

4x4 Consulting

Team Member Name	Year	Major
Colleen Azelby	2rd	MBA
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Advisor(s): Charlie Donovan

Topic: Clean Energy Solutions in Brazil through Electric Vehicle Battery Innovation

Audience: Executive Board of Audi

Sustainable Development Goals:

SDG Goal #7: Affordable and Clean Energy

SDG Goal #11: Make cities and human settlements inclusive, safe, resilient and sustainable

Executive Summary

In the global effort to mitigate climate change, there has been a monumental shift toward the deployment of Electric Vehicles (EVs) from large automakers around the world. Many of these car manufacturers have even established ambitious goals to transition to all-electric fleets by 2030. Audi in particular is working towards an EV-only fleet by 2029 and plans to offer 20 additional models by 2026. Although this is in alignment with UN Sustainable Development Goal 7, these initiatives have led experts to contemplate what to do with lithium-ion EV batteries once the vehicle reaches end of life. From this stems an opportunity for companies like Audi to explore alternative ways to maximize the full potential of their EV batteries before recycling. Because EV batteries are built to last for 10 to 20 years, this means that typically 60% - 70% of the EV battery capacity is still available after a vehicle reaches end of life. Although Audi has partnered with Redwood Materials to break down EV batteries into raw materials for recycling, these batteries still have significant energy potential despite some degradation from vehicle usage. Therefore, a huge question remains: what should Audi do with the remaining capacity of these batteries before they are properly recycled?

4x4 Consulting proposes that Audi partners with Energy Source, a Brazilian lithium battery specialist, to reprocess the unused energy from their EV batteries into safe and sustainable power sources for low-income communities in Brazil. Six percent (~12.6M) of Brazil's population currently live in low-income communities, commonly referred to as favelas, that lack reliable electricity. The current electrical infrastructure in many of these communities are unsafe because they are improvised by locals and poorly maintained. These connections are unsustainable as they overload the power grid and cause chronic blackouts. With our proposal, the unused energy from Audi's batteries will be used as power storage to provide backup electricity for these communities. This partnership between Audi, Energy Source, and the Brazilian government will provide safer, sustainable, and more resilient energy sources for communities that are most vulnerable.