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*Notes for Plenary Session:
Atlas of Green Technologies:
Potential and Opportunities*

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Purpose

- To create a comprehensive agenda of green innovation opportunities

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Why this presentation?

- We need a green agenda for MOT community
- Green goals cover a wide spectrum
 - From: Reduce, reuse, recycle. To: Molecular accountability
- Need to formulate goals in an MOT-compatible format
 - Concepts and structures in harmony with MOT procedures and BOK

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Two requirements

- Appropriate mindset – Technological acuity
- Structured tools – Atlas of Technological Pathways

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Technological acuity: Five key concepts

- **Technological acuity**
 - The active understanding of the full range of technologies and the pathways along which they progress
- **Technology**
 - Competence created by people and expressed in devices, procedures and human skills
- **Units of technology**
 - Technological entities, composites of “hardware”, “software” and “skillware”
- **Purpose of technology**
 - The provision of functionality
- **Functionality**
 - The ability to transform physical reality

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Models for grasping the “full range of technologies”

- Engineering model
 - Academic and professional categories – boundaries not defined
- Thematic model
 - Diverse physical categories – boundaries not defined
- Economic model
 - Economic categories, e.g., ISIC – boundaries defined but complex
- Functionality model
 - Technological categories, i.e., nine fundamental functions – boundaries defined and simple

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Functionality grid

		Action		
		Process	Transport	Store
Output	Matter (M)	Transforming substances	Moving substances	Holding substances
	Energy (E)	Generating energy	Transmitting energy	Keeping energy
	Information (I)	Composing messages	Sending messages	Saving messages

Van Wyk, Rias J: *Technology - A Unifying Code*, 2004, SMG, Cape Town, p. 34
Based on: Ropohl, Gunter: *Eine Systemtheorie der Technik*, 1979, Carl Hanser Verlag, Munich and Vienna, p. 178.

Use the functionality grid to

- Obtain a grasp of the full range of technologies
- Reveal the prime pathways of technological progress

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Use functionality grid to track technological progress

- Observe progress in each of nine cells
- Technological progress = Improved functionality
- Improved functionality = Better Technology Performance Metrics (TPMs)
- Three kinds of TPMs
 - More output with less input
 - Take less time
 - Require less space
- Create Atlas of Technological Pathways
 - Use twenty seven major trajectories
 - Use derived trends

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Atlas of Technological Pathways defines green opportunities

- Better TPMs = Less environmental disruption

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Green innovation opportunities - 1

		Action		
		Process	Transport	Store
Output	Matter (M)	Smog eating concrete	Magnetically levitated transport	Bio-degradable packaging
	Energy (E)	Bio fuels	Superconductive grids	Torus rings
	Information (I)	Energy efficient processors	Universal interface	Paperless info stores

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Green innovation opportunities - 2

		Action		
		Process	Transport	Store
Output	Matter (M)	Nanoscale manufacture	Particle transmission	Programmable packaging
	Energy (E)	Industrial photo synthesis	Solar tubes	Light stores
	Information (I)	Genetic synthesis	Meaning gleaning search engines	Quantum stores

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Wrap up

- **Comment by panelists**
 - Is this a valid quest?
 - Is this a workable approach?
 - Is technological acuity a viable managerial concept?
 - Is the functionality grid an understandable construct?
 - Is the Atlas a practical tool?
- **Possible enterprise**
 - An agenda of green innovation opportunities
 - Can this be brought to life?

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