

May 16, 2023

Hon Senator Mark Lawrence, Senate Chair

Hon Representative Paige Zeigler, House Chair

Joint Standing Committee on Energy, Utilities, and Technology

100 State House Station

Augusta, Maine 04330

RE Bloom Testimony in Support of LD 1850, *An Act Relating to Energy Storage and the State's Energy Goals*

Dear Senator Lawrence, Representative Zeigler, and members of the Energy, Utilities, and Technology Committee

Good afternoon, my name is Jordan Garfinkle I'm with Bloom Energy – thank you to the committee for allowing me to testify today I'm testifying in support of LD 1850 and I want to share a bit about the benefits of both short- and long-duration storage, and how hydrogen can play a key role in decarbonization as a form of long-duration energy storage

Bloom is a distributed energy company that makes solid oxide fuel cells and electrolyzers Fuel cells generate electricity at high efficiency without combustion Electrolyzers produce hydrogen, essentially converting renewable electrons into renewable molecules Our fuel cells and electrolyzers are based on something called a solid oxide platform, which the company's founders originally developed for NASA as part of the Mars program in the 1990s

Hydrogen and Energy Storage

- Energy storage will be increasingly important as we build out the massive renewables necessary to decarbonize
- As renewables make up a growing portion of the grid, we will need to contend with intermittent generation – we will need energy storage
- At its core, hydrogen is an energy *carrier* – fundamentally, it's a form of long-duration energy storage
- Hydrogen can be generated during times of high renewables output and stored, moved and used when and where it's needed

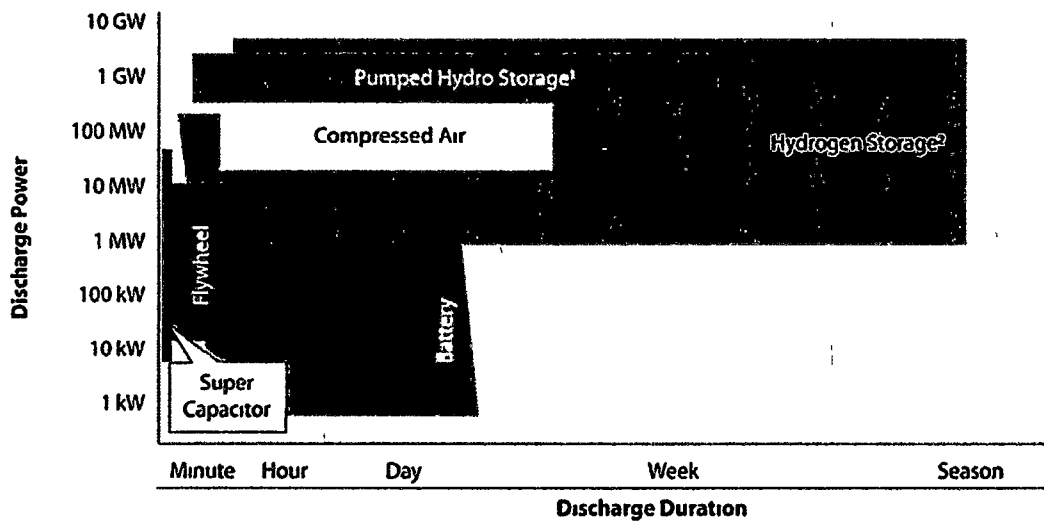


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Long-Duration Storage

- As renewables contribute a growing percentage of our electricity, we are going to need storage technologies that meet a range of criteria
- We will need a lot of short-duration systems, like batteries, that can discharge power over short periods, usually up to about 6 hours – these are critical for balancing supply and demand throughout the day
- But we’re also going to need systems that can store and discharge energy over much longer terms As the state pursues aggressive heat pump targets for home heating, it’s easy to envision an imbalance between renewable generation at night and high electricity needs for heating Batteries will get you from about sundown to bed time
- There is a need for long-duration storage as a distinct resource in addition to short-duration batteries – the two are complementary and each serve an important role
- In a climate bill last year, Massachusetts grappled with this same issue Ultimate, they defined long-duration storage as a system that can provide its full power for at least 10 hours
- And hydrogen can get us much more than 10 hours if needed The ability load shift seasonally with hydrogen means that excess wind in the winter or sun in the summer can be stored indefinitely and used when it’s needed

A number of different types of energy storage can fill distinct and important needs as we move towards a renewable grid The graphic below shows the characteristics of a range of technologies, each with their own strengths Hydrogen’s role is viewed largely to fill long-term and large-scale needs while other systems fill shorter-duration and smaller capacity needs



¹ Pumped hydro capacity is limited due to geographic constraints. Estimated maximum potential is <1% of U.S. electrical energy demand.

² As hydrogen, ammonia, or synthetic natural gas.

Figure 2. Battery and hydrogen storage cost comparison versus duration [9]

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¹ https://www.sandia.gov/ess-ssl/wp-content/uploads/2020/12/ESHB_Ch11_Hydrogen_Headley.pdf

We are thrilled to see this bill focuses on a technology neutral approach to energy storage, and look forward to the administration's long-duration storage report. We suggest that the bill include a clear definition of long-duration and ensure that when storage is procured the value of both long- and short-duration storage is considered.

Thank you again for the opportunity to provide testimony in support of LD 1850.

About Bloom Energy

Bloom Energy is a manufacturer of solid oxide fuel cell technology that utilizes an electrochemical process to power non-combustion microgrids as well as advanced electrolyzer systems capable of converting renewable electricity into renewable hydrogen. Our solid oxide fuel cells and electrolyzers are designed in a modular fault-tolerant format that provides mission critical reliability with no downtime for maintenance. Bloom Energy has installed around 1,000 of its non-combustion solid oxide fuel cell systems for customers in thirteen U.S. states and several international locations, with approximately 100 operating in New England. Our systems have proven resilient through outages caused by hurricanes, winter storms, earthquakes, forest fires, and other extreme weather and natural disasters.