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Application of UNFC for Petroleum and Total Resource Management
Satinder Purewal – Chair of PWG

Outline

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- Petroleum Work Group (PWG)
  - Vision/Mission
  - Recent Activities
  - PWG Projects
- UNFC – Petroleum
  - G Axis
  - Project Commerciality
  - Definition of a Project
  - F and E Axes
- Total Resource Management
  - Global Shared vision
  - Adding Value
- UNFC
  - SWOT
  - Challenges
- Closing Remarks

Petroleum Work Group (PWG)

Vision/Mission

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- ## Vision
  - PWG vision is to be the premier Petroleum expertise repository for UNFC with the primary goal of achieving Sustainable Development Goals (SDG's) through implementation of UNFC globally as a total resource classification and management system which can be used by a variety of interested entities to make policy and business decisions on energy.

- ## Mission
  - PWG mission is to proactively work with country stakeholders, develop UNFC petroleum specifications and guidelines, conduct pilot studies, hold workshops, promote uptake of UNFC in interested countries, provide advice on the realization of SDG's by using UNFC.

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- UNFC Specifications and Guidelines for Petroleum
  - Key Chapter 3 is almost 80% complete –PARTIALLY COMPLETED

- Comparison Review of Global Classification Systems - COMPLETED ✔

- Mexico Pilot (Case Study) – COMPLETED ✔

- Mapping of other systems to UNFC
  - Awaiting update of UNFC

- Chinese Classification system to UNFC (Case Study)
  - Bridging Documents signed in September 2018; awaiting data

- RF2013 Classification to UNFC (A case study)
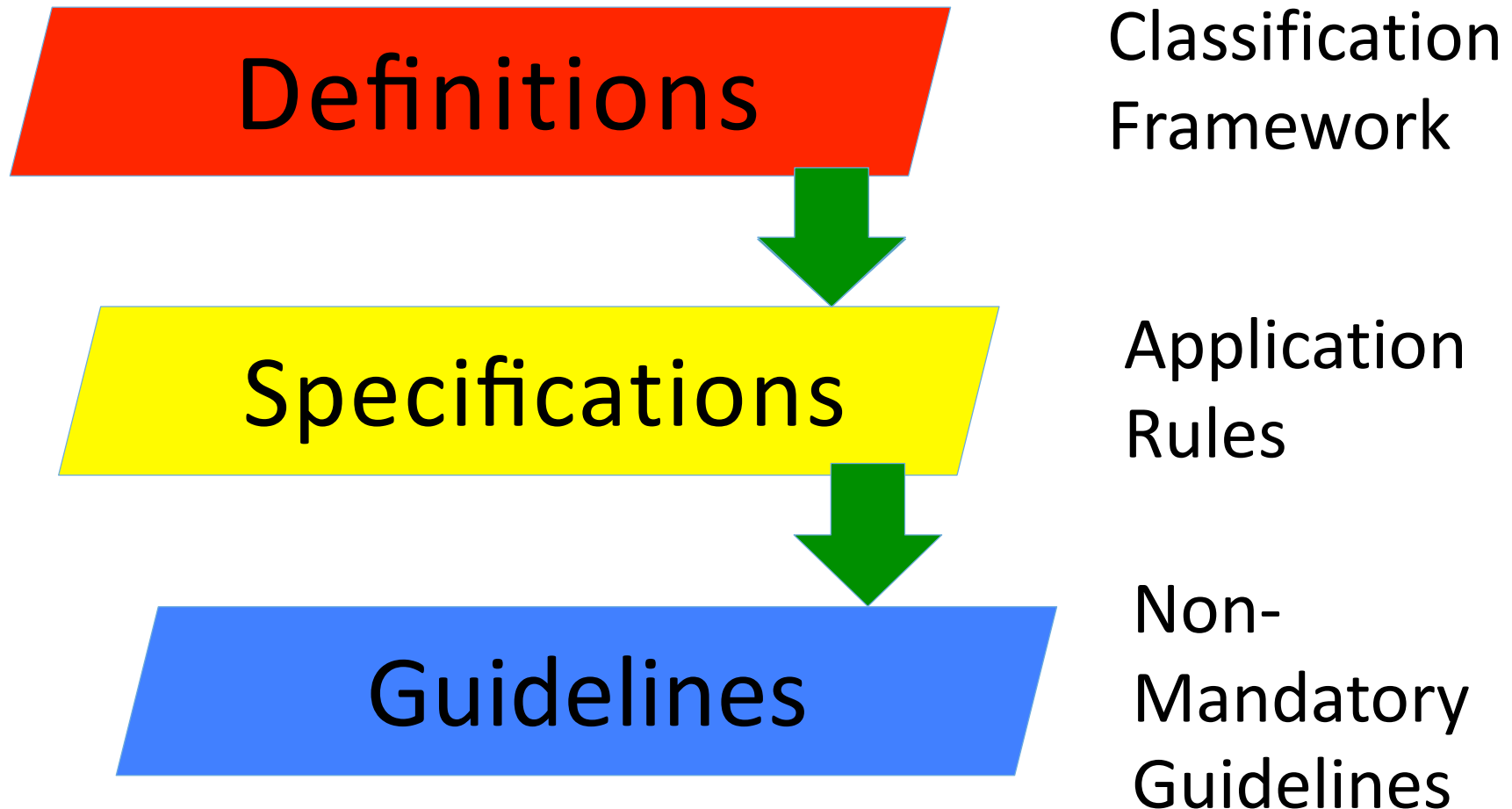 - Awaiting data from RF

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- UNFC Specifications and Guidelines for Petroleum
  - Complete by EGRM 11

- Mexico Pilot Extension (Case Study)
  - Discussions planned during 14-15 June 2019

- Mapping to UNFC
  - Await update of UNFC

- Chinese Classification system to UNFC (Case Study)
  - Ongoing

- RF2013 Classification to UNFC (A case study)
  - Awaiting data from RF

- Coal Bed Methane (Case Study)

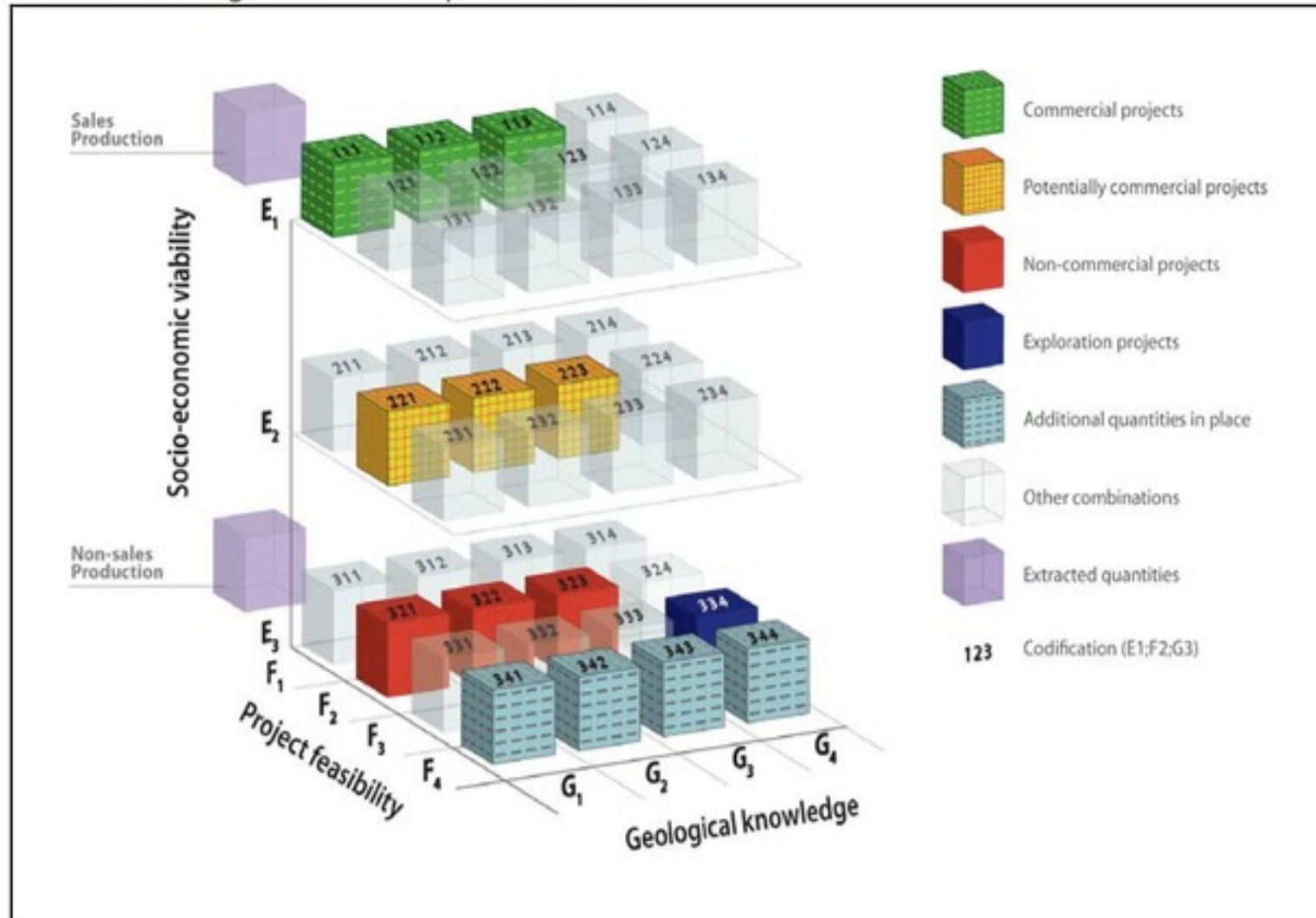UNFC Specifications and Guidelines for Petroleum

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Definitions — Classification Framework

Specifications — Application Rules

Guidelines — Non-Mandatory Guidelines

6

Categories and Classes

UNFC-2009 Categories and Examples of Classes

Generic Specifications – Petroleum G-axis Uncertainty 1

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UNFC Categories		
G1	1P	
G2	2P–1P	Reserves (incremental)
G3	3P–2P	
G1	1P	
G1+G2	2P	Reserves (Scenario)
G1+G2+G3	3P	
G1	1C -Low	
G1+G2	2C -Best	Contingent Resources
G1+G2+G3	3C -High	
G4.1	Low	
G4.1+G4.2 (=G4)	Best	Prospective Resources
G4.1+G4.2+G4.3	High	

Generic Specifications – Petroleum G-axis Uncertainty 2

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UNFC 'minimum' categories			UNFC Class
E1	F1	G1, G2, G3	Commercial Projects
E2	F2	G1, G2, G3	Potentially Commercial Projects
E3	F2	G1, G2, G3	Non-Commercial Projects
E3	F4	G1, G2, G3	Additional in Place
E3	F3	G4	Exploration Projects
E3	F4	G4	Additional in Place

- E and F categories set minimum standards for Classes
  e.g. Potential Commercial Project can be E2F2, E1F2, E2F1
- Non-Sales quantities are always classified as E3

Petroleum - Project Commerciality

	F1.1	F1.2	F1.3	F2.1	F2.2	F2.3	F3.1	F3.2	F3.3	F4
E1.1	1	2	3	4						
E1.2	1	2	3							
E2			4	4	5					
E3.1	12	12	12	12	12	12				
E3.2			6	6	6		8	9	10	
E3.3			7	7	7	7				11

key	UNFC Class
1	
2	Commercial Projects
3	
4	
5	Potential Commercial Projects
6	
7	Development unviable
11	Unrecoverable
8	
9	Exploration Projects
10	
11	Unrecoverable
12	Defined in PRMS but not classified
Grey	Uncommon mappings

Environmental and Social Considerations

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- E-axis categories explicitly define to take account of the social and environmental issues which may be relevant to the commercial viability of the petroleum extraction project

- This is in addition to legal, economic and other non-technical factors

- Time estimate of impact of social and environmental issues to be considered as part of life-cycle project planning

- Environmental and social impediments may prevent a project from proceeding or cessation of an ongoing project (unless remedial action taken agreed with all stakeholders)

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- A **Petroleum** Project is a defined development which provides the basis for economic evaluation and decision-making.

- **Exploration and appraisal delineation drilling** form the early stages of evaluation and the Project **may** be defined only in conceptual terms.

- More mature Projects will be defined in significant detail.

- Where no **petroleum** development can currently be defined for all or part of a **accumulation**, based on existing technology or technology currently under development, all quantities associated with that **accumulation** (or part thereof) are classified in Category F4.

Exploration Projects

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	Low Estimate	Best Estimate	High Estimate
Prospect	E3.2,F3.1,G4.1	E3.2,F3.1,G4.1+G4.2	E3.2,F3.1,G4.1+G4.2+G4.3
Lead	E3.2,F3.2,G4.1	E3.2,F3.2,G4.1+G4.2	E3.2,F3.2,G4.1+G4.2+G4.3
Play	E3.2,F3.3,G4.1	E3.2,F3.3,G4.1+G4.2	E3.2,F3.3,G4.1+G4.2+G4.3

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Additional Quantities in Place-Unrecoverable

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	Low Estimate	Best Estimate	High Estimate
Discovered	E3.3,F4,G1	E3.3,F4,G1+G2	E3.3,F4,G1+G2+G3
Undiscovered	E3.3,F4,G4.1	E3.3,F4,G4.1+G4.2	E3.3,F4,G4.1+G4.2+G4.3

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E axis "minimum" Category or Sub-Category	F axis "minimum" Sub-Category	UNFC-2009 Sub-class
E2	F2.1	Development Pending
E2	F2.2	Development on Hold
E3.2	F2.2	Development Unclarified
E3.3	F2.3	Development not Viable

- NB: Sub-categories set 'minimum' standards for sub-classes.
  e.g. Development pending must be at least E2F2.1 and cannot be E3 or F2.2 (or lower)
  However, it can be E1F2.1 or E2F1.3

Total Resource Management

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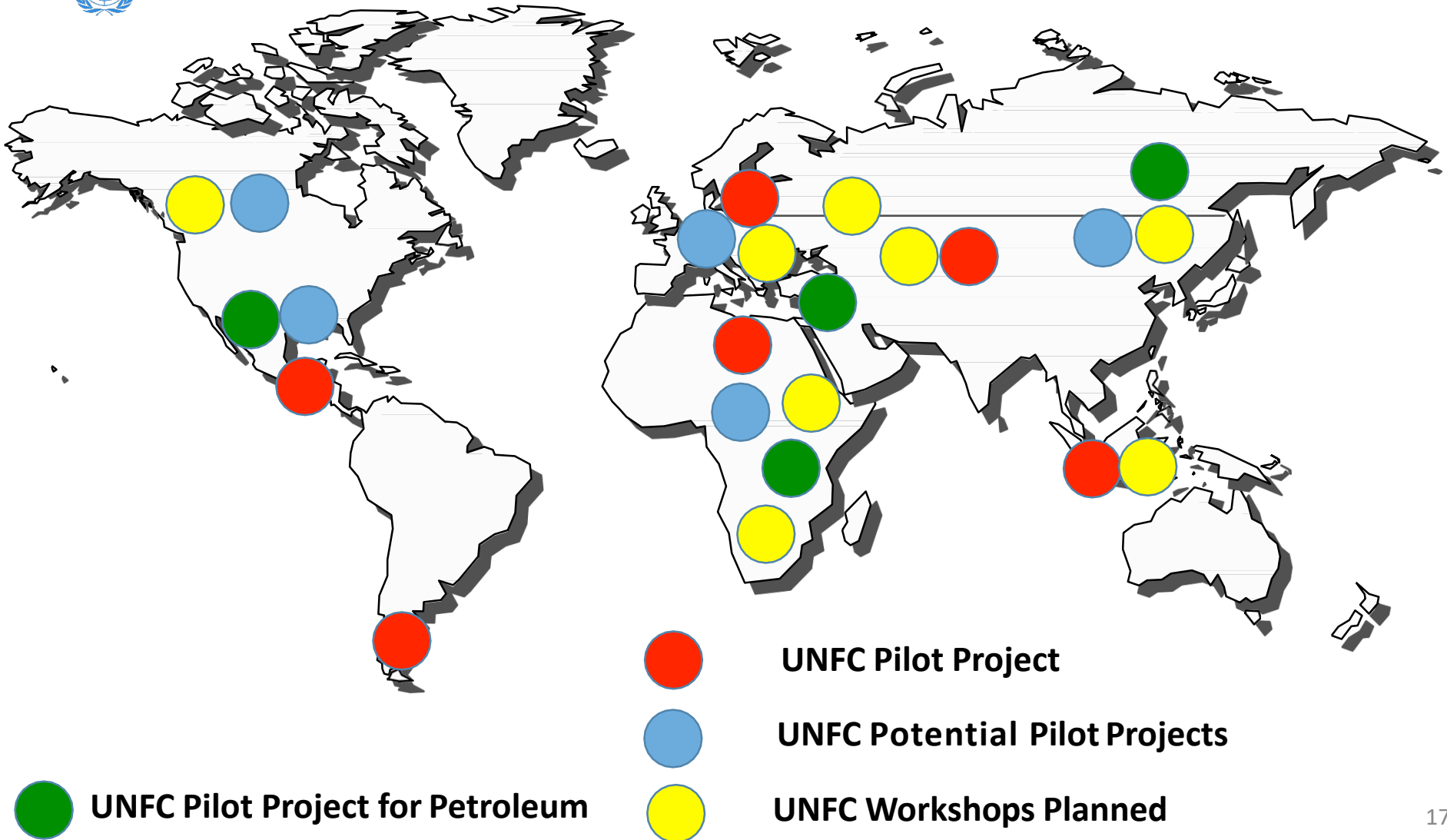
- Integrated Resource Management (IRM) Paper published by PWG in 2018
    - Aligned assessment of Total Resources (minerals, petroleum, renewables, etc.)
    - Classification and additional actions (such as detailed studies, including market analysis, obtaining regulatory approvals, securing project finance, etc.) to increase project maturity (E and F axes)
    - Integrated Resource Reporting
    - For NOC's, Resource regulators and other Government agencies
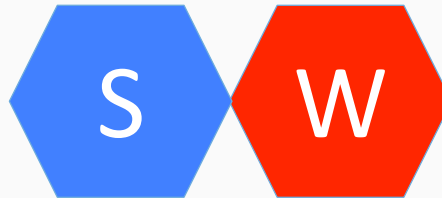
Global Shared Vision

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- 🔴 UNFC Pilot Project
- 🔵 UNFC Potential Pilot Projects
- 🟢 UNFC Pilot Project for Petroleum
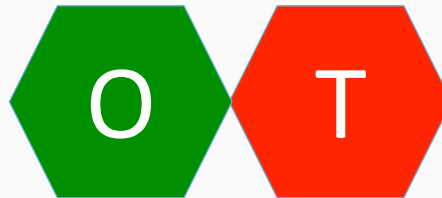- 🟡 UNFC Workshops Planned

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Strengths

- Numeric
- Covers all resources
- Uniquely captures socio–Economic issues
- Project based
- Maps to other systems
- 'Umbrella' Resource management System'

S **W**

Weaknesses

- Too complex due to 3D architecture
- Compromises mapping to other systems
- Slow uptake globally
- Perception (as a threat to other systems –This is also a S/O/T)

O **T**

Opportunities

- Integrated Resource Management (IRM)
- With NOC's and Government Regulators
- Workshops to promote UNFC globally
- Pilot Projects (test UNFC)

Threats

- Lack of uptake and support globally
- Other classification systems
- Potential marginalisation

UNFC – Global Context
Key Differentiators

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- UNFC use has been clearly demonstrated by success of the Mexico Pilot
  - Two papers will be presented in September at international conference

- Why use UNFC instead of other classification systems?
  - PWG project reviewed global classification systems
  - A paper is expected to be presented in future
  - SWOT analysis shows there are similarities and differences

- Key differentiators UNFC vis-a-vis other systems
  - Granular capture of Social and Environmental aspects
  - Project approvals would be linked to Some of the SDG's
  - Applies to all resources
  - Numeric

- What's needed?
  - Global uptake of UNFC
  - Requires traction by appropriate authorities to mandate its use in country
  - A period of transition will be required for training and uptake (up to 5 years)

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- 'Why change to UNFC if my classification system works'

- 'Costs involved in making the change'

- 'Massive Training effort required'

- 'Compliance – companies listed on stock exchanges use classification systems' ' doubles the costs for having two systems'

- 'UNFC is too complex'

- 'UNFC is relatively new while PRMS and CRISCO have been around longer'

- 'How can UNFC be regularly updated with few volunteers while PRMS and CRISCO have supporting societies with large memberships'

- Etc. etc.

Vision to develop strategies to counter real and imagined myths with clear messages

Concluding Remarks

- UNFC is a stand alone classification system for Petroleum

- UNFC maps seamlessly to other petroleum classification systems such as PRMS, RF2013, etc.

- UNFC promotes and uniquely incorporates environmental and social aspects into petroleum project consideration

- Successful UNFC usage for Petroleum demonstrated with Pilot Projects in several countries

- UNFC has multi-resource application other than petroleum (e.g. minerals, renewables, etc.).

- Total Resource Management may be possible by using UNFC as a tool for comparative analysis and decision making for finance allocation to national energy projects

Thank you!

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Mexico City

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