

PETITION FILED WITH THE DELAWARE PUBLIC SERVICE COMMISSION FOR THE OPENING OF A DOCKET TO REVIEW (1) APPROVAL OF THE QUALIFIED FUEL CELL PROVIDER TARIFF IN 2011; (2) RESULTING BURDEN TO DELMARVA POWER RATEPAYERS; AND (3) OPTIONS TO MITIGATE THIS BURDEN.

Petitioner: John A. Nichols, 406 Meadow Lane, Middletown, DE 19709, (302) 378-0683, j.nichols87@yahoo.com

A. Background

1. In June 2011, a proposed package of incentives was announced to encourage Bloom Energy, Inc. (BE), a fuel cell company headquartered in California, to locate a manufacturing plant in Delaware. The proposal was endorsed by political leaders (including then Governor Jack Markell and three members of Congress from Delaware), and by executives of BE, Delmarva Power (DP), and the University of Delaware. Press release package, 6/10/11. <https://bit.ly/2t8MP5e>

2. An integral element of the incentives package was a long-term arrangement between DP and BE for the construction and operation of facilities to generate 30 MW of electric power with BE fuel cells. The fuel cells were to be powered by chemical oxidation, as distinguished from combustion, of natural gas.

Delmarva Power is proposing to partner with Bloom Energy to facilitate a 30 MW fuel cell installation as part of the utility's renewable energy portfolio, pending legislative and regulatory approval. The Governor will be asking the General Assembly to consider legislation that would establish a regulatory framework for fuel cells, a reliable technology that is increasingly cost-competitive for commercial use. The proposed legislation would also enable locally produced, clean energy from Bloom Energy Servers to be counted towards Delmarva Power's renewable portfolio requirements.

If the legislation passes, Delmarva Power would then file a new manufactured-in-Delaware fuel-cell rate tariff with the Delaware Public Service Commission for its review and approval.

3. Legislation to "establish a regulatory framework for fuel cells" was subsequently introduced in the General Assembly, passed by an overwhelming margin, and signed by the governor on July 7. Among other things, this legislation provided that BE fuel cells made in Delaware would qualify as a "renewable energy" source for purposes of the Renewable Energy Portfolio Standards Act.

4. DP and BE negotiated a contractual arrangement for the fuel cell power facilities, which was to run for 21 years after the facilities came on line. DP was to provide natural gas at its cost plus a markup, act as the billing and collection agent for the qualified fuel cell provider (QFCP) tariff, and realize no profit or loss from the tariff. BE or its designee would operate the fuel cell facilities (FCF); the electric power produced would be sold to the electric grid at market price with the proceeds credited against the tariff.

5. The aggregate QFCP tariff was to be based on amortization of facilities cost + operating costs + natural gas purchases – sales of electricity to the grid. The aggregate tariff amount would then be allocated to DP ratepayers located in Delaware, and the amounts collected would go to BE or

its designee. The foregoing DP/BE arrangement was reviewed and approved by the Department of Natural Resources and Environmental Control (DNREC).

6. DP filed a QFCP tariff application based on the foregoing arrangement with the Delaware Public Service Commission (PSC) in August 2011. At the end of a lengthy evidentiary hearing on October 18, 2011, the PSC voted to approve the tariff subject to “entry of a [sic] formal Findings and Opinion in support of this Order at a later date.” Order 8062, 10/18/11.

7. On December 1, the PSC issued a comprehensive order confirming its approval of the QFCP tariff and spelling out the rationale: This proceeding was said to involve a binary choice, in that the PSC could either approve or disapprove the tariff but had no authority to require alternation of its terms as a condition of approval. Order 8079, 12/1/11.

8. The PSC found evidence to support each of the statutory criteria for approval of the tariff: The FCF would utilize innovative baseload technologies – offer environmental benefits relative to conventional baseload technology – promote economic development in the state (as the result of the fuel cell manufacturing plant) - promote price stability over the project term. For all the uncertainties and risks associated with the BE venture, it was concluded, the PSC had no basis to override the judgment of the experts who had studied the BE business model, devised the incentives proposal, and recommended going ahead with it. However, the PSC reserved “the jurisdiction and authority to enter such further orders in this matter as may be deemed necessary or proper.” Ibid.

9. In 2012, the first increment of the BE FCF came on line and DP started to add the QFCP tariff charge to the monthly electric bills of its ratepayers located in Delaware. Order 8136, 4/17/12.

10. The arrangement for the generation of electric power by the FCF is to remain in effect for 21 years, i.e., until 2033. No changes can be made except by mutual agreement of BE and DP. There is no obligation on BE’s part to upgrade the fuel cells in use as the technology improves, nor any express cap on the amount of the tariff that may be charged. Any legislative changes to void the agreement would trigger a “poison pill” requirement that DP ratepayers make immediate payment of all future tariffs due under the agreement.

11. To date, Delmarva ratepayers have been billed nearly \$200 million for the QFCP tariff, net of proceeds from selling all electric power produced to the grid (in competition with the other energy sources being used to generate electric power), which works out to some four or five dollars per month for a typical ratepayer. The cumulative tariff is increasing by about \$3 million per month, and if this pattern continues the payments will total nearly \$700 million through 2033.

12. Ratepayers receive a partial offset, in that a portion of the Bloom tariff may be applied to offset charges that would otherwise be due under the Renewable Energy Portfolio Standards Act. Fuel cells powered with natural gas are somewhat less efficient (over their time in service) than a combined cycle natural gas (CCNG) power plant, however, and therefore produce somewhat higher carbon dioxide emissions per unit of electric power.. Accordingly, ratepayers concerned about global warming cannot derive the moral satisfaction that they might derive from paying renewable energy subsidies that support wind and solar power.

B. Issues

HIGH COST – It was recognized from the outset that there would be some excess cost associated with the facilities to produce electric power from BE fuel cells. Said excess cost was to be covered by a QFCP tariff, which was initially forecast as less than 70¢ per month for the typical DP ratepayer. Press release package, 6/10/11. <https://bit.ly/2t8MP5e>

Delmarva Power estimates that the 30 MW fuel cell project would have an above market cost to Delaware residential ratepayers of less than \$0.70 per month.

Several months later, when the QFCP tariff was being reviewed by the PSC, the estimated cost had risen to \$1.00 per month (Delmarva Power) or \$1.34 per month (New Energy Opportunities, Inc., a consultant retained by the PSC). Order 8079, 12/1/11.

An intervenor in the proceeding, David Stevenson of the Caesar Rodney Institute, predicted that the cost to DP ratepayers would be considerably higher. Unlike the Delmarva Power estimates, the CRI estimates did not reflect a partial offset for reduction in other renewable energy charges. Given that the BE fuel cells did not represent a “renewable energy” source in the generally accepted sense, however, the CRI estimates arguably reflected a commonsense view of the QFCP tariff’s magnitude. Ibid.

CSI also suggested that the cost to ratepayers might be as high as \$4.32 per month for residential customers and up to \$110,000 annually for large manufacturing and commercial users.

As previously noted, the QFCP tariff charge to a typical DP ratepayer is currently on the order of \$4.00 – \$5.00 per month. And the CRI estimate of the cumulative cost of the tariff over its 21-year life (\$750 million) is in line with experience to date.

MINIMAL ENVIRONMENTAL BENEFITS – It was represented at the outset that generation of electric power from BE fuel cells would offer major advantages over alternative energy sources. Press release package, 6/10/11. <https://bit.ly/2t8MP5e>

Traditional fossil-fuel energy production may lose 60/70 percent of its energy during the combustion process, and up to 10 percent during transmission, so Bloom's fuel cells are significantly more efficient. Carbon emissions and water use are drastically reduced, while harmful air pollutants are virtually eliminated. Unlike other renewable sources such as solar or wind, Bloom Energy Servers provide reliable base load distributed power generation and can run day and night, regardless of the weather.

However, (a) combined cycle natural gas (CCNG) power plants would run just as efficiently, if not more so, achieving equivalent reductions in carbon emissions per units of electric power produced; (b) power losses during transmission were irrelevant as electric power from the FCF was to be sold to the grid; and (c) the comment about virtual elimination of harmful air pollutants, e.g., sulfur dioxide, was misleading as the BE fuel cells generate hazardous solid wastes that must be disposed of. Based on the information that is available, it is hard to tell whether BE has developed systematic and responsible procedures for disposing of the hazardous solid waste and cleared approval of said procedures with state and federal regulatory authorities.

There was considerable discussion of the purported environmental benefits of the BE fuel cell generation project during the PSC review of the QFCP tariff, with DNREC Secretary Colin O'Mara arguing that said benefits were substantial. Order 8079. 12/1/11.

DNREC also believes that Staff's Report underestimates the Project's environmental and health benefits. Secretary O'Mara contends that since the fuel cells will provide baseload power, comparing them to an intermittent source is not appropriate. Rather, the fuel cells' deployment will reduce the need for older, dirtier baseload units to operate as well as the need to fire older peaking units in times of high demand. These reductions in air pollution will be, according to the Secretary, substantial.

One might question, however, why the standard for comparison should be "older, dirtier baseload units" as opposed to new CCNG power plants that could achieve comparable or greater reductions in carbon emissions at much lower cost. Note the testimony by David Stevenson of CRI. Ibid.

Finally, CRI contended that a combined cycle natural gas facility would produce much more energy (300 MW versus 30 MW) with very little additional air pollutants, for approximately the same price to ratepayers as the Project.

ECONOMIC GAMBLE – The clincher argument for the BE incentives package was that it would induce a promising technology company to locate a manufacturing plant in Delaware (at the University of Delaware's Star Campus). Press release package, 6/10/11.

<https://bit.ly/2t8MP5e>

Bloom Energy has plans to build its new, high-tech manufacturing hub in Delaware, subject to a final agreement with Delmarva Power, as well as the passage of enabling legislation and regulatory approval. The new investment could create up to 1,500 high-tech jobs between the company and its suppliers at the site of the former Chrysler factory in Newark to manufacture Bloom Energy Servers, which are already helping to power companies like Google, FedEx, Coca-Cola and WalMart.

"Some of the world's largest companies have chosen Bloom Energy to power their growth, and now Bloom has chosen Delaware as the best site for their expansion," said Governor Jack Markell.

At the time, with Delaware employment in the doldrums, the prospect of "green jobs" resonated with the state's political establishment. This helps to explain why implementing legislation was passed so quickly by the General Assembly. Not until the QFCP tariff got to the PSC was there any serious discussion of whether the envisioned economic gains were realistic. Order 8079. 12/1/11.

We have comments from the Director of DEDO and testimony of Secretary O'Mara that the Project does create economic opportunity, and they have so certified the Project -- a necessary requirement under the Amendments. (Ex. 17 (O'Mara) att. 1) and 26 Del. C. §352(16)(b). Staff also agrees that the expected economic benefits associated with the Project substantially outweigh the projected costs to ratepayers.¹⁰ However, the concerns -- raised primarily by Staff -- are whether those economic benefits will actually be realized and what protections, if any, do ratepayers have if the benefits do not materialize.

After considerable discussion, the PSC was persuaded to accept the risks and uncertainties that were involved based on the judgement of the experts who had studied this matter and concluded that it would be a good deal for Delaware. Ibid.

On this point, we believe the State, and those who are charged with promoting economic development in Delaware, considered these risks to ratepayers when they invited Bloom to consider Delaware as a potential site for new manufacturing capability, negotiated economic incentives for Bloom to come here, drafted the Amendments and negotiated additional provisions that provided special force majeure protections for Bloom's fuel cell project investment in Delaware, and performed due diligence on Bloom and its business plan. In addition, State representatives testified before us that the business model was a good one that was sustainable over time and told us that we could rely on their expert opinion regarding the validity and sustainability of the Project in making our decision on this Application. (Tr[anscript]. at 399). As Secretary O'Mara acknowledged, the Commission's work may affect business development in the State, but it is not its primary expertise. (Tr. at 399) Thus, any concerns we may have about the level of risk that ratepayers are being asked to assume under this legislation must be tempered by the knowledge that the State has spent 17 months investigating this Project and its viability, and believes in its collective judgment that it is sustainable and will be successful for decades to come. (Id. at 401). We have nothing in this record to point us to a different conclusion.

Delaware's largest newspaper sounded a somewhat similar note in an editorial published after the PSC's October 18 vote to approve the QFCP tariff. Where will manufacturing jobs come from? News Journal, 10/25/11.

Bloom Energy & Fisker ventures "hold a lot of promise," but also "involve a lot of risk." Both could "succeed wildly" or "fail miserably." The only sure thing is "to do nothing and watch the middle class disappear." The loudest criticism of these ventures is claims of "crony capitalism," just look at that phony ABC News story about Fisker building cars in Finland with the proceeds of a US loan. Let the market support startups? Well, the market has mostly been helping US startups move overseas where labor is cheaper. "We are witnessing a vast structural change as products invented here are built overseas, leaving Americans to find service or government jobs. The Bloom and Fisker projects could have a different result, and "to our mind, that's worth the gamble."

Perhaps the incentives package for the BE venture was a risk worth taking. True, BE has fallen far short of its job creation goals in Delaware, after some 17 years of operation the firm has racked up over \$2 billion of losses, etc., but it's not necessarily fair to judge the decision with the benefit of hindsight.

Even if the gamble was justified, however, it should have not have been made with the DP ratepayer's money. If Governor Markell et al. believed so strongly that a bet on the BE venture was in Delaware's best interests, they should have proposed an incentives package funded by taxpayers of the state vs. DP ratepayers. There is nothing that makes the PSC responsible for promoting economic development; the PSC's responsibility is to protect Delawareans from being overcharged for electric power distribution and to balance the needs of the regulated utilities with the needs of the ratepayers.

NO CONTINUING PURPOSE – BE fuel cells offer a unique set of capabilities for electric power generation, which potentially make them suitable for general purpose use. Indeed, the

company's stated mission is "to make clean, reliable energy affordable for everyone in the world." Given such an ambitious mission, BE's interest in a trial of whether arrays of its fuel cells could compete with conventional power generation facilities in the commercial scale generation of electric power seems understandable – especially since whatever excess costs were incurred could be recouped from the DP ratepayers.

By building and operating the 30MW FCF in Delaware, BE gained "bragging rights" to "the largest utility scale deployment of fuel cell technology in the United States."

More tangibly, additional experience with fuel cell operation was gained, presumably contributing to continual improvement in BE's product technology (one of the company's key growth strategies). Bloom Prospectus for IPO, 7/26/18. <https://bit.ly/2NP2NJx>

•Significant and sustained improvements in "power density." We have continually added more generation capacity into the same footprint and expect to continue to do so with successive generations of our technology. Today's Bloom Energy Servers are capable of delivering five times the power of our first-generation system introduced only nine years ago, while staying within approximately the same service footprint.

•Continual increases in electrical efficiency. Efficiency is defined as the percentage of the energy in the fuel that is converted to electricity. The higher the efficiency, the less fuel used to generate a given unit of electric power output, resulting in lower fuel costs. Today, our Energy Servers are significantly more efficient than the average of the U.S. grid. The latest generation of our Energy Servers, which began shipping in 2015, is capable of beginning-of-life (BOL) efficiencies of 65%, and we expect to further improve the efficiency in succeeding generations. While the Bloom Energy Server is capable of operating at peak efficiency, typically efficiency of the latest generation of Energy Servers can range from 53% to 65% over the project term depending on environmental conditions and the age of the power modules. We have the flexibility to maintain efficiency at specific levels to comply with customer sustainability, regulatory compliance, or other requirements by managing the replacement cycle of the power modules in the Energy Server.

By this time, however, the Delaware demonstration seems to have conclusively established that BE fuel cells are **not** cost competitive for utility scale power generation. Costly fuel cells, John E. Greer, Jr., SAFE newsletter, Spring 2018. <https://bit.ly/2qujXCp>

Annual reports to Delaware's Public Service Commission for the first five years of operation show average power generation costs of 20.8¢/KWH versus 4.2¢/KWH realized from selling the power to the PJM electric grid at market value. The 16.6¢/KWH cost difference was passed on to Delmarva Power ratepayers (and customers of alternate suppliers in the Delmarva Power service area) via the "qualified fuel cell" tariff authorized by the PSC.

And there have been no indications that BE is planning to replace the fuel cells in operation with technologically improved fuel cells in an effort to improve cost performance, so little additional information is likely to be gained by continuing to run the facilities until 2033.

As for the other parties involved, DP would not be significantly impacted (however, they would miss the opportunity to sell natural gas to BE or its designee at a markup) by a decision to shut down the FCF. And DP ratepayers would welcome a shutdown decision, which would free them from continuing to pay the QFCP tariff.

PUBLIC SENTIMENT – The PSC can’t be expected to please the public all the time, but it’s worth noting that there been longstanding concerns about the QFCP tariff.

This was true in 2011, at a time when the political establishment of the state and the media were strongly supporting the incentive package (including the QFCP tariff) for BE. Order 8079. 12/1/11.

We received scores of written comments from members of the public, not all of whom were Delaware residents or even Delmarva ratepayers. The overwhelming majority of the written comments exhorted us to reject the Project, and echoed certain general themes. Many compared the Project to Solyndra, the recently failed solar company in California. Many called it a “boondoggle” or “crony capitalism.” Others complained that if the fuel cell technology were truly so promising, Bloom could have found private investment to back it. Still others expressed displeasure that Delmarva was not taking any risk since under the proposed tariff it will be made whole for all expenses it incurs. Many questioned the calculation of the \$1.00 per month cost to Delmarva ratepayers. Many also criticized the semantics of calling a generator fueled by natural gas a “renewable” resource. Very few written comments supported the Project.

Since 2011, the QFCP tariff has grown politically toxic. Few if any Delaware politicians would be inclined to support it now, and the media has grown increasingly skeptical. See, e.g., State-subsidized Bloom Energy reports more losses, Karl Baker, News Journal, 8/9/18. <https://bit.ly/2MwuarA>

As for the general public, there is continuing opposition. Among other things, a petition to Governor John Carney et al. is currently being circulated that urges termination of the QFCP tariff. To date, the petition has been signed by over 300 people. <https://bit.ly/2wgQTRV>

Considering the state of public opinion coupled with the specific issues that have been discussed, we respectfully submit that the PSC should reopen this matter with an eye to exploring options that might be taken to amicably (short of litigation, that’s not the PSC’s job) end or reduce the QFCP tariff.

C. Options

Even if BE and DP have no legal obligation to revisit this subject, it is possible that they would be willing to do so – if only to preserve their good name in the community. Here are some options that could potentially be explored, and there may well be others that we have not thought of.

- Upgrade the equipment in use at the FCF or adjust other operating procedures with a goal of reducing the cost of electric power being produced. As the saying goes, “if you always do what you always did, you will always get what you’ve always got.”
- Review the implications of shutting down and dismantling the FCF, including quantification of what payments BE would expect for this accommodation.
- Recommend legislation to replace the QFCP tariff with a taxpayer-funded subsidy payment.