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Systemic mine-site life-cycle management for reconciliation of conflicting societal objectives:

Nature protection vs. raw materials supply resilience

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THE CHALLENGE: BALANCING MINING AND ENVIRONMENT

OVERCOMING HURDLES TO RESPONSIBLE DOMESTIC MINING

A PATH TOWARDS SUSTAINABLE COEXISTENCE

The context

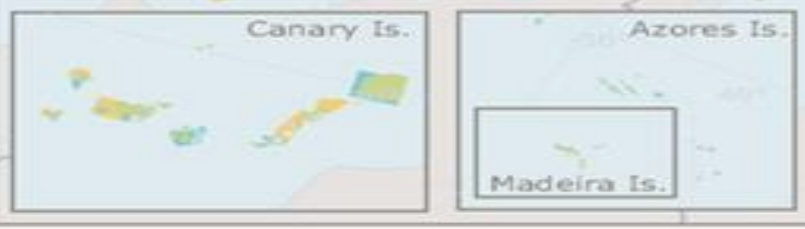
- Mining in the EU has been in a steady decline for decades
- The EU is exposed to severe mineral supply risks:
  - certain minerals occur at only few locations in the world,
  - supply is dominated by a small number of countries,
  - political threats, warfare, pandemics can disrupt supply,
  - fragmented and inconsistent regulatory approaches affect sustainable and responsible use of resources.
- Adaptation to climate-change and other circumstances should not massively detriment our life-style.
- … but what a desirable socio-economic trajectory should look like is open to societal discourse – new buzzword: *sufficiency*.

Perplexing dilemmas in the EU

- ***Protecting its natural environments and biodiversity vs.***
- ***ensuring a sustained and sustainable supply of mineral raw materials.***
- EU policy objectives - Green Deal and Energy Transition - require enormous additional quantities of minerals.
- Many ‘new’ materials, e.g. REE.
- Paradigm of economic growth.
- Decarbonisation is bought by using more minerals.
- Recycling only will have significant impact in a few decades from now
- Domestic supply enhances resilience, but stakeholder resistance (NIMBY).

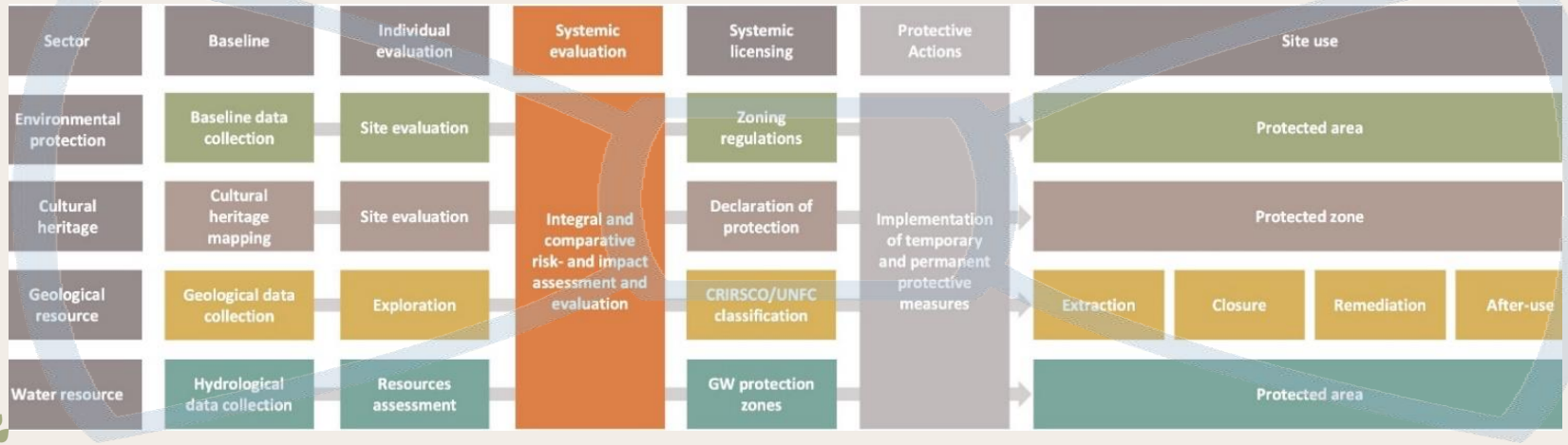
Conditions for mining in the EU

- The EU is densely populated and many protected areas.
- Public image of mining is shaped by past practices and their environmental and societal impacts and legacies
- Mining within the EU occurs already under very stringent regulations.
- Mining can be managed as a time-limited land-use.
- Project CIRAN (www.ciranproject.eu) explores innovative options for
  - systemic permitting procedures
  - a view beyond the time of active mining
  - reconciliating diverging societal interests.



Systemic approaches to land-use planning

- Today isolated procedures, based on sectoral policies and regulations.
- Decisions made exclusive and categorical.
- Permitting inconsistent, even contradictory
- Full spectrum of societal needs and expectations not considered.
- Systemic, cross-sectoral approaches enable balanced and integrated assessments during approval, permitting and life-cycle management.



The 3rd and 4th dimension in land-use planning

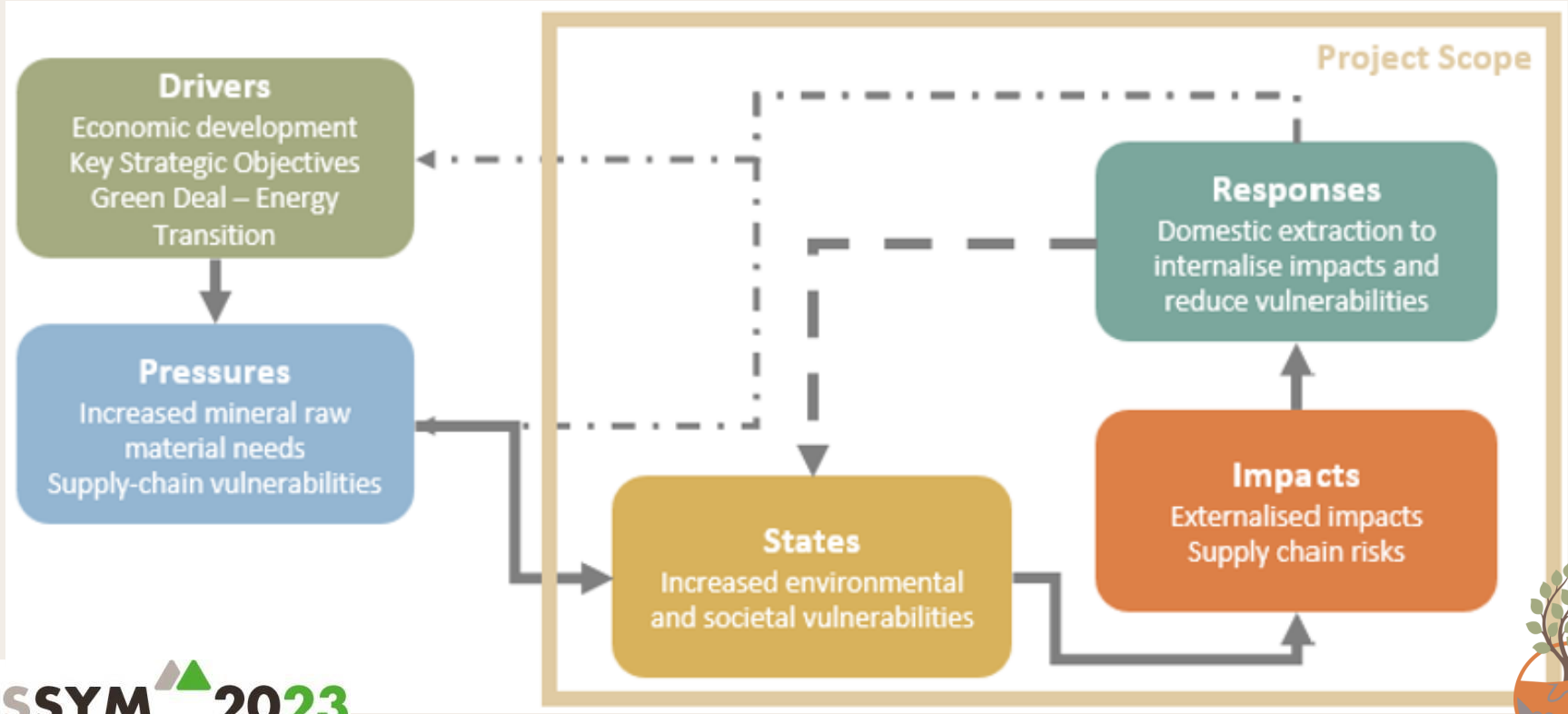
- Our world is 3-dimensional …
- Activities at depth do not necessarily interact with surface properties.
- A deep mine at depth does not necessarily communicate with ecosystems at the surface.
- Time is as a 4th dimension: from exploration to after-use.
- Systemic life-cycle management makes projects more responsible.
- Re-integrate the mine-site into the pre-existing landscape.
- Foster beneficial ecosystem services.
- Foster beneficial socio-economic services.

Justifying mining projects

- Mining projects are driven by the economic interests of investors.
- Evaluation of objective needs from a strategic supply resilience perspective.
- DPSIR (Drivers-Pressures-States-Impacts-Responses) model.
- The framing role of policy-decisions becomes more transparent.
- Foresight studies on future demands will inform the DPISR framework.
- Can mining be justified against
  - other imperative societal needs and expectations, and
  - protection of landscape, biodiversity and ecological function.
- CIRAN uses a ‘logical framework’ to ensure coherent decision-making based on a DPSIR approach.

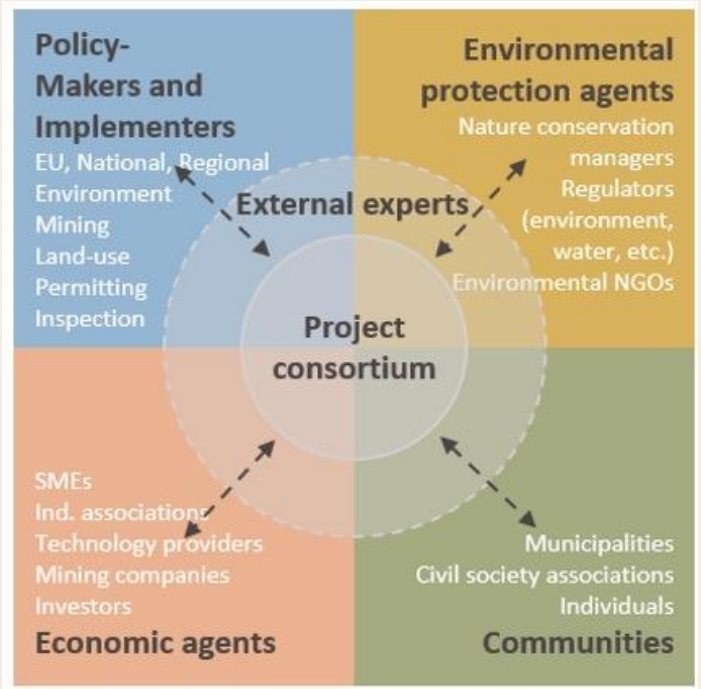
DPSIR analysis

- May include non-tangible drivers and pressures, such as the world views of certain stakeholder groups that shape the public debate.
- Analysis over the whole life-cycle will make transparent to stakeholders the consequences of their attitudes and wishes.



A lasting Community of Practice

- Foundation for a lasting Community of Practice (CoP) between
  - regional and local authorities (land-use, environment, water, etc.),
  - curators/managers of protected areas,
  - industry,
  - geological surveys, etc.
- Expert Groups work with project partners on
  - policy-making and -implementation,
  - economic drivers,
  - local governance and social capital,
  - nature conservation and ecosystems



Co-creation of knowledge and understanding

- A people-centred approach to land-use is much heralded in the EU.
- **But**: co-creation land-use practices remain peripheral.
- The consequences of major policy decisions (e.g. EU Green Deal) evolve unpredictably.
- Uncertainties due to imperfect understanding of socio-economic mechanisms and forces.
- Co-creation of modern social contract models to identify rights, obligations and responsibilities of all stakeholders.
- **Objectives:** a conceptual framework across the EU
  - to foster effective community participation in knowledge co-creation and transparent consultation,
  - to enable the coexistence of extracting CRMs and environmental protection.

The CIRAN project – a preliminary conclusion

- Bridges between established sectoral permitting methods and ones responding to the economic, environmental, societal, and governance (ESG) challenges of today.
- Transparent, system-oriented approach to managing natural resources above and below ground for the benefit of society.
- Paving the way towards sustainable co-existence of mining and protected areas.

CIRAN

- CIRAN is a three-year project, running from 1st January 2023 to 31st December 2025 with 13 partners from 11 European countries.

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