

**Increased deployment of Northfield Mountain pumped storage would simultaneously lower Massachusetts energy bills and reduce carbon emissions**

A competitively-bid contract that ensures two of Northfield Mountain's four pumped-storage hydroelectric units operate during periods of highest-cost electricity would help Massachusetts achieve major savings in energy costs and carbon emissions, specifically:



\$220 million savings for the Commonwealth's ratepayers from 2022 through 2030



Eliminating 875,929 metric tonnes of CO2 emissions across those nine years. That's equal to

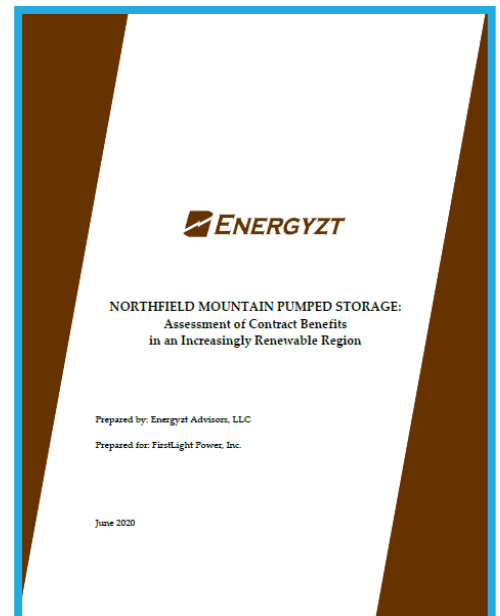
- taking 21,027 cars off the road every year
- eliminating the burning of 4,817 railcars' worth of coal
- the same level of CO2 reduction projected from Massachusetts' entire Clean Peak Standard program

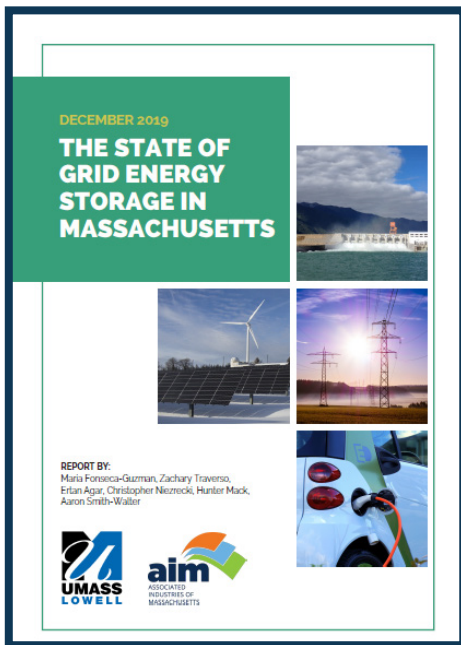


Reducing wintertime natural gas consumption in New England by 0.5 to 4.1 percent, improving regional winter energy security

These are key findings from a new report by Energzyt Advisors LLC, commissioned by FirstLight Power, in response to two landmark studies from 2019 conducted by the University of Massachusetts at Lowell and the Massachusetts Department of Energy Resources/Levitan & Associates focusing on the value of large-scale energy storage to support and maximize the economic and environmental benefits of offshore wind development.

Energzyt concludes: **"Northfield operations can shave peak prices and reduce carbon emissions, resulting in a net benefit that effectively pays for itself.** This dynamic makes Northfield a resource that provides net carbon emissions reductions for Massachusetts and New England, as well as for the entire Eastern Interconnect ... If Northfield were operated ... with the objective of reducing carbon emissions or cost to load, Massachusetts state **environmental objectives could be realized at a competitive cost for Massachusetts** residents ... [achieving] significant carbon emissions reductions at a reduced cost to load."



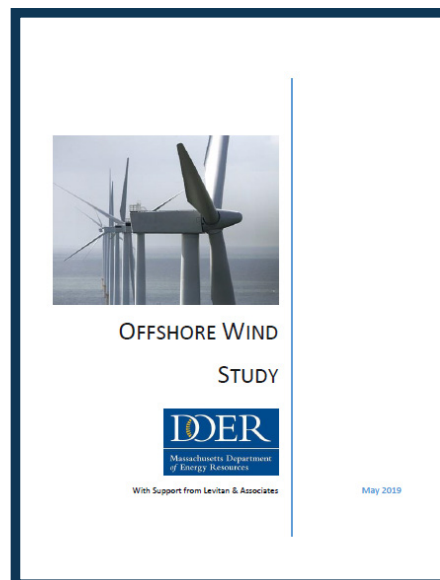


As noted by the UMass Lowell study, the 8,725-mWh-capacity Northfield Mountain has operated in recent years at less than 30 percent of its potential because its unrealized value in reducing carbon emissions is not fully priced into ISO-NE's energy dispatch. The Energyzt report notes that "in addition to Northfield, insights apply to the Bear Swamp Pumped Storage Generating Station and large battery facilities proposed to come online by the mid-2020s."

The report confirms and builds on key earlier findings from the

November 2019 UML report, which stated: "It is clear that deployment of thousands of megawatts of new renewable energy generating capacity, particularly offshore wind, will require thousands of megawatt-hours of storage capacity, including both increased utilization of the Commonwealth's now-underutilized pumped storage hydro facilities and the development of new storage systems ... The massive untapped potential of pumped hydro facilities for storing and moderating the intermittent nature of renewable electricity needs to be recognized."

The May 2019 DOER Offshore Wind Study, conducted with Levitan & Associates, also stated: "To support a growing amount of intermittent renewable energy generation, energy storage will need to be developed to charge during low cost periods when there is excess offshore wind and discharge during high cost peak times. Pairing energy storage with offshore wind will allow the Commonwealth to meet peak demand times with clean energy instead of high cost and high emissions fuel oil ... Analysis showed that the greatest benefits came from energy storage systems that were connected directly to the grid ... [and] provide other services to the system when not being utilized by the offshore wind. This would maximize the benefits of the energy storage without increasing cost."



## Energyzt Study

### Assumptions:

Based on confidential market-bidding strategy provided by FirstLight to Energyzt about prices at which Northfield Mountain could operate economically, and using Energy Exemplar's authoritative PLEXOS market model, Energyzt evaluated a scenario in which:

- Two of Northfield Mountain's four pumped-storage units are contracted to operate a minimum of five hours per day, the five highest-priced hours in the electric market, producing at least 1,460 MWh of electricity daily
- Those units, and the other two, also operate at other hours of the day when dispatched by Independent System Operator New England (ISO-NE) based on their competitive bid price
- Pumping to refill Northfield Mountain's reservoir is optimized to the most economically beneficial hours of the market
- Offshore wind deployment serving the New England grid grows from 73 MW in 2023 to 4,563 MW in 2027 to 7,240 MW in 2030
- Factors affecting electric markets including gross electric load, the mix of generating resources, behind-the-meter solar, energy efficiency, deployment of heat pumps and electric vehicles, and future prices for natural gas and oil are based on published projections by ISO-NE and the U.S. Energy Information Administration, and state environmental mandates and targets