



Application of UNFC for Resource Management

2018

17 – 18 October 2018

Stavanger, Norway

Introduction

When resource classification was first introduced in London in the early 20th century, it was a tool for the scientifically minded geologist. The emphasis was on distinguishing between observed quantities, interpolated quantities and extrapolated quantities - a discipline enforced on field geologists to this date. The result was naturally a classification of rocks in the ground. They were called proved, probable and possible quantities. We find the same basic concept in the classifications developed in the western and in the eastern hemispheres.

At the time, there was no need to have a common global classification. Those were the days when there was no correlation between the Boston and Chicago stock exchanges. A classification developed locally would do, and a large number of slightly different ones emerged.

The world has evolved. The Boston and Chicago stock exchanges no longer exist. The New York Stock Exchange has taken over and reacts to movements on the Asian stock exchanges within seconds.

At the time of the energy crisis in the 1970's classifications changed direction by accepting the criteria of economic recoverability. This was promoted by the USGS in the 1950s to become known as the McKelvey Box, named after its director.

In the 1990's another fundamental change occurred when the classifications were aligned with the value chains commonly used, particularly in the European petroleum industry. Eventually this was promoted by both the Society of Petroleum Engineers (SPE) and the World Petroleum Congress (now the World Petroleum Council) as their petroleum resource classification in 2000. This was elaborated to become the Petroleum Resource Management System (PRMS) as we know it today. In minerals, the value chain was expanded by explicitly adding consideration of economic and social conditions to the industrial value chain in an effort that started in Germany and Austria in classifying coal. The United Nations promoted this as its UN Framework Classification (UNFC). The first version appeared in 1997, the second, expanded to petroleum and minerals in 2004 and revised in 2009. In the same period, the mineral industry developed its reporting codes to include considerations of recoverability, economic, social and industrial readiness aimed particularly for stock exchange reporting. We know them as classifications made on the basis of the CRIRSCO template.

In this course, we focus on the application of the UNFC. It has become a classification of "what we get" as opposed to a classification of "what we found" where it all started in the early 1900. As such, it is no longer a classification of geological resources, but rather of the projects producing sales and non-sales products from them – and it need not be only from geological resources. It works as well for other products produced by investments. We are therefore witnessing a further development of the UNFC to renewable energy resources, underground storage projects and anthropogenic resources. Water may follow.

The UNFC links classification closely with resource management. Resource management is the object of the course offered by PETRAD. Candidates are encouraged to examine both and join both to the extent that they are interested in going deeper into this essential subject area.

Objective

Application of the UNFC is still a young professional activity and the call for training has been rising quickly.

The objectives of this course are:

1. Provide an understanding of the basic structure of the UNFC
2. To familiarise participants with the four principal areas of application, namely:
 - a. Policy formulation
 - b. Government resource management

- c. Industry business process management
 - d. Capital allocation
3. Illustrate the above with case studies

Target Audience

The target group for this course are geoscientist, engineers, economists, lawyers, analysts and communications/investor relation experts involved in:

- Policy development
- Government resource management
- Industry business process management
- Capital allocation and financial reporting

Pedagogical Approach

PETRAD believes that the best pedagogical learning approach is a combination of presentations, discussions, problem-based learning and team based learning. In this brief course, the sessions will consist of two lectures, each of 20 minutes followed by 20 minutes of discussion. Participants are encouraged to familiarising themselves with the UNFC before arriving at the course, and to submit topics that they are particularly interested in including in the discussion sections to the organisers on or before the 16th of February.

UNFC references are found here:

- <http://www.unece.org/energy/se/reserves.html>
- <https://www.unece.org/index.php?id=45992>

Program Schedule

Day 1

11:30 Registration and lunch

13:00 Welcome and introduction (Per Blystad)

Classification background (Sigurd Heiberg)

UNFC explained (Per Blystad)

Discussion

14:15 – 14:30 Coffee break

UNFC basics - Continued

Quality assurance, aggregation, accounting and disclosure (Sigurd Heiberg)

Relationship between the UNFC and classifications bridged to it (Per Blystad)

Discussion

15:30 - 15:45 Coffee Break

UNFC Applied

Applications in Policy formulation (Sigurd Heiberg)

Applications in Government Resources management (Per Blystad)

Discussion

16:45 - 17:00 Coffee Break

Applications in corporate business process management (Sigurd Heiberg)

Financial reporting and capital allocation challenges (Sigurd Heiberg)

Discussion

18:00: End of Day 1

19:00: Dinner

Day 2

9:00 Plenary session continued

Application to renewable energy (Gioia Falcone)

Application to geothermal energy (Gioia Falcone)

Discussion

10:00 – 10:15 Coffee break

Two working groups: Energy session and Raw Material session

Energy session

Raw Materials session

		Lecturers		Lecturers
10:15	Application to CCS	Karin Ask	UNECE Case 1	Janne Hokka
10:35	Case study: CCS			
10:55	Exercise			
11:15 Coffee or tea				
11:30	Case study: A petroelum field	tba	UNECE Case 2	Janne Hokka
11:50				
12:10	Exercise		Exercise	
12:30 Lunch				
13:30	Case study: The NCS	Per Blystad / Sigurd Heiberg	UNECE Case 3	Janne Hokka
13:50				
14:10	Exercise		Exercise	
14:30 Coffee or tea				
14:45	Case Study: Geothermal energy	Gioia Falcone	Nordic case	tba
15:05				
15:25	Exercise		Exercise	
15:45	Summary and evaluation		Summary and evaluation	
16:00 End of the course				

Venue

PETRAD, Professor Hanssens vei 10, Stavanger

Application details

Fee NOK 7 500 per person including two lunches, coffee, tea, dinner on the 17th of October and a one night stay at Ydalir Hotel from the 17th to the 18th of October.

Participants who wish to stay longer are encouraged to contact the hotel directly.

Participants are responsible to make their own travel arrangements to and from the venue.

Applications should be sent to PETRAD at training@petrad.no before the 21st of September. Admission will be announced on or before the 25th of September

Contact details

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Lecturers



Sigurd Heiberg

Project Director

Sigurd holds a BSc from the University of California and a SM degree in Geotechnology from the Massachusetts Institute of Technology. He has received formal management training at IMD, Switzerland on international management and High Performance Boards. Sigurd has spent most of his working life in Government and industry working on petroleum resources management and strategy, both as Deputy director of resource management responsible for development and production at the Norwegian Petroleum Directorate, as Petroleum exploration advisor to the Minister of Water, Energy and Minerals of Tanzania and as a member of Statoil's Corporate strategy team. He chaired the Oil and gas reserves committee of the Society of Petroleum Engineers when the SPE Resource classification that later became the SPE-PRMS was developed and the UNECE Expert group on resource classification when the UNFC-2009 classification was developed. He has also chaired the Bureau of the UNECE Intergovernmental Committee on Sustainable Energy. Sigurd has engaged in education by helping to form and build PETRAD. He has been a lecturer at the MIT Sloan Executive Education and at the University of Stavanger. He has been guest editor with MIT Professor Donald Roy Lessard of "Innovation in oil and gas through partnering", Elsevier's Volume 3 of Energy Strategy Reviews. He joined PETRAD as a Project Director in 2017.



Per Blystad

Per holds a Cand. Real (PhD) in geology from University of Bergen. After a few years working in a cross-disciplinary project connected to a huge hydro-electric development project in the south-western mountain area in Norway, the Ulla-Førre Investigations, he joined the Norwegian Petroleum Directorate (NPD) for more than 30 years working on petroleum resource management and project management. His working experience includes exploration and licensing, annual reporting to government from companies in relation to the revised annual national budget, resource assessments and methodology development of yet-to-find potential of petroleum on the Norwegian continental shelf. For six years Per coordinated the international project in NPD aiming at assisting countries in Asia and Africa to develop national petroleum resource management systems and capacities. After this Per was seconded as project coordinator in CCOP for two years in a project on Resource Evaluation and Planning. Per has been engaged in developing NPD's petroleum resource classification system. In 2001 he joined the UNECE Expert group on resource classification (EGRC). He was member of the Bureau and chaired the Petroleum group until 2004. He later chaired the EGRC Mapping Task Force prior to and necessary for developing the UNFC-2009 classification. He is member of the EGRC.



Janne Hokka

Janne holds MSc in economic geology from University of Helsinki. He has over 8 years of experience in different exploration and mining projects. He has also gained field experience as an exploration geologist in Australia in copper and uranium exploration and mining projects. He is accomplished in field exploration management, logging, soil sampling, QA/QC planning and monitoring, bedrock mapping, lithogeochemistry, database construction, 3D modelling and resources estimations. Currently he is working in Geological Survey of Finland specialising in the evaluation of Mineral Resources from early-stage exploration through to production. Janne focuses on Mineral Resource estimation and preparation of technical reports in accordance with international reporting guidelines, resource auditing and training programs predominantly for mafic-ultramafic related ore systems (Ni-Cu, Fe-Ti-V), but he also has experience in precious metals and uranium. He has been part of the Nordic Group preparing the Guidance for the Application of the UNFC-2009 for Mineral Resources in Finland, Norway and Sweden and he is the UNFC contact person in Geological Survey of Finland.



Prof. Gioia Falcone

Gioia Falcone is currently Rankine Chair, Professor of Energy Engineering at the University of Glasgow. Until June 2018, she was Professor and Head of the Geo-Energy Engineering Centre (formerly Oil & Gas Engineering Centre) at Cranfield University. Between 2011 and early 2016, she held the Endowed Chair and Professorship in Geothermal Energy Systems at Clausthal University of Technology, Germany, where she was also the Director of the Institute of Petroleum Engineering. Prior to joining academia, she worked with Eni-Agip, Enterprise Oil UK, Shell E&P UK and Total E&P UK, covering both

offshore and onshore assignments.

Gioia has served on several expert review panels, as technical editor/reviewer for several peer-review journals, and as member of several program committees of technical conferences around the world. She is one of the 23 members of the United Nations Economic Commission for Europe (UNECE) Bureau of the Expert Group on Resource Classification, and of its Renewable Reserves Working Group. She has led the development of the Specifications for the application of the UNFC to Geothermal Energy Resource. Karin



Karin Ask

Karin Ask is currently the Corporate Reserves Manager of the Norwegian Oil and gas company Equinor (previously Statoil), a position she has held since 2008. She has a bachelor degree in geology from Gothenburg University and a master of science degree in Petroleum Exploitation from Chalmers University of

Technology in Sweden. She has more than 30 years' experience from the oil and gas industry. Karin has been a member of the UNECE Expert Group on Resource Classification since 2008, as a Vice Chair of the Bureau until 2017 and as Chair of the Task Force for application of the UNFC to Injection Projects for the Purpose of Geological Storage. She is currently a member of the Technical Advisory Group (TAG).