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Monetizing Energy Storage

Massachusetts Case Study

BY ANDREW KAPLAN

Saying energy storage almost universally elicits the response, great idea! Consumers salivate over the prospect of lower electric bills. Environmentalists rejoice over reducing carbon emissions. Officeholders embrace the less politically risky alternative to asking voters to fund infrastructure patchwork. Entrepreneurs and academics welcome the opportunity to develop new technologies to satisfy society's energy hunger.

To date, there's been a collective shrug from political, business and other leaders dismissing the implementation of such a plan as too expensive. This has often derailed meaningful reform in energy usage policy.

Last month, Massachusetts released a two hundred seventy-page report entitled State of Charge. It's designed to thrust the Commonwealth into the vanguard of the expanding energy storage industry.

Commissioned as part of the Bay State's ten million-dollar Energy Storage Initiative enacted in May 2015, the report was co-funded by the Massachusetts Clean Energy Center and the Massachusetts Department of Energy Resources. It analyzes the costs and benefits of upgrading the efficiency of Massachusetts' grid infrastructure. It also offers recommendations for growing the Commonwealth's energy storage market and industry.

Currently, California and Oregon are the only states to issue an energy storage mandate. The Department of Energy Resources, co-author of the report, is charged with deciding by December 30, 2016, whether to establish such a mandate in Massachusetts and if procurement targets are warranted, the amount of additional energy storage to procure.

Utilities would have until 2020 to achieve the mandated procurement target. That the Department of Energy Resources, overseer of the Commonwealth's energy policies, has the legal authority to enact its own report's recommendations elevates State of Charge above other research white papers.

Other states formulating their own clean energy storage policies are thereby more likely to emulate the report.

The report establishes a goal of installing six hundred megawatts of advanced storage capacity by 2025 (roughly five percent of Massachusetts' peak load). This will enable Massachusetts ratepayers to realize savings of eight hundred million dollars in system costs.

It sets 1.76 gigawatts of storage as the optimal deployment level. This is the level deemed attainable if the storage is located properly, and if market and policy hurdles are removed.

From an environmental standpoint, the report contends that meeting energy storage goals would result in a carbon emissions reduction of more than one million metric tons

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of carbon dioxide over ten years. That is the equivalent of taking over seventy thousand cars off the road.

The report advocates that the Commonwealth integrate energy storage to slash energy costs, boost grid efficiency by reducing peak demand, and make better use of clean energy technologies.

According to the study, Massachusetts presently has two megawatts of energy storage. This ranks a modest twenty-third among states.

Between 2013 and 2015, the report found that the top ten percent of hours of electricity by cost made up forty percent of Bay State ratepayers' annual electricity bills. This translates to more than three billion dollars.

Regional peak demand is expected to increase by 1.5 percent annually, according to predictions by Independent System Operator-New England. So energy costs would continue to skyrocket without a concerted storage effort, the report concluded.

Rather than continue to purchase or generate energy at a premium price during high-demand periods, the report favors the use of energy storage technologies to store and discharge energy as needed. These storage resources include batteries, flywheels, and thermal and compressed air technologies.

Among other recommendations, the report calls for boosting the Commonwealth's funding for grant and rebate projects to twenty million dollars, from the previously announced allocation of ten million dollars.

The report also calls for state backing of commercial and industrial feasibility studies, encourages regional coordination regarding energy storage, seeks consideration of expanded use of energy storage in existing energy efficiency programs, and pairing storage with renewables in future long-term clean energy procurements.

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State of Charge meets head-on the brickbat of energy storage initiatives, that they're too expensive, through a detailed cost and benefits analysis. The analysis monetizes the benefits of expanding energy storage.

The study estimates that the cost of procuring the 1.76 gigawatt energy storage target would range from 970 million to 1.35 billion dollars, a daunting invoice indeed. The report however projects adoption of its recommendations would produce 2.3 billion dollars in system benefits to ratepayers.

It would provide another 1.1 billion dollars in market revenue to resource owners. And an additional 250 million dollars in regional system benefits to neighboring New England states, because of lower wholesale market prices across the regional grid.

State of Charge has the backing of Governor Charlie Baker, as well as the support of the Commonwealth's Senate and House leadership. The traditional utility companies that would have to purchase the advanced storage technologies, with the cost passed onto ratepayers, have held their fire.

Besides the lack of criticism from utilities, another advantage that may make State of Charge less pie-in-the sky is the presence of a strong academic research community. It's headed by the Massachusetts Institute of Technology, Harvard and other institutions, a valuable resource in developing advanced energy technologies.

It remains to be seen whether the promises of lower electric bills and job creation are borne out or whether the generated energy figures and proposed dollar savings are accurate.

What is clear is that if the Commonwealth follows the road map outlined by State of Charge, clean power companies and energy technology innovators nationwide should be drawn by the lure of rebates, grant money, and most important, a global showcase for their products. PUF

"The electric guitar was an idea whose time had arrived. By the early 1930s, a few factors had come together that made it all but an inevitability. The first was the widespread availability of electricity itself...

In the 1920s, for the first time ever, people found themselves living in an environment in which electrically amplified sound was everywhere. This constituted a major collective perceptual shift, a reorientation of the senses foregrounding the aural. It's what put the 'roar' in the Roaring Twenties – one more factor that contributed to the amped-up excitement of the era.

The electric guitar was very much the product of this zeitgeist, both technologically and culturally. Alongside the radio, P.A., and cinema sound, it was an innovation that would impact popular culture on an epic, unforeseeable scale."

Brad Tolinski and Alan Di Perna, "Play It Loud," Doubleday, 2016.