

Energy storage supports the grid in multiple ways

- Capacity reserves
- Frequency regulation
- Time-of-use shifting
- Voltage support

Grid support from storage has broad consumer benefits

- Increased renewable penetration by solving resource intermittency and enhancing ramping
- Reduced need for expensive and polluting “peaker” power plants at times of high demand
- Elevated resilience including better storm weathering and quicker bounce backs from blackouts

Energy storage takes many forms



Batteries



Pumped Hydro



Flywheels



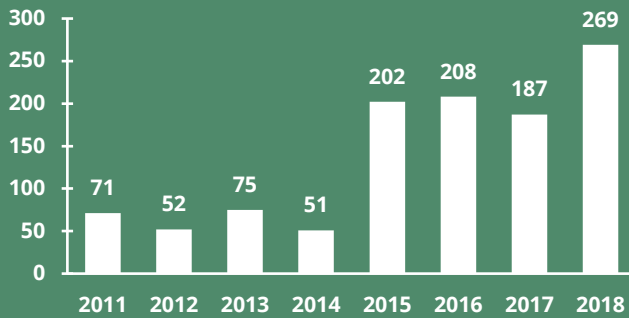
Compressed Air



Thermal

Deployment is growing

New U.S. Energy Storage by Year in MW

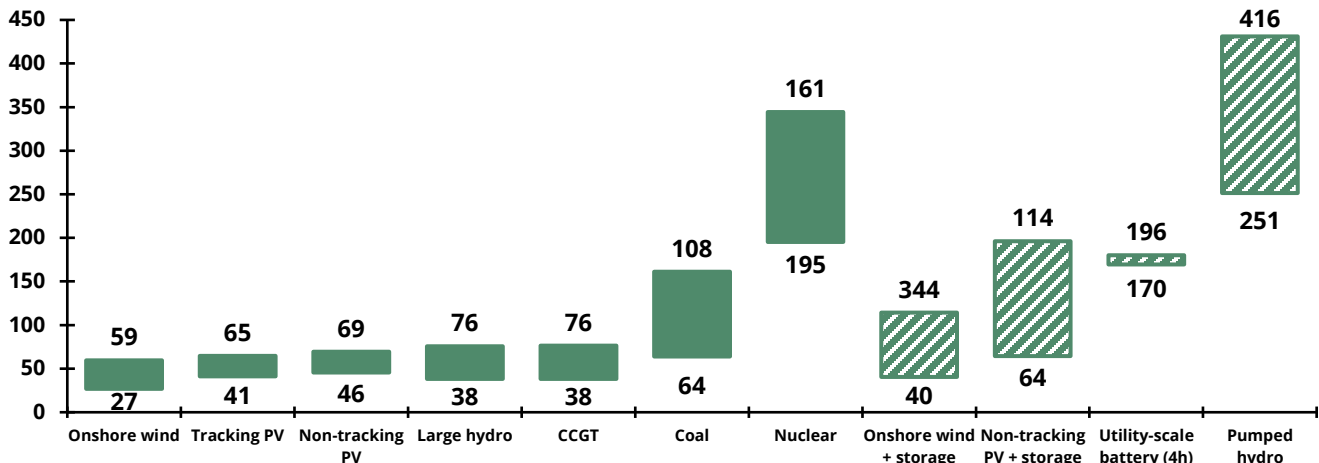


Source: BloombergNEF Storage Project Database

- 51 new energy storage projects came online in the U.S. in 2018 alone
- 9 of the 2018 projects can output at 10 MW or greater
- 25 of the 2018 projects, or 49%, were paired with renewable generation
- 7 of the 2018 projects, or 14%, were designed for frequency regulation
- None of the 2018 projects were paired with non-renewable generation

Costs are declining, but storage is not yet competitive

Levelized Cost of Electricity by Resource in \$/MWh, 2019



Source: BloombergNEF