

Cornwall

Enabling “Resource as a Service” framework based on UNRMS: The proposed case study in UK:

Presented by Frances Wall

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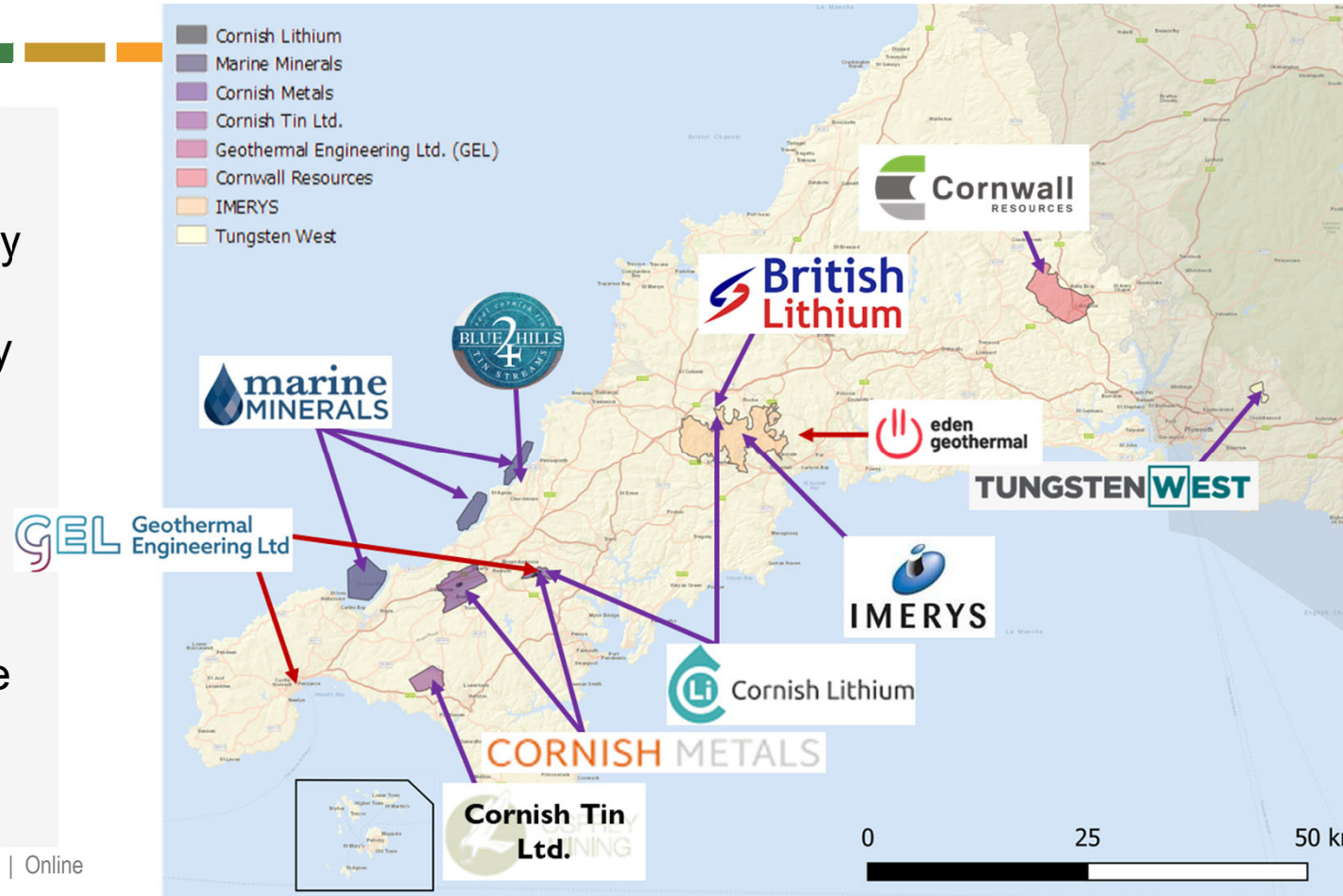


Cornwall, SW England

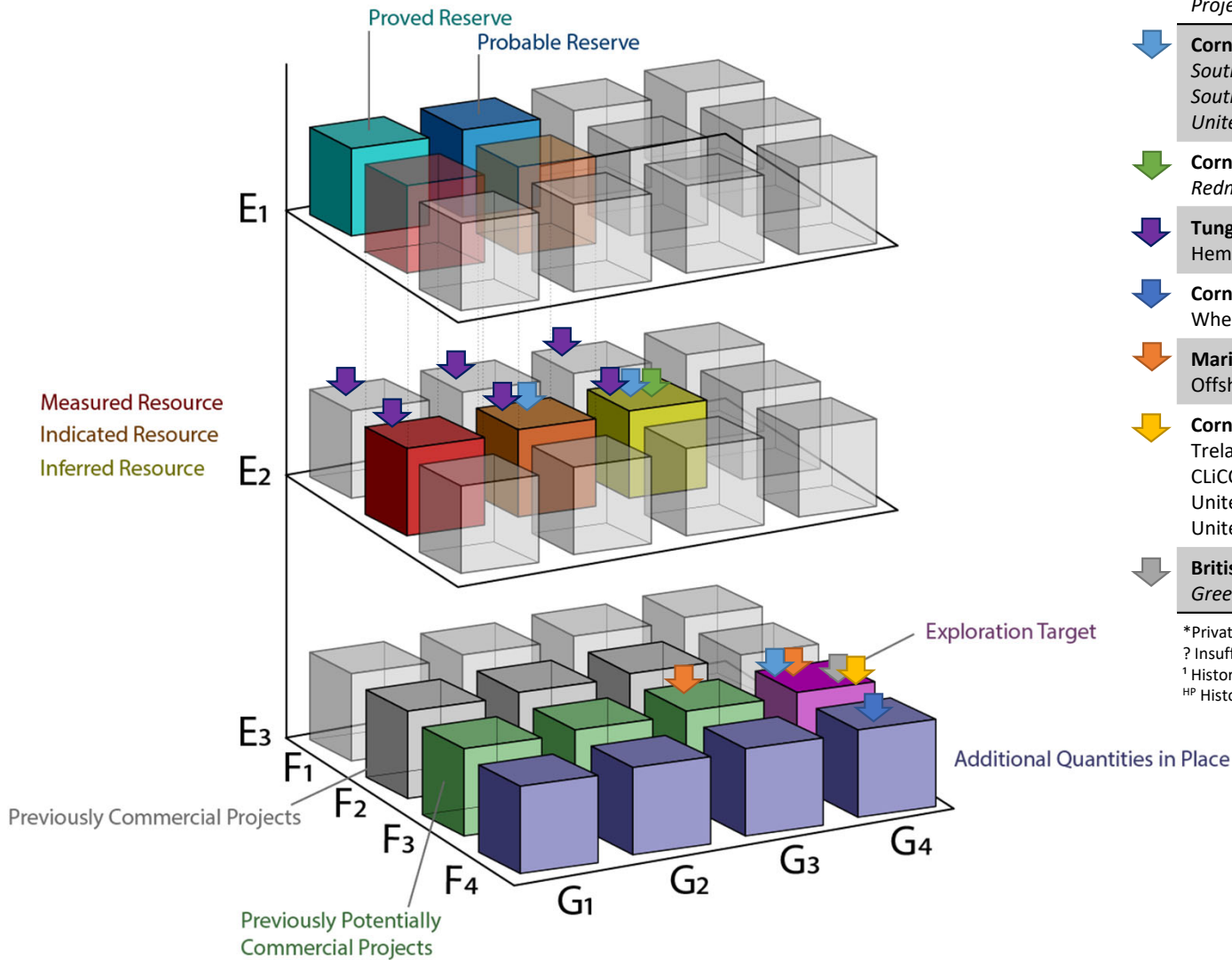
Granite-related development of critical metals and renewable energy



- Established kaolin mines
- Renaissance of exploration for technology metals (Li, Sn, W, Cu)
- Deep Geothermal energy in development
- Floating offshore wind in development
- Mining landscape world heritage site
- Region's population have low income despite high profile of Cornwall



UNFC categories and example classes mapped on relating to solid-mineral resources as explained in the UNFC-2009 CRIRSCO Bridging Document and further elaborated by Horn *et al.* (2021)



Company Project	Geological Knowledge	Project Feasibility	Socio-Economic Viability
↓ Cornish Metals <i>South Croft Upper</i> <i>South Croft Lower</i> <i>United Downs</i>	G2 + G3 G2 + G3 G4	F2 F2 F3	E2 E2 E3
↓ Cornwall Resources <i>Redmoor</i>	G3	F2	E2
↓ Tungsten West Hemerdon	G1 + G2 + G3	F2 >> F1	E2
↓ Cornish Tin* Wheal Vor	G4?	F4	E3?
↓ Marine Minerals* Offshore Placer	G3/G4 ^{HP}	F3	E3?
↓ Cornish Lithium* Trelavour CLiCCC United Downs Shallow United Downs Deep	G4? ¹ G4? ¹ G4? G4?	F3? F3? F3? F3?	E3? E3? E3? E3?
↓ British Lithium* <i>Greenbarrow</i>	G4? ¹	F3?	E3?

*Private company [reporting not code compliant]

? Insufficient data available to make informed classification

¹ Historical resource estimates for Li in granites of St Austell area by BGS (not project specific).

^{HP} Historical "Proven" reserve stated



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Resource Management System

Cornwall Case Study



- | | |
|--------------|---|
| Organisation | 1. Rights and responsibilities in the management of resources (state, regional) |
| ESG | 2. Responsibility to the planet |
| | 3. Responsibility to people [Social contract on natural resources H&S] |
| | 4. Integrated management of resources [UNFC] |
| | 5. Service orientation [research – different views of this] |
| | 6. Circularity [includes primary production comprehensive resource recovery] |
| facilitation | 7. Innovation |
| | 8. Collaboration [new] |
| | 9. Competency and capability [continuous strengthening of core competencies and capabilities, training, skills] |
| | 10. Transparency; |

Resource as a Service

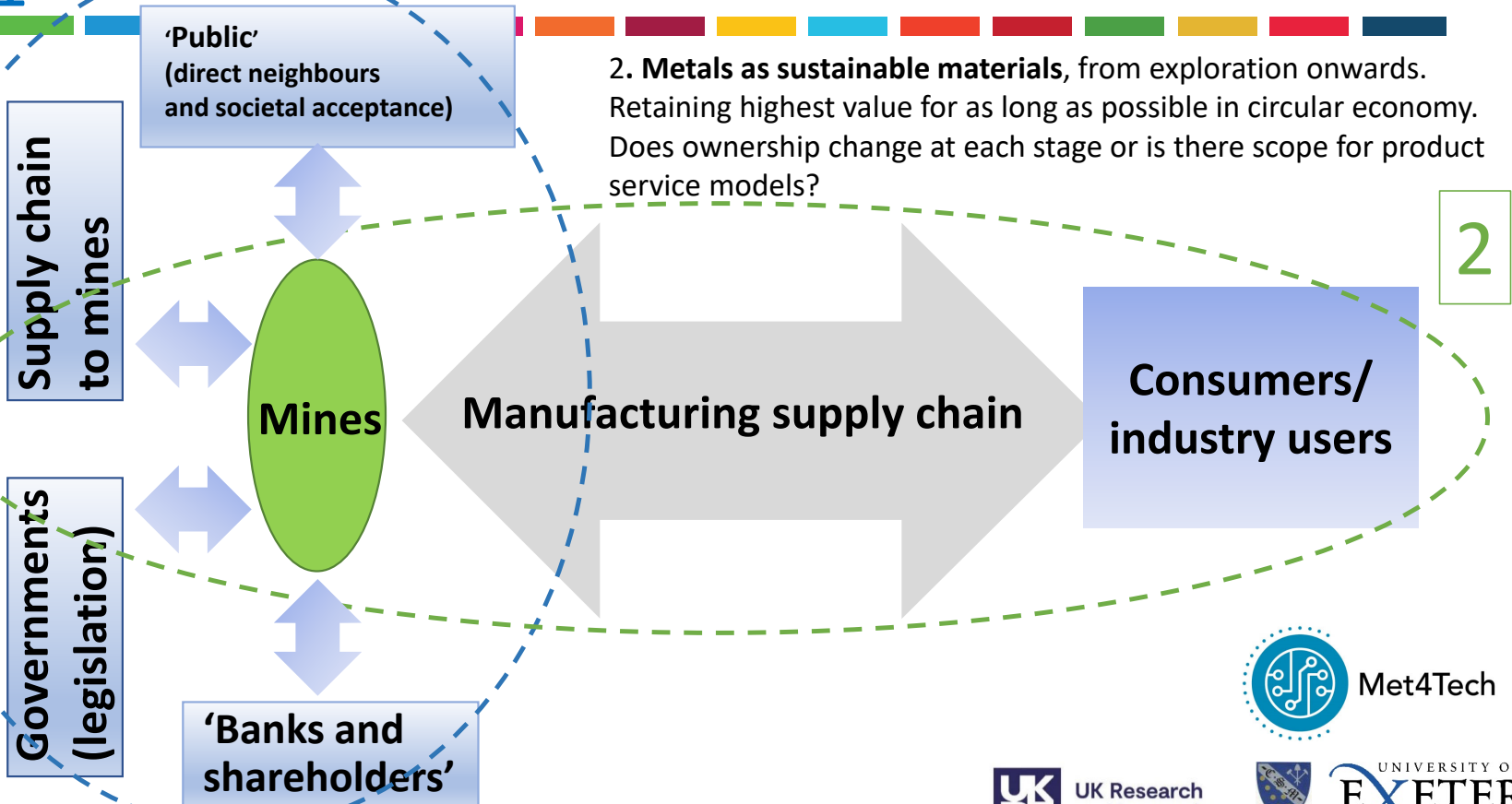
Scenario 4 – and relevant to Cornwall case study



UNEP

1

1. Turning geological natural capital into human, infrastructure, and environmental capital for the producers)
- this view might be seen as mining as a service



2. Metals as sustainable materials, from exploration onwards. Retaining highest value for as long as possible in circular economy. Does ownership change at each stage or is there scope for product service models?

2

Cornwall, SW England

Resources from Cornwall have been mined, and are now lost from the system



- 4000 years mining
- tin, tungsten, copper
- 1.6 million tonnes tin
- 1 million tonnes copper
- Where is it now?

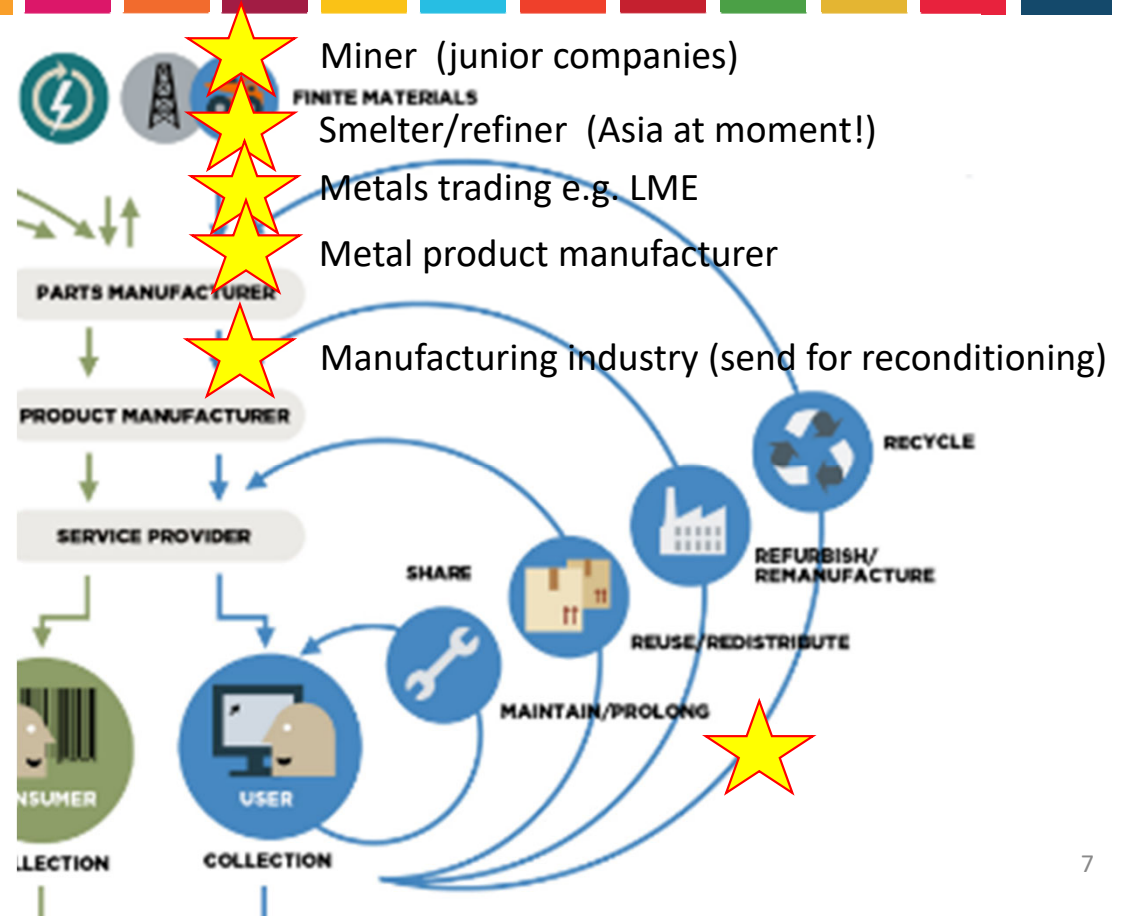


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Who might be the owner/distributor for resource as a service?



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Circular economy research project case study

Cornwall, UK

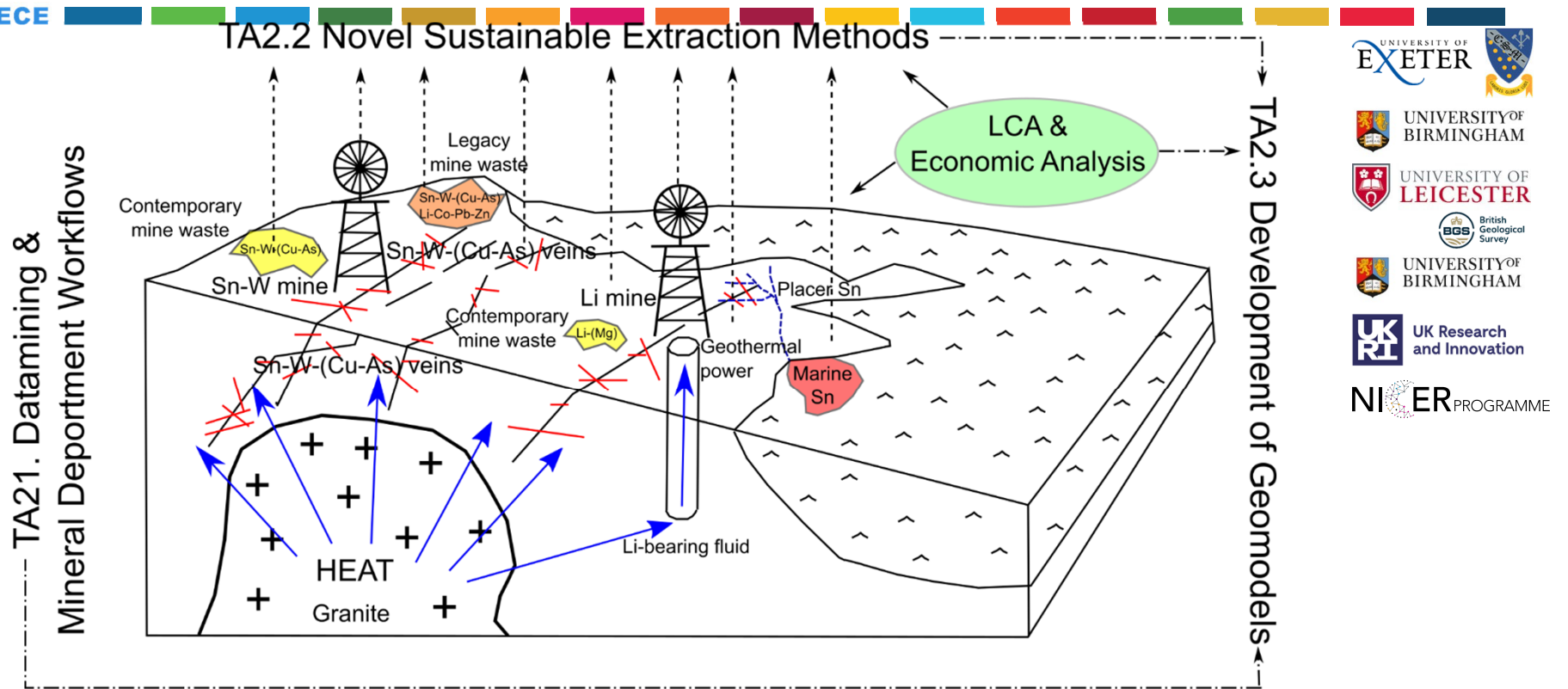


Figure 2. Preliminary conceptual circular economy geomodel for Cornish granite-related Li, Sn and W mineralisation and related mine waste

Three views RaaS:

- Selling resource to provide the service
- Maintaining the value chain by Raas (from which points?)
- Looking for synergies between businesses to create a circular economy.

Thank you!

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UK (research project: [Met4Tech.org](https://www.met4tech.org))

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