



THE UNFC E-AXIS SOCIO-ECONOMIC VIABILITY

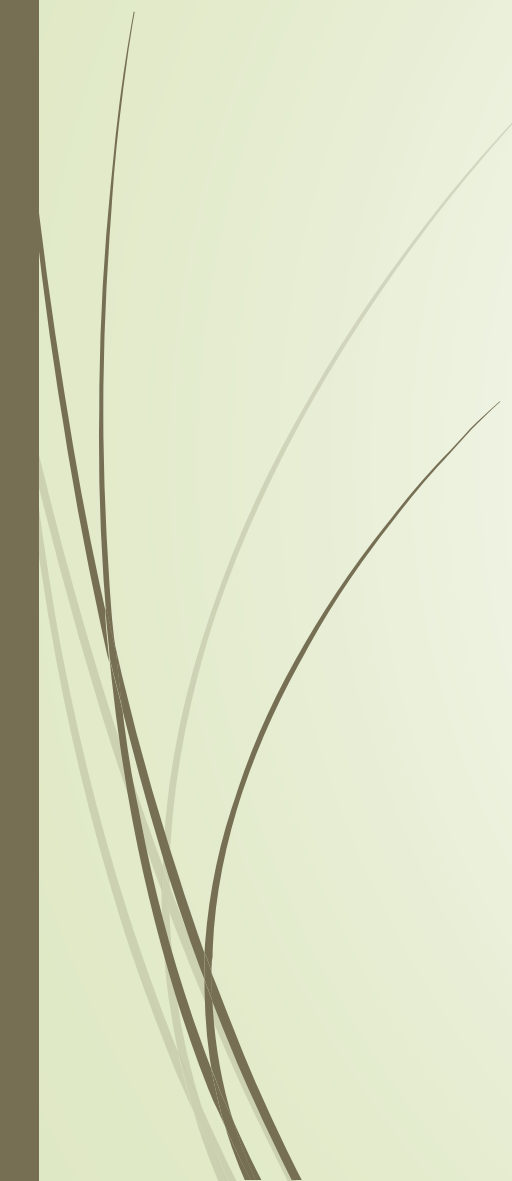
Dr. David Elliott

Chair, UNFC E-axis Sub-group

UNFC Workshop, Geneva, 26 April 2016



OUTLINE

- ▶ INTRODUCTION
 - ▶ THE UNFC AND THE E-AXIS
 - ▶ THE E-AXIS SUB-GROUP
 - ▶ IMPACT OF SOCIO-ECONOMIC FACTORS
 - ▶ CURRENT E-AXIS CATEGORIES AND GUIDANCE
 - ▶ SUB-GROUP REPORT
 - ▶ TERMINOLOGY AND CLARIFICATION
 - ▶ HIGH LEVEL GUIDANCE
 - ▶ DETAILED GUIDANCE
- 



SOCIO-ECONOMIC FACTORS

- The Socio-Economic E-Axis is described in the UNFC as:
- “The first set of categories (the E axis) designates 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.”



5TH SESSION OF THE EGRC REPORT

- Recommended the formation of a subgroup to the Bureau to prepare guidance on accommodating environment and social considerations in UNFC-2009
- Noted that these involve many diverse and complex issues. ... a wide range of material is already available on these issues ... requested that any guidance produced should revolve around high-level principles ...
- NOTE. There is a “wide range of material”, but not on classification!




PHASE 1 SUB-GROUP MEMBERSHIP

- ▶ Dr. David Elliott (Chair)
- ▶ Dr. Tom Schneider, Univ. of Alberta
- ▶ Ms. Kathryn Campbell, Sullivan & Cromwell, UK
- ▶ Prof. Roberto Villas-Boas, Centre for Mineral Technology, Brazil
- ▶ Ms. Claudia Wulz, European Community
- ▶ Mr. Slavko Solar, European Community
- ▶ Mr. Michael Lynch-Bell, UK
- ▶ Dr. Julio Claudeville, Argentina
- ▶ Mr. Michael Stanley, World Bank, USA
- ▶ Mr. Julian Hilton, UK.
- ▶ Dr. Anthony Hodge, ICMM, UK
- ▶ Mr. Luis Martins, Portugal
- ▶ Ms. Hua Yang, PetroChina




THE IMPACT OF “SOCIO-ENVIRONMENTAL” ISSUES

- ▶ Can result in legal, contractual, environmental, and/or government approval issues that affect timing
 - ▶ Delay in the implementation of a project can have a major impact on supply of a resource and on the discounted economic value
- ▶ May also affect:
 - ▶ Access to market
 - ▶ Construction or access to production and transportation facilities
 - ▶ Internal and external approval
 - ▶ Access to financing




E-AXIS SUB-CLASS E1

- ▶ **E1**, Commercial: discovered, with a known recovery process and economically viable.
- ▶ Sub-classes:
 - ▶ **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.



E-AXIS SUB-CLASS E2

- **E2**, “Expected to become economically viable in the foreseeable future”.
 - There are currently no sub-categories.
- Project Maturity Sub-classes (Potentially Commercial Projects)
 - Development Pending
 - Development on Hold



E-AXIS SUB-CLASS E3

- ▶ 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.”
 - ▶ 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 reasonable assumptions of future market conditions, it is currently considered that there are not reasonable prospects for economic extraction and sale in the foreseeable future.



CURRENT GUIDANCE

- ▶ F-AXIS and G-AXIS
 - ▶ Considerable guidance and well-developed resource-specific practice
- ▶ E-AXIS (Socio-Economic):
 - ▶ Economic conditions
 - ▶ Considerable guidance and well-developed resource-specific practice
 - ▶ Social (and environmental) conditions
 - ▶ Generally NOT resource specific
 - ▶ Cited as a factor in most resource-specific guidelines
 - ▶ But no significant guidance



RESOURCE SPECIFIC GUIDANCE

- Recognised by UNFC
 - Oil and Gas: SPE PRMS (Petroleum Resource Management System)
 - Minerals: CRIRSCO Template
 - Uranium and Thorium: NEA/IAEA Red Book
- Others
 - COGEH, NPD, SAMREC, JORC, NI 43-101, SEC, ESMA, PERC, etc.
- All recognise Socio-Environmental factors (not necessarily by that name), but there is no significant guidance regarding classification



SUB-GROUP PROGRESS REPORT, 2016

- Draft guidance on accommodating environmental and social considerations in the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009.
- To be presented and discussed at the EGRC meeting.



SUB-GROUP PROGRESS REPORT: MAIN CONCLUSIONS

- There is no significant guidance regarding classification with regard to Socio-Environmental factors.
- Many of these factors are common to all types of resource
- Three points:
 1. Clarification of terminology
 2. Preliminary proposal on high level guidance
 3. How are detailed guidelines to be developed?

CLARIFICATION OF TERMINOLOGY

- What is the difference between Social, Environmental, and Economic factors?
- What do the following mean?
 - “degree of favorability”
 - Economic in the narrow sense” and “Economically viable”
 - Commercial
 - Legal, regulatory, contractual conditions
 - Foreseeable Future
 - Potentially recoverable
 - Social licence
 - And some other terms

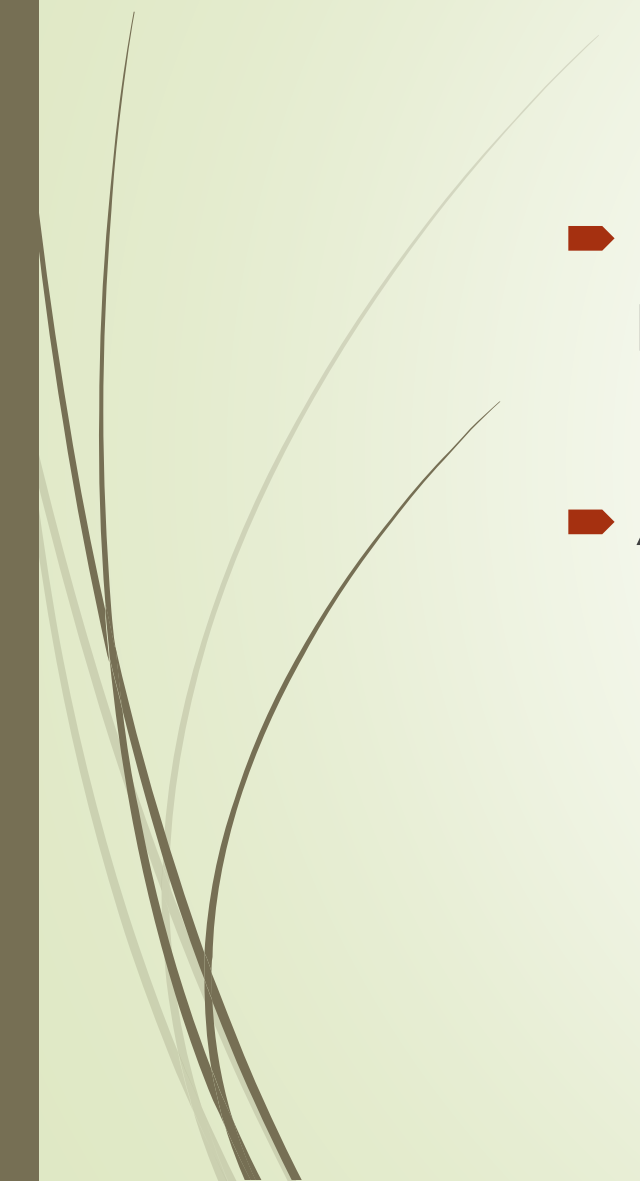


TERMINOLOGY: SOCIO-ENVIRONMENTAL

- ECONOMIC (in the narrow sense)
 - Satisfies criterion such a positive Net Present Value at a specified discount factor.
- ENVIRONMENTAL
 - The physical impact or changes to the natural environment (not on humans) due to an extraction project, often measurable (e.g., CO₂ emissions, amount of material moved, changes in surface geochemistry, etc.).
- SOCIAL
 - The impact on humans as a result of changes in the environment due to an extraction project (e.g., health issues due to heavy metal contamination). Some aspects may be measurable, but many others are qualitative or subjective.



DEGREE OF FAVORABILITY

- ▶ Not defined, but assumed to be the probability that a project will be carried out.
 - ▶ A key factor in classification
- 



TERMINOLOGY: ECONOMICS. UNFC USES

- ▶ “Economic in the narrow sense”. Not defined, but assumed to mean Economic as used in industry
 - ▶ E.g. a positive NPV at a reference discount factor.
- ▶ “Economically viable”.
 - ▶ ... include all “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.”
 - ▶ Assumed to mean Commercial.



TERMINOLOGY: CONTINGENCY

- A condition that must be satisfied for recovery of a resource:
 - specific to the project being evaluated; and
 - expected to be resolved within a reasonable timeframe.
- Commerciality requires all contingencies to be satisfied, including economics
- There are contingent factors in both the F and E-axes.
- Probably not the G-axis.



COMMERCIALITY (Contingencies)

- ▶ E-axis contingencies
 - ▶ Economic (e.g., $NPV > 0$ at a selected discount rate)
 - ▶ Non-Economic: Legal, contractual, environmental, governmental, and other social and economic concerns will allow for the actual implementation of the recovery project being evaluated
- ▶ F-axis contingencies
 - ▶ Recovery process
 - ▶ Reasonable expectation of:
 - ▶ Market
 - ▶ Production and transportation facilities
 - ▶ Internal and external approval
 - ▶ Reasonable development timetable



NON-ECONOMIC E AXIS CONTINGENCIES

In UNFC and elsewhere

- ▶ Legal framework. The right to produce and sell or benefit from a resource.
- ▶ Fiscal framework and Contractual conditions? (taxes, royalties, etc.)?
- ▶ Regulatory approval.
- ▶ Known environmental or social impediments or barriers.
 - ▶ However, even if they may be known to exist, there can be significant uncertainty as to the likelihood of their resolution. It is not obvious how the effect of these should be determined for classification, especially for those that fall outside a formal regulatory process.
- ▶ To which could be added:
 - ▶ Civil unrest
 - ▶ War



SOCIAL LICENCE



- Often arises because of concerns about the potential for harm (economic, physical or cultural) to the environment or people
- Several “definitions”, in summary:
 - Resolution of activities that could delay or prevent a project, by agencies inside or outside a formal legal and regulatory process.
 - Could be a result of concerns of local communities about the impact of a mineral recovery project, or of organisations that would not be directly affected but who have concerns of a more general nature.



FORMAL AND NON-FORMAL CONDITIONS

- ▶ FORMAL legal and regulatory processes
 - ▶ E.g., environmental approval or a licence to drill.
- ▶ NON-FORMAL, outside a formal legal or regulatory process:
 - ▶ Harder to determine how to classify.



“FORSEEABLE FUTURE” AND “POTENTIALLY RECOVERABLE”

- Under what conditions and by whom?
- Not the same for all users:
 - Government and large companies – many years
 - Smaller companies – few years, sometimes only one
- Introduce a potential “asymmetry” in classification that is significant for both the F and E axes.



E-AXIS SUB-CATEGORIES

- E.1 and E.3 No changes being considered
- E2, None at present but considering:
 - E2.1 Actively attempting to resolve contingencies
 - E2.2 No current attempt to resolve contingencies
- And the probability of success

HIGH LEVEL CLASSIFICATION ON LEVEL OF STAKEHOLDER ENGAGEMENT AND PROBABILITY OF APPROVAL

Stakeholder Engagement	Active	Not Active
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	

WHERE SHOULD DETAILED GUIDANCE BE?

- ▶ Most Social and Environmental classification factors are not commodity-specific
- ▶ How much detailed guidance is required?
- ▶ Should it be developed:
 - ▶ Separately in the commodity-specific documents:
 - ▶ PRMS, CRIRSCO, the NEA/IAEA Red Book, etc.
 - ▶ Single source:
 - ▶ Under the direction of the EGRC
 - ▶ Continuation of the work of this sub-group
 - ▶ Separate EGRC Task Force
 - ▶ ???



PROPOSED PLAN OF WORK

- Consider comments and feedback from the current EGRC.

- 1. Prepare terminology and definitions to be presented at the 2017 EGRC
- 2. Develop High level guidelines to be presented at the 2017 EGRC
- 3. Determine the approach to developing detailed guidelines:
 - Recommended. For common factors by the EGRC and for specific factors by the owners of the resource specific guidelines.
 - Alternative. Solely by owners of Resource specific guidelines.



THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- ▶ an average U.S. mining project can lose a third of its value due to permit delays, and in some cases, a project's value can be cut in half ... can even become economically unviable.
- ▶ a mine in the United States usually requires in the range of seven to 10 years to get the permits necessary to operate.

NMA Study, Permitting, Economic Value and Mining in the United States, 2015

- ▶ Social conflicts and red tape have caused the delay of \$21.5 billion worth of mining projects in recent years in Peru. (El Economista reports).

THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- Over 350 green energy projects were delayed or abandoned due to public opposition with the economic impact of these projects estimated at about \$1.1 trillion in GDP and 1.9 million jobs a year. (U.S. Chamber of Commerce, 2011)
- In the UK, 32 out of 66 applications for onshore wind farms were rejected in 2010.

Courtesy Dr. P. Pappas

THE IMPACT OF SOCIO-ENVIRONMENTAL FACTORS

- After more than six years of review, the United States President announced on November 6, 2015, his administration's rejection of the fourth phase of the Keystone Pipeline that would carry crude oil from Canada to Gulf Coast refineries.
- Opposition to Energy East and Northern Gateway pipelines to carry oil and gas from the West Canadian Sedimentary Basin to eastern and western coastal refineries and terminals.



IMPACT OF SOCIO-ENVIRONMENTAL FACTORS:

The Mackenzie Valley Pipeline

- ▶ Early 1970's, initial proposal for a gas pipeline from the Beaufort Sea, offshore NW Canada, through the Mackenzie Valley to Northern Alberta
- ▶ 1974 – 1977, hearings (Berger Inquiry) recommended a 10 year moratorium to deal with social and environmental concerns
- ▶ 1984, First land claim settlement with the Inuvialuit
- ▶ 2001, Memorandum of Agreement with the Aboriginal Pipeline Group
- ▶ 2003, Agreement between the Aboriginal Pipeline Group and TransCanada Pipelines
- ▶ 2011 Federal Government approval granted for a pipeline
- ▶ 2016 No start to construction