Response of Bloom Energy Corporation

To

"New York Energy Highway" Request for Information

May 30, 2012

1. Respondent Information

Bloom Energy Corporation ("Bloom Energy" or "Bloom") is a provider of breakthrough solid oxide fuel cell technology. Bloom Energy's fuel cell technology is able to produce clean, reliable, affordable power, from a wide range of fuel sources, including natural gas and biogas. Bloom Energy Servers™ are among the most efficient energy generators available, providing for significantly reduced electricity costs and dramatically lower greenhouse gas emissions. Bloom Energy Servers™ produce reliable baseload electricity using an environmentally superior non-combustion process that can be targeted into specific locations on the electric grid. The result is a new option for energy infrastructure that combines increased electrical reliability and improved energy security with significantly lower environmental impact.

Bloom Energy traces its roots to work performed by Dr. K.R. Sridhar, Bloom founder and Chief Executive Officer, in connection with a National Aeronautics and Space Administration (NASA) project in which Dr. Sridhar and his team built a fuel cell capable of producing air and fuel from electricity generated by a solar panel for NASA's mission to Mars. When the project ended in 2001, the team started a company dedicated to commercializing and deploying their clean and reliable fuel cell technology.

Bloom Energy's Investors include Kleiner, Perkins Caufield & Byers, New Enterprise Associates, and Morgan Stanley. In addition to Dr. Sridhar, the company's leadership team includes former Secretary of State General Colin Powell as a board member. Bloom Energy also recently welcomed world-renowned data center design expert Peter Gross, who joined to lead the company's "Mission Critical Systems Practice," which focuses on improving data security and reducing disruptions to mission critical government and business processes. The Company's Chief Operating Officer, Gary Convis, formerly served as EVP of Toyota Motor Engineering & Manufacturing North America, Inc., as well as in various roles with GM and Ford Motor Company, is leading the company's effort to scale up manufacturing.

Over the past few years, Bloom Energy has deployed its solid oxide fuel cells at over *75 different locations totaling over 35MW* of clean generating capacity. The company's customer list includes many of the world's most prominent corporations and organizations, including Lockheed Martin, Google, Walmart, Owens Corning, Washington Gas, Delmarva Power, AT&T, Bank of America, Apple, eBay, Fedex, PG&E, Staples, and The Coca-Cola Company. The company's existing fleet of Bloom Energy Servers has *a demonstrated capacity factor in excess of 95 percent.*

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2. Project(s) Description

Bloom Energy Servers are a reliable, clean, modular, and flexible alternative to the traditional “generation – transmission – distribution - customer” model of electric supply. Bloom Energy Servers allow power generation to be targeted directly into critical locations on the electric grid – either on the customer side of the meter or on the utility side of the meter. Each individual Bloom Energy Server generates 200 kW of baseload electricity generation. The modular design of the system allows projects to be flexibly sized to match customer and/or utility requirements as well as available footprint. The company is currently under agreement to develop projects in scale from across a range of as little as 200kW to as large as 27MW at a single location. A Bloom Energy Server can be installed virtually anywhere, requiring only a concrete pad, electric interconnect, low pressure (15 psi) gas, temporary water line, and an internet connection.

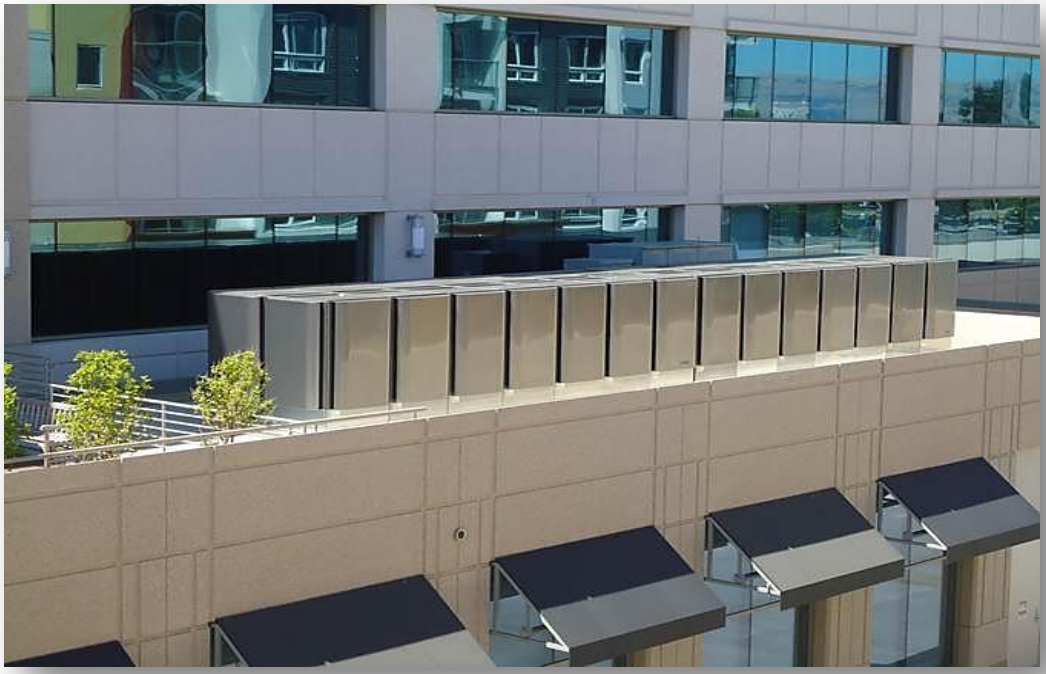

Figure 1 – Targeted Deployment of 400 kW Bloom Energy Server

The Bloom Energy Server is an “all-electric” solution that utilizes waste heat internally to increase the efficiency of electrical power production. This characteristic allows Bloom systems to be deployed at sites where it is not necessary to match on-site thermal loads or develop complicated infrastructure to handle thermal energy outputs. Instead, efficient and reliable electrical power production can be deployed by customers on-site or targeted by utilities into those specific places on the electric grid that provide the

greatest benefits in terms of reliability and cost savings achieved as a result of avoided transmission and distribution investments.

Bloom Energy Server projects are particularly suited to deployment in New York's downstate region with its higher requirements for reliability, challenging siting environment, and widespread natural gas supply network. Bloom Energy projects could be operational in a matter of weeks due to the "off-the-shelf" nature of the technology, established manufacturing capacity, relatively simple permitting/siting issues, and minimal supporting infrastructure requirements.

3. Project Justification

A. How Bloom Energy will create jobs and opportunities for New Yorkers.

Bloom Energy plans to utilize in-state local labor for its fuel cell installations in New York. Every installation contributes nearly $500,000 to the local economy in the form of labor, parts, services, and other expenses, in addition *to* the sales tax revenues from the sale of the Energy Server. As Bloom Energy project deployments in New York become more widespread, the company plans to increase the amount of investment within the state. In order to support additional New York projects, Bloom plans to hire, train, and permanently employ locally based service technicians, application engineers, project managers, sales and support personnel creating more skilled "green collar" clean tech jobs in the state.

Bloom's steady growth has already positively contributed to the New York economy. Since 2008 Bloom Energy has spent nearly $20 million in New York, including the acquisition of manufactured component parts and supplies from New York suppliers. As the number of projects in the state increases and as the company continues its growth, Bloom expects to source an increasing amount of manufactured component parts and supplies from New York sources.

The enhanced reliability of customer power supplies and the electric grid itself is an important element of continued job creation and economic growth, particularly in New York's vital manufacturing and financial sectors. According to the State Energy Plan, a survey of the economic losses in the Northeast region resulting from the blackout of 2003 estimated the total cost at between $7 billion and $10 billion dollars, including lost wages. Disruptions in electric supply can also lead to long term decisions to re-locate to areas with more secure power supplies.

B. How Bloom Energy will contribute to an environmentally sustainable future for New York State.

Bloom Energy will contribute to an environmentally sustainable future for New York State by providing a reliable on-site baseload power generation resource that is; (1) more efficient, (2) emits less air pollution, and (3) uses less water than any other option available to the Task Force. Bloom Energy Servers also do not entail the "siting" impacts that characterize virtually every other form of power generation. With minimal physical and environmental footprints, Bloom Energy servers eliminate the cost, complexity, interdependencies and inefficiencies associated with traditional centralized electrical transmission and distribution while increasing reliability.

Increased Efficiency

The Bloom Energy Server is one of the most efficient ways to convert gas into electricity. The Bloom Energy Server is capable of converting our most abundant domestic energy resource into electricity at the point of consumption - without the line losses associated with central station power generation - at electrical efficiencies exceeding sixty (60) percent, approximately twice as efficient as legacy distributed generation technologies.

Reduced Air Emissions

The Bloom Energy Server converts gas into electricity through an electrochemical reaction without combustion. The result is a dramatically lower air emission profile as compared to combustion-based power generation. CO_2 emissions have been independently verified at approximately 773 lbs/MWh, representing an over 40% reduction in carbon dioxide as compared to other generation options[1]. In

[1] The above emission data is based on the Bloom Energy Server when operating on natural gas fuel. Bloom Energy Servers can also provide a carbon neutral generation resource when fueled with biogas.

addition, Bloom systems virtually eliminate NOx emissions (less than 0.002 lbs/MWh), while Sulfur Dioxide and particulates emissions are essentially at non-detect levels. Figure 2 below shows the relative emission rates of a Bloom Energy Server versus other generation resources in New York.

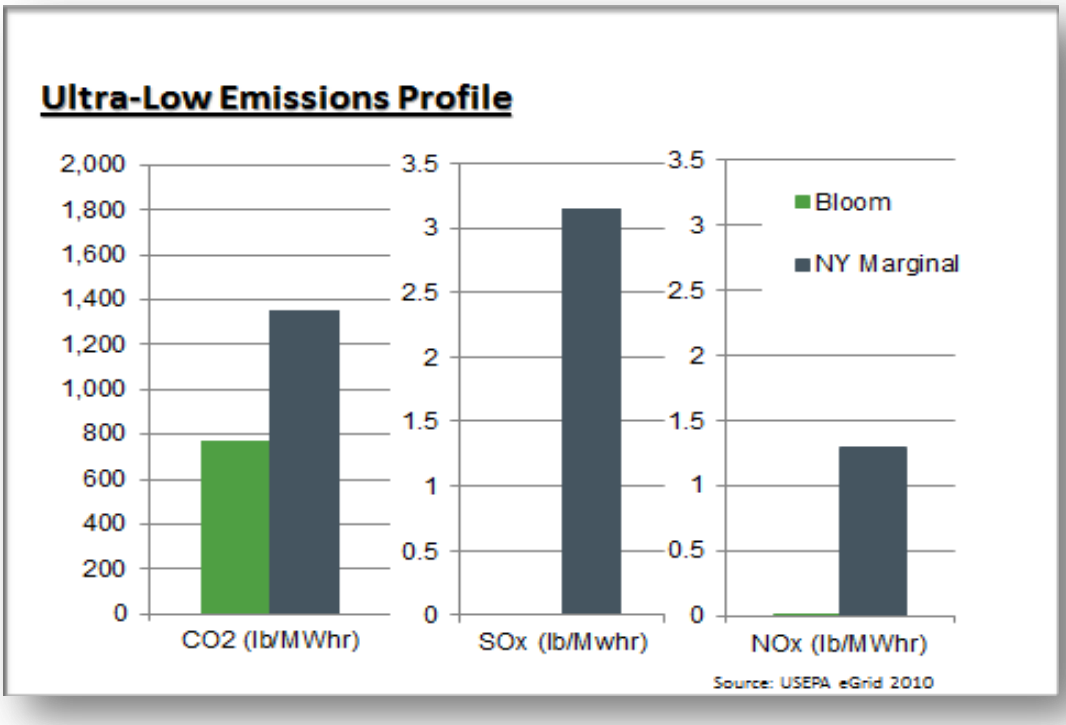

Figure 2 – Bloom Energy Server Emissions Compared to NY Marginal Emissions

The targeted deployment of Bloom Energy Servers into capacity constrained areas can reduce reliance on over-stressed components of the power grid, contributing to lower air emissions by reducing the likelihood of system outages and the consequent need for the use of back- up diesel generators. The air emissions resulting from a system outage can rapidly erode the benefits of air pollution control measures due to the extremely high emissions of diesel-fueled generation. The Bloom Energy Server can not only reduce the likelihood of a system outage, it can be deployed as a more reliable source of on-site generation eliminating the need for diesel back-up generators.

Requires Virtually No Water Usage

The Bloom Energy Server produces electricity on an essentially water-free basis. The system requires a small amount of water upon start up, and then there is no water consumed during normal operations. New York continues to confront significant impacts due to the extremely large amounts of water that most

forms of power generation require. Bloom Energy Servers can help mitigate these impacts by displacing high water usage options with a clean and water-free alternative. Figure 3 below shows the relative water usage of various forms of power generation.

Generation Type	Gallons/kWh	Annual Gallons per 200 kW
Bloom Energy Server	0.000013	24*
Efficient Combined Cycle Nat Gas	0.37	648,240
Average US Coal Plant	0.61	1,068,700
US Grid	0.87	1,524,240

Figure 3 - Relative Water Use

* Bloom Energy Servers Use No Water During Normal Operations. 24 gal/yr represents the initial 240 gallons spread over a server's 10-year life

Easy Siting

Bloom Energy Servers require a very small "footprint," are architecturally and aesthetically appealing, and produce very little noise. Bloom Energy servers can be located within the confines of a few parking spaces, or even on the top of a roof. In fact, some Bloom customers choose to locate their systems in highly visible, public locations due to their clean and quiet appearance. The systems produce only 70 decibels at 6' – far below any noise pollution threshold.

The installation of a Bloom Energy Server involves only the construction of a concrete pad and interconnects to the electric grid, gas supply, temporary water line and the internet. The deployment of a Bloom Energy Server does not involve the siting impacts associated with other forms of power generation, or the disruption to wetlands, streams, and forests that can be attendant to large scale transmission projects.

Figure 4 - Bloom Energy Servers - Bank of America

C. How Bloom Energy will apply advanced technologies to benefit system performance and operations.

Bloom Energy servers enable utilities, public authorities, or end use customers to strategically target clean and efficient generation into locations that enhance reliability and system performance. Bloom Energy servers have a proven track record of performance, with a demonstrated capacity factor of over 95%.

Increased Reliability

New York is the financial capital of the world. In order to secure that status in an increasingly digital economy New York must offer a truly secure and reliable energy supply – an energy supply free from even a momentary interruption. In March, 2012 the Bloom Energy Mission Critical Practice was launched to provide data centers, financial firms, government facilities, and other critical loads a power supply

option that is secure from a disruption in the electric grid. Enhanced reliability will encourage investment, particularly in the New York financial and internet-based sectors. Bloom Energy Servers deployed in Mission Critical mode are the single most secure electric supply option available for consideration by the Task Force.

One of the growing demands on the grid involves the continued growth of the data center marketplace. With large energy demands and very high power quality requirements, data centers are an increasingly challenging category of load center for the state's utilities. These data centers often require multiple grid feeds, costly uninterruptable power supply equipment, and dirty diesel generators. Bloom has developed a simpler way to power data centers & mission critical facilities. This modular, always-on architecture simultaneously addresses the key challenges of traditional data center design: reliability, energy efficiency, reduced operational cost, phased use of capital, and air and water sustainability. The Bloom Energy Server is an energy infrastructure tool that can enable New York to continue hosting critically important high reliability end users, without increased stress on the electric grid.

Improving the Grid

The internally redundant and modular Bloom Energy Server allows properly scaled generation resources to be targeted directly into capacity constrained areas within time frames not previously achievable, providing a new way to avoid and/or defer transmission and distribution upgrades. This reliable and targeted on-site baseload power option can mitigate these costs while at the same time helping the state to reach its Renewable Portfolio Standard objectives.

Bloom Energy Servers provide 24/7/365 continuous power that will not only stabilize the grid, but will improve the voltage profile of electric feeders on a consistent basis. Bloom Energy Servers can also provide reactive power compensation that can be adjusted seasonally or in real time for leading or lagging VAR support. The provision of targeted, scalable, all-electric baseload power generation enables micro-grid applications on a more flexible basis than ever before possible, opening the door to the development of localized micro-grid applications and further enhancing the flexibility and reliability of the overall grid system.

The Bloom Energy Server produces DC power as its native output, and can be deployed in a format that provides both DC power and AC power at the same location. Further, a Bloom Energy Server deployed today to produce AC power could later be re-configured to provide DC power. This characteristic is of critical importance if New York is to ready itself for the potential widespread adoption of electric vehicles. By providing a source of DC power for fast-charging electric vehicles without placing new demands upon the wider electric grid, Bloom Energy Servers can help ensure that the electric transmission and distribution system does not become a limiting factor in the effort to reduce the dependence of New York's transportation sector on dirty, and largely imported, gasoline and diesel fuel.

D. How Bloom Energy will maximize New York State electric ratepayer value in the operation of the electric grid.

Bloom Energy Servers can be a cost effective measure to address capacity constrained areas and defer transmission and distribution infrastructure upgrades due to their ability to be targeted and deployed virtually anywhere in the system. The Department of Energy reported that as electricity demand increased 50% from the 1970's to the 1990's, annual investment in new transmission capacity fell from $5.5 billion to less than $3 billion. As a result, the Edison Electric Institute estimated in 2008 that over the following 20 years, the US electric utility industry would need to spend "between $1.5 trillion and $2 trillion dollars" on infrastructure projects.[2] These substantial T&D costs are passed onto the ratepayers, increasing their cost of electricity significantly. The flexible onsite generation capability of Bloom Energy Servers can provide system planners and utilities with an alternative to transmission upgrades.

[2] "Transforming America's Power Industry," Edison Foundation, November 2008.

4. Permit/Approval Process

The deployment of Bloom Energy Servers will not involve the contentious, expensive, and time consuming siting process that have historically been associated with large central power generation and transmission line projects. Instead, a Bloom Energy Server project offers a plug and play solution that can rapidly proceed through the existing utility interconnection process to be deployed in a time frame well in advance of other options.

Figure 4 - 200kW Bloom Energy Server Installation

Bloom Energy Server projects do not require increases in gas distribution network pressure as is often the case with central power station projects and even some forms of distributed generation. The State Environmental Quality Review Act (SEQRA) process provides an existing framework to conduct permitting for this environmentally friendly power generation option. Bloom Energy can quickly, cleanly, reliably and efficiently help New York meet its growing energy needs.

5. Recommended Actions

Although the Bloom Energy Server has primarily been deployed as a “customer side of the meter” resource, the “NY Energy Highway” Request for Information has been limited to “utility side of the meter”

proposals. Therefore, although Bloom Energy Servers can be deployed on either side of the meter, and because Bloom Energy has experience with installations integrated directly into the grid, the following recommendations are limited to "utility-side" project deployments.

Utility-Side "Targeted Distributed Generation"

The Action Plan should include a proceeding modeled after the "Targeted Demand Side Management Program" that was adopted by the New York Public Service Commission for the Con Edison service territory in its June 1, 2011 Order in Case 09-E-0115. As part of the Action Plan, a similar program *for distributed generation* should be adopted that would allow New York's utilities to deploy distributed generation where it is demonstrated to be reliable, targeted, clean, cost-effective, and capable of rapid deployment.

In keeping with the existing Targeted DSM program, a Targeted Distributed Generation program could include eligibility criteria that would ensure that the deployment of distributed generation under the program is cost-effective taking into account the relative costs of avoided transmission and distribution infrastructure upgrades, the extent to which the distributed generation renders the system more reliable and flexible, as well as the comparative environmental impacts of clean distributed generation versus the central power station/transmission and distribution alternative, that includes a full comparison of CO_2, SOx, NOx, particulates, and water.

A Targeted Distributed Generation program that is modeled upon the existing DSM program would also include a mechanism for utilities to recover costs through each company's Monthly Adjustment Clause ("MAC"), pro-rata apportionment of costs across those rate classes that benefit, as well as an annual overall program expenditure cap. A Targeted Distributed Generation program would be a reliable, clean, and cost-effective initiative that will complement the transmission and re-powering initiatives of the Action Plan.

Public Authority "Standard Offer" or "Feed in Tariff" Programs

The Action Plan should include "Standard Offer" or "Feed in Tariff" programs for clean distributed generation that are cost effective and tailored to achieve the purposes of the Energy Highway Initiative. The public power authorities within New York State could develop Standard Offers that would apply within their respective service territories, customer bases, and system characteristics. A set of tailored Standard Offer(s) that are cost-effective and place clear and predictable price signals on; (1) reliability, (2) rapidity of deployment, and (3) environmental performance will be the most effective way to incent the deployment of clean distributed generation as an aspect of energy infrastructure on the utility-side of the

meter. An important aspect of Standard Offer or Feed in Tariff programs is that they can provide a clear price signal that will leverage private investment while placing the risk of performance on the project sponsor rather than the State of New York.

6. Conclusion

The Action Plan presents an opportunity to encourage the deployment of targeted, clean, and reliable distributed generation as a grid-strengthening aspect of energy infrastructure. Bloom Energy Corporation appreciates the chance to respond to the New York Energy Highway Request for Information (RFI) and looks forward to working with the Task Force during the next phase of the process.