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RESEARCH AND TECHNOLOGY AGREEMENTS IN THE NORWEGIAN CONCESSION SYSTEM OF THE 1970s—1990s

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This article is devoted to research and technology agreements in Norway, and their positive impact on the development of relations with foreign oil and gas companies during the period of formation of the Norwegian oil and gas industry. Based on archival documents, the article considers Norway's experience of conclusion of research and technology agreements for transferring the latest technologies of exploration and oil and gas production to national oil and gas companies in the process of developing the country's oil and gas industry. The author concludes that Norway made significant scientific and technological progress through promoting active cooperation with foreign companies. Norway's successful experience could be applied by Russian state authorities in order to develop relations with foreign oil companies. These companies could take part in offshore exploration in the Russian sector of the Barents Sea through concluding similar agreements between Russian state institutions, and foreign oil and gas companies, which would give an impetus to the development of the technological component of Russia's oil and gas sector. Research and technology agreements have been used by Norwegians with the aim of diversification of the economy and prevention of excessive dependence on the energy sector, which is one of the major challenges faced by Russia.

Key words: Norway, oil and gas industry, offshore, concessions, public policy, research and technology agreements

To ensure the sustainable use of natural resources to the benefit of society, Norway applied a system of concessions regulating relations between the state and companies over a long period. Norway's natural resources were always considered a national asset. The development of Norwegian oil and gas resources on the North Sea shelf initiated in 1965—1975 showed the efficiency of the concession system for securing national interests, maintaining the state control over natural resources, improving the technological

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level of Norway's oil and gas industry, diversifying its economy, and solving environmental and socioeconomic problems. An integral part of the Norwegian concession system and policy of granting licences to exploit the country's natural resources is the practice of concluding research and technological agreements with foreign companies. In view of the intensification of exploration of hydrocarbons and other natural resources on the Russian continental shelf, a study into Norwegian practices can be of use for establishing fruitful business relations with international companies, fostering research on energy and transferring the latest R&D technologies used by international companies to field development.

In the initial period of development of oil and gas resources on the North Sea shelf in the 1960s, Norway had neither sufficient experience nor qualified staff or technologies of offshore oil and gas production. In order to fill this gap, the Norwegian government developed and actively introduced the system of research and technological agreements with international companies, which were granted licences to exploit resources; thus, the socioeconomic development of the country and the diversification of national economy were ensured alongside the transfer of innovations and technologies to Norway's energy companies.

As L. Blicher emphasises, the agreements on technological cooperation with international companies were developed in the late 1970s predominantly by the Norwegian Ministry of Petroleum and Energy together with a number of other agencies [2, s. 11].

The idea of concluding these agreements was voiced by representatives of several foreign companies. They addressed the Ministry of Petroleum and Energy with requests for assistance in developing cooperation with Norwegian firms and institutions in the field of industrial manufacturing, energy and technology development [3].

In their turn, the Norwegian authorities also acknowledged a growing need for access to modern technologies in the field of construction, prospecting, and development of offshore oil and gas resources. They wanted to provide national Norwegian companies with an opportunity to act in the competitive environment as operators on production fields in the course of the development of the Norwegian continental shelf (NCS).

At the same time, the Norwegian authorities were concerned with a possibility that in a long-term perspective the production of hydrocarbons on the NCS could make Norway's economy dependent on the oil and gas sector [4, s. 150, 162]. Thus, they considered international cooperation in other sectors of Norwegian economy as an important means of its diversification.

As a result, the Norwegian authorities developed a package of standard agreements on technological cooperation with foreign countries and companies, and ensured their wide practical application.

The first type of the agreements was bilateral intergovernmental documents on cooperation in the field of energy. Norway concluded these agreements with such countries as Sweden, the FRG and France. Although such political declarations hardly affected the implementation of research and technological cooperation projects in the field of energy, they, however, did send important political signals about the parties' intentions and priorities [3, s. 5; 5, s. 57; 6, s. 10].

The second type of the agreements on technological cooperation was a result of discussions held by the Ministry of Petroleum and Energy with the participation of the Royal Norwegian Council for Scientific and Industrial Research, and representatives of international oil companies. The discussions aimed to formulate the principles and articles of future agreements. The process of their endorsement and approval took place in 1979 before the fourth concession round of the shelf distribution was held [2, s. 20]. The developed agreements regulated the relations between oil companies, and the Norwegian Ministry of Petroleum and Energy [7, s. 245].

Finally, the practice of interaction between Norwegian and foreign companies in the field of technologies incorporated goodwill agreements — unilateral declarations of intentions.

The endorsed texts of agreements contained definitions of R&D covered by cooperation. In particular, cooperation in offshore oil research had to include collaboration in studying, modernising and testing certain engineering solutions and products. It also focused on technological, economic and engineering studies in such fields as prospecting, drilling, field facilities construction, hydrocarbon production, oil and gas storage and transportation, and the development and construction of offshore objects (platforms, underwater systems and structures, loading equipment, pipelines etc.). It was also specified that research and technological activities in non-related fields could not be included in the agreements in question.

The above-mentioned list of cooperation areas suggests that the standard agreements did not define such concepts as technology, nor did they distinguish between basic and applied research, and R&D. However, these general provisions are included, as a rule, in agreements on technological cooperation. Some digressions from the endorsed wording can be found in the agreements concluded by individual oil companies with the Norwegian Ministry of Petroleum and Energy [7]. All types of the developed agreements applied only to research in the field of prospecting and production, excluding such areas as marketing and processing.

According to the first type of agreements called the 50/50 agreements, the operator or concessionary assumed an obligation of conducting at least 50 % of all research necessary for the development of an oil or gas field [7, s. 257].

Since the fourth concession round (1978), the 50/50 agreements were considered an integral part of the concession policy. They must be signed by all oil companies — including Norwegian ones — that act as field operators. All aspects relating to the implementation of the 50/50 agreement provisions are regulated directly by the oil and gas department of the Norwegian Ministry of Petroleum and Energy, which simultaneously monitors the activity of oil companies aimed at attracting contractors and subcontractors.

In order to assess the volume of research conducted in the framework of such agreements, scholars use the information published in White Paper No. 54 (1982—1983), White Paper No. 56 (1984—1985), White Paper No. 9 (1984—1985) and White Paper No. 46 (1986—1987). For example, Shell — the operator of the “Troll Phase 1” field — spent NOK 415m on research, 73 % of which was allocated for the services of Norwegian firms and institutions. In the framework of the Draugen project, NOK 157m was spent

on research and 80 % of the sum was allocated to Norwegian contractors. As we can see, the minimum requirement of 50 % of the allocated funds was exceeded in both cases.

Also, standard agreements on financing were developed alongside the 50/50 agreements; signing these agreements, the operator assumes an obligation to implement certain research projects on the territory of Norway over the period specified in the agreement within a budget drawn in advance [7, s. 264].

The companies that signed such agreements included ELF, ESSO and Shell. Other firms could sign agreements with the three above-mentioned companies in order to cut costs. For example, Total signed an agreement with ELF in 1979; it took an obligation to implement projects accounting for 1/3 of the cost of ELF's projects as well as to finance them.

As a result, in the framework of the financing agreements, ELF allocated NOK 143m for the Grondin and Skuld projects (1979—1984), Esso spent NOK 112.5m on the Guyed Tower project (1979—1985), Shell allocated NOK 30m for the Deep-EX project (1979—1984), and Conoco allocated NOK 100m for the Tension-leg-platform project (1980—1984) [7, s. 269].

The financing agreements played an important role in promoting cooperation between international oil companies, and Norwegian research and technological institutions. However, international companies were inclined to conclude goodwill agreements.

When signing the goodwill agreements, international oil companies declared their intention to conduct as much research in the field of energy as it was possible in Norway. Unlike the 50/50 agreements or the financing agreements, they did not contain any strict legal obligations. However, they required that international companies should submit annual reports to the Research Council of Norway [8, s. 268]. As a rule, the goodwill agreements were concluded when international oil companies did not participate in either the 50/50 agreements or the financing agreements [9, s. 8].

In the goodwill agreements, the Norwegian party engaged international companies in research and technological activities in the field of energy without strictly specified obligations. Projects implemented under the goodwill agreements concerned predominantly international companies' preparation of applications for licences in the framework of concession rounds. Unlike research conducted in the framework of the 50/50 agreements — when research was limited to a certain field — goodwill agreement projects were aimed at future field development. After satisfying the terms of the financing agreements, international companies often continued research in the framework of the goodwill agreements.

As Table 1 shows, the goodwill agreements accounted for more than half of the agreements between international firms and the Norwegian authorities. All oil and gas companies, except for Shell, concluded only one type of agreements. In the framework of further concession rounds, most international oil companies that acted as field operators concluded the 50/50 agreement that was accompanied by an increase in research conducted by their party. In effect, such a pattern resulted in the fact that the companies that were granted licences to exploit a certain field had to adhere to at least two types of technological agreements.

Table 1

Agreements signed by oil and gas companies as of 01.03.1981

Company	Type of the agreement		
	50/50	Financing	Goodwill
AGIP	—	—	**X**
AMOCO	**X**	—	—
ARCO	—	—	**X**
CHEVRON	—	—	**X**
CONOCO	—	**X**	—
DEMINEX	—	—	**X**
ELF	—	**X**	—
ESSO	—	**X**	—
FINA	—	—	**X**
GULF	**X**	—	—
HYDRO	**X**	—	—
MOBIL	—	—	**X**
PHILLIPS	—	—	**X**
SAGA	**X**	—	—
SHELL	**X**	**X**	—
STATOIL	**X**	—	—
SUPERIOR	—	—	**X**
TEXACO	—	—	**X**
TOTAL	—	—	**X**
UNION	—	—	**X**

In the framework of the fourth concession round, the Norwegian authorities introduced a new requirement for international oil companies — obligatory conclusion of the so-called industrial agreements [3, s. 9]. They stipulated that international companies should cooperate with Norwegian industrial and research organisations when placing orders for equipment. This principle had already been in use but the Norwegian authorities tried to give this cooperation a more official character.

It is important to emphasise that industrial agreements on cooperation covered collaboration between an international oil and gas company, and Norwegian firms and research institutions in areas closely connected with the oil industry [10]. These agreements aimed to simplify for Norway's industry the development of its significant industrial potential that emerged in the course of intensifying the activity of international companies on the NCS as well it facilitated its branch diversification.

In the framework of industrial agreements, cooperation had to be developed in accordance with market principles, i. e. partners chose each other without any interference of the authorities. It was aimed at using the competence and technologies of international companies also engaged in other industries for the benefit of new branches of national economy. Different types of agreements on technological development made a significant contribution to the acquisition of new knowledge in such areas as technologies, markets, entrepreneurship, education and globalisation by Norwegian companies.

This type of agreements was supervised by the Norwegian Ministry of Industry, which followed a restrictive policy towards making public the information on financing and content of projects. According to a report of the Ministry of Industry of January 1, 1984, 22 international oil companies invested NOK 1 billion in 95 projects in the fields of chemistry, engineering (electronics, data processing, offshore products) and the mining industry. Only 35 % of the projects included a research and technological component [11, s. 2].

Starting with the fifth concession round (1979), when granting licences to international companies, the authorities considered research and technological projects that were implemented or developed by licence applicants in the framework of agreements on technological and industrial cooperation. The task of managing and coordinating technological agreements with international firms in the framework of the fourth and fifth concession rounds was assigned to the Research Council of Norway. In effect, the Norwegian authorities forged connection between an opportunity to obtain a licence to exploit resources granted to international companies and their need to conduct certain research and technological operations on the territory of Norway thus contributing to the development of domestic industrial potential through new knowledge and technologies, including those in the field of creating a competitive national oil and gas industry.

At the same time, one should keep in mind that this task was assigned to the Research Council of Norway, which enjoyed close ties with Norway's industry and financed research projects in the oil and gas sphere implemented predominantly at the research institutes affiliated with the Council [12, s. 10].

As a result, the Research Council of Norway created a link between the needs of oil and gas companies to solve certain research and technological problems and the financing of Norwegian firms and institutions in the field of practical solutions to research and technological problems. One of the central problems of the Research Council was the accumulation of information and reports of international oil companies on recently launched, ongoing and future projects, which served as the basis for assessing the research and technological activity, and requirements of oil companies in the framework of technological agreements. In their turn, the data and assessments of the Research Council were not only brought to the notice of the Ministry of Petroleum and Energy but were also taken into account when holding concession rounds.

For successful implementation of its functions, the Ministry assigned the following tasks to the Research Council [13]:

– to provide the Ministry with regular updates on the plans and course of implementation of technological agreements;

– to issue a quarterly newsletter in order to inform the Norwegian scholarly community on framework agreements and relevant opportunities;

– to hold biannual meetings between representatives of Norwegian research institutes and industrial companies participating in the implementation of projects in the framework of technological agreements;

– to collect information and carry out annual updates on proposals and ideas of research institutions;

– to create an archive for research contracts and reports on their implementation.

Thus, the work of the Council and the governmental strategy were aimed at making Norway technologically independent within the energy industry in a long-term perspective by means of large-scale "norwegianisation" of prospecting, drilling, production, transportation and treatment. These tasks were fulfilled successfully by creating mechanisms of transferring technological knowledge and practices from international oil companies working on the NCS to Norwegian companies. In this respect, technological agreements became one of the methods of knowledge and innovation transfer [14, s. 1].

In 1984, the government corroborated their significance by emphasising the invariability of the guiding principles; however, it formulated new objectives [6, s. 4]:

– to use oil resources for ensuring balanced and competitive development of the country in a long-term perspective;

– to use the opportunities of cooperation with international oil companies to develop competences and technologies within Norwegian industries and research community;

– organise a Norwegian network of suppliers of goods and services to offshore market;

– create favourable conditions for the development of Norwegian industrial production in other economic fields.

Thus, the Norwegian government considered technological and industrial cooperation with Norwegian companies as an integral part of international companies' activities in Norway. It meant that they had to make their contribution to the industrial growth in cooperation with Norwegian companies and research institutions in the field of their competences. The primary objective of cooperation was the transfer of technologies and marketing experience, which could be used for commercial purposes. Initially, the importance of the technological agreements lay in investment in research infrastructure; however, later the technological agreements became more market-oriented [15, s. 5].

In 1985, the Council introduced three main assessment criteria.

Firstly, the activity of an international company in the implementation of the research aspect of the goodwill agreements was assessed.

Secondly, the Council evaluated the quality of each individual project in the framework of the goodwill agreements. The guiding principle behind this criterion was the old saying: "Quantity does not mean quality". The central requirement of the goodwill agreements was the need to implement projects in Norway.

In general, the process of technology and knowledge transfer can be achieved by means of granting the Norwegian partners access to laboratories of international oil and gas companies or assigning experts from international companies to Norwegian project teams.

Finally, the Council analysed research profiles of international oil and gas companies. It was suggested that oil companies concentrate efforts in their competence areas, which at the same time should relate to their activities in Norway.

Officially, the procedure of using the agreement system was abandoned in early 1994 when Norway acceded to the European Economic Area. The reason behind the abandonment was the rules of the European Union excluding any discrimination barriers to companies registered in the EEA member states.

Despite the fact that during later concession rounds the conclusion of an agreement was unnecessary, it was still suggested that international companies report on their research activity to the Ministry of Petroleum and Energy, and the Research Council of Norway. After 1994, one of the conditions for obtaining an offshore production licence was proof of the company's sufficient technological level for working on the shelf. Moreover, the Ministry of Petroleum and Energy announced that information on research and technological development relating to the NCS exploration was necessary for statistical purposes and financing research [16].

In this connection, the Petroleum Act of 1985 was revised and expanded with the following definition: "The licensee shall submit information on plans for further exploration of a deposit and exploration results to the Norwegian Petroleum Directorate" [17].

However, this information was not to be used as an official criterion for assessing a company in the course of a concession round. Starting with the 15th round, applicants were asked to provide information on their technological expertise, in particular, their research experience. It is worth noting that, when considering applications within the 15th round, the Ministry of Industry paid special attention to companies' achievements in research projects implemented in the course of the previous rounds. So, two companies — Conoco and ELF — were "punished" for poor organisation of projects when exploring Heidrun and Frøy/Lille-Frigg fields. These international companies did not manage to obtain operator licences [18].

So, the system of technological agreements was actively used by the Norwegian government in order to transfer innovations and technologies from international oil and gas companies to Norwegian companies in the period of development of oil and gas industry, and the lack of national research and technological achievements.

All in all, these agreements had a favourable effect not only on the development of Norway's energy industry but also the country's socioeconomic development as they contributed to the development of an efficient and modern oil and gas industry, and the diversification of the structure of Norway's industry. The Norwegian experience is worth studying for the purpose of attracting international companies to exploration of oil and gas fields on the territory of Russia in order to adopt latest research results and create optimum conditions for the country's innovative development. Russian authorities responsible for exploration of hydrocarbon resources could adopt Norway's practices of concluding research and technological agreements with international companies with the aim of gaining access to western research results and stimulating development of modern technologies in the oil and gas sector in Russia. The adoption of Norwegian practices could contribute to the diversification of Russia's economy and its dependence on the oil and gas sector. Russian authorities who make decisions on granting exploration licences should take into account the level of international com-

panies' research activity in Russia as well as their efficiency and contribution to the development of overall business activity. Thus, international companies will be forced not only to invest but also to get interested in the efficiency of their investments.

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