



The UNFC for Coal, Uranium and Other Solid Minerals

- Current Status and Opportunities for Improvement

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The Second Session

of

**Ad Hoc Group of Experts on Harmonization of
Energy Reserves and Resources Terminology**

9-11 November 2005, Geneva

CONTENT

- *Introduction*
- The UNFC for Solid Fuels & Mineral Commodities
 - Development of the First Version-R.70
 - Recommendation of the First Version for Worldwide Use
 - Trial Period
 - UNECE & CMMI Agreement
 - Guideline Document
- Extension of the System: UNFC for Energy & Mineral Resources
- The UNFC Applied to Coal, Uranium & Other Solid Minerals-
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 - Additional Classes for Uranium Resources
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INTRODUCTION-

Objective of UNFC

UNFC designed as an umbrella system which is internationally applicable and acceptable to

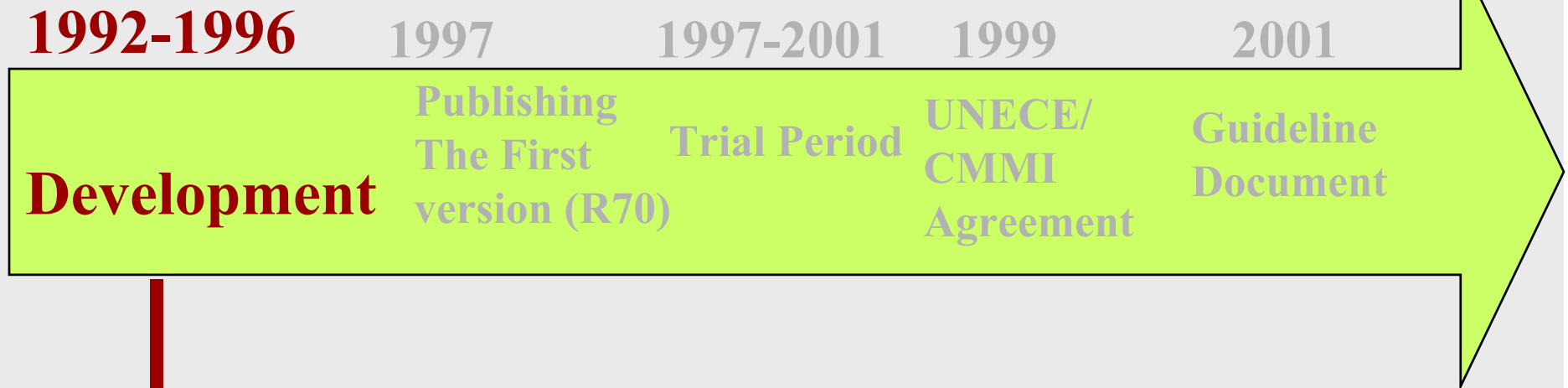
- harmonise existing different terminology and definitions by using numerical codification system
- result improvements in the international comparability of mineral statistics
- facilitate international trade and cooperation
- provide efficient link between market economy countries and countries in transition

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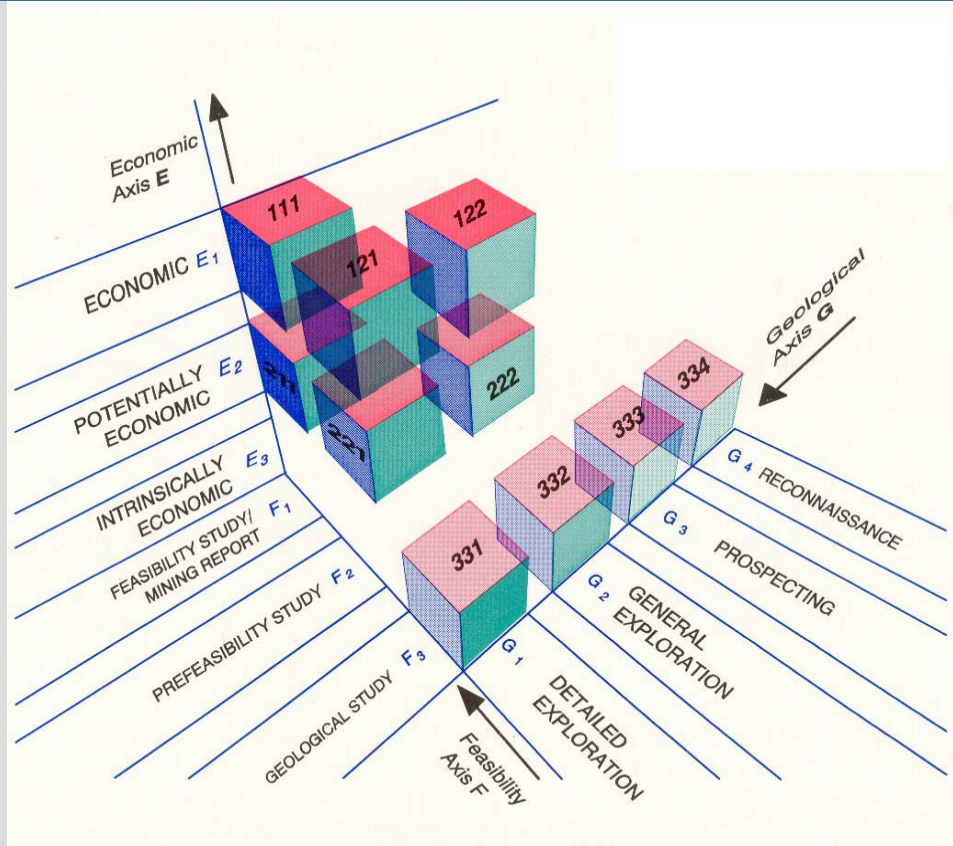
The UNFC

for Solid Fuels and Mineral Commodities



- **UNECE Working Party on Coal initiated the first version in 1992**
- **Consultations were held from >50 countries & organisations**

The UNFC *for Solid Fuels and Mineral Commodities-* *Development*

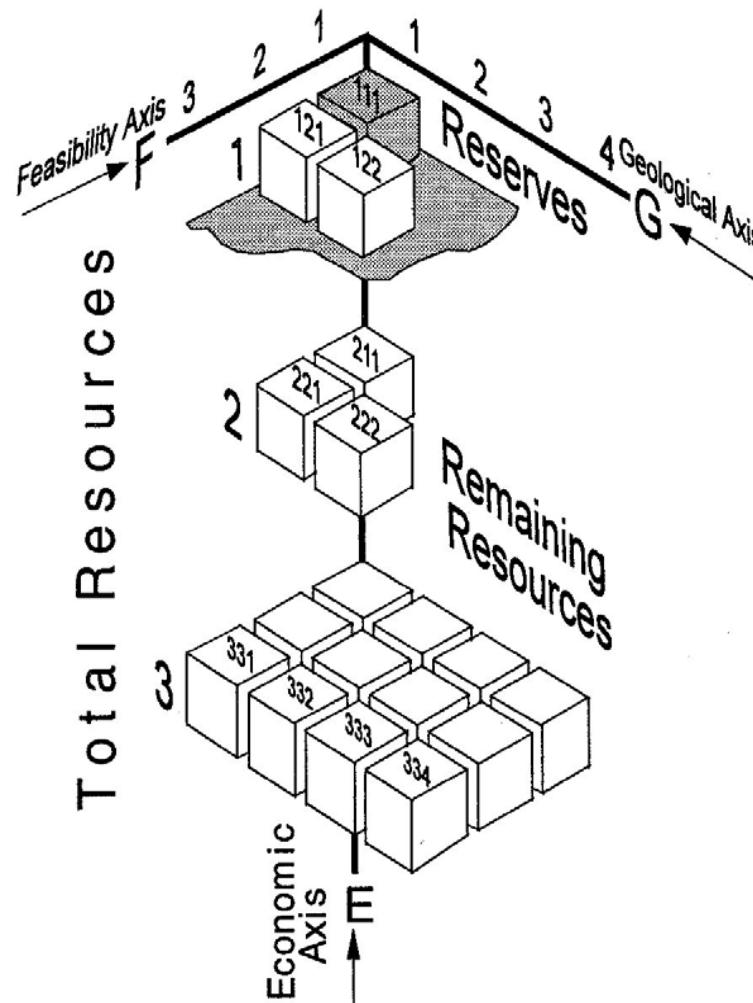


Classification

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

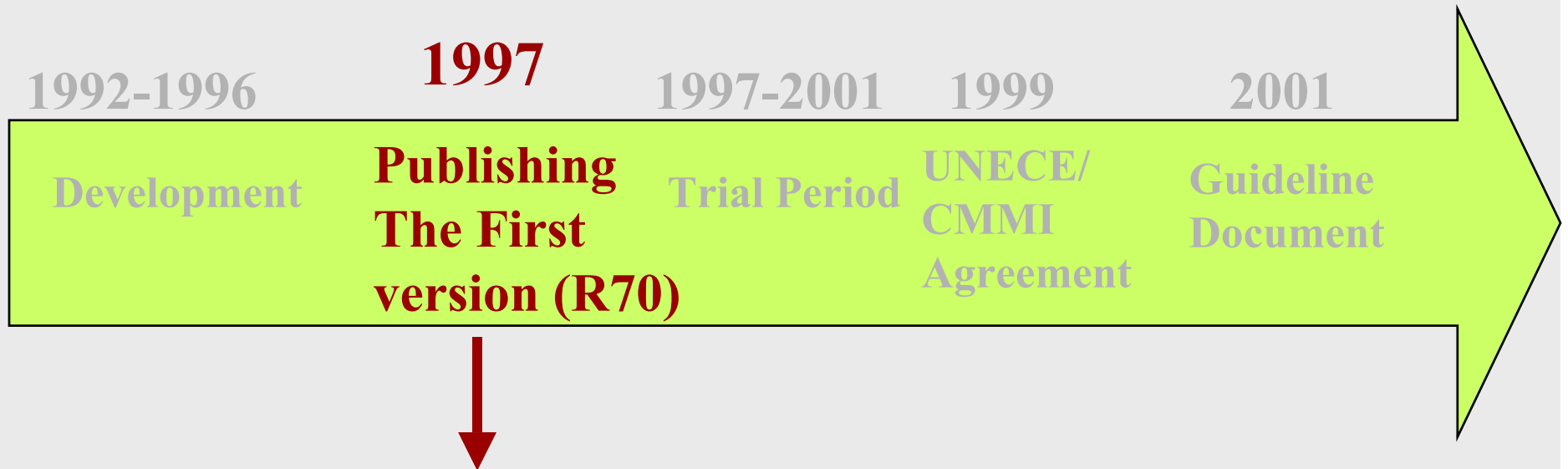
The UNFC *for Solid Fuels and Mineral Commodities-* *Development*

■ Codification



The UNFC

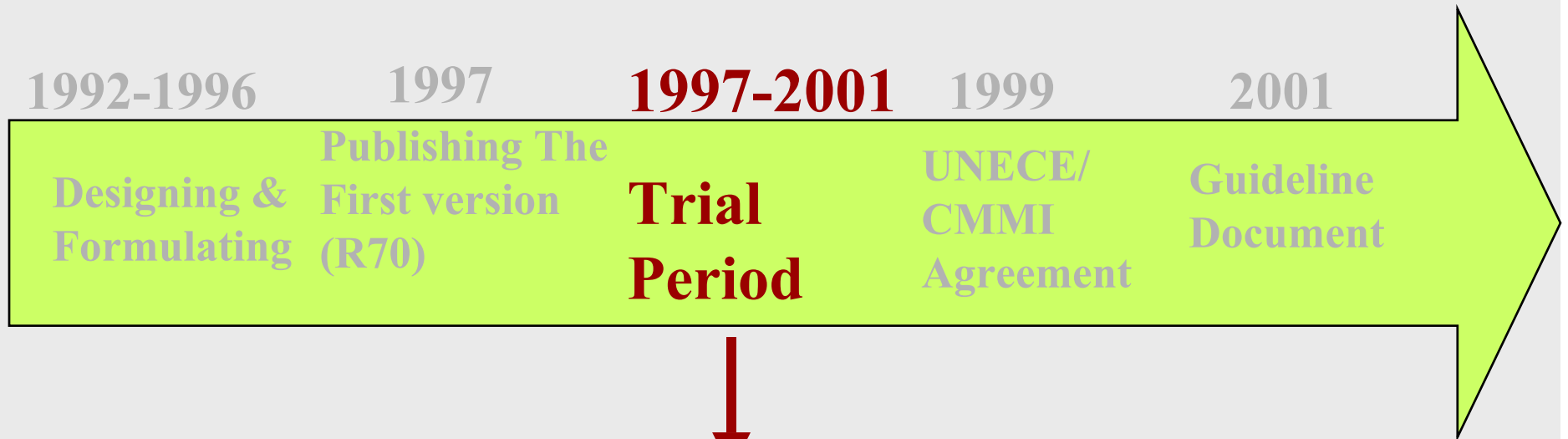
for Solid Fuels and Mineral Commodities



- **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).**

The UNFC

for Solid Fuels and Mineral Commodities

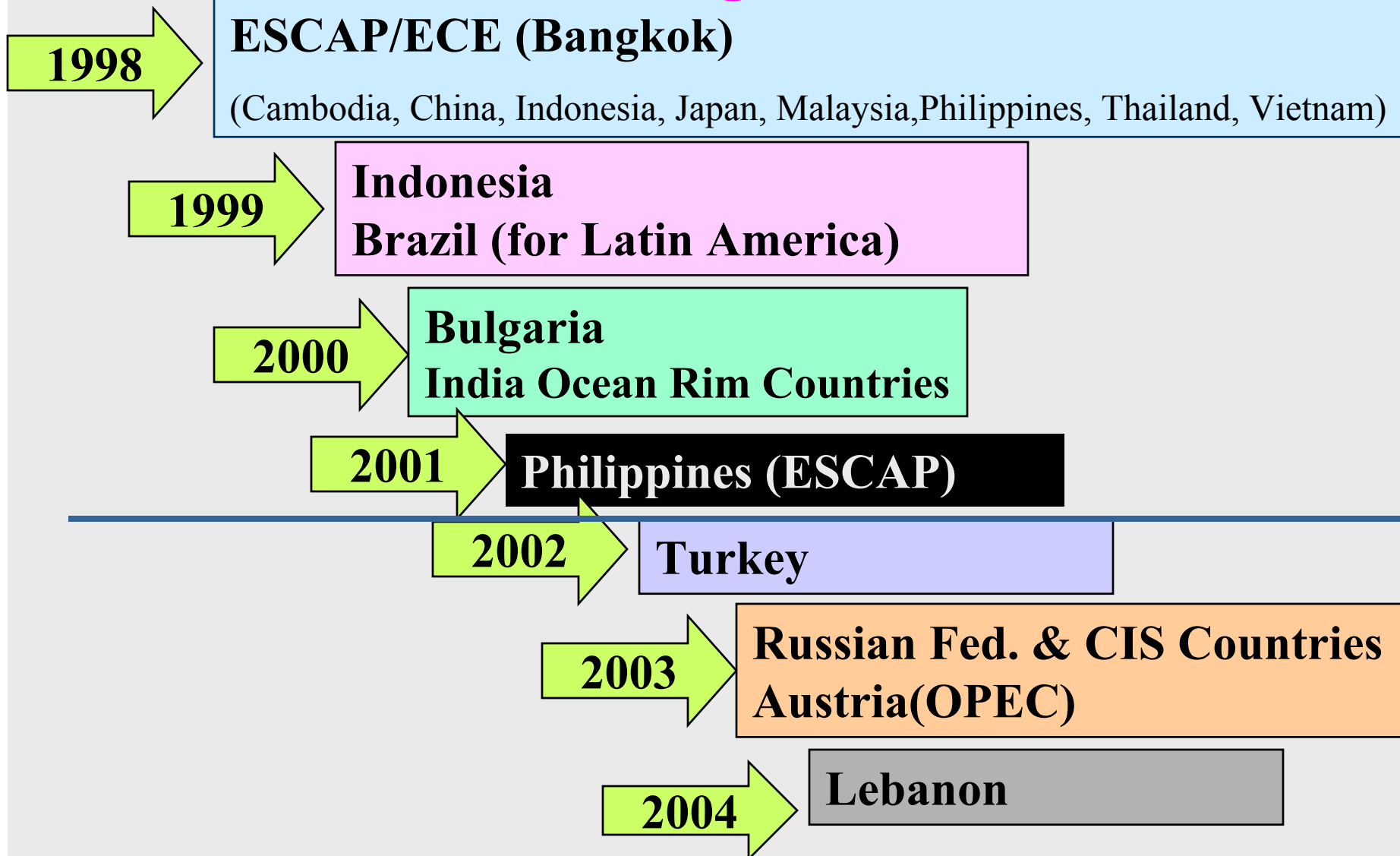


- **applied in >60 countries worldwide, a number of them introduced the UNFC for Solid Fuels and Mineral commodities as a national system, & others adapted their national systems to the UNFC principles**

The UNFC

for Solid Fuels and Mineral Commodities-

Trial Period- Previous Organized Seminars



The UNFC

for Solid Fuels and Mineral Commodities-

Trial Period- Previous Organized Seminars

RESULTS of SEMINARS

- **Organising regional or national seminars help national experts**



to put the UNFC into practice more easily

- by introducing the UNFC principles,
- by highlighting handicaps during the implementation.



in particular to adapt country's national systems into the UNFC principles.

The UNFC

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

The UNFC ***for Solid Fuels and Mineral Commodities-*** ***Trial Period – Some countries The UNFC Applied to Coal Deposits***

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

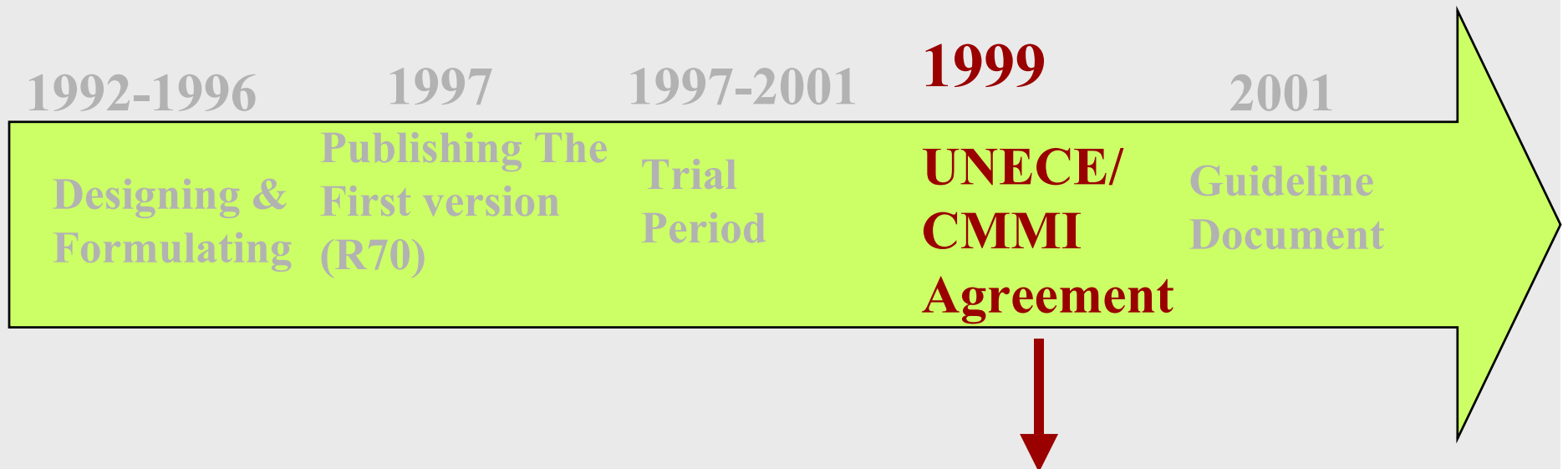
The UNFC

for Solid Fuels and Mineral Commodities- Trial Period – Case Studies

- **Brazil**
- **Bulgaria**
- **Canada**
- **China**
- **Finland**
- **Germany**
- **Greece**
- **Hungary**
- **India**
- **Indonesia**
- **Malaysia**
- **Poland**
- **Portugal**
- **Romania**
- **Russia**
- **Slovakia**
- **Slovenia**
- **Ukraine**
- **USA**
- **Yugoslavia**

The UNFC

for Solid Fuels and Mineral Commodities



- **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)**

The UNFC

for Solid Fuels and Mineral Commodities

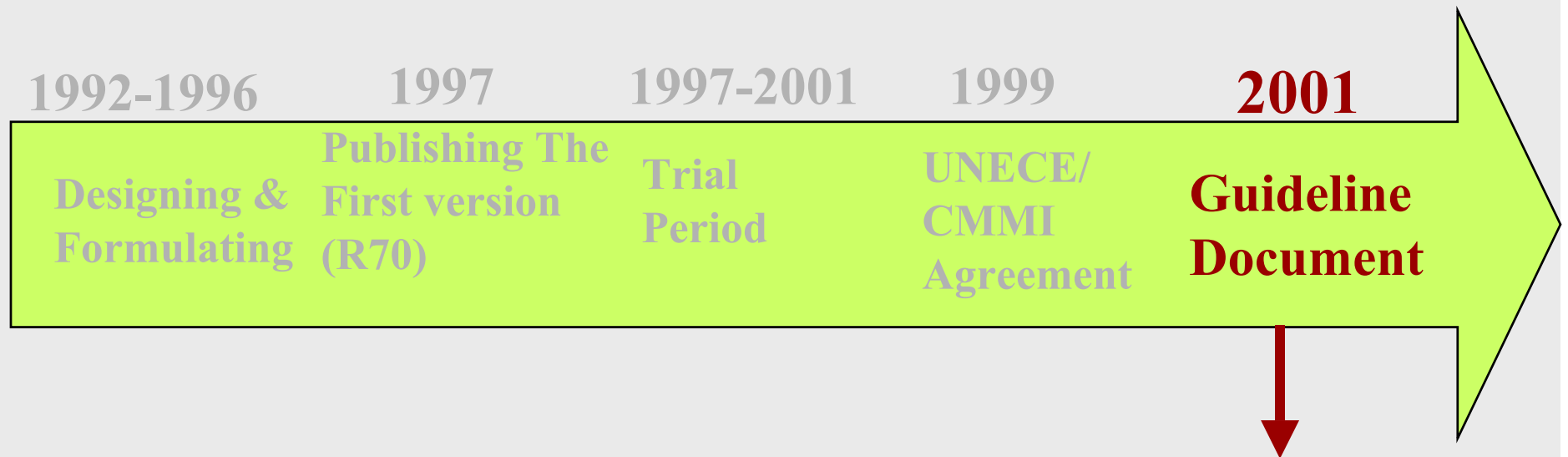
Joint UN/CMMI Definitions

CODE	CMMI CATEGORY	UN CATEGORY
111	Proved Mineral Reserve	Proved Mineral Reserve
121 and 122	Probable Mineral Reserve	Probable Mineral Reserve
211	Measured Mineral Resource	Feasibility Mineral Resource
211 and 222	Indicated Mineral Resource	Prefeasibility Mineral Resource
331	Measured Mineral Resource	Measured Mineral Resource
332	Indicated Mineral Resource	Indicated Mineral Resource
333	Inferred Mineral Resource	Inferred Mineral Resource
334	Not Available	Reconnaissance Mineral Resource

Source: ENERGY/2000/11

The UNFC

for Solid Fuels and Mineral Commodities



- **Guidelines are aimed at both technical and non-technical persons and are designed to assist in the use and application of UNFC.(Document ENERGY/2001/11)**

The UNFC

for Solid Fuels and Mineral Commodities ***The Guidelines Document***

Text

- 1. Introduction**
- 2. Objective**
- 3. Application of the UN Framework Classification**
- 4. Systems integration and reporting of mineral reserves/resources figures**
- 5. The terms Reserve and Resources**
- 6. Definition of Reserve and Resource Classes**
- 7. World Energy Resource Survey**
- 8. Codification**

The UNFC ***for Solid Fuels and Mineral Commodities*** ***The Guidelines Document***

Appendices

- 1. Definitions of Terms to be used in the English Language version of the UNFC for R/R - Solid Fuels and Mineral Commodities**
 - **Definitions of Stages of Feasibility Assessment**
 - **Definitions of Stages of Geological Study**
 - **Definitions of Economic Viability Categories**
 - **Schematic Illustration of UNFC**
 - **Definition of Competent Person**
- 2. List of the More Important Items to be Addressed in a Geological Study**
- 3. List of the More Important Items to be Addressed by Feasibility Assessment**
- 4. Codification**

CONTENT

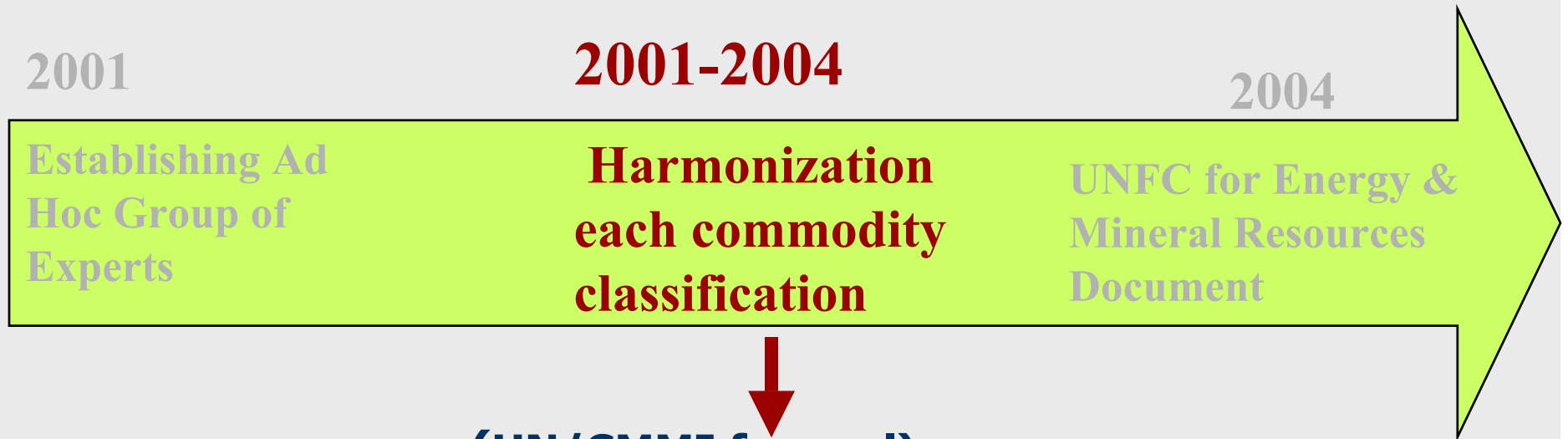
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Extension of the System: UNFC for Energy & Mineral Resources



- **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



- (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).

Extension of the System: UNFC for Energy & Mineral Resources



- **UNECOSOC 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 (UNECOSOC resolution 233/2004)**

Extension of the System: ***UNFC for Energy & Mineral Resources***

Text

- I. Introduction**
- II. Background**
- III. Acknowledgements**
- IV. Normative Reference**
- V. Bibliography**

The Classification

- 1. General**
- 2. *The UNFC applied to coal, uranium & other solid minerals***
- 3. The UNFC applied to petroleum**
- 4. Categories**
- 5. Definitions**

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UNFC Applied to Coal, Uranium&Other Minerals

- *a comparision with the previous version-R70*



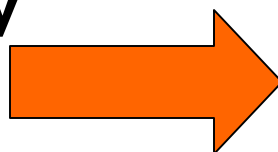
- **Since UNFC for solid fuels and minerals in application worldwide by about 60 countries since 1997, no big changes have been done on this version**
- **All category & axes names, figures kept same as the previous version**
- **Joint UN/CMMI definitions for mineral reserve and resource classes (agreed upon in 1999) were replaced with the definitions in the R.70 Document**

UNFC Applied to Coal, Uranium & Other Minerals

- *a comparison with the previous version-R70*

R.70 (1997)

- No sub-category codes



■ Final UNFC version (2004)

for E1

- **E1.1** as needed
- **E1.2** codes for
- **E2.1** sub-categories
- **E2.2** will be added

for F1

- **F1.1**
- **F1.3**

e.g. 1.1;1;1 → E1.1, F1 and G1

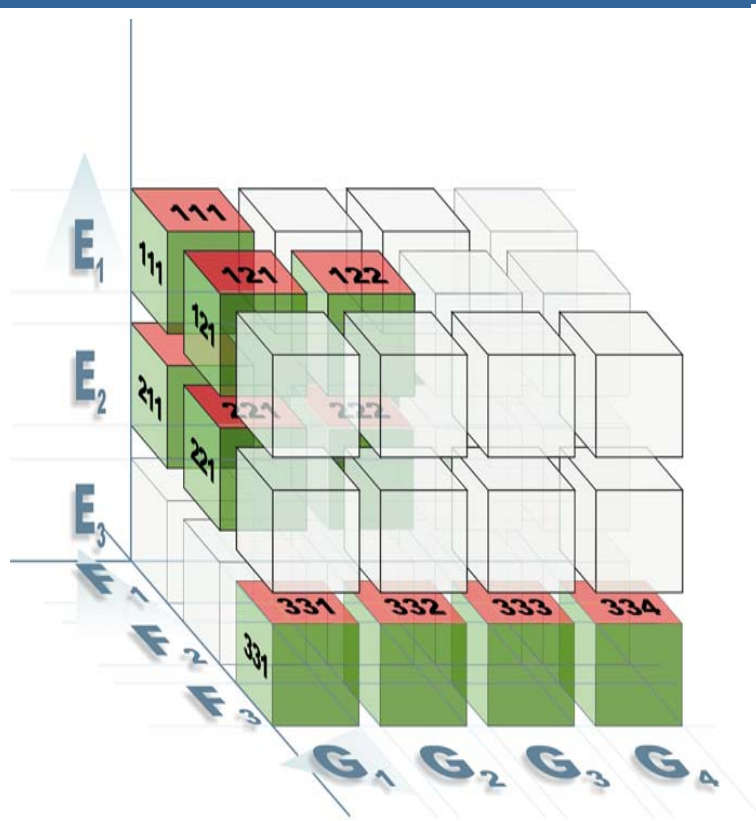
UNFC Applied to Coal, Uranium&Other Minerals

– *Additional Classes for Uranium Resources*

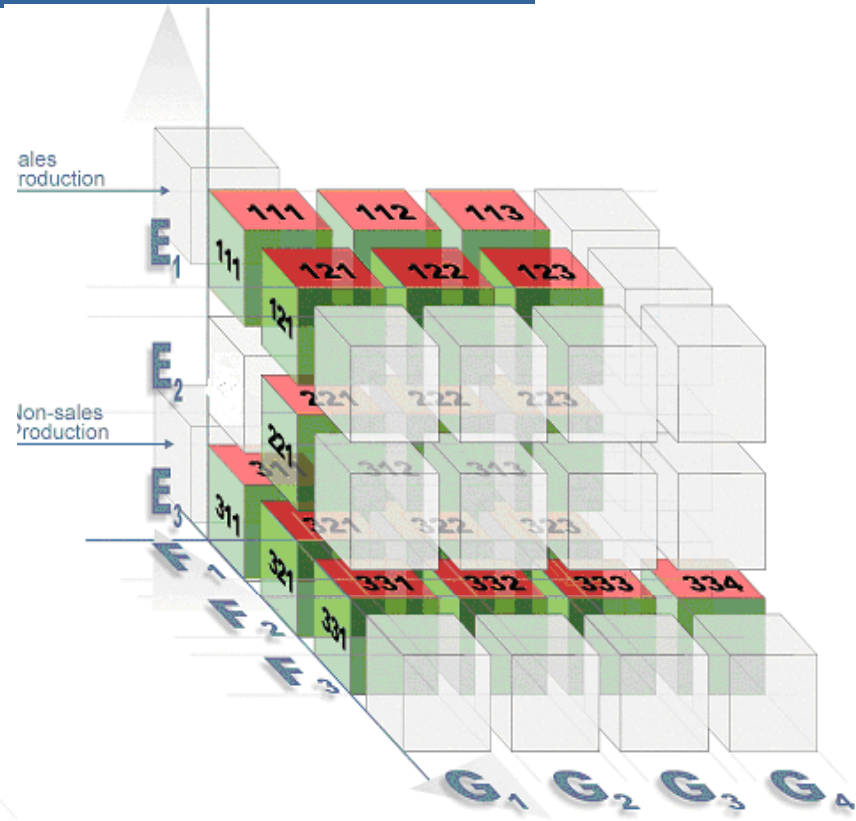
- 1. Reasonably Assured Resources (RAR) code 111+ 211
- 2. Estimated Additional Resources-Category I(EAR I) code 121+122+221+222
- 3. Estimated Additional Resources-Category II(EAR II) code 333
- 4. Speculative Resources code 334

UNFC Applied to Coal, Uranium & Other Minerals

- *A Comparison with the UNFC Applied to Petroleum*



COAL, URANIUM & OTHER SOLID MINERALS



PETROLEUM

UNFC Applied to Coal, Uranium & Other Minerals

- A Comparison with the UNFC Applied to Petroleum

	2004 Coal, Uranium & Other Solid Minerals	2004 Petroleum
Categories and Sub-Categories	Label	Label
E1	Economic	Economic
E1.1	Normal Economic	Normal Economic
E1.2	Exceptional Economic	Exceptional Economic
E2	Potentially Economic	Potentially Economic
E2.1	Marginal Economic	Marginal Economic
E2.2	Sub-marginal Economic	Sub-marginal Economic
E3	Intrinsically Economic	Intrinsically Economic
E3.1	Not used	Non-sales
E3.2	Not used	Undetermined
E3.3	Not used	Unrecoverable
F1	Mining Report &/or Feasibility Study	Justified Development &/or Production Project
F1.1	Mining Report	Project in Production
F1.2	Not used	Committed Development Project
F1.3	Feasibility Study	Uncommitted Development Project
F2	Pre-feasibility Study	Contingent Development Project
F2.1	Not used	Under Investigation
F2.2	Not used	Unclearified or On Hold
F2.3	Not used	Not Viable
F3	Geological Study	Project Undefined
G1	Detailed Exploration	Reasonably Assured Geological Conditions
G2	General Exploration	Estimated Geological Conditions
G3	Prospecting	Inferred Geological Conditions
G4	Reconnaissance Study	Potential Geological Conditions

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UNFC Applied to Coal, Uranium&Other Minerals

- *updating the Guidelines document*

- Updating the existing Guidelines to UNFC for Reserves/Resources- Solid Fuels and Mineral Commodities is continue by including the developments since 2001 and by adapting it to the final version of the UNFC
- While updating the Guidelines document, cooperation with CRIRSCO is essential.

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CONCLUSION and RECOMMODATIONS

- **The UNFC is a flexible system;**
 - meets the requirements for application at national, industrial and institutional level & used for international communication & global assessments,
 - meets the basic needs for an international standard required to support rational use of resources, improve efficiency in management and enhance the security of both energy supplies and of associated financial resources,
 - assists countries in transition economies in reassessing their energy and mineral resources according to criteria used in market economies.

Ways of Successful UNFC Implementation

