Overview of UNFC for Mineral Reserves & Resources and Status of UNFC Studies in Turkey

Mücella ERSOY, Turkish Coal Enterprises
EXPERT GROUP ON RESOURCE CLASSIFICATION

International UNFC(2009) Workshop
29-30 Sept 2011, Ankara
• **Development and Application of First Version UNFC(1997) – Solid Fuels and Mineral Commodities**
  – Testing of First Version for TKI owned lignite deposits
  – Participation of Turkey in Expert Group of Resources Classification
  – Organising joint UNECE-Turkey Seminar at MTA, Turkey
  – Preparing Case Study: Yatagan – Eshisar Mining Area, Turkey

• **Development and Application of UNFC(2004) – Coal, Uranium and Other Minerals**
  – Updating Case Study reflecting changes

• **Mapping of UNFC to the other Systems for Mineral-CRIRSCO Template**
  – Participating in Mapping study

• **UNFC(2009) for Fossil Energy and Mineral Reserves and Resources**
  – Participating in development studies of UNFC(2009)
  – Organising joint UNECE-Turkey Workshop in Ankara, 2011
**INTRODUCTION - Objective of UNFC**

*UNFC designed as an umbrella system which is a universally acceptable and internationally applicable scheme*

- for the classification and reporting of fossil energy and mineral reserves and resources
- currently the only classification in the world to do so.
INTRODUCTION-
Principal Applications of UNFC

- improve efficiency in governments’ resource management
- improve in the international comparability of energy statistics
- corporate industry’s business processes
- facilitate international financial reporting
Consultations were held with >50 countries & organisations.

UNFC (1992-1996) - First Version (R70)
(Solid Fuels and Mineral Commodities)
**Classification Criteria**

- **E**: Economic Viability
- **F**: Feasibility Assessment
- **G**: Geological Assessment

3 Dimensional

Only for Solid Fuels & Mineral Commodities

36 possible classes were available in total but 8 of them were used often

### Economic Viability
- E1: Economic
- E2: Potentially Economic
- E3: Intrinsically Economic

### Feasibility Assessment
- F1: Feasibility Study &/or Mining report
- F2: Prefeasibility Study
- F3: Geological Study

### Geological Assessment
- G1: Detailed exploration
- G2: General Exploration
- G3: Prospecting
- G4: Reconnaissance
- **Codification**

- in the order of

- **EFG**
UN International Framework Classification for Reserves/Resources—Solid Fuels and Mineral Commodities was adapted by UNECOSOC in 1997 and recommended for worldwide application (ECOSOC Decision 226/1997).

1997: Publishing The First version (R70)

1997-2001: Trial Period

1999: UNECE/CMMI Agreement

- Tested & applied in >50 countries worldwide, a number of them introduced the UNFC for Solid Fuels and Mineral commodities as a national system, & others adapted their national systems to the UNFC principles
TRIAL PERIOD: Testing & Application of UNFC (1997) for coal deposits

- Tested & applied in >50 countries worldwide, a number of them introduced the UNFC for Solid Fuels and Mineral commodities as a national system, & others adapted their national systems to the UNFC principles

Europe
- Austria, Bulgaria, Estonia, Germany, Greece, Hungary, Lithuania, Poland, Romania, Russia, Slovenia, Slovakia, Spain, Turkey, Ukraine

Asia-Pacific
- Armenia, China, Cambodia, India, Iran, Indonesia, Kazakhstan, Malaysia, Philippines, Thailand,

America
- Brazil, USA

Africa
- Zimbabwe
The UNFC(1997) for Solid Fuels and Mineral Commodities-
TRIAL PERIOD

- Adaptation of country’s national systems to UNFC principles and implementation were conducted by mainly:
  - individual mining companies from industry
  - government organisations such as:
    - Ministries of Natural Resources
    - National Geological Surveys
  - Technical Universities, Institutes, Bureaus on mining and geology

- National Classification System

<table>
<thead>
<tr>
<th></th>
<th>IDENTIFIED</th>
<th>UNDISCOVERED</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Proved</td>
<td>Probable</td>
</tr>
<tr>
<td></td>
<td>6.976 Bt</td>
<td>0.871 Bt</td>
</tr>
<tr>
<td>RESERVE</td>
<td>7.95 Billion ton</td>
<td></td>
</tr>
<tr>
<td>POTENTIAL</td>
<td>307.8 Million ton</td>
<td></td>
</tr>
</tbody>
</table>

TOTAL: 8.3 Billion Ton

Source: Ersoy, M, 2001

### Turkey: Lignite Deposits

**June 2002**

<table>
<thead>
<tr>
<th>Total Resource</th>
<th>Definitions</th>
<th>Code</th>
<th>$10^6$ t</th>
<th>$10^6$ toe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reserve</td>
<td>Economically extractable quantity, appropriately assessed</td>
<td>111</td>
<td>5784</td>
<td>891</td>
</tr>
<tr>
<td></td>
<td></td>
<td>121</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>122</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Potentially economically extractable quantity, appropriately assessed</td>
<td>211</td>
<td>377</td>
<td>72</td>
</tr>
<tr>
<td></td>
<td>which is currently not economic but may possibly be so in future</td>
<td>221</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>222</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Remaining/</td>
<td>Intrinsically economic in-situ quantity with future economic prospect</td>
<td>331</td>
<td>334</td>
<td>64</td>
</tr>
<tr>
<td>Additional</td>
<td>pending appropriate assessment</td>
<td>332</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Resources</td>
<td></td>
<td>333</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>334</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td><strong>Unevaluated Remaining Resources</strong></td>
<td></td>
<td>1776</td>
<td>336</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
The UNFC(1997) for Solid Fuels and Mineral Commodities - TRIAL PERIOD - Organized Seminars

1998
ESCAP/ECE (Bangkok)
(Cambodia, China, Indonesia, Japan, Malaysia, Philippines, Thailand, Vietnam)

1999
Indonesia
Brazil (for Latin America)

2000
Bulgaria
India Ocean Rim Countries

2001
Philippines (ESCAP)

2002
Turkey

2003
Russian Fed. & CIS Countries
Austria (OPEC)

2004
Lebanon
UNECE-TURKEY JOINT SEMINAR, MTA, 2002

Subjects Discussed at the Seminar

• Historical Background of UNFC
• Principles and advantages of UNFC for evaluation of reserves/resources under market conditions
• National Classification System
• Case study (Turkey)
  – A proposal for adaptation of the National System to UNFC
  – Practical application of UNFC to Turkish Lignite Deposits
  – Handicaps faced during applying UNFC to lignite deposits
  – Comparison of terminologies used at both systems
  – Discussion of local experts about implementation of UNFC and adaptation National Classification System to UNFC
A Proposal for Turkish Terminologies

Source: Ersoy, M., 2002, UNECE-Turkey Joint Seminar, MTA, Ankara
### Summary of Results of Seminar - A proposal for Adaptation of National System to UNFC (1997)

#### UN Framework Classification

<table>
<thead>
<tr>
<th>Ulusal Sistem</th>
<th>Detail Exploration/ Exploration During Exploitation</th>
<th>General Exploration</th>
<th>Prospecting</th>
<th>Reconnaissance</th>
</tr>
</thead>
</table>

#### Feasibility Study and/or Mining Report

<table>
<thead>
<tr>
<th></th>
<th>Ekonomic Viability</th>
<th>Categories:</th>
<th>Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Ekonomic</td>
<td>(111)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>Potentially Ekonomic</td>
<td>(112)</td>
<td></td>
</tr>
</tbody>
</table>

#### Prefeasibility Study

<table>
<thead>
<tr>
<th></th>
<th>Ön Fizibilite Çalışması ve/veya Madencilik</th>
<th>Ekonomic Viability</th>
<th>Categories:</th>
<th>Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(121)</td>
<td>1-2: Ekonomic to Potentially Ekonomic (Intrinsically Ekonomic)</td>
<td>(332)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(221)</td>
<td>not relevant</td>
<td>(333)</td>
<td></td>
</tr>
</tbody>
</table>

#### Geolojik Study

<table>
<thead>
<tr>
<th></th>
<th>Jeolojik Rapor</th>
<th>Ekonomic Viability</th>
<th>Categories:</th>
<th>Code:</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>(1-2)</td>
<td>1: Ekonomic</td>
<td>(331)</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>(2-3)</td>
<td>2: Potentially Ekonomic</td>
<td>(332)</td>
<td></td>
</tr>
<tr>
<td>?</td>
<td>(333)</td>
<td>? : Undetermined</td>
<td>(334)</td>
<td></td>
</tr>
</tbody>
</table>

**Source**: Ersoy, M, 2002, “Results of Seminar on UNFC held in Turkey”, Geneva
The UNFC(1997) for Solid Fuels and Mineral Commodities -
TRIAL PERIOD - Case Studies

- Brazil
- Bulgaria
- Canada
- China
- Finland
- Germany
- Greece
- Hungary
- India
- Indonesia
- Malasia
- Poland
- Portugal
- Romania
- Russia
- Slovakia
- Slovenia
- Turkey
- Ukraine
- USA
- Yugoslavia(Former)
CASE STUDY: Application of UNFC(1997) to Yatagan-Eskihisar Mining Area, TKI

Yatagan Mining Area:
- Eskihisar lignite deposit
- Y.Bagcilar lignite deposit
- Turgut lignite deposit

* in operation since 1979 with the capacity of 3,500,000 t/y

CASE STUDY: Application of UNFC (1997) to Yatagan-Eskihisar Mining Area, TKI

All deposits in The Yatagan Mining Area Evaluated Base on:

E: Economic Viability
F: Feasibility Assessment
G: Geological Assessment

## Classification of the Deposits According to Turkish Classification System in 2003

<table>
<thead>
<tr>
<th>OL*</th>
<th>Deposit</th>
<th>Proved</th>
<th>Probable</th>
<th>Possible</th>
<th>Developed</th>
<th>TOTAL</th>
</tr>
</thead>
<tbody>
<tr>
<td>7200</td>
<td>Eskihisar</td>
<td>36,918</td>
<td>-</td>
<td>-</td>
<td>404</td>
<td>37,322</td>
</tr>
<tr>
<td></td>
<td>Y.Bagcilar</td>
<td>8,107</td>
<td>(7,296)</td>
<td>-</td>
<td>-</td>
<td>8,107</td>
</tr>
<tr>
<td>3303</td>
<td>Turgut</td>
<td>1,327</td>
<td>(1,194)</td>
<td>-</td>
<td>-</td>
<td>1,327</td>
</tr>
<tr>
<td></td>
<td>Total (in operation)</td>
<td>46,352</td>
<td>(41,717)</td>
<td>-</td>
<td>404</td>
<td>46,756 (42,120)</td>
</tr>
<tr>
<td></td>
<td>Pillars**</td>
<td>8,266</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>8,266</td>
</tr>
<tr>
<td>Turgut-2</td>
<td>3303</td>
<td>4,222</td>
<td>(3,800)</td>
<td>-</td>
<td>-</td>
<td>4,222</td>
</tr>
<tr>
<td>TOTAL</td>
<td></td>
<td>58,840</td>
<td>(55,517)</td>
<td>404</td>
<td></td>
<td>59,244 (55,921)</td>
</tr>
</tbody>
</table>

* Operating Licence numbers
** Pillars left for ancient city, landslide and Milas highway
*** ( ) Extractable reserve

<table>
<thead>
<tr>
<th>UN FRAMEWORK CLASSIFICATION</th>
<th>Detail Exploration/ Exploration During Exploitation</th>
<th>General Exploration</th>
<th>Prospecting</th>
<th>Reconnaissance</th>
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</thead>
<tbody>
<tr>
<td>ULUSAL SISTEM</td>
<td>Detay Arama/ İşletme Dönemi Aramalar</td>
<td>Genel Arama</td>
<td>Prospeksiyon</td>
<td>Ön Arama</td>
</tr>
<tr>
<td>Feasibility Study and/or Mining Report</td>
<td>Fizibilite Çalışması ve/veya Madencilik Raporu</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 45,429 (111)*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>40,886 (111e)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 1,327 (211)**</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>3 8,266 (311)***</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Prefeasibility Study</td>
<td>Ön Fizibilite Çalışması</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>1 (121)</td>
<td>+(122)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Geologic Report</td>
<td>Jeolojik Rapor</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>(1-2) (331)</td>
<td>(1-2) (333)</td>
<td>(1-2) (334)</td>
<td></td>
</tr>
</tbody>
</table>

**Economic Viability Categories:**
1: Economic
2: Potentially Economic (Intrinsically Economic)

* Eskihisar and Y.Bagcilar Deposits
** Extractable reserve of Eskihisar and Y.Bagcilar deposits
*** Turgut Deposit
**** Pillars left for ancient city, landslide and Milas highway
***** Turgut-2 deposit

**CASE STUDY:** Yatagan-Eskihisar Mining Area

**Comparison of Classification Results**

<table>
<thead>
<tr>
<th>Deposit</th>
<th>NATIONAL SYSTEM</th>
<th>UNFC</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Term</td>
<td>Quantity (Mt)</td>
</tr>
<tr>
<td>Y.Eskihisar Mining Area</td>
<td>Proved Reserve</td>
<td>37.3</td>
</tr>
<tr>
<td>Eskihisar Deposit</td>
<td>Proved Reserve</td>
<td>8.1</td>
</tr>
<tr>
<td>Y.Bagcilar Deposit</td>
<td>Proved Reserve</td>
<td>1.3</td>
</tr>
<tr>
<td>Turgut Deposit</td>
<td>Proved Reserve</td>
<td>4.2</td>
</tr>
<tr>
<td>Pillars</td>
<td>Proved Reserve</td>
<td>8.3</td>
</tr>
<tr>
<td>Turgut-2 Deposit</td>
<td>Proved Reserve</td>
<td>4.2</td>
</tr>
</tbody>
</table>

**TOTAL RESERVE 59.2**

**TOTAL MINERAL RESOURCE 59.2**

**Total Extractable Reserve** 45.9 **Extractable Min. Reserve** 40.9

13.8 Mt difference in Proved Mineral Reserve

In 1998, the UNECE Task Force and CMMI Expert Group reached an agreement to integrate their respective definitions into a single, universally applicable set of definitions. The joint UN CMMI definitions for reserves/resources were completed in November 1999 (Document ENERGY/2000/11)
<table>
<thead>
<tr>
<th>CODE</th>
<th>CMMI CATEGORY</th>
<th>UN CATEGORY</th>
</tr>
</thead>
<tbody>
<tr>
<td>111</td>
<td>Proved Mineral Reserve</td>
<td>Proved Mineral Reserve</td>
</tr>
<tr>
<td>121 and 122</td>
<td>Probable Mineral Reserve</td>
<td>Probable Mineral Reserve</td>
</tr>
<tr>
<td>211</td>
<td>Measured Mineral Resource</td>
<td>Feasibility Mineral Resource</td>
</tr>
<tr>
<td>211 and 222</td>
<td>Indicated Mineral Resource</td>
<td>Prefeasibility Mineral Resource</td>
</tr>
<tr>
<td>332</td>
<td>Indicated Mineral Resource</td>
<td>Indicated Mineral Resource</td>
</tr>
<tr>
<td>333</td>
<td>Inferred Mineral Resource</td>
<td>Inferred Mineral Resource</td>
</tr>
<tr>
<td>334</td>
<td>Not Available</td>
<td>Reconnaissance Mineral Resource</td>
</tr>
</tbody>
</table>

Source: ENERGY/2000/11
The UNFC for Solid Fuels and Mineral Commodities
Joint UN/ CMMI Definitions (Geneva Accord)

UNFC (1997) for Solid Minerals

CMMI

additional classes at the UNFC (1997)
The UNECE Committee on Sustainable Energy decided to create an Intergovernmental Ad Hoc Group of Experts on the Harmonization of Energy Reserves/Resources Terminology (ECE/ENERGY/47, para. 13) to extend the principles of UNFC for Solid Fuels and Mineral Commodities to other energy resources (oil, natural gas and uranium).

The Ad Hoc Group of Experts was split into three groups: coal and minerals, petroleum and uranium.
Extension of the System:
UNFC for Energy & Mineral Resources

2001
Establishing Ad Hoc Group of Experts

2001-2004
Harmonization each commodity classification

2004
UNFC for Energy & Mineral Resources Document

- (UN/ CMMI for coal)
- SPE/ WPC/ AAPG for petroleum
- IAEA/ NEA for uranium

In addition to above organizations several national classification systems played important role in harmonization process including revised national classification system of Russia Fed., including also that of the Australian Joint Ore Reserves Committee (the JORC Code).
UNECSOC recommended an amendment to the 1997 UNFC incorporating petroleum (oil and gas) and uranium resources. This extended its application fully to fossil energy and mineral resources (UNECSOC resolution 233/2004).
UNFC(2004)-
Coal, Uranium and the Other Minerals

- Main Objective is to extend UNFC(1997)
  - Petroleum (Oil & Natural Gas) &
  - Uranium

- For UNFC(2004) “Petroleum” and “Coal, Uranium and Other Minerals” :
  - Two sets of definitions, one for Minerals and one for Petroleum

- Sub-category codes and definition

Coal, Uranium & Other Minerals

- After UN/CMMI agreement (1999), joint definitions for mineral reserve and resource classes have been frozen. (Joint UN/CMMI definitions for mineral reserve and resource classes (agreed upon in 1999) were replaced with the definitions in the R.70 Document-1997)
- UNFC (1997) for solid fuels and minerals were in application worldwide by about 50 countries since 1997)
- a comparison with the UNFC 1997(R70)

**R.70 (1997)**
- No sub-category codes

**UNFC version (2004)**
- for E1
  - E1.1 as needed
  - E1.2
  - E2.1
  - E2.2
- for F1
  - F1.1
  - F1.3

**e.g.** 1.1;1;1 → E1.1, F1 and G1

- **A Comparison with the UNFC Applied to Petroleum**

<table>
<thead>
<tr>
<th>Categories and Sub-Categories</th>
<th>2004 Coal, Uranium &amp; Other Solid Minerals</th>
<th>2004 Petroleum</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>E1 Economic</strong></td>
<td><strong>Economic</strong></td>
<td><strong>Economic</strong></td>
</tr>
<tr>
<td>E1.1 Normal Economic</td>
<td>Normal Economic</td>
<td></td>
</tr>
<tr>
<td>E1.2 Exceptional Economic</td>
<td>Exceptional Economic</td>
<td></td>
</tr>
<tr>
<td><strong>E2 Potentially Economic</strong></td>
<td><strong>Potentially Economic</strong></td>
<td></td>
</tr>
<tr>
<td>E2.1 Marginal Economic</td>
<td>Marginal Economic</td>
<td></td>
</tr>
<tr>
<td>E2.2 Sub-marginal Economic</td>
<td>Sub-marginal Economic</td>
<td></td>
</tr>
<tr>
<td><strong>E3 Intrinsically Economic</strong></td>
<td><strong>Intrinsically Economic</strong></td>
<td></td>
</tr>
<tr>
<td>E3.1 Not used</td>
<td>Non-sales</td>
<td></td>
</tr>
<tr>
<td>E3.2 Not used</td>
<td>Undetermined</td>
<td></td>
</tr>
<tr>
<td>E3.3 Not used</td>
<td>Unrecoverable</td>
<td></td>
</tr>
<tr>
<td><strong>F1 Mining Report &amp;/or Feasibility Study</strong></td>
<td>Justified Development &amp;/or Production Project</td>
<td></td>
</tr>
<tr>
<td>F1.1 Mining Report</td>
<td>Project in Production</td>
<td></td>
</tr>
<tr>
<td>F1.2 Not used</td>
<td>Committed Development Project</td>
<td></td>
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<td>F1.3 Feasibility Study</td>
<td>Uncommitted Development Project</td>
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<td><strong>F2 Pre-feasibility Study</strong></td>
<td>Contingent Development Project</td>
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<td>F2.1 Not used</td>
<td>Under Investigation</td>
<td></td>
</tr>
<tr>
<td>F2.2 Not used</td>
<td>Unclarified or On Hold</td>
<td></td>
</tr>
<tr>
<td>F2.3 Not used</td>
<td>Not Viable</td>
<td></td>
</tr>
<tr>
<td><strong>F3 Geological Study</strong></td>
<td>Project Undefined</td>
<td></td>
</tr>
<tr>
<td><strong>G1 Detailed Exploration</strong></td>
<td>Reasonably Assured Geological Conditions</td>
<td></td>
</tr>
<tr>
<td><strong>G2 General Exploration</strong></td>
<td>Estimated Geological Conditions</td>
<td></td>
</tr>
<tr>
<td><strong>G3 Prospecting</strong></td>
<td>Inferred Geological Conditions</td>
<td></td>
</tr>
<tr>
<td><strong>G4 Reconnaissance Study</strong></td>
<td>Potential Geological Conditions</td>
<td></td>
</tr>
</tbody>
</table>
• Minor changes have required
• For instance: sub-categories were used as

Turgut Deposit: \(2:1;1;1\) Feasible Mineral Resource

Mücella ERSOY, Nisan 2010
Mapping Task Force

2007

Establishing Mapping Task Force

2008

Agreement for revision of UNFC(2004)

2009

UNFC(2009) Document

- invited to consider the changes to the UNFC for (solid) minerals and for petroleum to align these on a project status based framework.

- To include recommended changes to the three underlying classifications for further consideration

- to exploit flexibility inherent in the current systems in the form of specifications and guidelines that may affect practise within the current systems.

UNFC (2004) for Solid Minerals

CRIRSCO Template

Production (Total Extracted)
## High Level Mapping of UNFC to CRIRSCO Template

<table>
<thead>
<tr>
<th>Fundamental Characterization</th>
<th>Solid Mineral Classes</th>
<th>UNFC E axis</th>
<th>UNFC F axis</th>
<th>UNFC G axis</th>
</tr>
</thead>
<tbody>
<tr>
<td>DISCOVERED AND MINEABLE</td>
<td>MINERAL RESERVES</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
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</table>

*Not part of the Template but may be used for internal project management*

Source: MTF Report
– Remove category and sub-category labels, and agree harmonized (generic) one set definitions of categories and sub-categories

– Recommendation that the UNFC document is revised and simplified to reflect proposed changes and mapping modules
Agreement for revision of UNFC(2004)

2007
Establishing Mapping Task Force

2008
Agreement for revision of UNFC(2004)

2009
UNFC(2009) Document

• revision of UNFC(2004) based on Mapping Task Force recommendation
UNFC(2009) Document

2007
Establishing
Mapping Task
Force

2008
Agreement for
revision of
UNFC(2004)

2009
UNFC(2009)
Document

- AHGE March 2009
- AHGE October
- Committee on Sustainable
  Energy, November 2009
### Economic & Commercial Viability
- **E1**: Confirmed to be economic
- **E2**: Expected to become economic
- **E3**: Not expected to become economic or too early stage to determine economic viability

### Field Project Status & Feasibility
- **F1**: Feasibility confirmed
- **F2**: Feasibility under evaluation
- **F3**: Feasibility not known
- **F4**: No project identified

### Geological Knowledge
- **G1**: High confidence
- **G2**: Moderate confidence
- **G3**: Low confidence
- **G4**: Potential accumulation
## UNFC- 2009- Alignment with CRIRSCO

### UNFC- 2009- 2 Dimensional

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<thead>
<tr>
<th>Class</th>
<th>Categories</th>
<th>E</th>
<th>F</th>
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<td>Additional quantities in place associated with known deposits</td>
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<td>1,2,3</td>
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### CRIRSCO Template

#### MINERAL RESERVES
- Proved (111)
- Probable (112)

#### MINERAL RESOURCES
- Measured (221)
- Indicated (222)
- Inferred (223)

### Exploration Project

(334)

Source: Ferdi Camisani, 2009
Alignment with the Other Systems

• Alignment with the other systems is underway
CONCLUSION and RECOMMENDATIONS

• Requirements for Turkey: Internationally acceptable reporting standard
  – To end problem of terminology caos
  – Reporting not only by geological knowledge but also by economic & social viability and Feasibility & project status
  – Require both public market reporting and inventories reporting
    • Public market reporting for investors & stock exchanges
    • Inventories reporting for resource management
  – Compatible energy statictics
CONCLUSION and RECOMMENDATIONS
Recommended Further Steps

• Establishing National teams comprising of all related parties

• Completing mapping study base on Turkey’s conditions in close cooperation with UNECE (Technical Advisory and Assistance )

• After completing mapping study: reestimation of reserves/resources require strategic approach:
  • Adaptation within Mining Law
  • Organising training programs country wide
  • Lectures at the universities
  • Usage of advanced mining software packages for estimation of resources/reserves
  • Development of mining management system