

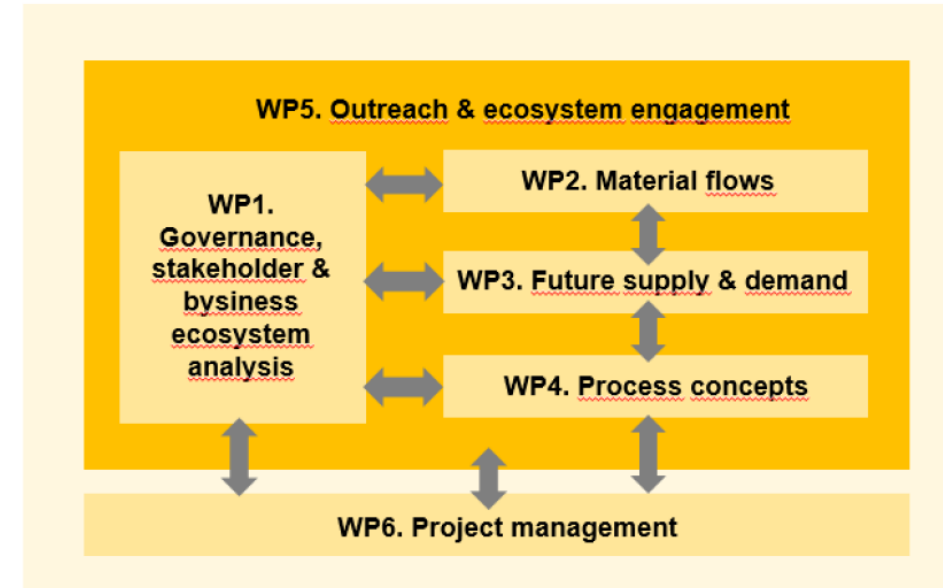
GOVERMAT, Multi-level governance of critical materials for future electric mobility, 01.01.2022 - 31.12.2025

- Research group:
 - PI: Research Professor Elina Huttunen-Saarivirta, VTT, elina.huttunen-saarivirta@vtt.fi; +358 401453199.
 - Sub-PI: Professor Rauno Sairinen, University of Eastern Finland, rauno.sairinen@uef.fi; +358 504423146.
 - Sub-PI: Professor Ari Jokilaakso, Aalto University, ari.jokilaakso@aalto.fi; +358 503138885.
 - Sub-PI: Professor Ulla Lassi, University of Oulu, ulla.lassi@oulu.fi; +358 400294090.
- Programme theme: Topic 1, Flows of critical materials in circular economy.
- Idea of the research: In GOVERMAT, a unique multi-disciplinary team combining the disciplines of environmental policy, innovation management, urban studies and several branches of materials science will provide new insights into the circular economy (CE) of critical raw materials (CRMs) for electric mobility. GOVERMAT will provide a knowledge foundation for reuse, recycling and substitution of CRM included in the following key components of electric vehicles: batteries, electronic components and high-performance magnets, and, alongside, catalyse new industrial and commercial opportunities. The GOVERMAT will concentrate on the role of regional-level stakeholders in CRM flows: it aims to identify the means and actions by which city regions can influence, promote and boost the sustainable supply of raw materials essential for electric vehicles. Via cities, and extending to national and global levels, both public and private stakeholders are linked with materials flows by defining the operation environment (regulations, incentives, agreements, business models).



Project objectives & work packages

1. Perform comprehensive multi-level governance, stakeholder and business model analyses of CRMs essential for future electric mobility.
2. Provide a holistic system-level overview of key material flows and value chains.
3. Present critical appraisal about the demand and supply of critical materials and circularity advancements in the future.
4. Develop economically viable and sustainable process concepts for the CE of CRMs for electric mobility.
5. Identify potential emerging business opportunities in the CE of CRMs for electric mobility.



- International collaboration is an inherent part of the project, with researcher mobility to, e.g., Germany and Sweden.
- Besides direct research collaboration, several stakeholders and ecosystems have expressed interest to collaborate by participating in the project events, data sharing and co-creation.



Project outcomes

- *GOVERMAT* research results will be published in scientific journals with high impact factors, number of planned publications:15.
- *GOVERMAT* will enable innovative and ambitious research topics for PhD students and post-docs working in the project, with networking within and outward the consortium.
- The policy, material, design and technology choices that lay the basis for the future circularity of CRMs for electric mobility will be analysed in detail:
 - Stakeholders that contribute to decision making and implementation of CE.
 - Material flows and the related stakeholders.
 - Future supply-demand dynamics, which defines the framework for the CE, design choices that could further advance CE, and alternative material choices.
 - New CE process concepts.
- The analysis will further enable to shed light on the causalities of these realms and to identify concrete means by which CE may be advanced.
- *GOVERMAT* will have a wide societal impact by providing information that is needed to guide the choices to the right direction that benefits the society, the businesses and the environment, via closing the CM loops.
 - The generated knowledge will likely introduce new knowledge-intensive jobs in the area and improve the overall well-being.

