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Environment - Environmental Impact; University of Texas Austin Details Findings in Environmental Impact (Lithium Supply Chains: Environmental Impacts and Trade-offs Analysis Using Life Cycle Assessment and Multi-criteria Decision Making)

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2025 JUL 1 (VerticalNews) -- By a News Reporter-Staff News Editor at China Weekly News -- New research on Environment - Environmental Impact is the subject of a report. According to news originating from Austin, Texas, by VerticalNews correspondents, research stated, "Demand for lithium-ion batteries is increasing rapidly due to growth in sales of electric vehicles (EVs), expansion of electricity storage for renewable sources, and their use in providing other grid services. This growth creates challenges in the battery supply chain, especially in extracting and processing critical minerals."

Financial support for this research came from Comparing Electricity Options Industrial Affiliates Program of the **Bureau of Economic Geology**, Jackson School of Geosciences, The University of Texas at Austin.

Our news journalists obtained a quote from the research from the University of Texas Austin, "Prospects for new battery production and raw material extraction and refining sites have been reported in the literature, yet the environmental impacts of varying material supply chains are less analyzed. In this study, four lithium battery supply chains-the conventional China route, the conventional Americas route, and two advanced Americas routes (lithium sourced from geothermal brine and from oil field brine), to produce lithium iron phosphate and lithium nickel cobalt aluminum oxide batteries from brine and spodumene were investigated in terms of 16 environmental impacts defined by ReCiPe life cycle impact assessment method and energy demand using life cycle assessment. Comparing lithium supply chains for batteries, the results indicate that the conventional Chile/ China route that uses Chilean brine as raw material leads to lower particulate matter, freshwater eutrophication and ionization radiation for lithium iron phosphate batteries, compared with the other routes. For lithium nickel cobalt aluminum oxide battery supply chains, on a per MWh basis, particulate matter emissions are highest for the conventional China route, but lowest eutrophication and ionization radiation impacts. In addition, we analyzed the trade-offs among these impacts, as well as energy consumption across supply chains, using multicriteria decision making (MCDM)."

According to the news editors, the research concluded: "Our results suggest that the prospective U.S. routes for both lithium iron phosphate and lithium nickel cobalt aluminum battery production are promising alternatives to the traditional China route in terms of reducing most environmental impacts; however, communities along the battery supply chain, whose environments are directly affected by production, should understand the trade-offs and negative impacts on their local environment."

For more information on this research see: Lithium Supply Chains: Environmental Impacts and Trade-offs Analysis Using Life Cycle Assessment and Multi-criteria Decision Making. Energy Reports, 2025;13:6566-6583. Energy Reports can be contacted at: Elsevier, Radarweg 29, 1043 Nx Amsterdam, Netherlands.

The news correspondents report that additional information may be obtained from Jani Das, University of Texas Austin, Jackson School of Geosciences, Bur Econ Geol, Austin, TX 78712, United States. Additional authors for this research include Michael H. Young, Gurcan Gulen, Shweta Singh and Zakariah Q. Harner.

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