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Intervener Comments on Delmarva Power Docket 11-362, Qualified Fuel Cell Provider Project Tariffs

The proposed Fuel Cell Tariff fails to meet the intent of its enabling legislation and should be rejected by the Public Service Commission (PSC). The Tariff guarantees Bloom Energy and Delmarva Power over one billion dollars in revenue over the next twenty-one years. Ratepayers have no guarantee of promised offsetting revenue from electric generation sales or the value of Renewable Energy Credits (REC's) or Solar Renewable Energy Credits (SREC's) and bear essentially all the downside risk of the project. In fact, ratepayers may only be reimbursed 25% of the \$1.1 billion cost instead of the 75% advertised. That risk justifies the use of conservative assumptions to give the ratepayers an honest view of what the Tariff may actually cost. Based on the Fuel Cell Act the PSC should consider six metrics when deciding to approve the Fuel Cell Tariff and none of these metrics are met in a compelling way:

- **Energy produced by fuel cells may not cost residential consumers more than energy from offshore wind mills or \$1.70 a month** - The Tariff case uses optimistic assumptions for the future value of REC/SREC's. Fuel cell credits will actually reduce the number of SREC's needed by about a third and REC's by a quarter. Delmarva Power admits in Tariff documents this will exert downward price pressure on the credits. Yet, the Tariff case documents use a significantly higher future REC/SREC price than was used in other Delmarva Power cases before the PSC and more than double current market prices (see the discussion below of future REC/SREC prices). The Tariff also assumes REC/SREC's will have value out to 2035 when the legislation requiring their purchase expires in 2025. Using more realistic assumptions for future REC/SREC's yields ratepayer costs of between \$1.79 and \$2.73 a month, clearly beyond the legislative cap of \$1.70 requiring rejection by the PSC. Since the energy credit assumptions are buried in the Tariff, changing the energy credit assumption would require dropping the levelized cost one third from \$154/MWh to about \$100/MWh.
- **Legislative negotiations hinged on a maximum electric power cost increase to residential ratepayers of \$.70 to \$1 a month** - On top of high future REC/SREC price assumptions, the Tariff case assumes high future electric prices which make the fixed price Tariff look more attractive. The exact same argument was made for the Offshore Wind Tariff. We now see the \$.70/month used in that offshore wind case was understated as electricity prices did not increase as expected so the \$.70/month is now \$1.70/month. The Tariff case assumes future electric prices will increase more than twice as fast as the U.S. Energy Information Agency 2011 Market Outlook (see discussion below of future electric prices). Combining more reasonable assumptions for both REC/SREC's (up to \$2.73/month) and future energy prices (up to \$1/month) results in a likely monthly increase of up to \$3.73 a month. The Tariff could cost manufacturers \$100,000 dollars a year over the life of the contract. Meeting the \$1/month cost target with a lower estimate of future conventional electricity prices would require cutting the size of the generation project in half to 15 MW.
- **Fuel Cells should be given credit if the project is important to economic development** - The Bloom manufacturing plant in Newark might have 900 employees with another 600 jobs for suppliers. However, Bloom Energy's future is highly speculative as it is still in the venture capital stage. Greentech Media reports (<http://www.greentechmedia.com/articles/read/Bloom-Energy-Delaware-and-Cogeneration-Reality/>) the company has only produced 100 servers over a five year span. The 30MW operation will need 300 servers in the next two years, a quantitatively large jump.



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Future success depends on the dubious future of government subsidies. We note Josh Richman's response in question PSC165 the 30MW project is absolutely dependent on the Cash Grant option from the federal government that ends 12/31/2011. How will any future project be funded then and how does Bloom expect to meet future sales projections? Virtually all current Bloom fuel cell applications are in California and even that state recently reduced fuel cell subsidies. A future based on subsidies is a future in great doubt. The solar manufacturer, Solyndra, just went bankrupt despite a \$535 million loan guarantee. In fact, over 95% of all new business start ups fail in the first five years. We note the life expectancy of the fuel cells is 4 years \pm 25% suggesting the manufacturing process is not in statistical control and needs dramatic improvement.

Building a fuel cell plant in Delaware is not solely based on passage of the Fuel Cell Tariff. Bloom will only be able to sell in states with fuel cell subsidies such as New York, New Jersey, Pennsylvania, and Connecticut. The only other Bloom Server manufacturing plant is a prototype facility in California. These facts suggest Bloom really needs an East Coast plant and Delaware is a great location with a substantial grant available that will cover one third of the construction cost. Given the speculative nature of the project and the possibility the manufacturing plant could be built without the Tariff, the PSC should give limited weight to the economic potential of the Bloom Energy manufacturing plant..

- **Fuel cells should be given credit if they will offer environmental advantages** - Fuel cells do generate electricity with less air pollution than some older conventional power sources. However, other available technologies such as advanced natural gas and onshore wind turbines produce even less pollution for about a third the energy cost. A conventional natural gas generator could produce ten times the power of the planned fuel cell generator for the same investment and save that much more air pollution. The PSC should give limited weight to this issue.
- **Fuel Cells should be given credit if the technology is innovative** - While fuel cells can be used at the point of electric use saving transmission losses and can use bio-gas, the proposed project will be a central power plant with the same transmission losses of any other plant and will be using natural gas. There are other fuel cell manufacturers and other technologies such as co-generation facilities that can provide similar benefits including the use of bio-gas as a fuel at one third the cost for power. The PSC should give limited weight to this issue.
- **The 30MW fuel cell project should be given credit if it will stabilize future electric prices** - Tariff case documents show the fuel cell project has no effect on future electric price stability.

Other Comments:

Inclusion of natural gas "banking" costs in the "Expected Case"

If the Bloom project uses more or less natural gas than expected in a given month they have the right to use a banking mechanism. In some situations Bloom could gain revenue and the added risk to consumers of higher costs was calculated in the application to be from $-\$.01/\text{month}$ to $+\%.10/\text{month}$. We strongly recommend the PSC require the use of the higher "banking" cost to measure the Tariff cost impact on consumers.



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Future Cost and Availability of Rare Earth Minerals a Concern

Bloom Energy refuses to divulge materials used in their fuel cells. Public information covering Solid Oxide Fuel Cell design, however, suggests they are probably using Yttrium and/or Cerium in the coatings. Both are currently imported mostly from China who has restricted supply. The price of these materials has increased 4X and 5X respectively. These facts add uncertainty to the future of fuel cells.

Renewable Energy Credit price forecasts

The “Expected Case” assumes the price for regular Renewable Energy Credits (REC) will be \$25.57 and for Solar Renewable Energy Credits (SREC) will be \$205.32. The 2010 Delmarva Power Integrated Resource Plan, still under consideration by the PSC, uses rates of \$18.29 and \$164.43. The discussion in Part 2 of the fuel cell application indicates the reduction in SREC requirements allowed by the Tariff will work to reduce prices as would be expected. Tariff documents state using the IRP estimates brings the cost to ratepayers to \$1.79/month, clearly over the legislative cap of \$1.70.

Even before the fuel cell announcement spot market prices had dropped dramatically to \$1.50 for REC’s and \$100 for SREC’s because of increased supply from new large scale wind and solar farms (see WWW.flettexchange.com for current SREC prices). Solar panel installed prices have come down 27% in the last year according to a U.S. Department of Energy Study. This was caused by a combination of too much solar panel production capacity in China and crashing demand in Europe as governments cut subsidies.

Subsidies remain high in the U.S. and lower panel prices have led to an increased number of new solar farms such as the Dover Sun Park (11.2MW), Perdue (1.6MW), and Astra Zeneca (1.7MW). Therefore, solar credits are flooding the market and the price for credits has dropped from about \$300 to \$100 each. Delaware is a trading partner for SREC’s with Pennsylvania where similar market forces have cut the spot market price to \$50. Since the Pennsylvania Renewable Portfolio Standard only requires one half percent solar by 2020, we should see a continuing surplus of that state’s SREC’s available in the Delaware market.

Federal subsidies for solar energy expire in 2016 and may be cut sooner because of budget restraints. Jurisdictions, like Delaware, that still have high subsidies may see a gold rush mentality from companies like White Oak Solar who owns the Dover Sun Park. White Oak has a guaranteed 11% return at a time when thirty year Treasury Bills offer 3% (calculated by the author from contract documents obtained in a FOIA request). Obviously, with that high a rate of return more companies will want to participate resulting in significant front loading against the solar Renewable Portfolio Standard requirements.

The same thing has been happening in the REC market in just about every state as wind subsidies expire in 2012. Delaware dropped from a high of about \$18/REC at the beginning of 2009 to about \$1.50, equal to surrounding states (<http://apps3.eere.energy.gov/greenpower/markets/certificates.shtml?page=5>). Again, a surplus of REC’s can be expected from Pennsylvania because of a lower percent requirement and generous definitions of what constitutes a REC. With the reduced REC/SREC requirements of the fuel cell project, Delmarva has already covered about half of their SREC needs by 2020 and 100% of their REC needs (without Bluewater Wind) through 2022. Delmarva’s reduced needs will act to lower prices. In fact, Delmarva Power will have a large surplus of REC’s until 2020 and will probably become a re-seller of REC’s. The “Expected Case” estimate of a \$25.57/REC price is 40% higher than the highest price seen to date and 17 times higher than the current spot market price. There is no obvious rationale to expect an increase in price from the current spot market price let alone the increase from the IRP price assumptions.



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We also note the Expected Case assumes REC/SREC's will be sold beyond the 2025 expiration date. The global trend is to reduce subsidies and renewable requirements not to increase them. The impact of the Fuel Cell Tariff should be re-calculated assuming no credits beyond 2025.

Part 2 calculates the impact from lower REC/SREC prices. Using the prices from the IRP increases the impact of the fuel cell tariff by \$.79/month to \$1.79. Using the current spot market price increases the Tariff impact by \$1.41 to \$2.41. Either case exceeds the cost of the offshore wind tariff which is the maximum allowed at \$1.70/month "ACT TO AMEND TITLE 26 OF THE DELAWARE CODE RELATING TO DELAWARE'S RENEWABLE ENERGY PORTFOLIO STANDARDS AND DELAWARE-MANUFACTURED FUEL CELLS", which indicates that the Tariff may not result in costs to consumers, on a levelized basis at the time of Commission approval, which exceed the highest price resource in Delmarva's portfolio of renewable options as of January 1, 2011.

Projected increase in electric rates

Part 2 of the application provides the assumptions used to calculate the cost and offsets of the Fuel Cell Tariff. The expected increase in electricity wholesale price over the 21 year term averages 4.5 % compared to 1.9% used over the same period in the 2011 Market Outlook Report published by the U.S Energy Information Agency in March of this year (<http://www.eia.gov/oiaf/archive/aeo10/index.html>). The higher rate makes the Tariff look more attractive. The primary driver of the higher rates in Part 2 is the expectation new EPA environmental regulations on coal plants will cause rapid price escalations. Coal provides about 43% of electric generation capacity in the U.S. and the regulations would cause a rapid increase in prices.

The key question is whether the regulations are implemented as planned and how rapidly the electric industry responds by switching to lower cost natural gas. The 1990 Clean Air Act called for a 90% reduction in air pollution per generating plant over a twenty year period. The goal was exceeded and the cost was about \$30 billion. The next 5% reduction proposed will be required in only three to five years and may cost over \$300 billion. The benefits of the new regulations are in doubt. For example, the mercury reductions will only cause a 1% improvement in airborne mercury levels. Incidence of asthma and chronic bronchitis have doubled since 1980 while power plant emissions have been cut in half suggesting other primary causes of increased health problems (<http://caesarrodney.org/index.cfm?ref=30200&ref2=214>). As a result the U.S. House of Representatives has already passed a budget that prohibits the EPA from spending money to implement the new regulations. Other bills are proposed to stop specific regulations and President Obama has delayed the implementation of the Ozone Rule, the most expensive new regulation, for two years. The EIA 2011 Market Outlook expected coal's share of electric generation to fall to 43% by 2035 and the natural gas share to increase to 25%. These share levels are now expected to be met in 2012 according to the EIA, twelve times faster than expected! The impact of potential EPA regulations falls rapidly as older coal plants are retired.

Delaware has paid a premium price for electricity for capacity charges because we import 60% of our power and so we add to grid congestion (http://www.caesarrodney.org/pdfs/Abandon_RGGL.pdf Table 2). Delaware needs about 1400 MW of added capacity to meet our needs and to maintain a 15.5% reserve margin to avoid these charges. Several projects may help close that gap and reduce capacity charges such as 618 MW being considered by Calpine for Dover and 287 MW being brought on line by PBF Energy at the Delaware City Refinery. The PSC staff has asked Delmarva to consider adding 450 MW and the fuel cell



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project might eventually go to 50 MW. If not already done so, the “Expected Case” should assume adequate capacity in Delaware to reduce capacity charges.

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