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Implementing the principles of the UNRMS for good resource governance



British
Geological
Survey

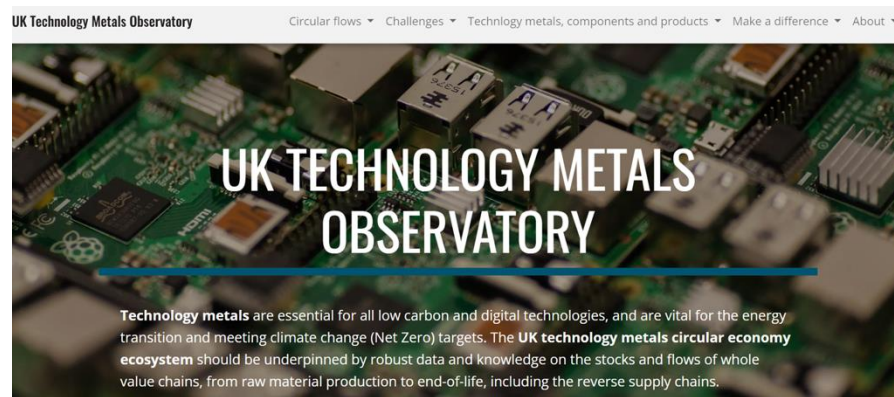
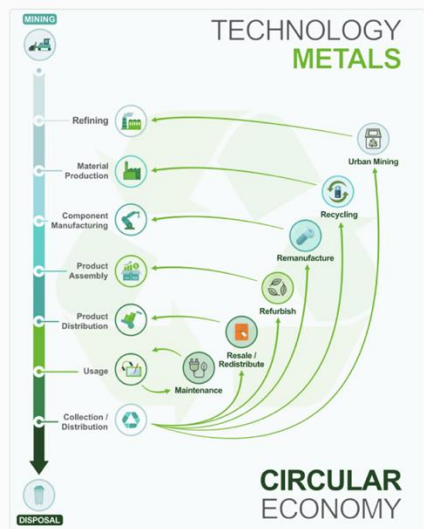
Wide portfolio of work applying the UNRMS principals for primary production

- **Lithium Brines:** implementing good ESG in the extraction of lithium brines from the lithium triangle in South America.
- **Sand:** Development of tools to enable sustainable sand extraction, integrating with UNRMS principles.
- **Nickel:** Sustainable mining in the Philippines; evaluating the use of UNRMS principles for monitoring and reporting sustainable mining. d conducting training.

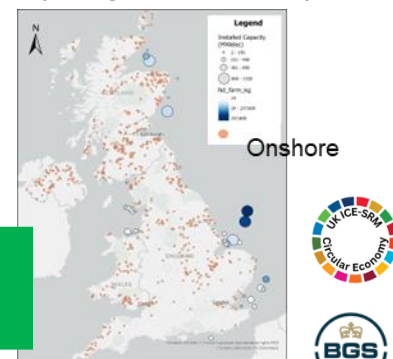
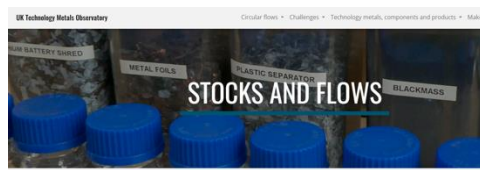


Work on the Circular economy of metals

- **Tech metals data observatory:**
Expanding the content of the techmetals data observatory in the UK
- **Deep-dives** into specific CRM supply chains.



(<https://techmetalsobservatory.org/index.html>)



GIS tool mapping magnets & REE in wind turbines



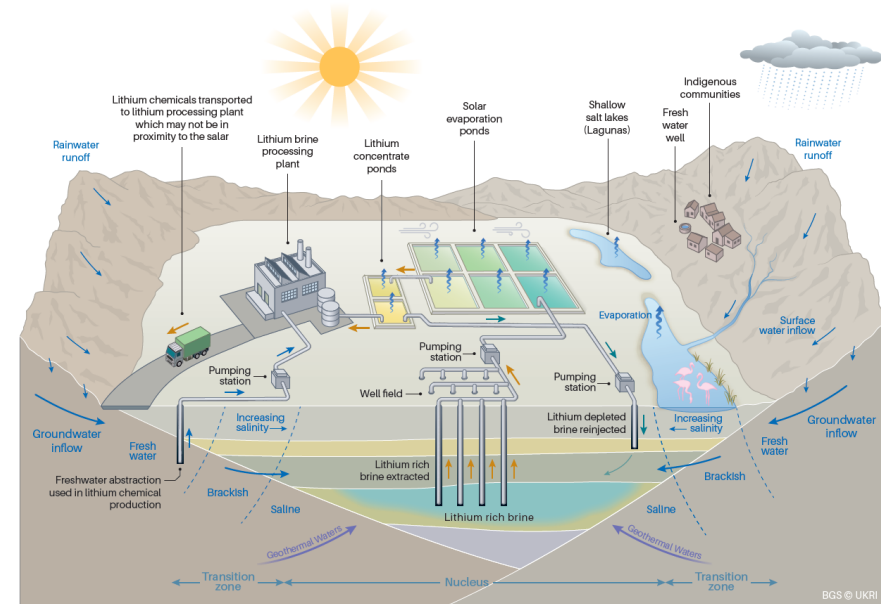
BACKGROUND

Lithium brines case study

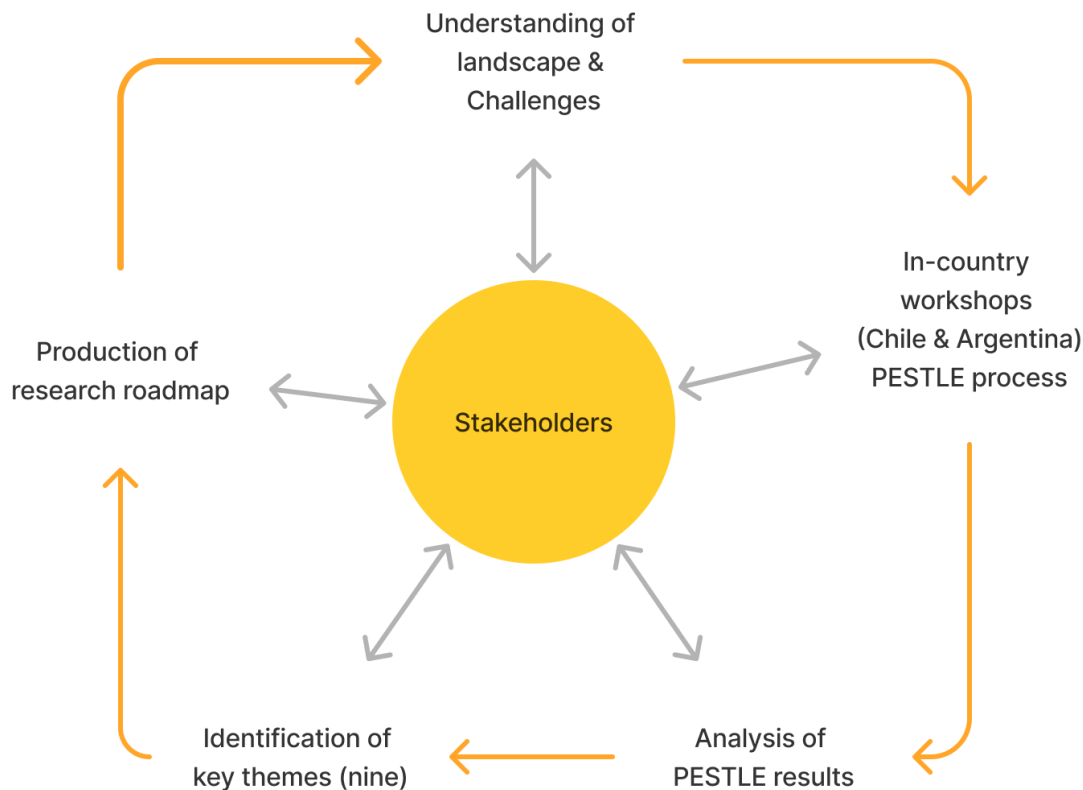
- Salars are complex systems; co-exist with communities and fragile ecosystems. Our understanding of them is limited but continues to develop.
- Improved understanding will support responsible up-scaling of production of Li and minimisation of impacts.

Project objectives:

- To identify challenges to responsible Li supply;
- To develop a research roadmap to address these issues and set plans for collaboration between global and local research communities.



Outline of process



Key themes of the research roadmap:

- Salar processes
- Environmental challenges
- New technologies for Li production
- Infrastructure, supply chains and development
- Data and Transparency
- Governance
- Social issues
- Standards & Certification
- Global Li market



Main challenges per theme

1. **Salar Processes:** development of agreed conceptual model / 4D understanding / salar observatory
2. **Environmental Challenges:** ongoing monitoring / baseline data / reinjection and mitigation of impacts
3. **New Technologies:** DLE understanding / Dynamic technology roadmap / green energy
4. **Infrastructure and Supply Chains:** infrastructure development/ understanding regional supply chains / monitoring indirect impacts /
5. **Data and Transparency:** data portals / materials to aid communication / good practice
6. **Governance:** participatory processes / institutional strengthening / revenue distribution
7. **Social:** communication between stakeholders / capturing disputes and transparency / developing communities
8. **Standards and Certification:** avoid duplication in standards / harmonisation & interoperability / developing good practice guidance
9. **Global Lithium Markets:** Ongoing monitoring incl. ESG / opportunities for mid-stream, down-stream / forecasts and scenario analysis



Short term research priorities

Salar Processes

Agreed conceptual model with ongoing development

Salar observatory with ongoing development

Improving geological and hydrogeological understanding

Environmental Challenges

Assessing the environmental impacts of wellfield and environmental receptors

Reinjection for reducing environmental impacts-How To ?

Monitoring baseline - development of monitoring in pristine areas

Ongoing monitoring of environmental impacts with life cycle thinking

New technologies for Li extraction and processing

Technology roadmap for lithium extraction and processing

DLE understanding and assessment of environmental impacts

DLE pilot testing facility for research and development

Infrastructure & supply chains

Training skilled workforce to assist with infrastructure requirements

Understanding regional supply chain and identification of pinch points

Monitoring indirect impacts of infrastructure development

Longevity of and responsible innovation in infrastructure development

Data & Transparency

Data infrastructure and portals to improve data accessibility and transparency

Improving data accessibility. Reaching out to many stakeholders and their needs

Streamline data reporting processes to reduce bureaucracy and time spent in collection and interpretation

Governance

Stakeholder mapping - power balance analysis

Cross intra-government collaboration to improve governance

Defining revenues from mining & diverted them to responsible supply

Ongoing consultation and participatory processes

Strategies and policy that extend beyond political cycles and are legally binding

Social issues

Improve participatory processes and decision making (communities involvement)

Job training - not just from the private sector

Effective communication between stakeholders

Capturing disputes and transparency in processes

Developing communities and managing demands e.g. for resources, infrastructure

Standards & Certification

Good practice guidance based on existing industry practice

Resource and reserves standards for lithium brines

Implementation of sustainability frameworks e.g. SESA, UNRMS

Monitoring standards to identify use and avoid repetition

Harmonisation and interoperability of standards

Global Lithium market


Forecasts and scenario analysis to estimate the future lithium market

Development of strategy that can improve economic resilience and attract new investment

Ongoing monitoring of the global lithium value chain

Developing opportunities for domestic midstream and downstream value chains

 Collaborative tasks with input from other stakeholders

 Research-led task

Case study on lithium

- Can we map the findings from our past visit against the UNRMS principles?
- What are the interdependences and linkages between lithium extraction and other economic sectors, but also resources?
- Drivers, policies, bottlenecks, aspirations, standards etc can be mapped to provide transparency of the lithium supply chain in Argentina
- **Enable the development of an information system that can be used to provide evidence towards SDGs and ESG.**