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## Economic Commission for Europe

### Committee on Sustainable Energy

#### Expert Group on Resource Classification

##### Sixth session

Geneva, 28 April – 1 May 2015

## Report of the Expert Group on Resource Classification

### I. Introduction

1. The sixth session of the Expert Group on Resource Classification was held on 28 April to 1 May 2015.<sup>1</sup>
2. This report summarizes the discussions on the work of the Expert Group at its sixth session. All the documents and presentations of the sixth session are available on the United Nations Economic Commission for Europe (ECE) website.

### II. Attendance

3. The meeting was attended by experts from the following ECE member countries: Belarus, Bulgaria, Canada, Denmark, Georgia, Germany, Hungary, Kazakhstan, Kyrgyzstan, Norway, Poland, Portugal, Romania, Russian Federation, Serbia, Spain, Tajikistan, the former Yugoslav Republic of Macedonia, Turkey, Turkmenistan, Ukraine, United States of America and Uzbekistan.
4. Experts from Algeria, Argentina, Australia, Bahrain, Brazil, Cambodia, Cameroon, China, Colombia, Egypt, India, Mexico, Mongolia, Morocco, Mozambique, Nigeria, Saudi Arabia, South Africa, Thailand, Uganda and the Bolivarian Republic of Venezuela participated under Article 11 of the Commission's Terms of Reference.
5. From the United Nations system and Specialized Agencies, a representative of the International Atomic Energy Agency (IAEA) attended. Representatives from the European

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<sup>1</sup> Official documents of the session are available at <http://documents.un.org/>. Unofficial room documents and presentations delivered at the meeting are available on the ECE website at: <http://www.unece.org/index.php?id=36110>.



Commission (EC), represented by the EC Directorate-General (D.G.) for Internal Market, Industry, Entrepreneurship and SMEs (D.G. GROWTH) and D.G. Eurostat, participated.

6. The following international organizations were represented: Coordinating Committee for Geoscience Programmes in East and Southeast Asia (CCOP) and the International Energy Agency (IEA).

7. Representatives of the following non-governmental organizations participated: American Association of Petroleum Geologists (AAPG), Centre for Mineral Technology, Committee for Mineral Reserves International Reporting Standards (CRIRSCO), EcoLomics International, European Federation of Geologists (EFG), EuroGeoSurveys, International Knowledge Centre for Engineering Sciences and Technology (IKCEST), International Geothermal Association (IGA), International Sustainable Energy Organisation for Renewable Energy and Energy Efficiency (ISEO), Latin American Mining Organization (OLAMI), Scientific and Technical Mining Association, Society of Exploration Geophysicists (SEG), Society of Petroleum Engineers (SPE), and Society of Petroleum Evaluation Engineers (SPEE).

8. In addition, the private sector was represented by experts from over 40 companies. Academia was also represented by experts from seven universities.

### **III. Adoption of the agenda (agenda item 1)**

*Documentation:* ECE/ENERGY/GE.3/2015/1

9. The provisional agenda as contained in the document ECE/ENERGY/GE.3/2015/1 was adopted without amendment.

### **IV. Election of Officers (agenda item 2)**

10. The Expert Group recalled it had elected a Bureau to take over from the end of the fifth session for a term of two years. No changes to the membership were noted.

11. The Bureau comprises: Mr. David MacDonald (United Kingdom) as Chair, Mr. Michael Lynch-Bell (United Kingdom) as Chairman Ex-officio, Mr. Igor Shpurov (Russian Federation) as First Vice Chair, and Mr. Tunde Arisekola (Nigeria), Ms. Karin Ask (Norway), Mr. Fatih Birol (International Energy Agency (IEA)), Mr. Dan Di Luzio (SPE) Mr. Roger Dixon (CRIRSCO), Mr. David Elliott (Canada), Ms. Mucella Ersoy (Turkey), Ms. Gioia Falcone (Clausthal University of Technology and International Geothermal Association), Mr. Kjell Reidar Knudsen (Norway), Mr. John Ritter (SPEE), Mr. James Ross (United Kingdom), Mr. Adichat Surinkum (CCOP), Mr. Daniel Trotman (United Kingdom), Mr. Harikrishnan Tulsidas (IAEA) Mr. Brad Van Gosen (United States of America), Mr. Narendra Verma (India), and Ms. Claudia Wulz (EC D.G. GROWTH) as Vice-Chairs.

12. The Expert Group agreed that the Chair of the Technical Advisory Group join the Bureau as an observer.

## **V. Workshop on the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (agenda item 3)**

13. The Chair provided a brief summary of the workshop held on 28 April noting its special focus on Central Asia with presentations on the status of resource classification and the potential for application of or mapping to the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009) by representatives from Kyrgyzstan, Tajikistan and Turkmenistan. The event was attended by over 90 participants, of which 20 were female, representing all UNFC-2009 end-users.

14. There was broad representation from the solid minerals sector, including nuclear fuel resources, as well as the petroleum sector. Academia, and the renewable energy and financial reporting sectors were also represented. The final programme and presentations delivered at the workshop are available on the ECE website.<sup>2</sup>

15. Interest was expressed by the participants in the event being repeated as part of the seventh session of the Expert Group. The Expert Group requested the secretariat to organize such a training event. It was requested that efforts be made to ensure the event is as interactive as possible.

## **VI. Opening remarks (agenda item 4)**

16. The session opened with an address by the Deputy Executive Secretary of ECE in which he welcomed the participants as key stakeholders in an industry that is critical for the world's future. He noted that the transition to a sustainable energy system requires energy efficiency from source to use, minimization of environmental impacts, reduction of energy and carbon intensities, and correction of energy market failures. Full integration of the energy markets of the ECE region under an efficient framework would significantly improve the essential technical, social, economic, and environmental contribution that energy must make. He noted that the work being undertaken by the Expert Group on elaborating guidance on environmental and social issues for the E-axis of UNFC-2009 ties in directly to this dimension. In closing, he observed that the process of debating, developing, and disseminating UNFC-2009 through public-private engagement has led to a highly efficient outcome. The Expert Group is considered by ECE as a model for how United Nations processes should function in the future.

17. The Chair thanked ECE for the unique platform it offers in allowing such a diverse range of stakeholders interested in resource classification and reporting to come together for the global good.

18. Mr. Tom Murley, Director and Head of Renewable Energy, HgCapital, delivered a presentation on The Importance of Resource Classification to Renewable Energy Investment. He drew attention to current estimates that over USD40 trillion of global investment in renewable energy, energy efficiency and carbon abatement are needed to avoid a two degree Celsius rise in global temperatures and underlined that this investment would need to come from the private sector. On average, energy production at wind plants is seven per cent below forecast and 65 per cent of wind farms are underperforming. He concluded that energy yield forecasting, particularly in the wind sector has not been good, leading to poor investment decisions. In his view an identifiable global standard on

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<sup>2</sup> <http://www.unece.org/index.php?id=35413>.

UNFC-2009 would be of great help to these investor and drive forward the funding needed for a low-carbon future. HgCapital's research confirms that getting the resource assessment wrong could lead to a 15 per cent loss in revenues over the life of the project and a 26 per cent lower internal rate of return.

19. The Chair also welcomed the participants, noting the large number of attendees taking part for the first time. He observed that the level of interest in and support for UNFC-2009 and the Expert Group is continuing to grow worldwide. He advised that a large number of countries and companies had sent apologies, but all had underlined their strong support for the work of the Expert Group and requested to be informed on the outcome of the sixth session.

20. The Chair noted that he and many of the Vice Chairs, as well as other members of the Expert Group, had delivered presentations at a number of minerals, petroleum and renewable energy-related conferences and workshops around the world and that these all served to promote greater understanding of the benefits of UNFC-2009.

21. Since the fifth session of the Expert Group, the work of the Bureau has been conducted through seven meetings (audioconferences) and regular e-mail correspondence. He noted that the minutes of the conference calls of the Bureau are available on the ECE website.<sup>3</sup>

22. The Chair thanked the Bureau members and their alternates for their efforts and commitment since the fifth session. He also thanked the Chairs and members of all sub-groups of the Expert Group on Resource Classification: Technical Advisory Group, Communications Sub-Committee, Task Force on Application of UNFC-2009 to Nuclear Fuel Resources, Task Force on UNFC and Recipient Reservoirs, Task Force on Application of UNFC-2009 to Renewable Energy Resources, Bioenergy Working Group, E-Axis Sub-Group, Expert Group Resourcing Strategy Working Group and also the Geothermal Working Group established under the International Geothermal Association to develop the geothermal specifications for UNFC-2009.

23. The Chair provided a brief update on the status of the development of UNFC-2009 and the areas of progress, in particular in relation to the Work Plan for 2013–2014.

24. The Chair drew attention to the draft set of conclusions and recommendations circulated prior to the meeting, noting that this was the method of working for the Expert Group adopted at its fourth session and which is in line with the Guidelines on Procedures and Practices for ECE Bodies that were adopted by ECE at its sixty-fifth session in April 2013. He emphasized that the draft conclusions and recommendations are not intended in any way to prejudice the discussions but rather to provide a draft text to facilitate discussions. The Expert Group agreed to consider and approve conclusions as the agenda items were discussed rather than considering them *en bloc* at the end of the meeting.

## **VII. Introduction of participants (agenda item 5)**

25. A tour de table was conducted during which all participants introduced themselves.

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<sup>3</sup> <http://www.unece.org/energy/se/reserves/bureau-mins.html>.

## **VIII. Activities and priorities of the Committee on Sustainable Energy and any matters for consideration by the Expert Group on Resource Classification (agenda item 6)**

26. The Director of the Sustainable Energy Division of ECE provided an update on the relevant outcomes of the twenty-third session of the Committee on Sustainable Energy, 19–21 November 2014. He advised that the Bridging Document between the Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA)/IAEA “Red Book” Uranium Classification and UNFC-2009 was endorsed by the Committee on Sustainable Energy and underlined that this was a significant milestone in the development of UNFC-2009. The Committee was briefed on the activities and status of implementation of the work plan of the Expert Group and endorsed the report of the fifth session of Expert Group. The Committee also endorsed the extension of the Expert Group’s Work Plan for 2013–2014 until the end of 2015 and this was approved by the ECE Executive Committee at its seventy-fifth session, 10 February 2015. The Committee on Sustainable Energy requested the Expert Group to prepare a work plan for 2016–2017.

27. The Director further advised that the Committee on Sustainable Energy had approved that Chairs of the subsidiary bodies of the Committee become members of the Bureau of the Committee, hence the Chair of the Expert Group on Resource Classification is now a Vice Chair of the Bureau of the Committee with mutual benefits for both bodies.

28. The Director drew attention to the work of the other subsidiary bodies of the Committee of most relevance to the Expert Group. In particular, he outlined the work of the four Task Forces on the Group of Experts on Gas which are focusing on development of Best Practice Guidance in Reducing Gas Leaks in the Gas Value Chain, Best Policy Practices on the Role of Natural Gas in Significantly Increasing the Uptake of Renewable Energy in the ECE, Best Practice Policy Guidance for Liquefied Natural Gas (LNG) and Removing Barriers to the Use of Natural Gas as a Transportation Fuel. He also outlined the work on methane management from all extractive activities that is being carried out under the auspices of the Committee on Sustainable Energy.

## **IX. Technical Advisory Group (agenda item 7)**

*Documentation:* EGRC-6/2015/INF.5 – Unofficial room document: Technical Advisory Group Annual Report *dated 20 April 2015*

29. The Chair of the Technical Advisory Group provided an update on the work carried out by the Technical Advisory Group since the fifth session. He outlined potential issues and challenges for the future, including concern over the potential workload for the Technical Advisory Group and the possible need for ad hoc technical input from Expert Group members.

30. The Chair advised the Expert Group of the range of projects expected to be required to be addressed by the Technical Advisory Group over the coming year, including mapping of other systems to UNFC-2009 and review of presented bridging documents. He also highlighted the need for clarity regarding the types of documents that need the review of the Technical Advisory Group and those that do not.

31. The members of the Technical Advisory Group are Mr. John Etherington (SPE (Chair)), Mr. Santosh Adhikari (Indian Bureau of Mines), Mr. John Barry (Irus Consulting Ltd), Mr. Per Blystad (Norwegian Petroleum Directorate), Mr. Roger Dixon (CRIRSCO), Mr. Michael Lynch-Bell (KAZ Minerals Plc), Mr. Alistair Jones (BP),

Mr. Maksim Saakian (State Commission of Mineral Reserves of the Russian Federation), Mr. Daniel Trotman (EY), with the Chair and secretary of the Expert Group as observers.

32. The Expert Group recommended that work should start on collation of issues for a future update of UNFC-2009 and requested the Bureau in cooperation with the Technical Advisory Group to prepare an overview of possible additions and/or modifications to UNFC-2009 incorporating Specifications for its Application for review by the Seventh Session of the Expert Group. The Expert Group recommended that an update of UNFC-2009 should not be planned before 2018.

33. The Expert Group recommended that a formal mechanism be established with CRIRSCO and any other systems bridged to UNFC-2009 to ensure that the Expert Group and the Bureau is able to monitor and discuss any potential revisions being considered with regard to planned updates to the CRIRSCO Template, or other bridged systems. The representative of SPE informed the Expert Group that it would receive a copy of any proposed changes to the Petroleum Resources Management System (PRMS) prior to any public comment period.

34. The Expert Group recommended that the Terms of Reference for the Technical Advisory Group (ECE/ENERGY/GE.3/2013/5) remain unchanged. The Expert Group concluded that the production of case studies and designation as primary presenters at conferences and workshops should not be viewed as being solely assigned to the Technical Advisory Group and recommended that the Technical Advisory Group, together with Bureau and other members of the Expert Group, should share these assignments on an “as available basis”.

35. The Expert Group requested the Technical Advisory Group to continue its work to update the mapping between UNFC-2009 and the new classification system of the Russian Federation for petroleum of 2013 and that it assist the State Commission on Mineral Resources of the Russian Federation to develop a draft bridging document for review by the Expert Group at its seventh session.

36. The Expert Group requested the Technical Advisory Group to assist the relevant Chinese authorities to develop a mapping and bridging document between (i) the China Mineral Reserves and Resources Classification System (CMRRCS) and UNFC-2009, and (ii) the Chinese Petroleum Resources/Reserves Classification System and UNFC-2009.

37. The Expert Group expressed its appreciation for the work undertaken by the Technical Advisory Group.

## **X. Generic specifications for the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (agenda item 8)**

38. The Chair noted that feedback from presentations on UNFC-2009 indicated the need for additional guidance regarding the G axis and the use of a Competent Person. Feedback had also been received regarding the naming of both the F and G axes.

39. The Expert Group recommended that any abbreviation of the G axis to “Geological knowledge” should be avoided and the full name “Geological knowledge and potential recoverability” be used wherever and whenever possible.

40. The Expert Group recommended that the G axis name, category definitions and supporting explanations be reviewed in detail during the next update of UNFC-2009 and one or more proposals developed for modifications that would better reflect the needs of the

renewables sector without compromising their applicability to solid minerals and petroleum.

41. The Expert Group further recommended that the current title of the F axis “Field project status and feasibility” be replaced in future documents, including slide presentations, by “Feasibility and project status”.

42. A number of presentations were delivered on differences globally in the use of the Competent Person. The CRIRSCO representative illustrated the advantages of requiring a Competent Person with respect to all the stakeholders in a project. Mr. Georgii Rudko, State Commission of Ukraine on Mineral Resources, explained that projects in Ukraine are evaluated by groups of national technical experts but the responsibility for the governance of resource estimates lies with the State Commission rather than a specific individual. The Chair of the Expert Group highlighted the differences between countries in the way the relevant regulator imposes restrictions on requirements for a Competent Person.

43. Several experts expressed the view that incorporation of a requirement for a Competent Person would enhance the credibility of UNFC-2009.

44. The Expert Group requested the Bureau to prepare a short guidance note on the use of Competent Person or Persons and its relationship with UNFC-2009 and that this be made available on the ECE website as soon as practicable.

## **XI. Application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 to solid minerals (agenda item 9)**

45. The representative of CRIRSCO provided a summary of the changes made to the November 2013 version of the CRIRSCO Template compared to the July 2006 version.

46. The Expert Group recommended that the revised Bridging Document between the CRIRSCO Template and UNFC-2009 be accepted without amendment (EGRC-6/2015/INF.3 dated 19 April 2015). The Expert Group further recommended that the revised Bridging Document be made available on the ECE website and included in the next revision of UNFC-2009 incorporating Specifications for its Application.

## **XII. Application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 to petroleum (agenda item 10)**

47. The representative of the Norwegian Petroleum Directorate (NPD) presented a review of the work of NPD to update the mapping of the Norwegian Resource Accounts of 2014 to UNFC using the PRMS Bridging Document. Details were provided on how the exercise was undertaken, as well as the results. It was found to be possible to present the NPD Resource Accounts (a total of 800 projects) using the Bridging Document. NPD is planning to revise its Guidelines in order to better align with UNFC-2009 which would facilitate the development of a Bridging Document between the NPD system and UNFC-2009.

48. The representative of SPE provided a status report on the planned update of PRMS. It is hoped to have a draft ready for public comment in mid to late 2016.

### **XIII. Application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 to nuclear fuel resources (agenda item 11)**

- Documentation:* ECE/ENERGY//2014/6  
 ECE/ENERGY/GE.3//2015/6  
 ECE/ENERGY/GE.3/2015/6/Corr.1  
 ECE/ENERGY/GE.3/2015/7  
 EGRC-6/2015/INF.8 – Unofficial room document: Draft Guidelines for Application of UNFC-2009 to Uranium and Thorium Projects *dated 23 April 2015*  
 EGRC-6/2015/INF.9 – Unofficial room document: Case Studies on Application of UNFC-2009 to Nuclear Fuel Resources *dated 23 April 2015*

49. The Chair of the Task Force on Application of UNFC-2009 to Nuclear Fuel Resources provided details of the final version of the Bridging Document between the Organisation for Economic Co-operation and Development (OECD) Nuclear Energy Agency (NEA)/IAEA Uranium Classification (“Red Book”) and UNFC-2009 (ECE/ENERGY/2014/6) endorsed by the Committee on Sustainable Energy at its twenty-third session. The Bridging Document will aid transfer of resources reported in the “Red Book” to UNFC-2009 and vice-versa.

50. The current members of the Task Force are: Mr. Luis Lopez (Argentina), Mr. Roberto Villas-Bôas (Brazil and Centre for Mineral Technology), Mr. LI Shengxiang (China), Mr. Prathap Singh Parihar and Mr. Akshaya Sarangi (India), Mr. Cassius Chiwambo (Malawi), Mr. Julian Hilton (United Kingdom), Mr. Bradley Van Gosen (United States), Mr. Paul Bankes (CRIRSCO), Mr. Robert Vance (NEA), Mr. Michael Lynch-Bell, Mr. David MacDonald and Mr. James Ross (Expert Group on Resource Classification), Ms. Adrienne Hanly (IAEA) and Mr. Harikrishnan Tulsidas (IAEA (Chair)), and the secretary of the Expert Group.

51. An overview of the scope and structure of the Guidelines was presented by the Chair of the Task Force. The objective of the Guidebook is threefold: (i) to assist IAEA and United Nations Member States in the application of the bridging scheme to UNFC 2009; (ii) to provide case studies and examples, which will illustrate the application of the UNFC-2009 Bridging Document in a consistent manner in various situations; and (iii) to look into aspects of sustainability and the environment that should be considered when classifying the projects.

52. The results of the case study “A thorium source in the Mountain Pass rare earth elements deposit, California, USA, and the application of UNFC-2009” (ECE/ENERGY/GE.3/2015/6) was presented by Mr. Bradley Van Gosen, United States Geological Survey (USGS).

53. Case studies “Application of UNFC-2009 to uranium resources in China and Niger” (ECE/ENERGY/GE.3/2015/7) was delivered by Mr. LI Shengxiang, China Uranium Corporation Limited, China National Nuclear Corporation (CNNC).

54. The representative of IAEA provided an update on projects for the period 2014–2015 (these are included under Item 17) and new projects planned for 2016–2019 under the IAEA Technical Co-operation Programme: an Inter-regional project on “Technology deployment and management of sustainable uranium extraction projects”;

a regional Asia-Pacific project on “Comprehensive recovery of Uranium and Related Resources Using Integrated Minerals Processing Technologies (C-PROMPT)”, which will include a number of UNFC-2009 workshops. It is also planned to develop a standard template for UNFC-2009 reporting and pre-feasibility/feasibility studies, as well as eLearning and development of an Online Network.

55. The Expert Group recommended that the draft Guidelines on Application of UNFC-2009 to uranium and thorium projects be updated in the light of the comments made during the meeting and issued as a publication before end-2015. The Task Force on Application of UNFC-2009 to Nuclear Fuel Resources should continue and its work should focus on updating the Guidelines, development of a good practices document or handbook and development of case studies.

56. The Expert Group expressed its appreciation for the work undertaken by the Task Force.

#### **XIV. Application of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 to renewable energy resources (agenda item 12)**

*Documentation:* ECE/ENERGY/GE.3/2015/3

EGRC-6/2015/INF.6 – Unofficial room document: Basis for Establishing Generic Specifications for the Application of UNFC-2009 to Renewable Energy Resources: Report Prepared by the Task Force on Application of UNFC-2009 to Renewable Energy Resources *dated 5 March 2015*

EGRC-6/2015/INF.10 – Unofficial room document: White Paper – Progress Update: IGA Working Group for the Development of Geothermal Specifications for UNFC-2009 *dated 17 April 2015*

57. The Chair of the Task Force on Application of UNFC-2009 to Renewable Energy Resources provided an update on the current and future proposed work of the Task Force. He outlined the challenges currently faced by the Task Force and then presented the proposed work plan for the Task Force for 2016–2017, including the timing for the publication of the commodity-specific specifications for geothermal in April 2017 and for bioenergy in April 2018.

58. The members of the Task Force are: Mr. Frank Denelle (Shell (Chair)), Ms. Raffaella Cristianetti (DuPont), Mr. Norbert Dolle (Shell), Ms. Gioia Falcone (Clausthal University of Technology and IGA), Mr. Bernard Seiller (Total), Mr. Jean-Alain Taupy (Total), Mr. Daniel Trotman (EY) and the secretary of the Expert Group.

59. The feedback from the public comment period held in 2014 and how the comments were addressed in the final draft of the generic specifications was outlined by Mr. Norbert Dolle.

60. Ms. Gioia Falcone presented an update on the status of the development of the geothermal specifications and work plans. In September 2014, ECE and the International Geothermal Association signed a Memorandum of Understanding to develop a globally applicable harmonized standard for reporting geothermal resources. The Geothermal Working Group that will develop the geothermal specifications for UNFC-2009 is now established. An overview of the white paper “Progress Update: IGA Working Group for the Development of Geothermal Specifications for UNFC-2009” was presented and it was also

noted that this document was presented to the World Geothermal Congress in Melbourne, 19–24 April 2015.

61. The members of the IGA Geothermal Working Group are: Ms. Gioia Falcone (Clausthal University of Technology/IGA Resources and Reserves Committee (Chair)), Mr. Miklos Antics (GPC IP/Geofluid), Mr. Roy Baria (Mil-Tech UK Ltd), Mr. Larry Bayrante (Energy Development Corporation), Mr. Paolo Conti (University of Pisa), Mr. Malcolm Grant, (MAGAK), Mr. Robert Hogarth (Hogarth Energy Resources), Mr. Egill Juliusson (Landvirkjun), Mr Harmen Mijnlieff (TNO), Ms. Annamaria Nador (Geological & Geophysical Institute, Hungary), Mr. Greg Usher (Jacobs), and Ms. Kate Young (U.S. National Renewable Energy Laboratory (NREL)).

62. Mr. James Primrose presented an update on the status of the development of the bioenergy specifications and planned work. He highlighted the activities and key issues facing the Bioenergy Working Group. Case studies have been developed on ethanol, energy crops, corn ethanol, cellulosic biofuels, biopower (wood feedstocks) and hydrogenated vegetable oil. These are draft case studies to help guide the work development of the specifications. As the methodology develops it is anticipated that the granularity of the case studies will evolve. Challenges in the work were highlighted, including on the issue of energy product and the selection of the reference point. There remains a need for a key stakeholder to take ownership of the development of the bioenergy specifications.

63. The members of the Bioenergy Working Group are: Mr. James Primrose (BP (Chair)), Mr. Doug Berven (POET), Ms. Raffaella Cristianetti (DuPont), Mr. Richard Hamilton (CERES), Mr. Jean-Alain Taupy (Total) and Mr. Michael McCurdy (Leidos Engineering).

64. The representative from ISEO drew attention to the work of the International Organization for Standardization (ISO) on standardization of renewables, including its standards ISO 13602-1 and ISO/DIS13602-3 enabling full energy costing with all ecological factors and energy statistics with a standardized terminology. The secretariat was requested to circulate details of the standards to the meeting participants. Following approval of the meeting report, the secretariat was advised by the ISO Central Secretariat that both aforementioned standards are not active ISO standards.

65. The need to cooperate with the International Renewable Energy Agency (IRENA) was highlighted and it was noted that ECE and IRENA established a Memorandum of Understanding in September 2014.

66. The secretariat clarified that the United Nations Sustainable Energy for All (SE4ALL) definition of Renewable Energy is adopted in the generic renewables specifications document.

67. The Expert Group recommended that the draft generic specifications for application of UNFC-2009 to renewable energy resources as contained in ECE/ENERGY/GE.3/2015/3 dated 20 February 2015 be accepted and made available on the ECE website as a draft document. The Expert Group requested the Task Force on Application of UNFC-2009 to Renewable Energy Resources to propose any updates to the generic specifications that may be needed as a result of the development of the commodity-specific specifications.

68. The Expert Group further requested the Task Force to prepare draft commodity-specific specifications for geothermal for review at the seventh session of the Expert Group and draft commodity-specific specifications for bioenergy for review at the eighth session.

69. The Expert Group requested the Bureau to provide additional guidance on the definition of a project for use in the classification of renewable energy and other commodities. The Expert Group further requested the Bureau to produce a set of synthetic case studies covering the major commodities, including oil and gas and solid minerals.

70. The Expert Group requested the Task Force, including its working groups, to share progress with the ECE Group of Experts on Renewable Energy, seek to establish synergies on the respective work plans and solicit inputs on the draft documentation on application of UNFC-2009 to renewable energy.

71. The Expert Group expressed its appreciation for the work undertaken by the Task Force.

## **XV. Use of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 for classifying injection projects (agenda item 13)**

*Documentation:* ECE/ENERGY/GE.3/2015/4

72. The Chair of the Task Force on UNFC and Recipient Reservoirs provided an update on the work of the Task Force since the fifth session.

73. The members of the Task Force are: Ms. Karin Ask (Statoil (Chair)), Ms. Michelle Bentham (British Geological Survey (BGS)), Mr. Simplicio Caluyong (CCOP), Ms. Eva Halland (NPD), Mr. Scott Frailey (Illinois State Geological Survey, United States), Mr. Wolf Heidug (King Abdullah Petroleum Studies and Research Centre), and Mr. Martin Hubbig (OMV).

74. The Chair of the Task Force introduced the draft Specifications for the Application of UNFC-2009 to Injection Projects (ECE/ENERGY/GE.3/2015/4). It was clarified that in the draft specifications the resource is the available reservoir in which a certain quantity of a given fluid can be stored and *not* the injected and stored fluid. Whilst the resource is referred to as the Storage Potential in the draft document, there is still ongoing discussion on other potential terms that could be used and the Chair requested feedback from members of the Expert Group on the appropriate term.

75. The Chair of the Task Force presented an example of a CO<sub>2</sub> injection project in Norway that demonstrates the application of the draft specifications.

76. The Expert Group recommended that the Task Force on UNFC and Recipient Reservoirs update the draft specifications in the light of the comments made at the meeting and issue them for public comment. A revised text should be submitted to the seventh session.

77. The Expert Group expressed its appreciation for the work undertaken by the Task Force.

78. The representative of SPEE provided an overview of the use of CO<sub>2</sub> for application to Enhanced Oil Recovery (EOR) Projects.

## **XVI. Other potential applications of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (agenda item 14)**

79. The classification of anthropogenic resources under UNFC-2009 including the application of UNFC-2009 to different wastes (such as industrial wastes) and waste facilities was presented by Professor Johann Fellner and Ms. Andrea Winterstetter, Institute for Water Quality, Resource and Waste Management, Vienna University of Technology. The chosen case study was a landfill mining project in Belgium with the aim to apply

UNFC-2009 to anthropogenic stock resources. It was noted that UNFC-2009 can be applied to such projects.

80. The representative of ISEO requested that work on this topic should be pursued as a priority, including organic waste converted into methanol. The Chair of the Bioenergy Working Group noted that it is envisaged that the conversion of the bio fraction of municipal solid waste to bioenergy, which would include biomethanol, would be captured under the specifications being developed for bioenergy.

81. The Expert Group recommended that the applicability of UNFC-2009 to landfill mining not be pursued at this time nor included as part of its 2016–2017 Work Plan, noting that further research is needed to define specific, quantifiable criteria for categorizing various kinds of anthropogenic resources under UNFC-2009 that would allow for fair comparisons between naturally occurring and anthropogenic resource deposits. The Expert Group confirmed that it encourages ongoing independent review of the potential use of UNFC-2009 for anthropogenic resources and other applications such as groundwater and methanol from organic waste.

## **XVII. Case studies and testing of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (agenda item 15)**

82. A series of presentations were delivered relating to the testing of and mapping to UNFC-2009:

(a) Ms. Annamaria Nador, Geological and Geophysical Institute of Hungary and EuroGeoSurveys presented on the State-of-the-Art and Potential for a Harmonized Classification of Geo-Energy Resources in Europe. She highlighted the challenges when undertaking geological surveys;

(b) The potential for mapping between the China Mineral Reserves and Resources Classification System (CMRRCS) and UNFC-2009 was provided by Mr. LI Jian of the Mineral Resources and Reserves Evaluation Center of the Ministry of Land and Resources of China. Following discussion, there was general agreement that this mapping and bridging work should start, with the first step being the translation of CMRRCS into English (see paragraph 36);

(c) Mr. Zoltán Horváth of the Geological and Geophysical Institute of Hungary and EuroGeoSurveys presented “Towards Establishment of a Harmonized Mineral Resources Classification in Europe – the EuroGeoSurveys Mineral Resources Expert Group (EGS MREG) Position”. He also presented a Hungarian Case Study;

(d) Mr. Azimjon Kholikov, State Committee on Geology and Mineral Resources, Uzbekistan, presented on the status of resource classification in Uzbekistan and the prospects for UNFC-2009. The current mineral resource classification of Uzbekistan is based on the Former Soviet Union system, which is mapped to the CRIRSCO Template. This allows a direct bridge to UNFC-2009 and presentation of Uzbekistan’s mineral resources in UNFC-2009 format;

(e) An update on the progress in the application of UNFC-2009 to mineral resources in Thailand was delivered by Mr. Tawatchai Chualaowanich, Department of Mineral Resources (DMR), Ministry of Natural Resources and Environment of Thailand. Details of the application of UNFC-2009 to DMR’s Mineral Exploration Projects were provided. Thailand is working to apply a ‘modified’ UNFC-2009 for the estimation of mineral reserves and resources nationally. UNFC-2009 and Specifications for its Application is being translated into Thai;

(f) Mr. Kumaran Nair Gopakumar, Oil and Natural Gas Corporation Limited (ONGC) of India, provided an overview of reserve estimation and categorization in ONGC. He additionally presented two case studies on UNFC-2009 for categorizing its existing reserves and resources according to UNFC-2009: the first case study was based on ONGC assets in India and the second on ONGC assets in South East Asia.

83. An update on the Project on Statistical Information on European Union (EU) Raw Material Deposits (Minventory) and other EU projects and activities of relevance to the Expert Group was provided by Mr. Slavko Solar, EC D.G. GROWTH.

84. Mr. Radoslav Vukas, Ministry of Energy and Mining of Serbia, provided an overview of the mineral potential of Serbia and highlighted the economic importance of coal, oil and gas, solid minerals, hydro and geothermal energy in the country. New legislation (rule books) is currently being developed in line with the Pan European Reserves and Resources Committee (PERC) Code, the Petroleum Resources Management System (PRMS) and UNFC-2009.

85. The Expert Group requested that the eight case studies on application of UNFC-2009 to uranium and thorium projects (EGRC-6/2015/INF.9 dated 23 April 2015) prepared by the Task Force on Application of UNFC-2009 to Nuclear Fuel Resources be issued as an electronic ECE publication by December 2015.

86. The Expert Group further recommended that a database of UNFC-2009 case studies be prepared and made available on the ECE website.

## **XVIII. United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 E axis – environmental and social considerations (agenda item 16)**

*Documentation:* EGRC-6/2015/INF.7 – Unofficial room document: Draft Terms of Reference for the E-Axis Sub-Group *dated 13 April 2015*

87. The Chair of the E-Axis Sub-Group presented the draft Terms of Reference and outlined the status of the work of the Sub-Group notably the collation of relevant information. He requested members of the Expert Group to provide copies of any documents that might be relevant to the work of the Sub-Group.

88. The members of the Sub-Group are: Mr. David Elliott (Geosgil Consulting (Chair)), Mr. Julio Claudeville (Barrick Argentina), Ms. Kathryn Campbell (Sullivan & Cromwell), Mr. Julian Hilton (U.K.), Mr. Anthony Hodge (International Council on Mining and Metals (ICMM)), Mr. Michael Lynch-Bell (KAZ Minerals), Mr. Luis Martins (Colt Resources), Mr. Thomas Schneider (University of Alberta, Canada), Mr. Slavko Solar (EC D.G. GROWTH), Mr. Michael Stanley (World Bank), Mr. Roberto Villas-Boas (Centre for Mineral Technology, Brazil), Ms. Claudia Wulz (EC D.G. GROWTH) and Ms. YANG Hua (PetroChina).

89. The representative of ISEO drew attention to the extensive documentation that is available and offered to assist the Sub-Group.

90. A panel discussion solicited the views of the Expert Group on the importance of social licence and environmental issues on the E-axis.

91. The Expert Group recommended that the Terms of Reference for the E-axis Sub-Group as contained in informal document EGRC-6/2015/INF.7 dated 13 April 2015 be approved without amendment.

92. The Expert Group requested the Sub-Group to review the existing body of knowledge relevant to this work.

## **XIX. Education and outreach and activities of the Communications Sub-Committee (agenda item 17)**

*Documentation:* EGRC-6/2015/INF.4 – Unofficial room document: Education and Outreach and activities of the Communications Sub-Committee *dated 5 March 2015*

93. The Co-Chairs of the Communications Sub-Committee provided an update on the work and activities of the Sub-Committee since the last Expert Group meeting, covering the membership, communications and education strategy, current activities, events attended in 2014 and 2015, and future events and work plans.

94. The membership of the Communications Sub-Committee is: Mr. John Brooks (AAPG (Co-Chair)), Ms. Carolina Coll (BG Group (Co-Chair)), Ms. Tana Garcia Lastra (Corporación de Reservas Estratégicas de Productos Petrolíferos (CORES)), Ms. YANG Hua (PetroChina), Mr. David MacDonald (Chair, Expert Group on Resource Classification), Mr. Jan Roelofsen (Independent Consultant), Mr. Jean-Alain Taupy (Total), Mr. Daniel Trotman (EY) and the secretary of the Expert Group. The intent is to identify a new member to represent the CRIRSCO Template/solid minerals sector.

95. Members of the Expert Group were encouraged to identify events at which a presentation on UNFC-2009 could usefully be delivered and also to volunteer to deliver such presentations.

96. The CCOP representative provided an update on workshops held related to UNFC-2009, as well as future plans. He expanded on the Department of Mineral Fuels of Thailand Project on Petroleum Resources/Reserves Classification and Reporting System, which aims to facilitate the development of a Guideline on reporting of petroleum resources, reserves and injection projects based on international standards. He drew attention to the interest among CCOP member countries to use UNFC-2009 as a common template for future reporting of their petroleum reserves and resources.

97. The Chair provided feedback on the first UNFC-2009 ‘Train the Trainers Workshop’ held in Geneva on 30 April 2015. Interest was expressed in this event being repeated.

98. The Chair, on behalf of the Expert Group, expressed appreciation to the Communications Sub-Committee for its on-going work.

99. Events held in 2014 and 2015 to promote and/or test UNFC-2009 were then discussed. Three key events were discussed in more detailed as outlined in paragraphs 99 to 101.

### **A. Africa Regional Workshop on Application of UNFC-2009 to Uranium Resources, Johannesburg, South Africa, 10–14 November 2014**

100. The Joint IAEA and ECE Regional Workshop on Application of UNFC-2009 to Uranium Resources was organized by the Council for Geoscience of South Africa and supported by CRIRSCO and the South African Code for Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC). Some 40 experts from Algeria, Chad, Cameroon, Democratic Republic of Congo, Ghana, Malawi, Mali, Morocco,

Namibia, Nigeria, South Africa, Sudan, Tunisia and Uganda participated. The programme and presentations delivered at the workshop are available on the ECE website.<sup>4</sup>

**B. ECE Workshop on UNFC-2009 Classification for Renewable Energies – Opportunities and Challenges, Geneva, Switzerland, 17–18 November 2014**

101. The event was organized by ECE immediately after the first meeting of the ECE Group of Experts on Renewable Energy. The programme and presentations delivered at the workshop are available on the ECE website.<sup>5</sup>

**C. UNFC-2009 Workshop, New Delhi, India, 10 January 2015**

102. The event was organized by the Association of Petroleum Geologists of India, in cooperation with ECE, as part of Geo-India 2015, in New Delhi, 11–14 January 2015. Some 50 participants largely from the petroleum sector attended. All were presented with a certificate of participation at the close of the event.

103. Projects and planned events in 2015 and 2016 to promote and/or test UNFC-2009 were then discussed, including:

(a) China-Ukraine Workshop on Resource Classification: Status, Mapping and Application, Beijing, China, 3–5 June 2015;

(b) IAEA and ECE Regional Training Course on “UNFC-2009 for Evaluation of Uranium and Thorium Resources and to Leverage Transparent and Effective Communications”, Luxor, Egypt, 18–22 October 2015. The event is being organized by the Nuclear Materials Authority of Egypt, with some 40 participants anticipated.

104. The Chair noted that many requests and proposals have been received to organize workshops and/or provide training/capacity building on UNFC-2009 in relation to potential implementation, including from Azerbaijan, Colombia, Cuba, Tajikistan, Thailand, the former Yugoslav Republic of Macedonia and Venezuela.

105. Mr. XIE Kechang from the International Knowledge Centre for Engineering Sciences and Technology (IKCEST), which operates under the auspices of the United Nations Educational, Scientific and Cultural Organization (UNESCO), presented on IKCEST's Idea and Vision of Knowledge Resources Convergence in relation to China's energy sector. A key focus of IKCEST is to provide support to developing nations.

106. The Expert Group agreed that an educational and training session on UNFC-2009 should be organized on the first day of the seventh session of the Expert Group.

**XX. Resourcing Strategy for the Expert Group on Resource Classification (agenda item 18)**

107. Mr. Sigurd Heiberg, Petronavit a.s. delivered a presentation that addressed the application of UNFC-2009 to improve the performance of private public partnerships. He pointed out the importance of integrative dynamic capabilities in government and industry to shape industrial ecosystems in which efficient activities could thrive. Application of the

<sup>4</sup> <http://www.unece.org/index.php?id=37192>.

<sup>5</sup> <http://www.unece.org/index.php?id=36626>.

four purposes of UNFC-2009 was emphasized: policy formulation, Government resource management, industrial business processes and capital allocation.

108. The Chair provided an overview of the need for extrabudgetary funding to support the work on UNFC-2009 going forwards, noting the challenges and opportunities. The development, promotion of and capacity building on UNFC-2009 is dependent upon very significant voluntary contributions from experts globally (including man-hours, travel, expertise, and sponsorship of events) and this cannot continue in the longer term without additional administrative support from the ECE secretariat and travel support to the volunteers. The intent is, however not to replace the voluntary contributions but to supplement them with any extrabudgetary funds. It was emphasized that having a voluntary nature helps to ensure the needed degree of independence for the work.

109. During the discussions it was proposed to prepare a benefit review plan, including how the work offers tangible benefits to society.

110. The Expert Group requested that the Bureau develops and executes a resourcing strategy together with an estimated funding requirement, identifies potential donors and approaches them for support. Updates should be provided to the Expert Group during the year and a report at its seventh session.

## **XXI. Update on financial reporting (agenda item 19)**

111. An update on financial reporting was provided, including amendments to the Canadian National Instrument (NI) 51-101.

112. The Expert Group requested the Bureau to continue to monitor developments related to financial analyses and capital allocation and to update the seventh session accordingly.

## **XXII. Work plan for 2016–2017 (agenda item 20)**

*Documentation:* EGRC-6/2015/INF.2 – Unofficial room document: Draft Work Plan for the Expert Group on Resource Classification for 2016–2017 dated 14 April 2015

113. The Expert Group noted that the Committee on Sustainable Energy at its twenty-third meeting in November 2014 endorsed the extension of the Expert Group's Work Plan for 2013–2014 to the end of 2015 and that this was subsequently approved by the Executive Committee of ECE at its seventy-fifth meeting.

114. The Expert Group reviewed and discussed its draft Work Plan for 2016–2017.

115. The Expert Group recommended that the draft Work Plan for 2016–2017 as contained in the Annex be submitted to the Committee on Sustainable Energy for endorsement and to the Executive Committee for subsequent approval.

## **XXIII. Other business (agenda item 21)**

116. Following discussion and careful review and in the light of the expanded scope of application of UNFC-2009, the Expert Group agreed that its seventh session needs to be held over four days, including an educational and training session on UNFC-2009, but with the option for the total number of days to be reduced subject to the agenda items required. The proposed dates for the seventh session are 26 to 29 April 2016.

117. No other issues were raised.

**XXIV. Adoption of conclusions and recommendations  
(agenda item 22)**

*Documentation:* EGRC-6/2015/INF.1 – Unofficial room document: Draft Conclusions and Recommendations for the Expert Group on Resource Classification Sixth Session *dated 15 April 2015*

118. The conclusions and recommendations were adopted and are included under the relevant agenda items.

**XXV. Adoption of the report and close of the meeting  
(agenda item 23)**

119. The report of the meeting was adopted subject to any necessary editing and formatting. The report will be posted to the ECE website.

## Annex

### Expert Group on Resource Classification Work Plan for 2016–2017<sup>6</sup>

1. Annex II of the Executive Committee decision on matters related to the Committee on Sustainable Energy (ECE/EX/7) mandates the Expert Group on Resource Classification (the Expert Group) to carry out concrete results-oriented activities related to the classification of energy and mineral reserves and resources.
2. According to its Terms of Reference, the Expert Group will concentrate on the promotion, application, maintenance and further development of the United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 (UNFC-2009).
3. The mandate for the Expert Group is approved until December 2019.

#### I. Concrete activities

4. The Group of Experts proposes to undertake the following activities:

##### (a) UNFC-2009 and the Specifications for its Application

**Description:** The Expert Group will ensure testing, review, ongoing maintenance and periodic updating of UNFC-2009 and the generic specifications for its application. The Expert Group should be open to the exploration and development of other applications of UNFC-2009.

**Work to be undertaken:** The Expert Group will review UNFC-2009 and the Specifications for its Application and start collating any additions, modifications and updates that may be identified. The Bureau of the Expert Group, in cooperation with the Technical Advisory Group, will work on this issue between annual sessions. The work will be conducted in close cooperation with all UNFC-2009 stakeholders, in particular, CRIRSCO and SPE in order to ensure that the three-way alignment between UNFC-2009, the CRIRSCO Template and PRMS is maintained. Case studies will be sought to demonstrate that UNFC-2009 meets the needs of the four principal applications for which it has been designed (international energy and mineral policy formulation; Government resource management; industry business process management; and financial analyses and capital allocation). The Expert Group will encourage stakeholders to carry out cross-mapping with other systems. Ideally, this would include government to government mapping, mapping to commercial systems, and testing of the bridging documents to the CRIRSCO Template, PRMS and the NEA/IAEA Uranium Classification (“Red Book”). Upon request, the Expert Group will explore and develop other applications of UNFC-2009, provided such work does not compromise the Expert Group’s ability to fulfil its other obligations.

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<sup>6</sup> This is the Work Plan for 2016–2017 as recommended by the Expert Group on Resource Classification at its Sixth Session.

**Deliverables:**

- (i) Collated list of issues for a future update of UNFC-2009 incorporating Specifications for its Application and an overview of possible additions and/or modifications for consideration by the Expert Group;
- (ii) Case studies demonstrating how a UNFC-2009 inventory is built, and how it may be used for: international energy and mineral policy formulation; Government resource management; industry business process management; and, financial analyses and capital allocation;
- (iii) Updated mapping of UNFC-2009 to the petroleum classification of the Russian Federation of 2013 and a draft bridging document for review;
- (iv) Assistance provided to the relevant Chinese authorities in the development of mapping and bridging documents between UNFC-2009 and the Chinese Mineral Reserves and Resources Classification System (CMRRCS) and the Chinese Petroleum Reserves and Resources Classification System.

**Timeline:**

- (i) Outline of possible modifications to UNFC-2009: April 2016;
- (ii) Series of case studies subject to resource availability: April 2016 to ongoing;
- (iii) Mapping of UNFC-2009 to the petroleum classification system of the Russian Federation of 2013 and a draft bridging document: April 2016, revised draft April 2017.
- (iv) Update of the status of relevant mapping and bridging documents, including to the Chinese petroleum and mineral classification systems: April 2016, revised drafts April 2017.

**(b) Governance of UNFC-2009**

**Description:** The Expert Group, including through its Bureau and Technical Advisory Group, will provide assistance and advice on how to interpret, apply and/or map, or bridge, to UNFC-2009 as and when requested, as well as to compile and analyze the results of such initiatives.

**Work to be undertaken:**

- (i) The Technical Advisory Group will perform in accordance with its terms of reference outlined in document ECE/ENERGY/GE.3/2013/5. The Bureau will review the terms of reference on an ongoing basis and should any modifications be proposed they would be submitted to the Expert Group for consideration.
- (ii) The Bureau will review and prepare a guidance note on the application and use of the G-axis name, category definitions and supporting explanations in the light of its expanded use by the renewables sector.
- (iii) The Bureau will review and prepare a guidance note on the need for and responsibilities of a Competent Person or Persons with regard to UNFC-2009.
- (iv) The Bureau will review and prepare a guidance note on the definition of a project in relation to UNFC-2009.

**Deliverables:**

- (i) Report of the work of the Bureau submitted annually to the Expert Group.
- (ii) White papers and/or guidance related to the application and use of the G axis, Competent Person, and the definition of project all in the context of UNFC-2009 submitted to the Expert Group for review and publication on the ECE website.

**Timeline:**

- (i) Annual report of the Technical Advisory Group to the Expert Group Seventh Session: April 2016;
- (ii) Annual report of the Technical Advisory Group to the Expert Group Eighth Session: April 2017;
- (iii) White papers and guidance related to the application and use of the G axis, Competent Person, and the definition of project, all in the context of UNFC-2009: March 2016.

**(c) Application of UNFC-2009 to renewable energy resources**

**Description:** The Expert Group through its ad hoc Task Force on Application of UNFC-2009 to Renewable Energy Resources will develop documentation that will allow UNFC-2009 to be applied to renewable energy resources. The work will be conducted in cooperation with other relevant stakeholders and international organizations and will respect the Memorandum of Understanding between ECE and the International Geothermal Association.

**Work to be undertaken:**

- (i) Update the draft generic specifications for the application of UNFC-2009 to renewables;
- (ii) Develop specifications for the application of UNFC-2009 to bioenergy;
- (iii) Develop specifications for the application of UNFC-2009 to geothermal;
- (iv) Develop specifications for the application of UNFC-2009 to hydro, solar and wind;
- (v) Develop guidelines and case studies for the application of UNFC-2009 to renewables.

**Deliverables:**

- (i) Documentation that allows UNFC-2009 to be applied to renewable energy resources, including generic specifications, commodity-specific specifications and guidelines. All documentation to be subject to review by the Expert Group and submitted for public comment;
- (ii) A series of case studies on application of UNFC-2009 to bioenergy, geothermal, hydro, solar and wind.

**Timeline:**

- (i) Presentation of revised generic specifications for the application of UNFC-2009 to renewables to the Expert Group (revisions to the generic specifications will become apparent as the work on the commodity-specific specifications progresses): April 2016 and April 2017;
- (ii) Presentation of the draft specifications for the application of UNFC-2009 to geothermal to the Expert Group: April 2016, final draft text April 2017;

- (iii) Presentation of the draft specifications for the application of UNFC-2009 to bioenergy: April 2017, final draft text April 2018;
- (iv) Presentation of the draft specifications for the application of UNFC-2009 to hydro, solar and wind: April 2018 subject to resource availability;
- (v) Guidelines and case studies for the application of UNFC-2009 to renewables: as from April 2016 to ongoing.

**(d) Accommodating environmental and social considerations in UNFC-2009**

**Description:** The Expert Group through its Socio-Economic (E-Axis) Sub-Group will develop guidance on accommodating environmental and social considerations in UNFC-2009 and the Generic Specifications for its Application.

**Work to be undertaken:** The Socio-Economic (E-Axis) Sub-Group will work according to the Terms of Reference recommended by the Expert Group at its sixth session (EGRC-6/2015/INF.7 dated 13 April 2015). The work will be conducted in cooperation with as wide a range of UNFC-2009 stakeholders as possible. The Sub-Group will report to the Bureau of the Expert Group between annual sessions of the Expert Group.

**Deliverables:** Guidance on assessing the environmental and social considerations for the classification of resources according to UNFC-2009. This is expected to include and provide, but is not limited to: a list and definitions of the E-axis classification factors as identified in UNFC-2009; guidance for the E-axis factors which should revolve around high-level principles; and, a recommendation on the extent to which more detailed guidance is required.

**Timeline:**

- (i) Presentation of draft guidance on accommodating environmental and social considerations in UNFC-2009 and the Specifications for its Application to the Expert Group: April 2016, final draft text April 2017;
- (ii) Presentation of a recommendation on the need, if any, for more detailed guidance: April 2017 to ongoing.

**(e) Education and outreach**

**Description:** The Expert Group through its ad hoc Communications Sub-Committee (Terms of Reference for the Communications Sub-Committee contained in Annex I to ECE/ENERGY/GE.3/2014/6) will implement the agreed education and outreach strategy. The Expert Group will develop education programmes on UNFC-2009 using, in particular, the capabilities of industry professional societies and associations.

**Work to be undertaken:**

- (i) Organize national and regional workshops on UNFC-2009;
- (ii) Finalize and keep updated the standard presentations on UNFC-2009;
- (iii) Implement the education and outreach strategy;
- (iv) Develop an application tool for UNFC-2009.

**Deliverables:** A report of the education and outreach activities to be delivered annually to the Expert Group. Development and maintenance of standard presentations on UNFC-2009. Training and capacity-building events on UNFC-2009 organized globally. An electronic application tool to facilitate use and understanding of UNFC-2009 developed.

**Timeline:**

- (i) Annual reports of the Communications Sub-Committee presented to the Expert Group: April 2016 and April 2017;
- (ii) Standard presentations on UNFC-2009 posted to the ECE website: March 2016 to ongoing;
- (ii) National and regional workshops: ongoing;
- (iii) Draft UNFC-2009 application tool: April 2017.

**(f) Use of UNFC-2009 in classifying injection projects**

**Description:** The Expert Group through its ad hoc Task Force on Application of UNFC-2009 to Injection Projects will develop documentation that will allow UNFC-2009 to classify injection projects (e.g., storage of carbon dioxide, natural gas storage or other fluid waste disposal projects).

**Work to be undertaken:** Continue work to investigate how, for example, oil and gas companies classify and evaluate the maturity of their gas injection projects today, and propose a draft set of specifications.

**Deliverables:** Specifications for the application of UNFC-2009 to injection projects for the purpose of geological storage, which are to be issued for public comment. Guidelines for application and case studies are also required.

**Timeline:**

- (i) Draft specifications for the application of UNFC-2009 to injection projects for the purpose of geological storage: April 2016, final draft specifications: April 2017;
- (ii) Guidelines and case studies: April 2017 to ongoing.

**(g) Application of UNFC-2009 to nuclear fuel resources**

**Description:** Classification of nuclear fuel resources is currently undertaken according to the NEA/IAEA “Red Book” uranium classification system. The “Red Book” is now aligned with UNFC-2009 through a Bridging Document (ECE/ENERGY/2014/6). Guidelines and case studies are needed to assist with the application of UNFC-2009 for the classification of identified and predicted resources of uranium and thorium.

**Work to be undertaken:** The Expert Group through its ad hoc Task Force on Application of UNFC-2009 to Nuclear Fuel Resources will produce a handbook of good practices for uranium and thorium resource management by compiling and evaluating a set of assumptions (including moderating factors such as use efficiency and rates of leakage or loss) as aligned to the UNFC-2009 E, F, and G axes, to the key milestones of typical mining and processing projects, and taking into consideration social and environmental factors, on the basis of which resource estimates are generated and evaluated, especially in the exploration stages.

**Deliverables:** Handbook of good practices for uranium and thorium resource management and case studies on application of UNFC-2009 to uranium and thorium projects submitted for consideration by the Expert Group.

**Timeline:**

- (i) Case studies on the application of UNFC-2009 for the classification of identified and predicted resources of uranium and thorium: April 2016 to ongoing;

- (ii) Proposed modifications to the UNFC-2009 and “Red Book” Bridging Document: April 2017 to ongoing;
- (iii) Handbook of good practices for application of UNFC-2009 for uranium and thorium resource management: April 2018.

**(h) Financial reporting**

**Description:** UNFC-2009 has been designed to meet, to the extent possible, the needs of all applications pertaining to financial reporting standards, particularly those promulgated by the International Accounting Standards Board (IASB).

**Work to be undertaken:** The Bureau of the Expert Group will monitor relevant developments in financial reporting globally that might have an impact on reserves and resources.

**Deliverables:** Annual status report submitted to the Expert Group on any changes or developments in the financial reporting sector globally with implications or potential implications for UNFC-2009.

**Timeline:** Status report on financial reporting issues of relevance to reserves and resources submitted to the Expert Group annually: April 2016 and April 2017.

**(i) Resourcing Strategy**

**Description:** Development, promotion of and capacity building on UNFC-2009 is dependent upon significant voluntary contributions (man-hours, travel, expertise, sponsorship) and it cannot be expected that this can continue in the longer term.

**Work to be undertaken:** The Bureau of the Expert Group will develop a resourcing strategy together with an estimated funding requirement, identify potential donors and approach them for support.

**Deliverables:** Report and update to the Expert Group at its Seventh Session: April 2016.

**Timeline:** Update provided to the Expert Group on the development of a resourcing strategy for promotion and further development of UNFC-2009: April 2016.

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