

Mining beyond Mining

Introducing the latest UN framework
UNFC & UNRMS



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Overview of my experience



- Engineer, Master of Science, Master of Business and Administration
- 1991 – Enter COGEMA (then AREVA, today ORANO): nuclear fuel cycle
 - Spent fuel recycling and Return of high level waste from France to Japan and Germany
 - Development of uranium mining ventures and modelling of enrichment by laser
 - Non proliferation and safeguards
 - Counsellor for international affairs to the CEO
 - AREVA Japan, Strategy and Partnership
 - Mitsubishi Nuclear Fuel Co, senior executive vice president
- 2011 – 2015 Nuclear Counsellor, French Embassy in Japan (and Mongolia)
- 2015-2022 IAEA, Director Fuel Cycle and Waste Management
 - Including decommissioning, research reactors, medical waste and radioactive sources
- 2022 – Independant International Expert, President - The Sailing Brain Consulting



Critical Raw Materials and the World

- You don't choose where the geology is
- Extractive industries have a footprint
 - Especially mining: environment, social, carbon footprint, ...
- Downstream, refining is a mainly chemical process
 - Safety and environmental impact
- Recycling is also a chemical process
 - And transportation from where the used equipment is to the processing plant can also have an impact

True for all
extractive
industry

Mining and Critical Raw Material
and Developing Countries Practices
are under scrutiny



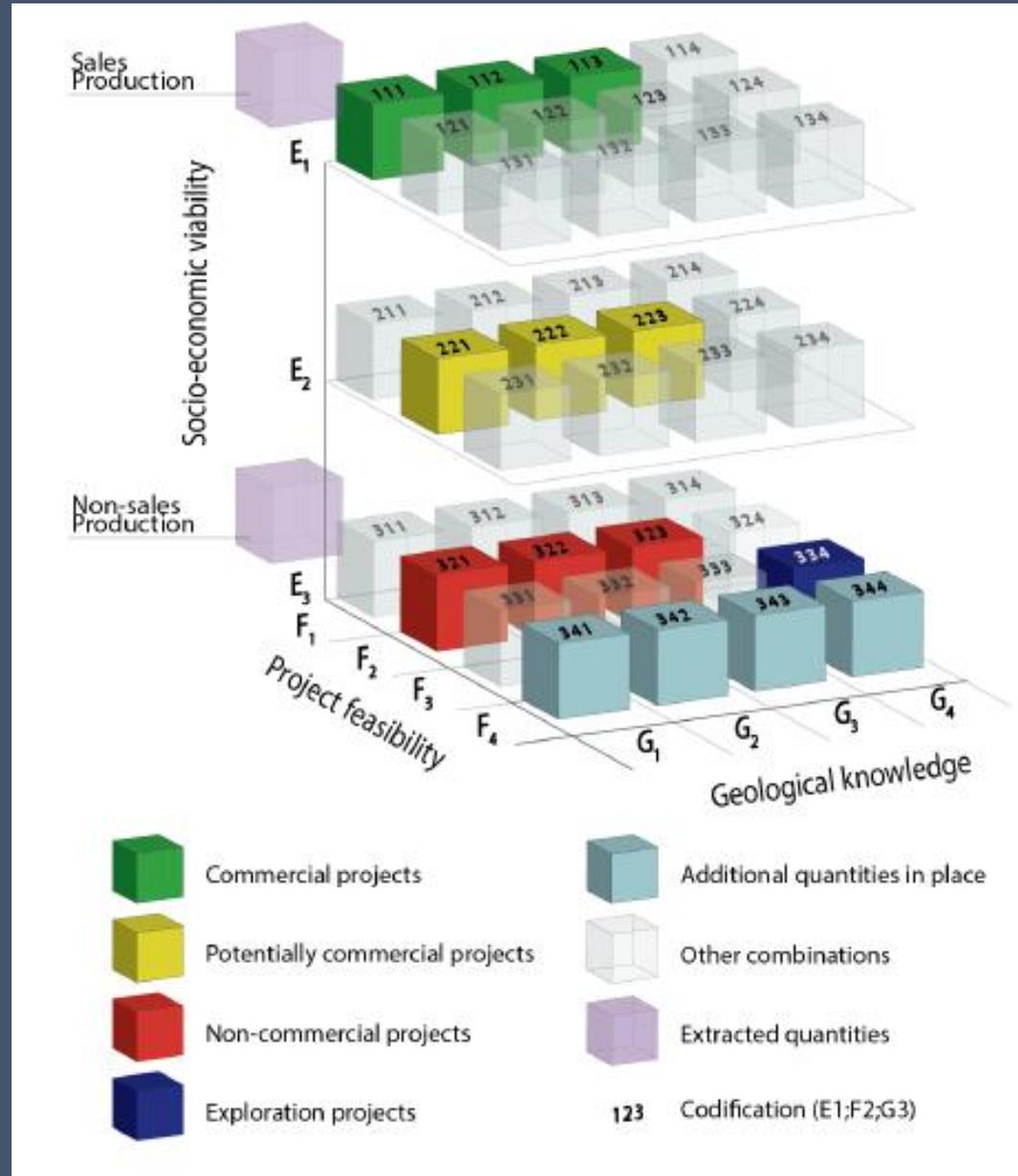
UNFC

U.N. Framework Classification for Resources

A classification going beyond geology



UNFC: a comprehensive and multi-dimensional assessment



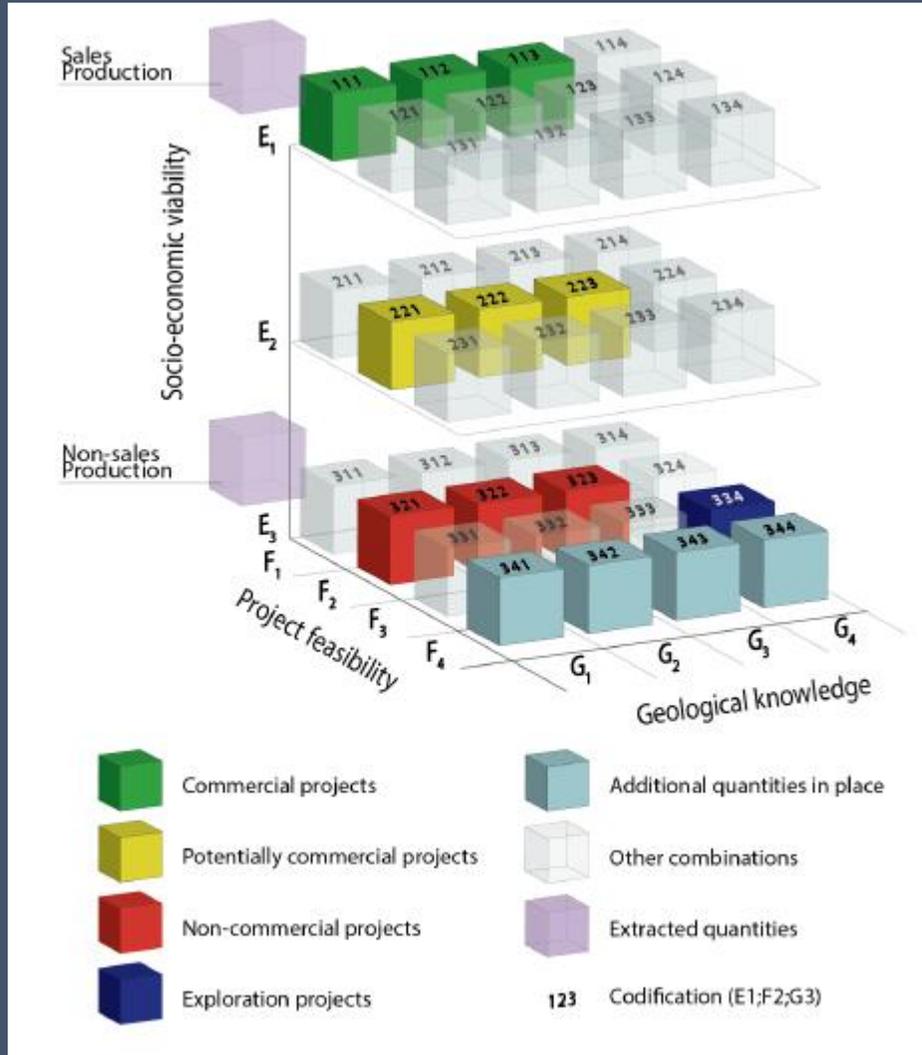
UNFC: a classification going beyond geology

- **G-Axis: Geology**
 - Inferred, Indicated, Measured
 - Compatibility with existing classification framework
- **F-Axis: Feasibility**
 - technical
 - economical
- **E- Axis: Socio-Economic**
 - Licensing and permitting
 - environmental
 - consultation with local communities,

A tool to better understand “time to market”



What UNFC brings: a comprehensive and multi-dimensional assessment

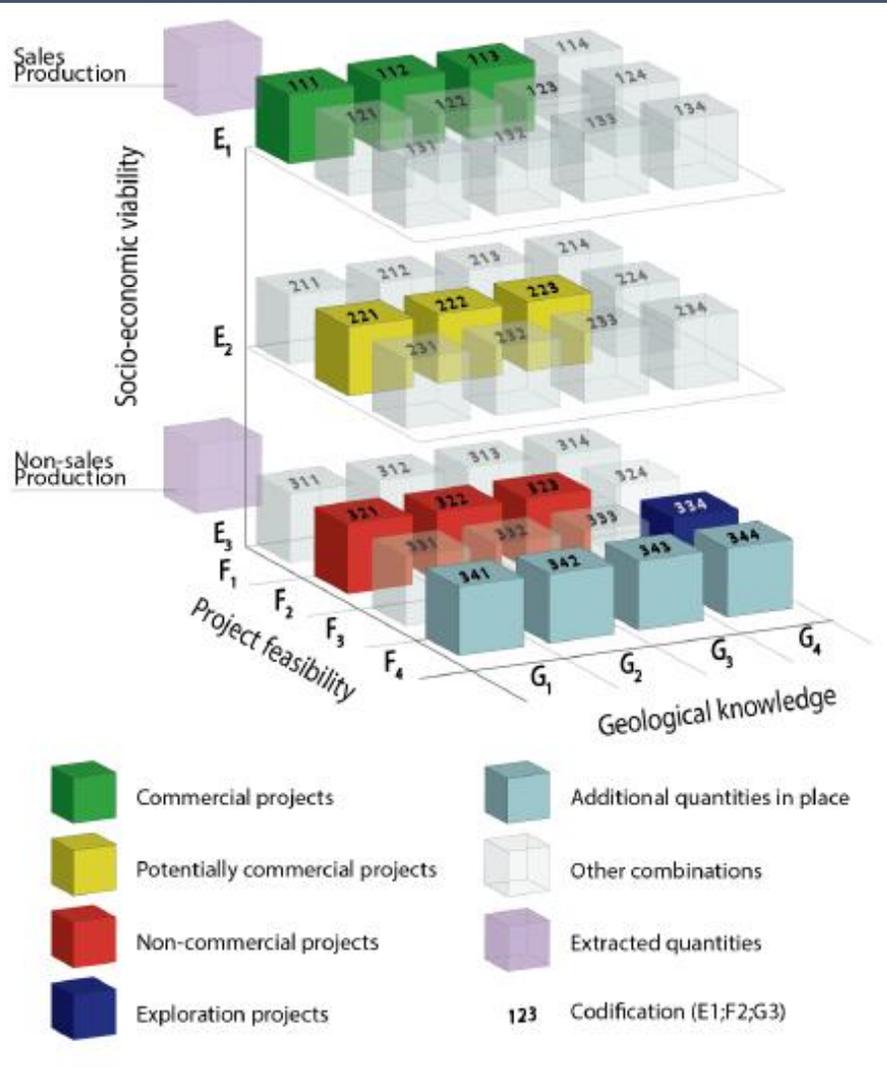


- ## Benefits of using UNFC
- Structured framework of principles, rules and guidelines
 - Aligned to major international and national classification systems
 - Provides simplicity without sacrificing completeness or flexibility
 - Leverages global communications



Circularity: account for « above the ground » minerals

UNFC's classification can be applied



Geology

→ « Urban » mining

Project feasibility

→ Collection and recovery

→ Process for reuse in same or different product

→ Market and economic viability

Socio economic viability

→ Business plan

→ Environmental impact

→ Permitting and local dynamic



UNRMS

U.N. Resource Management System

Principles for a fair and sustainable
resource management



The social and societal aspects

- “Acceptance”, social aspects are also important
 - Not in my backyard
 - Why me?
 - Why in these countries ?
 - Geopolitical views or Advocacy for a cause
- The large multinational in a poor and undeveloped place
- What do I know from my supply chain?
 - Human rights
 - Working conditions
 - Mining to fund war

Mining and Critical Raw Material
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Global cooperation - a key enabler for sustainable supply of critical raw materials.

- The global supply chain for critical raw materials is complex and often involves countries with different regulations, policies, and environmental standards.
- **Global cooperation and coordination among countries, industries, and stakeholders are crucial to ensure the sustainable and responsible sourcing, extraction, and recycling of critical raw materials.**
- Support for the global south, infusion of green finance and technology transfer are integral to the global collaboration.



UNRMS in its own words

UNRMS is a comprehensive resource management system for sustainable development that supports and enables the implementation of the 2030 Agenda for Sustainable Development. It covers various resources, such as minerals, petroleum, renewable energy sources, nuclear resources, anthropogenic resources, geological storage and groundwater.

UNRMS is designed to be a/an:

- Global voluntary system for resource management to be used by governments, industry, investors and civil society;
- Innovative integrated resource management framework for resources that supports the development of policies and regulations in the sustainable management and advancement of the Sustainable Development Goals (SDGs);
- Comprehensive information framework and methodology to support resource progression applicable for programme, portfolio, project and asset-level management;
- Sustainability framework to aid the financing of resource sectors.





UNRMS principles

- State rights and responsibilities in the management of resources
- Responsibility to the planet
- Integrated management of resources
- Social engagement
- Service orientation for the use and re-use of resources
- Comprehensive resource recovery
- Value addition
- Circularity
- Health and safety
- Innovation
- Transparency
- Continuous strengthening of core competencies and capabilities



Other frameworks and guidelines

- UN Guidance for Action on Critical Energy Transition Minerals
 - 7 principles
- OECD guidelines
 - Due Diligence guidance for responsible mineral supply chain
- EITI Extractive Industries Transparency Initiative
 - Corruption or mis-used of funds can be an issue ...
- IRMA: Initiative for Responsible Mining Assurance

IRMA's approach to responsible mining is to independently assess social and environmental performance at mine sites globally using an internationally recognized standard that has been developed in consultation with a wide range of stakeholders.



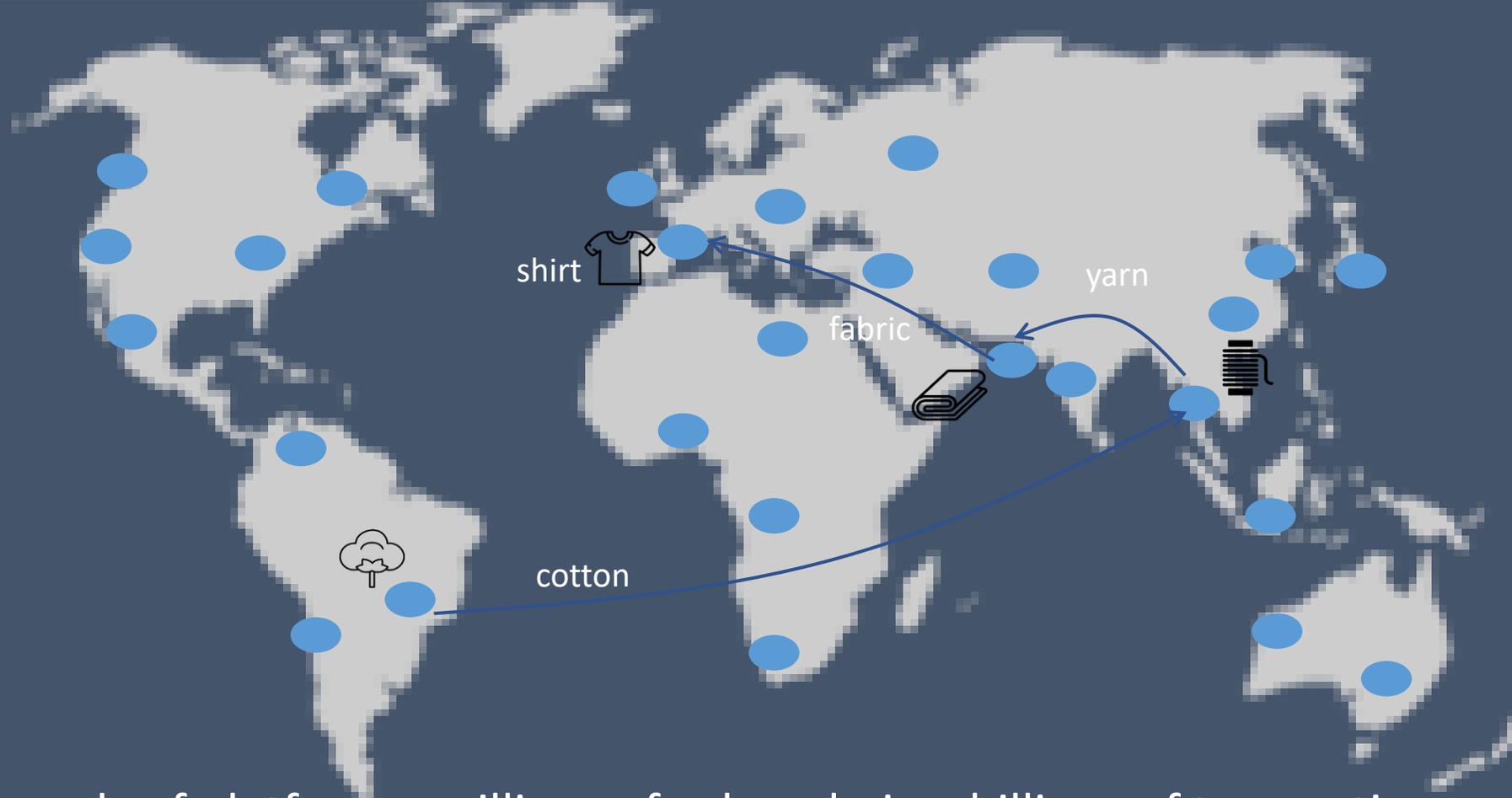
Traceability and Identification

- Digital Product Passport
 - Material content
 - Origin
- Digital Credential
- UNTP protocol



UNTP is an interoperability protocol, not a platform

Leave data where it is but link it together when needed using decentralised events.
Use any software you like – so long as it conforms to UNTP.



Thousands of platforms, millions of value-chains, billions of transactions



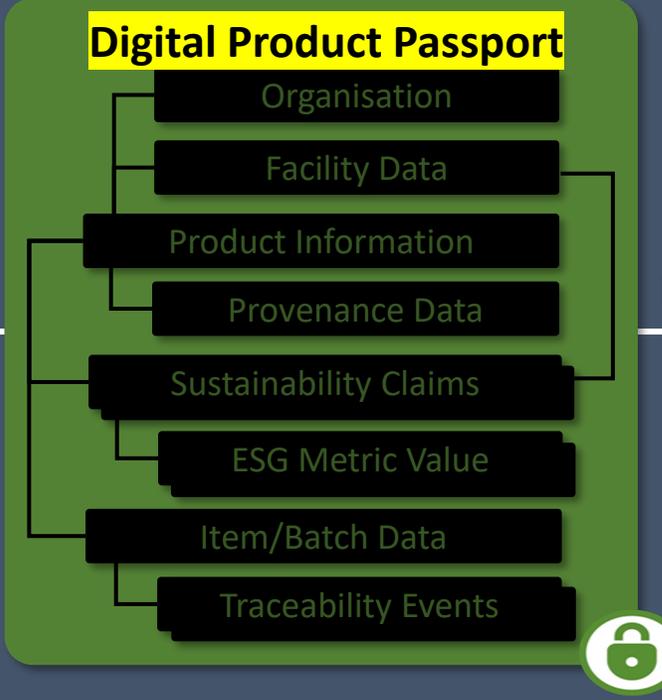
It defines 3 documents and a simple way to share them

If you've got the product ID then you can get the data, readable by humans and machines

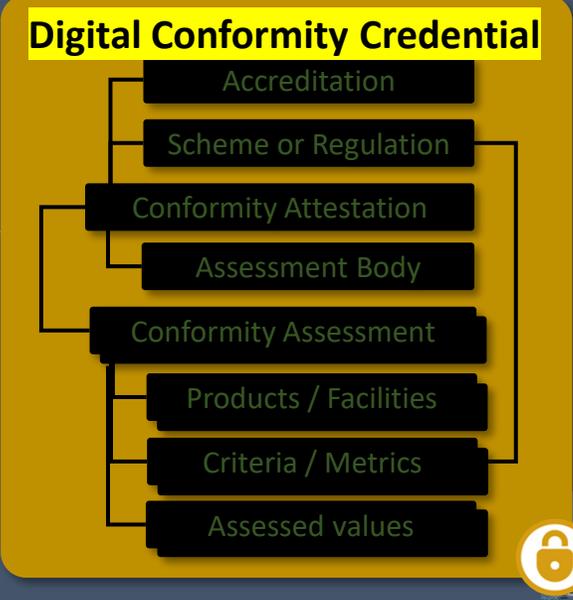


Transparency

Traceability



Trust



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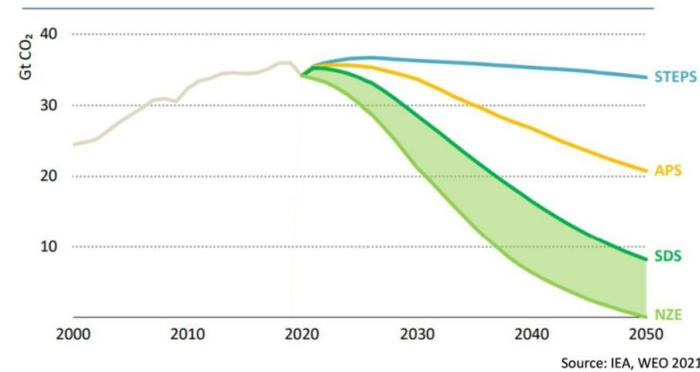
Mining beyond Mining

Thank you for your attention
Questions and Discussion are Welcome

An Utopia can become True with Vision and Dedication



We all know this: more electricity needed ! And let's have it no / low carbon

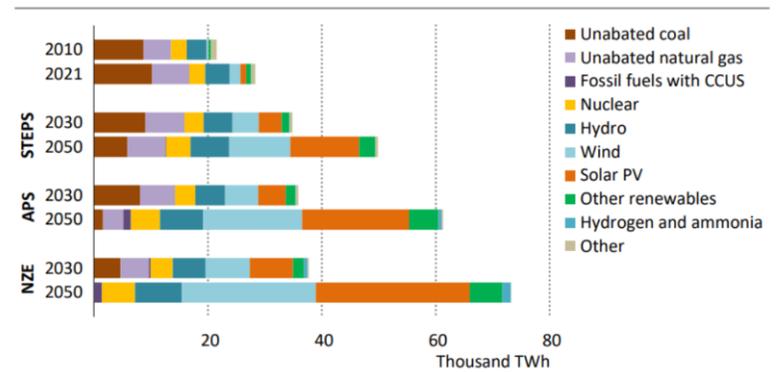


STEPS: Stated Policies Scenario/ *Scénario politiques Déclarées*
APS: Announced Pledges Scenario/ *Scénario Engagements Annoncés*
SDS: Sustainable Development Scenario/ *Scénario Développement Durable*
NZE: Net Zero Emission/ *Scénario Zéro Emissions Nettes d'ici 2050*

IEA / WEO scenarii

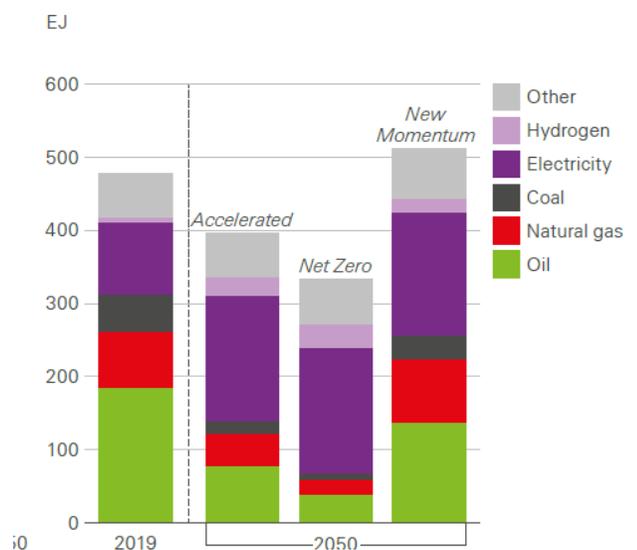
Even with more sobriety

Figure 6.7 Global electricity generation by source and scenario, 2010-2050



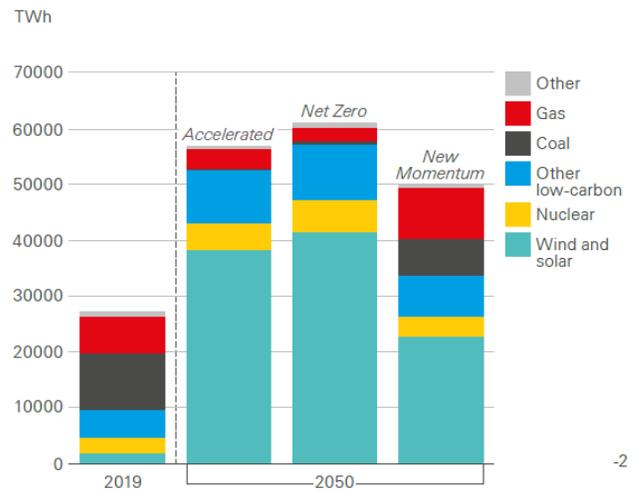
IEA. CC BY 4.0.

Total final consumption by fuel



BP Outlook

Electricity generation by fuel



-2

More electricity needed ! And let's have it no / low carbon

Even with
more sobriety

Green Renewable Energies



Red Critical Raw
Material

Digitalization and AI



Red Critical Raw
Material

More minerals needed !

Traceability and Identification

- Digital Product Passport
 - Material content
 - Origin
- UNTP protocol
- Digital Credential

- Blockchain
- Artificial Intelligence

Which can scale across entire supply chains.

Each party can implement UNTP without any dependency on other parties.

