



May 22, 2015

Judith Judson, Chair  
Energy Efficiency Advisory Council  
c/o Mass. Dept. of Energy Resources  
100 Cambridge Street, Suite 1020  
Boston, MA 02114

Re: Comments of Bloom Energy on Joint Statewide  
Three-Year Electric and Gas Energy Efficiency Plan

Dear Council Members:

Bloom Energy Corporation (“Bloom Energy”) is pleased to submit the following comments on the Draft Massachusetts Joint Statewide Three-Year Electric and Gas Energy Efficiency Plan.

Bloom Energy is a provider of solid oxide fuel cell technology that generates clean, reliable, and efficient onsite power using an environmentally superior non-combustion process. This technology offers end-users the most efficient commercially available means to convert gas into electricity, rather than into both electricity and heat. Bloom Energy provides an all-electric solution for customers who desire clean and reliable distributed power generation, but may not have the thermal requirements necessary to support a well-designed CHP solution. All-electric fuel cells do not require matching thermal and electric loads, and can be targeted into locations that most effectively enhance the efficiency and resiliency of the electric system. Bloom Energy currently has over 160 megawatts (“MW”) of operating “Energy Servers” at over 200 locations across the United States and in Japan – and our customers are eager to begin deploying them in Massachusetts.

1. Opportunities for Clean and Resilient Energy

Instead of capturing the waste heat for external purposes, Bloom Energy’s fuel cell technology utilizes “waste heat” internally to increase electrical efficiency. This innovative architecture commercializes the most electrically efficient way to convert gas to delivered electricity. The non-combustion system produces significantly less CO<sub>2</sub> than centralized generation and essentially eliminates SO<sub>x</sub> and NO<sub>x</sub> emissions, as well as water use. Bloom

systems provide primary power for some of the highest reliability requirement customers in the U.S, simultaneously enhancing the resiliency of the electric distribution system, avoiding T&D investments, and reducing system maintenance requirements. Other states in the northeast and elsewhere are increasingly recognizing the value of distributed generation solutions like Bloom's all-electric fuel cells as a mechanism to increase efficiency and enhance reliability.

The potential addressable market in Massachusetts is significant, including supermarkets, retail locations, distribution centers, corporate headquarters, and data centers. These types of customers invest in on-site generation because it enhances reliability and saves them money. When these investments in distributed generation are made, they will represent long-term investments in Massachusetts, signaling a commitment to a given location over the long term. However, due to the current limitations of the CHP program in Massachusetts as compared to clean energy programs in other states, Bloom Energy customers with a significant presence in the Commonwealth are instead investing in clean energy projects in Connecticut, New York, and California, rather than in Massachusetts.

Other states in the Northeast, such as New York, New Jersey, and Connecticut have recognized the value of clean fuel cell technology to achieving their environmental, energy, and economic development priorities. They have taken steps to make funding available annually for programs fuel cells are eligible for. There are no such programs currently available in Massachusetts and the current design of the CHP program excludes the majority of electricity customers in the Commonwealth from participating.

## 2. CHP Program Eligibility

The Massachusetts Combined Heat and Power (CHP) initiative is currently structured in a way that excludes customers without a matching thermal load from participation in the program. Only CHP technologies are eligible for the program, while many customers who want on-site clean power do not have a 24x7x365 thermal load. As a result, the majority of electricity customers in the Commonwealth are paying for the program, but cannot benefit from it.

After recognizing the exclusionary nature of an approach that requires external thermal utilization, both California and New Jersey have acted to expand their CHP programs to allow the most efficient non-combustion all-electric fuel cells to compete.<sup>1</sup> Massachusetts should do the same.

---

<sup>1</sup> The California Self Generation Incentive Program (SGIP) initially required a minimum electric and external thermal efficiency, but thereafter an alternative "functional equivalency" was created for all-electric systems that exceed 40% HHV efficiency. By Order dated December 14, 2011, the New Jersey Board of Public Utilities created a Standalone CHP-Fuel Cell Incentive Program, which included fuel cell technology systems achieving an output electrical efficiency of greater than 45% HHV.

This proposal to expand eligibility for Massachusetts' CHP program is consistent with the intent of, and would maintain the credibility of, the program. Massachusetts should very carefully limit any expansion of eligibility only to the cleanest and most efficient forms of all-electric distributed generation to maintain the overall cost-effectiveness of the program. Bloom Energy proposes that eligibility be limited to only those projects with; (1) an electrical efficiency of no less than forty five (45) percent higher heating value ("HHV"), and (2) emissions of no more than 0.07 pounds per megawatt-hour (MWh) of nitrogen oxides, 0.10 pounds per MWh of carbon monoxide, 0.02 pounds per MWh of volatile organic compounds, and one grain per 100 standard cubic feet<sup>2</sup>, and (3) no consumption or discharge of water during normal operating conditions.

The proposed adjustments to the eligibility criteria will significantly reduce criteria pollutant emissions and water use as compared to currently eligible projects, decrease GHG emissions as compared to the generation displaced by the projects, and enable increased *system level* efficiency – while enabling Massachusetts customers who have been paying into the energy efficiency funds for years to invest private capital to deploy on-site generation. Bloom is not proposing that the CHP program be in any way diminished, but rather that it be augmented to allow more customers to increase the efficiency of their electricity supply through a form of distributed generation that produces less overall air pollution and other forms of environmental impact than many of the projects currently funded by the program.

### 3. The BCR Test

The benefit-cost ratio ("BCR") test currently utilized to assess CHP projects excludes many of the considerations that the Council itself is required to take into account in approving the Plan. The Council is required to "determine the economic, system reliability, climate and air quality benefits of efficiency and load management resources, conduct and recommend relevant research, and recommend long term efficiency and load management goals to maximize economic savings and achieve environmental goals." G.L. c. 25, § 22(b). As detailed below, many of these important values and benefits are excluded from the current CHP program BCR test.

First, the CHP program BCR test also excludes consideration of the extent to which a customer is willing to contribute private funds to support a distributed generation project. While the Draft Plan claims that the administrators have "carefully and successfully managed expenditures to keep costs as low as possible, with the goal of maximizing the value of each dollar spent," in actuality a project that is funded with an 80/20 ratio of customer to program funds is evaluated on an equal basis with a project that is funded with only a 50/50 ratio of customer to program funds. As a result, the current BCR test misses opportunities to leverage

---

<sup>2</sup> Emissions limitations derived from the CT "LREC" low emission distributed generation program. The combustion technologies currently funded by the MA CHP program exceed these emissions limits.

significant private investment into the Massachusetts electricity market. Consistent with G.L. c. 25, § 22(b) the BCR test should be modified to credit the value of private project funding.

Second, the extent to which a particular project enhances the efficiency of the *overall* electric system is not captured by the test, instead the test is focused on the efficiency of the individual project itself. Examples of excluded considerations include reduced congestion resulting from generation targeted into critical areas on the grid, voltage management that enhances the efficiency of grid operations, and the ability to provide leading or lagging power factor improvement. Consistent with G.L. c. 25, § 22(b) the BCR test for the CHP program should be expanded to include consideration of system efficiency and system reliability benefits, in addition to project level considerations and avoided T&D expenditures.<sup>3</sup>

Third, the BCR test excludes consideration of customer and societal resiliency. The existing BCR framework does not recognize the benefits of resiliency to a telecommunications hub, data center, or government facility that is critical to security and the continuity of the Commonwealth's economy. Other jurisdictions in the northeast and elsewhere are increasingly recognizing the value of distributed generation as a means to prepare in advance for widespread grid outages. The Council should ensure that customer and system resiliency are taken into account in the administration of the CHP program.

#### 4. Conclusion

The eligibility criteria for the MA CHP program should be updated to permit customers to select the newest, most electrically efficient, non-combustion fuel cell technologies. The program BCR test should consider the degree to which private investment leverages CHP program funding, and include the value of increased system efficiency, economic development, grid resiliency, avoided emissions, and avoided water usage.

Very truly yours,

/s/

Charles Fox  
Director, East Coast Regulatory Affairs  
& Business Development  
Bloom Energy Corporation  
PO Box 1406  
Princeton, NJ 08540  
[charles.fox@bloomenergy.com](mailto:charles.fox@bloomenergy.com)

---

<sup>3</sup> See also Energy Efficiency Guidelines, §§ 3.4.4.1(a)(iii) and (iv) (Energy Efficiency Program Cost-Effectiveness, Avoided Transmission and Distribution Benefits); D.P.U. 08-50-B at 50 (2009).