

# A brief overview of UNFC-2009 and application to Renewables

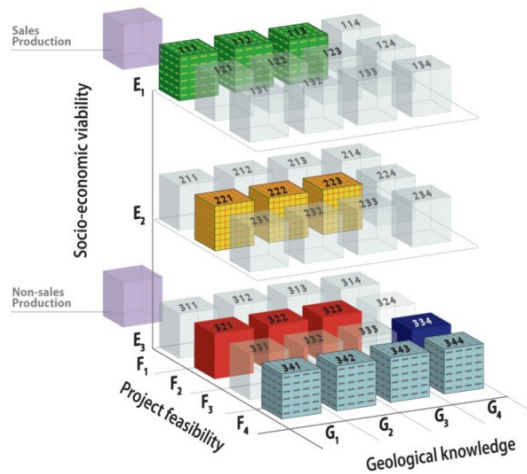
**Presented on behalf of the EGRC and the Task Force on  
Application of UNFC-2009 to Renewable Energy**

By Norbert Dolle

Geneva  
17-18<sup>th</sup> November 2014



# UNFC-2009 Classification



1. What is it?

2. How it works

3. Specifications

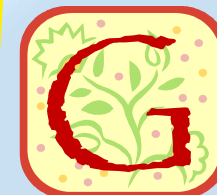
4. Application to Renewable Energies

5. Opportunities & Challenges

6. Summary

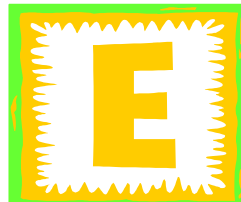
# UNFC-2009

- **United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources**
- **Generic, principles-based system**
  - Applicable to both solid minerals and fluids
  - Project-based
- **Based on three criteria**
  - **E**conomic and social viability
  - **F**ield project status and feasibility
  - **G**eological knowledge

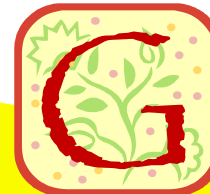


# Why three criteria?

## Proved reserves must be ...



**Economic to extract  
(commercially feasible)**



**Geologically well defined  
(with high confidence)**

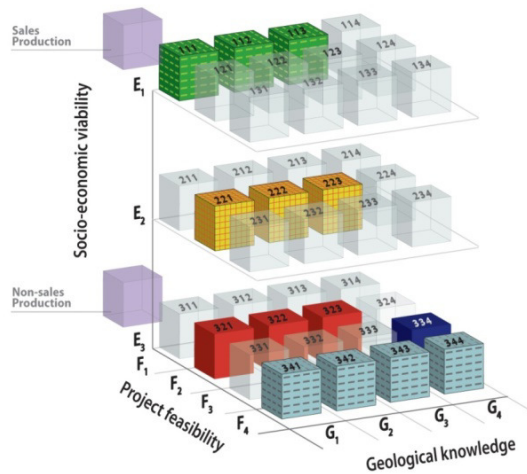
**Technically feasible  
to extract**



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Note that UNFC only uses the term “reserves” in a very general way

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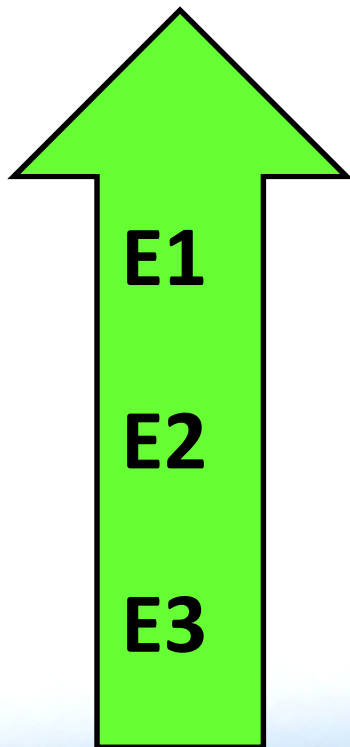
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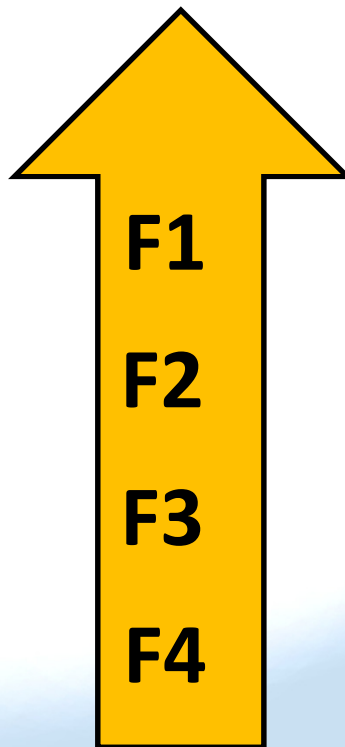
# UNFC – How it works

**Numerical coding system based on three criteria:**

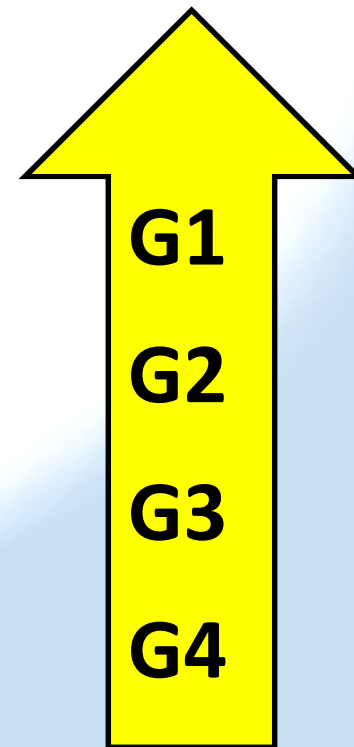
**Economic and  
social viability**



**Field project status  
and feasibility**

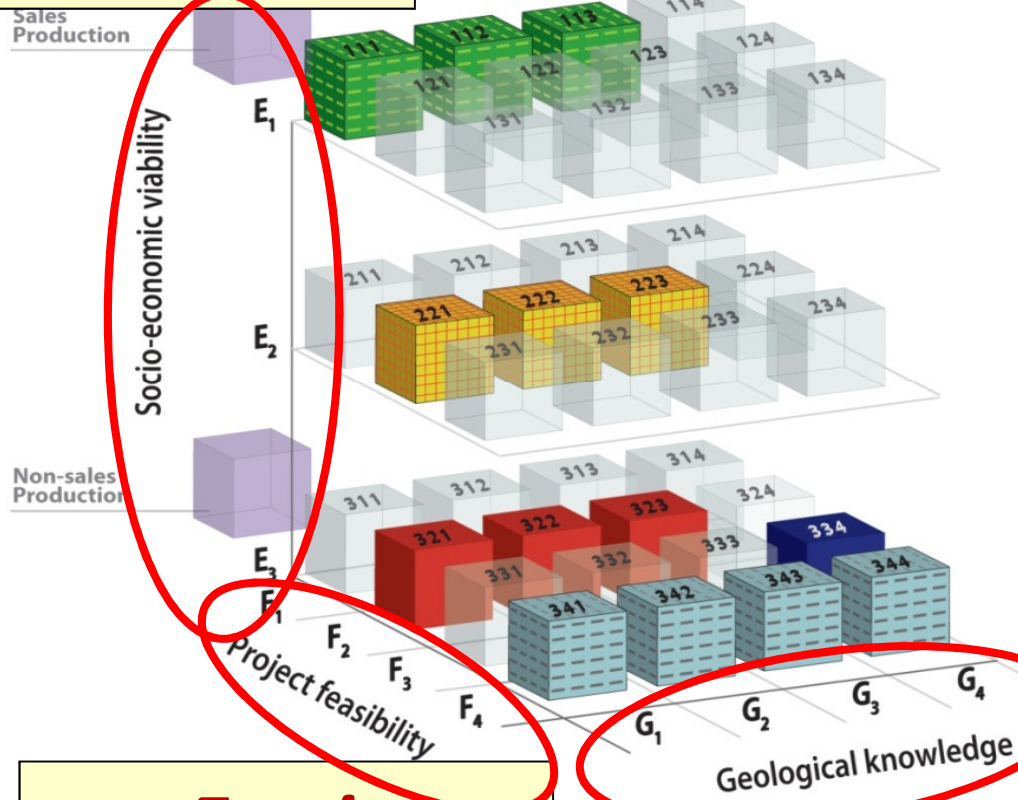









**Geological  
knowledge**



# UNFC – How it works

***E axis categories***



-  Commercial projects
-  Potentially commercial projects
-  Non-commercial projects
-  Exploration projects
-  Additional quantities in place
-  Other combinations
-  Extracted quantities
- 123** Codification (E1;F2;G3)

***F axis categories***

***G axis categories***



# E axis category definitions

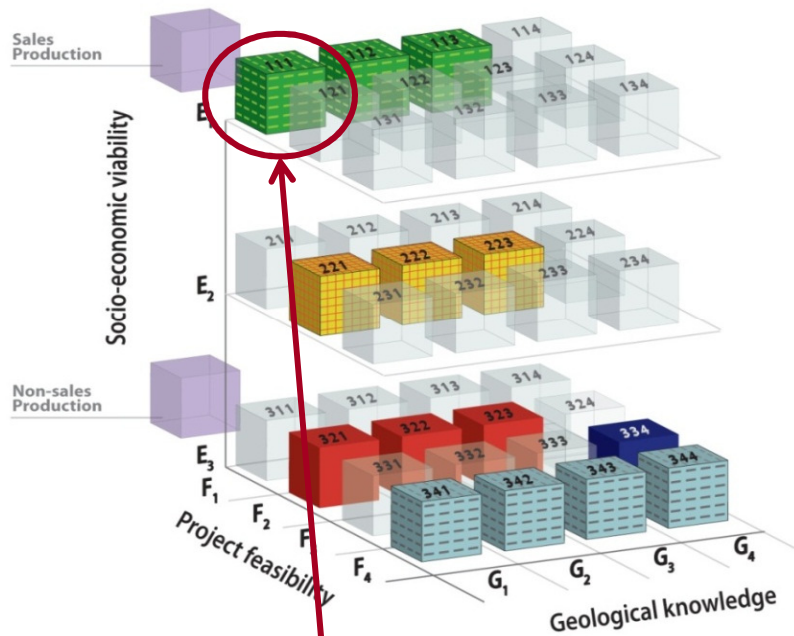
Category	Definition
E1	Extraction and sale has been confirmed to be economically viable.
E2	Extraction and sale is expected to become economically viable in the foreseeable future.
E3	Extraction and sale is not expected to become economically viable in the foreseeable future or evaluation is at too early a stage to determine economic viability.



# UNFC – How it works

- **The category definitions are the building blocks of the system**
- **These are combined (E, F, G) in the form of classes**
- **Class 111 means that the reported quantities have satisfied the definitions for:**
  - **E1, F1 and G1**
- **There are no constraints on combinations, but not all will be meaningful**

# UNFC – How it works



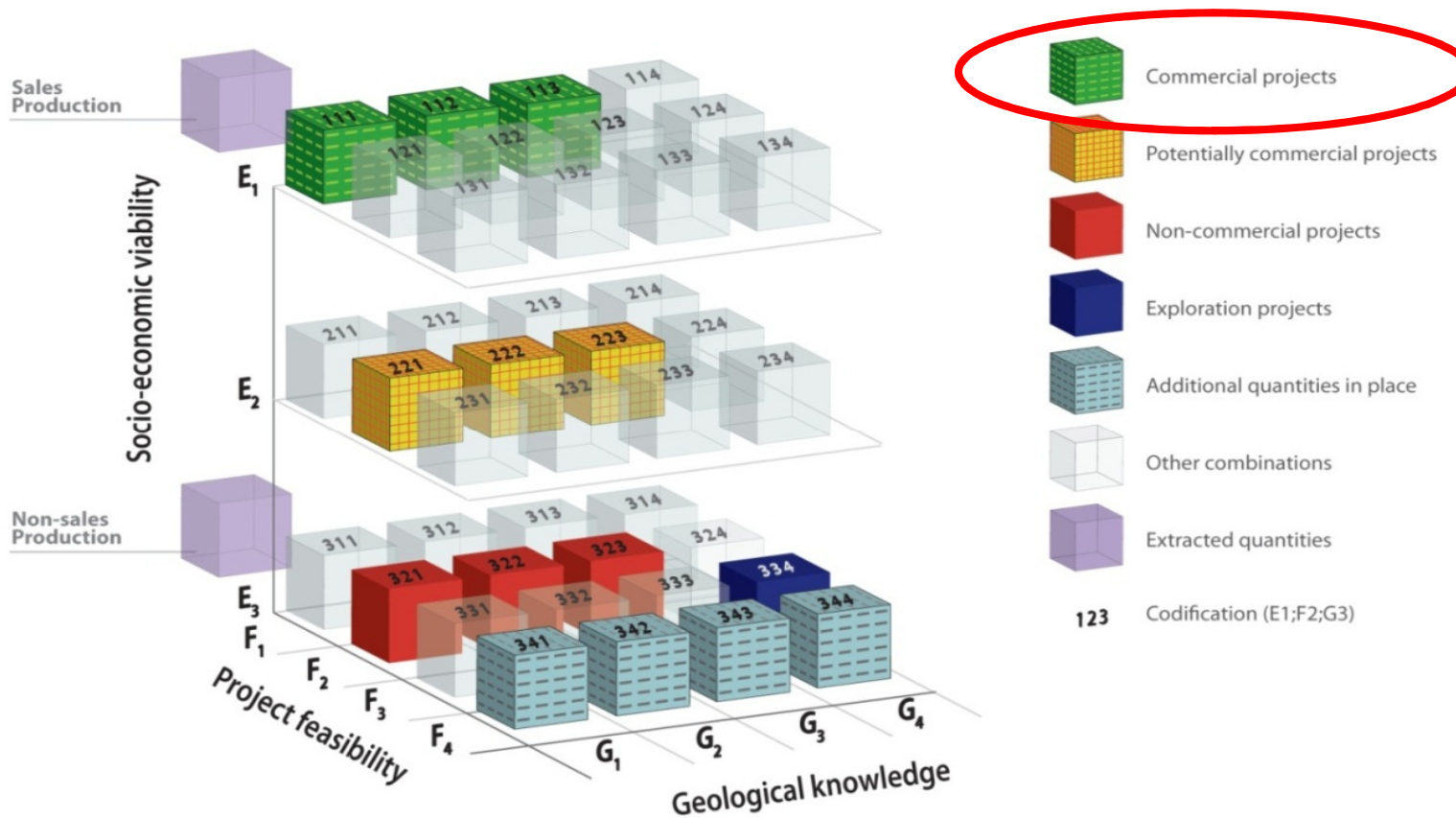
**UNFC Class: 111**

Category	Definition
E1	Extraction and sale has been confirmed to be economically viable.

Category	Definition
F1	Feasibility of extraction by a defined development project or mining operation has been confirmed.

Category	Definition
G1	Quantities associated with a known deposit that can be estimated with a high level of confidence.

# UNFC – Examples of classes



# UNFC – 2D representation

Total commodity initially in place	Extracted	Sales Production			
		Non-sales Production			
		<u>Class</u>	<u>Categories</u>		
			E	F	G
	Future recovery by commercial development projects or mining operations	Commercial Projects	1	1	1, 2, 3
	Potential future recovery by contingent development projects or mining operations	Potentially Commercial Projects	2	2	1, 2, 3
		Non-Commercial Projects	3	2	1, 2, 3
	Additional quantities in place associated with known deposits		3	4	1, 2, 3
	Potential future recovery by successful exploration activities	Exploration Projects	3	3	4
	Additional quantities in place associated with potential deposits		3	4	4

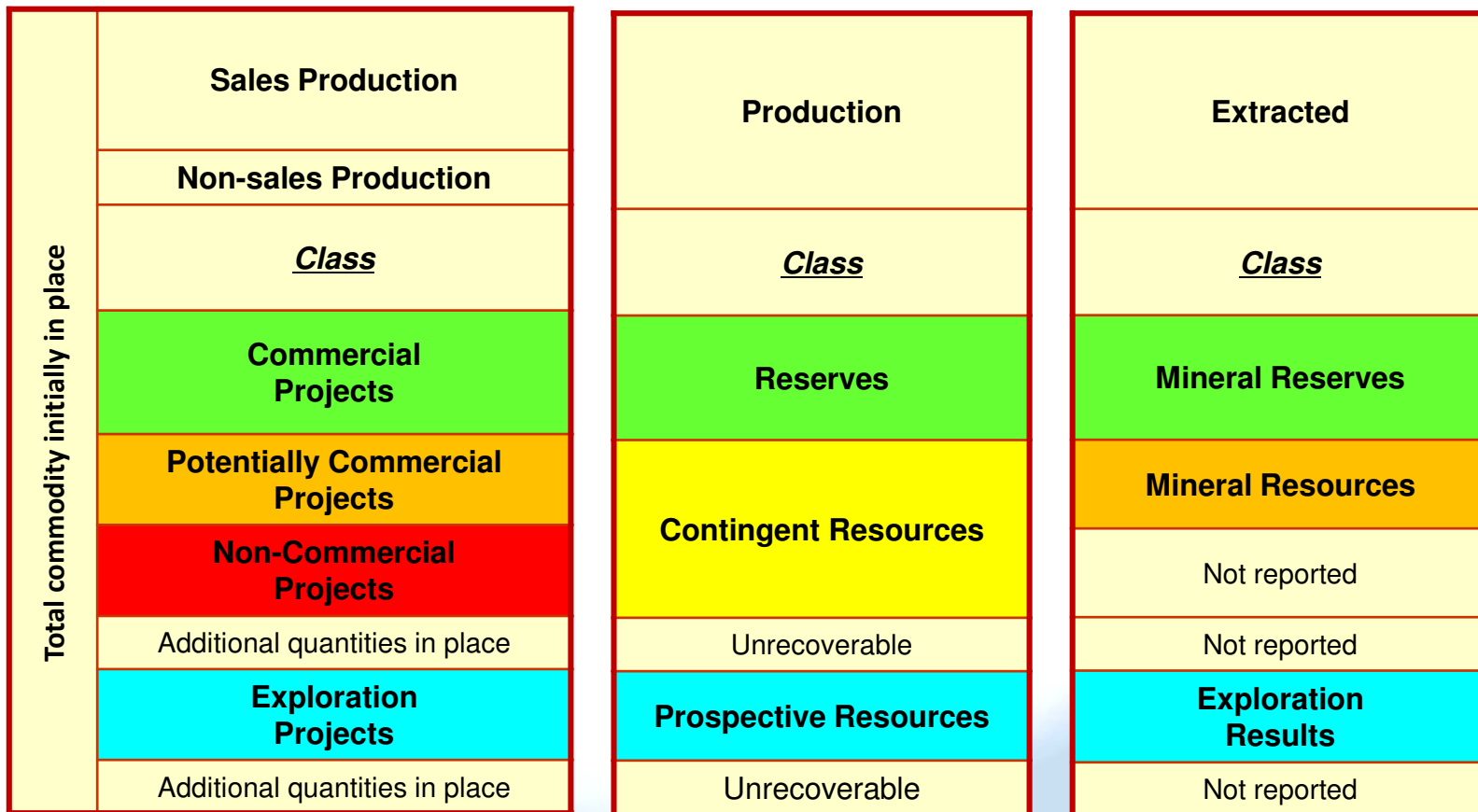
***Each class is uniquely defined by its code***

# Alignment of systems (schematic)

## UNFC-2009

## PRMS

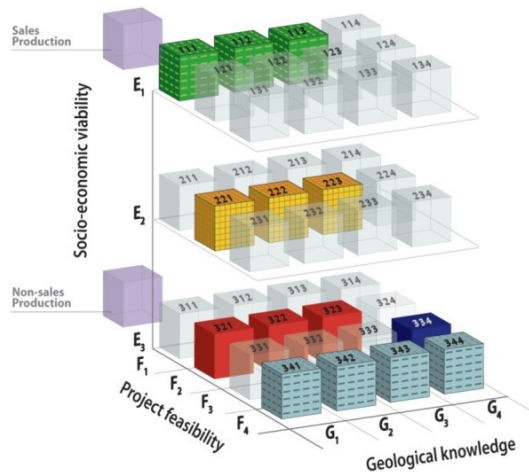
## CRIRSCO



# How can we use alignment?

- **Quantities can be estimated using current well-established commodity-specific systems**
- **Reporting under these systems can continue unchanged**
- **But the same quantities can also be reported under UNFC using the numerical codes**
- **The reporting is then independent of commodity type, extraction methodology and ambiguous terminology (e.g. “reserves”)**

# UNFC-2009 Classification



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# What are specifications?

Definitions

Classification  
Framework

Specifications

Application  
Rules

Guidelines

Non-  
Mandatory  
Guidance



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**UNFC**

**Classification Framework and Category Definitions**

**Generic Specifications**

***Bridging Document***

***Bridging Document***

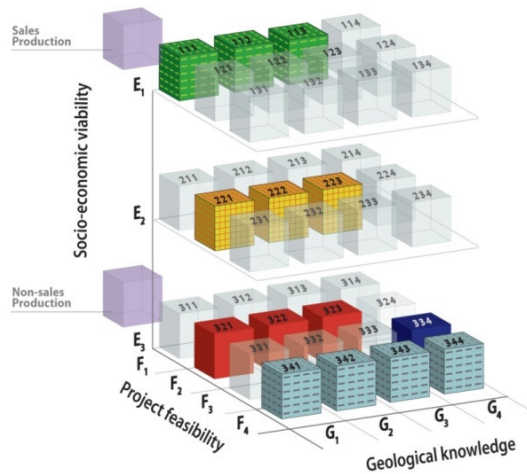
***Bridging Document***

**Petroleum Specifications  
PRMS**

**Solid Mineral Specifications  
CRIRSCO**

**Other Aligned Systems**

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**UNFC**

**Classification Framework and Category Definitions**

**Generic Specifications**

*Bridging Document*

*Bridging Document*

*Renewable Specifications*

**Petroleum Specifications  
PRMS**

**Solid Mineral Specifications  
CRIRSCO**

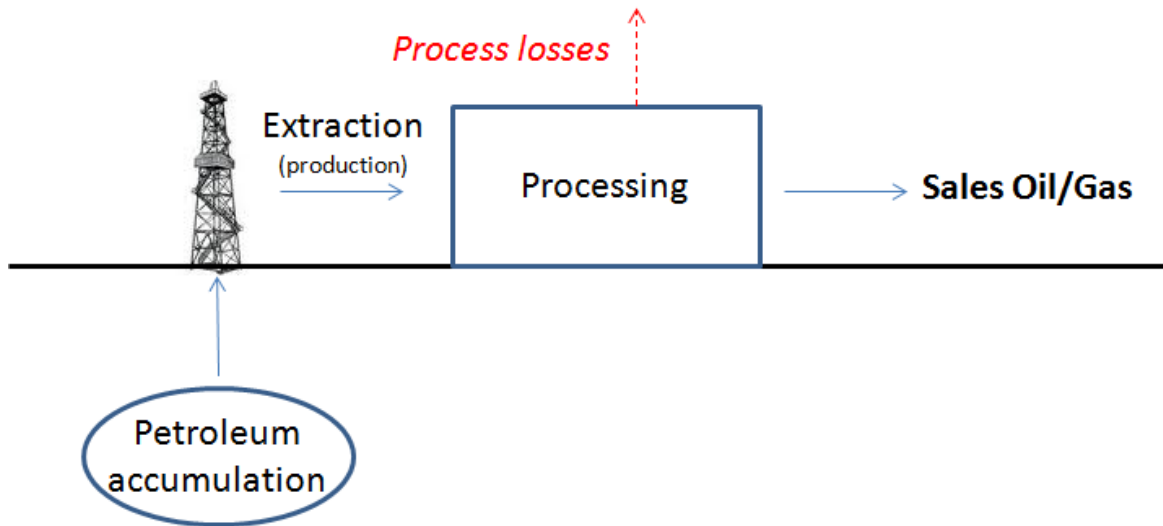
**Geothermal Specifications**

**Bioenergy Specifications**

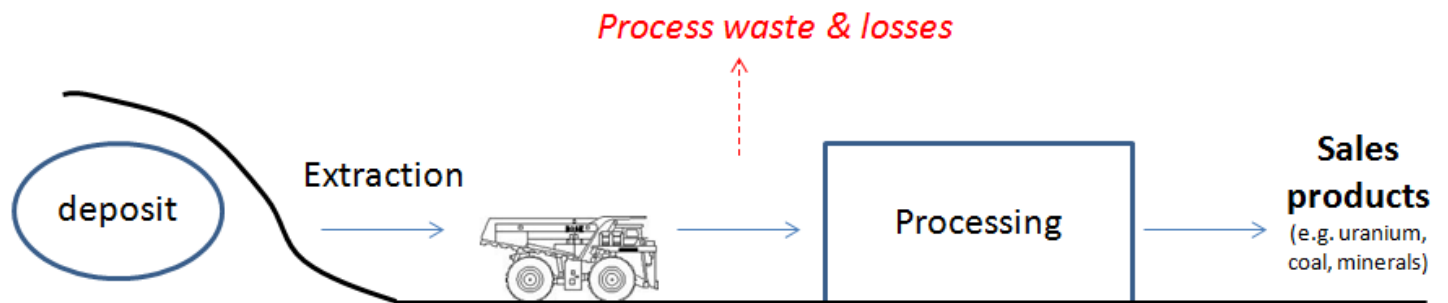
**Wind/Solar/Hydro Specifications**

[Draw from] existing Codes/Frameworks/Guidelines/Practices

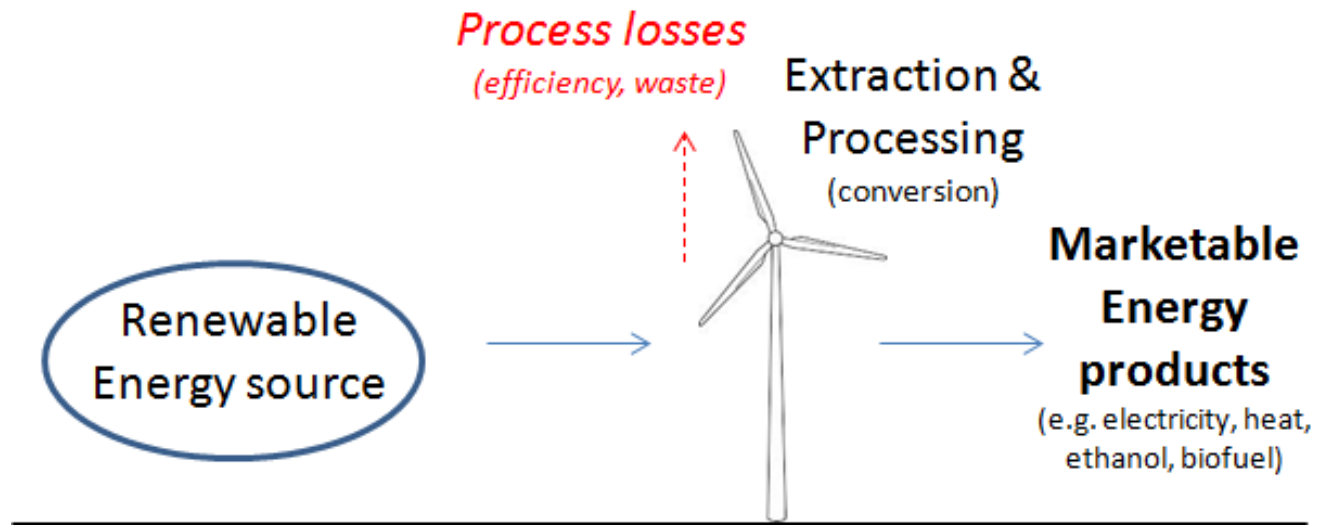
# UNFC-2009 is “project-based”



The **project** generally represents the level at which a decision is made whether or not to proceed (i.e., spend more money)



# Renewable energy projects are very similar to fossil energy or mineral projects



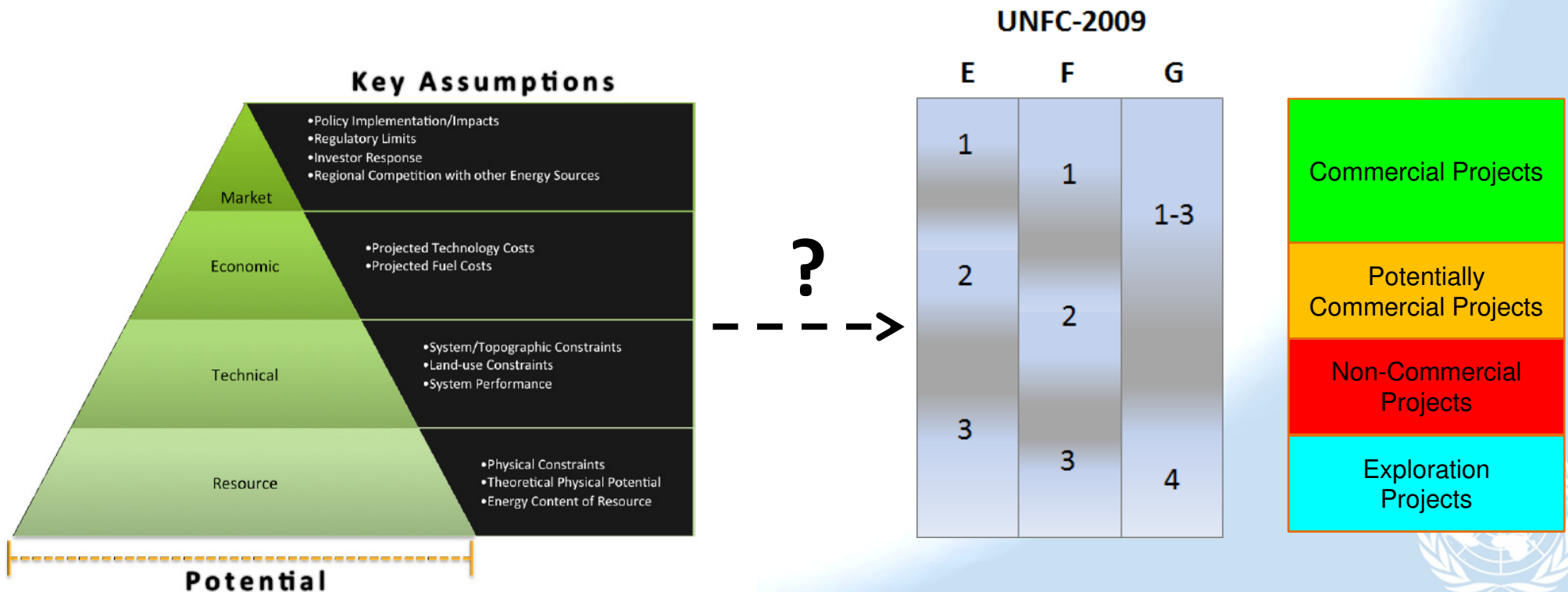
The Project is the link between the Renewable Energy Source and sales quantities of Energy Products and provides the basis for economic evaluation and decision-making

# REN Projects

- **Renewable Energy Projects have similar characteristics as Fossil Fuel and Mineral Projects:**
  - The Project requires access to the deposit, accumulation or source
  - The Project includes a “process” to extract or convert the sales products
  - The Project requires access to a market
  - The Project has elements of risks and rewards for the investor
  - The Project has an expected production (and revenue) profile
- **The UNFC-2009 principles can therefore be applied**

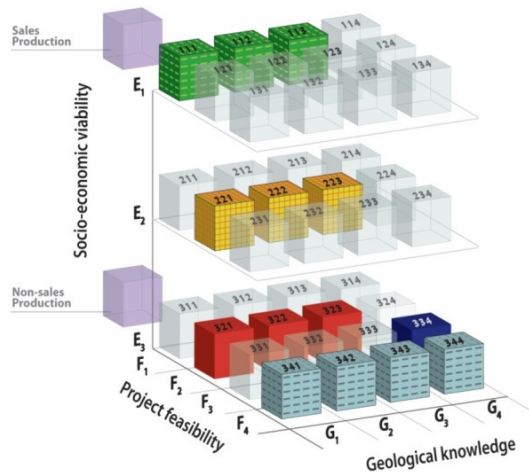
# Translating “potentials” to the UNFC?

- There is no existing, consistent and universally agreed classification framework for renewable energy, but (various) definitions of “potentials” are frequently used
- At high level, it is possible to compare these with the UNFC categories



Levels of Renewable Energy potential (based on Table 4-1 in the 2011 update of DOE EERE (2006))

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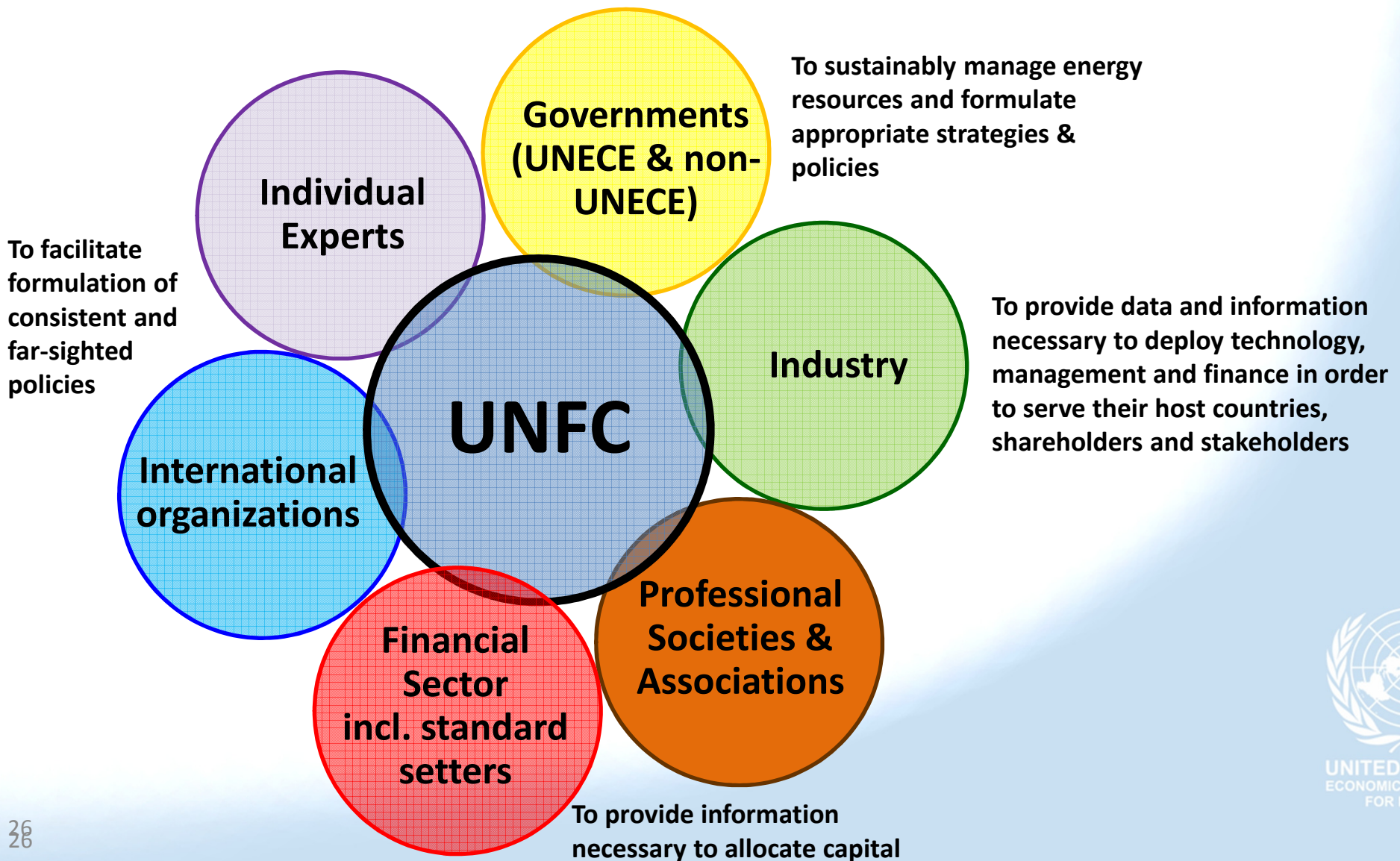
**6. Summary**



# Opportunities

- **Application of UNFC facilitates a more consistent language and terminology**
- **Application of UNFC leads to a more transparent comparison of Renewable Energies and Renewable vs. Non-Renewable Energies**
  - **Governments: Policy making – energy sustainability**
  - **Financial & Corporate sector: Capital allocation**
  - **Identification and removal common blockers**

# Who uses resource data and the UNFC?



# Challenges

- **Many different stakeholders, relatively fragmented and limited global consolidation yet**
  - How to get input and support from full spectrum of stakeholders
  - Who will “own” and “maintain” the Specifications?
  - Is this initiative too early?
- **Common practice of using “Annual Capacity” and “Potential” is not aligned with UNFC-2009 project-based approach**
  - Is there sufficient incentive among stakeholders to define a Project and Project Life Time

# What has been done so far?

- **The Task Force on the Application of the UNFC-2009 to Renewable Energy was established in 2013**
- **Generic Specifications on the Application of the UNFC-2009 to Renewable Energy drafted and issued for public comments (2014)**
- **Public comments received, update of Generic Specifications is ongoing for approval by EGRC in April 2015**
- **The Task Force has set up 3 work streams to deliver (at least) one set of draft commodity specifications by April 2015**



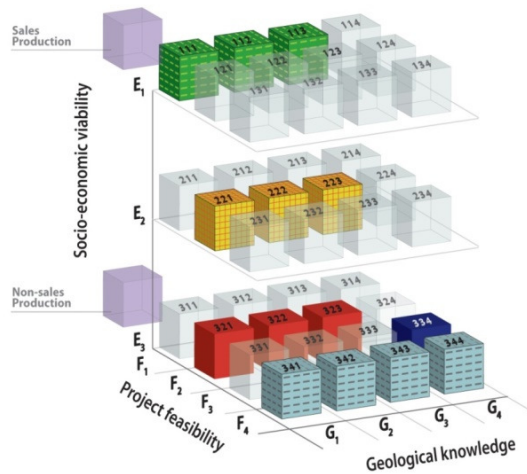
# Summary of public comments

**Very useful and detailed comments received from 15 parties:**

- **General support that UNFC can be applied to Renewables**
- **Some comments appear to have been made on the basis of the Renewable Specifications in isolation, without appreciation that these are meant to complement and be consistent with UNFC**
- **Some confusion about “Annual Capacities” and “Potentials” versus the project-based concept of UNFC**
- **Some misunderstanding between the role of the G axis vs. that of the F and E axes**



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# In summary ...

- **UNFC-2009 is a generic, principles-based system**
  - Applicable to both solid minerals, fluids ... and renewables
  - Uses a numerical coding system
- **Based on three criteria**
  - Economic and social viability
  - Field project status and feasibility
  - Geological knowledge
- **Key goal is to provide a tool to facilitate global communications**
  - Other systems can be linked to it using bridging documents
- **General specifications for the application to Renewables have been drafted and issued for comment**
  - Next step is to prepare commodity-specific specifications (Geothermal, Bioenergy, Solar/Wind/Hydro)