

Utility-Scale Battery Storage & Grid Modernization New Mexico Science, Technology, & Telecommunications Interim Committee Hearing

Wardah Abbasi, Project Director, NextEra Energy Resources September 1, 2023



NextEra Energy is a leading clean energy and utility infrastructure company active across North America.



A growing, diversified and financially strong company

As of December 2, 2022
 As of September 30, 2022
 Source: S&P Capital IQ



NextEra in New Mexico







Approximately			
\$1.5 billion			
total capital investment			







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Energy storage technologies: some commercially available today, others early-stage design or pilot stages





Recent market and technology advancements have allowed a rapid increase in lithiumion based project deployments.



Lithium-ion battery cells are connected to form battery modules. Multiple battery modules are stacked into battery racks. Several racks are built within containers or buildings.



Total system includes containers, HVAC, power controls, inverters, and transformers - most often provided by different suppliers and integrated by a single system provider.



Electric Vehicle (EV) market demand is the primary driver in reducing lithium-ion battery costs for utility storage applications.⁽¹⁾



[NEED TO CONFIRM STILL THE CASE] Due in part to these cost declines, the economics of pairing storage with solar to provide a near firm product are now favorable in many regions.



In many regions, near-term demand for storage is being driven by resource adequacy procurements and renewable integration needs.



[NEED TO UPDATE FOR 2022/23, IF POSSIBLE] Over 4.3 GW of battery storage facilities are now in operation across the U.S.; ~1.5 GW of these have come online this year alone, while nearly 5 GW add'l are expected to come online in 2022⁽¹⁾



1) Wood Mackenzie Operational US Battery Storage Project Database as of 11-7-2021 and Wood MacKenzie U.S. Energy Storage Monitor Q4 2020

New Mexico's Energy Transition Act & Energy Storage

- Energy Transition Act of 2019
 - Utilities 50% renewables by 2030, 80% by 2040 (2050 for coops)
- HB 233 (2020): Energy Grid Modernization Roadmap Act, Grid Modernization Advisory Group, Whitepaper #11 - Storage
 - "It is critical to realize that firm, fossil-based, energy resource is being replaced by the renewable resources that are so abundant in NM. Storage provides a non-fossil, firming, resource. Strategically located, storage can be a non-wires alternative and add local resilience."
 - "Battery based storage, both grid- and customer-scale, appears, at least for now, to be the most feasible storage option for grid modernization in New Mexico."
 - "We recommend that New Mexico commit to adding 100MW/800 MWH of storage each year to achieve adequate capacity to decarbonize by 2050."



Grid Modernization Advisory Group

Whitepaper Series #11: Storage

As utilities and coops achieve higher levels of renewables, there is a greater need for energy storage to "firm" renewables.

New Mexico's Energy Transition Act & Energy Storage Utilities' Integrated Resource Plans (IRPs)

• PNM 2020-2040 IRP

- Need for 523 MW of new storage by 2025 under Technology Neutral Scenario
- Need for 807 MW of new storage by 2025 under No New Combustion Scenario

El Paso Electric/NM 2021-2040 IRP

 Preferred Plan Need for 94 MW of incremental storage in 2025, 51 MW in 2031, 192 MW in 2035, 101 MW in 2040, and 352 MW in 2045.

SPS/NM 2022-2041 IRP

– [NEED DATA HERE]



As utilities and coops achieve higher levels of renewables, there is a greater need for energy storage to "firm" renewables.

New Mexico will need to attract a lot more investment in energy storage to achieve ETA supporting grid modernization.

- Potential legislation to extend industrial revenue bond authority (IRB) to standalone energy storage
 - Currently, some storage co-sited with renewables qualifies for IRB incentives
 - As grid power is more renewable (i.e. PNM at 40% renewable/55% carbon-free in 2022), there is an increasing need for non-solar paired T&D storage projects that store increasingly renewable grid power.
 - Incentives will facilitate deployment of non-solarpaired T&D storage projects.



IRB standalone storage incentives support the investments needed in battery storage to reach ETA goals and maintain reliability.



EXTera RESOURCES



Appendix



Electric Vehicle market demand has also driven investment in recycling technologies, to provide alternative sources for battery raw materials

Battery End-of-Life Considerations

- Most "end-of-life" lithium-ion batteries still contain material that can be extracted and reused in various applications
 - Recycled materials include nickel, lithium, copper, cobalt, etc.
 - Can be repurposed in new batteries, or other industrial products
- Diversifying raw material sources can stabilize future battery costs
 - Use of recycled materials can also support battery manufacturer sustainability goals



Expectations are that recycling costs for lithium-ion batteries will be cost neutral or slightly profitable over the near term, with potential upside as recycling technology improves



Although rare, lithium-ion battery fires in both EV's and utility installations have occurred. Proper design considerations and active monitoring is key for safety.

Battery Design	 UL9540A testing by battery suppliers informs on fire risk and mitigation approaches 		
Environmental Conditions	Heating and cooling designed to maintain required ambient conditions		
Container Ventilation	Container ventilation can be used to remove flammable gases in the event of a fire		
Fire Suppression System	Fire suppression agent and overall system design are based on battery design	EMERGENCY PLAN	EVACUATION PLAN
Emergency Response Plans	 Procedures for first responders to follow, contact information and related safety plans 		

Robust industry standards have been developed for energy storage facility safety over the past few years, many based on past learnings.



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