



Compiling physical asset accounts for petroleum resources in Norway

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Preface

This document demonstrates the feasibility for compiling the physical asset accounts for petroleum resources on the Norwegian continental shelf according to SEEA-CF standard. It is the first outcome from an ongoing project ('Valuation of petroleum resources in Norway') at Statistics Norway, which is partly financed by Eurostat (Project number and acronym: 101122519, 2022-NO-SNA-UPDATE).

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Statistics Norway, 25.01.2024

Lasse Sandberg

Abstract

The physical asset accounts for petroleum resources on the Norwegian continental shelf over the period 2017-2022 are compiled according to SEEA-CF standard, in terms of the suggested form and classifications, allowing a clearer and more meaningful international comparison.

The physical asset accounts for Norwegian petroleum resources are compiled, with clear distinction being made across various types of petroleum resources (i.e., oil, gas, NGL, and condensate), as well as different classes (i.e., Classes A, B, C, and potential deposits that is not included in SEEA-CF standard). Therefore, not only totals including all classes of individual types of resources, but also estimates by individual type and class are calculated and reported in the compiled physical asset accounts.

The compiled physical assets accounts are prerequisite for further compiling the corresponding monetary assets accounts for petroleum resources in Norway, both expected to be included in the Norwegian Environmental Accounts (NEA). In addition, the monetary values calculated from the asset accounts can possibly be incorporated in the balance sheet accounts in the Norwegian National Accounts (NNA), as suggested by the recent UN Task Team Guidance Note for SNA updating.

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1. Introduction

Petroleum resources on the Norwegian continental shelf play a vitally important role in the Norwegian economy and for the financing of the Norwegian welfare state. For instance, the oil and gas sector contributes dominantly, and either directly or indirectly, to the entire Norwegian economy in terms of value added generated, investments conducted, export delivered, and government revenues rendered.¹

In the current Norwegian National Accounts (NNA), established by following the latest international statistical standard, i.e., the *System of National Accounts 2008* (2008 SNA) (United Nations *et al.*, 2009), extracted oil and gas from petroleum activities are recorded as output in the production accounts of the oil and gas sector, but petroleum resources by its own right has not yet been registered in the balance sheet accounts as an asset.

Likewise, although the current Norwegian Environmental Accounts (NEA) have natural resources including oil and gas covered by its material flow accounts, the asset accounts for petroleum resources are still missing. However, compiling asset accounts is explicitly recommended by the *System of Environmental Economic Accounting 2012 - Central Framework* (SEEA-CF) (United Nations *et al.*, 2014), another international statistical standard for constructing environmental accounts.

The wanted asset accounts for petroleum resources in the NEA and the NNA are an essential component in any consistent and integrated accounting system because they can present crucial information about the stock status of petroleum resources at a point in time. Only if the stock information is used together with the flow information as currently recorded in the NNA and the NEA, can sustainability issues be addressed in a more appropriate way.

Physical asset accounts for petroleum resources, by organizing quantity information of the opening and closing stock and the changes in stock over the accounting periods, are needed for further constructing monetary asset accounts in the NEA, and possibly, in the balance sheet accounts in the NNA, if alignment is made for asset boundary between SEEA-CF and 2008 SNA.²

As a typical subsoil asset, the underground quantity of petroleum resources that one might reasonably expect to be extracted is not known with large precision. As a result, the concentration, quality, extractability, and commerciality of petroleum resources in the deposit should be constantly assessed, the result of which will influence the likelihood, the cost of extraction, and the degree of confidence regarding the quantity that can be extracted in the future. Therefore, a thoughtful resource classification system is needed by taking these factors into consideration.

In Norway, petroleum resources are classified by a resource classification system designed by the Norwegian Petroleum Directorate (NPD)³, which categorizes the originally recoverable petroleum resources according to their position in the development chain from a discovery is made, or a new effort to increase the recoverable resources of a field is identified, and up to the point when the resources have been produced (Andersen *et al.*, 2018). Using this classification system, the NPD compiled and reported the Norwegian petroleum resource accounts annually at its official website.

For allowing clearer and more meaningful international comparisons, SEEA-CF suggests that known deposits be categorized in three classes: Class A (Commercially recoverable resources), Class B (Potentially commercially recoverable resources), and Class C (Non-commercial and other known

¹ See various statistics in National Accounts and Government Finance Statistics published by Statistics Norway at: <https://www.ssb.no/en/statbank>

² Note that the asset boundary in SEEA-CF is in general larger than that in 2008 SNA.

³ The Norwegian Petroleum Directorate (NPD) is changing its name to the Norwegian Offshore Directorate as of 1 January 2024.

deposits). Each class is defined according to combinations of criteria derived from the *United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009* (UNFC-2009) (United Nations, *et al.*, 2010, 2013), which is a generic, flexible scheme for classifying and evaluating quantities of fossil energy and mineral resources.

During the course of updating 2008 SNA, extending the current 2008 SNA to incorporate aspects of SEEA-CF was suggested, for example, as regards the valuation of natural resources. In particular, it was recommended that new classification be added to the updated SNA for delineating mineral and energy resources, by explicitly referring to SEEA-CF classification. This would increase the consistency between the two international standards and make the updated SNA definition of economic assets more precise in the case of mineral and energy resources (Fixler, 2022).

The aim of this document is to compile physical asset accounts for petroleum resources in Norway according to SEEA-CF standard, based on data that are directly drawn from the annual petroleum resource accounts published by the NPD. In addition, it is hoped that the documented results will also fulfil one of the specific objectives of an ongoing project ('Valuation of petroleum resources in Norway') at Statistics Norway, which is partly financed by Eurostat (Project number and acronym: 101122519, 2022-NO-SNA-UPDATE).

The rest of the document is structured as follows. Section 2 introduces the Norwegian petroleum resource classification system. As an example, the 2022 petroleum resource accounts classified by the Norwegian system are presented with information needed for compiling the physical asset accounts. In Section 3, a short overview of UNFC-2009 classification is given first, then the methodology by the NPD for mapping the Norwegian system to UNFC-2009 classification by using bridging documents is briefly described. In this Section, the 2022 petroleum resource accounts by following UNFC-2009 classification are provided.

Section 4 introduces the suggested SEEA-CF classification. By means of the correspondence table between UNFC-2009 and SEEA-CF classification, the 2022 petroleum resource accounts are converted according to SEEA-CF classification. In Section 5, by following the general form of physical asset accounts and classification for mineral and energy resources as recommended by SEEA-CF, the 2022 physical asset accounts for petroleum resources in Norway is constructed. To reflect the uncertainty around the estimated results, both the Low, Base, and High estimates are reported in this Section.

Based on the time series data of the published NPD's petroleum resource accounts, the physical asset accounts for Norwegian petroleum resources over the period 2017-2021 are compiled and reported in Appendixes A, B, and C, for Base, Low, and High estimates, respectively. Finally, Section 6 concludes the document.

2. The Norwegian petroleum resource classification system

In Norway, the following stipulation is legally and clearly written in the Section 19 of the Regulations relating to resource management in the petroleum activities on the Norwegian continental shelf: *'the petroleum resources shall be classified in accordance with the resource classification of the Norwegian Petroleum Directorate'*.⁴

Indeed, the resource classification system developed by the NPD serves as an important tool for maintaining an overview of the overall petroleum resources on the Norwegian continental shelf, so that the Norwegian authorities can have the best possible basis for planning measures to ensure good resource management and for forecasting future production and activities (Andersen *et al.*, 2018).

'Resources', as applied in the Norwegian classification system, refer to all recoverable volumes of petroleum, classified according to their maturity with regard to development and production. As shown in Table 2.1, the system has three classes: Reserves, Contingent resources, and Undiscovered resources. Within each class, there are several sub-classes (or resource classes) that are defined by maturity.

Table 2.1 Overview of classes, resource classes (sub-classes), project categories and uncertainty categories

Class	Resource class (sub-class)	Resource class code	Project category	Uncertainty category
	Produced	RC0		
Reserves	In production	RC1		L, B, H
	Approved for production	RC2	F, A	L, B, H
	Decided for production	RC3	F, A	L, B, H
Contingent resources	Production in clarification phase	RC4	F, A	L, B, H
	Production likely, but not clarified	RC5	F, A	L, B, H
	Production unlikely	RC6		L, B, H
	Production not evaluated	RC7	F, A	L, B, H
Undiscovered resources	Prospects	RC8		L, B, H
	Unmapped resources	RC9		L, B, H

Source: Andersen *et al.* (2018)

'Reserves' are the volumes of petroleum resources that the licensees have decided to recover and are classified as resource class (RC) 1 to 3. 'Contingent resources' have been proven, but no decision has been made regarding their production. This class also includes resources in projects to improve recovery, and resources that are unlikely to be produced, such as RC6 as listed in Table 2.1.

'Contingent resources' are classified in RC 4 to 7. 'Undiscovered resources' are estimated quantities of petroleum resources that are probably present but that have not yet been proven by drilling. These are classified in RC 8 and 9. In addition, the resource class 'Produced', as listed in the second row of Table 2.1, refers to (accumulated) historic production, i.e., all the petroleum resources that have been produced, sold, and delivered up to the present.

The letters F and A as shown in the 'Project category' column in Table 2.1 are used to distinguish between development of new discoveries and deposits (F) and measures leading to improved recovery of petroleum from a deposit (A). F stands for 'First' and A for 'Additional'. A combination of resource class (RC1, RC2 ...) and project category (F, A) is used where this is relevant.

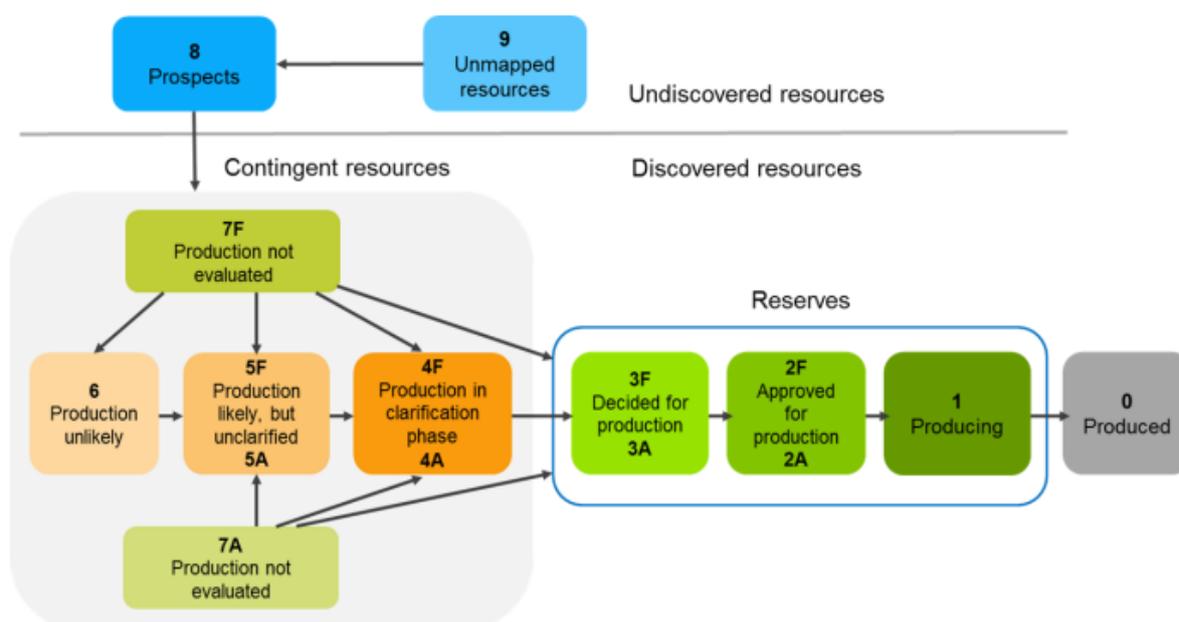
⁴ More information about the Resource Management Regulations can be found at: <https://www.npd.no/en/regulations/regulations/resource-management-in-the-petroleum-activities/>.

The letters L, B, and H in the last column of Table 2.1 ('Uncertainty category') refer respectively to Low, Base (or Best), and High estimates of petroleum resource volumes that are expected to be recovered from a project. Uncertainty category is not used to define classes, but to indicate the uncertainty in the estimates.⁵ The Norwegian resource classification system requires that all resource estimates must describe a low estimate, a base estimate, and a high estimate.

As known, petroleum resources are produced through industrial projects. Discoveries and fields may be developed in stages, with a number of different projects at different stages of maturity with regard to development and production. Therefore, the Norwegian classification system has been developed in order to follow changes in the resource base by following discoveries, fields, and projects through various phases. In other words, the system classifies the petroleum resources in the different projects according to their maturity.

Figure 2.1 gives a schematic overview of the Norwegian resource classification system in which changes and links between different stages and sub-classes are visualized in a diagrammatic way.

Figure 2.1 Schematic overview of the NPD's classification system



Source: Anderson *et al.* (2018)

Based on the resource classification system, the NPD compiles and publishes annual petroleum resource accounts at its website.⁶ As an example, a part of the 2022 resource accounts is reported in Table 2.2, which shows the original recoverable petroleum resources on the Norwegian continental shelf as of 31 December 2022, classified by both classes and sub-classes.

Note that all the estimates as shown in Table 2.2 are Base estimates, reflecting the current understanding of the scope, properties, and recovery rate of the reservoir, and are calculated using either a deterministic or stochastic method.⁷

⁵ For more and detailed information about the definition of sub-classes, project category, and uncertainty category, as well as the corresponding supplementary explanations, please refer to Andersen *et al.* (2018).

⁶ <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

⁷ If the base estimate is calculated using a stochastic method, the expected value shall be reported.

In the resource accounts, the petroleum resources are grouped into four types according to the Norwegian situation: oil, gas, natural gas liquids (NGL), and condensate. Oil and condensate are listed in million standard cubic metres (Sm³), gas in billion standard cubic metres (Sm³), and NGL in million tonnes. The conversion factors applied for converting different volume units into a common unit, i.e., oil equivalent (o. e.) are as follows: 1 Sm³ of oil equals to 1 Sm³ o. e., 1000 Sm³ of gas equals to 1 Sm³ o. e., 1 tonne of NGL equals to 1.9 Sm³ NGL and 1.9 Sm³ o. e., and 1 Sm³ of condensate = 1 Sm³ o. e.. Therefore, the sum of the total resource volume across the four types in terms of million Sm³ o. e. is also reported (see the last column in Table 2.2).

Table 2.2 Petroleum resources accounts classified by the Norwegian system (as of 31.12.2022, Base estimate)

Class	Code	Resource class (sub-class)	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
	RC0	Produced	4727	2922	252	120	8247
Reserves	RC1	In production	727	1210	57	16	2060
	RC2	Approved for production	215	124	6	1	351
	RC3	Decided for production	109	135	15	0	272
		Sum reserves	1051	1469	77	17	2684
Contingent resources	RC4	Production in clarification phase	32	22	2	0	58
	RC5	Production likely, but not clarified	99	111	11	0	232
	RC7F	Production not evaluated	41	31	2	0	76
	RC7A	Production not evaluated	140	95	0	0	235
		Sum contingent resources in fields	311	260	15	1	600
	RC4	Production in clarification phase	30	48	1	1	81
	RC5	Production likely, but not clarified	139	87	3	1	233
	RC7F	Production not evaluated	58	95	2	0	157
	Sum contingent resources in discoveries	227	230	6	2	471	
	Sum contingent resources	539	490	21	3	1071	
Undiscovered resources	RC8/9	Resources in prospects, leads and unmapped prospects	1930	1725	0	110	3765
		Sum total resources	8247	6606	350	250	15767
		Remaining resources	3520	3684	98	130	7520

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

The volume of the total resources (see the second-to-last row in Table 2.2) on the Norwegian continental shelf is the sum of all sub-classes (RC0 to RC9). Since some of them have been extracted up to the date the resource accounts was compiled, which is the sub-class RC0 (see the second row in Table 2.2), the 'Remaining resources' (see the last row in Table 2.2) can be calculated as the difference between the total resources and the 'Produced', leading to the 'Remaining resources' being just the sum of sub-classes RC1 to RC9.

As shown in Table 2.2, as of 31 December 2022, in terms of all petroleum resources on the Norwegian continental shelf, slightly more than half of the total resources have been extracted (i.e., 8247 out of 15767 million Sm³ o. e.). This is the same for oil (i.e., 4727 out of 8247 million Sm³). On the other hand, slightly less than half of natural gas have been extracted (i.e., 2922 out of 6606 billion Sm³), the same is true for condensate (i.e., 120 out of 250 million Sm³). As for NGL, slightly more than 70 percent have been extracted as of 31 December 2022 (i.e., 252 out of 350 million tonnes).

3. Mapping the Norwegian system to UNFC classification

3.1. UNFC classification

UNFC-2009 is a universally acceptable and internationally applicable scheme for the classification and reporting of fossil energy and mineral reserves and resources (UNECE, 2010, 2013). It is a generic principle-based system in which quantities are classified on the basis of the three fundamental criteria of 'Economic and social viability (E)', 'Field project status and feasibility (F)', and 'Geological knowledge (G)'.

Criterion E designates the degree of favourability of economic and social conditions in establishing the commercial viability of the project. Criterion F designates the maturity of studies and commitments necessary to implement mining plans or development projects, extending from early exploration efforts occurring before it has been confirmed that a deposit or accumulation exists, to projects involving extraction and sale of a product. Criterion G designates the level of certainty of geologic knowledge and of potential recoverability of quantities of the resource concerned (UNECE, 2010, 2013).

Table 3.1 UNFC-2009 Classes and Sub-classes defined by Sub-categories

UNFC Classes Defined by Categories and Sub-categories						
Extracted		Sales Production		Categories		
		Non-sales Production				
Class		Sub-class		E	F	G
Total Commodity Initially in Place	Known Deposit	Commercial Projects	On Production	1	1.1	1, 2, 3
			Approved for Development	1	1.2	1, 2, 3
			Justified for Development	1	1.3	1, 2, 3
		Potentially Commercial Projects	Development Pending Development on Hold	2 ^a	2.1	1, 2, 3
			Development Unclassified	2	2.2	1, 2, 3
	Non-Commercial Projects	Development Unclassified	3.2	2.2	1, 2, 3	
		Development Not Viable	3.3	2.3	1, 2, 3	
		Additional Quantities in Place	3.3	4	1, 2, 3	
	Potential Deposit	Exploration Projects	[No sub-classes defined] ^b	3.2	3	4
		Additional Quantities in Place		3.3	4	4

Source: UNECE (2010, 2013)

Note:

a: Development Pending Projects may satisfy the requirements for E1.

b: Generic sub-classes have not been defined here, but it is noted that in petroleum the terms Project, Lead, and Play are commonly adopted.

Table 3.1 presents an overview of classes, sub-classes that are defined by the above mentioned three criteria or categories. A class is uniquely defined by selecting from each of the three criteria a particular combination of a category or a sub-category (or groups of categories/sub-categories). Since the codes are always quoted in the same sequence (i.e., E; F; G), the letters may be dropped

and just the numbers are retained. The numerical code defining a class/sub-class is then identical in all languages using Arabic numerals.⁸

As a revised version of UNFC-2004 which was the first United Nations' Framework Classification for Minerals and Fossil Fuels, UNFC-2009 extended its coverage by including e.g., renewables and CO₂ storage in its classification system. More significantly, it was purposely designed to ensure alignment with other widely used systems in the extractive industries – such as the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template/the Society of Petroleum Engineers (SPE)/World Petroleum Council (WPC)/American Association of Petroleum Geologists (AAPG)/Society of Petroleum Evaluation Engineers (SPEE)/Petroleum Resource Management System (SPE-PRMS). As a result, the application of UNFC-2009 facilitated greatly the mapping with other classification systems.

Here is an example. The degree of uncertainty associated with quantity estimates, measured by using either deterministic or probabilistic methods, is usually communicated by generating three specific scenarios or outcomes (Low, Best, and High estimates). This approach is typically applied for petroleum resources, as is also demonstrated by the Norwegian resource classification system as shown in table 2.1 in Section 2. Note that within the Norwegian system, the letter B refers to Base estimate, equivalent to Best estimate as being usually called under other circumstances.

Following UNFC-2009 classification, for known deposit or discovered resources, a high confidence estimate (G1 or 1 as shown in Table 3.1) is directly equivalent to a Low estimate scenario (L as shown in Table 2.1), whereas the combination of the high confidence and moderate confidence estimates (G1+G2 or 1+2 in Table 3.1) is equivalent to a Best estimate scenario (B in Table 2.1). The combination of high, moderate, and low confidence estimates (G1+G2+G3 or 1+2+3 in Table 3.1) is equivalent to a High estimate scenario (H in Table 2.1). As for potential deposit or undiscovered resources, G4.1 is equivalent to a Low estimate, G4.1+G4.2 to a Base estimate, and G.4.1+G4.2+G4.2 to a High estimate between the UNFC-2009 Generic Specification and the Norwegian classification system.

Recently, an updated version of UNFC-2009 with the full name of *United Nations Framework Classification for Resources – Update 2019* (UNFC-2019) is issued out, intending to satisfy the requirements of different resource sectors and applications. This updated UNFC classification is fully aligned to the sustainable resource management called for by the 2030 Agenda for Sustainable Development (UNECE, 2020). Nonetheless, except for some changes in names and further clarifications, the classification structure in UNFC-2019 is almost the same as that in UNFC-2009 as shown in Table 3.1.

3.2. Mapping through bridging document

The NPD developed its own resource classification first in 1996, revised it in 2001 in order to better align it with the SPE-PRMS classification at that time. The latest version of the NPD's resource classification system 2016 clarified the correspondence with the UNFC-2009 classification, for example, by harmonizing the description with terminology used in UNFC-2009 as well as in SPE-PRMS.

Mapping between the Norwegian system and UNFC-2009 classification was once tried in a 2012 pilot study by mapping the Norwegian numbers directly to UNFC-2009 definitions and supporting explanations. In a 2014 case study, however, the conversion of the 2013 petroleum resource

⁸ For more and detailed information about the definition of categories/sub-categories and their supporting explanations, please refer to UNECE (2010, 2013).

accounts to the UNFC-2009 classification was carried out using the UNFC-2009 Generic Specifications and the PRMS Bridging Document ⁹, which explains the connections between the two systems (Knudsen *et al.* 2015).

First, the Norwegian system was mapped to the PRMS classification, which was quite straightforward. According to the definitions and specifications of the two systems, there is a 'reasonable' one-to-one relationship between the two. Second, by means of the Bridging Document between the PRMS and UNFC-2009 which describes how each PRMS Project Maturity Sub-class is mapped along the E-F matrix, using UNFC-2009 sub-categories. Then the PRMS codes are replaced with the codes of the Norwegian sub-classes, so that the mapping between the Norwegian system to UNFC-2009 classification is achieved.

The difficulties as regards where to put each of the project estimates in a most appropriate way are solved by taking into consideration Norwegian situations and specifications. For example, some combinations in the E-F matrix are not relevant for Norway, while others are carefully dealt with by using detailed information for allocating some projects into appropriate combination of subcategories.¹⁰

Following the methodology just described, the NPD compiled petroleum resource accounts classified according to both the Norwegian system and UNFC-2009 classification and published the annual results at its website since 2016.¹¹

Table 3.2 Petroleum resources accounts classified according to UNFC-2009 (as of 31.12.2022, Base estimate)

UNFC class	UNFC sub-class	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
1;1;1+2	1.1;1.1;1+2	727	1210	57	16	2060
	1.1;1.2;1+2	215	124	6	1	351
	1.1;1.3;1+2	109	135	15	0	272
	Sum	1051	1469	77	17	2684
1;2;1+2	1.1;2.1;1+2	58	57	2	1	121
	Sum	58	57	2	1	121
2;2;1+2	2;2.1;1+2	5	13	0	0	18
	2;2.2;1+2	237	198	15	1	464
	Sum	242	211	15	1	482
3;2;1+2	3.2;2.2;1+2	0	0	0	0	0
	3.3;2.3;1+2	239	221	4	0	468
	Sum	239	221	4	0	468
3;3;4.1+4.2	3.2;3;4.1+4.2	1930	1725	0	110	3765
	Sum	1930	1725	0	110	3765

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table 3.2 presents the Base estimate of the 2022 Norwegian petroleum resource accounts according to UNFC-2009 classification. Note that UNFC class and sub-classes are displayed by the numerical codes of (sub)categories in the table. As shown, the basic information as regards the estimated numbers in Table 3.2 is the same as that in Table 2.2 which is classified by the Norwegian system.

⁹ See Figure IV.3 in UNECE (2013).

¹⁰ More information on how to map the Norwegian system to UNFC-2009 classification are in Knudsen *et al.* (2015).

¹¹ The NPD resource accounts used UNFC-2009 classification until 2019 (for the period 2016-2019), from 2020 they used the updated UNFC-2019 (UNECE, 2020) for the period 2020 up to the present.

4. Converting the Norwegian system to SEEA-CF classification

4.1. SEEA-CF classification

In SEEA-CF, known deposits are categorized in three classes, each defined according to combinations of the three-dimensional criteria (i.e., E, F, G) derived from UNFC-2009 classification as described in subsection 3.1 and shown in Table 3.1 (United Nations *et al.*, 2014):

Class A: Commercially recoverable resources.

This class includes deposits for projects that fall in categories E1 and F1 and where the level of confidence in the geologic knowledge is high (G1), moderate (G2) or low (G3), such as on-production projects, projects approved for development and projects justified for development.

Class B: Potentially commercially recoverable resources.

This class includes deposits for those projects that fall in the category E2 (or eventually E1) and at the same time in F2.1 or F2.2 and where the level of confidence in the geologic knowledge is high (G1), moderate (G2) or low (G3), such as economic and marginal development projects pending and development projects on hold.

Class C: Non-commercial and other known deposits.

These are resources for those projects that fall into category E3 and for which the feasibility is categorized as F2.2, F2.3 or F4 and where the level of confidence in the geologic knowledge is high (G1), moderate (G2) or low (G3), such as unclarified development projects, non-viable development projects, and additional quantities in place.

Table 4.1 Correspondence between UNFC-2009 and SEEA-CF classification

SEEA-CF class	UNFC-2009 categories				
	E	F	G		
			Low	Best	High
Class A: Commercially recoverable resources	1	1.1	1	1+2	1+2+3
	1	1.2	1	1+2	1+2+3
	1	1.3	1	1+2	1+2+3
Class B: Potentially commercially recoverable resources	1.1	2.1	1	1+2	1+2+3
	2	1.3	1	1+2	1+2+3
	2	2.1	1	1+2	1+2+3
Class C: Non-commercial and other known deposits	2	2.2	1	1+2	1+2+3
	3.2	1.3	1	1+2	1+2+3
	3.2	2.1	1	1+2	1+2+3
	3.2	2.2	1	1+2	1+2+3
	3.3	1.3	1	1+2	1+2+3
	3.3	2.1	1	1+2	1+2+3
	3.3	2.2	1	1+2	1+2+3
Potential deposits (not included in SEEA-CF)	3.3	2.3	1	1+2	1+2+3
	3.3	4	1	1+2	1+2+3
	3.2	3.1	4.1	4.2+4.2	4.1+4.2+4.3
	3.2	3.2	4.1	4.2+4.2	4.1+4.2+4.3
	3.2	3.3	4.1	4.2+4.2	4.1+4.2+4.3
	3.3	4	4.1	4.2+4.2	4.1+4.2+4.3

Source: Adapted from Table 6 in Pionnier and Yamaguchi (2018)

Note that SEEA-CF classification excludes potential deposits where there is no expectation of the deposits' becoming economically viable and there is a lack of information needed to determine the feasibility of extraction or to have confidence in the geologic knowledge (United Nations *et al.*, 2014).

Based on the definitions, a correspondence table between SEEA-CF classes and UNFC-2009 classes as well as subclasses can be identified, as presented in Table 4.1. This correspondence table is extracted from the original correspondence tables which are used for mapping SEEA-CF classification with the CRIRSCO and SPE-PRMS classifications via UNFC-2009 and are applied for compiling the OECD database of mineral and energy resources (Pionnier and Yamaguchi, 2018).

For the ease of visual comparison, the defined SEEA-CF three classes are colour coded in Table 4.1, with Class A being coloured as green, Class B as yellow, and Class C as red, respectively. Although the 'Potential deposits' are not included in SEEA-CF classification, they are coloured as blue in the table, also for easy communication.

4.2. Converting by correspondence table

By using the correspondence table as shown in Table 4.1, the Norwegian petroleum resource accounts for 2022 as presented in Table 3.2, which follows UNFC-209 classification, are reclassified according to SEEA-CF classification. The reclassified 2022 resource accounts are reported in Table 4.2, also colour coded in the same way as described above.

Table 4.2 Petroleum resources accounts classified according to SEEA-CF (as of 31.12.2022, Base estimate)

SEEA-CF class	UNFC class	UNFC sub-class	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
Class A	1;1;1+2	1.1;1.1;1+2	727	1210	57	16	2060
		1.1;1.2;1+2	215	124	6	1	351
		1.1;1.3;1+2	109	135	15	0	272
		Sum	1051	1469	77	17	2684
Class B	2;2;1+2	1.1;2.1;1+2	58	57	2	1	121
		2;2.1;1+2	5	13	0	0	18
		2;2.2;1+2	237	198	15	1	464
		Sum	299	268	17	2	603
Class C	3;2;1+2	3.2;2.2;1+2	0	0	0	0	0
		3.3;2.3;1+2	239	221	4	0	468
		Sum	239	221	4	0	468
Potential deposits	3;3;4.1+4.2	3.2;3;4.1+4.2	1930	1725	0	110	3765
		Sum	1930	1725	0	110	3765

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Again, the basic information as regards the estimated numbers in Table 4.2 is the same as that in Table 3.2. In fact, the basic information is the same across the three tables as presented in the document, i.e., Table 2.2, Table 3.2, and Table 4.2. The only difference among them is the classification, with Table 2.2 according to the Norwegian resource classification system, Table 3.2 to UNFC-2009 classification, and Table 4.2 to SEEA-CF classification.

Following the same methodology and procedure, the published Norwegian petroleum resource accounts over the period 2016-2022 can all be reclassified according to SEEA-CF classification.

5. Physical asset accounts according to SEEA-CF standard

For the compilation of physical asset accounts for natural resources as recommended by SEEA-CF, both stock and flow information are needed. As for the petroleum resources on the Norwegian continental shelf, all the required information for constructing the physical asset accounts can be derived from the NPD's annual petroleum resource accounts published at its website.

Following the general form of the physical asset accounts as suggested by SEEA-CF,¹² information from the published annual resource accounts can be organized to show the opening stock at the beginning of the year in concern, changes during the year, and closing stocks at the end of the year, i.e.,

Closing stock (at the end of the year or the beginning of the next year)

= Opening stock (at the beginning of the year or the end of the last year)

+ Total changes during the year.

The 'Total changes' during the year include both 'Additions' to stock and 'Reductions' in stock. The 'Additions' to stock can come from flow components such as 'Discoveries', 'Upward reappraisals', and 'Reclassifications', while the 'Reductions' in stock may be due to other types of flow components such as 'Extractions', 'Catastrophic losses', 'Downward reappraisals', and 'Reclassifications'.¹³ All these flow components are central to the physical asset accounts because they can provide valuable information regarding the availability of the natural resources in concern.

Owing to limited information that can be drawn from the NPD's published annual petroleum resource accounts, only 'Extractions' for SEEA-CF Class A resources (Commercially recoverable resources) can be obtained and derived as the difference of the 'Produced' resources (sub-class RC0) between two consecutive years.

As visualized in Figure 2.1, there are both inflows and outflows through most of the resource classes (sub-classes) as defined by the NPD's petroleum resource classification system. For the moment, only net changes (net flows) in each sub-class (from RC0 to RC8/9, see Table 2.1) are reported in the NPD's annual petroleum resource accounts. Therefore, for all other (than 'Extractions') flow components, before further detailed information can be acquired, only the net changes, reported as 'Total changes' in the physical asset accounts, can be presented.

Again, by using 2022 as an example, the physical asset accounts for petroleum resources on the Norwegian continental shelf in 2022 are compiled according to SEEA-CF standard, in terms of the form and classification applied. The physical assets accounts with Base estimate for 2022 are reported in Table 5.1, the basic information of which is consistent with those in Table 4.2.

The corresponding physical asset accounts for Norwegian petroleum resources in 2022 with Low and High estimates are reported in Table 5.2 and Table 5.3, respectively. Moreover, the physical asset accounts for Norwegian petroleum resources over the period 2017-2021 are reported in Appendix A for Base estimate, Appendix B for Low estimate, and Appendix C for High estimate, respectively.

¹² A general form of physical asset accounts for mineral and energy resources is presented in Table 5.8 in SEEA-CF (United Nations *et al.*, 2014).

¹³ Definitions of all the flow components relevant for the physical asset accounts can be found in SEEA-CF (United Nations *et al.*, 2014).

Table 5.1 Physical asset account for petroleum resources in 2022 (Base estimate)

	Type of petroleum resources				SUM (million Sm ³ o. e.)
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	
Class A: Commercially recoverable resources					
Opening stock as of 31.12.2021	1045	1449	74	19	2653
Extractions	-96	-124	-5	-2	-231
Other changes	103	144	8	1	262
Closing stock as of 31.12.2022	1051	1469	77	17	2684
Class B: Potentially commercially recoverable resources					
Opening stock as of 31.12.2021	441	426	37	3	941
Total changes	-142	-158	-20	-1	-338
Closing stock as of 31.12.2022	299	268	17	2	603
Class C: Non-commercial and other known deposits					
Opening stock as of 31.12.2021	258	197	5	0	464
Total changes	-19	24	-1	0	4
Closing stock as of 31.12.2022	239	221	4	0	468
Potential deposits (not included in SEEA-CF)					
Opening stock as of 31.12.2021	1935	1735	0	120	3790
Total changes	-5	-10	0	-10	-25
Closing stock as of 31.12.2022	1930	1725	0	110	3765

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Different from Table 5.1, estimates for NGL and Condensate are grouped together in Table 5.2 and Table 5.3, because separate information for NGL and Condensate for either Low or High estimates is currently not available from the NPD's published annual petroleum resource accounts.

Table 5.2 Physical asset account for petroleum resources in 2022 (Low estimate)

	Type of petroleum resources			SUM (million Sm ³ o. e.)
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	
Class A: Commercially recoverable resources				
Opening stock as of 31.12.2021	848	1 277	130	2 255
Extractions	-96	-124	-11	-231
Other changes	145	106	18	270
Closing stock as of 31.12.2022	897	1 259	138	2 293
Class B: Potentially commercially recoverable resources				
Opening stock as of 31.12.2021	330	288	40	658
Total changes	-105	-110	-23	-238
Closing stock as of 31.12.2022	226	178	17	420
Class C: Non-commercial and other known deposits				
Opening stock as of 31.12.2021	149	117	14	280
Total changes	-15	12	-4	-8
Closing stock as of 31.12.2022	134	128	10	273
Potential deposits (not included in SEEA-CF)				
Opening stock as of 31.12.2021	1 254	1 110	129	2 493
Total changes	13	24	-14	23
Closing stock as of 31.12.2022	1 267	1 134	115	2 516

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table 5.3 Physical asset account for petroleum resources in 2022 (High estimate)

	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
	Class A: Commercially recoverable resources			
Opening stock as of 31.12.2021	1 208	1 669	216	3 093
Extractions	-96	-124	-11	-231
Other changes	125	66	-55	135
Closing stock as of 31.12.2022	1 237	1 611	150	2 997
	Class B: Potentially commercially recoverable resources			
Opening stock as of 31.12.2021	544	619	116	1279
Total changes	- 161	- 267	- 85	- 513
Closing stock as of 31.12.2022	383	352	31	766
	Class C: Non-commercial and other known deposits			
Opening stock as of 31.12.2021	366	296	25	686
Total changes	-22	2	-5	-24
Closing stock as of 31.12.2022	343	298	20	662
	Potential deposits (not included in SEEA-CF)			
Opening stock as of 31.12.2021	2838	2503	158	5499
Total changes	97	- 49	- 43	5
Closing stock as of 31.12.2022	2935	2454	115	5504

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Up to now, the physical asset accounts for petroleum resources on the Norwegian continental shelf have been compiled according to SEEA-CF, with clear distinction being made across various types of petroleum resources (i.e., oil, gas, NGL, and condensate), as well as across different classes (i.e., Classes A, B, C, and potential deposits that is not included in SEEA-CF).

As recommended by SEEA-CF, not only totals including all classes of individual types of resources, but also estimates for individual type and class itself should be calculated and reported. Because each type and class has a different likelihood of extraction, simple summation of the available resources for a specific natural resource, such as petroleum resource, may give a misleading indication of available resources.

6. Concluding remarks

Based on the NPD's annual petroleum resource accounts published at its website, the physical asset accounts for petroleum resources on the Norwegian continental shelf over the period 2017-2022 are compiled according to SEEA-CF standard, in terms of the suggested form and classifications, enabling a clearer and more meaningful international comparison.

The physical asset accounts for Norwegian petroleum resources have been compiled, with clear distinction being made across various types of petroleum resources (i.e., oil, gas, NGL, and condensate), and different classes (i.e., Classes A, B, C, and potential deposits that is not included in SEEA-CF). Therefore, not only totals including all classes of individual types of resources, but also estimates for individual type and class itself are calculated and reported.

Quantity information drawn from the physical asset accounts alone cannot be directly compared with or added to other asset types in monetary terms for sustainability analysis by following the capital approach. However, the compiled physical assets accounts are prerequisite for further compiling the corresponding monetary assets accounts for petroleum resources in Norway, both expected to be included in the NEA.

Possibly, the monetary values calculated from the asset accounts can be further incorporated in the balance sheet accounts in the NNA, if thoughtful alignment of the asset boundary is made between SEEA-CF and 2008 SNA, as suggested by the relevant UN Task Team Guidance Note for SNA updating.

In the compiled physical asset accounts as presented in this document, many other flow components except for 'Extractions' are not in place. Therefore, investigation of the possibility for identifying information to further decompose 'Total changes' into other components, such as 'Discoveries', 'Upward/downward reappraisal', and 'Classification', is the next step to follow.

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Appendix A: Physical asset account for petroleum resources in Norway according to SEEA-CF (2017-2021, Base estimate)

Table A1.1 Physical asset account for petroleum resources 2017 - 2021 (Class A, Base estimate)

	Class A: Commercially recoverable resources				
	Type of petroleum resources				
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
2017					
Opening stock as of 31.12.2016	991	1782	112	23	3008
Extractions	-92	-124	-11	-2	-238
Other changes	232	72	8	0	318
Closing stock as of 31.12.2017	1131	1729	109	21	3089
2018					
Opening stock as of 31.12.2017	1131	1729	109	21	3089
Extractions	-86	-113	-18	3	-230
Other changes	133	6	1	-2	138
Closing stock as of 31.12.2018	1177	1622	92	22	2997
2019					
Opening stock as of 31.12.2018	1177	1622	92	22	2997
Extractions	-83	-117	-10	-1	-219
Other changes	75	39	5	-1	122
Closing stock as of 31.12.2019	1169	1544	87	21	2900
2020					
Opening stock as of 31.12.2019	1169	1544	87	21	2900
Extractions	-98	-110	-8	-2	-226
Other changes	54	6	-3	-1	53
Closing stock as of 31.12.2020	1125	1440	76	18	2727
2021					
Opening stock as of 31.12.2020	1125	1440	76	18	2727
Extractions	-102	-116	-11	-1	-240
Other changes	22	125	9	1	165
Closing stock as of 31.12.2021	1045	1449	74	19	2653

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table A1.2 Physical asset account for petroleum resources 2017 - 2021 (Class B, Base estimate)

	Class B: Potentially commercially recoverable resources				
	Type of petroleum resources				
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
2017					
Opening stock as of 31.12.2016	673	434	35	4	1176
Total changes	-132	-7	0	0	-138
Closing stock as of 31.12.2017	541	428	35	4	1038
2018					
Opening stock as of 31.12.2017	541	428	35	4	1038
Total changes	-71	-3	-2	1	-78
Closing stock as of 31.12.2018	469	425	33	4	960
2019					
Opening stock as of 31.12.2018	469	425	33	4	960
Total changes	-27	5	-3	0	-27
Closing stock as of 31.12.2019	442	430	30	5	933
2020					
Opening stock as of 31.12.2019	442	430	30	5	933
Total changes	-35	26	5	0	0
Closing stock as of 31.12.2020	407	456	34	5	933
2021					
Opening stock as of 31.12.2020	407	456	34	5	933
Total changes	34	-30	3	-2	8
Closing stock as of 31.12.2021	441	426	37	3	941

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table A1.3 Physical asset account for petroleum resources 2017 - 2021 (Class C, Base estimate)

	Class C: Non-commercial and other known deposits				
	Type of petroleum resources				
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
2017					
Opening stock as of 31.12.2016	190	172	2	3	368
Total changes	11	5	0	-2	15
Closing stock as of 31.12.2017	202	177	2	1	383
2018					
Opening stock as of 31.12.2017	202	177	2	1	383
Total changes	16	3	0	5	23
Closing stock as of 31.12.2018	217	179	2	5	406
2019					
Opening stock as of 31.12.2018	217	179	2	5	406
Total changes	29	10	0	0	39
Closing stock as of 31.12.2019	246	190	2	5	446
2020					
Opening stock as of 31.12.2019	246	190	2	5	446
Total changes	42	9	2	-5	50
Closing stock as of 31.12.2020	288	199	4	0	495
2021					
Opening stock as of 31.12.2020	288	199	4	0	495
Total changes	-30	-2	0	0	-31
Closing stock as of 31.12.2021	258	197	5	0	464

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table A1.4 Physical asset account for petroleum resources 2017 - 2021 (Potential deposits, Base estimate)

	Potential deposits (not included in SEEA-CF)				
	Type of petroleum resources				
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL (million tonne)	Condensate (million Sm ³)	SUM (million Sm ³ o. e.)
2017					
Opening stock as of 31.12.2016	1285	1465	0	120	2870
Total changes	710	405	0	15	1130
Closing stock as of 31.12.2017	1995	1870	0	135	4000
2018					
Opening stock as of 31.12.2017	1995	1870	0	135	4000
Total changes	-15	-40	0	-5	-60
Closing stock as of 31.12.2018	1980	1830	0	130	3940
2019					
Opening stock as of 31.12.2018	1980	1830	0	130	3940
Total changes	5	-25	0	-10	-30
Closing stock as of 31.12.2019	1985	1805	0	120	3910
2020					
Opening stock as of 31.12.2019	1985	1805	0	120	3910
Total changes	-45	-30	0	0	-75
Closing stock as of 31.12.2020	1940	1775	0	120	3835
2021					
Opening stock as of 31.12.2020	1940	1775	0	120	3835
Total changes	-5	-40	0	0	-45
Closing stock as of 31.12.2021	1935	1735	0	120	3790

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Appendix B: Physical asset account for petroleum resources in Norway according to SEEA-CF (2017-2021, Low estimate)

Table B1.1 Physical asset account for petroleum resources 2017-2021 (Class A, Low estimate)

	Class A: Commercially recoverable resources			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	867	1 646	200	2 713
Extractions	-92	-124	-22	-238
Other changes	211	25	102	338
Closing stock as of 31.12.2017	986	1 547	280	2 813
2018				
Opening stock as of 31.12.2017	986	1 547	280	2 813
Extractions	-86	-113	-31	-230
Other changes	94	71	-85	80
Closing stock as of 31.12.2018	994	1 504	164	2 662
2019				
Opening stock as of 31.12.2018	994	1 504	164	2 662
Extractions	-83	-117	-19	-219
Other changes	61	-14	20	67
Closing stock as of 31.12.2019	972	1 373	165	2 510
2020				
Opening stock as of 31.12.2019	972	1 373	165	2 510
Extractions	-98	-110	-18	-226
Other changes	4	23	108	135
Closing stock as of 31.12.2020	878	1 286	255	2 419
2021				
Opening stock as of 31.12.2020	878	1 286	255	2 419
Extractions	-102	-116	-22	-240
Other changes	72	108	-104	76
Closing stock as of 31.12.2021	848	1 277	130	2 255

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

- 1 Sm³ of oil = 1 Sm³ o. e.
- 1000 Sm³ of gas = 1 Sm³ o. e.
- 1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.
- 1 Sm³ of condensate = 1 Sm³ o. e.

Table B1.2 Physical asset account for petroleum resources 2017-2021 (Class B, Low estimate)

	Class B: Potentially commercially recoverable resources			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	473	297	47	817
Total changes	-102	-16	0	-118
Closing stock as of 31.12.2017	371	281	47	699
2018				
Opening stock as of 31.12.2017	371	281	47	699
Total changes	-34	5	-6	-35
Closing stock as of 31.12.2018	337	286	41	664
2019				
Opening stock as of 31.12.2018	337	286	41	664
Total changes	-55	5	-3	-53
Closing stock as of 31.12.2019	282	290	38	611
2020				
Opening stock as of 31.12.2019	282	290	38	611
Total changes	-9	22	42	55
Closing stock as of 31.12.2020	274	312	80	666
2021				
Opening stock as of 31.12.2020	274	312	80	666
Total changes	57	-24	-40	-8
Closing stock as of 31.12.2021	330	288	40	658

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table B1.3 Physical asset account for petroleum resources 2017-2021 (Class C, Low estimate)

	Class C: Non-commercial and other known deposits			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	106	121	4	231
Total changes	16	-3	-4	9
Closing stock as of 31.12.2017	122	118	0	240
2018				
Opening stock as of 31.12.2017	122	118	0	240
Total changes	-1	-9	2	-7
Closing stock as of 31.12.2018	122	109	2	233
2019				
Opening stock as of 31.12.2018	122	109	2	233
Total changes	7	6	8	21
Closing stock as of 31.12.2019	128	115	10	253
2020				
Opening stock as of 31.12.2019	128	115	10	253
Total changes	180	-3	-138	39
Closing stock as of 31.12.2020	309	112	-128	292
2021				
Opening stock as of 31.12.2020	309	112	-128	292
Total changes	-159	5	142	-12
Closing stock as of 31.12.2021	149	117	14	280

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table B1.4 Physical asset account for petroleum resources 2017-2021 (Potential deposits, Low estimate)

	Potential deposits (not included in SEEA-CF)			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	700	856	113	1 669
Total changes	635	488	83	1 206
Closing stock as of 31.12.2017	1 335	1 344	196	2 875
2018				
Opening stock as of 31.12.2017	1 335	1 344	196	2 875
Total changes	-15	-5	-16	-36
Closing stock as of 31.12.2018	1 321	1 339	180	2 839
2019				
Opening stock as of 31.12.2018	1 321	1 339	180	2 839
Total changes	-116	-156	7	-266
Closing stock as of 31.12.2019	1 204	1 183	187	2 574
2020				
Opening stock as of 31.12.2019	1 204	1 183	187	2 574
Total changes	-103	26	2	-76
Closing stock as of 31.12.2020	1 101	1 209	189	2 498
2021				
Opening stock as of 31.12.2020	1 101	1 209	189	2 498
Total changes	153	-99	-60	-5
Closing stock as of 31.12.2021	1 254	1 110	129	2 493

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Appendix C: Physical asset account for petroleum resources in Norway according to SEEA-CF (2017-2021, High estimate)

Table C1.1 Physical asset account for petroleum resources 2017-2021 (Class A, High estimate)

	Class A: Commercially recoverable resources			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	1 126	1 932	259	3 317
Extractions	-92	-124	-22	-238
Other changes	250	40	63	353
Closing stock as of 31.12.2017	1 284	1 848	300	3 432
2018				
Opening stock as of 31.12.2017	1 284	1 848	300	3 432
Extractions	-86	-113	-31	-230
Other changes	155	36	-68	123
Closing stock as of 31.12.2018	1 353	1 770	201	3 324
2019				
Opening stock as of 31.12.2018	1 353	1 770	201	3 324
Extractions	-83	-117	-19	-219
Other changes	75	91	47	213
Closing stock as of 31.12.2019	1 345	1 744	228	3 318
2020				
Opening stock as of 31.12.2019	1 345	1 744	228	3 318
Extractions	-98	-110	-18	-226
Other changes	-13	5	65	58
Closing stock as of 31.12.2020	1 234	1 639	276	3 149
2021				
Opening stock as of 31.12.2020	1 234	1 639	276	3 149
Extractions	-102	-116	-22	-240
Other changes	76	147	-39	184
Closing stock as of 31.12.2021	1 208	1 669	216	3 093

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table C1.2 Physical asset account for petroleum resources 2017-2021 (Class B, High estimate)

	Class B: Potentially commercially recoverable resources			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	877	601	91	1 569
Total changes	-147	-3	13	-137
Closing stock as of 31.12.2017	730	598	104	1 432
2018				
Opening stock as of 31.12.2017	730	598	104	1 432
Total changes	-132	-7	-23	-162
Closing stock as of 31.12.2018	598	591	81	1 270
2019				
Opening stock as of 31.12.2018	598	591	81	1 270
Total changes	-7	1	2	-4
Closing stock as of 31.12.2019	591	592	83	1 266
2020				
Opening stock as of 31.12.2019	591	592	83	1 266
Total changes	-109	32	68	-9
Closing stock as of 31.12.2020	482	624	151	1 257
2021				
Opening stock as of 31.12.2020	482	624	151	1 257
Total changes	61	-5	-35	22
Closing stock as of 31.12.2021	544	619	116	1 279

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table C1.3 Physical asset account for petroleum resources 2017-2021 (Class C, High estimate)

	Class C: Non-commercial and other known deposits			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	283	231	11	525
Total changes	3	7	-2	8
Closing stock as of 31.12.2017	286	238	9	533
2018				
Opening stock as of 31.12.2017	286	238	9	533
Total changes	29	23	0	52
Closing stock as of 31.12.2018	315	261	9	585
2019				
Opening stock as of 31.12.2018	315	261	9	585
Total changes	46	16	7	69
Closing stock as of 31.12.2019	361	276	17	654
2020				
Opening stock as of 31.12.2019	361	276	17	654
Total changes	419	16	-332	102
Closing stock as of 31.12.2020	780	292	-316	756
2021				
Opening stock as of 31.12.2020	780	292	-316	756
Total changes	-414	4	340	-70
Closing stock as of 31.12.2021	366	296	25	686

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.

Table C1.4 Physical asset account for petroleum resources 2017-2021 (Potential deposits, High estimate)

	Potential deposits (not included in SEEA-CF)			
	Type of petroleum resources			
	Oil (million Sm ³)	Gas (billion Sm ³)	NGL and Condensate (million Sm ³ o. e.)	SUM (million Sm ³ o. e.)
2017				
Opening stock as of 31.12.2016	2 189	2 364	132	4 685
Total changes	599	132	-95	636
Closing stock as of 31.12.2017	2 788	2 496	37	5 321
2018				
Opening stock as of 31.12.2017	2 788	2 496	37	5 321
Total changes	-2	-32	-47	-81
Closing stock as of 31.12.2018	2 787	2 464	-10	5 240
2019				
Opening stock as of 31.12.2018	2 787	2 464	-10	5 240
Total changes	171	137	106	413
Closing stock as of 31.12.2019	2 957	2 600	96	5 653
2020				
Opening stock as of 31.12.2019	2 957	2 600	96	5 653
Total changes	-220	-27	172	-75
Closing stock as of 31.12.2020	2 738	2 574	267	5 578
2021				
Opening stock as of 31.12.2020	2 738	2 574	267	5 578
Total changes	100	-71	-110	-80
Closing stock as of 31.12.2021	2 838	2 503	158	5 499

Source: <https://www.npd.no/en/facts/resource-accounts-and-analysis/>

Note: Standard cubic metre oil equivalent (Sm³ o. e.) is calculated by using the following rules:

1 Sm³ of oil = 1 Sm³ o. e.

1000 Sm³ of gas = 1 Sm³ o. e.

1 tonne of NGL = 1.9 Sm³ NGL = 1.9 Sm³ o. e.

1 Sm³ of condensate = 1 Sm³ o. e.