

# International Arctic Petroleum Cooperation

Barents Sea scenarios

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## Chapter 1 Introduction

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# 1 Introduction

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Will Arctic states cooperate in the development of Arctic petroleum resources? This is what they declare, but the barriers to the cooperative development of Arctic petroleum resources are intensifying and the future is unclear. This book looks in detail at the preconditions and outlook for the cooperative development of Arctic petroleum resources.

Arctic oil and gas figure prominently in the regional economic hopes and strategies of many of the Arctic states. However, if and how these resources are developed depends on the political and economic choices made by relevant national actors, the technology developed and global trends outside the circumpolar region.

The Barents Sea is a microcosm and indicator of what can happen elsewhere in the Arctic: the Gulf Stream makes it largely ice-free; it is closer to oil and gas markets than most other parts of the Arctic and many different countries are present in the broader Barents region, while it is divided between Russia and western Europe.

Applying a cross-disciplinary approach, including geopolitical, institutional, technological, corporate and environmental perspectives, a team of Norwegian and Russian researchers offer the reader three scenarios as possible ways of thinking about the future of Norwegian–Russian petroleum cooperation in the Barents Sea towards 2025, taking the Murmansk Treaty signed in 2010 by Norway and Russia as the point of departure. This treaty delineated the maritime boundary between the two countries in the Barents Sea, creating new opportunities for petroleum development in a large, previously disputed, area, while creating a framework for Norwegian–Russian cooperative exploitation of trans-boundary oil and gas fields.

It is essential to remember that while oil and gas resources are valuable, they are also expensive to extract, especially in a harsh-climate frontier environment like the Arctic. The Shtokman project in the Russian part of the Barents Sea – which Western companies once competed excitedly to access, but later put on ice – has already shown that even the greatest projects may be commercially vulnerable. Regional economies of scale can be decisive for project costs: a project realized on its own will often be far more expensive than if it is carried out in coordination with other projects in the same area, sharing

infrastructural facilities (pipelines, LNG facilities, electricity supply, etc.); mobile infrastructure (rigs, ships, etc.); a skilled labor pool; rescue services and so on. Without Norwegian–Russian cooperation across the Barents Sea border, many such opportunities for economies of scale may be lost, and the development of the resources below the seabed will be less likely. The lower the price of oil and gas, the more acute this point becomes. Accordingly, cooperation may be both a possible outcome and a chosen strategy.

We have written this book at a time when the barriers to the cooperative development of Arctic petroleum resources are intensifying and the future is unclear. The core question addressed by this book is thus all the more pressing: What factors would need to fall into place for the cooperative development of Arctic petroleum resources?

In order to speak to this question, this book is centered on scenarios – a range of possible futures of Norwegian–Russian petroleum cooperation in the Barents Sea towards 2025 – developed by a team of Norwegian and Russian researchers. The aim of scenarios is not to attempt to forecast or make projections, but rather to identify alternative possible developments with an emphasis on the unpredictable interaction between multiple factors.

These scenarios are based on the thematic chapters that make up the majority of this book. Part I (Chapters 1–2) introduces and presents the scenarios. In the belief that the underlying analysis of trends and possible developments is an equally important aspect of scenarios as the scenarios themselves, we have given the thematic chapters much space in the book and kept the scenarios correspondingly brief. Parts II and III are dedicated to unveiling in detail the building blocks for the scenarios presented in Chapter 2 and provide extensive background knowledge on the Barents Sea developments. In particular, Part II (Chapters 3–7) examines economic and political factors that may influence the development of the Barents Sea as well as experience from past cooperation. Part III (Chapters 8–14) focuses on technology and the natural environment.

This book is a result of the joint effort of the core group of Norwegian and Russian researchers who are involved in NAREC – the Norwegian and Russian Education and Research Consortium for International Business Development in the Energy Sector – and who have cooperated on different research and education programs for several years. NAREC was formally established in October 2009 with the purpose of strengthening education and research cooperation between Norwegian and Russian institutions with support from the Norwegian and Russian Ministries of Foreign Affairs. This cooperation gives the book strength in that it brings into close conversation different views on similar issues from researchers in both countries.

### **Summaries of the chapters**

Part I of the book contains this introduction and Chapter 2. In Chapter 2, a six-person scenario-building team – Indra Overland, Alexei Bam-bulyak, Anatoli Bourmistrov, Ove Gudmestad, Frode Mellemvik and Anatoly

Zolotukhin – discusses the assumptions, uncertainties and three scenarios for the development of the petroleum sector in the Barents Sea. Drawing on a time-honored methodology for scenario building used by Royal Dutch Shell and the points made in the thematic chapters (3–14), the team identifies 10 assumptions and 12 major uncertainty factors that the authors see as shaping the future of cooperation and petroleum development in the Barents Sea. Putting these different uncertainties together, three scenarios are developed providing different understandings of the future.

The scenario “After You, Sir” describes a situation in which unconventional oil and gas reduce the prices of oil and gas in global energy markets, and Norway and Russia are therefore hesitant to make a first move in order to make petroleum-related investments in the region. Thus, two countries are like two British gentlemen in front of a door, each politely ushering the other to enter first but neither of them actually going through the door.

In contrast, in the scenario “Parallel Play”, oil and gas prices are relatively high, but there is a freeze in political relations leading to the noncooperative development of the Barents Sea.

Finally, the scenario “Let’s Dance” envisages a possible future where a breakthrough has been made in noncarbon energy sources. In spite of relatively good cooperation between Norway and Russia, only a few big gas projects are developed in the Barents Sea.

Part II of the book comprises five thematically specific chapters dedicated to issues of politics, economics and experiences from past cooperation between Norway and Russia. In Chapter 3, Indra Overland, Nodari Simonia, Sergei Vasiliev and Elana Wilson Rowe examine the international context for Barents oil and gas. According to their analysis, the global context will be more important than Arctic politics for the development of the Barents Sea. In identifying relevant factors, the authors conclude that Asia in spite of its remoteness is particularly important as it may have a double effect on developments in the Barents Region. On the one hand, Asian economic growth is important because it can drive rising demand for oil and gas, and thus make challenging projects in the Barents Sea financially attractive. On the other, Asian economic growth may change Russia’s internal priorities, causing it to develop the eastern parts of the country rather than the Barents Sea. Furthermore, any financial downturn in China and other Asian countries will have complex and unforeseeable effects. The future of the Barents Sea will therefore depend on how the Asian economies develop and how the impact plays out in international oil and gas markets and Russian priorities. Two other factors examined by the authors are the development of unconventional oil and gas and the possibility of a new global climate policy regime.

In Chapter 4, Alexei Bambulyak, Svetlana Golubeva, Maria Sydnes, Are Kristoffer Sydnes, Lars-Henrik Larsen and Vlada Streletskaia identify similarities and differences in petroleum resource management in Norway and Russia. They demonstrate that the petroleum industry in both countries is moving northwards and in order to secure environmentally safe oil and gas exploration

and production in the Barents Sea region, both countries are developing new regulations. The authors examine the current management regimes in both countries in terms of licensing, environmental control and oil-spill response with especial focus on the Barents Sea. They conclude that, despite the fact that the resource management systems in the two countries are different, they also have many similarities in terms of basic principles of licensing, impact and risk assessment and pollution control. Implications for potential regulatory harmonization between Norway and Russia are also discussed.

In Chapter 5, Anatoli Bourmistrov, June Borge Doornich and Andrey Krivorotov discuss the driving forces for Norwegian–Russian business-to-business cooperation in the petroleum sector. The chapter shows that the rich oil and gas resources in the Barents Sea – including the expected trans-boundary resources in the previously disputed area – are a driving force for business-to-business cooperation. Opportunities for knowledge and technology transfer, as well as sharing expertise, represent benefits for cooperation that can provide the advantages of economy of scale and economy of scope in developing demanding areas of the Barents Sea. By describing historical aspects of business-to-business cooperation between the petroleum industries in the High North, key driving forces and factors that can promote and limit future cooperation in the Barents Sea are illuminated. It is argued that in the short term cooperation will most probably occur in the southwestern part of the Barents Sea in Norway because of this area’s accessibility in terms of climate, logistics and finances. In the long run, cooperation may be focused on the exploration and development of the southeastern part of the Barents Sea on the Russian side. It is further argued that oil and gas resources in the delimitation-line areas, and particularly trans-boundary resources, will be explored and developed last because of lack of experience in cooperation and differences between the regulative frameworks of the two countries.

In Chapter 6, Indra Overland and Andrey Krivorotov take as their point of departure the 2010 Murmansk Treaty and discuss the history, present and possible future of Norwegian–Russian political relations and their implications for the development of Barents Sea oil and gas resources. The authors argue that a good political relationship between the two countries can facilitate oil and gas projects in the Barents Sea, while noncooperative relations will slow them down. The authors also discuss how the Barents Sea may interact with other factors and priorities inside Norway and Russia, and how Norwegian–Russian relations are influenced by the broader Russian–Western relationship.

In Chapter 7, Anatoli Bourmistrov, Ove Gudmestad, Valery Salygin and Anatoly Zolotukhin describe the experience of Norwegian–Russian cooperation on education in the areas of energy management and petroleum technology. The chapter shows how favorable political attention in both Norway and Russia directed towards the development of Arctic petroleum resources, joint political initiatives in both countries and the possibility of the international harmonization of education brought by the Bologna process have created space for cooperation in the field of oil and gas education between Norwegian and

Russian universities. Despite considerable differences in education standards and cultures, two universities in Norway and two in Russia strategically developed joint degree/dual degree education programs in energy management and petroleum technology for the benefit of the authorities and industries in both countries. Reviewing this experience, the authors conclude that, in the case of education and research, it has been possible to establish long-term and beneficial cooperation based on the continuous search for synergies, respect for differences, experimentation and the involvement of dedicated individuals.

Part III of the book comprises seven chapters dedicated to technology and the natural environment. In Chapter 8, Mark Verba, Gennady Ivanov and Anatoly Zolotukhin describe the structure of the geological and geophysical profiles and the main features of oil and gas content in the Barents Sea. In Chapter 9, Anatoly Zolotukhin, Anton Sungurov and Vlada Streletskaia describe and compare the Barents Sea hydrocarbon resource base and production potential on both the Norwegian and Russian sides of the boundary. Both chapters indicate a great discovered and undiscovered potential of hydrocarbon resources in the Barents Sea that can contribute to the global energy supply. The development of these resources can be an important driving force to stimulate the development of domestic and international petroleum industries and active collaboration between those. However, the authors conclude that it also requires a much clearer understanding of the market potential for Arctic gas and oil in the global energy supply picture including issues related to e.g. demanded volumes, project development time frames and transportation routes.

In Chapter 10, Maria Bulakh, Ove Gudmestad and Anatoly Zolotukhin describe how hydrocarbon fields in the newly delineated border area in the Barents Sea of Norway and Russia can be developed based on subsea technology. Founded on data from previous geological surveys, the authors describe the physical environmental conditions in the most promising area of the Barents Sea – the Fedynsky High, analyze the main challenges for exploration and production and suggest possible scenarios for oil and gas fields' technical development and arrangements. The authors conclude that subsea development is the most promising approach for gas fields; the corresponding technology for oil is still premature.

In Chapter 11, Tore Markeset, Anette Sæland, Ove Gudmestad and Javad Barabady discuss the design and use of petroleum production facilities in conditions of Arctic operational environments. The authors demonstrate how remote Arctic locations affect an industrial production facility's design, construction and installation, as well as its operation, maintenance, support and decommissioning phases. Criteria for the efficient design of facilities for the Arctic that help avoid injuries and prevent loss of human life, prevent environmental disasters, mitigate high costs and improve performance efficiency are presented and discussed.

In Chapter 12, Ove Njå and Ove Gudmestad address problems of crisis management in cold climate areas. Because the Arctic is associated with a harsh climate, environmental vulnerability and limited experience in emergency response, the

authors discuss the design of appropriate technical safety systems in the petroleum industry and related shipping sectors. They emphasize the known and potential uncertainty dimensions and recommend how these can be addressed by the design approach based on all available knowledge to identify, recognize and prevent hazards. The chapter also explores structures that are already employed to work close to or in transit through the Barents Sea. Furthermore, the chapter describes the efficiency of different emergency response equipment, the consequences of the long distances to shore bases and the limited infrastructure of Northern Norway and northwestern Russia.

In Chapter 13, Roald Kommedal, Andrea Bagi and Tor Hemmingsen address potential environmental effects of oil and gas exploration and production in the Barents Sea related mainly to offshore operations. The chapter starts by addressing both general and Arctic-specific environmental issues, and then highlights the challenges of creating safe working conditions on offshore Arctic installations followed by a discussion of oil behavior in open water and the effects of oil on marine organisms. A description of specific Arctic environmental issues focusing on the Barents Sea and its natural ecosystem follows, together with an overview of management strategies to tackle operational and accidental emissions of pollutants under Arctic conditions. The authors conclude that potential oil spills represent the largest threat to the Barents Sea and, therefore, it is essential to plan in detail for possible scenarios and to develop appropriate contingency strategies in order to achieve the necessary level of preparedness.

Finally, in Chapter 14, Per-Arne Sundsbø discusses issues of the winterization of onshore facilities and outdoor work areas. Because wind and drifting snow are among the most essential characteristics of the Arctic climate, increasing petroleum activity means that proper winterization of equipment is an indispensable condition for successful operations in Arctic conditions. The author describes and reviews different winterization measures. The chapter also provides design guidelines for wind and snow control, while illustrating that selected control measures should be carefully designed and implemented according to a systematic and overall wind and snow control strategy for petroleum facilities.

### **Use of this book**

We hope that this book will be useful for many readers, including researchers, NGO representatives, students, policymakers and business actors concerned with the development of the Arctic petroleum resources. The development of Arctic resources requires multidisciplinary knowledge. Engineers must understand the geopolitical, environmental and managerial complexities involved in petroleum projects, and managers and politicians need to be equipped to understand the engineering and operational challenges of the Arctic. We also hope that this book will interest scholars in the fields of political science, international and cross-cultural management, geography, petroleum, cold climate technology, geopolitics, Arctic studies, energy policy and Russian studies. This book can also be useful as a syllabus for both petroleum technology and petroleum

management oriented introductory Arctic resource management courses for students at graduate and postgraduate levels.

Finally, the book's application may be related directly to the scenarios it contains. Chapter 2 highlights three qualitatively different descriptions of the future. These are three pictures of what may happen, not what will happen. Still, these pictures of the possible future may be relevant for readers, who can help to think through possible consequences for their organization, institution or company in case each scenario materializes.

However, the book highlights only three out of many conceivable scenarios for the development of the petroleum resources in the Barents Sea. In this sense, the aim of this book is also to demonstrate the many uncertainties involved in the development of the Barents Sea and examples of how scenario methodology may be applied. The range of assumptions and uncertainties identified in the thematic chapters provide ample ground for scenario development beyond those three presented here. In this regard, we hope that the book will inspire readers who would like to construct their own scenarios for the Barents Sea and/or to apply scenario methodology to the discussion of petroleum development in other parts of the Arctic.

Although the book relates to interaction on the border between Norway and Russia, we think its relevance extends beyond those geographical limits. Similar analysis can be used to pave the way to a better understanding of the opportunities and challenges for cooperative development of Arctic petroleum resources in other Arctic regions as well as in the Arctic as a whole. Ultimately, the book should prove valuable also to policymakers and entrepreneurs outside the Arctic countries dealing or wishing to deal with Russia and Norway in the energy sector.

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