TRIPLE E - EV BATTERIES AND LIFE CYCLE ASSESSMENT

Sustainability and electric driving

Within the sustainability scene, electric mobility has grown massively popular with general adoption by society and consumers over the past decade. With the current trend, Electric Vehicles (EVs) are expected to make up approximately 50% of the passenger vehicle market by 2030. Whilst consensus might be hard to pin down among car enthusiasts regarding the cost benefit of driving electric, the arguments for sustainability can be written down somewhat more objectively.

For one, electric driving has some clear benefits for air quality and climate change mitigation. 'Zero emission' rightfully applies to the avoidance of characteristic emissions from internal combustion engines such as nitrogen oxides, carbon monoxides and smog forming photochemical oxidants. In terms of greenhouse gasses, electric driving roughly saves 35-40% CO2-emissions when charged on an average Western power grid and even more when charged on renewable energy from for instance solar panels or windmills [source][source][1].

The dark side of electric mobility

The downside of electric driving for sustainability is often overlooked. The lithium-ion battery cells that power EVs and allow it to charge seem to be the biggest hiccup in the EVs supply-chain - with negative impacts mostly affecting climate change, general pollution and social impact.

[1] Reductions are based on a full lifetime comparison, comparing an electric to a petrol-fuelled car

Besides the necessity of lithium, other minerals typically needed are cobalt and nickel. The mining of these ‘conflict’ minerals is highly scrutinized among sustainability advocates for the negative social impact, toxic chemical release and greenhouse gas emissions needed from the harvest of raw minerals to the manufacturing into battery cells. On top of that, most batteries are not properly recycled at the end of their functional life resulting in the release of hazardous substances and a waste of valuable, impactful resources.

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New Battery Legislation

With the growing trend of electric mobility comes higher demand for batteries and higher yields of battery waste. It is in this light that the EU has drafted a new battery directive in 2020 intended to replace the existing one adopted in 2006 [source][source2]. The 2020 battery directive has been commissioned to contribute to the protection, preservation and improvement of the quality of the environment by minimising negative impact of batteries

and battery waste. It also intends to provide organisations measures to measure battery environmental impact and improve performance in this regard [source][source].

The Power of Life Cycle Assessment

An essential methodology in measuring the environmental performance of batteries (and other products) is the science of Life Cycle Assessment, LCA in short [source]. LCA, within European standards, allows the calculation of a rich set of impact categories for a given functional of a product (i.e per battery) taking into account all negative impact taking place during the extraction of raw materials, manufacturing of raw materials into a product, the use phase, the end-of-life processing and transport taking place during all phases of the life cycle. The LCA results of a given battery can shed light on the total impact per battery and what the effect of impact reduction measures might have on the life cycle of a battery.

One of the requirements of the new battery directive is the obligated reporting of the carbon footprint of EV batteries at key life cycle stages as well as details on the material composition, percentages of minerals and recycled materials, electrochemical performance and other factors to push for sustainable life cycle management.

Batteries, Sustainability and Triple E

Enter TripleE, a revolutionary digital data platform empowering enterprises, knowledge institutes and governmental organisations with trustworthy and transparent data on the location, performance, life expectancy, environmental impact and value of Li-ion EV batteries. At TripleE any battery project can be registered in the standardized data recommended by the EU battery directive known as a 'Battery Passport'. Once a battery is registered to the TripleE platform, a Life Cycle Assessment is generated for your battery project resulting in a total carbon footprint, among other performance indicators used for assessing the potential remaining financial value of your batteries in a circular economy.

Currently, TripleE is developing a system where platform clients will have the possibility to get their batteries tested by a certified partner to analyse the best end-of-life destination between repairing, reusing or recycling your battery. All LCAs conducted by TripleE adhere to the latest EU data quality standards for environmental footprints [source]. Using TripleE, your company can be ready for the upcoming legislation on Carbon Footprinting for batteries.

Are you ready to learn more about your batteries and of other battery projects in the TripleE Ecosystem, follow us on LinkedIn to stay posted. Interested in becoming a partner or stakeholder or eager to join the launch pilot phase, send us a message at info@triplee.io or contact any of the founders through LinkedIn.