RECHARGING THE PLANET: EVALUATING ADVANCED BATTERY RECYCLING'S SUSTAINABILITY SPARK

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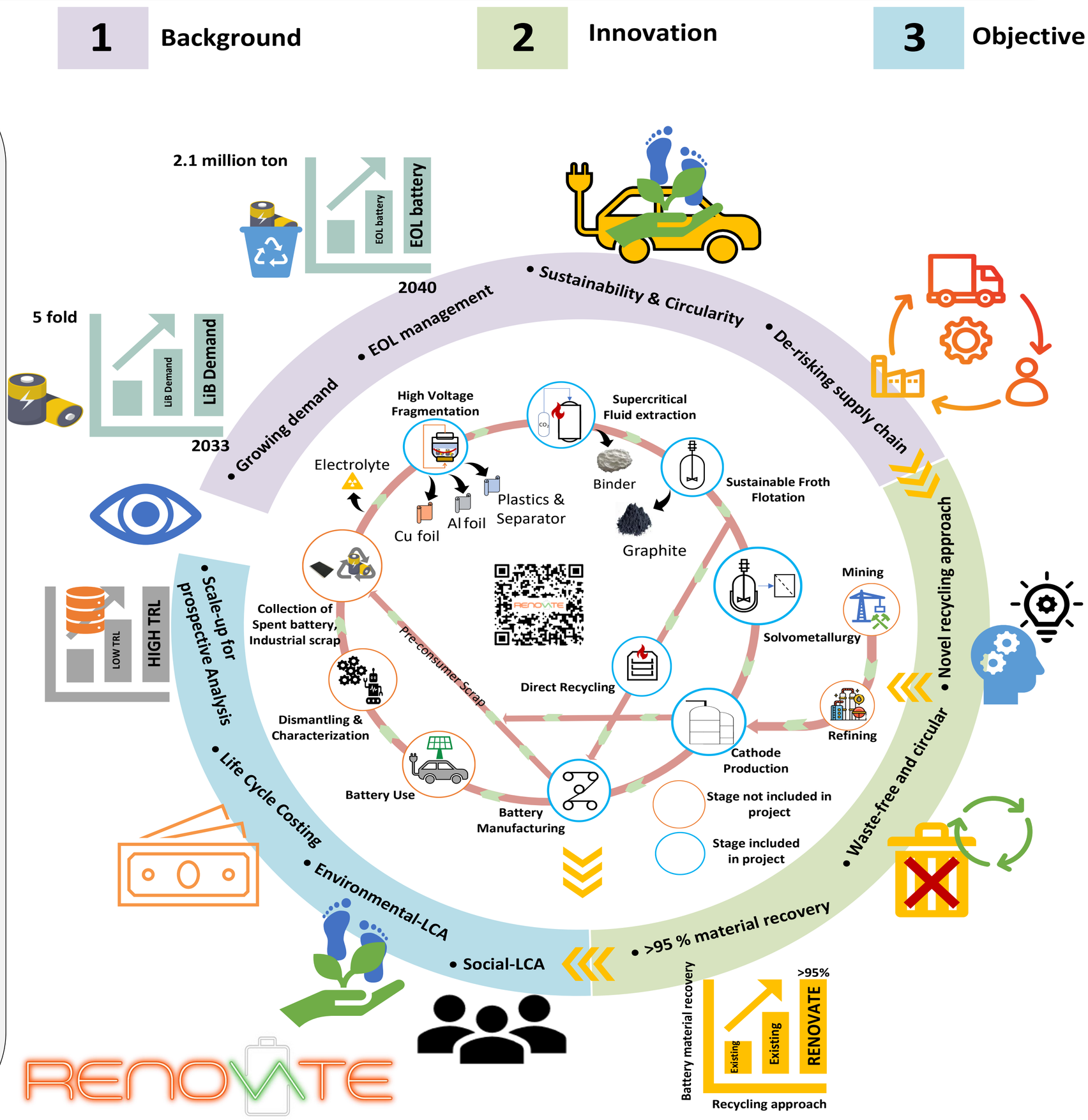
Background

- The global push for sustainable mobility and storage of excess renewable energy is intensifying the demand for lithium-ion batteries.
- Batteries installed in the last decade and in the future will gradually come to their end of life in the upcoming years, and will pose significant challenges to the environment if not properly managed.
- Recycling and recovery of battery waste feeds will play an important role in providing secondary resources and supply security for regions with low primary battery material production, thereby enhancing the sustainability of the overall battery supply chain.

Innovation

- A novel recycling approach will be developed for high recovery rates of battery materials. Pretreatment by high-voltage fragmentation, and subsequent recycling technologies, such as direct recycling (for low value-batteries e.g. LFP) or solvo-metallurgy (for high value-batteries e.g. NMC/NCA) is identified at TRL 4.
- Manufacturing and validation of new cells from recycled materials.
- Valorization of side waste streams to obtain valuable materials, such as surfactants, making the entire recycling process waste-free and circular.



Objective

- Quantification of environmental, societal, and economic impacts of the RENOVATE's recycling approach in a prospective manner.
- Support the identification of the most promising recycling technology and recycling process chain for different battery chemistry types with significantly different composition shares.
- Scale-up of the life cycle inventory data to a higher TRL will be performed to compare the competitiveness with state-of-art or alternative emerging recycling process chains.

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