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Application of UNFC-2009 to Renewable Energy Resources

UNFC Workshop, Tuesday 26 April 2016

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History

- UNECE called upon the EGRC to "*develop ideas on how the UNFC could apply to and integrate renewable energy by December 2013*"
- Separately, an industry-led working group developed an estimation and classification methodology for Renewable Energy (London workshop, December 2012)
- The working group reported their findings at the 4th session of the EGRC held in Geneva in April 2013
- The EGRC established a Task Force on the Application of UNFC-2009 to Renewable Energy Resources
- The Task Force presented draft generic Specifications at the 5th session of the EGRC in 2014 and final generic Specifications at the 6th session in 2015
- The Task Force has initiated Work Groups (Geothermal, Bioenergy, and soon Wind & Solar) to develop commodity-specific Specifications

Why consider renewables in terms of resources and reserves?

Renewable asset owners	• Enhanced overview of asset values • Provide a measure of comparability with traditional energy systems • Offer a basis to estimate the scale of each renewable resource • Provide reliable estimates based on best practices and common standards
External stakeholders	• **Investment community** – Better assess and contrast investment opportunities – Enhance portfolio valuation • **Governments** – Better understand total resource base – Facilitate achievement of integrated energy strategy and policies • **Global organisations** – Assess and contrast global energy systems and different energy sources • **Other external users** (Interested public, accounting profession, technical consultants, etc.)

How large could renewable resources be?

- Bloomberg New Energy Finance used a simplified approach to estimate renewable resources from wind and bioenergy in the US and Brazil

Figure 1: US energy reserves

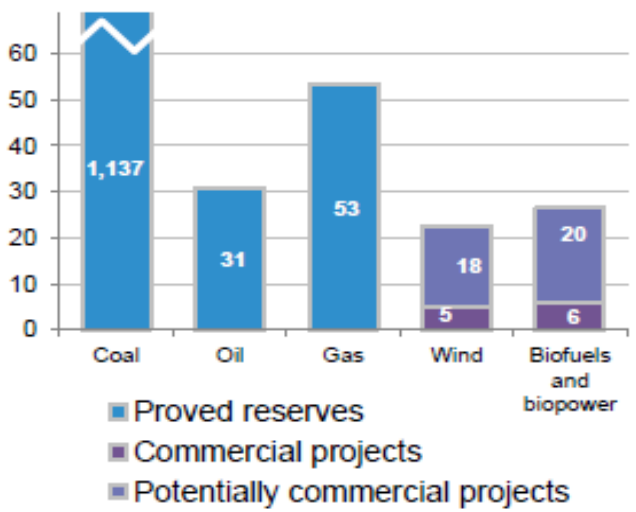
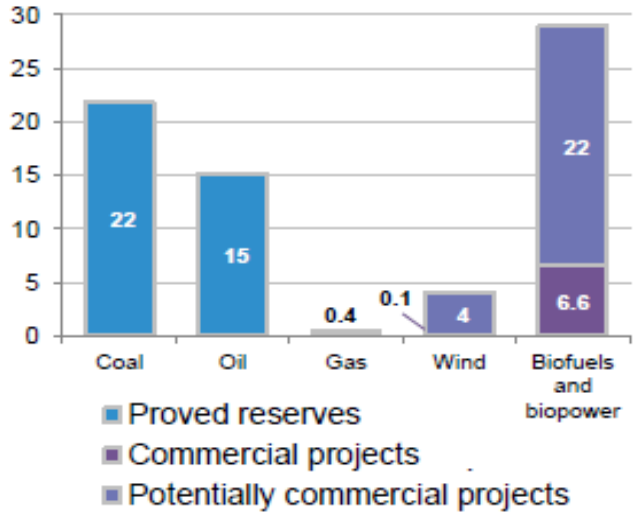


Figure 2: Brazil energy reserves



Source: Bloomberg New Energy Finance, BP Statistical Review 2012. Note that Commercial projects are equivalent to Proved reserves for fossil fuels.

In the US, these are about 1/7 the size of Proved oil and gas reserves

In Brazil, these resources amount to over 2/5 of the country's Proved oil and gas reserves

Is it feasible to apply resource classification to renewable projects?

- Most renewable projects are not subject to depletion, as for fossil fuels and minerals
- However, they can be considered in the same way: in terms of future cumulative energy production under a prescribed set of conditions
- Renewable projects are similar to fossil and mineral projects:
  - a project has a fixed level of investment, with an expected production profile
  - they progress through stages
  - they have similar prerequisites such as gaining access to the resource and market, receiving authorisation, and validation of the economic case
  - as the project develops, risk declines and certainty of returns improves
- This means they can be evaluated and classified into categories depending on their technical, commercial and socio-economic viability

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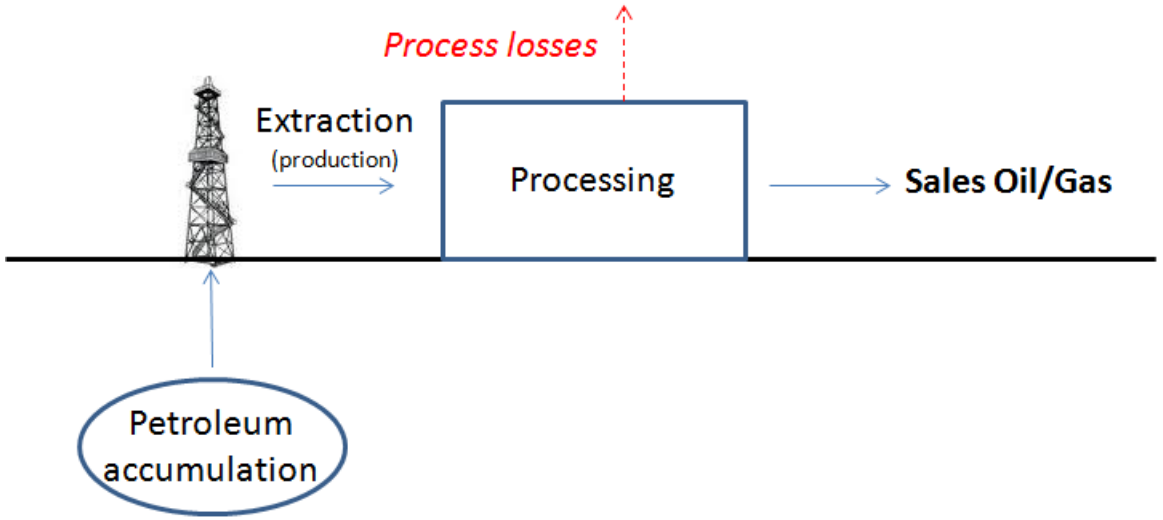
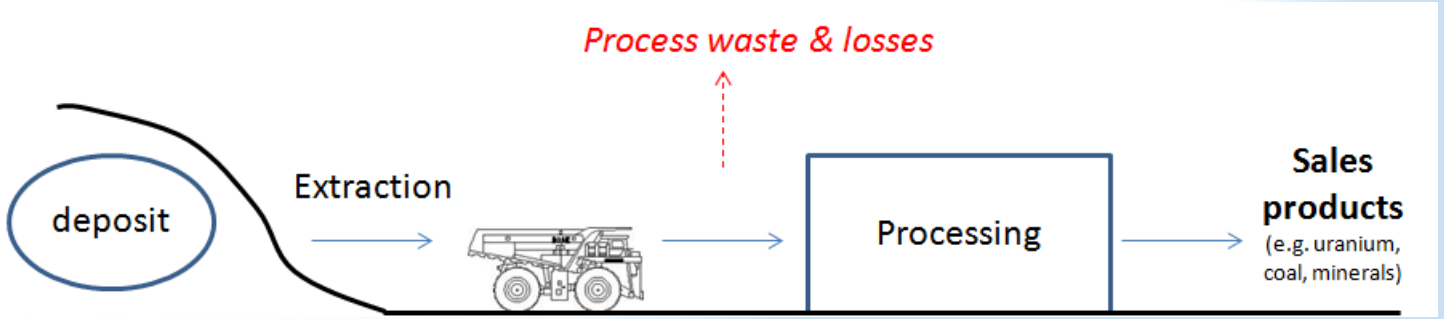
The Concept: UNFC-2009 is “Project-Based”



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



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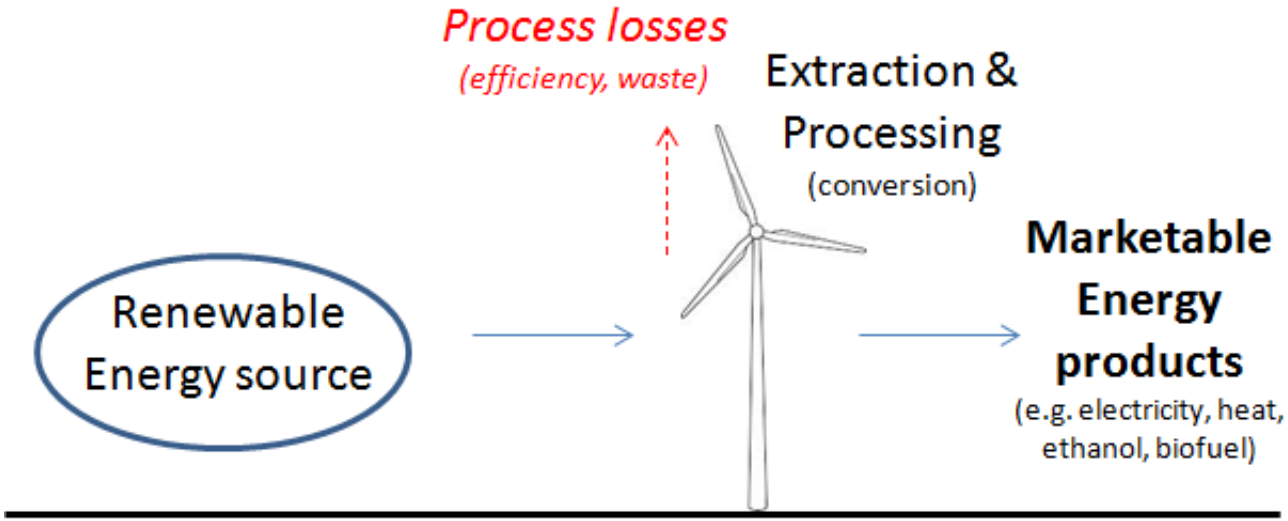
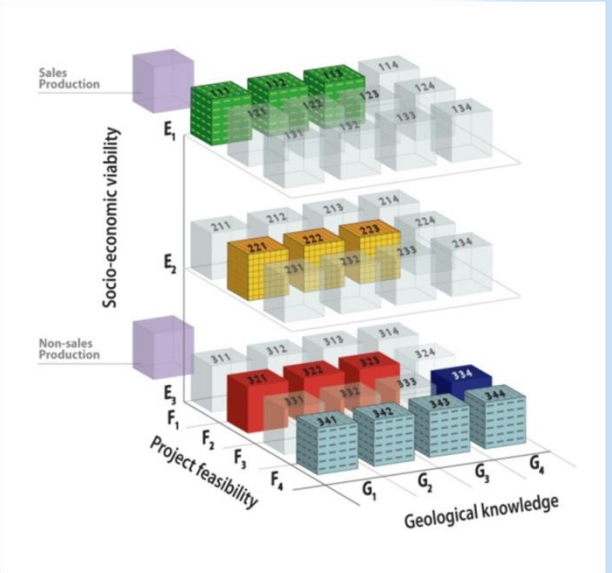
Renewable Energy Projects are Very Similar to Fossil Energy or Mineral Projects



UNFC-2009



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

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What are “Renewable Energy Resources”?

Renewable Energy Source:
The primary energy available for extraction/conversion

Renewable Energy Resources:
cumulative quantities of extracted and marketable Energy Products from the Renewable Energy Source, measured at a Reference Point

Renewable Energy Source

Extraction / Conversion

Examples: Electricity

Heat

Biofuel

Examples: *sun, wind, bio mass, earth heat, river flow, tides etc*

Process/project:
Wind park, solar park, hydro power plant, sugar cane mill, geothermal

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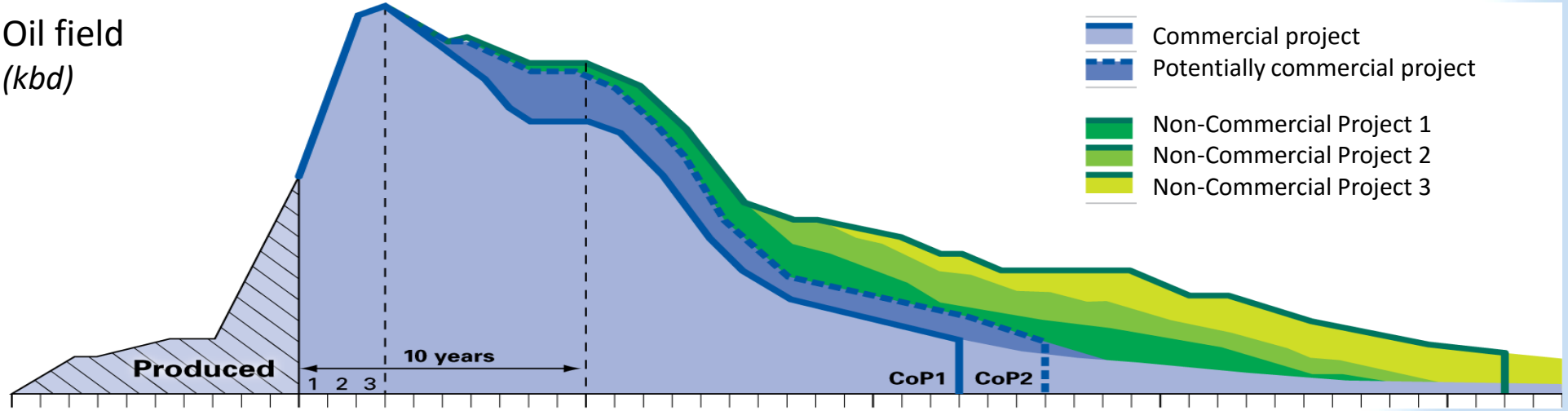
Illustration: oil field vs wind farm

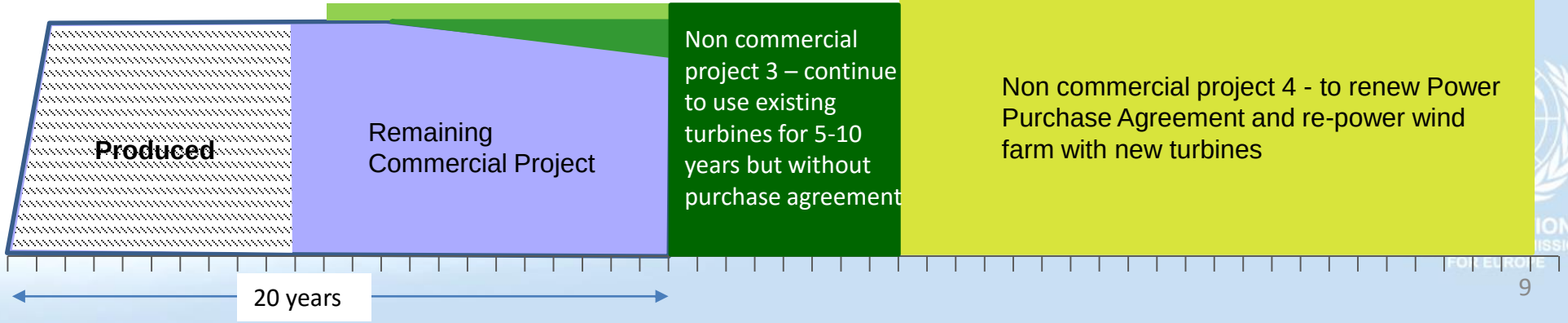
Oil field
(kbd)

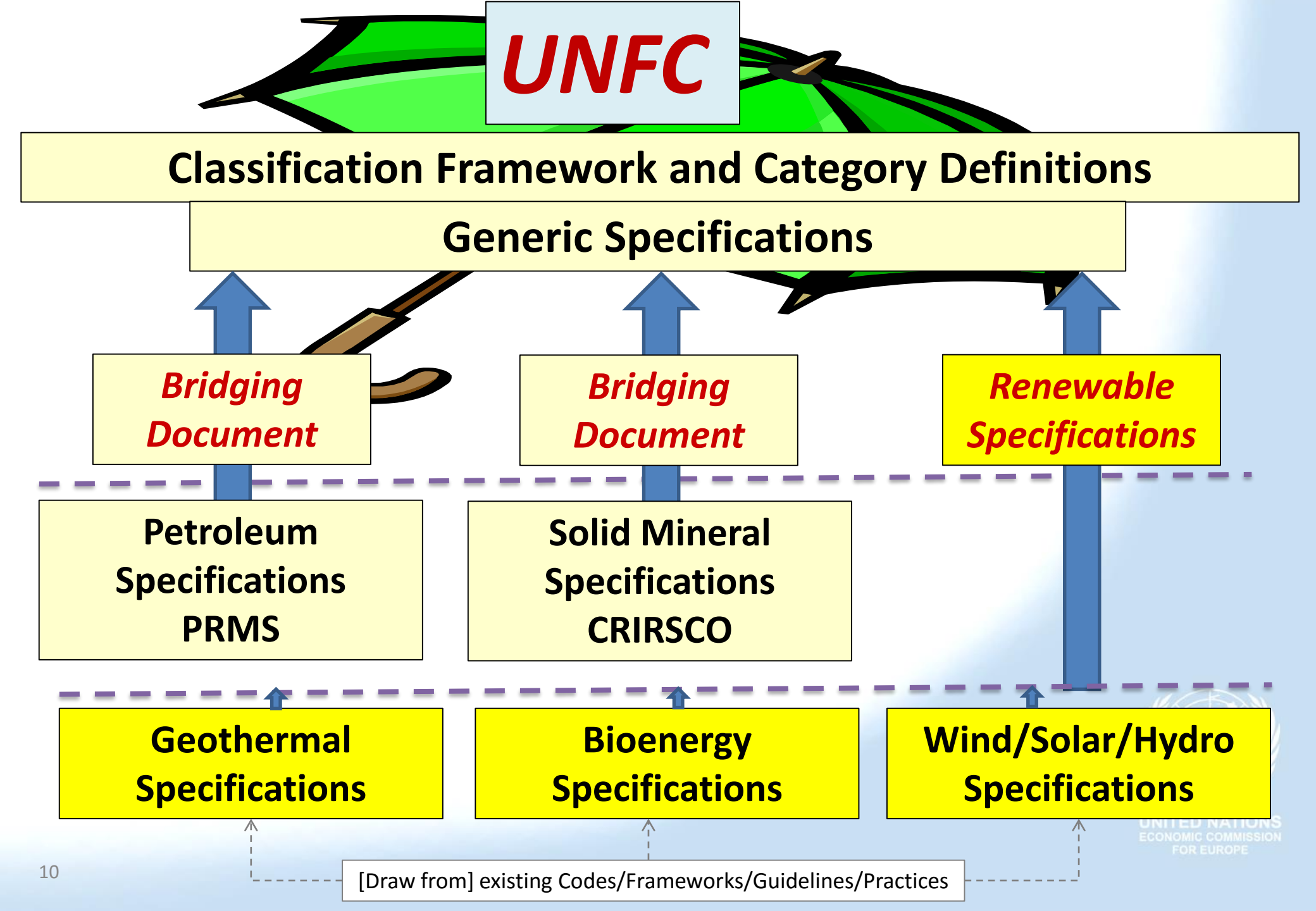


Non commercial project 1 - to invest in plant efficiency to retain same throughput over lifetime of the plant

Non commercial project 2 - to increase turbine efficiency and decrease downtime on maintenance, resulting in higher throughput

Wind Farm
(MWh)




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

Progress to Date

- **2015** - **Draft Generic Specifications** on the application of the UNFC-2009 to Renewable Energy as been published on the UNECE website after incorporation of comments received from the Public and the EGRC TAG.
- Two working groups have been established to develop the **Commodity-specific Specifications for:-**
  - **Geothermal:** (in MoU with IGA). Initial draft specifications to be presented at the 7th EGRC session, final specifications at the 8th session (2017).
  - **Bioenergy:** Initial draft specifications to be presented at the 8th EGRC session, final specifications at the 9th session (2018).
  - **Solar/Wind/Hydro:** work on-going to establish a working group.
- **G Axis Review WG:** WG established to review and produce recommendations to improve and clarify the applicability of the G axis to renewables.

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Summary

- Renewable Energies form a rapidly growing (all be it from a small base) proportion of the world's primary energy supply.
- The Paris agreement on the limitation to global temperature increase is likely to require further significant renewable energy development and growth.
- Considering environmental and societal pressures, they should be developed and implemented in the most **effective & efficient way**
- Such development will take place only if there is a **business case for investors** to finance this development
- This business case demands a **representative evaluation** of the uncertainty, maturity and value of the resources to develop
- The application of the **UNFC-2009** to Renewable Energies provides a universally recognized system to help conduct this evaluation

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