Rondeel et al. (eds), Geology of gas and oil under the Netherlands, 1996 / *Geologie en Mijnbouw* **74**: 341–344, 1996.

The role of oil and gas in the Dutch energy policy *

C.W.M. Dessens
Ministry of Economic Affairs, Postbus 20101, 2500 EC Den Haag, the Netherlands

Introduction

Recently I have been told about an article of Dr. Van Waterschoot van der Gracht, one of the founding fathers of the Geological Survey of the Netherlands, in an AAPG Bulletin, dating from 1936, in which he stated: "I believe that Palaeozoic accumulations of petroleum may be expected in Europe" (Van Waterschoot van der Gracht 1936). We can smile about it today, but at the time, it was a daring prediction.

At most places in Europe, the Palaeozoic formations lie at great depths, deeper than anyone had drilled at the time. Dr. Van Waterschoot's 1936 forecast can be compared with someone saying today that large gas reserves are to be found at a depth of five to ten kilometres. Most of us would reject such predictions out of hand. They don't fit with our current scientific insights. Nevertheless, some caution is called for. After all, oil and gas exploration is an activity which regularly produces surprises. Just when we think that we have reached the bottom of the bottle, new discoveries are made. Striking examples of this can be documented from the Netherlands, of which I shall mention a few.

In 1938, oil was discovered near The Hague, entirely by accident. It happened during a public demonstration of how drilling works. Entirely unexpectedly, the drillers struck oil at a depth of 600 m. Not long afterwards, the Schoonebeek oil field was discovered, which is still one of the largest onshore oil fields in western Europe.

The biggest surprise came in 1959, when the Groningen gas field was discovered. Originally, estimates of the reserve were cautious. But gradually it became clear that one of the largest gas fields in the world had been drilled.

At that moment, in the early 1960s, the Dutch government began to realise that its mining policy would have to be drastically revised. A system was designed which, in its main points, is still intact today and has proved extremely successful. To present an idea of the Netherlands' current position:

- The Netherlands is the fourth largest gas producer in the world.
- It supplies more than 40% of the European Community's gas demand.
- Dutch energy production virtually covers domestic consumption.

I will briefly explain how this position has been reached. My address will focus on three points:

1. The main lines of Dutch energy policy.
2. The results of this policy.
3. Possible future developments.

The main lines of energy policy

One of the basic principles of the government's energy policy is that gas reserves should be used in a way that provides most benefits. To achieve this, several measures have been taken. To start with, the gas policy is aimed at close coordination of upstream and downstream activities. Energie Beheer Nederland BV (EBN), a specialised company owned by the State, participates both in gas production and in the main Dutch gas marketing and transport company, NV Nederlandse Gasunie. Furthermore, the private parties (Shell and Esso) involved in the production of the most important Dutch gas field (Groningen), also participate in Gasunie.

State participation through EBN in other exploration and production ventures, operated by private companies, also serves the general interest.

In addition, the Minister of Economic Affairs has been granted a number of decisive powers with respect to Gasunie's activities. His approval is needed for

* Keynote address to the American Association of Petroleum Geologists' International Conference *'New views on old world oil – Technology leads the way'*, The Hague, 18 October 1993.

Gasunie's yearly Marketing Plan, its gas purchases and sales contracts, and its investments in infrastructure.

Finally, the Dutch government at an early stage determined a special pricing principle for gas since gas is a special commodity. In the energy market, gas is always an alternative for other energy sources and it is not easy to process. Therefore the normal bargaining processes cannot apply to gas, and the price mechanism of, say, the cattle market is not valid. In view of this situation, the principle of 'market value' was introduced.

Market value principle

In the Netherlands, the price of gas has been linked to a product for which the market mechanism does apply. We use the term 'market value' for this. The principle is that the price of gas should be linked to that of the closest alternative. For the households, that is heating oil, and for large-scale users, fuel oil. In electricity generation a linkage to coal is also possible.

The market value principle is attractive for both consumers and producers. The advantage for the consumer is a price guarantee. Gas is never more expensive than its alternatives. Therefore, the consumer will not easily switch to another fuel. The producers also benefit, as they are given a sales guarantee. In the Netherlands, the costs of transport and distribution are exceptionally low. There is one transport company, which operates on cost base and is therefore not a profit-centre. As a result, most of the natural gas earnings are passed on to the producers. We call this the net-back principle.

Small fields policy

Another important element in the Dutch energy policy is that of the small fields. After the first oil crisis in 1973, the country's energy dependence on politically less stable countries was realised. A policy aimed at discovery and development of our national reserves as far as possible has been developed since.

This policy could only be realised if sensible use was made of the Groningen gas field. This field is so large that it can be used to absorb considerable fluctuations in the supply from other fields and in demand. Maximum use is made of the Groningen field in winter, while production is cut back in summer, as shown in Fig. 1. Groningen therefore acts as a balance. Figure 2 illustrates that Groningen also serves as a balancing field over longer periods.

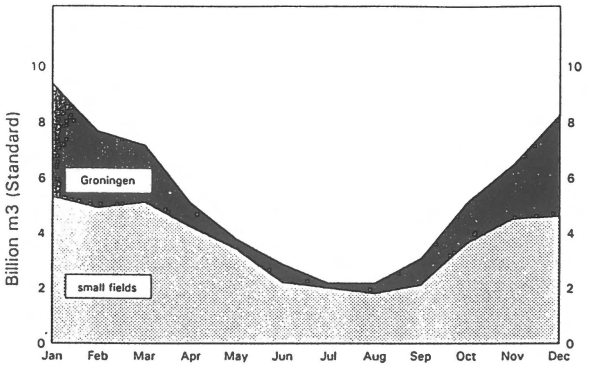

Fig. 1. A typical profile of the yearly gas production in the Netherlands, which illustrates the balancing of gas production by the Groningen field.

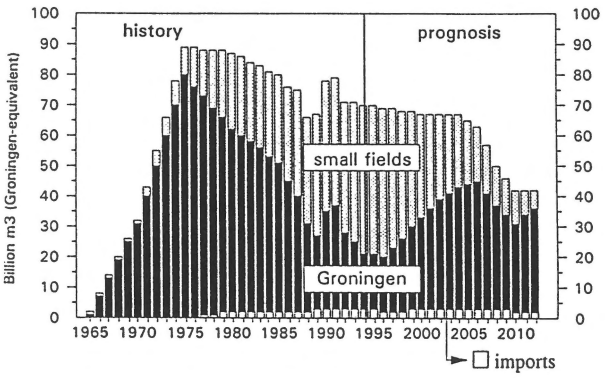

Fig. 2. Gas intake by Gasunie from fields in the Netherlands and abroad.

The Groningen field covers the difference between supply and demand over a number of years, as well as within the year. This affords a high degree of freedom in the development of smaller fields, which is extremely attractive for the oil companies.

An important feature of the Dutch energy policy has been to keep the fiscal and financial rules of the game as constant as possible. This offers operators a high degree of security, a significant factor, particularly where large investments are involved. Where has this mining policy led us? This brings me to my second point.

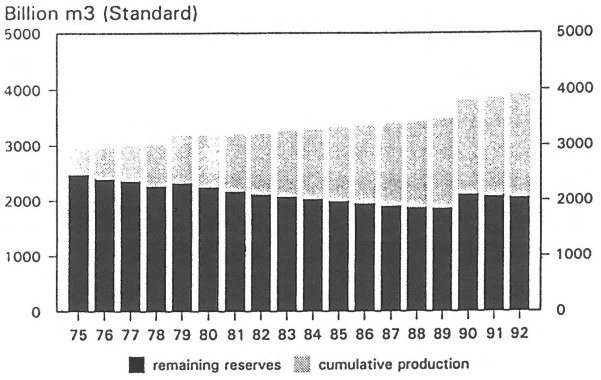

Fig. 3. Development of gas reserves in the Netherlands 1975–1992. Historical data (year end).

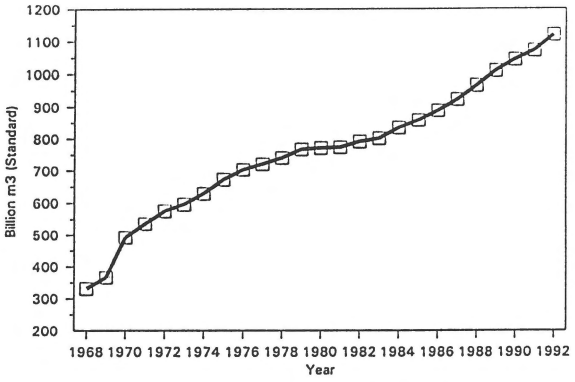

Fig. 4. Newly found, cumulative gas reserves in the Netherlands, 1968–1992, excluding the Groningen gasfield.

Results of energy policy

I should like to illustrate the results of the Dutch mining policy with some graphs. Figure 3 shows the development of Dutch gas reserves. The graph is based on data which are published yearly by the Ministry of Economic Affairs. It shows that reserves of some 3900 billion (10^9) m^3 have now been confirmed. Of this amount, a total of about 1850 billion m^3 has been produced.

Of the 3900 billion m^3, some 2750 billion m^3 lies in the Groningen gas field. The other fields together contain about 1150 billion m^3, which is a substantial volume. The development of the natural gas reserves is expressed in Fig. 4 as a creaming curve. The graph shows little or no creaming in recent years. Each year, additional gas volumes are discovered in the order of some 35 billion m^3.

Three-dimensional seismic makes an important contribution to this success. It is one of the most significant technological developments of the last twenty years. About 35 000 km^2 of the Netherlands, including almost 60% of its total licence area, is now covered with 3D. I suspect that the Netherlands is one of the most intensively recorded countries in the world. As a result, exploration wells have a high success rate. In 1992, one in two exploration wells was successful.

So far, 275 gas fields and 38 oil fields have been discovered. More than half of the gas fields contain reserves of less than 2 billion m^3.

Having outlined what has been achieved, I shall now try to give an idea of what can be expected in the future.

Potential developments

According to the Geological Survey of the Netherlands, 200 to 400 billion m^3 of natural gas is still to be discovered. In this respect there is no need to worry about the near future. However, it will demand a substantial effort to discover and produce this gas. A complicating factor here is that many of the prospects are situated under environmentally sensitive areas such as the Waddensea and the IJsselmeer lake.

Unfortunately, the oil industry still suffers from an image of being a polluting industry. Oil blow-outs and burning gas wells are regularly shown pictures in the media. This creates the idea that the oil industry does not operate safely, an idea which is subsequently used as an argument to keep oil companies out of environmentally sensitive areas.

I have some difficulty with this picture of the industry. Practice has shown that the operators working in the Netherlands satisfy the highest safety and environmental standards. I know that they apply the latest technology to maintain these standards or to improve them still further. I am therefore convinced that they are able to drill in sensitive areas in a responsible fashion.

There is a second factor which affects the exploration and production climate: the continuing low price of oil. Some operators allow themselves to be discouraged by this, and reduce their drilling activities or transfer them to greener pastures. This trend can be seen in the Netherlands, but also in neighbouring countries.

In times of recession, industry tends to point an accusing finger at the government. This is understand-

able, but is it fair? As I explained at the start of my address, the Dutch government has developed a system which is beneficial to society, but also to industry. I should like to recall the small fields policy, the market value pricing policy and the net-back principle.

The Dutch government has also developed programmes to increase publicity on what lies beneath the surface of the Netherlands, within the limits, of course, of what the Mining Act allows. I am referring specifically to the activities of the Geological Survey, mapping programmes, deep seismic research and gas atlas. The industry can benefit from these studies.

You will not hear me say that things cannot be done better. Particularly for the smallest fields, those with a reserve of less than 3 billion m^3, special incentives will probably be needed. The government is discussing this subject with the organisation of Dutch operators.

However, do not expect miracles from the government. In the first instance, the industry has to work its own miracles. I am referring here to measures such as cost cuts and coordination. I am convinced that it is possible to develop marginal fields at lower costs, although this will require innovative and technological brainwork. This may ask for a kind of cultural change in the industry, but I think the results will be worth the effort.

References

Van Waterschoot van der Gracht, W.A.J.M. 1936 Possibility of oil and gas production from Paleozoic formations in Europe – Amer. Ass. Petroleum Geol. Bull. 20: 1476–1493