UNRMS in Action
UK Circular Approach

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RESOURCE MANAGEMENT WEEK 2024
Circular Economy, is a core component of the UNRMS

Fundamental principles relating to Circular Economy include:

- **Principle 5**: Service Orientation for the Use and Reuse of Resources
- **Principle 6**: Comprehensive Resource Recovery
- **Principle 7**: Value Addition
- **Principle 8**: Circularity
Case Study: UK Circular Approach
UK Critical Minerals Strategy – NICER, Met4Tech – CMIC - ICE-SRM Circular Economy

- UK Critical Minerals Strategy
  - Accelerate – Collaborate - Enhance
    - “...accelerating a circular economy of critical minerals in the UK...”

- National Interdisciplinary Circular Economy Research (NICER) program including the UKRI Circular Economy Centre for Technology Metals (Met4Tech)

- Critical Minerals Intelligence Centre (CMIC)

- International Centre of Excellence on Sustainable Resource Management in the Circular Economy – Opening April 2024
Case Study: UK Circular Approach

Cornwall Case Study

- UNESCO World Heritage Site: Cornwall and West Devon Mining Landscape
- Surface Quarrying: Kaolin, Lithium, Tungsten, Rubidium, Caesium, Potassium
- Agri/Aqua-Culture: Sustainable agriculture, aquaculture, and water resourcing practices
- Remediation: Value-creation from cleaning up industrial legacy
- Exceptional Natural Spaces: 250 km Heritage Coast, 167 SSSI, 12 Special Conservation Areas, 498 County Wildlife Sites, 9 Marine Conservation Areas, 20% UK’s designated bathing beaches
- Building Space for Nature: Nature recovery
- Underground Mining: Tin, Tungsten, Copper, Zinc, Mine water geothermal heat, energy storage infrastructure
- Deep Geothermal: Electricity, Heat, Lithium
- Shallow Geothermal: Heat, Lithium
- Metasedimentary Country Rock (Kilias)

Principle 5: **Service Orientation for the Use and Reuse of Resources**

Resources shall be produced primarily as a **service to society**

- **Resources as a Service**
- “Providing a service rather than selling goods”
- Challenging for exploration and extractive companies to identify how they would work within this framework in the current linear system.

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**“Two views of sustainability”**

1. Turning geological natural capital into human, infrastructure, and environmental capital. For the producers this may be seen as providing a service.

   - "Public" direct neighbours & wider society. Accept & partner to build human, business & infrastructure capital.

2. Metals as sustainable materials, right from the first stages of exploration, and retain highest value for as long as possible in a Circular Economy.


**Principle 6: Comprehensive Resource Recovery**

Sustainable resource management shall facilitate and support the knowledge base and systems for comprehensive value recovery at all operation stages.

- **Innovative Resource Capture**
  - Identifying and capturing the full resource potential.
  - Requires a collaborative approach between industry, society, service providers, and governance organisations.
  - How can business models be developed for this? How to record value that is not associated with direct profit creation?
Principle 7: Value Addition

Sustainable resource management shall **facilitate and support value addition** throughout the life cycle.

- **Value Chain Maturity**
- Opportunities for industrial symbiosis.
- Opportunities for regional – national value addition.
- Highlights where value chain needs to transition across borders and/or where there are missing ‘links’ in the chain.
Principle 7: Value Addition

Sustainable resource management shall **facilitate and support value addition** throughout the life cycle.

UNFC for downstream and reverse logistics value chain components require additional study.
Waste – what is in a word?

“Any substance or object which the holder discards or intends or is required to discard.” EU, 2008, Directive 2008/98/EC

Precautionary, catch-all definition that is designed for hazard minimisation which can be at odds with material circularity.

Easy to call a material stream waste, however once it is termed waste it is very challenging to reprocess or recycle.

Principle 8: Circularity
Sustainable resource management shall facilitate and support the knowledge base and systems for responsible design, use, reuse, recycling and minimization of waste at all stages

Circular Economy Butterfly Diagram:
Adapted after: Ellen MacArthur Foundation Circular economy systems diagram (February 2019) and Galloud & Laperche Circular Economy, Industrial Ecology and Short Supply Chain (2018)
1. **Resources as a Service** is viewed as an interesting concept, however, primary producers, especially smaller scale operators and/or exploration companies find it hard to see the link to their operations.

2. **Novel and innovative technologies** can unlock opportunities for comprehensive resource recovery – there is progress in this area – requires a broader range of stakeholders to enable and scale-up responsibly.

3. **Value addition** is seen as a crucial aspect of critical minerals value chains – much of the value add is in the downstream which is often outside of the regional area – requires a more national/global study to identify opportunities.
   - Feasibility studies on value addition have been commissioned building on ideas from the Cornwall UNRMS Case Study.

4. **Waste definitions** can cause challenges for circularity ambitions.

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**Summary**

**Case Study: UK Technology Metal Circularity**
Thank you!

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