



October 4, 2021

Dr. Joy Wang

Team Lead

MI Power Grid: New Technologies and Business Models Work Group

Michigan Public Service Commission

7109 W. Saginaw Highway

Lansing, MI 48917

Re: MPG New Tech - Draft Report Comments

Bloom Energy is pleased to respectfully provide the following comments on MI Power Grid: New Technologies and Business Models Draft Report dated September 15, 2021. Bloom Energy is a manufacturer of solid oxide fuel cell technology that utilizes an electrochemical process to power non-combustion microgrids. Bloom Energy has installed over 700 non-combustion fuel cell systems for customers in 13 U.S. states as well as in Japan, South Korea, and India. Our systems have proven resilient through outages caused by hurricanes, winter storms, strong winds, earthquakes, forest fires, and other extreme weather and natural disasters.

We acknowledge that this proceeding has been underway for some time and Bloom Energy have not heretofore been a participant. Simply put, we have previously been focused on the deployment of new technologies and business models in other jurisdictions, with an emphasis on the installation of non-combustion microgrids that have demonstrably increased the energy resilience of the communities in which they operate.

In light of the advanced stage of the Draft Report we would like to submit the following limited set of comments in hopes that the issues raised herein can be addressed before the Draft is finalized.

- The Draft Report includes an entire section on combustion combined heat and power (CHP) but does not mention another rapidly growing form of reliable distributed generation on the market - fuel cells. Fuel cells are a non-combustion technology that utilize an inherently reliable electro-chemical conversion process to generate electricity at exceedingly high capacity factors without producing local air pollutants.

- A wave of recent studies has shown that local combustion-related pollutants like NO<sub>x</sub>, SO<sub>2</sub>, and PM are far more harmful to human health than previously believed, and that the greatest impacts occur disproportionately in lower-income communities. The economic and health benefits associated with reducing NO<sub>x</sub> and PM emissions have been found to exceed the economic and health benefits of reducing GHG emissions on a per ton basis. [https://policyintegrity.org/files/publications/E Value Brief - v2.pdf](https://policyintegrity.org/files/publications/E_Value_Brief_-_v2.pdf)
- CHP projects require a matching thermal and electric load. The vast majority of customers, including many of Michigan's most critical facilities, do not have matching thermal and electric loads. Solid oxide fuel cells are the most efficient way to produce on-site power where there are not matching thermal and electric loads.
- Fuel cells are increasingly being used to ensure an un-interrupted supply of electricity for the types of customers that are important to community resilience, including telecommunications, supermarkets, data centers, large retail stores, and health care facilities. We believe that community resilience is an under-emphasized concept in energy planning that, to date, has received less attention than "grid resilience" or "customer resilience." The former term is intended to focus on those facilities that, although operated by private businesses, allow wider communities to maintain continuity of services during outages of the electric grid. For example, telecommunications, transportation infrastructure, food and water supply chains, and health care services.
- Bloom Energy alone has installed over 100 solid oxide fuel cell powered microgrids. These facilities have powered through more than 1,800 electric grid outages, including multi-day outages and significant events like SuperStorm Sandy, Tropical Storm Isaias, and the wildfire related Public Safety Power Shutoff (PSPS) events in California.
- The native output of fuel cells is direct current (DC) power, making them an extremely efficient and reliable form of on-site power generation for electric vehicle (EV) charging. A distributed approach to supplying EV chargers using inverter-based technologies like solar and fuel cells avoids the DC>AC>DC inversions that are necessary for electric grid based EV charging as well as the risks associated with shifting the state's transportation system over to an electric distribution grid that is less reliable than it could be.

- Fuel cells have already been used to avoid very significant ratepayer expenditures on traditional wires solutions. In New York City the electric utility Con Edison used a combination of end use energy efficiency, energy storage, and fuel cells to avoid the need for an expensive transmission line and substation, ultimately *saving ratepayers nearly \$1 billion*.
- The Draft Report states that “CHP can be fueled by lower carbon or renewable fuels, like biogas, renewable natural gas (RNG), and hydrogen. These fuels can further reduce emissions” without distinguishing between combustion and non-combustion technologies. While it may be appealing to assume that substituting hydrogen or biogas for fossil fuels will have a positive environmental impact, the reality is more complex. Harmful emissions, such as NO<sub>x</sub>, SO<sub>2</sub>, and PM are produced by high temperature combustion, regardless of whether the combusted fuels are fossil fuels or renewable fuels such as green hydrogen and biogas. However, these negative health and environmental consequences are not present when the same fuels are converted to electricity in fuel cells.

We very much appreciate the opportunity to submit these comments and will stand ready to serve as a resource if further information is required during the process of finalizing the Draft Report.

Very truly yours,

Charles Fox  
Vice President  
Bloom Energy Corporation  
4353 North First Street  
San Jose, CA 95134  
212-920-7151  
charles.fox@bloomenergy.com