



ENERGY Storage in AUTOMOTIVES

Energy storage has emerged as a critical technology to reduce dependence on fossil fuels in the transportation and energy generation industries. It is gaining traction around the world and could fundamentally change electricity market dynamics

Energy storage has its main applications in both ...



Battery Electric Vehicles



Hybrid Electric Vehicles

Lithium-ion is getting the most attention and has progressed the furthest ...

... But sometimes non lithium-ion technologies appear to work better



Lithium-ion technologies have accounted for more than 90% of new energy-storage deployments



Prices of these batteries have been falling much to the liking of the customers, while the safety has improved



Wide spread use right from stationary energy storage to individual commercial, industrial, and residential systems



For residential solar-plus storage applications, certain lead-acid products are more profitable than lithium-ion cells



For large-scale firming of wind power, flow cells can be more economic than lithium-ion cells for all but the shortest periods



Leveraging EV batteries to Stationary Grid Storage ...

- Use of electric vehicles (EVs) as mobile power storage, thereby eliminating the need to build costly stationary grid storage for energy from renewable sources
- By removal of the need to build stationary grid storage, EVs can provide a dual benefit of reducing carbon in transportation while lowering the costs for widespread renewables integration



Key Drivers ...

The quest for connectivity



Connectivity in the car is increasing rapidly, with Wi-Fi technology, 4G, camera and video services becoming the norm. For all of these features to work seamlessly, the vehicle must possess seamless connectivity which is obtained through battery energy storage. Battery energy storage with high-power, fast-response energy ultra capacitors, handle peak power demands and help extend battery lifetime

Increasing electrification of vehicles



It is estimated that the global electric vehicle market will grow at a CAGR of ~30% during the 2018-2025. Government support in the form of subsidies, grants, and tax rebates, improving charging infrastructure, increasing vehicle range, and reducing Electric Vehicle battery cost has resulted in growth of electric vehicles globally which further drives the need for energy storage

Emergence of autonomous driving



Industry analysis predicts that about 15% of cars in 2030 will be fully autonomous i.e. these vehicles will be able to navigate crowded city streets, read stop lights, change lanes and detect pedestrians. This technology will require more power, voltage, and energy storage which will be largely obtained from lithium-ion batteries

Favorable Government Policies



Favorable regulatory landscape & investments by governments toward the expansion of renewable and sustainable power generating sources is one of the key factors driving the energy storage industry. For instance, China's National Energy Administration (NEA) plans to invest more than USD 300 billion toward the integration of renewable energy technologies by 2020



What are the major Automotive Manufacturers doing ...



Connected six shipping container sized units, five of which house 500 i3 BMW manufactured battery packs, to the UK National Grid



Piloting a new project called the Audi Smart Energy Network, involving stationary storage batteries with solar installations and a software allocating the energy as per the need by home or vehicle



Has entered into a strategic partnership with Powervault to offer home energy storage systems – consisting of used electric vehicle batteries



Nissan and its affiliate 4R Energy Corporation have launched a new initiative to give used Nissan LEAF batteries a second life as the energy storage banks for off-grid lights



... and then there is Tesla !!!



- Sells batteries that are packaged up and wrapped with software and cooling systems that can be plugged into the power grid, paired with solar and wind farms, and used to store energy for buildings and homes
- In a partnership with Panasonic for developing lithium-ion batteries with little or no cobalt content, for the Model 3, Tesla's first mass-market car model

Key Insights

- Going ahead, major automotive manufacturers around the world are making a big commitment to EVs, with a view to consider the batteries as means of energy storage and one day sell back the electricity to the grid manufacturers
- Declining battery costs have positioned EVs for market success in the years to come, with lithium-ion batteries being the frontrunners



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