Ingenious Brain

Case Study

How IeB

Enabled a Global Client to Achieve ~$30,000 Cost Savings from EV Battery Repurposing

Objective

Seeking to unlock greater value from EV battery systems, a global client partnered with us to explore advancements in EV battery technologies, with a focus on second-life applications in residential energy storage. The objective was to identify viable pathways to enhance energy efficiency, lower costs, and strengthen sustainability outcomes by extending battery life beyond primary automotive use.

Our Strategic Approach

To evaluate the potential of second-life EV batteries and their integration into residential energy storage systems, we conducted a technology- and application-focused assessment, comprising:

EV Battery Technology Assessment

Reviewed advancements in EV battery technologies, including improvements in energy density, fast-charging capabilities, thermal management, and safety features. Assessed how these advancements influence battery degradation profiles and suitability for second-life applications.

Second-life Feasibility Evaluation

Analyzed the technical feasibility of repurposing spent EV batteries for residential energy storage, considering remaining capacity, performance consistency, safety requirements, and system integration challenges.

Application & System Integration Analysis

Evaluated residential energy storage use cases, including load balancing, backup power, and renewable energy integration. Assessed system design considerations such as battery management systems (BMS), power electronics compatibility, and lifecycle performance.

Economic & Sustainability Assessment

Assessed cost implications and environmental benefits of battery repurposing compared to procuring new storage systems. Evaluated potential reductions in capital expenditure and improvements in overall battery lifecycle sustainability.

Snippets

Company	Partner(s)	New Energy	Details	Region
ecostor	NA	Utilizing Solar Cells	Eco-star provides residential energy storage solutions based on batteries that have gone through a first life in vehicles; Works with different modes • General mode – PV • Energy storage mode – PV • Peak & valley mode • Micro grid - PV	Norway >>

Company	Compatible Vehicles & V2L Outlet(s)	Val Segment	Details	Source
KIA	EV6 | One 120-volt	Camping	• **220V** of alternating current • V2L feature offers **3.6 kW** of power • Inside: just select Utility mode to use the outlets • Outside: simply attach the vehicle-to-load connector to the charging outlet	>>

Impact

This assessment translated battery innovation into tangible cost and sustainability benefits by:

- Delivering cost savings of approximately $30,000 through optimized use of second-life battery assets.
- Enabling the client to repurpose spent EV batteries, reducing the need to purchase new batteries by 15%.
- Supporting a circular battery strategy that extends battery life while reducing environmental impact.

Conclusion

Through a focused evaluation of EV battery advancements and second-life applications, IeB helped the client adopt a comprehensive and practical approach to battery reuse. The insights enabled cost-efficient residential energy storage deployment while supporting broader goals of innovation, resource efficiency, and environmental sustainability in the evolving electric mobility ecosystem.

Ingenious e-Brain

Ingenious e-Brain is a global research advisory and management consulting firm that helps businesses future-proof their operations by addressing complex challenges with sustainable, strategic, and expert-led solutions. With a global network of industry experts, analysts, scientists, and consultants, we bring world-class research capabilities and a proven track record of delivering 5,000+ projects across various industries.

With over 13 years of proven excellence, we have successfully tackled complex business challenges for Fortune 500 and Global 1000 corporations, industry leaders, manufacturing giants, startups, investors, universities, and leading companies across domains including automotive, energy, chemicals, advanced materials, life sciences & chemistry, healthcare, medical technology, personal & home care, sustainability, consumer packaged goods, and hi-tech industries.

Our services empower organizations to accelerate innovation, optimize R&D portfolios, and navigate complex intellectual property (IP) challenges, all while scaling operations with resilience. We support clients at every stage of the innovation process, from product launches and IP co-creation to market intelligence, consumer sentiment analysis, and gathering actionable customer insights through surveys.

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