



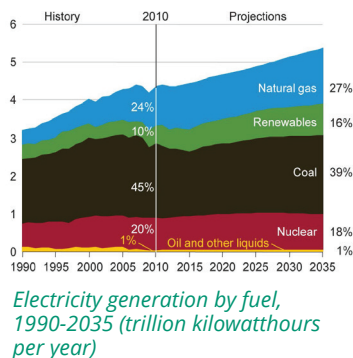
TECHNICAL & ECONOMIC ANALYSIS PROVIDE KEY PERSPECTIVES ON ENERGY STORAGE

Sandia National Laboratories identifies opportunities for economical investment in grid energy storage technologies by identifying technical requirements and evaluating storage technologies.

ESTABLISHING ECONOMIC COMPETITIVENESS

Energy storage technologies can transform electric systems operation by providing flexibility. This can improve the efficiency of electric system operation. For example, energy storage systems can smooth the otherwise variable production of renewable energy technologies and help shift the peak demand to reduce peak electric prices.

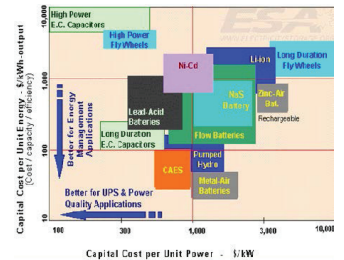
Though energy storage technologies can be game-changing grid technology, they must inevitably compete with alternative technologies solving similar problems. This means they must offer greater value at lower cost, while continuing to adhere to industry regulations and policy requirements. To this end, Sandia National Laboratories identifies opportunities for investment in grid energy storage technologies by identifying technical requirements and evaluating storage technologies. This allows researchers to evaluate their economic competitiveness.



of renewable energy. Combining diverse multidisciplinary expertise, researchers evaluate critical dimensions of the dynamic and highly complex environment to identify the best opportunities where energy storage technologies will be the most competitive and beneficial.

INCREASING ECONOMIC BENEFIT IN ENERGY STORAGE TECHNOLOGY

Sandia also develops methods to evaluate the economics of energy storage technologies. Researchers combine multidisciplinary expertise with sophisticated computational modeling to demonstrate how energy storage technologies can be effectively deployed in the grid. Illuminating specific developments that improve the economics of energy storage technologies, these evaluations unearth opportunities for improving energy storage. This input is used to produce and optimize increasingly competitive and economically-beneficial technology.



FILLING THE GAPS AND IMPROVING SYSTEMS

Given the dynamic relationship of economics, engineering and technology, Sandia's use of economics and technical analysis is an innovative approach to solving complex problems in the grid. Currently, Sandia is working with state and local utility commissions by offering perspectives on the opportunities for investing in energy storage in regulated utility areas. Several projects are underway working with utilities dedicating a portion of their grid to storage technologies. Performance and cost evaluations are done using a production cost model. In addition to increasing involvement with local utilities, this facilitates an increasingly active exchange addressing local utilities' problems and national grid challenges.

EXPLORING INTEGRATION OPPORTUNITIES

Sandia investigates how energy storage technologies contribute to electric systems using detailed economic and engineering models. These approaches analyze the value energy storage technologies can provide in restructured wholesale markets and regulated utility environments in an era of emerging retail markets, smart grids and penetration

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