

Energy Storage: The Current and Future Role of Lithium Ion Batteries



for

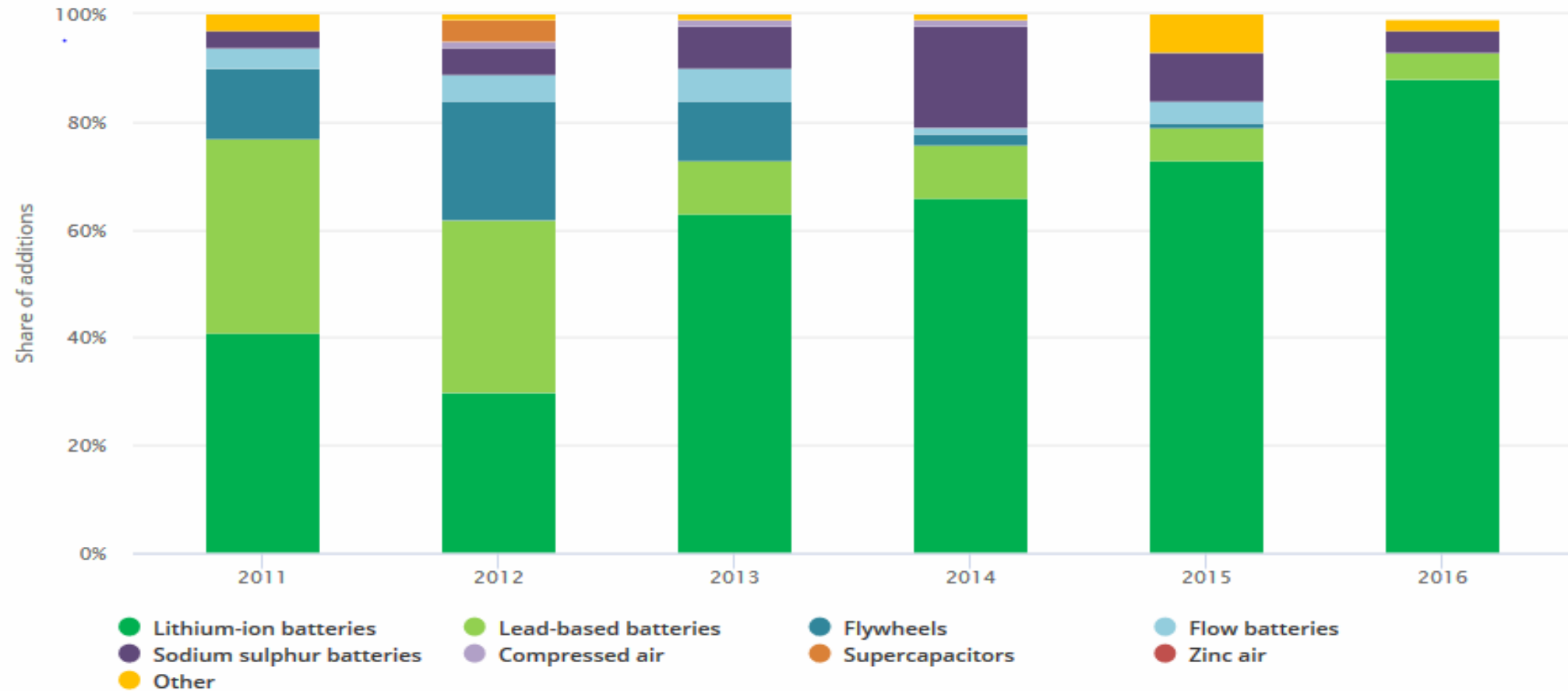
MITEI External Advisory Board

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LITHIUM-ION BATTERIES HAVE RAPIDLY COME TO DOMINATE AMONG ALTERNATIVES TO PUMPED HYDRO, AS SHOWN BY THEIR GROWING MARKET SHARE (DARK GREEN)

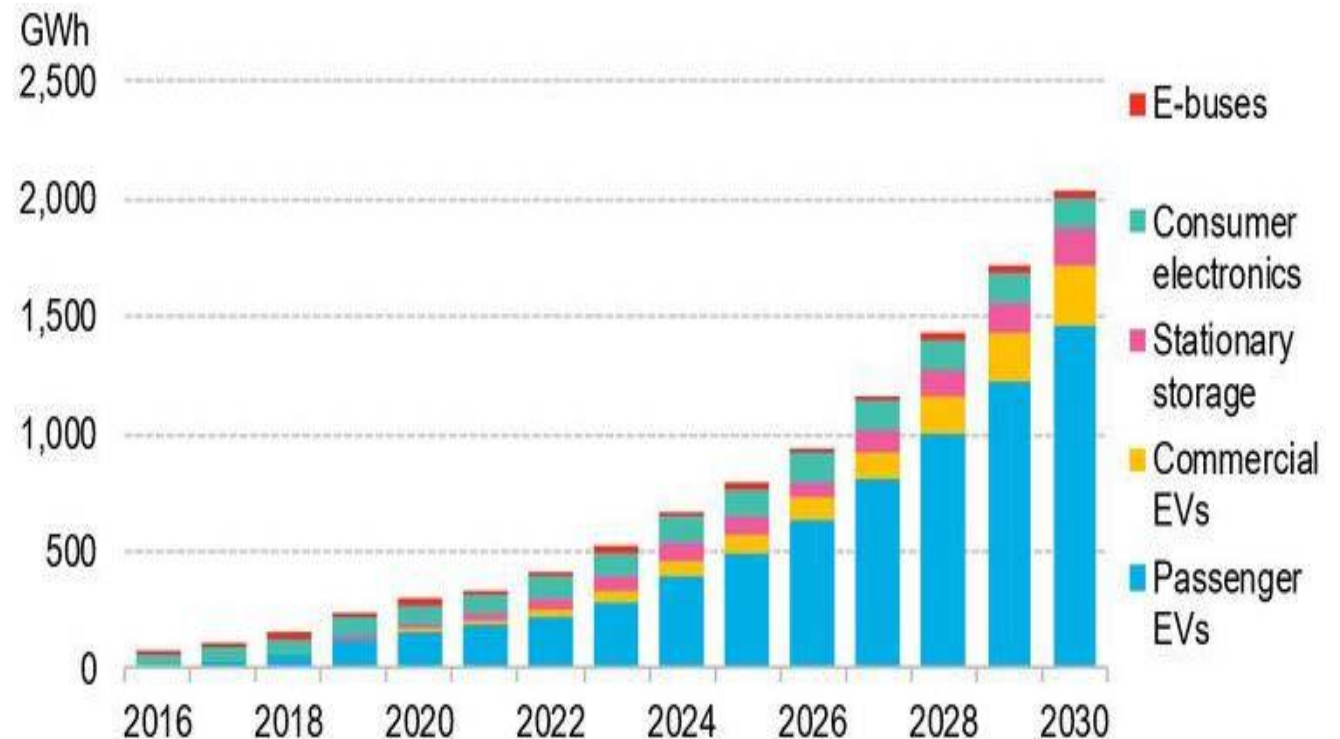
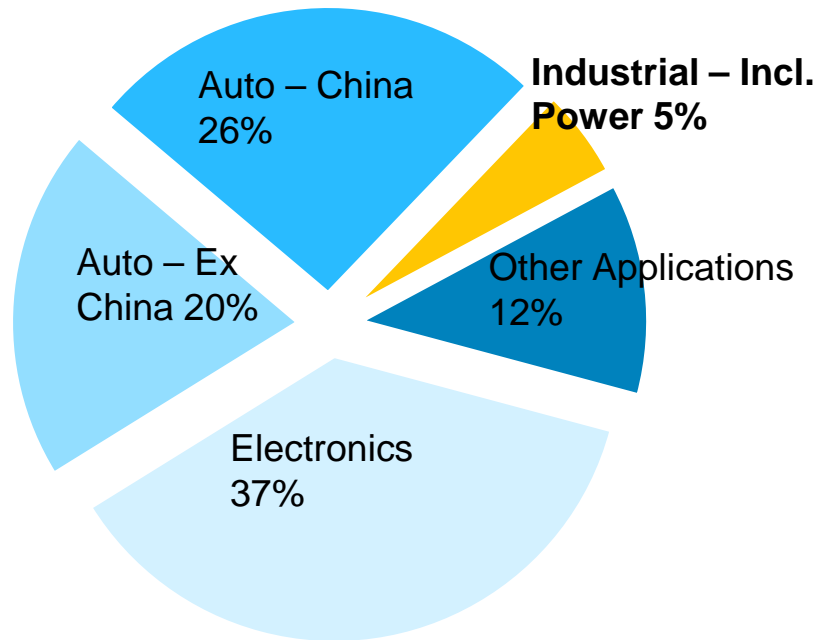


Source: International Energy Agency: Tracking Clean Energy Progress 2017

STATIONARY STORAGE IS ONLY A SMALL PART OF THE LI-ION BATTERY MARKET, WHICH IS DOMINATED BY GROWTH IN EV APPLICATIONS

Breakdown of 2017 Li-ion battery market by end use sector

Percent of total market (117.5 GWhs)

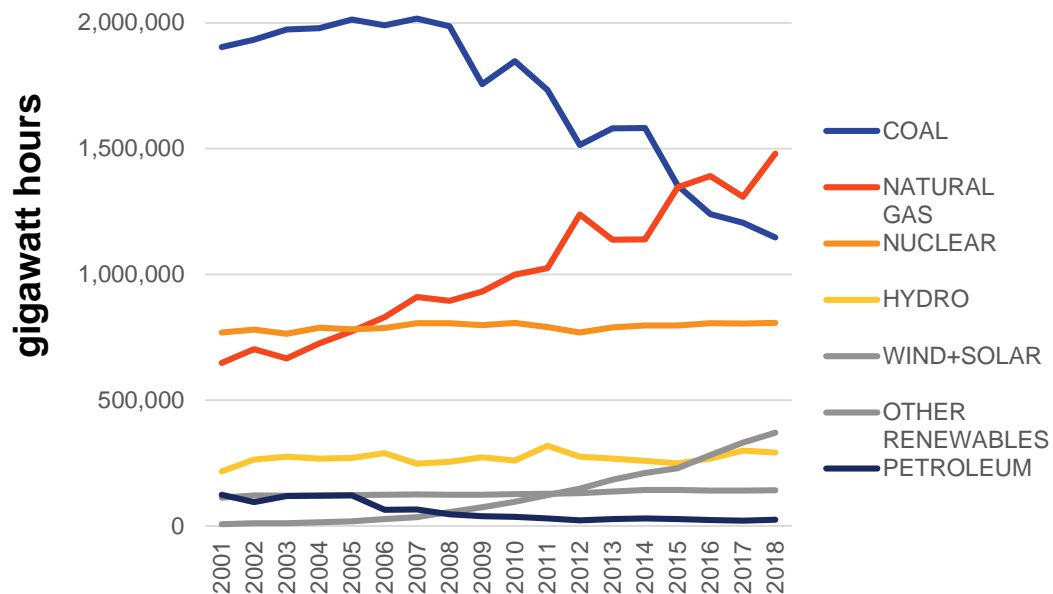


Source: BloombergNEF, Avicenne for consumer electronics numbers.

KEY NEAR- AND LONG-TERM STORAGE QUESTIONS

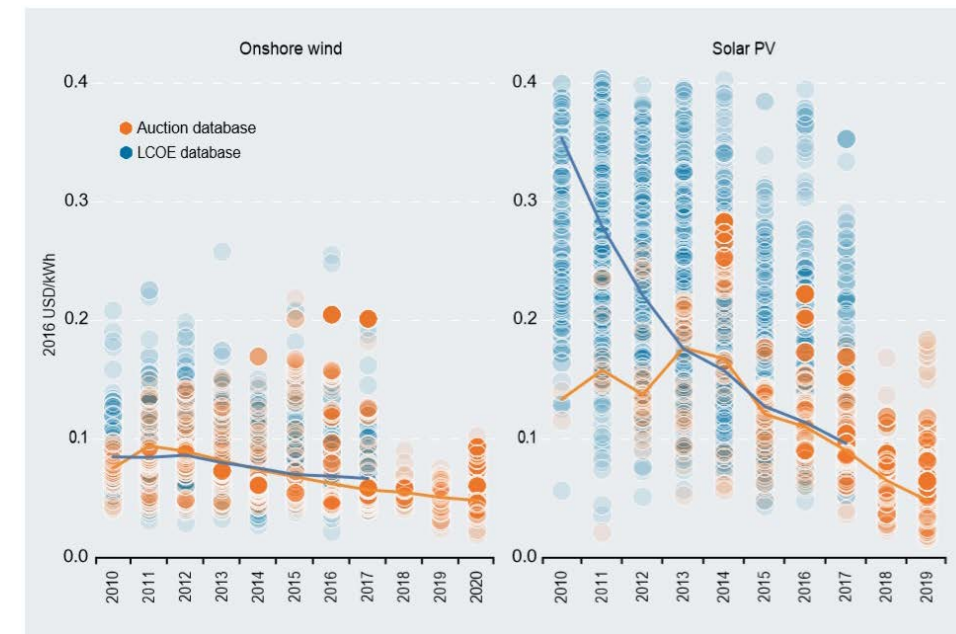
- Near term: How competitive are renewables+storage compared to existing generators (coal, NG, nuclear) and new NG generators?
- Long term: What is the role of storage (amount & type) in decarbonizing electricity systems?

U.S. Net Generation by Energy Source



Source: U.S. Energy Information Administration

Global LCOE and auction price trends for on shore wind and solar PV



Source: IRENA Renewable Cost Database and Auctions Database.

Note: Each circle represents an individual project or auction result, while the solid line is the capacity-weighted average from each database.