

**Economic Commission for Europe**

Committee on Sustainable Energy

**Expert Group on Resource Classification****Sixth session**

Geneva, 28 April – 1 May 2015

Item 7 of the provisional agenda

**Technical Advisory Group****Annual Report of the Technical Advisory Group**

As indicated in the Terms of Reference (ECE/ENERGY/GE.3/2013/5), there will be an annual report on 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.

Following is the annual report for the period from the initial 27 February 2014 teleconference through to the Expert Group on Resource Classification Sixth Session in April 2015 prepared by the TAG Chair and reviewed by the full TAG and the Secretariat

The TAG was officially formed in February 2014 with 14 members (see annex 1). Following the teleconference organizational meeting on 27 February 2014, John Etherington was appointed to chair the TAG for an initial two-year term. One additional teleconference call was held on 19 March 2014 followed by the first “face-to-face” meeting in Geneva prior to the Expert Group fifth session on 30 April 2014.

Since this last Expert Group meeting, the TAG held five teleconference calls and will meet “face-to-face” in Geneva on 28 April 2015. Meetings were supplemented by extensive email-based discussion.

**Projects Completed:** During this first full year of operation, the TAG completed its review of and issued a recommendation to the Bureau on the following projects:

**NEA/IAEA Classification System and UNFC-2009 Bridging Document:** Roger Dixon (CRIRSCO) assumed the lead on this project with support from Harikishnan Tulsidas (IAEA). A major concern was the potential overlap between reporting according to the NEA/IAEA “Red Book” using guidance in the Red Book and with regulatory disclosures using the CRIRSCO Template. To address this issue, the Uranium Group issued a companion document mapping the Red Book classification to the CRIRSCO Template. The Uranium Task Force followed up on 21 March 2015 with a Guidebook for the Application of UNFC-2009 to Uranium and Thorium Projects. The document including six case studies is currently being reviewed by the TAG.

**CRIRSCO Template and UNFC-2009 Bridging Document Update:** Roger Dixon had the lead on this project. Updates to the CRIRSCO Template and thus to the UNFC-2009 Bridging Document included:

- Revised definitions of basic resource classes and categories
- Addition of two new terms: Exploration Target and Scoping Study
- Addition of a clause on “Effective Date”
- Modification of clause 30 (Pre-Feasibility or Feasibility Study)
- Addition of clause 51 on reporting of Unconventional Energy Resources

These changes improve the consistency of reporting using the CRIRSCO Template being the primary commodity specific specifications and guidelines for solid minerals under the UNFC umbrella. A preliminary update was delivered to the Bureau on 20 February 2015. After extensive TAG discussion on mapping of Exploration Target and Exploration Results to UNFC-2009, a revised version was submitted to the Bureau in early April 2015.

**Application of UNFC-2009 to Solid Minerals Case Study (ECE/ENERGY/GE.3/2014/4):** John Barry led this project. The purpose of the very detailed case study undertaken by Stephen Henley was to:

- (i) Illustrate the mapping of mineral resources and reserves from public reports using CRIRSCO-aligned standards to UNFC-2009.
- (ii) Assess how well UNFC-2009 works in practice.
- (iii) Identify areas for improvement in both the framework and the specifications (including the current bridging documents) as documented in UNECE Energy Series 42.
- (v) Identify areas where additional guidelines are needed to assist users.

A key recommendation in the case study was to modify UNFC-2009 generic specifications P, Q, and R and/or the CRIRSCO Bridging Document to reinforce a strict focus on geological data to underpin G-axis categories. Henley noted that the current document supports use of the G-axis as a general indicator of uncertainty as applied in petroleum reporting under PRMS. The TAG recognizes this difference in interpretation but believes that the current wording in Series 42 category definitions and generic specifications provides flexibility in fit-for-purpose application on UNFC categorization at the commodity level. TAG recommended no change in specifications P, Q, and R at this time. Further case studies should be considered and other systems aligned/mapped to UNFC-2009 before changes are contemplated.

**Injection for the Purpose of Geological Storage:** Per Blystad coordinated this project with the Injection task force on “Specifications for the Application of UNFC-2009 to Injection Projects for the Purpose of Geological Storage”. This is not a Bridging Document but rather a Specification Document that provides commodity specific rules on using the existing UNFC-2009 principles and structure to standardize description of those projects involving injection of gas/fluids for the purpose of geological storage.

UNFC-2009 was originally designed to classify projects for extracting naturally occurring energy resources to support oil and gas and solid mineral industries. In this application the resource is defined as the capacity for geological storage in a given reservoir. The quantity that is classified is the quantity of a given gas/fluid, for example CO<sub>2</sub>, that can be stored in this reservoir by implementing a defined injection project.

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:** Alistair Jones is the TAG project lead. The Task Force on the Application of the UNFC-2009 to Renewables is developing Renewable Specifications. Phase 1 developed generic specifications. The document lays out how UNFC-2009 should be extended to cover renewable resources, by highlighting existing UNFC-2009 text and adding additional explanation or comments.

The draft Specifications are clearly written and consistent with UNFC-2009. The use of the G-axis to describe the level of confidence in the estimate is appropriate and consistent with UNFC-2009. The specifications appear to be complete as a generic document, although writing of several commodity-specific specifications will provide a valuable test of this.

A supplementary document contained a draft of a Table of Contents for Commodity-Specific Renewable Projects. As work on individual specific commodities progresses, additional issues will undoubtedly arise causing additions and revisions to the table of contents but the current document provides for consistency in the development process.

**User Support:** The TAG received enquiries from the Indian Oil and Natural Gas Corporation (ONGC) in January and March 2015 regards categorizing resources and the relationship of SPE-PRMS 2007 to UNFC-2009. One question was: “what justification is required to confirm that a project is economic (E1)?” The TAG advised that this is covered under Generic Specification L. Later questions concerned the application of SPE-PRMS and related UNFC-2009 coding to specific situations. The TAG pointed to UNECE Energy Series 42 category definitions and Annex IV Bridging Document to PRMS to assist.

**Ongoing Projects:** The following projects were initiated and are still in progress:

**India Transition from UNFC of 1997 to UNFC-2009:** The project was proposed in early 2014 by Santosh Adhikari but TAG involvement was deferred pending better definition of the key issues.

The classification and reporting of solid mineral resources of India are based on the principles of the UNFC of 1997 which was adopted in 2003. The National Mineral Inventory data base of the country is also maintained as per UNFC-1997. The UNFC of 1997 underwent revisions in 2004 and was further revised as UNFC-2009 to achieve alignment and harmonization with the CRIRSCO template and PRMS. The UNFC of 1997 and UNFC-2009 are not fully aligned. There are changes in the definitions of the individual categories of the three axes of the UNFC system. This poses some degree of challenge for switching over directly from UNFC of 1997 to UNFC-2009. An attempt has been done to map the resources at deposit level as well as at an inventory level estimated based on principles of UNFC-1997 to UNFC-2009.

**Russian RF-2013 to UNFC-2009 Bridging Document:** John Etherington is leading this project. 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 Russia (GKZ) to the TAG on 21 August 2014. John Etherington provided the TAG’s requirements for bridging RF-2013 petroleum classification to UNFC-2009. The GKZ delivered a first draft RF-2013 to UNFC-2009 mapping document on 17 March 2015 which is currently under TAG review. GKZ staff will participate in review session for a TAG sub-group and invited industry experts scheduled for 28 April 2015 in Geneva.

**Standard UNFC Presentations and Simplified Case Studies:** A self-evaluation was undertaken by UNECE in early 2014 to assess the efficiency, effectiveness and relevance of the programme and activities dedicated to support the development and dissemination of UNFC-2009. A number of items were identified for follow-up by the TAG in cooperation with the Bureau’s Communications Sub-committee. Educational and interactive tools need to be developed and circulated widely to demonstrate that (i) UNFC-2009 is not overly complex once users have familiarized themselves with the system, and (ii) the added flexibility and granularity provided by the three axes of UNFC-2009 offer great added value for resource classification and management. A simplified case study should be prepared, in cooperation with the Technical Advisory Group, illustrating the process of estimating projects on each of three axes and how the information is stored and reviewed.

These projects are being coordinated by Danny Trotman and the UNECE Secretariat. The Communications Sub-Committee submitted a suite of standard power point presentations on 6 January 2015. Consolidated TAG feedback focused on ensuring that the simplified graphics clarify the UNFC-2009 key principles. Notes pages will be appended to the power point files to assist presenters in delivering a consistent message to their audience. The TAG will review these speaker notes when available.

Plans to develop a companion abbreviated case study are currently under review.

**Future Projects:** The following projects are expected to be available for review in 2015-16:

**Renewable Commodity Specific Projects:** Development of Commodity-Specific Specifications has started, with an initial focus on geothermal – this work is being undertaken by a Working Group of the International Geothermal Association (IGA). The Working Group is led by Gioia Falcone, a member of the EGRC Renewables Task Force. Work has also started on development of bioenergy specifications. Work on development of hydro, solar and wind specifications is currently “on hold” pending staffing of task forces, time and the need to identify supporting international organizations such as has been achieved for geothermal with IGA (a Memorandum of Understanding is in place between UNECE and IGA for the development of the geothermal specifications). The TAG foresees that it will be required to review documents relating to geothermal potentially end-2015 and both geothermal and bioenergy in 2016 and 2017.

**Chinese Petroleum Classification:** Initial contacts indicate that the Chinese will be in a position to work with the TAG in 2016 on a mapping to PRMS and bridging to UNFC-2009.

**Canadian Oil and Gas Evaluation Handbook (COGEH):** The Calgary Chapter of the Society of Petroleum Evaluation Engineers (SPEE) has proposed a mapping to PRMS and bridging to UNFC-2009 in 2015–2016.

**User Support:** It is forecast that additional requests to support users in the implementation of UNFC-2009 (similar to the 2015 ONGC request) will be received as government agencies in several countries have indicated plans to align their inventory systems with UNFC-2009.

**TAG Terms of Reference (TOR) Review and Operational Issues:** The TAG TOR requires an annual internal review of the scope of the mandate, operational issues encountered and, where appropriate, make recommendations for improvements.

As in any organization staffed by volunteers distributed internationally, there are issues around maintaining communication and broad-based involvement. Not only does this present workload sharing issues but the TAG needs to maintain the diversity of function and location sought in the original TAG design. Despite these issues, the TAG has accomplished an impressive work programme in 2014–15 and is working cohesively.

Operationally, TAG has designated project leads that work with the EGRC task forces on major projects and isolate key issues for discussion leading to a TAG consensus recommendation. In general, this has worked well. The project leads have maintained good communication with these groups and timing issues are mutually resolved.

Since the Bureau Chair and the UNECE Secretariat sit as observers on the TAG and are copied on all correspondence, the Bureau is kept fully informed. The UNECE Secretariat continues to provide logistical support (booking conference calls, populating the TAG website, etc.) as well as providing advice on procedures and facilitating external interfaces. As the year progressed, the TAG Chair assumed primary responsibility for issuing draft agendas and meeting minutes and the UNECE Secretariat continues to review the drafts and suggest required edits.

The TAG project recommendations to the Bureau are drafted by the TAG chair and circulated for comments and edits by the full TAG before final submittal.

With regard to the original TOR, the production of case studies and designation as primary UNFC presenters at conferences and work sessions may be a problem given the workload and the additional travel costs. It is recommended that TAG members, along with Bureau and other EGRC members should share these assignments on an “as available basis”.

### Issues and Recommendations to Improve UNFC-2009

Given its involvement in the full range of projects and the details reviewed, the TAG is well positioned to offer opinions on some potential issues that may arise.

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 accelerating. At each stage in this process, interpretations of the basic definitions are often slightly modified from the original context. While the TAG has yet to formulate specific mitigation recommendations, the following is a list of general “areas of concern”.

#### (A) How to Maintain Internal Consistency while Expanding Integrated Systems?

UNECE Energy Series 43 p.17 states that: “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).*”

UNECE Energy Series 43 p. 27 clarifies that a Bridging Document is “A document that explains the relationship between UNFC-2009 and another classification system, including instructions and guidelines on how to classify estimates generated by application of that system using UNFC-2009 Numerical Codes”. A Mapping Document is explained in p. 28 of the same document as “The output of a comparison between another resource classification system and UNFC-2009, or between that system and Aligned Systems, which highlights the similarities and differences between the systems. A Mapping Document can provide the basis for assessing the potential for other system to become an Aligned System through the development of a Bridging Document”.

The TAG interpretation of the requirement for verification varied. Some interpret that a direct mapping to UNFC-2009 that complies with definitions and generic specifications is sufficient. Others believe that there should be an auxiliary mapping to CRIRSCO, PRMS or any other Aligned System to ensure that estimates reported are comparable.

The TAG used a pragmatic approach to the issue. 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.

In the coming year TAG will be studying integration of several different classification systems focused on the same commodity, in this case, petroleum. Ultimately each system may be bridged to UNFC-2009. The challenge is to maintain consistency between these systems such that assessment results are uniquely reflected in the UNFC-2009 categories and classes. Supplemental mapping to the existing aligned system, while not mandated, would assist in confirming consistency and comparability.

For the Renewables, the focus will be on the category definitions and generic specifications. In many cases these are not “bridging documents” but “specification documents” that apply UNFC-2009 where no industry standard classification for the specific commodity is available.

The Bridging and Specification documents developed to date provide an effective template for future projects. Emphasis is on retaining the basic UNFC-2009 category definitions but appending any additional context that clarifies their application for this commodity. Each of the UNFC-2009 Generic Specifications are listed and notes appended, where required, to provide additional guidance relative to the subject commodity.

**(B) How to manage additional sub-categories?**

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. For example, Henley's report examined an option that focused specifically on "permitting" in mining projects. We could create a sub-category of F-axis to specifically identify "permitting status". However, since UNFC applies to all energy sources, the generic sub-category would have to be coordinated across commodities. For example, once a F2.1.1 is created, it precludes anyone else from creating a sub-category with that same numeric.

This problem arose when PRMS wanted to include indications of reserves funding/operational status (developed/undeveloped) in the system. In the final Bridging Document PRMS representatives opted for a text annotation (DP, DNP, U) (see page 45 of UNECE Energy Series 42). Use of such non-numeric codes should only be used on an exception basis. This issue may arise more often as aligned systems are added where each has a unique feature that they wish to track using sub-categories.

**(C) Consistent Economic Conditions.**

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 assigned the same UNFC coding but derived from different classification systems.

Moreover, as used in UNFC-2009, "market conditions" are more than financial returns but includes social/environmental returns and constraints that are not currently well defined (This issue is currently being studied by a separate Bureau committee).

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

CRIRSCO requires that 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) use 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.

**Annex 1: Members of the Technical Advisory Group as at 1 April 2015**

<b>Members</b>	<b>Affiliations</b>	<b>Country</b>	<b>Representing</b>
Santosh Adhikari	India Bureau of Mines	India	Solid Minerals & UNFC 1997
John Barry	Irus Consulting Ltd	Ireland	Solid Minerals
Per Blystad	Norwegian Petroleum Directorate	Norway	Petroleum & National Reporting
Leesa Carson	Geoscience Australia	Australia	Minerals & National Reporting
Roger Dixon	SRK Consulting	South Africa	CRIRSCO
John Etherington (Chair)	PRA International Ltd	Canada	SPE PRMS
Alistair Jones	BP Exploration	UK	Petroleum Industry
Michael Lynch-Bell	KAZ Minerals Plc	UK	Financial Reporting (Alternate)
Maksim Saakian	State Commission on Mineral Resources (GKZ)	Russian Federation	Petroleum, Minerals & Government Reporting
Danny Trotman	Ernst & Young LLP	UK	Financial Reporting
Harikrishnan Tulsidas	International Atomic Energy Agency (IAEA)	IAEA	Nuclear Fuel Resources

**Observers**

David MacDonald	BP Exploration	UK
Charlotte Griffiths	UNECE Sustainable Energy Division	Switzerland