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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in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009**Draft guidance on accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources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****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 of the E Axis of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009). Economic issues were not part of the mandate, nor does it address the wider social or environmental issues that lie beyond the realm of classification. A progress report (ECE/ENERGY/GE.3/2016/8 (2016 Report)) was presented to the seventh session of the Expert Group in April 2016 and the current report is a continuation of the work described in the 2016 report. As directed, it has addressed the socio-environmental issues at a high level and proposed high-level guidance. The recommendations in this report fall into three main areas: (a) high-level guidance on accommodating social and environmental considerations in UNFC-2009; (b) the process for the development of detailed guidelines; and (c) clarification of terms related to socio-environmental factors. The latter is presented in a separate report entitled Draft guidance on accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources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 (ECE/ENERGY/GE.3/2017/7) that recommends the Bureau of the Expert Group to consider the clarification of some terms in UNFC-2009 that were considered necessary to the work of the Sub-group.

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I. Introduction

1. Until recently, social and environmental factors have rarely been considered in the classification of natural resources. Their importance has grown considerably in the last few years. Many projects have been delayed or cancelled because they failed to meet social or environmental expectations, even though they met all other requirements of the E, F and G axes of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009).

2. The Expert Group on Resource Classification (Expert Group) E-axis Sub-group was established to examine the social and environmental aspects of classification using UNFC-2009. A progress report Draft guidance on accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (ECE/ENERGY/GE.3/2016/8) (2016 Report), with preliminary recommendations, was presented at the seventh session of the Expert Group in 2016. Appendix I of the 2016 Report contains a summary of existing classification guidance on social and environmental issues from various classification systems. Although many of these systems identify social and environmental issues as classification criteria, they provide no substantial guidance.

3. The major recommendations of the 2016 Report were:

(a) A clarification of terminology, for example, the difference between “economic” and “economic in the narrow sense”, and for other terms.

(i) Although necessary for the work of the Sub-group, clarification of terminology is broader than strictly socio-environmental issues, for which reason, recommendations have been presented in a separate report offered for consideration during the next planned update of UNFC-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 (ECE/ENERGY/GE.3/2017/7)). The clarified terminology that has been used in this report is provided in a Glossary of Terms, as Annex V.

(b) High level guidance, including a division of the E2 category into E2.1 and E2.2, based on the probability¹ that a project will proceed.

(c) The development of detailed guidelines for socio-environmental issues;

(i) Issues common to all resource types should be done by the Expert Group; and

(ii) Issues that are specific to a resource type, should be done by the organizations that provide the resource specific guidelines. To avoid differences and to ensure consistency, these guidelines should be prepared in coordination with UNFC-2009.

(d) The socio-economic E axis includes both social and economic issues. The mandate of the Sub-group does not include the economic aspects, but it was necessary to consider them to a limited extent. The development of detailed guidelines for the E axis that

¹ The term probability that is used in this report reflects the usage of qualitative words, such as “likely”, that are associated with common expectations of probability. See Mosteller, F. and Youtz, C., 1990, Quantifying Probabilistic Expressions, Statistical Science, Vol. 5, No. 1 pp.1 -34.

is recommended should include consideration of the economic aspects and also the relation of the E axis to the other UNFC-2009 axes.

II. Terms of Reference

4. The Terms of Reference for the current Phase 2 of the E-axis Sub-group that were approved at the sixth session of the Expert Group in 2015 are:

Phase 2 Sub-group Terms of Reference

5. Prepare guidance on assessing environmental and social considerations for the classification of resources according to UNFC-2009. This is expected to include, but is not limited to providing:

6. A list and definitions of the E-axis classification factors, as identified in UNFC-2009.

7. Guidance for the E-axis factors which, as noted by the Expert Group, “should revolve around high-level principles”.

8. A recommendation on the extent to which more detailed guidance is required.

9. A recommendation on how the high-level and any detailed guidance should be provided. Most of the E-axis classification factors are not commodity-specific, and the Sub-group should consider whether guidance should be:

(a) Separately in each of the commodity-specific documents, by the organizations that manage the resource classifications and guidance documents (Petroleum Resources Management System (PRMS), Committee for Mineral Reserves International Reporting Standards (CRIRSCO) Template, and the Organisation for Economic Cooperation and Development (OECD) Nuclear Energy Agency (NEA)/International Atomic Energy Agency (IAEA) resource reporting scheme (also known as the ‘Red Book’), and also those under development for Injection Projects for the purpose of geological storage., and for renewable energy. Currently, there is little guidance on the E axis factors in any of these; or

(b) as a single source and, if so, whether this should be prepared under the direction of the Expert Group, either by a continuation of the work of this Sub-group, by a separate Task Force of the Expert Group; or,

(c) by other means.

10. Consider establishing sub-classes to distinguish between various E-axis factors, such as environmental and social conditions. UNFC-2009 currently does not provide for making this distinction.

11. Many of the UNFC-2009 E-axis factors are of a broad scope, but the Sub-group should consider only those aspects that are relevant to UNFC-2009 E-axis resource classification, not the broader issues.

III. Scope

12. The Terms of Reference direct the Sub-group to: "... consider only those aspects that are relevant to UNFC-2009 E-axis resource classification, not the broader issues."

13. Socio-environmental issues, typically described as a requirement for "social licence" or "social licence to operate" (SLO), have attracted a large amount of interest and attention in recent years. While acknowledging the importance of the broader issues, UNFC-2009 classifies projects that are currently commercial, potentially commercial or non-commercial, at the time of evaluation, and within the foreseeable future.

14. Resource evaluation and classification, by measures such as a Net Present Value (NPV), has traditionally focused on the immediate extraction process, as carried out by operating entities, while usually ignoring consideration of externalities, such as many socio-environmental issues. An externality is 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."²

15. Although there is not always agreement on what should be included, externalities have become an increasingly important factor in decisions on resource extraction projects, and hence on classification. For classification under UNFC-2009, it is recommended that only those externalities that are considered to directly impact the project that is being assessed should be considered.

16. The E axis is concerned with "socio-economic" criteria for the classification of resources using UNFC-2009. Although the mandate of the E-axis Sub-group is to consider the socio-environmental and not the economic aspects of the E axis, it was necessary to address the latter to a limited extent, to distinguish them from the socio-environmental aspects and the impact that the latter may have on project economics.

IV. The UNFC-2009 E axis

A. Introduction

17. 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."

18. This is not intended to include factors other than the socio-environmental, such as the economics, market prices, legal, regulatory or contractual conditions, but the latter do not exist in isolation, and the relationship between them and socio-environmental factors has been addressed as needed.

19. The UNFC-2009 E-axis Categories and Sub-categories can be found in UNFC-2009 *incorporating* Specifications for its Application, ECE Energy Series No. 42, Part I, Annex I, page 9 and Annex II page 12, respectively. Since these Categories and Sub-categories were developed, there has been increased recognition of a requirement for social acceptability of projects, often externalities outside the realm of formal regulatory approval. UNFC-2009 also classifies projects based on level of maturity (UNFC-2009 Specification G: Classification of projects based on level of maturity).

² <https://en.wikipedia.org/wiki/Externality>

20. The UNFC-2009 E axis combines two aspects of resource classification that are not directly related, the economics and the socio-environmental aspects of a project. A project may meet all the feasibility requirements of the F and G axes and the economic component of the E axis, but unless it is also socially and environmentally acceptable, it often cannot proceed.

B. The components of the E axis

21. These were discussed at length in the 2016 report and are not addressed further. Annex II contains the current E-axis Categories and Sub-categories, and Annex III shows the proposed revisions.

C. Social licence to operate

22. 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. Consideration should also be given to whether a social licence to operate is likely to be maintained in the future.

23. 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 specific and individual contingencies that apply to a project, and the term “social licence” is not recommended as a classification criterion.

D. The relationship between socio-environmental and other factors

19. The various factors involved in resource classification do not exist in isolation, and the distinction between them is rarely black and white (i.e., binary)³. The related factors of ownership, contract terms, legal, regulatory issues, and in some cases, fiscal terms (taxes, royalties, etc.) may be affected by social and environmental issues. A delay due to the resolution of these as a result of socio-environmental issues can have a significant impact on the economics of projects, even making them no longer economically viable (i.e., negative NPV). Subsidies may allow an otherwise uneconomic project to proceed as part of a social initiative.

24. Some of the factors that affect the E axis may also affect the F axis.

V. Current E-axis guidelines

25. There is a large literature around the issue of socio-environmental matters, mainly on how to handle them when developing a project, but little that is related to classification.

³ The classification of resources is often more of an exercise in Fuzzy Logic than Boolean (binary) Logic. See https://en.wikipedia.org/wiki/Fuzzy_logic.

26. Appendix I of the 2016 Report contains a summary of material from various sources relating to the E axis and socio-environmental factors. In most instances, these are cited as classification criteria, however none contain any significant guidance. This is unlike the F and G axes, which are covered in considerable detail in resource-specific guidance and associated publications.

27. Annex I of this document lists the sources that were consulted for the 2016 Report and adds some new ones.

28. The World Bank and the International Finance Corporation (IFC), must rate projects to assess their risk and uncertainty before making loans. Although their publications do not classify projects in the same way as UNFC-2009, they provide a useful approach for developing detailed guidelines.

29. The System of Environmental-Economic Accounting (SEEA) is managed by the Statistics Division of the United Nations Department of Economic and Social Affairs and refers to UNFC-2009 as the standard for energy classification. Although SEEA refers to environmental and social factors, it provides no significant guidance as to how they affect classification.

VI. High-level classification guidance for the E axis

A. Introduction

30. The Sub-group was directed to provide: “Guidance for the E-axis factors” which, as noted by the Expert Group, “should revolve around high-level principles”.

31. Detailed guidelines are beyond the scope of this report, but the distinction between these and “high-level principles” is not clear. This is especially the case because, unlike the F and G axes, there is little in the resource specific guidelines to back up any high-level principles.

32. There is a high degree of commonality in the socio-environmental aspects of all resource types, although there will also be issues that are specific to a resource or jurisdiction.

33. The evaluation and classification of resources according to UNFC-2009 assumes that it is carried out by a Competent Person. However, the assessment of social and environmental contingencies falls outside the historic resource evaluation and classification process and the expertise of most evaluators, and it will often be necessary to involve others with the appropriate expertise.

B. Social and environmental classification criteria

34. Classification into one of the UNFC-2009 Classes or Sub-Classes depends on the probability of satisfying the social and environmental criteria that are required for a project to proceed. The E axis refers to “Degree of Favourability”, which is essentially the probability that a project will proceed.

35. Contingencies are conditions that must be resolved before a project can proceed to execution. While almost all projects involve social and environmental issues, they will not always be contingencies. For instance, in developed areas, regulatory approval may be a matter of routine to the extent that it need not be considered a contingency. The discussion below focuses mainly on social and environmental issues that are considered to be contingencies.

36. Environmental and social factors can be considered under two headings:

(a) Those subject to formal legal and regulatory processes, such as the granting of environmental approval, approval to drill, explore or develop, and generally lie within the control of an operator, partnership, or government. In this case, estimating the probability that a project will proceed as a result of Active Stakeholder Engagement may be relatively straightforward.

(b) Those outside a formal process, when the estimation of the probability of approval will usually be much more difficult and may lie beyond the control or influence of an asset owner or even a government. For example, concerns of local communities about the impact of a mineral recovery project on the community, or of organisations that would not be directly affected by concerns of a more general nature, and could involve informal civil activity ranging from protests to violent action. These issues would typically be dealt with by discussion and negotiation between interested parties, which could trigger further activity within a formal legal or regulatory setting. In the extreme, *force majeure* due to civil unrest and war may fall under this heading.

37. The steps in the classification process are:

(a) Identification of the relevant social and environmental contingencies.

(b) Make an estimate of the probability that socio-environmental issues will be resolved and maintained over the life cycle of the project. This will depend on the specifics of an asset or project and the legal, regulatory and social environment in which it is proposed to be carried out. In many cases, there will be a history of similar project developments that can be used as analogues. Although an assessment of the probability of resolving socio-economic contingencies is likely to be subjective to some degree, it should be based as much as possible on a documented analysis.

(c) Consideration of the status of the efforts being made to resolve socio-environmental issues. The level of effort and engagement required will depend on the project. In some cases, socio-environmental issues may not be a contingency; in other cases, a high level of effort may be required over an extended period.

(i) Active Stakeholder Engagement in the resolution of social and environmental contingencies must be based on substantial evidence, and would not be satisfied by an unsubstantiated claim or a token effort. The nature of this will depend on the project and on the socio-environmental issues that are involved. It could include, for example, documented proof that an Environmental and Social Impact Assessment (ESIA) was being carried out or has been submitted for approval, that there are constructive discussions with interested parties, the establishment of training and other social programmes, etc. However, even active engagement with stakeholders does not necessarily mean that it will be successful. Similarly, a lack of engagement at the time of an evaluation does not necessarily mean that a project will be unable to proceed.

(ii) No Active Stakeholder Engagement in the resolution of social and environmental contingencies. The consequences of this will depend on the situation. In an established area with a history of resource development, project approval may be a matter of routine and require little or no effort. In other cases, it will result in a project not receiving approval and it being put on hold or abandoned.

38. The following points should be noted:

(a) An evaluation can only be based on the information that is available at the time of the evaluation.

(b) An estimate of probability should be at a level needed to classify to a particular UNFC-2009 sub-category (e.g., the Category may be the same whether the probability is 60 per cent or 70 per cent). It does not necessarily require formal calculation or great precision, and subjective estimation of probability⁴ (at different levels of sophistication) will usually be more appropriate.

(c) The uncertainty associated with any estimate should be recognized.

(d) There will usually be multiple contingencies and the lowest ranking one should be assigned to the overall project classification, as illustrated in the example in the Table in Annex IV.

(e) The method used to estimate a probability should be documented. This will be particularly important when the information is to be used for investment decisions or raising of funds for a project.

C. Changes to E-Axis Categories and Sub-categories

39. Suggested changes to E-axis Categories and Sub-categories are described below. However, these consider only socio-environmental factors, and hence it is recommended that further review be undertaken that incorporates economic factors and the relation to the other UNFC-2009 axes.

40. Classification depends on the activities directed towards the resolution of any outstanding issues, and there will be high, medium and low levels of probability of proceeding. Although the estimation of probabilities will be subjective, the percentages given below are based on studies of common usage of terms, such as “high probability”⁵. They are estimates and, as such are targets to be aimed at rather than rigorous, absolute, measures. When it is uncertain into which category a contingency would fall, the lower one should be selected.

41. The criteria of Probability of Approval and the Level of Stakeholder Engagement are related and may be combined as follows:

- (a) Active Stakeholder Engagement with:
 - High probability of approval (> 80%)
 - Medium probability of approval (50 – 80%)
 - Low (< 50%), or unknown probability of approval.
- (b) No Active Stakeholder Engagement:
 - A high probability (> 80%) of approval based on a demonstrated history of outcomes in analogous situations.
 - Medium probability (50 – 80%) of approval based on a demonstrated history of outcomes in analogous situations
 - Low (< 50%) or unknown probability of approval.

⁴ Subjective probability is based on personal belief that an event will occur. There are several approaches to making subjective probability estimates, from simple “guesses” to sophisticated Delphi exercises that combine the beliefs of a group of experts.

⁵ Although the probabilities shown here are empirical, they are based on surveys of word usage. A useful reference on this topic is, Mosteller, F. and Youtz, C., 1990, Quantifying Probabilistic expressions, *Statistical Science*, Vol. 5, No. 1 pp.1-34. The Intergovernmental Panel on Climate Change has a similar approach, but the words that it uses are not the same.

42. The revised E-axis Categories: the recommended change in terminology, from “economically: to “commercial”, was discussed in the 2016 Report and in the document Draft guidance on accommodating environmental and social considerations in UNFC-2009: Concepts and Terminology (ECE/ENERGY/GE.3/2017/7)⁶.

(a) **E1: Extraction and sale has been confirmed to be ~~economically~~ commercially viable.**

No change is proposed to the E1 Category or to the Sub-categories other than replacing references to economic viability with commerciality.

An economic project is one for which the revenue exceeds the cost (typically a discounted NPV > 0) (i.e., E1.1). However, E1.2 addresses the situation when an otherwise uneconomic project becomes viable as the result of “subsidies and/or other considerations”, which is often due to social considerations. Refer to Annex V, Glossary of Terms, for a proposed definition of a subsidy.

It is less clear what is meant by “other considerations”, but it implies a project that is not subsidized and runs at a loss, perhaps as the result of social considerations.

(b) **E2: Extraction and sale is expected to become ~~economically~~ commercially viable in the foreseeable future.**

No change is proposed to the E2 Category other than replacing references to economic viability with commerciality. The E2 category does not contain any Sub-categories, and it is recommended to consider establishing two Sub-categories, based on the probability of success, a significant aspect of which is the level of activity directed towards resolving the relevant contingencies. The level of engagement required for their resolution depends on the project, the formal regulatory requirements and the informal situation regarding socio-environmental issues. However, this does not automatically relate to the probability of approval. A high level of active stakeholder engagement could be tied to a low probability of approval. In a mature area, low or even no current active effort may be necessary for the probability of approval to be high.

E2.1 Issues are yet to be resolved, but there is high probability of their resolution evidenced by an active attempt to resolve all impediments (contingencies) with a high probability of success, based on the characteristics of the project, previous history of similar projects in the area, or other strong indications of success, within the foreseeable future.

E2.2 Issues are yet to be resolved, but:

There is an active attempt to resolve all impediments (contingencies) but with no more than a medium probability of success; or,

There is no active effort to resolve impediments, but based on the characteristics of the project and previous history of similar projects in the area, success is likely within the foreseeable future

⁶ The reasons for changing this terminology are discussed in the report Draft guidance on accommodating environmental and social considerations in UNFC-2009: Concepts and Terminology (ECE/ENERGY/GE.3/2017/7). The recommendation to use the term “commercial” has been maintained since “economic viability” does not capture the social and environmental issues. However, as noted by some last-minute reviewers, the term “commercial” also includes F and G-axis issues and there might be a more suitable term for use just with the E axis, such as “socio-economic viability”. Whatever term is used, it must be clearly defined.

The relationship of E2.1 and E2.2 to the Project Maturity sub-classes is discussed briefly below, but it should be noted that it is not a simple one-to-one relationship.

- (d) **E3: Extraction and sale is not expected to become economically commercially viable in the foreseeable future or evaluation is at too early a stage to determine economic commercial viability.**

No change is proposed to the E3 Category or Sub-categories other than replacing references to economic viability with commerciality. Projects with a low or no Probability of Approval, or with a medium level of approval but no active management to obtain approval would be classified as E3.

43. The application of the above to classification in UNFC-2009 is summarized in the table below.

High Level Classification on Level of Stakeholder Engagement and Probability of Approval

<i>Stakeholder Engagement</i>	<i>Active</i>	<i>Not Active</i>
Probability of Approval		
High (> 80%)	E2.1	E2.2
Medium (50 – 80%)	E2.2	E3.3
Low (< 50%)		E3.3
Unknown or unclarified		E3.2

44. Further consideration of and guidance on social and environmental contingencies should be addressed in detailed guidelines.

45. Annex III of this document shows a revised version of the Definition of Categories and Supporting Explanations for the E axis as contained in Annex I of UNFC-2009 *incorporating* Specifications for its Application, Part I. The revised text incorporates the proposed change in the description of projects from “economic” to “commercial”.

D. Related contingencies

46. As noted above, other E-axis factors may be affected by socio-environmental issues. The effect of these on classification is likely to vary between different for operators and others. For example:

(a) Ownership and Regulatory Approval are unlikely to be factors for governments, but will be significant for others.

(b) The decision to commit to execute a project usually lies with an owner, not with a government.

47. This may result in different classifications for the same project. This is recognized in UNFC-2009 Part II Section IV National Resource Reporting, although it focuses mainly on aggregation.

48. Related contingencies may include:
- (a) Legal framework. The right to produce and sell (or benefit) from a resource.
 - E3 if there is no legal right to produce and sell⁷, as is the case for many exploration activities and no negotiation or application in process.
 - E2 if the legal right to produce and sell is being negotiated but not finalized, or is in dispute.
 - E1 if the legal right to produce and sell is established and not in dispute.
 - (b) Regulatory approval. This is required for many aspects of extraction operations, ranging from major environmental approval to routine minor issues such as individual well abandonment approvals.
 - E3 if required but not applied for or applied for and not approved.
 - E2 if applied for but not yet received.
 - E1 if received or, located in areas and jurisdictions where there is an established history of approval and approval is expected.
49. Classification may be relatively straightforward for formal legal and regulatory processes, since they have either:
- (a) Not been initiated (i.e., not been applied for).
 - (b) Been initiated and in the process of being considered.
 - (c) Been initiated and approval has not been granted.
 - (d) Been approved.
50. Other E-axis non-economic factors mentioned in UNFC-2009, for which classification may be less clear, include:
- (a) Fiscal framework. The terms regarding taxes, royalties, production sharing, or other fiscal provisions under which extraction operations are carried out may be influenced by social and environmental considerations.
 - E3 if not determined.
 - E2 if it is being negotiated but not finalized, is in dispute, or there is uncertainty due to the possibility of a change that could affect the commercial viability of a project.
 - E1 if established, not in dispute or uncertain, and allows a decision to implement a project to be made.
 - (b) Contractual conditions. These are specific to an asset or project, but may contain terms beyond those of the legal or fiscal framework (e.g., a requirement to use local labour, private sector contracts, lease expiry after a specific time, abandonment and reclamation obligations, etc.). A contract may not always be required, but if it is:
 - E3 if it does yet not exist.
 - E2 if they are being negotiated but not finalized, are in dispute, or there is uncertainty due to the possibility of a change that could affect the commercial viability of a project.

⁷ Except for non-sales production, (E3.1)

- E1 if established, not in dispute or uncertain in any manner, and is expected to be concluded with a high degree of certainty.

51. Not all of these factors will be contingencies in every case, and there may be additional ones that are not listed here. An environmental or social contingency that results in the delay of a project can have a major impact on the economic viability (e.g. a decrease in the discounted NPV) that may warrant a reclassification.

E. Project Maturity Sub-Classes

52. The Guidelines on the Use of Project Maturity to Sub-classify Projects using UNFC-2009 as contained in UNFC-2009, Annex V, says that the Categories and Sub-Categories of UNFC-2009 reflect the probability of a project attaining commerciality. “The Project Maturity Sub-Classes are based on the associated actions (business decisions) required to move a project towards commercial production/extraction”.

53. The relation between the suggested E2 Sub-categories is not straightforward. E2, as it stands, does not provide information on the probability that the causes for a Project Maturity Sub-Class (i.e. Chance of Commerciality) of the projects On Hold or Justified for Development will be resolved. For a project On Hold, for instance, the probability that the relevant issues will be resolved will range from low to high.

54. Further consideration of this is recommended.

VII. Detailed guidance

55. **It is recommended that detailed guidelines for socio-environmental classification should be developed.** The guidelines in this report are only “high-level” principles, and the existing resource specific guidelines provide little or no guidance.

56. During the development of any such detailed guidelines, it is recommended that:

- A review of the high-level principles should be continued, to ensure consistency between these and the detailed guidance.
- The economic factors of the E axis should be taken into consideration.
- The relationship of the E axis to the other axes should be taken into consideration, including that some contingencies affect more than one axis.

57. The E-axis Sub-group was also directed to provide a recommendation on how the high-level and any detailed guidance should be provided. Most of the E-axis classification factors are not commodity-specific and the guidance could be developed, either:

- separately in each of the commodity-specific documents by the organizations that manage these documents (CRIRSCO Template, PRMS and ‘Red Book’, Injection Projects, and Renewable Energy), or
- as a single source and, if so, whether this should be prepared under the direction of the Expert Group, either by a continuation of the work of this Sub-group, by a separate Task Force of the Expert Group, or
- by other means.

58. The major socio-environmental factors are common to all types of resource, although there will be some that are specific to a resource, and may also differ between jurisdictions. This could be dealt with by having a common document, the main section of

which deals with the common issues, but with sub-sections for each type of resource and, possibly, jurisdiction.

59. The development of detailed guidelines independently by the various resource-specific areas would lead to duplication of effort and may result in inconsistencies between them.

60. It is recommended that the Expert Group establish a follow-up ‘sub-group’ to develop detailed guidelines:

(a) For E-axis socio-economic issues, not solely for the socio-environmental aspects of the E axis.

(b) Consider the relationship of the E axis to the F and G axes, especially when a contingency can affect more than one axis.

(c) Identify the issues that are common to all resource types and develop detailed guidelines for these.

(d) In cooperation with the owners of resources specific and, possibly, jurisdiction guidelines:

(i) Identify the issues that are specific to individual resource types and encourage the owners to develop the relevant socio-economic guidelines.

(ii) Aim for consistency between the common and resource specific guidelines, by developing them in cooperation with a ‘sub-group’ of the Expert Group and the owners of such guidelines.

(e) Continue to clarify the relevant terminology.

VIII. Conclusions and recommendations

61. This document provides information and recommendations on the socio-environmental factors of the UNFC-2009 E axis. It proposes some high-level guidance and also clarification of some terms in UNFC-2009. Although UNFC-2009, the associated resource specific classification guidelines (CRIRSCO Template, PRMS, NEA/IAEA ‘Red Book’), and similar systems, cite social and environmental issues as factors in classification, none of them contain any significant guidance.

62. The recommendations in the report fall into three main areas:

(a) Clarification of terms related to the UNFC-2009 E axis. The E axis combines economic and socio-environmental factors, and this report proposes a revision of terminology to distinguish between them. It also addresses the concept of a contingency (which is not confined to the E axis but also relevant to the F axis) and notes that the E-, F- and G-axes factors are not completely independent. A summary of the proposed terms that have been used in this report is provided in a Glossary of Terms (Annex V). Details are contained in a separate report (Draft guidance on accommodating environmental and social considerations in UNFC-2009: Concepts and Terminology (ECE/ENERGY/GE.3/2017/7)).

(b) High-level guidance on accommodating social and environmental considerations in UNFC-2009. This includes a proposed split of the E2 Sub-category into E2.1 and E2.2, reflecting the high and medium probability of satisfying the social and environmental contingencies, as evidenced by the level of effort, the historical record in the area of operation, or other evidence.

(c) The development of detailed guidelines. As noted, there are no detailed guidelines on classification for socio-environmental issues in UNFC-2009 or the resource-specific guidelines. Since many of these will be common to all resource types, to avoid duplication of effort and possibly conflicting guidelines, it is recommended that this detailed guidance should be prepared under the aegis of the Expert Group. Guidelines on issues that are specific to a specific resource type would be the responsibility of the authors of the relevant resource specific guidelines in cooperation with the Expert Group.

63. During the preparation of this report of the E-axis Sub-group, it was found necessary to clarify a number of related concepts and terms, as presented in a separate document (ECE/ENERGY/GE.3/2017/7). It is recommended that this be further considered and addressed in the planned update of UNFC-2009.

IX. Summary of Recommendations

64. The recommendations of the E-axis Sub-group can be summarized as follows:

(a) Establish an Expert Group on Resource Classification sub-group to develop detailed guidelines for the E axis that apply to all resource types recognized by UNFC-2009.

(b) In cooperation with the owners of resource specific guidelines, develop resource specific guidelines.

(c) Clarify concepts and terminology (see ECE/ENERGY/GE.3/2017/7).

Annex I

References on Socio-Environmental Issues

A. Sources cited in the 2016 Report

The 2016 Report summarized information on socio-economic issues from a number of sources, collected mainly by searching them using the term “social” (and variations such as “socio”). The sources included the following (reference should be made to the 2016 Report for details):

United Nations Economic Commission for Europe (ECE) publication, United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 incorporating Specifications for its Application, ECE ENERGY SERIES No. 42.

The commodity-specific guidelines that are currently recognized by UNFC-2009:

(a) CRIRSCO Template for solid minerals. Appendix III of the 2016 Report also contains extracts from The Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (‘the Joint Ore Reserves Committee (JORC) Code’).

(b) Petroleum Resources Management System (PRMS) for oil and gas and the associated Application Guidelines.

(c) NEA/IAEA Uranium Classification (‘Red Book’).

Extracts from other documents on socio-environmental issues:

(a) Canadian Oil and Gas Evaluation Handbook (COGEH).

(b) JORC Code (one of the CRIRSCO-style reporting standards).

(c) South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code).

(d) Pan-European Standard for Reporting of Exploration Results, Mineral Resources and Reserves (PERC, “the PERC reporting standard”).

(e) Regulatory reporting agencies (Canadian Securities Administrators (CSA) National Instrument 51-101 (CSA NI 51-101), United States Securities and Exchange Commission (SEC)/Financial Accounting Standards Board (FASB), European Securities and Markets Authority (ESMA)).

B. Additional sources

(a) The Equator Principles⁸

The Equator Principles (EP) is a risk management framework, has been adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects. Currently, 84 Equator Principles Financial Institutions (EPFIs) in 35 countries have officially adopted the EP, covering over 70 per cent of international Project Finance debt in emerging markets.

⁸ http://equator-principles.com/resources/equator_principles_III.pdf

It contains a significant amount of material that will be of assistance in the further development of social and environmental guidelines for UNFC-2009 including Industry Sector guidelines that may be relevant for classification with respect to the E axis:

- Mining
- Offshore Oil and Gas Development
- Onshore Oil and Gas Development
- Liquefied Natural Gas (LNG) Facilities
- Geothermal Power Generation
- Wind Energy
- Crude Oil and Petroleum Product Terminals
- Gas Distribution Systems.

(b) System of Environmental-Economic Accounting (SEEA)

SEEA is managed by the Statistics Division of the United Nations Department of Economic and Social Affairs. It refers to UNFC-2009 as the standard for energy classification. Information on SEEA is available on the website of the United Nations Statistics Division⁹.

The document Statistical Papers Series M No. 93, International Recommendations for Energy Statistics (IRES) is also available on the website of the United Nations Statistics Division¹⁰. Although IRES refers to environmental and social factors, it provides no significant guidance as to how they affect classification. Table 11.3: Energy Indicators linked to the environmental dimension, lists some factors but is general and of limited scope.

(c) International Finance Corporation (IFC), 2015. The Art and Science of Benefit Sharing in the Natural Resource Sector DISCUSSION PAPER¹¹

This is a well written review of the social and environmental factors that need to be considered for the development of a natural resource and which are summarized in Boxes and IFC Guiding Questions at the end of each chapter. Although it does not provide guidance that would be directly applicable to UNFC-2009, it may assist in the development of detailed guidelines.

(d) International Finance Corporation (IFC), The Sustainability Framework¹²

This consists of:

- (a) The Policy on Environmental and Social Sustainability, which defines IFC's commitments to environmental and social sustainability.
- (b) The Performance Standards, which define clients' responsibilities for managing their environmental and social risks.
- (c) The Access to Information Policy, which articulates IFC's commitment to transparency.
- (d) Environmental and Social Categorization.

⁹ <http://unstats.un.org/unsd/envaccounting/seea.asp>

¹⁰ http://unstats.un.org/unsd/energy/ires/IRES_Whitecover.pdf

¹¹ <https://commdev.org/the-art-and-science-of-benefit-sharing-in-the-natural-resource-sector/>

¹² http://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_site/Sustainability+and+Disclosure/Environmental-Social-Governance/Sustainability+Framework

(e) **Global Reporting Initiative**

- G4 Sustainability Reporting Guidelines¹³
- Global Reporting Initiative G-4 Sector Disclosures (Oil and Gas)¹⁴

A comprehensive compilation of many factors related to reporting oil and gas activities (which includes renewables and biofuels), many of them socio-environmental in nature. This can be a useful reference when developing detailed guidelines for UNFC-2009. The only reference to a reporting standard is to the SEC/FASB requirements.

¹³ <https://www.globalreporting.org/standards/g4/Pages/default.aspx>

¹⁴ <https://www.globalreporting.org/standards/Pages/default.aspx>

Annex II

Current E-axis Categories (Extracts from UNFC-2009 incorporating Specifications for its Application, ECE Energy Series No. 42 and ECE/ENERGY/94)

A. Categories and Sub-categories

Extract 1. “The first set of categories (the E axis) designates the degree of favourability 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.”

Extract 2. Footnote c to Figure 2 ‘Abbreviated Version of UNFC-2009, showing Primary Classes’:

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

Extract 3. “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 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. A deposit or an accumulation may give rise to several projects with different status.”

Definition of Categories and Supporting Explanations (UNFC-2009, Annex I^a, page 9)

Category	Definition ^b	Supporting Explanation ^c
E1	Extraction and sale has been confirmed to be economically viable. ^d	Extraction and sale is economic on the basis of current market conditions and realistic assumptions of future market conditions. All necessary approvals/contracts have been confirmed or there are reasonable expectations that all such approvals/contracts will be obtained within a reasonable timeframe. Economic viability is not affected by short-term adverse market conditions provided that longer-term forecasts remain positive.
E2	Extraction and sale is expected to become economically viable in the foreseeable future. ^d	Extraction and sale has not yet been confirmed to be economic but, on the basis of realistic assumptions of future market conditions, there are reasonable prospects for economic extraction and sale in the foreseeable future.

E3	Extraction and sale is not expected to become economically viable in the foreseeable future or evaluation is at too early a stage to determine economic viability. ^d	On the basis of realistic assumptions of future market conditions, it is currently considered that there are not reasonable prospects for economic extraction and sale in the foreseeable future; or, economic viability of extraction cannot yet be determined due to insufficient information (e.g. during the exploration phase). Also included are quantities that are forecast to be extracted, but which will not be available for sale.
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^a Annex I forms an integral part of UNFC-2009.

^b The term “extraction” is equivalent to “production” when applied to petroleum.

^c The term “deposit” is equivalent to “accumulation” or “pool” when applied to petroleum.

^d The phrase “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.

Definition of Sub-categories (UNFC-2009, Annex II^a, Page 12)

Category	Sub-category	Sub-category Definition
E1	E1.1	Extraction and sale is economic on the basis of current market conditions and realistic assumptions of future market conditions.
	E1.2	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.
E2	No Sub-categories defined	
E3	E3.1	Quantities that are forecast to be extracted, but which will not be available for sale.
	E3.2	Economic viability of extraction cannot yet be determined due to insufficient information (e.g. during the exploration phase).
	E3.3	On the basis of realistic assumptions of future market conditions, it is currently considered that there are not reasonable prospects for economic extraction and sale in the foreseeable future.

^a Annex II forms an integral part of UNFC-2009.

Extract 4. (from UNFC-2009, Part II)**“H. Distinction between E1, E2 and E3**

The distinction between quantities that are classified on the Economic axis as E1, E2 or E3 is based on the phrase “reasonable prospects for economic extraction and sale in the foreseeable future”. The definition of “foreseeable future” can vary depending on the commodity and hence more detailed specifications can be found in relevant commodity-specific systems that have been aligned with UNFC-2009. The Economic axis Categories encompass all non-technical issues that could directly impact the viability of a project, including commodity prices, operating costs, legal/fiscal framework, environmental regulations and known environmental or social impediments or barriers. Any one of these issues could prevent a new project from proceeding (and hence quantities would be classified as E2 or E3, as appropriate), or it could lead to the suspension or termination of extractive activities in an existing operation. Where extractive activities are suspended, but there are “reasonable prospects for economic extraction and sale in the foreseeable future”, remaining technically recoverable quantities shall be reclassified from E1 to E2. Where “reasonable prospects for economic extraction and sale in the foreseeable future” cannot be demonstrated, remaining quantities shall be reclassified from E1 to E3.”

Annex III

Proposed revised E-axis Categories

The current UNFC-2009 E-axis Categories and Sub-categories are provided in Annex II of this document. Suggested revisions are shown below, in *italics* and include:

- (a) Changing “economic” to “commercial”,
- (b) Adding sub-categories E2.1 and E2.2 to differentiate the level of project activity devoted towards the resolution of socio-environmental contingencies situations and the probability that they will be resolved in the foreseeable future.
- (c) Projects that are unable to proceed until the resolution of social or environmental issues, but for which there is no attempt to resolve them or expectation of their resolution in the foreseeable future would be classified as E3.3.

Suggested Revised Categories

<i>Category</i>	<i>Definition^a</i>	<i>Supporting Explanation^b</i>
E1	Extraction and sale has been confirmed to be economically <i>commercially</i> viable	Extraction and sale is economic <i>commercially viable</i> on the basis of current market conditions and realistic assumptions of future market conditions. All necessary approvals/contracts have been confirmed or there are reasonable expectations that all such approvals/contracts will be obtained within a reasonable timeframe <i>and there are no impediments to the delivery of the product to a market. Commercial</i> Economic viability is not affected by short-term adverse market or other conditions provided that longer-term forecasts remain positive. <i>Adverse changes in conditions could result in reclassification to E2 or E3.</i>
E2	Extraction and sale is expected to become economically <i>commercially</i> viable in the foreseeable future. ^c	Extraction and sale has not yet been confirmed to be economic <i>commercial</i> but, on the basis of realistic assumptions of future market conditions, there are reasonable prospects for economic extraction <i>commerciality</i> in the foreseeable future. <i>Removal of all impediments (contingencies) is necessary for reclassification to E1.</i>
E3	Extraction and sale is not expected to become economically <i>commercially</i> viable in the foreseeable future or evaluation is at too early a stage to determine economic <i>commercial</i> viability. ^c	On the basis of realistic assumptions of future market conditions, it is currently considered that there are not reasonable prospects for <i>commerciality</i> economic extraction and sale in the foreseeable future; or, <i>commercial</i> economic viability of extraction cannot yet be determined due to insufficient information (e.g. during the exploration phase). Also included are quantities that are forecast to be extracted, but which will not be available for sale.

^a Annex I forms an integral part of UNFC-2009.

^b The term “extraction” is equivalent to “production” when applied to petroleum.

^c The term “deposit” is equivalent to “accumulation” or “pool” when applied to petroleum.

Suggested revised Sub-categories

<i>Category</i>	<i>Sub-category</i>	<i>Sub-category Definition</i>
E1	E1.1	Extraction and sale is economic <i>commercially viable</i> on the basis of current market conditions and realistic assumptions of future market conditions.
	E1.2	Extraction and sale is not economic <i>commercially viable</i> 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.
E2	<i>E2.1</i>	<i>Issues are yet to be resolved, but there is high probability of their resolution evidenced by an active attempt to resolve all impediments (contingencies) with a high probability of success, based on the characteristics of the project, previous history of similar projects in the area, or other strong indications of success, within the foreseeable future.</i>
	<i>E2.2</i>	<i>Issues are yet to be resolved, but:</i> <i>There is an active attempt to resolve all impediments (contingencies) but with no more than a medium probability of success, or,</i> <i>There is no active effort to resolve impediments, but based on the characteristics of the project and previous history of similar projects in the area, success is likely within the foreseeable future.</i>
E3	E3.1	Quantities that are forecast to be extracted, but which will not be available for sale.
	E3.2	Economic <i>Commercial viability</i> of extraction cannot yet be determined due to insufficient information (e.g. during the exploration phase). <i>Or,</i> <i>Whether or not there is an active effort to obtain approval, the outcome is unknown or unclarified.</i>
	E3.3	On the basis of realistic assumptions of future market conditions, It is currently considered that there are not reasonable prospects for economic commerciality <i>extraction and sale</i> in the foreseeable future. <i>Whether or not there is an active effort to obtain approval, the probability of receiving approval is less than medium and may be zero.</i>

Annex IV

Example of E-axis Classification

This example shows that if multiple issues have to be dealt with, the overall ranking is that of the lowest potential E Category.

<i>Issue / potential contingency</i>	<i>Level of engagement</i>	<i>Probability of approval</i>	<i>Potential E Category</i>
Legal	Relevant licences	done	E1
Regulatory	Relevant permissions	granted	E1
Market access	Local use	99%	E1
Social	No objections expected	90%	E1
Economic	Project screened economic	POM = 95%	E1
Political	No worries expected	99%	E1
Internal & external approvals/commitments	Commitments made	100%	E1
Environmental	Licence approval in process. Issue with the black rimmed beetle frog habitat	50%	E2
Timing (<5 years or >5 years)	<5 years	Uncertain (see environmental)	E2
Total = lowest ranking issue			E2

Annex V

Glossary of Terms

As noted in the text, a separate report, Draft guidance on accommodating environmental and social considerations in UNFC-2009: Concepts and Terminology (ECE/ENERGY/GE.3/2017/7), was issued to clarify some existing terms and definitions and to propose new ones. That document should be consulted for details. However the key proposals are provided here for convenience.

(a) To avoid confusion, between the terms “commercial”, “economic” and “economic in the narrow sense” it is recommended that UNFC-2009 uses:

- **Economic** instead of **Economic (in the narrow sense)** to describe only the monetary aspects of a project – for instance, a discounted Net Present Value (NPV) greater than zero, the common usage of the word “economic” for project assessment, or similar measures.
- **Commercial** (UNFC-2009 “economic”, or in the footnote to UNFC-2009 Figure 2, instead of “economic viability” (as used in UNFC-2009), in the E-axis definitions since the former does not encompass the increasingly important social and environmental contingencies¹⁵.
- **Contingencies** are criteria or conditions that must be satisfied before a project can proceed. They may include “market prices and relevant legal, regulatory, environmental and contractual conditions” and others.

(b) 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:

- **Environmental**, as the physical or biological impact on, or changes to, the pre-existing environment due to a project (e.g. heavy metal contamination).
- **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.
 - Changes in social systems and structures (e.g. ownership claims, traditional land usage, etc.).

Although it is the negative impacts that attract attention, they may also be positive.

(c) The ability to proceed with a project may also be affected by political matters triggered by social or environmental concerns. It is by no means clear that a formal definition is required, but the following may be of use (refer to document ECE/ENERGY/GE.3/2017/7 for further discussion of this issue).

¹⁵ However, as noted by some late reviewers, the term “commercial” also includes F and G-axis issues. The recommendation to use “commercial” 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.

- **Political.** Action by controlling organizations or bodies that may impede, prevent, or facilitate proceeding with a project.
 - **Subsidy.** Direct funding or other forms of assistance (e.g., 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. The quantities associated with such a project should be regarded as being subsidized for classification according to UNFC-2009 and therefore classified as E1.2.
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