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Accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009**Draft guidance on accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009: Concepts and Terminology****Prepared by the E-axis Sub-group of the Expert Group on Resource Classification***Summary*

The Expert Group on Resource Classification E-axis Sub-group was established to examine the social and environmental aspects of classification using the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009). A progress report on the development of draft guidance on accommodating environmental and social considerations in UNFC-2009 was presented at the seventh session in 2016 (ECE/ENERGY/GE.3/2016/8), and a report on draft guidance on accommodating environmental and social considerations in UNFC-2009 has been prepared for review by the Expert Group at its eighth session in 2017 (ECE/ENERGY/GE.3/2017/6). During the preparation of these reports, it was found necessary to clarify terms and concepts related to classification, some of which are also of general relevance to UNFC-2009. This report on concepts and terminology is presented for consideration by the Expert Group at its eighth session and during the review and update of UNFC-2009 that is planned for 2018 or later.

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I. Introduction

1. The document Draft guidance on accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) (ECE/ENERGY/GE.3/2016/8) (2016 Report), was presented at the seventh session of the Expert Group on Resource Classification in April 2016. The E-axis Sub-group was directed to continue to work further on this topic and present its recommendations to the eighth session of the Expert Group in 2017.
2. The major recommendations of the 2016 Report were:
 - (a) Establish a sub-group of the Expert Group on Resource Classification to develop detailed guidelines that apply to all resource types recognized by UNFC-2009.
 - (b) In cooperation with other working groups develop resource specific guidelines.
 - (c) Clarify concepts and terminology.
3. The Terms of Reference of the E-axis Sub-group require it to provide: “A list and definitions of the E-axis classification factors, as identified in UNFC-2009”, that is, recommendation (a) of the 2016 Report: “Clarification and revisions of terms related to the UNFC-2009 E axis”.
4. This was not intended to include factors other than the socio-environmental, such as economics, market prices, legal, regulatory or contractual conditions. However, the latter do not exist in isolation, and during the preparation of the 2016 Report, it became evident that clarification of additional concepts and terminology would be necessary.
5. This report specifically addresses recommendation (a) on clarification of terminology. It covers issues that arose during the preparation of the Draft guidance on accommodating environmental and social considerations in UNFC-2009, that will be presented at the eighth session of the Expert Group in 2017, and that should be considered during the next planned update of UNFC-2009. Other issues, not addressed here are likely to arise in the future.
6. Several of the issues discussed in this note are of general relevance, and the forthcoming update of UNFC-2009 should also consider how these terms and concepts are used elsewhere, such as in the System of Environmental-Economic Accounting 2012 (SEEA 2012, also recognized by the United Nations), and the Global Reporting Initiative (GRI).
7. Recommendations on items (b) and (c) are presented in a separate report (ECE/ENERGY/GE.3/2017/) that uses the concepts and terminology of this report.

II. Terms and Concepts

A. Degree of favourability

8. UNFC-2009 describes the E-axis factors as (reference UNFC-2009 incorporating Specifications for its Application, Part I, Section II, Categories and Sub-categories):

“...the degree of favorability of social and economic conditions in establishing the commercial viability of the project including consideration of market prices and relevant legal, regulatory, environmental and contractual conditions”.

9. The phrase **degree of favourability** is not defined, but when used for classification would be expressed by the probability that a project will be carried out. This is captured qualitatively by UNFC-2009, with 111 being the highest probability and other classes, such as 221, having a lower probability.

10. Definition

Degree of favourability describes the probability that all conditions required for a project to be carried out will be met.

B. Commerciality and economic viability

11. Commercial viability is described (UNFC-2009 incorporating Specifications for its Application, Part I, Section III, Classes Footnote c to Figure 2) as:

“Commercial Projects have been confirmed to be technically, economically and socially feasible....”

12. That is, they have satisfied all requirements of the E, F and G axes, to be feasible to proceed. (This is also the sense in which the term “commercial” is used in the Petroleum Resources Management System (PRMS).)

13. The terms “**economically viable**” and “**economic (in the narrow sense)**”, are used in Footnote d of UNFC-2009 incorporating Specifications for its Application, Part I, Annex I, Definition of Categories and Supporting Explanations as:

“**economically viable** encompasses economic (in the narrow sense) plus other relevant “market conditions”, and included consideration of prices, costs, legal/fiscal framework, environmental, social and all other non-technical factors that could directly impact the viability of a development project.”

14. This definition of “economically viable” (which includes “economic in the narrow sense”) is for the E-axis factors, but a project would not be commercially viable unless it also met the requirements for the F and G axes.

15. The term “economic in the narrow sense” is not defined in UNFC-2009, nor is it commonly used elsewhere, but it is considered to mean that a project satisfies a monetary criterion, such as having a positive Net Present Value (NPV) at a specified discount factor.

16. To avoid confusion, between the terms “commercial”, “economic” and “economic in the narrow sense” it is recommended that UNFC-2009 and successor versions thereof use:

(a) **Economic** instead of **Economic in the narrow sense**. It considers only the monetary aspects of a project - for instance, a discounted NPV greater than zero (without subsidies or similar measures). This is the common usage of the word “economic” for project assessment and consistent with the definition of the word in the Oxford English Dictionary as “maintained for profit”.

(b) **Commercial** (UNFC-2009 “economic”, or in the footnote to UNFC-2009 Figure 2, instead of “economic viability” (as used in UNFC-2009) since it includes not only economic but that there are no other barriers to production (i.e. no contingencies). It also encompasses all the requirements for a project to proceed, including those of the F and G axes. It should be noted that UNFC-2009 Project Maturity Sub-Classes (Figure 3 and Annex V of UNFC-2009) uses the term Commercial in this sense, rather than “economic” and this recommendation would bring consistency throughout UNFC-2009.

17. It has been proposed to replace the term “economic” with “commercial” in the E-axis definitions since the former do not encompass the increasingly important social and environmental contingencies. However, as noted by some reviewers, the term

“commercial” also includes F and G axis issues. The recommendation has been maintained, but there might be a more suitable term for use with the E axis. However, “Economic viability” does not capture the social and environmental issues and “Socio-economic viability” may be considered. Whatever term is used, it must be clearly defined.

18. Definitions

(a) **Economic:** a project is considered to be economic when it indicates a positive return on investment, measured by a monetary criterion, such as having a positive NPV at a particular discount factor.

(b) **Commercial:** a project is considered to be commercial when it is not only economic, but also satisfies all the other criteria of the E, F, and G axes that are required for the project to proceed. These requirements are described as contingencies until they are satisfied.

C. Externalities

19. It will not always be clear what contingencies should be considered for the assessment of a resource project. Resource Classification has traditionally focused on the immediate extraction process as carried out by an operating entity with little or no consideration of externalities, which are described as:

“In economics, an externality is the cost or benefit that affects a party who did not choose to incur that cost or benefit. Economists often urge governments to adopt policies that "internalize" an externality, so that costs and benefits will affect mainly parties who choose to incur them.”¹

20. Concerns about socio-environmental issues often involve externalities that have not been previously considered in resource assessment but are becoming of increasing importance. They may be dealt with by an Environmental and Social Impact Assessment (ESIA) although not every project will be subject to such a process. For classification according to UNFC-2009, externalities would be included in the concept of contingent factors, but it will not always be agreed on as to what these are. Examples are:

- Consideration of the CO₂ emissions of a project beyond the immediate impact.
- The design of a national legal/fiscal framework that promotes the development of a resource.

21. It is not clear that guidance should be added to UNFC-2009 for this, but it has become a significant factor in obtaining “social license” and thought should be given to this issue.

D. Contingencies

22. UNFC-2009 incorporating Specifications for its Application, Part I, Section III, Classes, states:

“Potentially recoverable quantities may be recovered in the future through projects that are **contingent** on one or more conditions yet to be fulfilled. **Contingent projects** are classified into projects for which the social and economic conditions are expected to be acceptable for implementation and those where they are not. In

¹ <https://en.wikipedia.org/wiki/Externality>

the former case, contingency is caused by the recovery project not being sufficiently matured to confirm technical and/or commercial feasibility, which can then provide the basis for a commitment to extract and sell the commodity at a commercial scale. In the latter case, neither the project nor the economic and social conditions are sufficiently matured to indicate a reasonable potential for commercial recovery and sale in the foreseeable future.”

23. Contingencies are criteria that must be satisfied before a project can proceed to production and may include “market prices and relevant legal, regulatory, environmental and contractual conditions” (UNFC-2009 III Classes), and others. Although the specific contingencies may differ between projects, many would include social and environmental issues. In some cases, a contingency could fall within the scope of both the E, F and G axes.

24. The Petroleum Resources Management System (PRMS) refers to contingencies and the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template uses the term “modifying factors” in the same sense. They may include “market prices and relevant legal, regulatory, environmental and contractual conditions” and others.

25. Definition

Contingencies are criteria or conditions that must be satisfied before a project can proceed.

26. Appendix IV (a) ii, of the 2016 Report contains an extract from the Canadian Oil and Gas Evaluation Handbook (COGEH) Volume 2, Section 2 (Resources Other than Reserves (ROTR) Guidelines) that discusses contingencies in detail. To provide context, and as an example, this is summarized below, but not all contingencies will be relevant in every case, nor is this list necessarily complete.

(a) Technical contingencies

- Established Technologies (not a contingency, but included for completeness and equivalent to the United States Securities and Exchange Commission (SEC) “Reliable Technologies”). Reserves may be assigned.
- Technology Under Development. Field tests to establish the economic viability of an extraction process. Contingent Resources, but not Reserves, may be assigned.
- Experimental Technology. Field tests to establish the technical viability of a recovery process. No recoverable resources may be assigned.

(b) Economic contingencies

- Fiscal regime (prices, royalty rates, production sharing terms, income taxes in the case of after-tax evaluations, etc.). Note: an example is a contingency for the gas price to increase from US\$ 2/Mcf (1,000 cubic feet of natural gas) to US\$ 4/Mcf to move from being uneconomic to being economic.
- Costs (capital costs, operating costs, pipeline tariffs or tolls, etc.).

(c) Non-technical contingencies

- Legal: the right to explore for, produce and sell, or receive hydrocarbons in kind, or payment for risk services.
- Regulatory contingencies: regulatory approval to proceed with development and production.
- Market access.

- Political factors: these could include political or social unrest, war, or government action of any kind that may impede proceeding with a project. See separate comment below.
- Social licence: social licence is related to environmental contingencies, but it is not necessarily a function of formal regulatory approval. What constitutes social license is not readily determined and depends heavily on subjective personal opinions and political issues specific to each project's geographic location. At this time, guidance on the role of social license in the classification of oil and gas resources is not well developed. See separate comment below.
- Internal and external approvals and commitment to project development.
- Development timing.

E. Environmental, social, and political contingencies

27. Neither social nor environmental factors are defined in UNFC-2009, nor any of the resource specific guidelines, and the difference between them is not always clear. A formal definition may not be necessary, but it should be understood what these terms mean. The following is suggested:

(a) **Environmental**, as the physical or biological impact on, or changes to, the pre-existing environment due to a project (e.g. heavy metal contamination). It is often measurable (for example, CO₂ emissions, the amount of waste moved, changes in surface geochemistry, etc.).

(b) **Social**, as the impact on humans, from a project, such as:

- Environmental changes (e.g. health issues due to heavy metal contamination). Some aspects may be measurable, but many others are qualitative, or,
- Changes in social systems and structures (e.g. ownership claims, traditional land usage, land, and other values changes, etc.).

28. These impacts are commonly thought of as being negative, but can be positive. Examples of positive environmental impacts include the reprocessing of mine wastes to recover metals and carbon dioxide capture. Similarly, for social impacts, such as the use of a flooded abandoned quarry for use or a flooded abandoned quarry for use as a reservoir or for recreation, job creation, and advances in technology.

29. Assessment of these impacts requires an integrated use of the physical and biological sciences, engineering and the social sciences.

(c) **Political**: UNFC-2009 does not mention political factors as a contingency although they can have a significant influence on the ability to proceed with a project. Both the CRIRSCO Template and PRMS include political factors but without definition or clarification. It is not often clear where the boundary between social and political issues would lie. From the point of view of classification, they can be considered to be action by a controlling organization that may influence, impede, or facilitate the ability to proceed with a project. The controlling organization can be varied, from a formal government, to guerrilla activity, and action may include legislation, expropriation, armed conflict, etc.

30. Political factors may sometimes be considered as force majeure situations. An example of this was the reclassification of reserves (111, 112, 113) to contingent resources (221, 321) as the result of armed conflict in Libya in 2011.

31. The resolution of political factors would usually be beyond the influence of most users of UNFC-2009 other than governments. There is an argument for considering such factors as belonging at least in part, to the F axis, although they are not currently mentioned as such.

32. Formal definitions of the terminology used above may not be required, but an understanding of them is needed and could be:

33. Definitions

(a) **Environmental:** the physical and biological impact on, or changes to the pre-existing environment, due to a project (e.g. heavy metal contamination).

(b) **Social:** the impact on humans, from a project, such as:

- Environmental changes (e.g. health issues due to heavy metal contamination).
- Changes in social systems and structures, (e.g. ownership claims, traditional land usage, land, and other value changes, etc.).

(c) **Political:** action by controlling organizations or bodies that may impede, prevent, or facilitate proceeding with a project.

F. Social licence to operate (SLO)

34. A project cannot proceed unless the relevant social and environmental contingencies are resolved, typically described as obtaining a “**social licence to operate**” (SLO). There are several “definitions” of “**social licence**”, but in summary and with respect to this exercise, achieving a social licence to operate is the resolution of any social and environmental issues that could inhibit or prevent a decision to proceed with the project. This does not mean that all issues will have been resolved to the satisfaction of all parties, but that, for a specific project, they have been resolved to the extent that the project can proceed, even if there are still objections. Considerations should be given to whether a social licence to operate is likely to be maintained in the future.

35. It can be considered as having two components:

(a) Those subject to formal legal and regulatory processes such as the granting of environmental approval, approval to drill, explore or develop.

(b) Those outside a formal legal or regulatory process. These may be externalities such as local communities that have a concern about the impact of a mineral recovery project on the community, or organizations that would not be directly affected but who have concerns of a more general nature. This may trigger further activity within a formal legal or regulatory setting, or informal civil activity ranging from protests to violent action. In the extreme, civil unrest and war may also fall under this heading.

36. These factors could also be further divided into those issues that can or cannot be affected by an organization (operating entity or government).

37. The achievement of SLO does not necessarily mean that all issues have been resolved to the satisfaction of all parties, but that, for a specific project, they have been resolved to the extent that the project can proceed, even if there are still objections. Consideration should also be given to whether a social licence to operate is likely to be maintained over the life cycle of a project.

38. The term “social licence to operate” collects all “social” issues (contingencies) relevant to resource exploration and development under one heading, and although it may be useful as an informal term, it is not always clear what it might include. Classification

should be based on the individual contingencies that apply to a project, and ‘social licence’ is not recommended as a classification criterion.

III. Other issues

A. Abandonment and reclamation

39. The terms “abandonment” and “reclamation” are not used in UNFC-2009, but they are very much part of socio-environmental considerations, and therefore some thought is needed as to how they could affect classification under UNFC-2009.

40. There are three possible stages in this process²:

- Abandonment: for projects that include wells, such as oil and gas or geothermal, this involves downhole work to seal off any flow in the well bore, and surface work so that there is no evidence that there was a well there. For projects that do not have wells, abandonment is irrelevant.
- Decommissioning: the removal of surface facilities associated with a project, which could include anything from minor local facilities to major facilities such as large processing plants or offshore structures.
- Remediation: The restoration of the surface to conditions that are required by regulatory or other provisions. This can involve minor activities to major restoration projects.

41. A possible additional stage is:

- Regeneration, during which the land is returned or reconstituted for productive use (not necessarily measured by its economic value), for example, a rock quarry used as a reservoir or lake for recreation.

42. The evaluation and classification, of new projects typically include forecast A&R costs, but for ongoing projects, the criterion is often that an economic limit is reached when the revenue is equal to the operating cost, without the inclusion of A&R costs.

43. Provision for A&R costs may be made in a number of ways, including government schemes that mandate payment into escrowed funds. However, it is not uncommon for a project to reach the end of its life without the means to carry out A&R (in the oil and gas industry, this has led to thousands, of “orphan” wells around the world), often leaving significant environmental problems. Similar issues occur for mining activity when abandoned mine sites are left without remediation. When this occurs, the responsibility for environmental remediation becomes the responsibility of society.

44. How should issues of abandonment, reclamation and remediation be handled for classification according to UNFC-2009? In some cases, excluding AD&R as a consideration could result in a resource being classified as E1, when including it may could make a project a type of E3.3. Should inclusion of AD&R be mandatory for UNFC-2009 when it is a significant likelihood for a project?

² The abbreviations A&R (Abandonment and Reclamation) and AD&R (Abandonment, Reclamation and Decommissioning) generally include all three of these activities, as does, in a different context, the accounting term ARO (Asset Retirement Obligations).

B. Subsidies

45. UNFC-2009 Sub-class E1.2 states:

“Extraction and sale is not economic on the basis of current market conditions and realistic assumptions of future market conditions, but is made viable through government subsidies and/or other considerations.”

46. UNFC-2009 does not contain a definition of a subsidy, and neither do the CRIRSCO Template or PRMS. There are two aspects:

(a) An economically viable project normally has a fiscal regime imposed by a government (royalties, taxes, etc.) that enables society to share in the results of an operation. Adjustments to the terms of such a regime may be modified so that it remains viable for an operator while still providing for a government take. Such adjustments are sometimes claimed to be a subsidy, but are part of a normal fiscal structure and should not be regarded as a subsidy for classification under UNFC-2009.

(b) Direct funding or other forms of assistance (i.e. grants, low-interest loans, guarantees of product prices) by a government of a project that would otherwise be uneconomic, that results in it being economic for the owners. This may be for social or other reasons and may be regarded as an equity contribution, but for UNFC-2009, the quantities associated with such a project should be classified as E2.1

47. Definition

Subsidy: direct funding or other forms of assistance (i.e. grants, low interest loans, guarantees of product prices) of a project that would otherwise be uneconomic, that results in it being economic for the owners. The quantities associated with such a project should be regarded as being subsidized for classification under UNFC-2009 and therefore classified as E1.2.

C. Safety and security

48. During the review of this paper, there was a question as to whether safety and security should also be considered. This has not been addressed but is noted for future consideration.

IV. Recommendations

49. The terminology and concepts discussed in this document have been adopted in the preparation of the report “Draft guidance on accommodating environmental and social considerations in UNFC-2009” (ECE/ENERGY/GE.3/2017/6), that is to be presented at the eighth session of the Expert Group on Resource Classification. This was considered necessary for the E-axis Sub-group exercise, although it goes beyond its immediate concerns. It is of limited scope and does not necessarily cover all relevant issues.

50. This report is not intended as a proposal to formalize its recommendations, but that the issues raised herein should be considered further by the Expert Group on Resource Classification, notably for the planned update of UNFC-2009 scheduled for 2018 or later.