

Economic Commission for Europe
Committee on Sustainable Energy
Expert Group on Resource Classification
Seventh session
Geneva, 26–29 April 2016
Item 8 of the provisional agenda
Governance of UNFC-2009

Technical Advisory Group Annual Report 2016

Prepared by Mr. John Etherington, Chair, Technical Advisory Group

1. As indicated in the Terms of Reference, there will be an annual report from the Technical Advisory Group (TAG), produced by the Secretariat in consultation with the Chair and members. The report will review the operation and functioning of the Group and, where appropriate, make recommendations for improvements.
2. Following is the annual report for the period April 2015 to April 2016.
3. Since being officially formed in February 2014 with 11 members, several changes in the TAG membership have occurred. The past and current membership is as shown in Table 1 on page 10. The TAG is currently seeking two new members.
4. Since the Sixth Session of the Expert Group on Resource Classification (EGRC), the TAG held six teleconference calls and will meet “face-to-face” in Geneva on 26 April 2016. Meetings were supplemented by extensive email-based discussion.

Projects Completed:

5. During this past year, the TAG completed its review of, and issued a recommendation to the Bureau on the following projects:

Russian Federation petroleum reserves and resources classification-2013 to UNFC-2009 Bridging Document:

6. The new Russian Federation petroleum reserves and resources classification (RF-2013) was approved in November 2013 for implementation effective 1 January 2016. A formal request to assist in developing a Bridging Document was submitted by the FGU State Commission on Mineral Reserves of the Russian Federation (GKZ) to the TAG on 21 August 2014.
7. The initial working session with GKZ took place in Geneva in April 2015. Thereafter GKZ provided English versions of the RF-2013 guidelines and supporting documentation.
8. At the request of GKZ, a working session with the TAG was held 12–13 October 2015 in London to review progress on the new RF-2013 classification for oil and gas to UNFC-2009 bridging document. The Russian delegation consisted of four representatives of GKZ and associated organizations; the TAG was represented by a subgroup of five members and the Chair of the Expert Group on Resource Classification.

9. The work session resulted in a consensus mapping of RF-2013 classes to the UNFC-2009 E/F-axis categories. There was not final consensus on consolidating G-axis levels of uncertainty by RF-2013 segments into field and project classes. The work session provided a valuable exchange of ideas and concepts allowing the TAG to better understand RF-2013 and the GKZ to better understand the UNFC-2009 bridging document requirements.

10. The GKZ provided the initial draft bridging document on 31 December, 2015. Based on TAG feedback, the GKZ submitted revised documents on 2 February and 7 March. While the TAG has not fully completed its reviews, the GKZ will present a summary of progress to date to the seventh session of the EGRC. An additional work session is scheduled for 26 April 2016 in Geneva to resolve outstanding issues.

Guidelines for the Application of UNFC-2009 to Uranium and Thorium Projects:

11. The Nuclear Fuels Task Force finalized draft Guidelines for the Application of UNFC-2009 to Uranium and Thorium Resources. It was circulated and posted to the UNECE website on 25 June for a two month public comment period ending 20 August 2015. Included were eight Case Studies to elaborate the guidelines. Mr. Jean-René Blaise, an expert in uranium projects, assisted in the review of the Uranium Guidelines and case studies. Additional TAG comments were submitted prior to the final recommendation on 19 October 2015. "Application of UNFC-2009 to Nuclear Fuel Resources - Case Studies" (ECE ENERGY SERIES No. 46) was issued on 30 December 2015 and posted to the UNECE website.

12. Three additional case studies were prepared prior to the seventh session of the EGRC. The TAG review was facilitated by external experts: Mr. Jean-René Blaise (for Mongolia and Egypt) and Ms. Adrienne Hanly of IAEA (for Paraguay). TAG recommendations were provided to the Bureau for approval in late January.

Specifications for the Application of UNFC-2009 to Injection Projects for the Purpose of Geological Storage:

13. This is not a Bridging Document but rather provides guidance on using the existing UNFC-2009 principles and structure to standardize description of those projects involving injection of fluids for the purpose of geological storage.

14. The TAG recommended and the Bureau approved the draft document in March 2015. The document was then posted on the UNFC website for public comment due 15 September, 2015. The Task Force submitted a revised document in March 2016 which the TAG recommended for approval by the Bureau on 15 March.

15. The document illustrates how UNFC-2009 categories, sub-categories and generic specifications can be modified to support injection projects while maintaining the underlying classification principles.

Renewable Generic Specifications Update:

16. The original specifications document was approved by the Bureau in 2014.

17. In May 2015, the Renewables Task Force submitted for TAG review a set of PowerPoint slides to clarify some key points raised by the renewable sub-groups (and primarily by the geothermal sub-group, where the analogy to oil and gas is perhaps the closest). The slides presented a simplified petroleum project work flow with emphasis on project definition at various stages and classification using UNFC-2009.

18. The Task Force developed an updated draft of the Generic Renewable Specifications. This was received for TAG comment on 15 January and the TAG provided feedback to the Renewables Task Force on 1 February and to the Bureau on 8 February.

19. It was recognized that as work on individual specific commodities progresses, additional issues will undoubtedly arise causing further additions and revisions, but the current document provides for consistency in the development process.

Geothermal Specifications Document:

20. This is the first of a planned series of documents addressing commodity specific renewable projects (geothermal, bioenergy, wind, and solar). The Geothermal Working Group provided several interim discussion documents and issued a full draft of the Geothermal Specifications for review by the TAG and the Bureau on 7 March. The TAG issued its review to the Bureau on 24 March and supports the working group in preparing a presentation of the project to the seventh EGRC session.

E-axis Working Group Report:

21. The E-axis Sub-group shared draft versions with both the TAG and the Bureau. The TAG completed its initial review and submitted a recommendation to the Bureau on 30 January 2016. The TAG supports the draft revisions to the E-axis category definitions; however, the recommended division of the E2 category into E2.1 and E2.2 may not appropriately address the issue of incorporating environmental and social factors in project reporting under UNFC-2009.

22. While it is appropriate to present this paper for discussion at the seventh EGRC session, the final recommendations to be included in the next revision of UNFC-2009 guidance should consider clarifications on both the E and F-axes categorization and their combination to definitively assign projects to sub-classes.

Project Definition Study:

23. The TAG completed a preliminary review of the submitted draft of the discussion document “What is a Project” on 30 January, 2016. Several issues were raised in the combined Bureau and TAG review of the document and are addressed in the latest revisions.

24. With regard to the E-axis study, this report will be presented to the seventh EGRC session as a discussion document and any amendments to UNFC-2009 will consider clarifications on both the E and F-axes categorization and their combination to definitively assign projects to sub-classes.

Standard UNFC Presentations and Simplified Case Studies:

25. The Communications Sub-Committee submitted a suite of standard PowerPoint presentations on 6 January 2015. Consolidated TAG feedback was provided focusing on ensuring that the simplified graphics clarify the UNFC-2009 key principles.

User Support:

26. The TAG received an enquiry from Mr. Siddaratha Kulkarni from Soil Tech India in September 2015 on application of UNFC-2009 in a minerals project. The TAG addressed his concerns.

Ongoing Projects: The following projects are in progress:

Chinese Petroleum Classification Bridging Document.

27. The Chinese delegation approached the TAG at the EGRC sixth session in 2015 to begin the process of building a bridging document to UNFC-2009 for petroleum.

28. In early 2016, the Chinese Ministry of Land and Resources (MLR) submitted a request for public bids regarding the bridging of the Chinese petroleum classification to UNFC-2009. Based on their bid, the contract was awarded to the Research Institute for Petroleum Exploration and Development (RIPED) in Beijing. Ms. Yang Hua is a member of RIPED and remains the primary contact for this project.

29. On 2–3 February 2016, Dominique Salacz met with Yang Hua and four RIPED colleagues in Beijing. A draft report on this work session is in preparation. A second work session between RIPED and the TAG is scheduled for 25 April in Geneva prior to the EGRC seventh session. The goal remains to complete the China Petroleum and UNFC-2009 Bridging Document before the April 2017 EGRC meeting.

Bridging Document to Chinese Solid Minerals Classification:

30. The Chinese delegation approached the TAG at the EGRC sixth session to begin the process of building a bridging document to UNFC 2009 for solid minerals. An initial work session is scheduled for 26 April 2016 in Geneva. The goal is to complete the China solid minerals and UNFC-2009 Bridging Document prior to the 2017 EGRC meeting.

Bioenergy Specifications Document:

31. The Bioenergy Working Group issued a first proposal on 8 June 2015 in which it requested the TAG's input and guidance on the appropriate Energy Product definition for the purposes of the Bioenergy Specification.

32. The Bioenergy Working Group has issued a white paper on Access and Entitlement for TAG comment. A meeting with the TAG has been scheduled on 26 April 2016 in Geneva to review progress on developing specifications. The final Bioenergy Specifications are targeted for completion prior to the April 2017 EGRC session.

Uranium/Thorium Best Practices:

33. The working group plans to follow up their Guidelines document with a discussion of industry 'best practices'.

E-axis and Project Definition:

34. It is expected that there will be additional discussion based on feedback from the presentations at the EGRC seventh session on the E-axis status report and the draft Guidance Note on Project definition. A number of the recommendations in the E-axis report will feed into an umbrella project to draft revisions to UNFC-2009.

User Support:

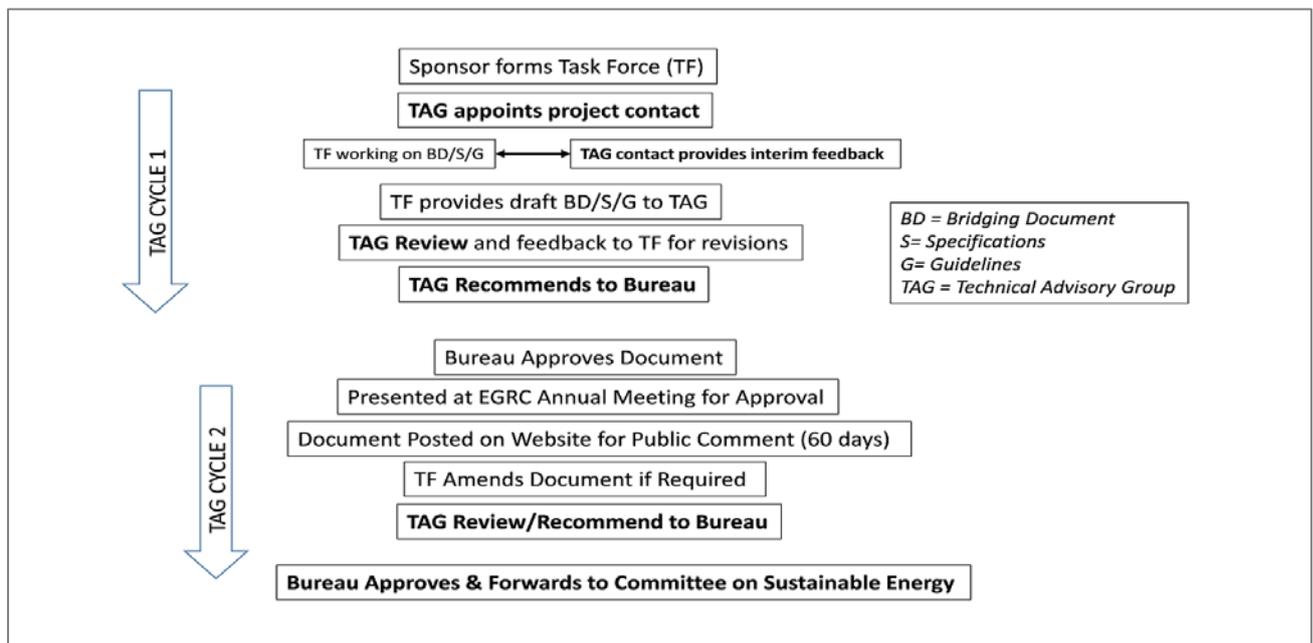
35. It is forecast that additional requests to support users in the implementation of UNFC-2009 will be received as government agencies in several countries have indicated plans to align their resource inventory systems with UNFC-2009.

TAG Terms of Reference (TOR) Review and Operational Issues:

36. The TAG TOR requires an annual internal review of the scope of their mandate, operational issues encountered and, where appropriate, make recommendations for improvements.

27. Operationally we have designated project leads that work with the EGRC task forces on major project details and isolate key issues for discussion leading to a TAG consensus recommendation.

28. An overview of the TAG review process divided into two sections is shown in Figure 1. In Cycle 1 the TAG contacts work with the project teams to develop the initial bridging or specification document through to Bureau approval. Cycle 2 focuses on public feedback and resulting amendments to the documents prior to final Bureau approval and submittal to the Committee on Sustainable Energy.

Figure 1: TAG Review Process

29. Since the Chair of the EGRC and the UNECE Secretariat sit as observers on the TAG and are copied on all correspondence, the Bureau is kept fully informed. The EGRC Secretary continues to provide excellent logistic support (booking conference calls, populating the TAG website, etc.) as well as providing advice on procedures and facilitating external interfaces. The TAG Chair has assumed primary responsibility for issuing draft agendas and meeting minutes and the UNECE Secretariat reviews and edits the drafts.

30. The TAG project recommendations are drafted by the TAG Chair but circulated for comments and edits by the full TAG before final submittal. In more recent projects the documents (e.g. Geothermal Specifications) are submitted for joint TAG and Bureau review. While designed to accelerate the process this combined review process complicates the designation of responsibility for aggregating comments and coordinating with the project teams.

31. The ‘production of case studies and designation as primary UNFC presenters at conferences and work sessions’ included in the original TAG TOR may be a challenge given the TAG’s workload and the additional travel costs involved. TAG members, along with Bureau members and other EGRC members should share these assignments on an “as available basis”.

Issues and Recommendations to Improve UNFC-2009

32. Given its involvement in the full range of projects and the details reviewed, the TAG is well positioned to offer opinions on a number of potential issues.

33. The application of UNFC-2009 is being expanded beyond its original focus on classifying and reporting minerals and petroleum extraction projects to the full range of energy projects, including renewables. Moreover, bridging/mapping of additional mineral and petroleum classification systems is progressing. At each stage in this process, interpretations of the basic definitions are often modified from the original intent. While we have yet to formulate specific mitigation recommendations, the following is a list of general “areas of concern”.

(1) How to Maintain Internal Consistency while Expanding Integrated Systems

34. UNECE Energy Series 42 p.17: “Other classification systems may be mapped to the UNFC-2009 through CRIRSCO Template/PRMS or directly to UNFC-2009. In either case, the mapping must comply with all UNFC-2009 definitions and generic specifications. In particular, the relationship between mapped systems must be documented in a Bridging Document that shall be subject to evaluation by the Technical Advisory Group which will then recommend endorsement by the Expert Group on Resource Classification *only where the resultant estimates reported under UNFC-2009 are considered to be comparable with no significant difference to those that would result from the application of classification systems for which Bridging Documents have already been endorsed by the Expert Group on Resource Classification (i.e. Aligned Systems).*”

35. The TAG interpretation of the above requirement in italics was varied. One group interpreted that a direct mapping to UNFC-2009 that complied with definitions and generic specifications was sufficient. Another group said that even where a direct mapping to UNFC-2009 was used, there must be an auxiliary mapping to the CRIRSCO Template and/or PRMS to ensure that estimates reported are comparable. The TAG used a pragmatic approach to the issue. Where the commodities being classified are the same or similar to those addressed in the CRIRSCO Template or PRMS, a dual mapping may be required to assess consistency. In the case of the NEA/IAEA Bridging Document a companion mapping to the CRIRSCO Template was provided and proved valuable in validating the Bridging Document. While a

companion mapping of the GKZ RF-2013 petroleum classification to PRMS has not been specifically required as part of their Bridging Document preparation, comparability can be assessed using a common bridging document format modelled on that used in the UNECE Energy Series 42 CRIRSCO Template and PRMS bridging documents.

36. For renewables, the focus will be aligning the category definitions and generic specifications as contained in UNECE Energy Series 42.

(2) Additional sub-categories?

37. A promoted feature of UNFC-2009 is its increased granularity and the ability to increase that granularity through addition of more sub-categories to identify key features of a project. This problem arose when PRMS wanted to include reserves funding/operational status (developed/undeveloped) in the system. In the final Bridging Document they opted for a text annotation (DP, DNP, U) (see page 45 of UNECE Energy Series 42). But should this be encouraged or is it counter to UNFC principles to use only numeric codes? This issue may arise more often as aligned systems are added and for which each has a unique feature(s) that it is requested to be tracked using sub-categories.

38. A recent issue arose in the RF-2013 mapping regarding Category E3.1 to account for forecasts of all non-sales quantities. PRMS restricts this to gas or oil consumed in operations which may be included as reserves in some regulatory reports but excludes flare and losses. Should sub-categories be created under E3.1 to separately report these quantities and maintain a full accounting that sums to total petroleum initially in place?

(3) E-axis Issues

39. How to distinguish Resources “economic now” from “uneconomic now but potentially in the future”. The problem is that E1 and E2 both allow “realistic assumptions of future market conditions”. Generic Specification “L” requires that the basis for the assumptions shall be disclosed. However, this latitude and lack of more specific economic guidance in the Bridging Documents makes it difficult to achieve consistency in quantities reported under different classification systems. The NEA/IAEA “Red Book” Classification uses standardized cost of production classes which does achieve a level of comparability.

40. As discussed in the E-axis Working Group document (Draft guidance on accommodating environmental and social considerations in UNFC-2009, ECE/ENERGY/GE3/2016/8), the term “economic” should be replaced by the more comprehensive term “commercial” and supported by a chance of adequacy on the components (social license, regulatory approvals, legal issues, etc.) Or should chance of adequacy be accommodated in the F-axis regards project maturity? Another issue that arose in the RF-2013 bridging was related to E1.2 where projects are made economic through government subsidies. Should this be restricted to subsidies confirmed as of the effective date or can it include cases where there is a reasonable expectation of future confirmation?

(4) Uncertainty Assessment and Reporting / Use of G-axis for Quantity Uncertainty

41. Under the CRIRSCO Template, the G-axis is related purely to the level of geological knowledge and confidence associated with a specific part of a deposit. However, PRMS (and more recently Renewables) uses the G-axis as a general indicator of the range of uncertainty in the quantities being reported. It is accepted that solid minerals reporting using the CRIRSCO Template should use the more restrictive interpretation of geological knowledge and confidence.

42. UNFC-2009, subject to commodity specific specifications, allows discrete estimates (G1, G2, G3) (incremental method) or scenario uncertainty for the total accumulation (G1, G1+G2, G1 + G2 + G3). Generic specification “Q” allows equivalent labels in addition to these unwieldy numeric codes (low estimate, best estimate, high estimate). While assumed, it has not been demonstrated that a scenario derived best estimate would be the same quantity as the sum of deterministic increments G1+G2 for the same project.

43. In many cases, specifically in petroleum, the scenario method is based on probabilistic methods where best estimate is P50 from a cumulative probability distribution. There is no requirement to present evidence that a probabilistic best estimate of quantities is equivalent to a deterministic best estimate or the sum of incremental G1+G2.

(5) Aggregation of Classes, Categories and Projects

44. Generic Specification “K” requires that projects “that are classified in different categories on the Economic or Feasibility axis shall not be aggregated with each other without proper justification and disclosure of the methodology adopted. In all cases, the specific Classes that have been aggregated shall be disclosed in conjunction with the reported quantity (e.g. 111+112+221+222) and a footnote added to highlight that there is a risk that projects that are not classified as E1F1 (Commercial Projects) may not eventually achieve commercial operation.”

45. There should be additional requirements that in addition to G1 and G2 (and G3) quantities there may be significant differences in levels of confidence of each category and not all of G2 (and G3) quantities will transfer to G1. There are few guidelines in the commodity systems to quantify risk and uncertainty to support aggregation.

46. Because of the above differences in confidence levels and the impact of the central limit theorem, the confidence in sum of G1 quantities in multiple projects will be greater than for a single project. Conversely the sum of G1+G2+G3 across multiple projects will result in a confidence level less than this sum for an individual project. Again neither UNFC-2009 nor the commodity systems provide guidance on aggregating projects with varying risk and uncertainty into portfolios for internal and external comparisons.

(6) In-place vs Sales Quantities

47. A typical resource assessment process includes 3 or 4 steps:

(a) Assess the total raw commodity available referred to as the “in-place” resource without any consideration of recovery process or economics.

(b) Assess the quantity (and quality) of the raw commodity that is technically feasible to recover using a specified recovery programme.

(c) Assess the quantity and quality of raw commodity that can be commercially recoverable under defined social and economic conditions.

(d) Assess the refined commercial sales quantities that can be delivered to the market using defined processing and facilities.

48. At each stage in this process there is a series of parameters cut-offs (e.g. minimum grade or hydrocarbon saturation, minimum zone thickness, minimum porosity, minimum rate of return). Without quantification and disclosure of the cut-offs, it is difficult to achieve consistency in assessed quantities at each reference point in the process.

49. While the above issues relate to petroleum and minerals extraction, applying the same logic to injection and renewables projects is more complex. For example in geological storage projects the equivalent in-place parameter is the total pore space available but only a portion of that pore space can be effectively utilized depending on the physical properties of the reservoir and the injected materials.

50. For renewables such as wind and solar, the equivalent in-place must be assessed with a defined accessible project area and consider replenishment rates.

(7) Integrating Systems with Different Mandates

51. UNFC-2009 is a generic classification system that applies to all energy sources (petroleum, solid minerals, renewables, ..) and should be applicable by the full range of stakeholders. However, the aligned systems have variable internal scope and focus. For example, the CRIRSCO Template was designed to accommodate regulatory reporting focused on Mineral Reserves and Mineral Resources. Since few agencies support reporting non-commercial deposits and pre-discovery estimates, the template originally had few guidelines in this area (note the 2013 revision for Exploration Target).

52. PRMS attempted to provide guidance for internal management of petroleum resources in all maturity stages from basin analysis through to producing projects. As more regulatory agencies have adopted PRMS, the latitude for updates to continually improve the system for internal project and portfolio management have been restricted.

53. The NEA/IAEA Red book is oriented towards international inventories and lacks the granularity to support regulatory disclosures. As more national inventory systems are integrated the consistency issue becomes more important. What is the relationship between a USGS country assessment of technically recoverable volumes of oil and the summation of all projects reported by companies to that country's security regulators?

(8) Integrating Initiatives for a UNFC Update

54. Over the last year, individual working groups have examined potential updates to the E-axis, F-axis (project definition) and the G-axis (applied to renewables). As discussed above, the TAG has encountered specific issues in ongoing bridging documents requiring clarifications. The underlying commodity specific systems (CRIRSCO Template and PRMS) have or are undergoing updates and clarifications. In preparation for a potential UNFC-2009 update in 2018, the challenge is to integrate these initiatives into a consolidated action plan.

Table 1: TAG Members as at April 2016

	Members	Affiliations	Representing	Joined	Withdrew
	Santosh Adhikari	Indian Bureau of Mines	Solid Minerals & UNFC 1997	April 2014	April 2016
1	John Barry	Irus Consulting Ltd	Solid Minerals	April 2014	
2	Andrew Barrett	Geoscience Australia	Minerals & National Reporting	July 2015	
	Per Blystad	Norwegian Petroleum Directorate	Petroleum & National Reporting	April 2014	July 2015
3	Jan Bygdevoll	Norwegian Petroleum Directorate	Petroleum & National Reporting	July 2015	
	Leesa Carson	Geoscience Australia	Minerals & National Reporting	April 2014	March 2015
4	Roger Dixon	SRK Consulting	CRIRSCO	April 2014	
5	John Etherington	PRA International Ltd	SPE PRMS	April 2014	
6	Alistair Jones	BP Exploration	Industry, Petroleum, Renewables	April 2014	
	Michael Lynch-Bell	KAZ Minerals Plc	Financial Reporting (Alternate)	April 2014	Oct 2015
	Maksim Saakian	State Commission on Mineral Reserves of the Russian Federation (GKZ)	Petroleum, Government Reporting	April 2014	April 2016
7	Dominique Salacz	Evolution Resources SA	Petroleum Industry	April 2015	
8	Alex Shpilman	V.I.Shpilman Research and Analytical Center	Petroleum, Government Reporting	Nov 2015	
	Danny Trotman	Ernst & Young LLP	Financial Reporting	April 2014	April 2016
9	Harikrishnan Tulsidas	International Atomic Energy Agency (IAEA)	Nuclear Fuel Resources	April 2014	
	Observers				
	David MacDonald	EGRC Chair			
	Charlotte Griffiths	Sustainable Energy Division			
