional two-dimensional seismic exploration was conducted in those blocks.

2.2.2 Exploration wells (wildcats)

Table 3 shows the number of wildcats drilled for oil and gas over a series of years. In common with table 1 showing onshore activities, this analysis of offshore wells distinguishes between oil and gas where the well struck hydrocarbons.

Table 3a lists all the offshore exploration wells completed in 1982, stating the name, operator and result achieved.

Table 3: Offshore exploration wells

year	number	result		
		oil	gas	dry
before 1962	-	-	-	-
1962	3	-	-	3
1962 to 1967	-	-	-	-
1968	7	-	2	5
1969	15	-	2	13
1970	14	1	6	7
1971	18	-	3	15
1972	16	-	10	6
1973	17	-	4	13
1974	16	1	7	8
1975	15	-	6	9
1976	16	-	5	11
1977	23	-	3	20
1978	18	-	4	14
1979	17	1	7	9
1980	26	4	6	16
1981	15	1	3	11
1982	35	7	6	22
TOTAL	271	15	74	182

Table 3a: Offshore exploration wells completed in 1982

No. *)	Name of well	Operator	Result
1	A14-1	NAM	dry
2	B10-2	Amoco	dry
3	B18-3	NAM	oil
4	F2-3	Union	dry
5	F3-8	NAM	gas
6	F5-2	BP	dry
7	F11-3	NAM	dry
8	F14-3	Placid	dry
9	F17-3	NAM	oil
10	F17-4	NAM	oil
11	J3-1	NAM	dry
12	K8-9	NAM	dry
13	K12-6	Placid	gas
14	K16-3	Union	dry
15	K18-3	Conoco	dry
16	L11-9	Placid	dry
17	L14-4	Placid	dry
18	L16-5	Conoco	dry
19	L16-6	Conoco	oil
20	M7-2	Petroland	dry
21	M8-1	NAM	dry
22	M10-2	NAM	dry
23	M11-1	NAM	gas
24	P2-4	BP	gas
25	P5-3	Mobil	dry
26	P8-2	Mobil	oil

No. *)	Name of well	Operator	Result
27	P9-2	Amoco	oil
28	P12-3	Pennzoil	gas
29	P15-3	Amoco	oil
30	Q4-3a	BP	dry
31	Q7-3	NAM	dry
32	Q7-4	NAM	dry
33	Q8-4	BP	gas
34	Q11-2	NAM	dry
35	Q13-3	Amoco	dry

*) Ref. annex 18a.

The level of exploration drilling for hydrocarbons offshore rose sharply in 1982: the number of wells drilled was almost 2½ time as large as in the preceding year. One direct reason for this was that, early in 1983, the oil companies will become confronted with the expiry of first-round exploration licences, and they will therefore have to make as many hydrocarbon finds as possible to give them a basis for filing an application for a production licence. By filing such a licence application, the expiry date of the exploration licence is deferred until the Minister has decided on that application.

Of the 35 offshore exploration wells completed in 1982, seven struck oil and six gas. This brought the success ratio practically back to the level of two years previously: in 1980 it was 38%, in 1981 27%, and in the year under review the success ratio climbed back to 37%. In this respect, however, it should be noted that

one of the gas strikes, namely by NAM in block M11, concerns an accumulation which must be regarded as being commercially doubtful. A further gas strike by NAM, with well F3-8, took place in a production licence area granted in the course of 1982. With well K12-6, Placid International Oil Ltd. confirmed a commercial gas reservoir in the southern part of block K12, for which a production licence was granted early in 1983. Part of this new gas reservoir extends into the adjacent K15 production licence area of NAM, and will in due course be produced for joint account. Pennzoil Nederland Company found gas in well P12-3. There are also indications suggesting the presence of a separate oil reservoir, which however could not be confirmed by a production test because of technical difficulties. From the drilling rig, which has not been moved, a second well is currently being drilled in order to appraise this probable oil accumulation. The other gas strikes were made by British Petroleum Maatschappij Nederland B.V. (BP) in blocks P2 and Q8.

NAM confirmed oil in two geological structures in its F17 exploration licence. NAM also encountered a small-sized oil reservoir in the south of its block B18, adjacent to its production licence area F3.

Major oil finds were made by, consecutively, Amoco Netherlands Petroleum Company in its block segment P9a and by Mobil Producing Netherlands Inc. in its block segment P8a. These finds may relate to one and the same oil reservoir, which extends partly into the

adjacent exploration licence area P9c of Union Oil Company of the Netherlands/Nedlloyd Energy B.V.

An oil strike which led to the filing of an application for a production licence was made by Continental Netherlands Oil Company (Conoco) in the south east of block L16a.

In conclusion, Amoco confirmed the presence of oil in its first exploration well drilled in block P15a.

The exploration well Q13-3, also drilled by Amoco, yielded indications of oil and gas, but since they were not in producible quantities this well was abandoned as a dry hole. For the other exploration wells which remained unsuccessful, reference is made to table 3a in which these holes are designated "dry" in the "result" column. For the location of the wells drilled during the year under review, reference is made to the map of offshore activities in 1982, shown in annex 18a.

2.2.3 Appraisal wells

Table 4a summarises the appraisal wells completed in 1982 for the evaluation of geological structures in which the presence of hydrocarbons had previously been confirmed. In 1982, the number of appraisal wells declined by over 40% in comparison with the preceding year. Of the total of ten wells drilled in this category, three were in production licence areas. They were NAM's K8-10 well and Placid's L10-23 and L11-8. The latter failed to strike hydrocarbons.

Table 4: Offshore appraisal wells

year	number	result		
		oil	gas	dry
before 1962	-	-	-	-
1962	-	-	-	-
1962 to 1967	-	-	-	-
1968	-	-	-	-
1969	1	-	-	1
1970	-	-	-	-
1971	1	1	-	-
1972	1	-	-	1
1973	2	-	1	1
1974	1	-	1	-
1975	3	-	1	2
1976	3	1	2	-
1977	5	1	3	1
1978	5	1	2	2
1979	4	-	3	1
1980	5	2	2	1
1981	17	6	5	6
1982	10	1	6	3
TOTAL	58	13	26	19

The well L10-23 confirmed a gas accumulation that had originally been struck by the first well carried out in the north of block L10, in 1969/1970. The above-mentioned NAM well struck gas. The NAM well K17-8

confirmed a gas reservoir in block K17 that had previously been proven. In block L15, for which NAM has filed an application for a production licence, a gas accumulation was confirmed which extends into the adjacent block L12b, for which a production licence has similarly been applied for. This accumulation was first struck by NAM in 1979. The appraisal well to confirm one of the oil accumulations in the exploration licence area F17 struck by NAM in the year under review, failed to find the reservoir rock concerned.

The well L2-7 confirmed a gas reservoir that had already been discovered by NAM in 1968 with its exploration well L2-1. On initial formation testing, the appraisal well showed a fairly large productivity. With its well Q8-3, BP confirmed a gas reservoir which it had found in 1976 with its first exploration well in this block.

In 1982 Conoco drilled an outstep well to assess the size of the oil accumulation in the south-east of block segment L16-a which it had discovered in that same year and for which a production licence application is under consideration. This well found only minor oil shows in the sandstone layer concerned. The well P15-4 confirmed the oil reservoir struck by Amoco in its exploration licence area P15a in the year under review.

Tabel 4a: Offshore appraisal wells completed in 1982

No. *)	Name of well	Operator	Result
36	F17-5	NAM	dry
37	K8-10	NAM	gas
38	K17-8	NAM	gas
39	L2-7	NAM	gas
40	L10-23	Placid	gas
41	L11-8	Placid	dry
42	L15-4	NAM	gas
43	L16-7	Conoco	dry
44	P15-4	Amoco	oil
45	Q8-3	BP	gas

*) Ref. annex18a.

2.2.4 New reservoirs

In 1982, growing interest in oil was clearly manifested by the oil companies in their exploration activities in the Netherlands sector of the North Sea continental shelf. This is most clearly illustrated by the fairly spectacular relative rise in the number of newly discovered oil reservoirs by six, to a total of sixteen oil reservoirs as at 1st January 1983.

By comparison with the preceding year this represents a 60% increase.

In quantitative terms, the most important oil strike in 1982 was that made by Amoco and Mobil in blocks P8a and P9a. According to the available data, this is a discovery that is most certain to raise the volume of expected oil reserves in the Netherlands sector of the

North Sea continental shelf. Wells to be drilled in the near future by the licence-holders, which include Union Oil, will be able to further appraise the extent of this oil accumulation.

During the year under review, the most prospective areas in B and F blocks and in P and Q blocks, in terms of oil exploration, received the bulk of attention from the companies operating on the continental shelf. Of the offshore wildcats drilled in 1982, 63% were focussed on these areas. In the Central North Sea Graben region (B and F blocks) three new oil accumulations and one new gas reservoir were struck. In the P and Q block areas, besides the above-mentioned P8-P9 oil reservoir, Amoco discovered the oil accumulation in P15. Furthermore, three new gas reservoirs were struck in the latter area: one by BP in P2, another by Pennzoil in P12, and in Q8 again by BP (see also table 4a).

In the area of K and L blocks, the oil reservoir struck by Amoco in block L16 is worthy of mention. As stated above, Conoco found it worthwhile to apply for a production licence for block segment L16a, for which a first round exploration licence is currently held. The most important gas find on the continental shelf is that by the Placid well K12-6. As has been mentioned before, the geological structure concerned extends into the production licence area K15 of NAM, and the reservoir will be produced jointly.

3.1 Onshore

3.1.1 Development of oil fields

Nederlandse Aardolie
Maatschappij B.V.

In the "Schoonebeek" concession, 29 wells no longer producing were abandoned. A total of 35 injection wells were repaired, completed and brought back into operation. No new production wells were drilled during the year under review.

About 20 km of pipeline, varying from 2" to 8", was laid to replace old pipelines. Altogether 60 well locations were revamped and new locations constructed. In the water treatment plant, the six slob fields were given a new cement cover. During the year under review, construction of the new regional office at Schoonebeek was completed. In the western Netherlands, three new production wells were drilled and completed in the Zoetermeer field within the "Rijswijk" concession. In the Wassenaar field, two wells were drilled and completed as cold-water injection wells. In the IJsselmonde field, three wells drilled in 1981 were taken into production. In addition to repairs and maintenance work on wells and locations, about 28 km of existing pipeline was replaced in this concession. Revamping of the De Lier crude-oil terminal was completed.

3.1.2 Development of gas fields

Nederlandse Aardolie
Maatschappij B.V.

In the "Groningen" concession one new production well was drilled and completed. A number of wells were subjected to an acid treatment to boost production, while two wells were abandoned because they were found to be salt-squeezed.

Revamp work on the Tussenschenklappen and Nieuw Scheemda clusters was completed. Similar work commenced on the Oude Statenzijl 1 and 2 clusters.

In the "Drenthe" concession one new production well was drilled and completed. Construction of the gas treatment plant at the Roden 1 cluster was concluded.

In the "Schoonebeek" concession area two new production wells were drilled and completed.

In the other concession areas, regular repair and maintenance work was carried out.

Petroland B.V. c.s.

In the "Slootdorp" concession area, work was confined to annual maintenance. In the "Leeuwarden" concession area five wells were drilled; one failed to strike gas and was abandoned. Construction of the second compressor building on the site of the gas-treatment at Garijp was completed. The first of three compressors was installed in the course of the year under review.

Amoco Netherlands
Petroleum Company

Construction of the gas compressor station on the site of the gas-drying installation at Koedijk in the "Bergen" concession was completed. No new wells were drilled in this concession area. One well was successfully repaired at the Bergermeer site. With a

view to boosting gas production, one well at the Bergermeer location and one at the Bergen location were reperforated with good results.

Chevron Oil Company
of the Netherlands

During the year under review no new production wells were drilled in the "Akkrum" concession area. A gas-drying installation and a gas-metering station were installed at the Ak-13 location. Although the station is only scheduled for full completion in 1983, in consultation with Gasunie the metering installation became operational in December.

The well Ak-13 was brought into production after a gas transmission pipeline had been laid between the Ak-13 and the Gasunie grid.

3.2 Offshore

3.2.1 Development of oil fields

Union Oil Company of
the Netherlands

In the course of 1982, the Helm and Helder production platforms and the Helder wellhead production platform were installed in block Q1. Four wells were drilled and completed from the Helm platform. At the Helder platform, six new wells were drilled and completed; drilling of the seventh well began.

In order to carry the Q1 oil to be produced, a 20" pipeline was laid from Q1 block via IJmuiden and along the North Sea Canal to the oiltanking storage facility

at the America Dock in Amsterdam. The first oil produced from the Netherlands part of the continental shelf was landed through this pipeline in the autumn of 1982.

Exactly two years passed between the start-up of the Q1 project by the licencees Union Oil Company of the Netherlands and Nedlloyd Energy B.V. in the second half of 1980 and its completion. Meanwhile work has begun on the construction of a third drilling and production platform.

Nederlandse Aardolie-
maatschappij B.V.

The construction of a two-phase oil and gas pipeline is planned in order to carry the hydrocarbons produced from block F3 c.a. to Eemshaven, at the northernmost point of the coast. In mid December 1982 the Cabinet took a decision on the route to be chosen across the Wadden Zee to the east of Schiermonnikoog, with landfall on the Groningen coast and from there to Eemshaven. The Physical Planning working committee is to draw up strict conditions governing the precise details of the route to be followed and the method of pipeline construction.

3.2.2 Development of gas fields

Nederlands Aardolie-
maatschappij B.V.

The K7-FA-1 production platform was completed and installed. At the same time, an 18" pipeline was laid between the K7-FA-1 and K8-FA-1 platforms. At the K7-FA-1 platform five wells were completed and came into production in October. The accommodation module was put into place on the previously installed

K15-FB-1 platform. Construction of the gas-treatment installation began, and the six previously drilled wells were completed prior to the laying of a 24" pipeline to Den Helder via Callantsoog. The landfall of this pipeline at Callantsoog received Government approval in the course of the year under review. In order to allow this gas, which has a different, low-calorific analysis, to be received in Balgzand near Den Helder, work began on enlarging the existing gas-treatment installation there.

Pennzoil Nederland
Company c.s.

In 1982, a 10" gas pipeline and a 2" methanol pipeline between platforms K10-B and K10-C and a 20" gas pipeline between platforms K10-B and K13-C were laid. Five production wells were drilled from the K10-B drilling platform. This platform is scheduled to come onstream early in 1983, while the K10-C platform is to follow later in the same year.

From the K13-C platform two production wells were drilled and brought into production. After unsuccessful attempts to repair it, another well was abandoned. Finally, two Solar Centaur compressor units were installed on the K13-C platform. These compressors are to be started up in 1983.

Petroland B.V. c.s.

In view of the falling reservoir pressure in block L7, the compressor platform L7PK was installed and hooked-up alongside the central complex in that block. Two compressors were also installed.

In block L4 two production wells, which had been spudded in 1981, were completed in 1981. The L4A production and drilling platform was put into place on

the jacket installed in 1982 and the hook-up with the gas and glycol pipeline to L7P was established. The platform is expected to go onstream early in 1983.

Placid International
Oil Ltd.

One well was drilled and completed from the L10-D platform. Plans have been submitted, following the grant of a production licence for block K12, for the installation of a platform for the production of the gas confirmed in wells K12-2 and K12-3.

Mobil Producing
Netherlands Inc.

For the purpose of gas production in block P6, in 1982 the jacket with deck sections of the future production platform P6-A was put into place over the previously drilled P6-5 well. In 1983 the drilling of a number of production wells will commence from this location, and at the same time a 20" gas transmission pipeline will be laid from P6-A to Placid's L10-A production platform.

3.3 1982 production figures

PRODUCTION

Oil production: in 1982; onshore:

	"Schoonebeek" concession	"Rijswijk" concession	Total
Oil production in 1982 (in tonnes)	894,837	581,665	1,476,502
Cumulative oil produc- tion through 1982 (in tonnes)	29,981,807	23,284,398	53,266,205
	1 tonne = 1.10 m ³	1 tonne = 1.07 m ³	

Oil production: in 1982; offshore

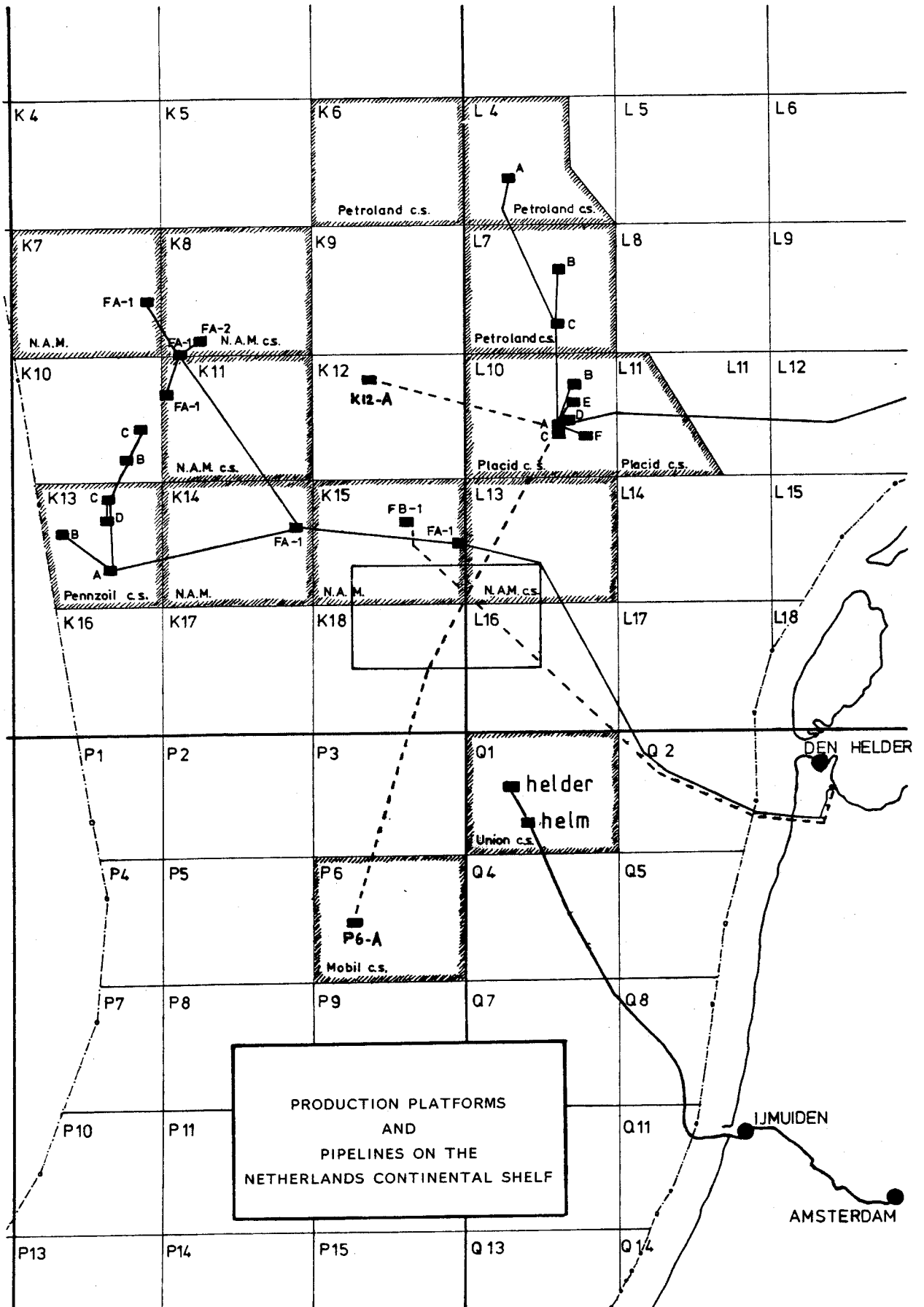
Licence holder	1982 (in tonnes)	cumulative through 1982 (in tonnes)
Union (Q1)	148,923	148,923
	1 tonne = 1.07 m ³	

Gas production: in 1982; onshore

Concession-holder	10 ⁶ m ³ ₁₅	10 ⁶ m ³ 35.17 MJ/m ³ ₀
Amoco ("Bergen" concession)	1,400.0	1,520.0
Chevron ("Akkrum" concession)	711.6	650.0
NAM (all concessions)	57,033.5	54,550.0
Petroland ("Leeuwarden" and "Slootdorp" concessions)	859.2	810.0
Total	60,004.3	57,530.0

Gas production: in 1982; Continental Shelf

Concession-holder (operator)	10 ⁶ m ³ ₁₅	10 ⁶ m ³ 35.17 MJ/m ³ ₀
NAM (K8, K11, K14, K15, L13, K7)	5,235.0	5,680.0
Pennzoil (K13)	2,430.8	2,580.0
Petroland (L7)	1,159.0	1,230.0
Placid (L10)	2,242.4	2,410.0
Union (Q1)	6.1	7.0
Total	11,073.3	11,907.0
Total Netherlands	71,077.6	69,437.0



4.1 Introduction

Reserves of natural gas and/or oil (hydrocarbons) are calculated, under the responsibility of the Geological Survey of the Netherlands, primarily by the volumetric method, because it is the only practicable method for fields which have scarcely any production history. Most of the Netherlands offshore fields come into this category. In addition, the material balance method has been used to supplement the volumetric estimate in incidental cases where gas production has been continuing for an extended period.

For oil reservoirs which have been in production for a considerable period, such as those in the NAM "Schoonebeek" and "Rijswijk" concessions, analysis of the production history has also been taken into account for the purpose of determining the reserves. Annex 12 examines in detail the methods for calculating hydrocarbon reserves; the units used and the categories and definitions of the reserves are also explained.

Estimates of the volumes of gas or oil technically recoverable from each reservoir are based on geological and reservoir data and the outcome of interpretation of those data. The question of whether a deposit is commercially producible or not is disregarded.

For a number of reservoirs, a provisional estimate only was made of the reserves. Structures in which merely gas or oil shows were found are not included in the estimate of recoverable reserves.

4.2 Gas reserves

4.2.1 Onshore

Table 5 summarises onshore gas reserves, including those in Netherlands territorial waters, as at

1st January 1983, stated in milliards (10^9) of cubic metres, at 0 °C and 1.01325 bar absolute (= 1 atmosphere absolute) and at 15 °C and the same pressure and also at the standard gross calorific value of 35.17 megajoules (= 8,400 kcal) per m^3 at 0 °C and 1.01325 bar (= 1 atmosphere absolute), which is the gross calorific value of natural gas of Groningen-field quality. Use of the above-mentioned standard for all gas qualities yields figures which do not as a rule represent actual volumes, but the volumes that would be obtained if all the gas qualities had the same calorific value per cubic metre. See also Annex 12.

Table 5: Onshore gas reserves (in $10^9 m^3$)

At 1-1-1983	Reserves			Proven		
	0°C	15°C	35.17 MJ	0°C	15°C	35.17 MJ
"Groningen" concession	1491	1573	1496	1189	1254	1193
Other concessions	236	249	248	102	108	108
Concessions applied for and Drilling permits	22	23	25	12	12	13
Total onshore	1749	1845	1769	1303	1374	1314

4.2.2 Offshore

Table 6 shows the reserves in the Netherlands sector of the North Sea continental shelf at 1st January 1983, likewise expressed in milliards (10^9) of cubic metres at 0 °C and 1.01325 bar (= 1 atmosphere absolute) and 15 °C and the same pressure, and at the standard gross calorific value of 35.17 megajoules (= 8,400 kcal) per m^3 and 0 °C and 1.01325 bar absolute.

Table 6: Offshore gas reserves (in 10^9 m³)

At 1-1-1983	Reserves			Proven		
	0°C	15°C	35.17 MJ	0°C	15°C	35.17 MJ
Production licences, current:	189	199	211	102	108	114
applied for:	45	47	47	21	22	22
Exploration licences	25	26	26	11	11	11
Total onshore	259	272	284	134	141	147

4.3 Oil reserves

4.3.1 Onshore

The following table summarises onshore oil reserves, including those in Netherlands territorial waters, at 1st January 1983, expressed in millions (10^6) of cubic metres at a pressure of 1.01325 bar (= 1 atmosphere absolute) and a temperature of 15.6 °C (60 °F). This includes a sub-division for the two concessions held by Nederlandse Aardolie Maatschappij B.V.

Table 7: Onshore oil reserves at 1/1/1983 in 10^6 m³ at 1.01325 bar absolute and 15.6 °C

Concession	Reserves	Proven
Schoonebeek	28	7
Rijswijk	10	3
Total onshore	38	10

4.3.2 Offshore

The oil reserves in the Netherlands sector of the North Sea continental shelf at 1st January 1983 are summarised in Table 8, grouped in the same way as the figures for natural gas shown in Table 6. Offshore oil reserves are expressed in the same units as those used for onshore reserves (see Table 7).

Table 8: Offshore oil reserves (in 10^6 m³ at 1.01325 bar absolute and 15.6 °C)

At 1-1-1983	Reserves	Proven
Production licences, current:	13	8
applied for:	7	3
Exploration licences:	29	16
Total offshore	49	27

4.4 Development of reserves

4.4.1 Natural gas

Table 9 below summarises the development of total Netherlands natural gas reserves for the period 1st January 1968 to 1st January 1983 as at the report dates.

Tabel 9: Development of gas reserves over the 1968-1983 period
(in 10^9 m³)

Date	Netherlands onshore			Netherlands offshore			Netherlands Total		
	0°C	15°C	35.17 MJ	0°C	15°C	35.17 MJ	0°C	15°C	35.17 MJ
1 Jan. 1968	2302	2430	not available	not known	not known	not available	2302	2430	not available
1 Oct. 1971	2228	2352	ditto	99	104	ditto	2327	2456	ditto
1 Jan. 1974	2125	2243	ditto	200	211	ditto	2325	2454	ditto
1 Jan. 1976	2026	2137	ditto	322	340	ditto	2348	2477	ditto
1 Jan. 1977	1924	2030	ditto	348	367	ditto	2272	2397	ditto
1 Jan. 1978	1892	1996	1908	344	363	392	2236	2359	2300
1 Jan. 1979	1828	1928	1844	326	343	367	2154	2271	2211
1 Jan. 1980	1917	2023	1937	288	304	325	2205	2327	2262
1 Jan. 1981	1851	1953	1870	282	298	315	2133	2251	2185
1 Jan. 1982	1800	1899	1822	261	275	289	2061	2174	2111
1 Jan. 1983	1749	1845	1769	259	272	284	2008	2117	2053

In 1982 the volume of total Netherlands gas reserves fell by 57 milliard (at 15 °C and 1.01325 bar absolute), which represents a relative reduction of 2.7%. Although this reduction was less than in the preceding year (when it was 3.4%), nevertheless it represented a continuation of the downward trend of total Netherlands gas reserves as a result of production, which began to manifest itself in 1976 after remaining remarkably stable, with a small interruption in 1979.

As at 1st January 1983, the recoverable reserves of the Groningen gas field represented about 72% of total Dutch gas reserves.

This meant that the Groningen field remained at the same level as in the two preceding years: as at 1st January 1980 its share had been 1% higher, while the year before it had accounted for 69% of the total. In 1982, the Groningen gas field supplied over 68% of the annual gas production of the Netherlands as a whole; in 1981 the corresponding figure had been just over 70% (1980: just over 72%, 1979: about 75% and 1978: about 84%). It follows that the contribution by the other, smaller producing gas fields to the total annual production of the Netherlands is increasing. The recoverable reserves in this smaller category of fields - 55 in number - accounts for 13.6% of the total for the Netherlands, including the continental shelf, as at 1st January 1983. Last year this figure was 13.1%, when the number of these smaller producing gas fields was one fewer.

Gas reserves onshore and in Netherlands territorial waters fell by 54 milliard m³ (at 15 °C and 1.01325 bar absolute) during the year under review. In absolute terms, this decrease is the same as the year before. The relative reduction was just over 2.8% (in 1981: just over 2.7%).

In 1982, the annual gas production from reservoirs within Netherlands territory amounted to 60 milliard m³ (at 15 °C and 1.01325 bar absolute); this is 11 milliard lower than in 1981, and represents a relative fall of 15.5% (1981: 9.3% lower). About 10% of the 1982 production of natural gas was compensated by the

aggregate effect of new gas finds and re-evaluation of known reservoirs. This addition to reserves, disregarding production, is 6 milliard m³ (at 15 °C and 1.01325 bar absolute), 2 milliard m³ of which is attributable to new finds.

Natural gas reserves in the Netherlands sector of the continental shelf fell by 3 milliard m³ (at 15 °C and 1.01325 bar absolute) in 1982, representing a decrease of 1.1% by comparison with the reserves as at 1st January 1982. Re-interpretation of existing gas reservoirs appraised in the course of 1982 yielded an increase in reserves of 14 milliard m³, while new finds yielded a 22 milliard m³ increase in offshore gas reserves. The combined effect of this is an increase in reserves, disregarding production, of 8 milliard m³. The new finds were unable to compensate for the decline in reserves caused by production despite the fact that they represented additional reserves amounting to twice that production figure.

Annex 13 shows the distribution of the initial gas reserves over the total number of reservoirs for the Netherlands as a whole. It is interesting to note the large number of reservoirs with small reserves: 48% of the total number of gas reservoirs have an initial reserve - i.e. disregarding production - smaller than 2 milliard m³ (at 15 °C and 1.01325 bar absolute).

4.4.2 Oil

Table 10 below summarises the development of oil reserves in the Netherlands over the period from 1st January 1970 to 1st January 1983.

Table 10: Development of oil reserves from 1970-1983
 (in 10^6 m³ at 15,6°C and 1,01325 bar absolute)

date Jan. 1	Netherlands onshore			offshore	Netherlands total
	Schoonebeek conc.	Rijswijk conc.	total		
1970	27	9	36	-	36
1971	26	8	34	-	34
1972	25	7	32	-	32
1973	23	6	29	-	29
1974	21	6	27	-	27
1975	30	10	40	14	54
1976	41	10	51	14	65
1977	40	9	49	16	65
1978	35	11	46	7	53
1979	34	11	44	9	53
1980	33	10	43	11	54
1981	30	11	41	14	55
1982	29	10	39	20	59
1983	28	10	38	49	87

The year 1982 was marked by the first oil production from the Netherlands offshore. As at 1st January 1983, a total volume of 0.16 million m³ of oil had been produced from the Helm and Helder fields in the Q1 production licence area of Union Oil Company of the Netherlands/Nedlloyd Energy B.V. Union Oil expects to begin producing from a third field in the same block, know as Hoorn, in the second half of 1983.

Effectively, Union Oil's production from block Q1 marks the beginning of oil production in the Netherlands sector of the continental shelf. This development will continue in the near future as the other offshore oil fields discovered in recent years are brought into production.

The year under review was also featured by the discovery of six offshore oil reservoirs, as was already mentioned in chapter 2. These new oil reservoirs, the most important of which are those struck by Mobil in block P8 and by Amoco in block P9, have led to a spectacular increase in the volume of oil reserves in the Netherlands sector of the North Sea. On 1st January 1983 the figure for offshore oil reserves was almost $2\frac{1}{2}$ times as large as the year before. The relative increase for the Netherlands as a whole is 47.5%. This increase is almost entirely attributable to the new oil discoveries offshore. This time, reinterpretation of existing offshore oil reservoirs made only a very small contribution.

The fluctuations in onshore oil reserves, quite apart from the fall due to production, are caused by the combined effects of the results of appraisal wells to evaluate known oil-bearing structures in the two concessions and resultant reinterpretations, by analysis of the production history and related reservoir behaviour, and also by extrapolating the expected results of secondary and tertiary recovery projects, such as cold and hot water injection and steam injection to enhance oil recovery from the reservoirs. The latter effect, in which economic

considerations obviously play a decisive role, is very important for Schoonebeek in particular, both at present and in the recent past.

4.4.3 Final remark

As a result of the fact that this report had to be drawn up on the basis of provisional reserves for a number of recently proven gas and oil reservoirs, full data on which were either not yet available or still undergoing interpretation, part of the compensatory effect upon the decline in reserves has been left out of account. The figures stated for reserves, therefore, should be regarded as likewise provisional, and they will certainly be revised in the near future.

5.1 Mining legislation*)

5.1.1 Netherlands mainland The production of oil and gas on the Netherlands mainland (including territorial waters) is governed by the Mining Act of 1810 (Bulletin des Lois, 285). Under this Act, such production is subject to a concession that is granted by the Crown, after hearing the Council of State. Physical access to the land in order to carry out works at the selected location(s) is subject to the consent of the landowner concerned. The concession gives the concession-holder perpetual ownership of the "mine", that is to say the hydrocarbons present below the surface.

The Mining Act 1903 (Official Journal 1904, No. 73) provides for the concession-holder to be served notice of default for failure to fulfil the obligations relating to exploitation of the mine that are incumbent on him by provisions of and pursuant to the Act. Furthermore, on the basis of the latter Act, the Mining Regulation 1964 (Official Journal, No. 538) was enacted, laying down rules governing the mining operations. These rules concern in particular safety aspects of the exploration for and production of minerals, the health of the workers involved, the work required to produce the minerals, and the prevention of danger, damage or nuisance by works and installations associated with production operations.

*) Please note that in the Netherlands system "mining" includes exploration for and production of oil and gas.

In addition to the landowner's consent, under Section 2 of the Minerals Exploration Act (Official Journal 1967, No. 258) exploratory drilling for hydrocarbons is subject to a licence ("boorvergunning") issued by the Minister of Economic Affairs. This requirement does not apply where a concession-holder undertakes drilling in a concession for which he has already been granted a production licence.

Before taking a definitive decision on the grant of concessions or drilling licences, the Minister of Economic Affairs will seek the advice of the inter-departmental

Advisory Commission on vulnerable areas to be safeguarded from drilling operations (known as the "Eisenburg Commission"), which is made up of representatives of the Ministries of Defence, Agriculture and Fisheries, Transport and Public Works, Housing, Physical Planning and Environment, Economic Affairs and the Geological Survey of the Netherlands. This Commission was appointed by the Minister of Economic Affairs in 1973, in order to guarantee well-balanced consideration of the interests of the energy supply against other interests such as nature conservation, the landscape and the environment.

Before issuing its advisory report, the Commission in its turn consults the authorities of the province(s) concerned. On the basis of this report, all drilling licences and concessions are made subject to a condition which prohibits the undertaking of drilling operations or erection of above-ground installations within those areas designated as being extremely vulnerable and of great value.

Furthermore, the holder of a concession of drilling licence is obliged to conduct consultations on the erection of structures, the construction of sites and roads, the route of pipelines to be laid and the construction of certain drilling locations, with the Interdepartmental Physical Planning Commission appointed by the Minister of Economic Affairs, with a view to ensuring that such works are integrated as acceptably as possible in their natural environment. This requirement has applied since 1966; concessions granted before that date are subject to the condition that consultations as mentioned above must be conducted with a physical planning commission to be appointed by the province involved. The Director of the Geological Survey of the Netherlands reports on the geological aspects and the boundaries of the area for which a licence has been applied for.

A General Administrative Order of 30th January 1953 (Official Journal, No. 37) defined above-ground works and installations associated with production of minerals. The significance of this Order is that such works and installations are not subject to the Labour Act 1979, the Industrial Safety Act 1934 and the Public Nuisance Act, but to the legislation on mining, in this case the Mining Regulation 1964, which incorporates among other things provisions which correspond with those of the Acts just mentioned.

5.2.1 Continental Shelf

Exploration for and production of minerals in the Netherlands sector of the continental shelf are subject to a regime which differs from the regulations which

apply on the mainland. The rules applicable on the continental shelf are laid down in the Mining Act, Continental Shelf, which came into effect on 1st March 1967, and in the Mining Regulation, Continental Shelf, based on that Act.

This Act distinguishes between three licences, namely:

- the prospecting licence, which gives a non-exclusive right to carry out seismic exploration for an area and a period determined in the licence;
- the exploration licence, which gives an exclusive right to carry out exploration activities, including the drilling of wells, for one or more blocks or block segments;
- the production licence, which gives an exclusive right to produce the mineral stated in the licence, in one or more blocks or block segments.

These licences may be made subject to restrictions and directions; as regards hydrocarbon exploration and production licences, these are laid down in the General Administrative Order of 1976 (Official Journal, No. 102). Among other things these concern financial arrangements, state participation, duration of the licence, and mandatory obligation on the licensee to perform operations.

Before 1976, a similar arrangement applied (General Administrative Order 1976, Official Journal, No. 24) which is also applicable to production licences for blocks where licensees held a exploration licence granted before the entry into force of the General Administrative Order of 1976.

Rules relating among other things to the safety, health and working conditions of persons employed on offshore installations are laid down in the Mining Regulation, Continental Shelf, (Official Journal 1967, No. 158) which is based on Section 26 of the Mining Act, Continental Shelf. This Regulation also contains requirements designed to protect shipping and the fishing industry, and to prevent pollution of the sea. Where certain matters cannot be covered by general rules, the Mining Regulation, Continental Shelf, provides in many respects for specific directions to be issued by the Inspector-General of Mines for the purpose of its practical implementation. The Inspector-General is responsible for the supervision of mining operations both onshore and offshore.

Pursuant to Section 3 of the Mining Act, Continental Shelf, General Administrative Orders may be issued prohibiting the grant of licences or exemptions for certain portions of the continental shelf designated in that Order. Certain areas, which are indicated on the Mining Legislation Chart (Official Journal 1976, No. 102) are excluded on account of shipping and defence interests. Furthermore, Section 12 of the Mining Act, Continental Shelf, provides for the issuance of General Administrative Orders subjecting certain areas designated in the Order to certain restrictions as regards the performance of exploration and production operations. These areas are known as restricted areas, and a number have already been designated, likewise on account of shipping and/or defence interests. These areas are also indicated on

the Mining Legislation Chart. The main consequences which the designation of a restricted area has for a licensee are that in order to place an installation in such an area, special approval is required from the Minister of Economic Affairs, who will grant that approval in agreement with his colleague at Transport and Public Works and/or Defence (in non-restricted areas, the approval of the Minister of Economic Affairs alone is sufficient). A licensee is only subject to the regime of a restricted area if it is granted the licence after the restricted area has been designated. Where licences have already been issued as of the date on which such an area is designated, its consequences (for example special approval) do not extend to the licence-holders concerned; neither do they apply to a production licence still to be granted under Section 13, subsection 1, of the Mining Act, Continental Shelf. Nevertheless, a code of practice is observed whereby, in coordination with the companies involved, the closest possible consultations are held with a view to achieving the best possible location - also from the shipping and defence angle - of installations in the latter situations as well.

On all applications for licences and concessions, both in offshore areas and on the mainland, the Geological Survey of the Netherlands first issues its evaluation, followed by the advice of the Mining Council.

5.1.3 Financial Arrangements The Dutch Government holds the view that the revenues earned from exploiting hydrocarbon resources on Dutch territory should also benefit the community at large.

The Government has chosen to leave the initiative to explore for and produce oil and gas with private enterprise. In this connection, a system of financial arrangements has been set up to share the revenues of oil and gas production between the State, as guardian of the public interest, and the oil company. The guiding principle here is that the oil company must be offered the prospect of a fair return on its investment. In the first place, oil companies, like any other industrial company, pay corporation tax on the profit earned on their operations. On top of that, additional financial arrangements have been imposed by means of the mining legislation and supplementary agreements, which can be divided into various categories.

A. Concessions granted before 1968

The agreements under which these concessions were granted include the provision that each year the concession-holder has to pay the State 10% of the net income as reported on a statement of income to be drawn up. In this statement of income, for the purpose of calculating the "share in the profit" (Winstaandeel = WA), the corporation tax due is counted as an expense item. On the other hand, the WA is an expense item for the purpose of calculating net income for this tax. The effective burden is therefore lower than a mere summation of the tax rates would suggest. In 1948, this arrangement produced an approximately 50/50 sharing of the profit at the tax rate then prevailing. At the present-day corporation tax rate of 48%, the cumulation of corporation tax and 10% WA represents an effective tax burden of around 51%.

Special conditions apply to the "Groningen" concession. When the concession was granted, the State stipulated that it would take a 40% share in production. On top of that, surplus revenue arrangements have been agreed with the licence-holder. Under these arrangements, the State is entitled to an additional payment (over and above corporation tax and WA) totalling 85% and 95% respectively of revenues exceeding certain reference price levels.

B. Licences based on the General Administrative Order 1967

When an exploration licence is received, a bonus of fls. 1000 per sq.km is payable. In addition, an annual land rental per sq.km is due. The production licence-holder also has to pay the State an annual land rental. The Royal Decree of 11th June 1976 laid down that these amounts are to rise in line with the annual wage index figure.

If the licence-holder is producing, it has to pay the State royalties. Royalties are calculated according to a "slice scale", the percentage of the slices rising according to the production volume. Royalties are based on the wellhead value of the produced hydrocarbons. Here again, a "profit share" (winstaandeel = WA) is payable on the profit made on production. This WA is calculated by a different formula from that applied to the previous category of concessions, because it was not certain that production operations on the continental shelf would always attract

corporation tax. The WA was therefore set at 50% of the net income reported on a statement of income, less tax payments, to be drawn up annually.

In addition, the State is entitled to take a 40% stake in the production of gas. This stake is held by DSM Aardgas B.V., a subsidiary of Dutch State Mines N.V. When granting the production licence, it is for the State to decide whether or not to take part. If it does so, the State refunds 40% of the cost of the actual exploration effort which led to the find. It does not therefore bear any of the general exploration risk, even if further exploration is continued in the licence area.

C. Licences based on the General Administrative Order 1976

The General Administrative Order of 1976 imposed a number of new conditions which are applicable only to licences granted after 1976.

The bonus and land rental amounts are doubled. The inflation indexation method was retained. The royalty rates were changed, as was the method for their calculation. The scale of royalties likewise progresses with production, but now applies to the entire production volume, unlike the slice system. The value taken for calculation purposes is the value of the hydrocarbons in place.

This method of calculation allows for the production costs, with a view to encouraging the development of high-cost fields. The WA rate was set at 70%, an extra allowance of 70% on the depreciation of physical assets

and 20% of operating costs being discounted. This arrangement, however, provides for a minimum of 50% to be payable in all cases, for which purpose the special allowance is disregarded.

The State was assigned a 50% stake for both oil and gas production.

D. Concessions granted after 1968

Concessions granted between 1968 and 1976 were made subject to the provisions of the General Administrative Order 1967.

Concessions granted since 1976 have been made subject to the provisions of the Royal Decree 1976.

5.2 Recent Developments

- 5.2.1 New Mining Legislation The year under review saw the beginning of an overall review of Dutch mining legislation. The intention is in particular to modernize the mining legislation as applicable to the mainland, and to modify it to meet practices which have already grown into custom in a variety of fields. At the same time a study will be carried out into the feasibility of integrating onshore and offshore legislation into a single statutory act. Special attention will also be devoted to statutory provisions concerned with nature and environmental conservation. In particular the procedures relating to the weighing of those interests require workable implementing procedures.
- 5.2.2 Amendment of Mining Regulation, Continental Shelf Previous reports have already referred to the preparation of a major amendment of the Mining Regulation, Continental Shelf. These amendments

embody the modification of a number of technical requirements, and they also supplement and intensify the requirements designed to prevent sea pollution.

Among other things, the amendments are aimed at preventing the discharge of oil and oil-containing mixtures, sewage and refuse connected with exploration and production operations, and at providing a contingency plan and organisation in case a disaster should strike an installation. In 1982 the preparatory work, which has reached an advanced stage, was brought to successful completion. The revised Mining Regulation, Continental Shelf, was published in the Official Gazette No. 82 of 1983.

5.2.3 Amendment of hydrocarbon production concessions

At the end of the year under review, the process of framing a rather comprehensive General Administrative Order amending the hydrocarbon production concessions granted under the Mining Act 1810, had been virtually completed.

The relevant Royal Decree may be expected to appear in the Official Gazette very shortly.

The amendments, which were agreed by the concession-holders involved, relate largely to requirements designed to prevent soil and water pollution during exploratory drilling for and the production of hydrocarbons, and the preservation and/or restoration of the landscape at drilling and production locations. In addition it provides coordination especially as regards time limits, for the conditions governing the physical planning consultations attached to the concessions and under

which those consultations are required to be conducted with a physical planning commission appointed or designated by the Minister of Economic Affairs. It further provides for concessions granted before 1968 to become subject to a mandatory geological reporting procedure identical to that imposed on subsequently granted concessions. Finally, in those concessions which also include territorial sea or other surface waters, the Order declares a number of requirements of the Mining Regulation, Continental Shelf, correspondingly applicable. The above amendment of that Regulation envisages the addition of requirements governing, inter alia, the prevention of sea pollution, the arrangement, completion and safeguarding of producing wells and the performance of repairs and maintenance on them, in addition to contingency plans, disaster management and the training of personnel with a view to the prevention or elimination of hazards.

5.2.4 Publication of the various hydrocarbon concessions

A publication is due to appear very shortly, prepared by the Ministry of Economic Affairs and listing all the concessions for the production of oil and gas granted to date and giving the text as amended - most recently by the above-mentioned General Administrative Order - on the occasion of enlargements of the concession field or otherwise. Copies of this publication will be sent automatically to the central government bodies concerned, the provinces involved and the holders of the various concessions. In addition, further copies may be ordered from the Mining and Coal Directorate of the Ministry.

5.2.5 Special surcharge on surplus revenues from gas

In July 1982, the draft bill for a statutory arrangement announced in May 1981 was submitted to Parliament, under which gas producers will be subject to a special levy. The surcharge will be imposed on "surplus revenues" of the gas producers in the Netherlands and the Netherlands sector of the Continental Shelf. The standing Parliamentary Commission for Economic Affairs held a public hearing about the bill on the 25th October 1982.

5.2.6 Priority Certificates

As mentioned above in section 5.1.1, the drilling of exploration wells for gas and oil requires a drilling licence under the Minerals Exploration Act. This Act put an end to the exploration freedom which had existed for a considerable period under Section 10 of the Mining Act 1810. This freedom to undertake exploration activities has so far be maintained unabridged with regard to geophysical surveying activities prior to the drilling of wells.

It follows from Section 5, subsection 1, of the Minerals Exploration Act which requires that an application for drilling licence must be accompanied by a chart on which the locations are indicated where the drilling is to take place during the first two years under that licence, that the legislator has proceeded on the assumption that an application for drilling licence is preceded by a ^{physi}geological survey. It is clear that for an indication of eligible drilling locations to be at all accurate, a fairly thorough knowledge of the configuration of the sub-surface is required.

Until a few years ago, companies engaged in minerals exploration in the Netherlands used to perform the necessary preliminary surveys automatically. However, the sharp rise in costs associated especially with seismic surveying and the processing of the resultant data, has led to a situation in which the Ministry of Economic Affairs has in recent years become increasingly confronted with applications for drilling licence that are scarcely if at all based on adequate supporting geological data. The companies had become less and less willing to undertake an expensive exploration programme without first being certain that they would be allowed to complete it by drilling wells. Consequently, it was not possible for such applications to be settled immediately. Failing sufficient data, an acceptable weighing of interests with regard to the designation of extremely vulnerable and highly valuable areas within which drilling is prohibited, proved impossible. In this way, exploration activities directed at finding the hydrocarbon deposits so vital to the energy supply and the entire economy of the Netherlands, threatened to stagnate.

After consultations with the Netherlands Oil and Gas Exploration and Production Association (NOGEP), an arrangement for geophysical exploration in support of applications filed for drilling licences was introduced, which was published in the Official Gazette No. 224 of 1982. Under this arrangement, "priority certificates" will be issued on application, to furnish the companies concerned the guarantee that, following seismic exploration of the priority area, an application for drilling licence, if any, will be treated with priority.

The priority areas will be demarcated in the geologically most acceptable way. The demarcation of a subsequent drilling licence, if any, will of course be based on the results of the geophysical exploration carried out in the meantime. This exploration must be completed within a set period (maximum 18 months). It should be noted that a priority certificate does not give its holder exclusive rights to undertake geophysical exploration in the priority area.

The arrangement outlined above serves to replace a former arrangement, which was negotiated with the NOGPA privately and was not published. Already, an application of a priority certificate has been submitted under this new arrangement.

5.2.7 Closed period for offshore exploration licences

The Official Gazette No. 219 of 12th November 1982 published the Royal Decree No. 40 of 5th October 1982 under Section 5 of the Mining Act, Continental Shelf, providing for a closed period for applications for offshore hydrocarbons exploration licences, commencing three months after the date on which that Decree was published in the Official Gazette and ending as from 1st January 1984. Furthermore, the above Decree provides for a closed period for the application for such licences from 1st April 1984 to 31st March 1985.

The reason for the former closed period is the fact that, under the provisions of Section 21 of Article II of the Royal Decree dated 27th January 1967 implementing Section 12 of the Mining Act, Continental Shelf, relating to exploration and production licences for or also for hydrocarbons, the term of validity of exploration licences granted in 1968 expires in

March/April 1983, thereby rendering a considerable part of the continental shelf available once again for the grant of licences. During the closed period, the final reports to be submitted by the licence-holders under Section 12, subsections 4 and 5, of Article II of the above-mentioned Royal Decree of 1967, within three months after expiry of the term of the licence will be studied. In addition, the closed period gives the companies involved an opportunity to perform any studies necessary in support of further licence applications. It may be expected that the oil companies will be fairly interested in the areas becoming available. With a view to careful consideration of the licence applications to be submitted, the Royal Decree of 5th October 1982 provides for a further closed period of one year, namely from 1st April 1984 to 31st March 1985, following a limited open period of three months. Allowing the companies only three months to submit licence applications will make it possible for a complete picture of the level of interest to be built up within that period, after which all the applications can be considered at the same time.

5.2.8 Memorandum on
Harmonization of North
Sea Policy

In May of the year under review, the Minister of Transport and Public Works submitted the Memorandum on Harmonization of North Sea Policy, which was drafted by the Interdepartmental Committee for North Sea Affairs as a policy intention for the Second Chamber. This Memorandum reflects the Government's desire to seek a further-reaching coordinated and balanced development of activities relating to the North Sea. Virtually all Ministries played a part in framing the Memorandum, which sets out the structure and the starting-points upon which the harmonization

process is based. In addition, a programme of specific measures has been drafted, selected by a ranking exercise from an inventory of existing fields of tension. Especially important to hydrocarbons exploration and production are those measures which will be taken on the initiative of the Ministry of Economic Affairs. Chief among these are:

- a programme of research into standards for the embedding of pipelines;
- an investigation into the need to extend the safety zone requirement to include mobile installations;
- as part of the overall review of the mining legislation, giving attention to the question of the extent to which supplementary conditions can be imposed when granting production licences;
- at the same time, considering whether requirements for accident prevention at installations (contingency plan), as incorporated in the amended Mining Regulation, Continental Shelf, can be made correspondingly applicable within the three-mile zone.

In addition, the above-mentioned Memorandum on developing the continental shelf also includes a number of priority points concerning:

- the planning of exploration and production operations;
- planning procedures of pipeline landfalls;
- supervision of exploration and production operations;
- representation of certain interests in the mining legislation.

The Memorandum will pass through a procedure in which it is subjected consecutively to public codetermination and external consultancy, and also administrative consultation. The Public Works Council is responsible for consultancy matters, and for this purpose it was extended on 8th September 1982 by the addition of a North Sea Commission, which includes representatives from all circles interested in North Sea policy. The Netherlands Oil and Gas Exploration and Production Association represents the mineral resources interests in this Commission.

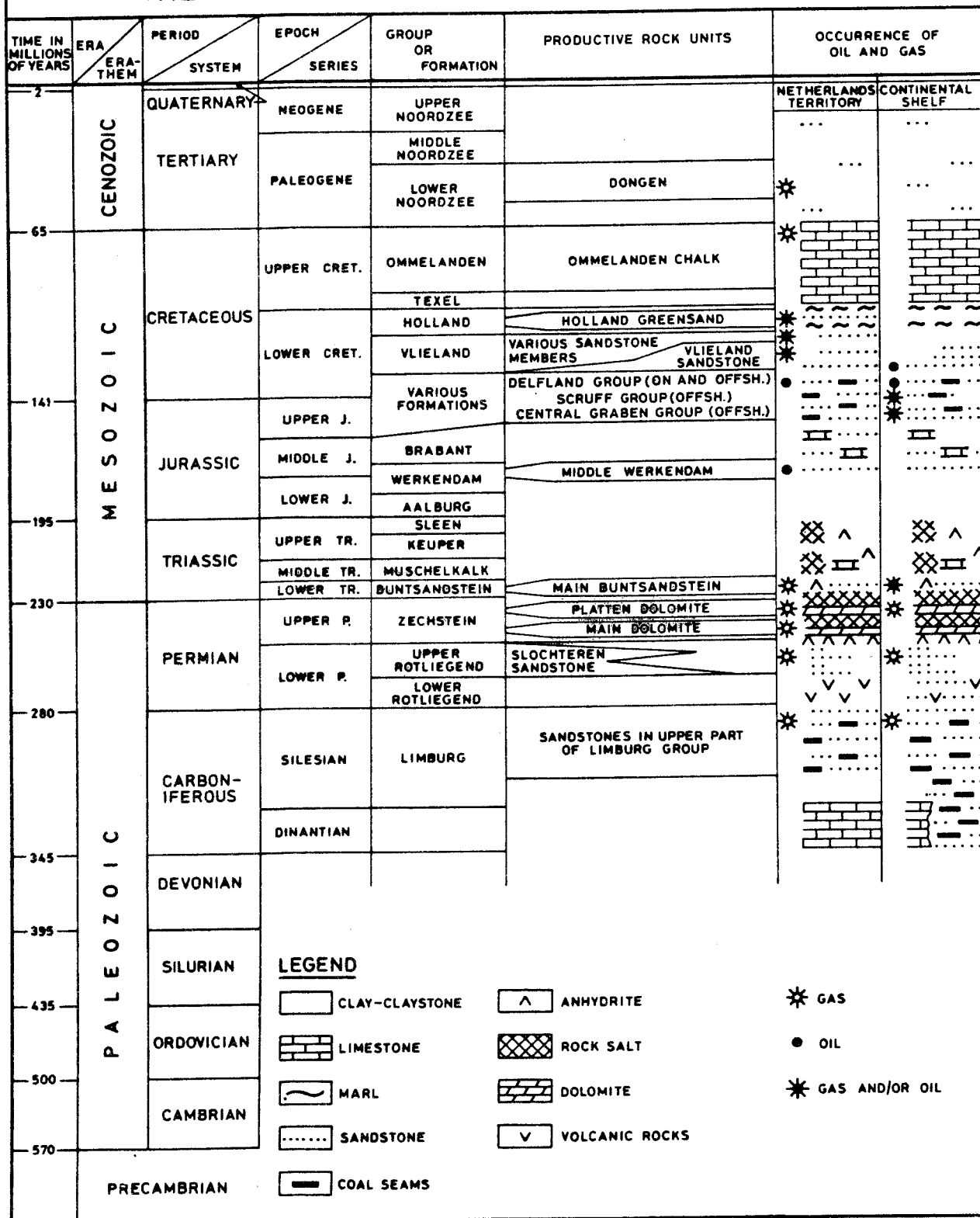
ANNEXES



1. Geological timetable with composite stratigraphic column of the Netherlands and the continental shelf.
 2. Exploratory activity (seismic surveying) 1963-1982,
 3. Exploratory activity (drillings + results) 1959-1982.
 4. Drilling activity (number of wells) 1960-1982.
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 13. Distribution of the initial reserves over all natural gas reservoirs as at January 1st 1983.
 14. Onshore drilling licences granted.
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18. The Netherlands offshore: exploration and production licences.
 - 18a. The Netherlands offshore: activities and changes in 1982.
 19. The Netherlands onshore: activities and changes in 1982.
 20. The Netherlands onshore: concessions and drilling permits.
 21. The Netherlands and the Netherlands part of the continental shelf: gas and oil reservoirs and pipelines.
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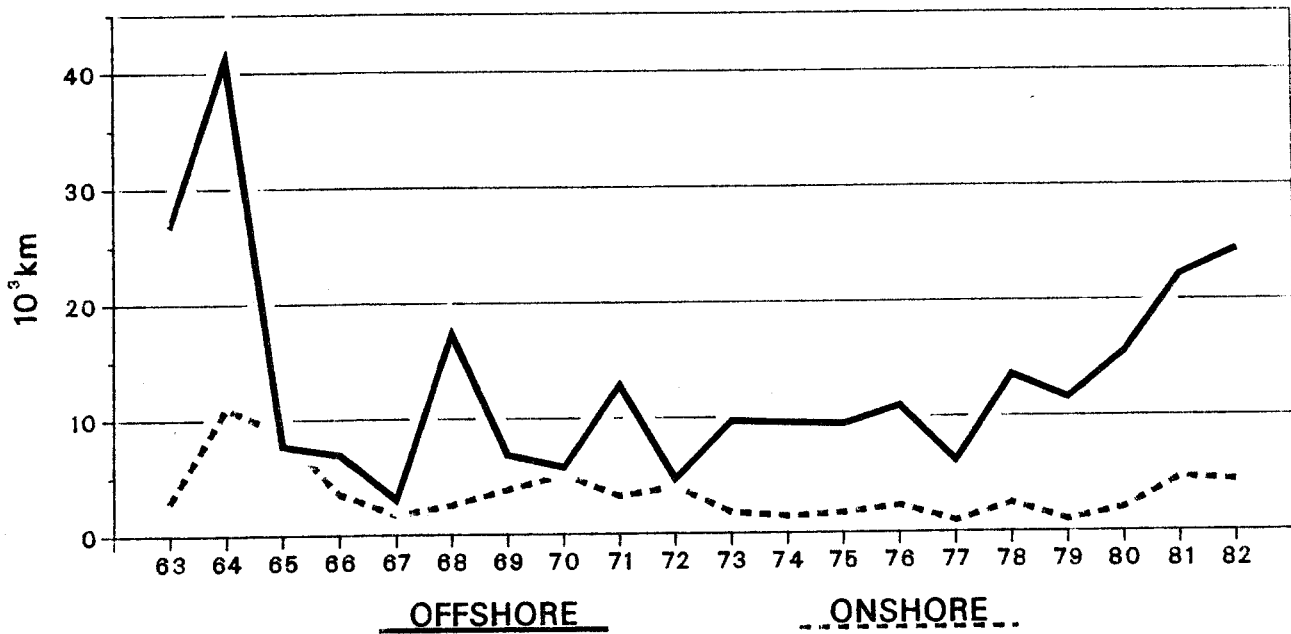


GEOLOGICAL TIMETABLE WITH COMPOSITE STRATIGRAPHIC COLUMN OF THE NETHERLANDS AND THE CONTINENTAL SHELF





Exploratory Activity
1963 - 1982
kms of Seismic Surveying



kms of Seismic surveying

	Offshore	Onshore	Total
1963	26.778	2.860	29.638
64	41.136	10.992	52.122
1965	7.707	8.885	16.592
66	6.939	30.510	10.449
67	3.034	1.673	4.707
68	17.349	2.541	19.890
69	6.846	3.857	10.703
1970	5.780	5.113	10.893
71	12.849	3.252	16.101
72	4.716	4.034	8.750
73	9.708	1.783	11.491
74	9.536	1.422	10.958
1975	9.413	1.706	11.119
76	10.963	2.318	13.281
77	6.184	0.948	7.132
78	13.568	2.466	16.044
79	11.575	0.986	12.561
1980	15.497	2.017	17.964
81	22.192	4.627	26.819
82	24.376 ^{*1}	4.363 ^{*2}	28.739

*1 = incl. 334 km² = 9585 km 3-D seismic surveying

*2 = excl. 172 km² 3-D seismic surveying



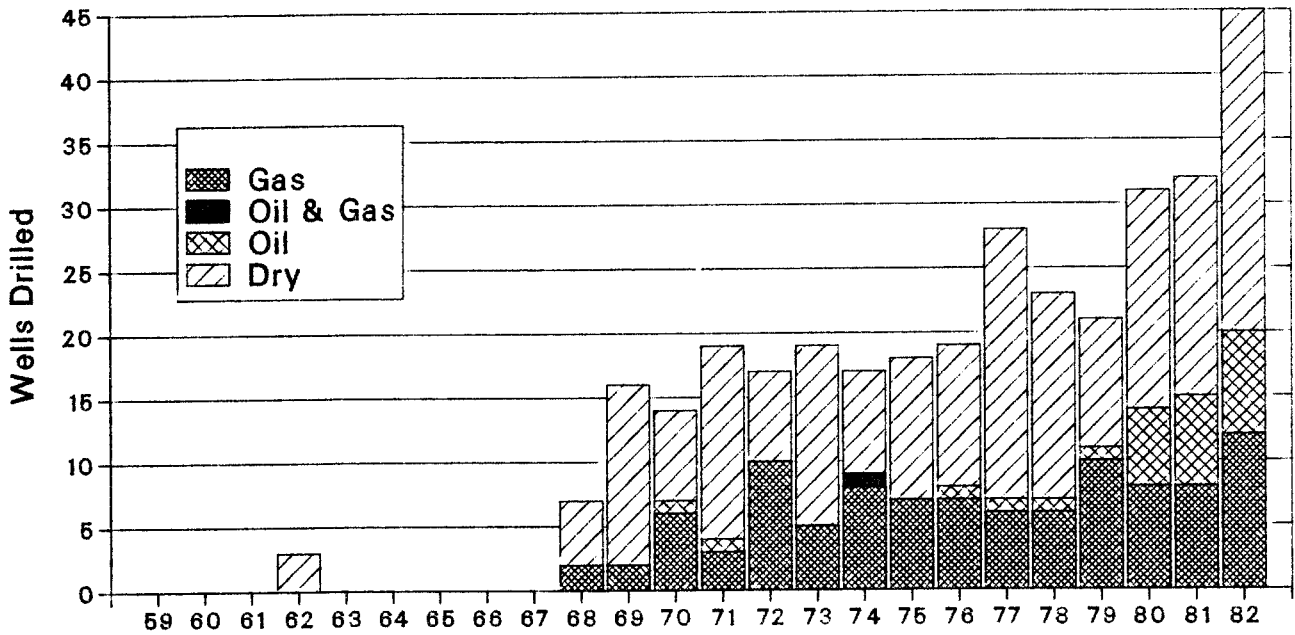
Exploratory Activity

1959 - 1982

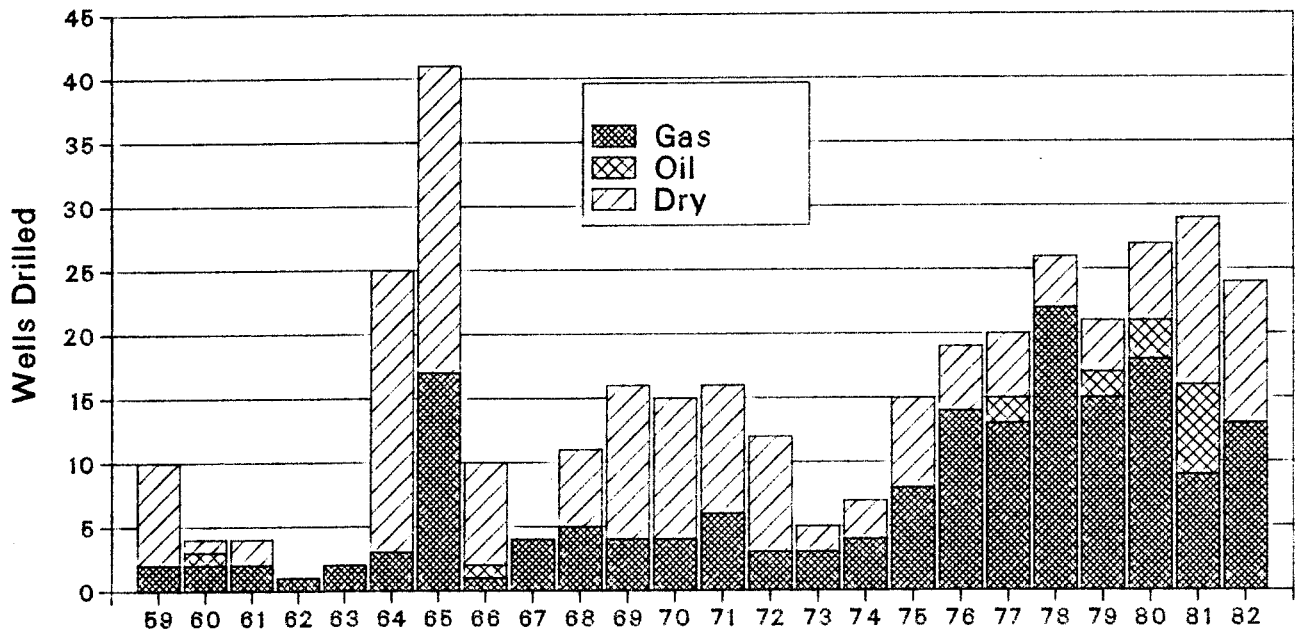
Drillings + Results

(Wildcats + Appraisal)

Offshore



Onshore



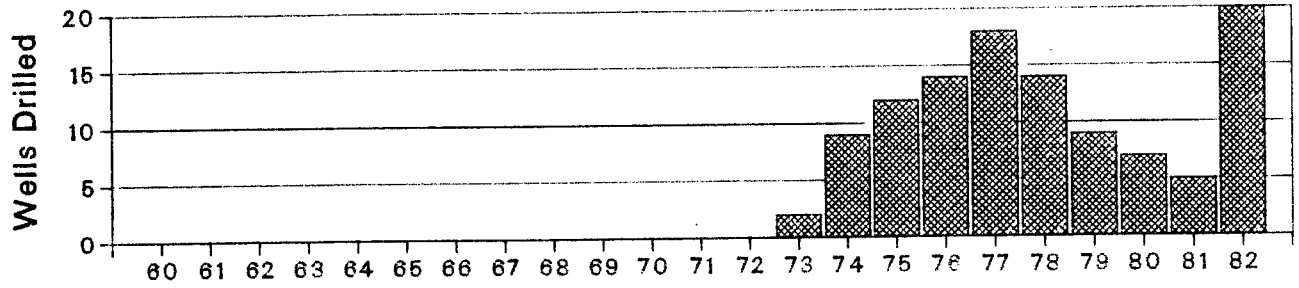


Production Activity

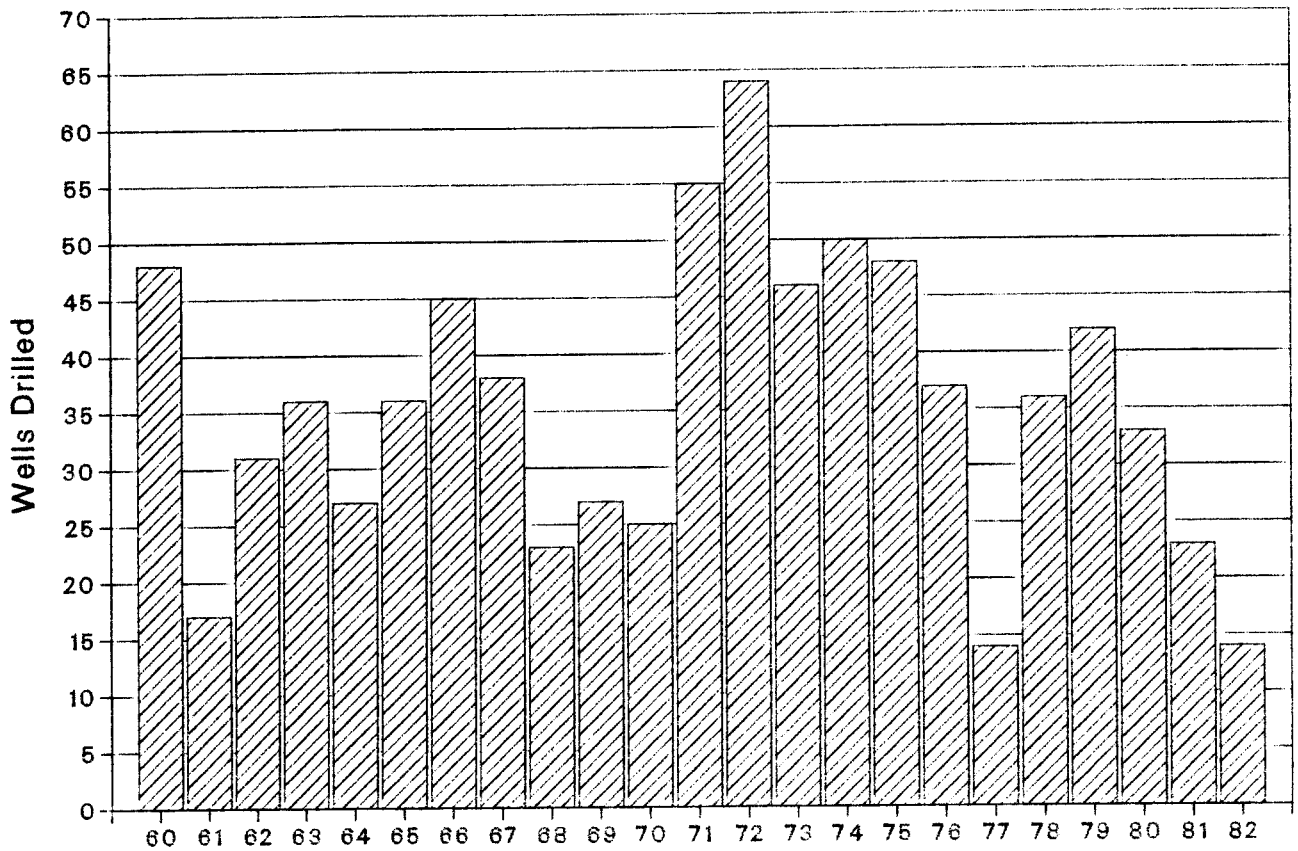
1960 - 1982

Number of Wells

Offshore



Onshore

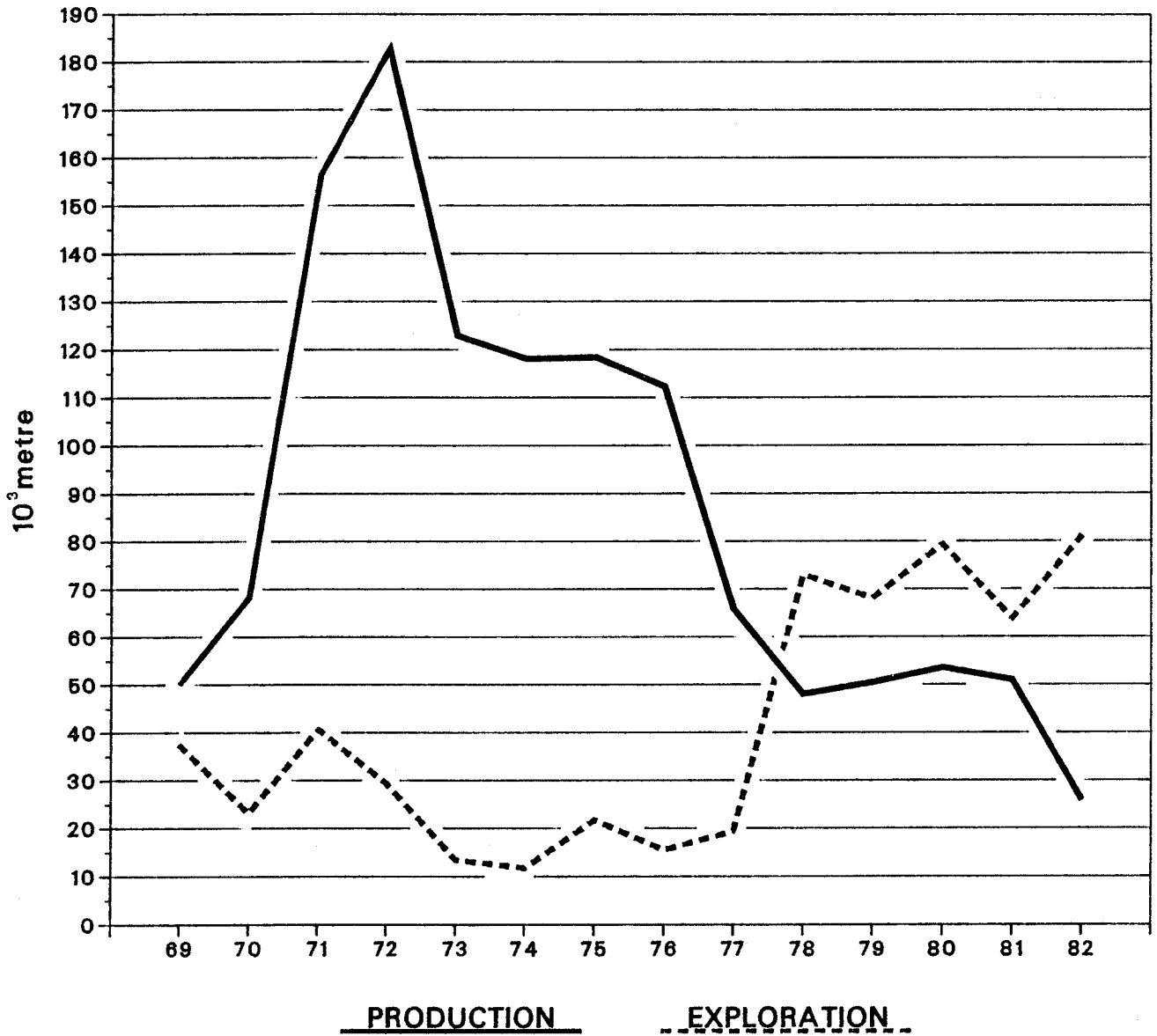




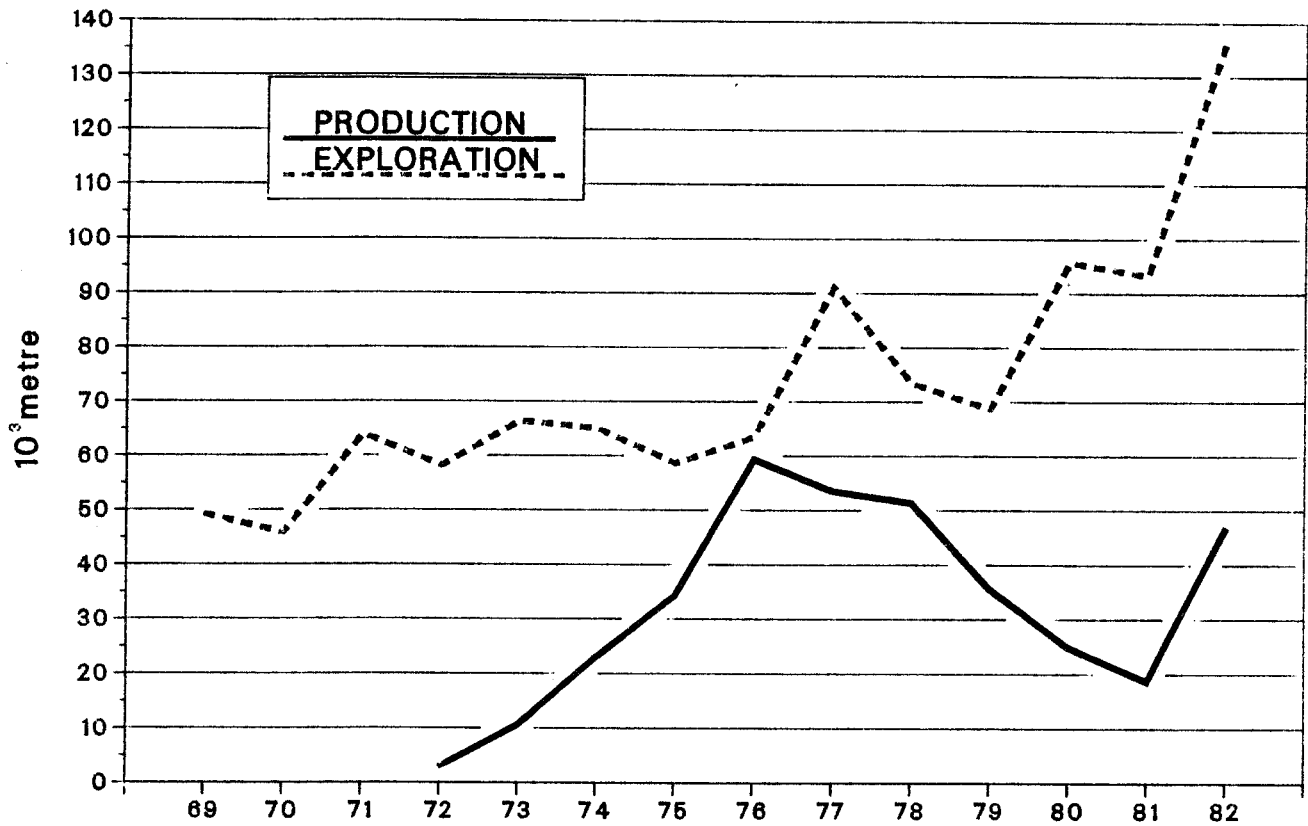
REVIEW OF DRILLING OPERATIONS IN THE NETHERLANDS DURING 1982

Geogr. position	Type of well	Gas	Oil	Water Disposal	Dry	TOTAL
Netherlands onshore	Exploration	5	-	-	9	14
	Appraisal	8	-	-	2	10
	Production	8	3	2	1	14
Total Neth. Onshore		21	3	2	12	38
Netherlands sector of the continental shelf	Exploration	6	7	-	22	35
	Appraisal	6	1	-	3	10
	Production	10	10	-	-	20
Total Netherlands sector of Cont. Shelf		22	18	-	25	65
Total Netherlands		43	21	2	37	103

Drilling Activity
1969 - 1982
number of metres
Onshore



Drilling Activity
1969 - 1982
number of metres
Offshore

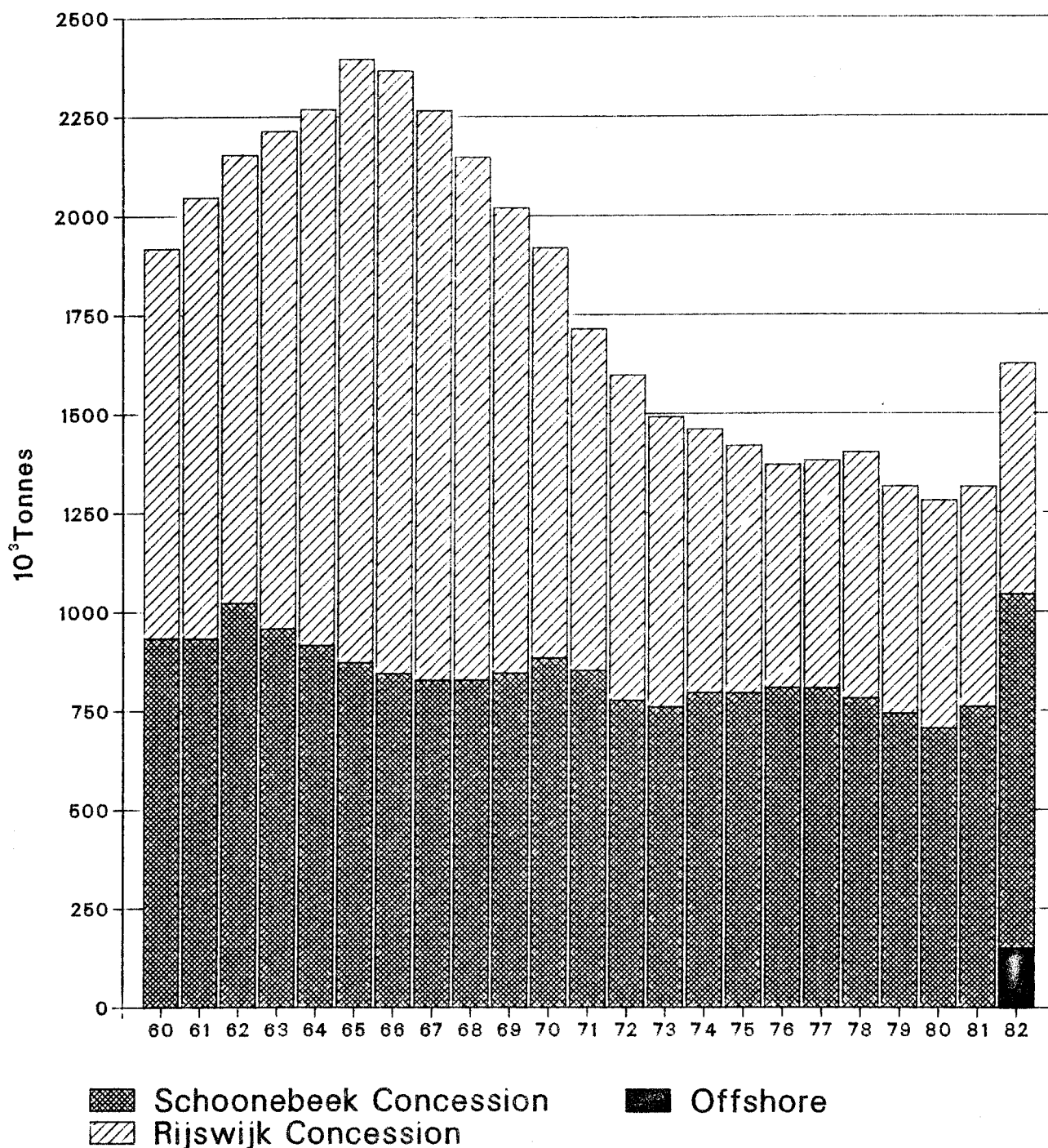


metres

	Onshore		Offshore		Total	
	Prod.	Exploration	Prod.	Exploration	Prod.	Exploration
1969	50.125	37.410	----	49.224	50.125	86.634
1970	68.270	23.146	----	45.838	68.270	68.984
71	156.419	40.621	----	63.979	156.419	104.600
72	182.787	29.334	2.966	58.176	185.753	87.510
73	122.838	13.414	10.616	66.425	133.454	79.839
74	118.046	11.728	23.045	65.051	141.091	76.779
1975	118.399	21.697	34.320	58.632	152.719	80.329
76	112.264	15.481	59.335	63.483	171.599	78.964
77	65.835	19.392	53.490	91.010	119.325	110.402
78	48.053	72.974	51.344	73.410	99.397	146.384
79	50.500	68.100	35.600	68.700	86.100	136.800
1980	53.564	79.363	24.864	95.702	78.425	175.065
81	51.005	63.852	18.674	93.245	69.679	157.097
82	26.029	81.070	46.867	137.403	72.896	218.473

Oil Production

1960 - 1982



tonnes	"Schoonebeek" Concession	"Rijswijk" Concession	Offshore	Total
1982	894.837	581.665	148.923	1.625.425
cumulatively through	29.981.807	23.284.398	148.923	53.415.128
	1 tonne = 1,10 m ³	1 tonne = 1,07 m ³	1 tonne = 1,07 m ³	

Oil Production

Annex 7a

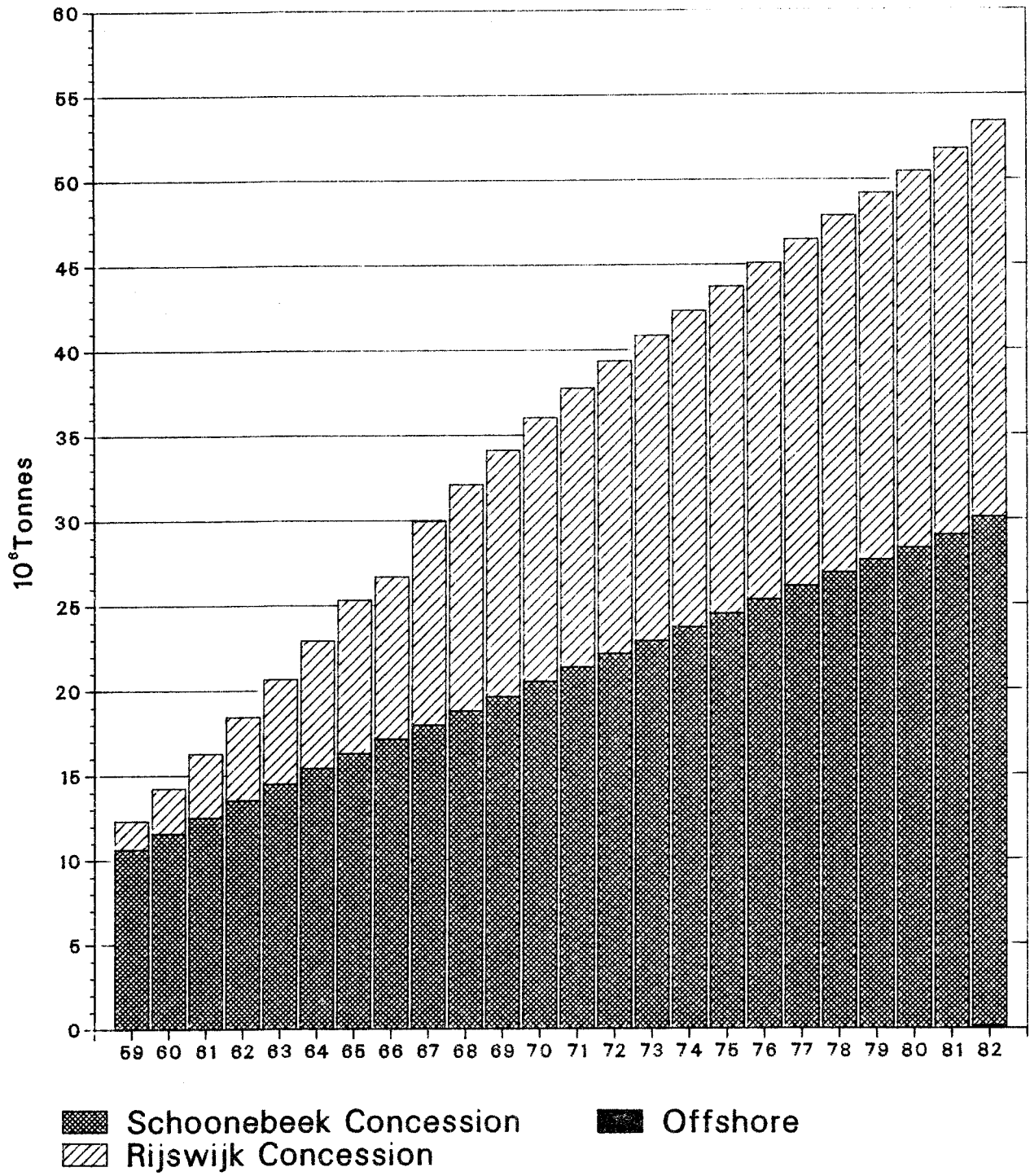
1960 - 1982

in tonnes

	Schoonebeek Concession	Rijswijk Concession	Offshore	Total
1960	933 898	983 770	-	1 917 668
61	933 092	1 113 450	-	2 046 542
62	1 022 559	1 131 929	-	2 154 488
63	957 829	1 255 936	-	2 213 765
64	915 568	1 352 934	-	2 268 502
1965	871 928	1 523 472	-	2 395 400
66	844 345	1 521 732	-	2 366 077
67	827 396	1 437 857	-	2 265 253
68	827 813	1 319 673	-	2 147 486
69	845 458	1 174 358	-	2 019 816
1970	884 071	1 034 566	-	1 918 637
71	852 039	862 144	-	1 714 183
72	775 665	821 478	-	1 597 143
73	759 260	732 454	-	1 491 714
74	795 332	665 607	-	1 460 939
1975	794 374	624 664	-	1 419 038
76	807 855	563 020	-	1 370 875
77	806 915	574 672	-	1 381 587
78	781 080	621 174	-	1 402 254
79	743 123	572 664	-	1 315 787
1980	705 488	574 612	-	1 280 100
81	760 135	554 927	-	1 315 062
82	894 837	581 665	148 923	1 625 425

Cumulative Oil Production

1959 - 1982



Cumulative Oil Production

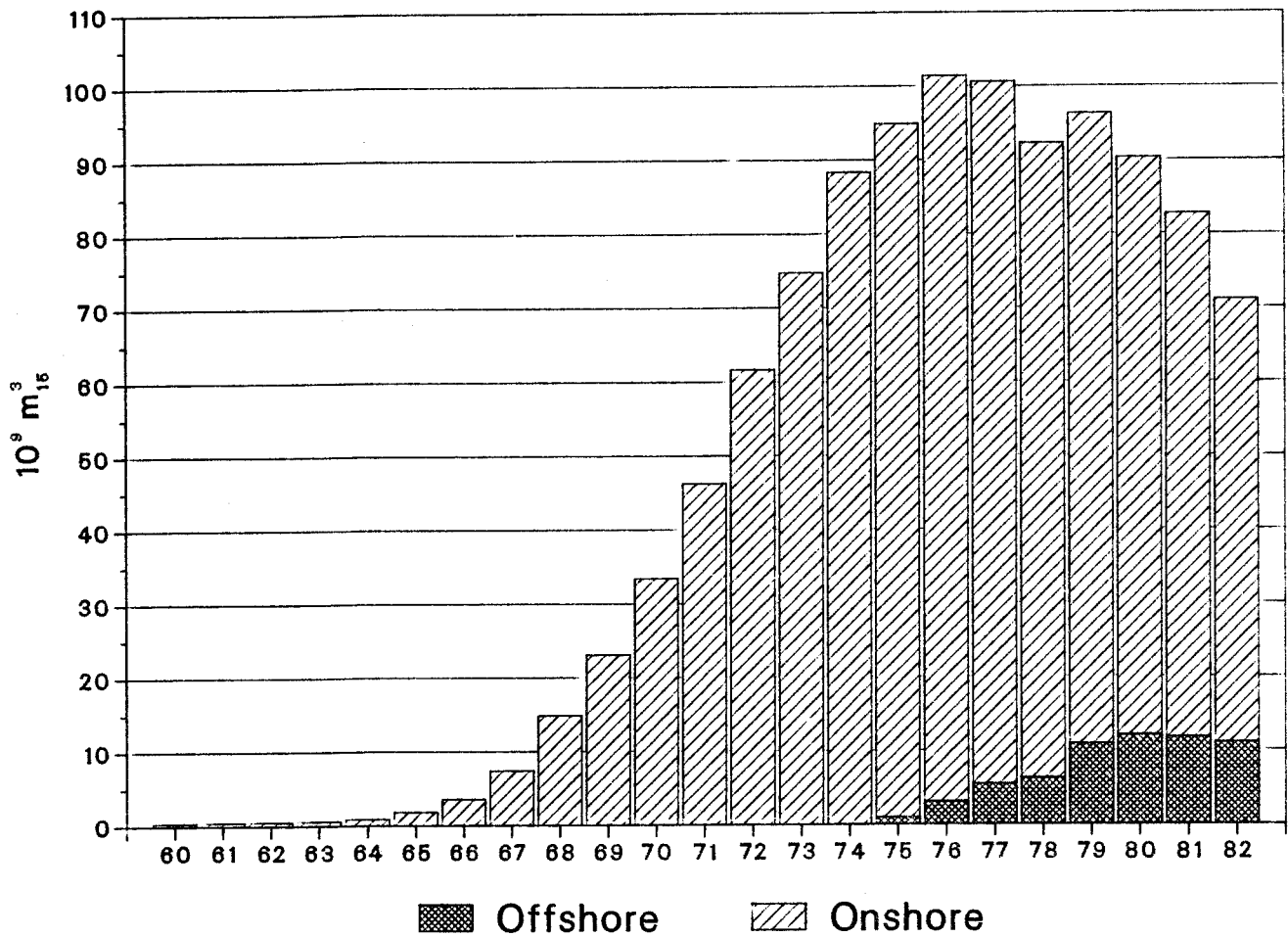
Annex 8a

10³ tonnes

	Schoonebeek concession	Rijswijk concession	Off- shore	Total
1959	10 642	1 685	-	12 327
1960	11 576	2 669	-	14 244
61	12 509	3 782	-	16 291
62	13 531	4 914	-	18 445
63	14 489	6 170	-	20 659
64	15 405	7 523	-	22 928
1965	16 277	9 046	-	25 323
66	17 121	10 568	-	27 689
67	17 948	12 006	-	29 954
68	18 776	13 326	-	32 102
69	19 622	14 500	-	34 122
1970	20 506	15 535	-	36 040
71	21 358	16 397	-	37 754
72	22 134	17 218	-	39 352
73	22 893	17 950	-	40 843
74	23 688	18 617	-	42 304
1975	24 482	19 241	-	43 723
76	25 290	19 804	-	45 094
77	26 097	20 379	-	46 476
78	26 878	21 001	-	47 879
79	27 621	21 573	-	49 194
1980	28 327	22 148	-	50 475
81	29 087	22 703	-	51 790
82	29 982	23 285	149	53 416

Natural Gas Production

1960 - 1982



Concession/ licence-holder	1982 10 ⁶ m ³ (15° C)	cum. through 1982 10 ⁶ m ³ (15° C)
Amoco	1 400.0	14 687.8
Chevron	711.6	3 991.1
NAM	57 033.5	1 001 440.4
Petroland	859.2	7 274.8
Onshore total	60 004.3	1 027 394.1
NAM	5 235.0	20 950.8
Pennzoil	2 430.8	14 208.0
Petroland	1 159.0	7 026.7
Placid	2 242.4	19 571.0
Union	6.1	6.1
Offshore total	11 073.3	61 762.6
Netherlands total	71 077.6	1 089 156.7

Natural Gas Production

Annex 9a

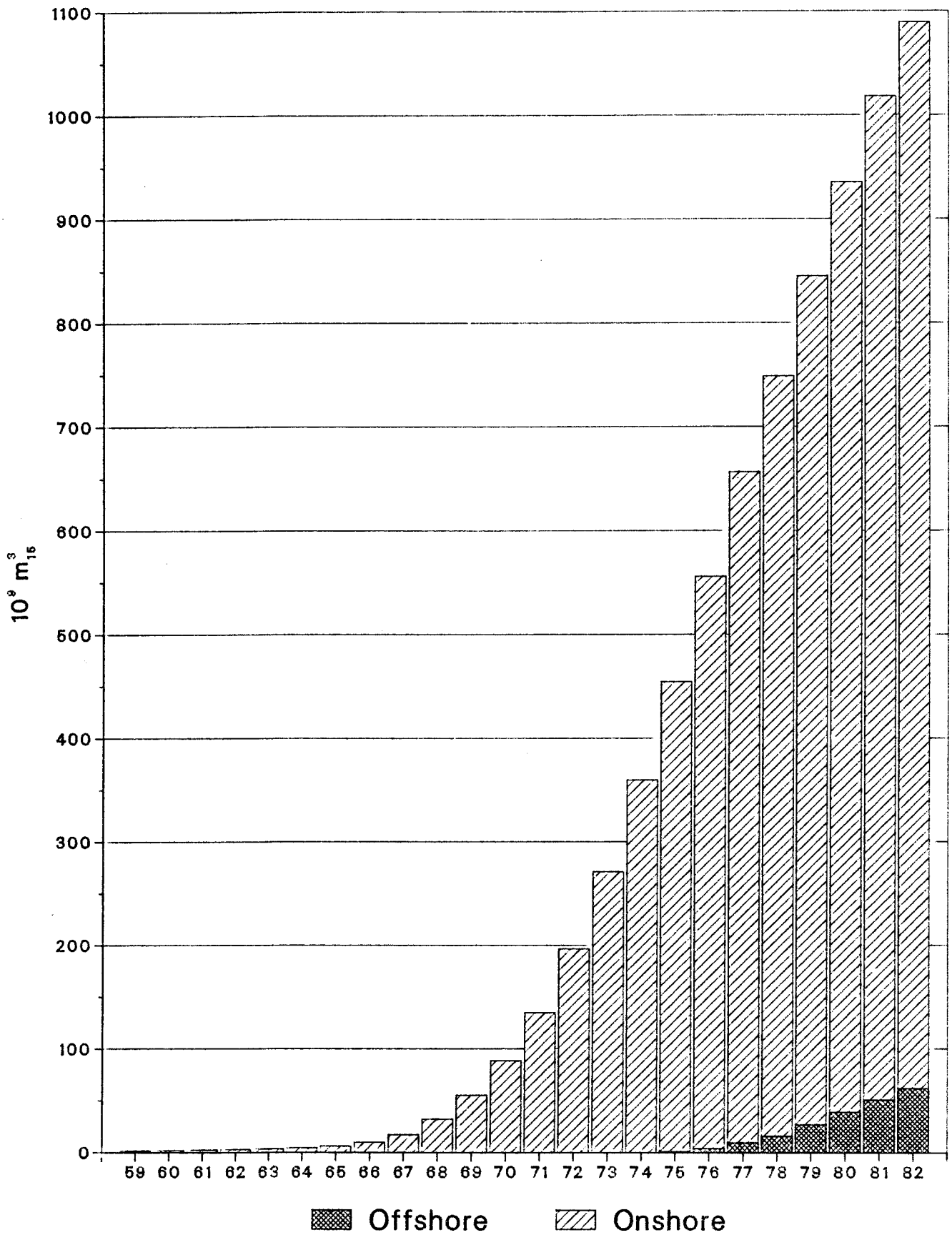
1960 - 1982

10^6m^3 (15° C)

	Onshore	Offshore	Total
1960	383.9	-	383.9
61	476.4	-	476.4
62	538.1	-	538.1
63	602.7	-	602.7
64	875.8	-	875.8
1965	1 817.6	-	1 817.6
66	3 564.0	-	3 564.0
67	7 422.7	-	7 422.7
68	14 889.0	-	14 889.0
69	23 097.3	-	23 097.3
1970	33 417.8	7.9	33 425.7
71	46 248.3	2.4	46 250.7
72	61 661.1	1.4	61 662.5
73	74 765.9	7.8	74 773.7
74	88 358.7	14.6	88 373.3
1975	93 924.0	963.3	94 887.3
76	98 307.4	3 092.7	101 400.1
77	95 108.6	5 479.6	100 588.2
78	85 980.4	6 298.5	92 278.9
79	85 367.2	10 925.5	96 292.7
1980	78 208.9	12 102.0	90 310.9
81	70 928.3	11 798.3	82 726.6
82	60 004.3	11 073.3	71 077.6

Cumulative Natural Gas Production

1959 - 1982



Cumulative Natural Gas Production

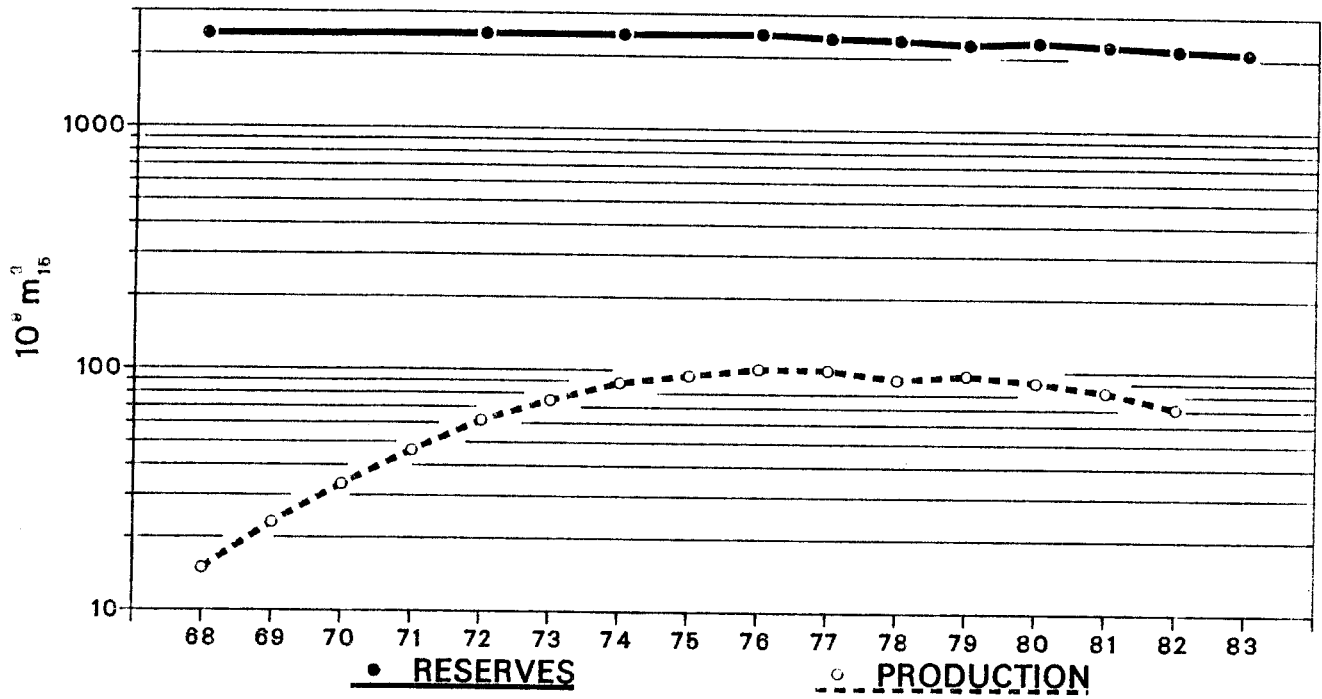
Annex 10a

10^6m^3 (15°C)

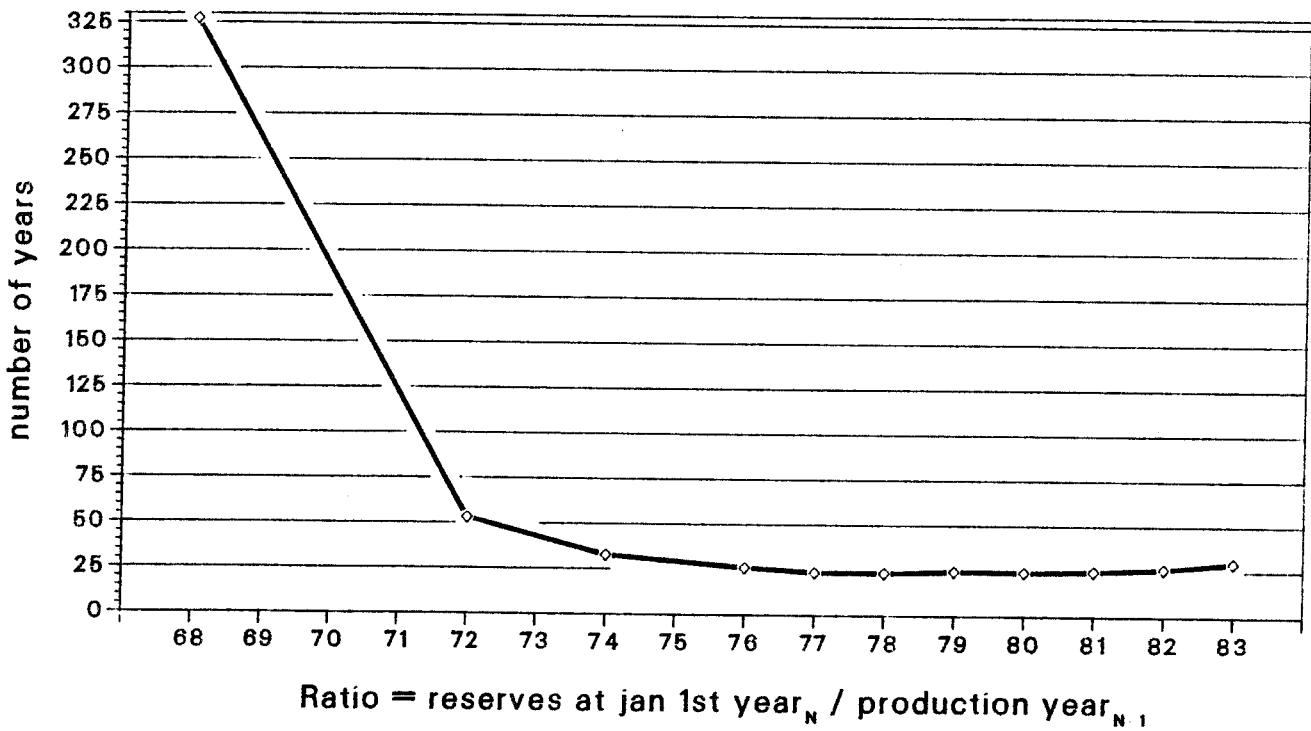
	Onshore	Offshore	Total
1959	1 445.6	-	1 445.6
1960	1 829.5	-	1 829.5
61	2 305.9	-	2 305.9
62	2 844.0	-	2 844.0
63	3 446.7	-	3 446.7
64	4 322.5	-	4 322.5
1965	6 140.1	-	6 140.1
66	9 704.1	-	9 704.1
67	17 126.9	-	17 126.9
68	32 015.8	-	32 015.8
69	55 113.1	-	55 113.1
1970	88 531.0	7.9	88 538.9
71	134 779.3	10.3	134 789.6
72	196 440.4	11.7	196 452.1
73	271 206.3	19.5	271 225.8
74	359 565.0	34.1	359 599.1
1975	453 489.0	997.4	454 486.4
76	551 796.4	4 090.1	555 886.5
77	646 905.0	9 569.7	656 474.7
78	732 885.4	15 868.2	748 753.6
79	818 252.6	26 793.7	845 046.3
1980	896 461.5	38 895.7	935 357.2
81	967 389.8	50 694.0	1 018 083.8
82	1 027 394.1	61 767.3	1 089 161.4



Natural Gas
1968 - 1982
Reserves, Production



Ratio





Units, categories and definitions

Natural gas and oil consist largely of hydrocarbons, that is to say combustible chemical compounds of the elements carbon and hydrogen. Hydrocarbons is also the inclusive term for natural gas and oil, together with the other constituents such as carbon dioxide, nitrogen and sulphur compounds; it does not, however, include water with dissolved salts.

Units

Natural gas reserves are stated in terms of m³ volume at 1.01325 bar (= 1 atmosphere absolute) pressure and at 0 °C and 15 °C. Amounts of natural gas are not only stated in these units of volume, but also in units representing the calorific value of the gas. For this purpose the volumes of gas from various wells producing various qualities of gas are converted in terms of combustion heat, to the (notional) volumes which would be measured if all the wells produced gas of the same quality as that of the Groningen reservoir, which has a gross calorific value of 35.17 MJ/m³ (= 8.400 kcal/m³) at 0 °C and 1.01325 bar. This standard is used by N.V. Nederlandse Gasunie among others, and is based on the average combustion heat of natural gas from the Groningen reservoir.

Oil reserves are also stated in m³ at the same pressure, but at a temperature of 15.6 °C (= 60 °F) in accordance with the internationally recognised standard of the American Petroleum Institute (API).

In order to render the units comparable with other fuels in drawing up and using energy balances etc., a number of conversion figures are given below:

1 ton of oil equivalent = $41.9 \cdot 10^9$ Joule = 1191 m³ of natural gas
(0 °C; 35.17 MJ)

1 milliard (10⁹)m³ of natural gas = 0.84 million tons oil-equivalent, usually
written as: 0.84 MTOE

1 ton of coal equivalent = $2.93 \cdot 10^{10}$ Joule = 833 m³ natural gas
(0 °C; 35.17 MJ)

1 milliard (10⁹)m³ of natural gas = 1.20 million tons coal equivalent.

This report distinguishes between three categories of reserves^{*)}.

1. Initial reserves The most realistic estimate of the volume of hydrocarbons present in a reservoir and which on the basis of geological and reservoir data is assumed to be recoverable under present technological and economic conditions.

2. Reserves at reporting date That part of the initial reserves remaining after deduction of the total volume of hydrocarbons produced from the reservoir concerned before the end of the reporting year.

3. Proven reserves That proportion of the reserves at reporting date for which the probability that in reality they will equal or exceed the estimates may be put at 90%.

4. Unproven reserves The difference between the reserves at reporting date and the proven reserves is termed "unproven reserves".

The reserves considered in this review relate to the reservoirs in geological structures in which the presence of hydrocarbons has been actually proven by

*) Compared with previous years, the definitions have been simplified on a number of points for the sake of greater clarity.

one or more wells. These data are based on an inventory of these reservoirs made by the Geological Survey of the Netherlands, which includes accumulations whose commercial recoverability has not been definitely established at the reporting date; for example, on account of their geographical position.

Methods for calculating hydrocarbon reserves

The volumetric method of calculating oil and gas reserves requires the following basic data or parameters.

1. The gross rock volume of the reservoir. This is obtained from interpretation of geophysical (mainly seismic) exploration data, from which the shape of the reservoir structure can be derived. The upper boundary is formed by the base of the sealing cap rock, while the lower boundary of the hydrocarbons accumulation is the gas/water contact or the oil/water contact, also called the water table.
2. The net/gross rock volume ratio of the reservoir. This is an important parameter because production from the accumulation will only take place from those parts which are sufficiently gas- or oil-permeable.
3. The porosity of the reservoir rock. This is the percentage of the rock volume occupied by the interconnected pores.
4. Gas or oil saturation. This is the percentage of the rock pore volume which is occupied by gas or oil. For the rest it contains water.

5. The volume ratio of a given weight quantity of gas or oil under standardised measurement conditions at the surface, compared with the pressure and temperature conditions in the reservoir. Determining factors are the reservoir pressure and temperature and the standard pressure and temperature. In the case of natural gas, the volume ratio is called expansion factor, which is also influenced by the gas deviation factor of the gas under afore mentioned conditions. The deviation factor indicates the extent to which the gas deviates in behaviour from an ideal gas. The standard pressure used is 1.01325 bar absolute (= 1 atmosphere absolute), and both 0 °C and 15 °C are used as standard temperature.

The volume ratio for oil is affected by the quantity of gas dissolved in the oil at the reservoir pressure and temperature, and which is released as associated gas under standard conditions. In the case of oil, the same standard pressure of 1.01325 bar is used, and the standard temperature is 15.6 °C (60 °F), based on the internationally recognised standard of the American Petroleum Institute (API).

The depth of the water table, the net/gross thickness ratio, the porosity and gas or oil saturation can all be found by interpretation of petrophysical well logs, from data obtained from rock samples, and by means of flow tests.

The latter data also allow the reservoir pressure and temperature to be calculated. The composition of the gas enables the deviation factor to be

calculated. The oil volume ratio is also determined by the composition of the oil itself.

Only part of the volume of hydrocarbons calculated in this way is recoverable. The recovery factor, as this amount is known, is determined by such factors as the quality of the reservoir rock (homogeneity, permeability), the production mechanism (depletion and/or water drive, for example) and also the reservoir pressure at which production is no longer warrantable (whether or not to apply compression in gas fields), limits to gas-oil and oil-gas ratios in production, and the accessibility of the hydrocarbon accumulation.

Once a new hydrocarbon accumulation has been discovered, the parameters are established which are needed to calculate the reserves, on the basis of the data yielded by the initial discovery well. At this stage it is still uncertain whether those parameters will in fact be applicable to the entire reservoir. As appraisal of the reservoir progresses and more data become available, the estimate of the reserves becomes increasingly accurate. For that reason these estimates have to be re-evaluated at regular intervals. This may result in upward or downward readjustments.

During the initial stage in the discovery of a field, the probability of hydrocarbons being present in part of the reservoir located further

away from the discovery well, or that is geologically somewhat isolated in relation to this well, can be expressed by applying a discount factor in calculating the reserves; this factor is assigned an individual value from case to case. In addition to the distance from the discovery well and "geological" position in relation to that well, this value is also determined inter alia by the development in the quality of the reservoir rock which may, geologically speaking, be reasonably expected, and by the nature and availability of exploration data in the immediate vicinity.

The material balance method, as used for certain producing gas accumulations, is based on comparison between the volume of natural gas withdrawn from the reservoir over a certain period from the first beginning of production, and the volume of gas remaining in the reservoir after that period. Extrapolation of the reservoir pressure, which decreases as production progresses, to a pressure at which commercial gas production is no longer possible, indicates the total volume of gas recoverable from the reservoir. This extrapolation takes account of the changing gas deviation factor as reservoir pressure falls. The quality and quantity of the relevant data on gas reservoirs which have been in production for a considerable period are often such that accurate determination of the rate of decline of the average reservoir pressure during the production history of the gas field can be

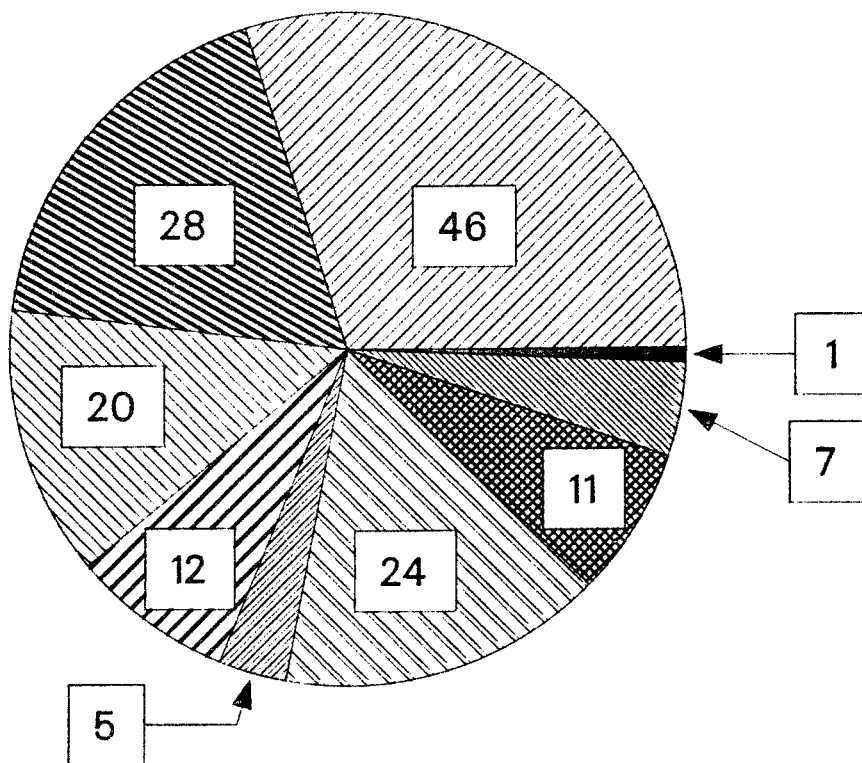
difficult in this method if estimating reserves. Other factors which can be a problem when using this method of estimating reserves are the complex structural make-up of the reservoirs and the inhomogeneous nature of the reservoir rock itself. Consequently, this method is usually not used by itself for the purpose of calculating reserves, but more as a back-up for the volumetric method and as an aid in evaluating the resultant calculations; to make this possible, however, it is necessary for sufficient gas to have been produced since gas first began to be withdrawn from the reservoir. Constant feedback with the volumetric procedure is practised.

Application of the material balance method to oil reservoirs is a good deal more complicated and requires considerably more data. This method has not been used here for the purpose of calculating oil reserves.

In estimating oil reserves by analysing the production history as explained in the previous section, the reservoir behaviour is predicted on the basis of the correlation between the production rate and cumulative production. The basis of this technique is extrapolation of trends in the production rate. This analysis also takes into account the gas/oil production ratio and the water/oil production ratio. The effect on the production performance of techniques designed to enhance production, such as for example water and steam injection, is estimated using the results

of field tests and enhanced recovery projects already completed or still in progress. Application of these secondary and tertiary recovery techniques also mean an increase in proven oil reserves.

Distribution of the Initial Reserves
over all Natural Gas Reservoirs
as at January 1st 1983



Total 154 Reservoirs

Initial Reserves in $10^9 m^3$

- | | | |
|-------------------|--------------------|----------------------|
| $0 \leq Res. < 1$ | $3 \leq Res. < 4$ | $10 \leq Res. < 20$ |
| $1 \leq Res. < 2$ | $4 \leq Res. < 5$ | $20 \leq Res. < 100$ |
| $2 \leq Res. < 3$ | $5 \leq Res. < 10$ | $Res. \geq 100$ |



ONSHORE DRILLING LICENCES GRANTED
and
NAMES AND ADDRESSES OF THE OIL COMPANIES
AT JANUARY 1, 1983

licence-holder	drilling licence	*	area in ha.	in force as from	Off. gaz.
1 <u>Amoco Netherlands Petroleum Company</u> Kon. Julianaplein 10 P.O.Box 11550 2502 AN THE HAGUE Tel.: 070 - 824241	Overflakkee	14	928	30-08-'80	175
2 <u>Amoco Netherlands Petroleum Company/ Petroland B.V.</u> Kon. Julianaplein 10 P.O.Box 11550 2502 AN THE HAGUE Tel.: 070 - 824241 - Dyas B.V. - Veba Oil Nederland BV - Thetis Aardolie Maat- schappij BV - Eurafrep Nederland BV - Corexland BV - Cofrland BV	Zuid-IJsselmeer	2	140.444	12-08-'74	163
3 <u>British Petroleum Exploratie Maatschappij Nederland BV/Gulf Oil Corporation</u> Catsheuvel 61 2517 KA THE HAGUE Tel.: 070 - 514661	Centraal Nederland	11	133.812	20-06-'80	129
4 <u>Chevron Oil Company of the Netherlands/ Texaco Netherlands Inc.</u> Conradkade 178 P.O.Box 944 2501 CX THE HAGUE Tel.: 070 - 614471	Donkerbroek	10	7.772	07-09-'79	185
5 <u>Chevron Oil Company of the Netherlands/ Texaco Netherlands Inc.</u> Conradkade 178 P.O.Box 944 2501 CX THE HAGUE Tel.: 070 - 614471	Zuid-Friesland II	8	72.760	30-06-'79	202

licence-holder	drilling licence	*	area in ha.	in force as from	Off. Gaz.
6 <u>Nederlandse Aardolie Maatschappij BV</u> Schepersmaat 2 P.O.Box 28 9400 AA ASSEN Tel.: 05920 - 69111	Utrecht	1	87.237	29-08-'71	175
	Terschelling West	6	329	26-06-'78	20
	Overijssel Noord II	9	18.245	12-06-'80	129
	Noordoost Overijssel	12	16.117	03-07-'80	135
	Noordoostpolder	13	61.090	05-07-'80	135
	Rotterdam-Zuid	16	23.517	09-01-'82	26
	Haulerwijk	17	4.742	02-03-'82	75
7 <u>Nederlandse Aardolie Maatschappij BV/DSM</u> Schepersmaat 2 P.O.Box 28 9400 AA ASSEN Tel.: 05920 - 69111	Brouwershavensche Gat	5	6.990	30-10-'77	227
	Zeeland	15	196.142	22-1-'81	27
8 <u>Petroland BV</u> De Horst 4 P.O.Box 93280 2509 AG THE HAGUE Tel.: 070 - 824001 - Thetis Aardolie Maat- schappij BV - Eurafrep Nederland BV - Corexland BV - Cofraland BV	Oosterend	3	9.100	13-08-'77	174
	Kolhorn	4	95.400	30-05-'78	113
	Gorredijk	7	71-000	29-09-'79	215

* Numbers refer to survey map in annex 20.

ONSHORE CONCESSIONS GRANTED
and
NAMES AND ADDRESSES OF THE OIL COMPANIES
AT JANUARY 1, 1983

concession-holder	concession	*	area in ha.	awarded	Off. gaz.
1 <u>Amoco Netherlands Petroleum Company</u> Kon. Julianaplein 10 P.O.Box 11550 2502 AN THE HAGUE Tel.: 070 - 824241 - Dyas BV - Veba Oil Nederland BV	Bergen	XIII	25.240	01-05-'69	94
2 <u>Chevron Oil Company of the Netherlands/ Texaco Netherlands Inc.</u> Conradkade 178 P.O.Box 944 2501 CX THE HAGUE Tel.: 070 - 614471	Akkrum	V	21.916,5	17-02-'69	46
3 <u>Nederlandse Aardolie Maatschappij BV</u> Schepersmaat 2 P.O.Box 28 9400 AA ASSEN Tel.: 05920 - 69111	Schoonebeek	VII	93.000	03-05-'48	110
	Tubbergen	VIII	17.700	11-03-'53	80
	Rijswijk	XIV	208.972	03-01-'55	21
	Rossum De Lutte	X	4.614	12-05-'61	116
	Groningen	II	297.000	30-05-'63	126
	Drenthe	VI	228.428	04-11-'68	234
	Tietjerksteradeel	III	35.995	17-02-'69	47
	Middelie	XII	68.152	01-05-'69	94
	Twente	IX	27.584	27-01-'77	26
4 <u>Nederlandse Aardolie Maatschappij BV/ Mobil Producing Netherlands Inc.</u> Schepersmaat 2 P.O.Box 28 9400 AA ASSEN Tel.: 05920 - 69111	Noord-Friesland	I	59.424	17-02-'69	47
5 <u>Petroland BV</u> De Horst 4 P.O.Box 93280 2509 AG THE HAGUE Tel.: 070 - 824001 - Thetis Aardolie Maat- schappij BV - Eurafrep Nederland BV - Corexland BV - Cofrland BV	Leeuwarden	IV	61.360	17-02-'69	46
	Slootdorp	XI	16.170	01-05-'69	94

Roman numerals refer to the survey map in annex 20.



OFFSHORE EXPLORATION LICENCES GRANTED
and
 NAMES AND ADDRESSES OF THE OIL COMPANIES
 AT JANUARY 1, 1983

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
1 <u>Amoco Netherlands Petroleum Company</u> Kon. Julianaplein 10, P.O.Box 11550 2502 AN THE HAGUE, Tel.: 070 - 824241 4th Round: P18a and P18b	201	21-12-'77	9('78)
2 <u>Amoco Netherlands Petroleum Company c.s. I.</u> Kon. Julianaplein 10, P.O.Box 11550 2502 AN THE HAGUE, Tel.: 070 - 824241 - Dyas BV, Exploratie- en Produktiemaat- schappij; - Veba Oil Nederland BV 1st Round: a) B10 4th Round: L5b, L8b	177 441	19-03-'68 26-05-'82	62 110
3 <u>Amoco Netherlands Petroleum Company c.s. II</u> Kon. Julianaplein 10, P.O.Box 11550 2502 AN THE HAGUE, Tel.: 070 - 824241 - companies named in 2, and: - Pennzoil Nederland Company c.s. (see under 27) - Petroland BV 1st Round: b) P9a, P9b, Q10a and Q13a	843	19-03-'68/'78	62/50
4 <u>Amoco Netherlands Petroleum Company c.s. III</u> Kon. Julianaplein 10, P.O.Box 11550 2502 AN THE HAGUE, Tel.: 070 - 824241 - Union Oil Company of the Netherlands - DSM NV - Dyas BV, Exploratie- en Produktiemaat- schappij - NedLloyd Energy BV - Veba Oil Nederland BV 4th Round: L16b and P11	595	10-07-'79	140

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
<p>5 <u>Amoco Netherlands Petroleum Company c.s. IV</u> Kon. Julianaplein 10, P.O.Box 11550 2502 AN THE HAGUE, Tel.: 070 - 824241</p> <ul style="list-style-type: none"> - BP Exploratie Maatschappij Nederland BV - Bricomin Exploration Company Ltd. - Dyas BV, Exploratie- en Produktiemaatschappij - Enserch Netherlands Inc. - GAO North Sea Ltd. - GAO North Sea Exploration Ltd. - Hubday Oil (Netherlands) Ltd. - Pacific Lighting Exploration Company - Petron Exploratie BV - Veba Oil Nederland BV <p>4th Round: P15c, Q10b, Q10c and Q13b</p>	499	26-11-'80	247
<p>6 <u>Bates Oil Corporation</u> Koninginnegracht 84, 2514 AJ THE HAGUE Tel.: 070 - 551687</p> <ul style="list-style-type: none"> - Houston Oil and Minerals of the Netherlands Inc. - Pogo Netherlands Inc. <p>4th Round: F8</p>	399	01-12-'78	2('79)
<p>7 <u>Bow Valley Industries Ltd. c.s. I</u> Mr. L.H.W. van Sandick, Blaak 101 3011 GB ROTTERDAM, Tel.: 010 - 147555</p> <ul style="list-style-type: none"> - C en K Nederland Corporation - Holland Sea Search NV - Saga Petroleum Nederland BV - Sceptre Oils Ltd. - Sunningdale Oils Ltd. - Vonk BV <p>2nd Round: Q14a</p>	13	14-10-'70/'80	208/209
<p>8 <u>Bow Valley Industries Ltd. c.s. II</u> Mr. L.H.W. van Sandick, Blaak 101 3011 GB ROTTERDAM, Tel.: 010 - 147555</p> <ul style="list-style-type: none"> - Kerr-McGee Corporation <p>4th Round: Q11b</p>	77	13-11-'80	230
<p>9 <u>B.P. Exploratie Maatschappij Nederland BV</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661</p> <p>4th Round: a) F7 and F10 b) F13 and F16</p>	800 807	26-09-'79 26-09-'79	200 200

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
10 <u>B.P. Exploratie Maatschappij Nederland BV/ Gulf Oil Corporation</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661			
1st Round: a) B13a and B16a	409	29-03-'68/'78	68/50
4th Round: c) F14b	201	26-06-'81	131
d) Q2a, Q5a and Q5b	39	25-02-'82	48
11 <u>B.P. Exploratie Maatschappij Nederland BV/ Gulf Oil Corporation c.s. I</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661 - Aminoil (Netherlands) Petroleum Company			
1st Round: b) P13a, Q4a and Q8	563	29-03-68/'78	68/50
12 <u>B.P. Exploratie Maatschappij Nederland BV c.s. I</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661 - Agip Nederland BV (first round only) - Bricomin Exploration Company Ltd. - Enserch Netherlands Inc. - GAO North Sea Ltd. - GAO North Sea Exploration Ltd. - Hubbay Oil (Netherlands) Ltd. - Pacific Lighting Exploration Company - Petron Exploratie BV - Scurry Rainbow Oil Ltd. (second round only) - Van Dyke Netherlands Inc.			
1st Round: b) B17a, F1a and F5	608	10-04-'68/'78	77/50
2nd Round: K4a, L1a and L1b	424	02-11-'70/'80	220/205

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
<p>13 <u>B.P. Exploratie Maatschappij Nederland BV</u> <u>c.s. II</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661</p> <ul style="list-style-type: none"> - Amoco Netherlands Petroleum Company c.s. I (see under 2) - Bricomin Exploration Company Ltd. - Enserch Netherlands Inc. - GAO North Sea Ltd. - GAO North Sea Exploration Ltd. - Hubbay Oil (Netherlands) Ltd. - Pacific Lighting Exploration Company - Petron Exploratie BV - Van Dyke Netherlands Inc. <p>1st Round: d) P2a, P15a and P15b</p>	436	10-04-'68/'78	77/69
<p>14 <u>B.P. Exploratie Maatschappij Nederland BV</u> <u>c.s. III</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661</p> <p>Companies named under 12, and:</p> <ul style="list-style-type: none"> - Petroland BV - Cofraland BV - Corexland BV - Eurafrep Nederland BV - Total Marine Exploitatie Maatschappij BV <p>1st Round: c) F12a, F15a and F18a</p>	629	10-04-'68/'78	77/50
<p>15 <u>B.P. Petroleum Development Ltd.</u> Catsheuvel 57-61, 2517 KA THE HAGUE Tel.: 070 - 514661</p> <p>2nd Round: Q16a</p>	85	22-09-'70/'80	191/90
<p>16 <u>Continental Netherlands Oil Company</u> Weigelia 25, Leidschenhage, P.O.Box 1122, 2260 BD LEIDSCHENDAM, Tel.: 070 - 209365</p> <ul style="list-style-type: none"> - Cities Service Neth. Petroleum Corporation - Den Norske Stats Oljeselskap AS - LL and E Netherlands Petroleum Company - Nederlandse Aardolie Maatschappij BV - Oranje-Nassau Energie BV - Petroland BV c.s. (see under 29) <p>1st Round: b) K18a, K18b and L16a</p>	431	18-04-'68/'78	79/57

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
<u>17 Mobil Producing Netherlands Inc.</u>			
Kon. Julianaplein 30, "Babylon"			
Tel.: 070 - 470144, P.O.Box 11630			
2502 AP THE HAGUE			
4th Round: a) F15b, F15c and G13	572	12-06-'79	127
b) G11, G14, G15 and G17	1.205	12-06-'79	127
c) B14 and B17b	525	25-10-'79	221
<u>18 Mobil Producing Netherlands Inc. c.s. I</u>			
Kon. Julianaplein 30, "Babylon"			
Tel.: 070 - 470144, P.O.Box 11630			
2502 AP THE HAGUE			
- Bow Valley Industries Ltd.			
- General Crude Oil Company International Ltd.			
- Pan Ocean Petroleum Netherlands Ltd.			
- Sceptre Oils Ltd.			
- Sunningdale Oils Ltd.			
3rd Round: P4a and P4b	82	19-12-'72/ '82	2('73)/ 1('83)
<u>19 Mobil Producing Netherlands Inc. c.s. II</u>			
Kon. Julianaplein 30, "Babylon"			
Tel.: 070 - 470144, P.O.Box 11630			
2502 AP THE HAGUE			
- Holland Sea Search NV			
- Kewanee Industries Inc.			
- Newmont Holland Inc.			
- Newmont Oil Company International			
- St. Joe Petroleum Holland Inc.			
- Sulpetro Ltd.			
- Tanks North Sea Ltd.			
- Tanks Oil and Gas Ltd.			
1st Round: b) P8a and S2	635	08-03-'68/'78	54/46
4th Round: P2b and P5	616	23-11-'78	248

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
20 <u>Nederlandse Aardolie Maatschappij BV</u>			
Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111			
1st Round: a) B18	198	08-03-'68/'78	54/50
b) F11a, F17a and L2	846	08-03-'68/'78	54/50
c) K17	414	08-03-'68/'78	54/50
2nd Round: a) L3a, L5a, L6a, L6b and G16a	552	21-09-'70/'80	191/177
b) P1	208	21-09-'70/'80	191/177
3rd Round: a) A14a and A18b	413	11-12-'72/'82	250/244
b) K1a, K1b, K3a, K3b, L15a	476	21-09-'70/'80	191/177
4th Round: a) L9	409	14-06-'78	128
b) E9, E12 and E15	1.203	14-06-'78	128
c) S1, S4 and S8	979	11-10-'78	211
d) O18a and R3a	238	11-10-'78	211
e) D18, K2 and K5b	807	08-06-'79	117
f) E17 and E18	808	19-02-'81	47
g) G18 and H16	477	26-03-'82	74
21 <u>Nederlandse Aardolie Maatschappij BV/</u>			
<u>Mobil Producing Netherlands Inc.</u>			
Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111			
1st Round: M8a, M9a, M11 and N7a	636	08-03-'68/'78	54/46
22 <u>Nederlandse Aardolie Maatschappij BV/</u>			
<u>Naamloze Vennootschap DSM</u>			
Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111			
4th Round: a) J3a	72	02-11-'76/'82	223/211
b) S3a, S5a	323	02-11-'76/'82	223/211
c) A9 and A12	529	20-12-'78	4('79)
d) P3	415	20-12-'78	4('79)
e) D6, D9, D15 and E7	859	24-02-'81	47
f) E5 and E8	797	24-02-'81	47
g) D3, E1 and E6	776	24-02-'81	47

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
<p>23 <u>Nederlandse Aardolie Maatschappij BV c.s. I</u> Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111</p> <ul style="list-style-type: none"> - Holland Sea Search NV - Newmont Holland Inc. - Newmont Oil Company International - Pan Canadian Petroleum Ltd. - Petrotex (Nederland) BV - St. Joe Petroleum Holland Inc. - Sulpetro Ltd. - Tanks North Sea Ltd. - Tanks Oil and Gas Ltd. - Zapata (Netherlands) Exploration Company <p>1st Round: d) Q7</p>	419	08-03-'68/'78	54/46
<p>24 <u>Nederlandse Aardolie Maatschappij BV c.s. II</u> Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111</p> <ul style="list-style-type: none"> - Aminoil (Netherlands) Petroleum Company - Clam Petroleum Company - Oranje-Nassau Energie BV <p>1st Round: L12a</p>	343	12-03-'68	54
<p>25 <u>Nederlandse Aardolie Maatschappij BV c.s. III</u> Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111</p> <ul style="list-style-type: none"> - Bow Valley Industries Ltd. - C en K Nederland Corporation - Pan Ocean Petroleum Netherlands Ltd. - Saga Petroleum Nederland BV <p>1st Round: Q11a</p>	85	28-03-'68/'78	74/50
<p>26 <u>Nederlandse Aardolie Maatschappij BV c.s. IV</u> Schepersmaat 2, P.O.Box 28, 9400 AA ASSEN, Tel.: 05920 - 69111</p> <ul style="list-style-type: none"> - Aminoil (Netherlands) Petroleum Company - Clam Petroleum Company - DSM NV <p>4th Round: L12b and L15b</p>	187	13-04-'78	84

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
27 <u>Pennzoil Nederland Company (Noord- winninggroep) c.s. I</u> Mauritskade 35, P.O.Box 13410 2501 EK THE HAGUE, Tel.: 070 - 924351			
- Amax Petroleum Corporation			
- Billiton Exploratie Maatschappij BV			
- Caland Exploratie BV			
- Delfzee BV			
- Estel Delfstoffen BV			
- Falcon Seaboard Inc.			
- Noordzee Selection BV			
- Nederlandse Aardolie Maatschappij BV (alleen M10 en E10a)			
1st Round: a) M10 and E10a	423	27-03-'68/'78	66/50
b) K5a	204	27-03-'68/'78	66/50
1st Round: b) P12	420	21-03-'68/'78	62/50
2nd Round: L8a	213	29-09-'70/'80	197/177
4th Round: D12, E13 and E14	1.051	02-03-'81	50
28 <u>Pennzoil Nederland Company (Noord- winninggroep) c.s. II</u> Mauritskade 35, P.O.Box 13410 2501 EK THE HAGUE, Tel.: 070 - 924351			
- companies named under 27, and:			
- Amoco Netherlands Petroleum Company c.s. (see under 2)			
4th Round: K10b	180	25-09-'79	200
29 <u>Petroland BV c.s.</u> De Horst 4, P.O.Box 93280, 2509 AG THE HAGUE, Tel.: 070-824001			
- Cofraland BV			
- Corexland BV			
- Eurafrep Nederland BV			
- Thetis Aardolie Maatschappij BV			
- Total Marine Exploitatie Maatschappij BV			
3rd Round: A16a	147	29-12-'72	13('73)
4th Round: a) M7	409	24-09-'79	200
b) O15a, O15b, P13b and P16a	496	10-04-'80	85
c) F9	399	28-08-'80	174
d) E4 and E16	802	25-02-'81	50

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
30 Placid International Oil Ltd.			
Kon. Julianaplein 15, P.O.Box 11727 2502 AS THE HAGUE, Tel.: 070 - 814581			
1st Round: b) F14a	202	03-04-'68/'78	71/50
3rd Round: A15	393	23-01-'73	27
4th Round: a) A8 and A11	771	01-06-'78	114
b) A5	90	02-04-'79	74
c) E10b and E11	601	01-04-'81	77
d) L11c	65	17-03-'82	67
31 Placid International Oil Ltd. c.s. I			
Kon. Julianaplein 15, P.O.Box 11727 2502 AS THE HAGUE, Tel.: 070 - 814581			
- Arco Netherlands Inc.			
- Canadian Superior Oil (Nederland) BV			
- Netherlands North Sea Superior Ltd.			
- Sinclair Netherlands Oil Company			
1st Round: K12	411	01-04-'68	71
32 Placid International Oil Ltd. c.s. II			
Kon. Julianaplein 15, P.O.Box 11727 2502 AS THE HAGUE, Tel.: 070 - 814581			
- Boele's Scheepswerven en Machinefabriek NV			
- Eason Netherlands Inc.			
- Goal Petroleum Plc.			
- Golden Eagle (Netherlands) BV			
- KTI Resources Ltd.			
- Mapco Netherlands Olie- en Gasexploratie BV			
- Sceptre Oils Ltd.			
1st Round: K9a and K9b	211	03-04-'68/'78	73/50
33 Placid International Oil Ltd. c.s. III			
Kon. Julianaplein 15, P.O.Box 11727 2502 AS THE HAGUE, Tel.: 070 - 814581			
- Eason Netherlands Inc.			
- KRC of Holland Inc.			
- Nederlandse Aardolie Maatschappij BV			
- Sceptre Oils Ltd.			
2nd Round: L14	412	15-10-'70	209

licence-holder	area in sq. km	in force as from/ relinquishment	Off. gaz.
34 <u>Placid International Oil Ltd. c.s. IV</u> Kon. Julianaplein 15, P.O.Box 11727 2502 AS THE HAGUE, Tel.: 070 - 814581 -Eason Netherlands Inc. - Goal Petroleum plc. - Golden Eagle (Netherlands) BV - KTI Resources Ltd. - Mapco Netherlands Olie- en Gasexploratie BV - Sceptre Oils Ltd.			
4th Round: K9c	198	30-05-'80	114
35 <u>Union Oil Company of the Netherlands/ NedLloyd Energy BV</u> Scheveningseweg 56, 2517 KW THE HAGUE Tel.: 070 - 520591			
1st Round: a) F4a	314	09-04-'68/'78	77/50
b) K16	267	09-04-'68/'78	77/50
2nd Round: L11b and L17a	224	11-02-'71/'81	39/31
4th Round: a) K18c and P9c	515	21-06-'79	127
b) B16c, E3 and F1b	764	04-06-'81	118
c) L1c	288	19-05-'82	110
36 <u>Union Oil Company of the Netherlands/ Mobil Producing Netherlands Inc./Holland Sea Search NV c.s.</u> Scheveningseweg 56, 2517 KW THE HAGUE Tel.: 070 - 520591 - NedLloyd Energy BV - Kewanee Industries Inc. - Newmont Holland Inc. - Newmont Oil Company International - St. Joe Petroleum (Netherlands) Corporation - Sulpetro Ltd. - Tanks North Sea Ltd. - Tanks Oil and Gas Ltd.			
4th Round: Q4b	284	19-09-'79	192
	<u>36.535</u>		
	=====		
TOTAL			

Nederlandse Olie en Gas Exploratie en Productie Associatie (NOGEPa)
Secretary A.J. Bosselaar
Koningin Julianaplein 30-08.2
Gebouw Babylon
2595 AA THE HAGUE
Tel.: 070 - 855634.

OFFSHORE PRODUCTION LICENCES GRANTED
and
NAMES AND ADDRESSES OF THE OIL COMPANIES
AT JANUARY 1, 1983

licence-holder	block	round explora- tion licence	area in sq. km	in force as from	Off. gaz. tion
1 <u>Mobil Producing Netherlands Inc.</u> Kon. Julianaplein 30 P.O.Box 11630 2502 AN THE HAGUE Tel.: 070 - 470144 - Holland Sea Search NV; - Kewanee Industries Inc.; - Newmont Holland Inc.; - Newmont International BV; - Newmont Oil Company International; - St. Joe Petroleum Holland Inc.; - Sulpetro Ltd.; - Tanks North Sea Ltd.; - Tanks Oil and Gas Ltd..	P 6	1	417	14-04-'82	83
2 <u>Nederlandse Aardolie Maatschappij BV</u> Schepersmaat 2 P.O.Box 28 9400 AA ASSEN Tel. 05920 - 69111	K14 K15 K 7 F 3	1 2 1 1	412 412 408 396	16-01-'75 14-10-'77 08-07-'81 09-09-'82	18 214 140 215
3 <u>Nederlandse Aardolie Maatschappij BV c.s. A</u> Schepersmaat 2 P.O.Box 28 9400 AA ASSEN tel. 05920 - 69111 - Aminoil (Neth.) Petroleum Comp.; - Clam Petroleum Comp.; - Oranje Nassau Energie BV.	K 8 K11 L13	1 1 1	409 411 412	26-10-'77 26-10-'77 26-10-'77	223 223 223

licence-holder	block	round explora- tion licence	area in sq. km	in force as from	Off. gaz. 203 28
4 <u>Pennzoil Ned. Company c.s. A</u> (Noordwinningsgroep) Mauritskade 35 P.O.Box 13410 2501 EK THE HAGUE Tel. 070 - 924351 - Amax Petroleum Corp.; - Billiton Exploratie Mij. BV; - Caland Exploratie BV; - Delfzee BV; - Estel Delfstoffen BV; - Falcon Seaboard Inc.; - Noordzee Selection BV.	K13	1	324	03-10-'73	203
	K10a	1	195	26-01-'83	28
5 <u>Petroland BV c.s. A</u> De Horst 4 P.O.Box 93280 2509 AG THE HAGUE Tel. 070 - 824001 - Corexland BV; - Cofraland BV; - Eurafrep Nederland BV; - Thetis Aardolie Mij. BV; - Total Marine Exploitatie Mij. BV.	K 6	1	407	20-06-'75	126
	L 7	1	409	20-06-'75	126
	L 4a	2	312	30-12-'81	82
	F 6	2	398	09-09-'82	215
6 <u>Placid International Oil Ltd.</u> Kon. Julianaplein 15 P.O.Box 11727 2502 AS THE HAGUE Tel. 070 - 814581	L10	1	411	13-01-'71	20
	L11a	(spont.)	185	13-01-'71	20
7 <u>Union Oil Company of the Netherlands/NedLloyd Energy Q/1 BV</u> Scheveningseweg 56a 2517 KW THE HAGUE Tel. 070 - 520591	Q1	1	415	11-07-'80	138
8 <u>Union Oil Company of the Netherlands/NedLloyd Energy BV</u> Scheveningseweg 56a 2517 KW THE HAGUE Tel. 070 - 520591	F2a	1	306	24-08-'82	215

PRODUCTION LICENCES APPLIED FOR

licence-holder	block	round explora- tion licence	in force as from	Off. gaz.
- Placid International Oil Ltd. c.s. I	K12	1	25-05-'77	100
- Ned. Aardolie Maatschappij BV	K17	1	13-03-'78	51
- Ned. Aardolie Maatschappij BV c.s. I	L12a	1	13-03-'78	51
- Ned. Aardolie Maatschappij BV	P 1	2	08-10-'80	195
- Placid International Oil Ltd c.s. III	L14	2	20-10-'80	203
- Ned. Aardolie Maatschappij BV	L15a	3	15-01-'81	9
- Ned. Aardolie Maatschappij BV c.s. IV	L12b/L15b	4	15-01-'81	9
- Union Oil Company of the Netherlands/ NedLloyd Energy BV	L11b	2	12-03-'81	49
- Continental Netherlands Oil Comp. c.s.	K18a+b	1	02-09-'81	167
- Continental Netherlands Oil Comp. c.s.	L16a	1	16-11-82	221



