UNECE

Bridging Document

between the

Oil and Fuel Gas Reserves and Resources Classification of

the Russian Federation of 2013

and the

United Nations Framework Classification for Resources

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Bridging Document between the Oil and Fuel Gas Reserves and Resources Classification of the Russian Federation of 2013 and the United Nations Framework Classification for Resources

Prepared by the State Commission of Mineral Reserves of the Russian Federation

Summary

This is a Bridging Document between the Oil and Fuel Gas Reserves and Resources Classification of the Russian Federation of 2013 (RF2013) and the United Nations Framework Classification for Resources (UNFC (2019)). It is an update of the previous Bridging Document between RF2013 and the 2009 United Nations Framework Classification for Fossil Fuel Energy and Mineral Reserves and Resources Bridging Documents explain the relationship between UNFC (2019) and other classification systems that have been endorsed by the Expert Group on Resource Classification as an Aligned System. This document compares reserves and resources by categories of RF2013 to Categories and Classes of UNFC (2019). RF2013 was approved by Order No. 477 of the Ministry of Natural Resources and Environment of the Russian Federation on 1 November 2013, registered with the Russian Ministry of Justice on 31 December 2013 under registration number 30943 and enacted on 1 January 2016. It contains uniform principles and establishes uniform guidelines for the estimation and reporting of reserves and resources of oil, fuel gases (free gas, gas from gas cap, gas dissolved in oil) and gas condensate in the Russian Federation. This Bridging Document does not carry any binding requirements for the independent application of RF2013. This Bridging Document shall be referred to when reporting estimates made in RF2013 and converted to UNFC (2019) categories. RF2013 is independent of UNFC (2019) and is mandatory for reporting by the Ministry of Natural Resources and Environment of the Russian Federation.

Contents

I. Introduction

1. The Oil and Fuel Gas Reserves and Resources Classification of the Russian Federation of 2013 (RF2013) is a system aligned with the United Nations Framework Classification for Resources (UNFC (2019))[1] and supported by the Russian Bridging Document 2016. An aligned system is a classification system aligned with UNFC (2019), as evidenced by the existence of a bridging document endorsed by the Expert Group on Resource Management.[2]

2. This Bridging Document provides a comparison of the RF2013 categories of reserves and resources with the Categories and Classes of UNFC.[3]

3. This Bridging Document is an update of the previous Bridging Document between RF2013 and the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009, including Specifications for its implementation, approved by the United Nations Economic Commission for Europe (ECE) Committee on Sustainable Energy at its twenty-fifth session on 30 September 2016.[4] In view of the release of an updated version of the United Nations Framework Classification for Resources in 2019 the Bridging Document was updated. The new version of the Bridging Document also takes into account the experience of applying the previous version of the Bridging Document to the estimates of reserves and resources of real projects evaluated using RF2013.

4. RF2013 was approved by Order No. 477 of the Ministry of Natural Resources and Environment of the Russian Federation on 1 November 2013, registered with the Russian Ministry of Justice on 31 December 2013 under registration number 30943 and enacted on 1 January 2016. It contains uniform principles and establishes uniform guidelines for the estimation and reporting of reserves and resources of oil, fuel gases (free gas, gas from gas cap, gas dissolved in oil) and gas condensate in the Russian Federation.

5. RF2013 is independent of UNFC (2019) and is mandatory for reporting by the Ministry of Natural Resources and Environment of the Russian Federation. This Bridging Document is complementary to but separate from the independent application of RF2013.

II. Basic principles for identifying reserves and resource categories in RF2013

6. RF2013 uses the term "reserves" for the recoverable quantities associated with all discovered accumulations (whether commercial, potentially commercial or non-commercial). The term "resources" is applied to quantities potentially recoverable from undiscovered accumulations. Oil and gas reserves in RF2013 are subdivided by the extent of commercial development and by the degree of geological knowledge into the following categories: A (developing, drilled), B1 (developing, not drilled, known), B2 (developing, not drilled, estimated), C1 (known) and C2 (estimated). RF2013 uses two terms for reserves: initial and remaining. Remaining reserves are derived by subtraction of produced quantities from initial reserves. When mapping to UNFC (2019), it is necessary to use the remaining reserves for all categories of reserves and resources of RF2013.

7. Reserves of a deposit/part of a deposit drilled by producing wells and developed in accordance with the approved project Design Document (Development Process Plan or amendment (supplement) thereto, Reservoir Management Plan or amendment (supplement) thereto) correspond to Category A (developing, drilled). Category A includes recoverable reserves of deposits/parts of deposits in which geological structure, shape and dimensions have been determined and fluid contacts have been substantiated by drilling, testing and well

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[1] ECE Energy Series No. 61 and ECE/ENERGY/125, Part II. Specifications for the Application of the United Nations Framework Classification for Resources (UNFC), I. Introduction, paragraph (d.), page11.

[2] Part II. Specifications for the Application of the United Nations Framework Classification for Resources (UNFC), Annex I. Glossary of terms, page 16.

[3] ECE Energy Series No. 61 and ECE/ENERGY/125.

[4] ECE Energy Series No. 42 and ECE/ENERGY/94.

logging data. The technological characteristics (production mode, oil, gas, condensate production rates, productivity of wells) have been established by well operation data.

8.   Category B1 (developing, not drilled, known) refers to reserves of adjacent parts of deposits not drilled by producing wells, planned to develop in accordance with an agreed Design Document, studied by seismic or other high-accuracy methods and drilled with prospecting, appraisal, exploration, transit or deepened production wells that yielded commercial oil or gas inflows (individual wells may not be tested, but their productivity is inferred by well logging and mud logging data and core data).

9.   Category B2 (developing, not drilled, estimated) refers to reserves of deposits/parts of deposits not drilled with producing wells planned to develop in accordance with an agreed Design Document that has been studied by seismic or other high-accuracy methods, which presence has been substantiated by data of geophysical and geological studies and testing of individual wells while drilling.

10.   Category C1 (known/explored) refers to reserves of deposits/parts of deposits that have not been brought into commercial development on which test operation thereof or test operation of individual wells may be carried out. Deposits shall be studied by seismic or other high-accuracy methods and drilled with prospecting, appraisal, and exploration wells that yielded commercial oil or gas inflows (individual wells may not be tested, but their productivity is inferred by well logging and mud logging data and core data).

11.   Category C2 (estimated) refers to reserves of deposits/parts of deposits, fields that have not been brought into commercial development, that are developed on the basis of a test operation plan, studied by seismic or other high-accuracy methods, which presence has been substantiated by data of geological and geophysical studies and testing of individual wells while drilling.

12.   In accordance with the rules and regulatory documents effective in the Russian Federation, for the deposits (fields) in commercial development (reserves of Categories A, B1, B2), the recoverable reserves (recoverable quantities) of oil, gas, condensate and associated commercial components should be determined as a result of technical and economic estimates for the recommended development scenario agreed in accordance with the established procedure, oil recovery factor, gas recovery factor, condensate recovery factor, estimated in Project Design Document for deposits (fields) development during cost-effective field life and during the period of reserves exhaustion.

13.   Technologically recoverable but non-profitable for recovery under current economic conditions, hydrocarbon reserves of the mentioned categories are referred to as A*, B1*, and B2*. Reserves of any category with the symbol "*" are defined as part of technologically recoverable reserves which are non-profitable for recovery on the date of evaluation. The estimates are derived by subtraction of profitable recoverable reserves from technologically recoverable reserves. Technologically recoverable and profitable recovery reserves are determined in each Field Project Design Document.

14.   For the fields under exploration (Categories C1 and C2), assessment of oil, gas and condensate recoverable reserves should be carried out in the Field (Deposit) Test Production Design agreed upon in accordance with the established procedure or with expert appraisals or simplified statistical methods of recovery factors determination (empirical methods, coefficient-based method, analogy method).

15.   Categories of technologically non-recoverable reserves are designated as follows: A**, B1**, B2**, C1**, and C2**. Under UNFC (2019), these are classified as Remaining Products not Developed. In RF2013, there is no such category of reserves as Remaining Products not Developed, but there are reserves in place and technologically recoverable reserves. Reserve estimates of any category marked with ** are the result of the subtraction of technologically recoverable reserves from geological reserves of the same Category, which corresponds to the concept of Remaining Products not Developed in UNFC (2019).

16.   Undiscovered Resources of oil, gas and condensate are subdivided by geological knowledge into Categories D0 (prepared), DL (localized), D1 (prospective), and D2 (expected).

17.   Resources of Category D0 represent a potential oil and gas discovery in a ready-to-drill trap and are used for prospecting works design. Category DL refers to resources of potential pay formations in traps revealed by the result of geological and geophysical prospecting operations within the areas with unproved commercial oil/gas presence.

18.   Category D1 refers to resources of lithology-stratigraphy complexes with already discovered oil/gas accumulations within major regional structures. Category D2 refers to resources of lithology-stratigraphy complexes with no discovered oil/gas fields (pools) within major regional structures.

19.   As in the case of reserves, categories of non-recoverable resources (technologically non-recoverable) are designated as follows: D0**, DL**, D1**, and D2**. Under UNFC (2019), these are classified as Remaining Products not Developed.

III.   Direct mapping of exploration and development project types in RF2013 and project classes/subclasses in UNFC (2019)

20.   UNFC (2019) (like the Society of Petroleum Engineers (SPE) Petroleum Resource Management System (PRMS)) is a project-based system. This means that the estimated quantity of hydrocarbons is dependent on the implementation of a particular project. According to UNFC (2019), one or more projects can refer to one natural object (hydrocarbon accumulation as a deposit or a field as a set of deposits).

A.   Hydrocarbon projects in the Russian Federation

21.   The sequence, in ascending order of maturity, of the viability of exploration and development projects:

        (1)   Regional geological exploration projects;[5]

        (2)   Prospecting projects;[6]

        (3)   Exploration projects;[7]

        (4)   Technical projects for development of technologies of hard-to-recover mineral resources (TP TRIZ);

        (5)   Field (deposit) pilot production projects (PPP);

        (6)   Field technological development - schemes (TDS);

        (7)   Field technological development projects (TDP).

22.   UNFC (2019) defines the following classes of projects in ascending order of maturity:

        (1)   Prospective Projects;

        (2)   Non-Viable Projects;

        (3)   Potentially Viable Projects;

        (4)   Viable Projects.

23.   In the Class **Prospective Projects** in UNFC (2019), Sub-classes are not defined. The Class **Non-Viable Projects** is subdivided into two Sub-classes: **Development Unclarified** and **Development Not Viable**. The class **Potentially Viable Projects** is subdivided into two Sub-classes: **Development Pending** and **Development on Hold**. The Class **Viable Projects**

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[5] Project documentation for regional geological study of subsurface resources.
[6] Project documentation for geological study of the subsoil, including prospecting and evaluation of hydrocarbon deposits.
[7] Project documentation to carry out works on exploration (additional exploration) of deposits of hydrocarbon raw materials.

is subdivided into three Sub-classes: **Justified for Development**, **Approved for Development** and **On Production**.

24.   **Regional Geological Exploration Projects** in the Russian Federation are primarily aimed at studying the geological structure and oil and gas content of large areas, and their area is measured in thousands of square kilometres. At this stage of work, resources are estimated in the categories D1 and D2. **Regional Geological Exploration Projects** map to UNFC (2019) **Prospective Projects**.

25.   In the Russian Federation, **Prospecting Projects** are divided into two stages, identification of targets for prospect drilling and drilling and testing of prospecting wells**.** The first stage of prospecting projects identifies resources in categories D0 and DL. These projects and resources are classified as UNFC (2019) **Prospective Projects.**

26.   The second stage of exploration projects in the Russian Federation is the **drilling and testing of prospecting wells**. These are **Prospective Projects** in UNFC (2019).

27.   The key point in RF2013 is the discovery of a field as a result of drilling and testing wells. The term 'reserves' applies only to discovered fields. The reserves of discovered fields correspond to reserve categories C1 and C2. Project maturity may vary for these reserve categories from a newly discovered field to the test production project and/or the testing of new technology prior to the design of a commercial field development.

28.   This is also a key point in UNFC (2019). It separates the **Prospective Projects** Class from all other more mature Classes.

B.   Exploration projects

29.   Once a new field is discovered as a result of a prospecting project, an **exploration project** is usually carried out on the field in the Russian Federation. In this case, the company has an exploration licence, and the reserves are in the UNFC (2019) Class **Non-Viable Projects,** Sub-class **Development Unclarified.** In accordance with UNFC (2019) Part II, Annex III, section (c) *"...(e.g. a recent new discovery) and/or where significant further data acquisition will be required...".*

30.   Another group of discovered deposits remain in the State's unallocated subsoil fund reserves, i.e., there is no exploration licence, and no exploration projects exist. In this situation, these reserves are classified as **Non-Viable Projects**, Sub-class **Development Not Viable**, and, in accordance with UNFC (2019) Part II, Annex III, section (c) "... *it can be helpful to identify and record these quantities so that the potential for a viable development opportunity will be recognized in the event of a major change in technology or environmental-socio-economic conditions*.".

C.   Technical projects for development of technologies of hard-to-recover mineral resources (TP TRIZ)

31.   The technical design is developed for the purpose of planning and controlling the execution of works to develop technologies for the development of hard-to-recover mineral resources. Designing and working to develop the technology does not result in a change in the categorization of reserves in RF2013. They will remain A*, B1*, and B2*. But in UNFC (2019), these projects will be classified as **Potentially Viable Projects**, Sub-class **Development Pending**.

D.   Field (deposit) pilot production projects (PPPs)

32.   Field development pilot works can be designed and carried out during the exploration phase. The design and execution of pilot works do not result in a change in the categorization of reserves in RF2013. They will remain C1 and C2. But in UNFC (2019), these projects will be classified as **Potentially Viable Projects**, Sub-class **Development Pending.**

E. Technological development schemes (TDS)

33.   In accordance with Russian regulations on the design of hydrocarbon deposits, technological schemes and development projects are created for the whole field. Subsequently, the initially created project can be changed and supplemented, but together with the changes and additions, it remains a single project for the entire field as of the date of approval of the project or Amendments (supplements) to it. When reserves under development (categories A, B1, B2) are recalculated from RF2013 to UNFC (2019) using the Bridging Document, the Design document itself (TDP, TDS) needs to be used.

34.   Category A, B1, and B2 reserves are mainly classified as **Viable Projects** (E1, F1, and G1, 2, 3).

35.   A project may be moved to the Class **Potentially Viable Projects**, Sub-class **Development on Hold** if the project work is suspended, but there are plans to recommence once resolved.

36.   A project may also be reclassified as a **Non-Viable Project** if it is stopped and there are no plans to reintroduce it in the foreseeable future. But for most technological development projects, reserves assessed in RF2013 under **categories A, B1, and B2** are classed as **Viable Projects** in UNFC (2019).

37.   Approval by the State of a development project created by a subsoil user company is the second key point in RF2013 in determining the class of the project and its maturity. The proposal of a project by a company and approval by the State means that all social and environmental constraints have been resolved. A production licence has been obtained. There may be a need for additional environmental approvals or additional social agreements, but these are not of a fundamental nature and are likely to be signed.

38.   Once the State approves the first field development project (the Technological Development Scheme), there is a time period before actual production from the project begins. If the evaluation date falls within this time interval, the project is assessed as a **Viable Project**, Sub-class **Approved for Development.**

39.   A project may have been approved by the State, but the company, for various reasons, has not yet proceeded with the project at the date of the evaluation but plans to do so in the near future. In this case, the project is also classified as a **Viable Project**, Sub-class **Approved for Development**. In most cases, the available Category A reserves within a project indicates that the project is classed as a **Viable Project**, Sub-class **On Production**.

F. Technological development project (TDP)

40.   The preparation by the company and approval by the State of the next project document (Technological Development Project) and its implementation places these projects in the Class **Viable Projects**, Sub-class **On Production**.

G. Classification of individual deposits (development targets) as independent projects

41.   A field development plan may include all the deposits (development targets) of the field, so the viability status of the project for each deposit (development target) may differ.

42.   In this case, when transferring reserves from RF2013 to UNFC (2019), it is necessary to consider the technological solutions for such a deposit (development target) stipulated by the project document for a hydrocarbon deposit as a separate independent project.

43.   Targets that are in commercial development and/or are to be brought into commercial development no later than ten years from the date of the evaluation are classified as **Viable Projects**, Sub-class **Approved for Development**.

44.   The necessity of separating the technological solutions envisaged for the development of a deposit (development target) into a separate project by UNFC (2019) may be caused by the following circumstances:

(a)   A deposit not previously brought into development which, according to the project, will not be brought into development in the next ten years. Such a development target must be classified as a stand-alone project by UNFC (2019), and its reserves must be reclassified as **Potentially Viable**, Sub-class **Development Pending**;

(b)   All reserves of deposit (development target) are estimated as category B2; reserve categories A and B1 are not applicable. Such a deposit requires exploration and must be classified by UNFC (2019) as a separate exploration project, and its reserves have been reclassified as **Non-Viable Project**, Sub-class **Development Unclarified**;

(c)   Deposits for which no project decisions have been made due to their unprofitability. Such a deposit must be classified by UNFC (2019) as a stand-alone project and reclassified as **Non-Viable Project**, Sub-class **Development Unclarified**;

(d)   The period of 10 years stated above is indicative. It can be increased by the evaluator using the Bridging Document or the auditor for large and unique offshore and polar deposits if justified.

IV.   Direct mapping between RF2013 categories and UNFC (2019) Categories/Sub-categories

A.   Application of the G axis

45.   There are three degrees of geological confidence in the reserve estimate for known (discovered) fields in UNFC (2019) of reserves: "high", "moderate", and "low", represented by the G1, G2 and G3 Categories. For undiscovered deposits that are known by indirect data only (at the stage of exploration projects), the G4 Category is used.

46.   RF2013 categories designate segments (parts) of the total accumulation according to their geological knowledge based primarily on the offset distance from existing wells. Recoverable quantities estimate in A and B1 segments, containing producing and exploration wells and adjacent areas, have a high level of confidence (G1). The B2 segment designates areas remote from wells with a lower confidence level for recoverable quantities estimates; confidence levels range from moderate to low (G2 + G3). Similarly, C1 has high confidence (G1), and C2 has confidence levels ranging from moderate to low (G2 + G3). This aligns with the incremental assessment method, as shown in Table 1.

Table 1
Comparison of RF2013 categories and the G axis of UNFC (2019)

	UNFC (2019) Categories, G-axis	RF2013 categories
G1	Product quantity associated with a project that can be estimated with a high level of confidence	A, B1, C1, A*, B1* A**, B1**, C1**
G2	Product quantity associated with a project that can be estimated with a moderate level of confidence	B2, C2, B2*, B2**, C2**
G3	Product quantity associated with a project that can be estimated with a low level of confidence	
G4	Product quantity associated with a Prospective Project, estimated primarily on indirect evidence	D0, DL, D1, D2 D0**, DL**, D1**, D2**

47.   In RF2013, the unprofitable parts of deposit reserves are defined. Symbol "*" is added to the name of the Category: A*, B1*, B2*. The profitability factor has no effect on the geological confidence scale; thus, A* and B1* estimates have a high level of confidence,

while B2* has a lower level of confidence. The same logic is applied to technologically unrecoverable quantities A**, B1**, B2**, C1** and C2**.

48.   With regard to Regional and Prospective Projects, while UNFC (2019) provides the option to sub-categorize G4.1, G4.2, and G4.3 based on geological uncertainty, under RF2013, these Categories refer to G4 without sub-categorization, when used alone it reflects the best estimate (G4.1+ G4.2.).

B.   Mapping of the E and F axes

49.   While the G axis defines the confidence levels in the reserve estimate within each project, the allocation to UNFC (2019) Classes and Sub-classes is based on a matrix formed from the E axis (Environmental and Socio-Economic Viability of the project) and the F axis (Technical Feasibility). Table 2 shows a comparison of RF2013 and UNFC (2019) in which the UNFC (2019) Sub-classes are not included, while Table 3 shows the mapping of the E-F Sub-category matrix to the RF2013 categories with colour coded and numeric keys. Note that the E and F Categories set minimum standards for UNFC (2019) Classes. For example, a **Potentially Viable Project** must be at least E2 and F2, but it could also be E2, F1.

Table 2
Comparison of Russian Federation project types and classification categories with UNFC (2019) project Categories and Classes

No	Russian project types	Russian classification categories	UNFC (2019) "minimum" Categories	UNFC (2019) Class
1	TDP, TDS (ongoing) Deposits brought into development and planned for production < 10 years	A, B1, B2	E1, F1, G1, G2, G3	Viable Projects
2	TDP, TDS (ongoing) unprofitable portion of reserves	A*, B1*, B2*	E2, F2, G1, G2, G3	Potentially Viable Projects
3	TDS, TDP Deposits not planned for production >10 years	B1, B2	E2, F2, G1, G2, G3	Potentially Viable Projects
4	TP TRIZ	A*, B1*, B2*	E2, F2, G1, G2, G3	Potentially Viable Projects
5	PPP	C1, C2	E2, F2, G1, G2, G3	Potentially Viable Projects
6	Exploration Projects	C1, C2	E3, F2, G1, G2, G3	Non-Viable Projects
7	Lack of projects, lack of licences	C1, C2 A*, B1*, B2*	E3, F4, G1, G2, G3	Non-Viable Projects
8	TDP, TDS, PPP Exploration Projects, no Projects	A**, B1**, B2**, C1**, C2** (non-recoverable)	E3, F4, G1, G2, G3	Remaining Products not Developed
9	Prospecting projects, regional projects	D0, DL, D1, D2	E3, F3, G4	Prospective Projects
10	Prospecting projects, regional projects	D0**, DL**, D1**, D2** (non-recoverable)	E3, F4, G4	Remaining Products not Developed

50. In many cases, one type of RF2013 project corresponds to more than one entry in the E-F matrix, as can be seen in Table 3.

Table 3
Mapping of the E-F axes matrix and project classes in UNFC (2019) to RF2013 categories with colour highlighted and digital numbers

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	1	2	3	4						
E1.2	1	2	3							
E2			4	4	5					
E3.1	12	12	12	12	12	12				
E3.2			6	6	6		8	9	10	
E3.3			7	7	7	7				11

UNFC (2019) Class	UNFC (2019) Sub-class	Code	Russian Project Types	RF2013 Category
Viable Projects	On Production	1	TDP, TDS	A, B1, B2
	Approved for Development	2	TDP, TDS	A, B1, B2
	Justified for Development	3	TDP, TDS	A, B1, B2
Potentially Viable Projects	Development Pending	4	TDP, TDS	A, B1, B2
			TP TRIZ	A*, B1*, B2*
			PPP	C1, C2
	Development On Hold	5	TDP, TDS	A*, B1*, B2*
			Exploration project completed, TDS project not approved	C1, C2
Non-Viable Projects	Development Unclarified	6	Exploration Project	C1, C2
	Development not Viable	7	No projects, no licence	C1, C2
Remaining Products not Developed		11		A**, B1**, B2** C1**, C2**
Prospective Projects		8	Prospecting project	D0
		9	Prospecting project	DL
		10	Regional project	D1, D2
Remaining Products Not Developed		11		D0**, DL**, D1**, D2**
Produced Not Sold		12[a]	TDP, TDS	

[a] Note that Code 12 refers to quantities typically referred to as "fuel, flare and losses". Fuel is that portion of production consumed in operations and thus not delivered to the sales reference point.

C. Remaining Products not Developed

51. **Remaining Products not Developed** in UNFC (2019) correspond to those quantities of hydrocarbons in all classes currently estimated as unrecoverable quantities, either technically or due to the lack of a defined project. UNFC (2019) establishes the use of Sub-categories E3.3 and F4 for the **Remaining Products not Developed.**

V. Mapping of the matrix in the UNFC (2019) E-F axes and project types in RF2013 and RF2013 categories

52. UNFC (2019) identifies Classes and Sub-classes for each type of project, corresponding to degrees of project maturity. RF2013 includes only categories of reserves and resources, however Russia has a system of exploration and development design of hydrocarbon deposits, mandatory requirements for projects and a system of state expert review and approval of projects. A mapping of project types in RF2013 with Classes and Sub-classes of projects in UNFC (2019) can be established (Table 3).

53. Since UNFC (2019) provides a greater degree of detail than RF2013, there are many cases where one RF2013 Category corresponds to several Sub-categories or cells in the E-F matrix (2019). This can be seen in Table 3. The criteria described in the following two sections, V.A and V.B, should be used to match RF2013 categories and to use the full range of UNFC (2019) Sub-categories.

54. UNFC (2019) uses four Classes for surface deposits: **Viable Projects, Potentially Viable Projects, Non-Viable Projects and Remaining Products not Developed**. Table 3 does not show recovered and sold quantities; recovered not sold quantities are shown in the box marked with the digital number 12.

A. Viable Projects

55. Recoverable quantities of Category A, B1 and B2 reserves in RF2013 are classified as commercially developed and correspond to UNFC (2019) **Viable Projects** class reserves because extraction of these quantities is planned in accordance with the approved and economically justified project Design Document; these quantities are sub-categorized as E1.1 in UNFC (2019).

56. Quantities for which extraction and sale became non-profitable on the basis of current market conditions and realistic assumptions of future market conditions but are made viable through government subsidies and/or other considerations are categorized as E1.2. Reserves of the fields of A*, B1*, and B2* categories of RF2013 where hydrocarbon production has become non-profitable due to changes in economic conditions (e.g., oil prices), but development continues because of the need to comply with various obligations, may map to this Sub-category. Category A, B1 and B2 reserves may be assigned to Sub-category E1.2 for a short period of time (usually up to two years) and to UNFC (2019) Class **Potentially Viable Projects**.

57. Associated quantities derived from categories A, B1, B2, A*, B1*, and B2*, as well as C1 and C2 categories that are forecast to be extracted but will not be available for sale refer to E3.1 (project code 12). The project Sub-category (F axis) will be the same as for associated quantities to be mined and sold from F1.1 to F2.3. The degree of geological uncertainty (G axis) also corresponds to the uncertainty in estimating the main product of the project.

B. Potentially Viable Projects

58. **Potentially Viable Projects** in UNFC (2019) may include four types of projects in RF2013:

(a) The Development Project is approved, there are Category A, B1, and B2 reserves, but the beginning of the development of deposits is delayed for a certain period of time (for over five years usually). Projects for which recovery technology is under development (category A, B1, B2 reserves);

(b) Projects for development of technologies of hard-to-recover mineral resources (category A*, B1*, B2* reserves);

(c) Field (deposit) pilot production projects (category C1, C2 reserves);

(d) Development projects to produce Remaining Products not Developed from segments A, B1, and B2 that are technologically recoverable but cannot be profitably recovered at this time without improving commercial conditions (product price, costs) not provided for in the approved project technological documentation as of the assessment date are categorized as A*, B1*, B2*;

(e) Exploration projects have been completed (category C1, C2 reserves), but the development project has not been prepared or approved yet. Pilot production works may be planned.

C. Non-Viable Projects

59. Exploration projects for discoveries (categories C1, C2) not approved for development are classified as **Non-Viable**, Sub-class **Development Unclarified** in UNFC (2019). Economic Viability cannot be determined due to insufficient information (E3.2). Depending on the stage of the feasibility study project, it may relate to one of the Sub-categories F1.3, F2.1 or F2.2.

60. When based on realistic assumptions of future market conditions, if it is currently considered that there are limited prospects for economic extraction of reserves of these categories in the foreseeable future (Sub-category E3.3), C1 and C2 reserves map to Sub-class **"Development Not Viable"** with an appropriate Sub-category F1.3, F2.1, F2.2, and F2.3, depending on the stage of the project on the justification of economic viability of extraction.

61. Projects **On Hold** (including deposits not brought into production or deposits not expected to be brought into production in the near term) are similar to Development Pending projects, but their progress in commerciality is constrained by activities which may be controlled by or outside the control of the evaluator. Projects on Hold fall into different categories to reflect the chance of commerciality but take into account the current lack of activity progress.

62. If the field (deposit) boundaries extend beyond the licence boundaries, then the question arises of how to classify the reserves in that marginal zone which extends beyond licence boundaries. The licence for such a marginal zone can be obtained by the company holding the licence for the main part, and if there is certainty and the reserves of the marginal zone do not exceed 20 per cent of the main part within the licence boundaries, then the project maturity and categorization is determined by the main part. Exceptions to this are where environmental or social restrictions have been imposed. For example, the licence boundaries are drawn along the boundaries of a nature reserve or a city boundary. In this case, the marginal reserves must be highlighted and categorized as **Non-Viable Projects**, Sub-class **Development Not Viable.**

VI. Identification of quantities defined but not classified in RF2013

63.   UNFC (2019) classifies all unsold quantities (lease fuel, flare and losses) as the Class "**Production which is unused or consumed in operations**". There is no such category of reserves in RF2013, but such a class can be proposed when analysing the Design Document. For example, associated gas may be used to generate electricity, flared, or fed into the trunk pipeline. If it is necessary to separate fuel from flare gas and losses, the volumes of the product stream should be reported separately.

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