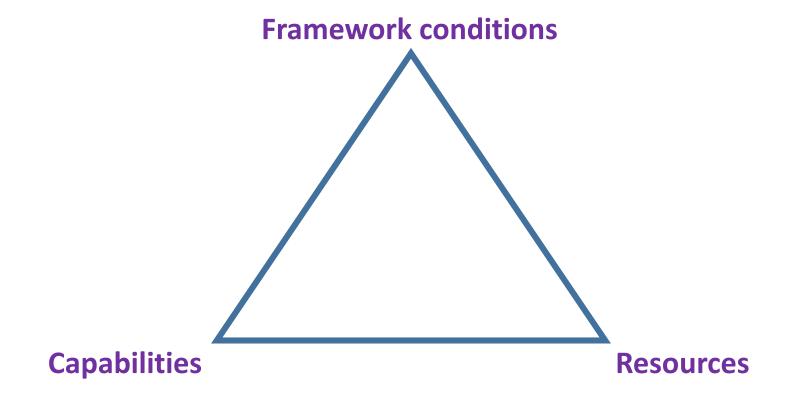
The role of UNFC in an efficient industrial ecosystem

David MacDonald, Julian Hilon, Sigurd Heiberg

UNFC Workshop at the 8th session of the EGRC Geneva, April 25th 2017



Three cardinal elements of industrial ecosystems



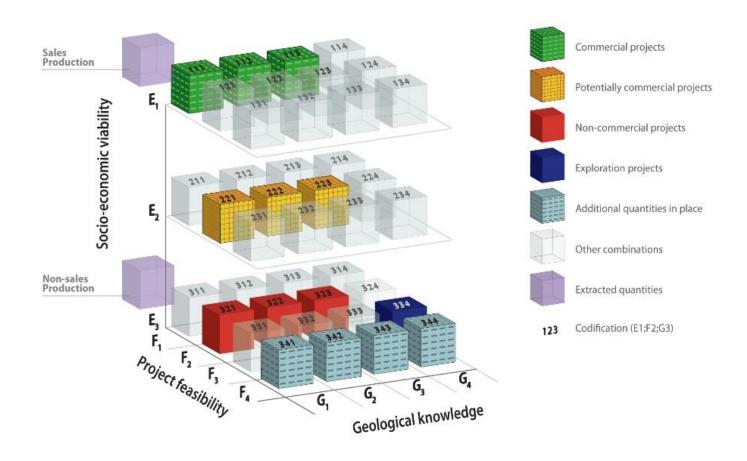
Securing affordable and sustainable services

- Value at the source of production
- Alignment of stakeholder interests
- Recovery factors, economic and social impact
- Security of energy and mineral supplies

E-axis: Economic, social and environmental frameworks

F-axis: Industry capability

G-axis: Resources



Accounting of change: Example for one project

					Output columns							
								F1		F2		Total
								Extractable	-	Extractable	_	quantity
					Sales	Non-sales	Commercial	non-sales	commercial	non-sales	in place	change
				Final quantity	10	1	116	4	0	C	190	
							E1F1.1	E3.1F1.1	E1F2.1	E3.1F2.1	E3.3F4	
		Class	Initial quantity	class no	1	2	3	4	5	6	7	
Input rows		Sales		1								
		Non-sales		2								
	Commercial	E1F1.1		3								
	F1 Extractable non-sales	E3.1F1.1		4								
	Potentially commercial	E1F2.1	100	5	10		95		0			į.
	F2 Extractable non-sales	E3.1F2.1	10	6		1	1	4		C		(
	Remaining in place	E3.3F4	200	7			20				190	10

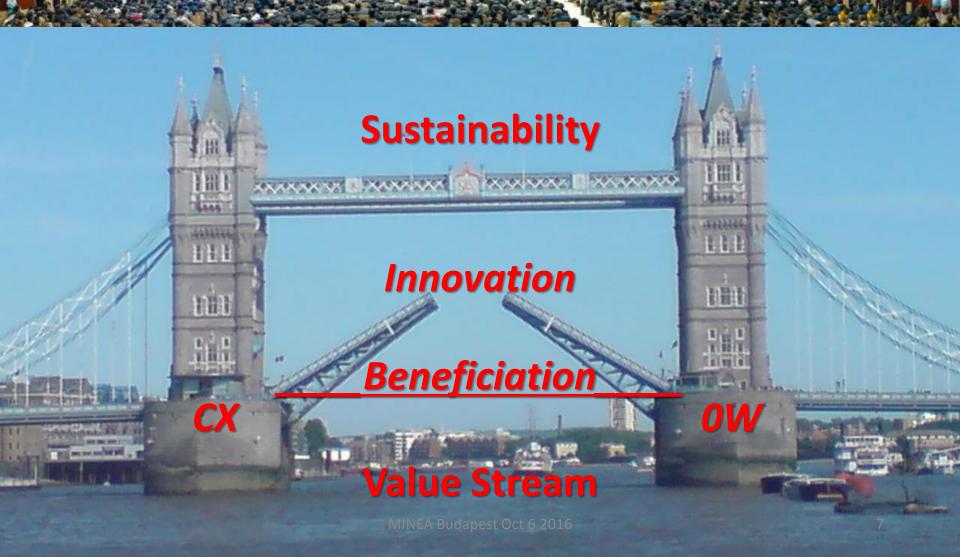
Stay flexible to weather multiple reform cycles

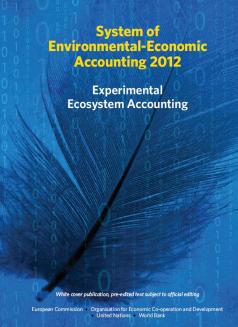
- Develop integrative dynamic capabilities for:
 - Comprehensive no-waste extraction under changing frameworks
 - High social and environmental demands to meet SDG's and Paris Accord
 - Professionals with transferrable skills capable of managing the public and private sectors
 - Appropriate capital allocation under change



United Nations Resource Classification for Fossil Energy and Mineral Reserves and Resources (UNFC), an International classification of energy and mineral resources that include socio-economic conditions for extraction

From Novel Concepts, To Innovative Solutions





System of Environmental-Economic Accounting 2012

Central Framework







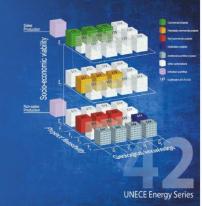






UNITED NATIONS ECONOMIC COMMISSION FOR EUROPE

United Nations Framework Classification for Fossil Energy and Mineral Reserves and Resources 2009 incorporating Specifications for its Application





Radiation Protection and Management of NORM Residues in the Phosphate Industry



The Toolkit is Available Let's use it!