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High quality LCA database and services to support green batteries transition – European project tackles first actions

Individual mobility must become greener – this could briefly summarize the requirements for the future development of vehicles. The European Union, with its Green Deal, has set a goal of net zero emission cars, which is driving the growing market for electric vehicles. However, electrical mobility is often criticized for the environmental impact of the battery value chain and insufficient recycling activities. The European HiQ-LCA project aims to change this situation by enabling more reliable Life Cycle Assessment (LCA) based on better data and therefore, by empowering stakeholders to find the best starting points for greater sustainability in their production and recycling processes.

Batteries are among the largest contributors to the carbon footprint of the electric vehicle (EV) production phase. Therefore, shifting the battery value chain to more sustainable practices is key to greening individual mobility, with decarbonization playing an important role. There is a strong need to reduce emissions and proof these reductions based on validated data and benchmarks. Life Cycle Assessment (LCA) has been increasingly implemented in EU policies over the last decades, in particular with the new Battery Regulation, which contains a mandatory LCA for each new battery. In addition, the industry is facing a strong societal push towards responsible sourcing and sustainable production. Existing LCA data for batteries and their supply chains is limited in its detail and applicability for electric vehicles. Nevertheless, the impact of batteries is not limited to electric vehicles or light means of transportation. For a sustainable energy transition, storing energy from volatile renewable sources in battery storage systems (BESS) will be another focus. “Batteries are the key for decarbonization of mobility and energy supply, but the critical resource demand and the environmental footprint of production reveal potential for improvement,” says Dr. Andreas Bittner, CEO from the European Lithium Institute eLi, who coordinates the HiQ-LCA project.

This implies a strong need for detailed high quality, granular data to accurately assess environmental impacts of EV batteries, that significantly exceeds the current state of the art. Therefore, the

Contact:
Marie-Luise Righi (dissemination office), Fraunhofer Institute for Silicate Research ISC, righi@isc.fraunhofer.de
Dr. Andreas Bittner, European Lithium Institute eLi, andreas.bittner@lithium-institute.eu

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European project HiQ-LCA, funded by EIT RawMaterials, intends to create detailed, representative, reliable and transparent LCA datasets representing the trustworthy and consistent carbon and environmental footprint of batteries. Bittner emphasizes: “A reliable Life Cycle Assessment based on comprehensive disaggregated data enables an effective optimization of processes and supply chains for a sustainable circular economy. That’s what the HiQ-LCA project team is aiming for!”

Based on the improved data, a unique Life Cycle Inventory database will be accessible via HiQ-LCA partner ecoinvent. The HiQ-LCA project team seeks also to develop innovative LCA services. Advanced methods for battery-specific LCA services will be provided to the battery supply chain industries and other stakeholders on a professional basis. These services will include quantifying and verifying environmental footprints, benchmarking, certification of products and guidance to improve environmental performance. Furthermore, training for professionals will be offered to improve the knowledge on means and techniques to lower the environmental footprint of battery production, usage and recycling. The potential for valorization of these services through a joint venture, between CellCircle, Minviro and BRGM, will be explored through the project.

The use of those services will enable industrials and/or stakeholders to evaluate processes and resources by their associated environmental impacts throughout their supply chains – in short: it will be the basis for distinguishing “green” from “dirty” processing routes of battery supply chain and manufacturing. This added value of information will support industry, investors, policy makers and the public to make the right decisions for climate protection and resource conservation when the large-scale EV battery industry is built in Europe.

Meet the HiQ-LCA team in Lille

On September 7, 2023, the HiQ-LCA team will host a stakeholder workshop for interested companies and institutions as part of the LCM 2023 conference in Lille.
Further information is provided on the project homepage: https://hiq-lca.eu

HiQ-LCA facts and figures

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Contact:
Marie-Luise Righi (dissemination office), Fraunhofer Institute for Silicate Research ISC, righi@isc.fraunhofer.de
Dr. Andreas Bittner, European Lithium Institute eLi, andreas.bittner@lithium-institute.eu

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Partners

- Bureau de Recherches Géologiques et Minières, BRGM, France
- CellCircle UG (haftungsbeschränkt), Germany
- ecoinvent Association, Switzerland
- Eramet SA, France
- European Lithium Institute eLi, Belgium (project coordinator)
- Fraunhofer Institute for Silicate Research ISC, Germany
- Fraunhofer Institute for Surface Engineering and Thin Films IST, Germany
- Ghent University, Belgium
- Leiden University, Netherlands
- Minviro Ltd, United Kingdom
- Northvolt AB, Sweden
- Université de Bordeaux, France

Picture

Batteries's environmental footprint has to be estimated in a variety of aspects – even more than mentioned above. HiQ-LCA aims for more sustainable production, usage and recycling of batteries and functional battery materials.
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