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Friday, October 2, 2009

Mary D. Nichols, Chairman
California Air Resources Board
1001 I Street
Sacramento, California 95812

RE: **Bloom Energy Comments on Promoting Combined Heat and Power**

Chairwoman Nichols,

Bloom Energy applauds the California Air Resources Board on its efforts to ensure that California establish itself as a global leader in the clean energy economy. As part of its efforts to promote combined heat and power (CHP) through the implementation of AB 32, we encourage ARB to include the newest, most electrically efficient distributed generation (DG) technologies.

The AB 32 scoping plan's recommendation to install 30,000 GWh of CHP in California is an important aspect of the state's carbon reduction policies. However, it is critical that the state uses a modern definition of CHP to include the newest, most innovative clean energy technologies. Unfortunately, if the state relies on an antiquated definition of combined heat and power, it could preclude the advancement of these new technologies. Furthermore, ARB may have difficulty reaching its goals without the acknowledgement of these new technologies. We believe it is critical for ARB to include the most efficient all-electric distributed generation (DG) technologies – not just traditional CHP – as eligible cogeneration technologies.

While legacy CHP technologies are designed to use their waste heat externally to improve their overall efficiencies and economics, the newest fuel cell technologies achieve unprecedented overall electrical efficiencies by *using their waste heat internally* to boost overall efficiency. The newest fuel cell technologies, like solid oxide fuel cells (SOFCs), operate at a much higher temperature (800°-1000° C) than other distributed generation technologies. This temperature range enables this technology to achieve unprecedented electrical efficiencies. However, achieving such a high electrical efficiency requires utilizing the waste heat generated from high temperature operation and recycling it *internally* rather than externally. Internal utilization of the waste heat *increases the electrical efficiency* of the energy produced and eliminates the need for the external utilization of waste heat to justify a DG installation.

This technological break through will ultimately make clean, efficient distributed generation feasible for all Californians. These new cogeneration technologies will allow customers to buy DG units even if they don't have need for thermal heat elsewhere in their facilities. What is required, however, is an updated CHP definition to facilitate opening new doors to promoting cogeneration where it was impractical before.

Because the existing cogeneration definition couldn't anticipate these recent technological advances when it was written decades ago, it doesn't cover the use of the heat when it is recycled within a system. If the state were to limit its focus on technologies included in the antiquated CHP definition

that requires external waste heat utilization, it would fail to recognize and support new innovations in the DG sector.

A modernized definition will allow for the increased use of efficient, ultra-clean, all-electric fuel cells that reduce emissions while creating California green-collar jobs. Recognizing the crucial role that ultra-clean DG solutions can provide both for GHG reductions and for easing the strain on the grid, ARB must use a modern definition of CHP that includes the most innovative and most electrically efficient solutions.

This definition that allows technologies that use their waste heat internally will drive a higher penetration of DG in California. Bloom Energy's customer research highlights a significant demand in our state for a clean, highly efficient, all-electric fuel cell system for self-generation without the added complexities of cogeneration. While traditional CHP DG technologies make sense for those with a consistent thermal load, the legacy cogeneration definition *requiring* external waste heat utilization is antiquated. Until now, the economics from less electrically efficient technologies dictated the external use of waste heat to bolster the payback of traditional cogeneration solutions. However, customers who do not have a consistent thermal load in our state should also be encouraged to install efficient DG as part of our GHG reduction roadmap.

Further, the most electrically efficient fuel cells used for stationary, baseload, distributed generation replace the need for additional emissions from combustion-based power plants while simultaneously reducing the burden on the transmission grid. Ultra-clean electricity generation at the point of demand does not require any additional infrastructure and allows capacity for more renewables to be brought to the load center via the off loaded capacity.

The California Air Resources Board must ensure that it does not inadvertently preclude the most electrically efficient, emerging technologies as part of its CHP definition. By only supporting legacy CHP installations, ARB would miss the unique opportunity to advance the most electrically efficient fuel cells, inadvertently standing in the way of the wide scale deployment of these new technologies. In order to accelerate the commercialization of the cleanest, most efficient DG technologies, it is critical that the scope of the Commission's efforts not be limited to the older, less electrically efficient, Combined Heat and Power (CHP) applications.

Sincerely,

Josh Richman
Director of Business Development
Bloom Energy Corporation