Annotated Bibliography

Source 1 - High Energy Density "Bezel-less" Lithium-ion Battery Using Solvate Ionic Liquid-based Quasi-solid-state Electrolyte

Unemoto, A., Hirooka, M., Seki, E., Kawaji, J., & Okumura, T. (2020). High Energy Density "Bezel-less" Lithium-ion Battery Using Solvate Ionic Liquid-based. Electrochemistry . https://doi.org/10.5796/electrochemistry.19-00076

This article describes research on leading-edge battery technology. The authors describe Lithium battery technology as critical to electric vehicles and renewable energy storage. In this case, efforts were focused on maximizing energy density, or the amount of energy that is stored in the battery per unit mass or unit volume. In this case, research was focused on a "bezel-less" battery design, which both increased battery safety and the usable volume of the battery.

While performance of lithium batteries are discussed at length, the environmental impacts of lithium mining are not discussed at all. Therefore, while there was little to no experimental bias, there exists a preconceived, almost closed-minded notion that large-scale commitment to lithium-ion batteries is a step in the right direction. According to a rigorous life-cycle assessment of electric vehicles, "variations of the specific energy requirements for battery manufacturing, the specific vehicle consumption, and the specific CO2 emission levels associated to energy exert a huge impact on the overall CO2 emissions of an EV" (Franzo & Nasca, 2020). Furthermore,

Source 2 - Energy Consumption, Pollutant Emissions and Cost of Electric Vehicles and Fuel Vehicles

Yue, H., Zhang, S., Tang, X., & Wang, W. (2021). Energy Consumption, Pollutant Emissions and Cost of Electric. *Material Science, Energy Technology, and Environment Engineering.* EDP Sciences.

This article comes from the 6th international Material Science, Energy Technology, and Environment Engineering conference in China. The experimental methods incorporated are well explained and reasonably sound. The vehicles used to demonstrate "Well to Wheel" environmental impacts are sufficiently comparable. Limitations of the methodology are discussed, "WTW system does not involve the part of automobile recycling, so the calculation of this article does not consider the disposal cost" (Yue, Zhang, Tang, & Wang, 2021).

The results were peer reviewed, however the formatting in some of the figures is slightly underwhelming. For example, graph axis labels are slightly cluttered, showing more points than necessary.

Source 3 - A comprehensive review of the key technologies for pure electric vehicles

Li, Z., Khajepour, A., & Song, J. (2019). A comprehensive review of the key technologies for pure electric. *Energy* .

Source 4 - Life cycle environmental assessment of charging infrastructure for electric vehicles in China

Zhang, Z., Sun, X., Ding, N., & Yang, J. (2018). Life cycle environmental assessment of charging infrastructure for. *Journal of Cleaner Production* .

Source 5 - The environmental impact of electric vehicles: A novel life cycle-based evaluation framework and its applications to multi-country scenarios

Franzo, S., & Nasca, A. (2020). The environmental impact of electric vehicles: A novel life cycle-based. *Journal of Cleaner Production* .

This article covers an in-depth life-cycle assessment of electric vehicles. While it primarily focuses on plug-in electric vehicles, fuel-cell and hybrid variants are also touched upon. The authors concluded that when comparing an electric vehicle to a reasonable similar internal combustion engine vehicle, "CO2 emissions associated to an EV over its life cycle are always lower than the ones associated to a comparable ICEV" (Franzo & Nasca, 2020).

Rigorous experimental methods were used, and a literature review was conducted to, "obtain a deep understanding of the extant knowledge base on the topic and to identify the research gaps to be addressed" (Franzo & Nasca, 2020). All tables, equations, and figures are formatted in a well-designed fashion. The authors demonstrate little to no experimental bias, and the limitations of the methods used are discussed at length. Finally, the authors demonstrate a lack of financial persuasion by declaring that they have, "no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper."

Source 6 - Electric vehicles standards, charging infrastructure, and impact on grid integration: A technological review

Das, H. S., Rahman, M. M., Li, S., & Tan, C. W. (2019). Electric vehicles standards, charging infrastructure, and impact on grid. Renewable and Sustainable Energy Reviews .