

**Minutes of the  
Somerset County Energy Council Meeting  
Tuesday, April 21, 2020**

Chairman William Amann called the meeting to order at approximately 6:10 PM. The members pledged allegiance to the Flag of the United States of America.

The roll was taken and the following members were **Present**

William Amann, Chairman  
Jeanne Perantoni, Vice Chair  
Axel Breidenbruch  
William Dondiego  
Jeffrey Grant  
Jeffrey Foose  
William Knox  
Walter Lane  
Monica Lazer

**Absent**

Wayne DeFeo, Secretary  
Paul Drake

**Also Present**

Honorable Melonie Marano, Freeholder Liaison  
Laurette Kratina, PP, AICP, Somerset County Planning Division, Staff Liaison  
Joe Bowering  
Garald Foley  
Steven Goldenberg  
Roy Horowitz

**New Business**

**Presentation by Joe Bowering, PJM Market Monitor:** Chairman Amann introduced Joe Bowering, the guest speaker for the evening. Mr. Bowering described his role as the Market Monitor for PJM, which is required as a tariff function by FERC. His work involves monitoring the market to make sure participants behave competitively; publishing detailed quarterly marketing reports that are posted on the PJM website; and developing market design proposals that will make the market more competitive. Jeff Grant noted that Mr. Bowering was invited to speak about how the grid will be managed and operated considering the increased reliance on renewables as called for in the 2019 NJ Energy Master Plan. He acknowledged the Council members' concerns about the recent widespread power outages in California due to forest fires, which were exacerbated by black start constraints associated with the heavy reliance on

renewables in that State and how this problem can be avoided in NJ if the State's renewable energy goals are achieved. He also noted as background information the limited remaining operating life (approximately 15 years) associated with the nuclear power plants serving NJ, which provide a significant percent of the State's baseload, and asked how the grid will be impacted when renewables increase to 75% by 2030.

Mr. Bowering responded by noting that PJM is the largest wholesale power market in the world, with 185,000 megawatts of installed capacity. The PJM price in 2019 was the lowest its been in 20 years – the average price was less than \$30. Due to the economic slowdown associated with the pandemic, the load is down significantly (by 7 percent) compared to this time last year and prices are also down this year by about 35%, which is quite dramatic. At the moment, renewables are a relatively small fraction of the PJM system. PJM currently has the smallest proportion of energy from wind and solar as compared to all the other markets in the U.S. and noted that NJ has a very aggressive goal of building and paying for offshore wind in its Energy Master Plan. Currently the PJM market, (created in 1927 by NY, NJ and MD), is successfully achieving its goal of using the cheapest most efficient energy resources available at any given point, but as we move toward renewables, some of this is changing. He spoke about the Minimum Offer Price Rule (MOPR), and how some people are concerned it will restrict growth in renewable generation as a grid resource, although he noted he does not feel this is true. He has been talking to many solar and wind developers over the last 6 months and believes they are very competitive right now and will only become more competitive. Although the price of renewables has been above that of conventional power sources, NJ's Solar Renewable Energy Credit (SREC) program has improved its competitiveness. He emphasized that the price of solar and wind power is continuing to come down in NJ and elsewhere.

Concerning power outages, Mr. Bowering noted that they generally are local, with approximately 90% of all outages in the U.S. affecting the distribution grid, which is run by local utilities; not the wholesale power grid. He described microgrids as a relatively inefficient way of adding resilience to the local power grid, and that it is cheaper to rely on large power suppliers. He noted that the MOPR is raising other issues. There are two primary components – the energy market and the capacity market. The total revenues from the energy and capacity markets cover what is needed. The markets have worked very well in phasing-out coal over the year and phasing-in gas and combined cycles. One of the concerns several states including NJ have with the new MOPR rule is that it will raise capacity market prices. An analysis of how the markets will look in the future is underway for NJ that will be provided to the NJBPU to help it decide whether it wants to remain in the capacity market. If not, it would still have to meet PJM's reserve margin and reliability requirements, but instead of having a competitive market that is going to provide the cheapest energy available through competition, the State will be negotiating with a small number of suppliers. One of PJM's concerns is market power, which is the ability of a supplier to set a rate above the competitive level, which could put the State at a disadvantage. The market will resemble a cost-of-service model, which was ended back in 1999. FRR is the mechanism for backing out of the capacity market, and the State would have to then negotiate with PSE&G and other suppliers for capacity. In PJM's view, this will raise rates rather than lower them. The State would lose the benefits of the competitive capacity market. NJ wants to build a significant amount of offshore wind, but it is a long way away from being cost competitive. It is well above the cost of other power sources. The State's decision to go for offshore wind means residents and businesses will have to pay more. The price per megawatt day is about \$120 - \$200 in New Jersey whereas the cost of off-shore wind is

probably twice that. The marginal cost when the wind is blowing is relatively low- almost zero, but the fixed costs are very substantial. The way new technologies develop is to do small-scale pilots to build up the expertise and capacity, which happened with solar and onshore wind, then eventually the price came down. The state needs to recognize that the cost will be higher. Mr. Breidenbruch asked about the environmental impacts of wind and Mr. Bowering agreed they need to be addressed, as well as the impact of the harsh conditions on the equipment. NJ signed a long-term contract with Orsted, which is reminiscent of the old co-gen contracts for which the State ended-up overpaying for, and which makes it less than competitive with other power sources.

At the request of Mr. Grant, Mr. Bowering provided an overview of the Minimum Offer Price Rule, adopted by NJ and Maryland involving gas-fired combined cycle generation, typically shale gas, which are very efficient, so they did not need the subsidies that NJ was supporting years ago. There was a Supreme Court ruling that said NJ could not do them because they would affect the wholesale power market by suppressing other things. The intent of the MOPR rules was to prevent states from using subsidies to unfairly control the wholesale power market by suppressing other suppliers and make them less competitive. The combination of SRECs and RECs which are payments to renewable sources are considered subsidies, and FERC established the new MOPR rule to protect the market from these subsidies. The timing is very interesting – it is coming at a time when renewables can stand on their own competitively. On the capacity-side, the cost of wind and solar are coming down. PJM believes the MOPR rules make sense and will not have a negative impact on NJ. The focus of the rule is subsidy protection. The subsidization of nuclear power plants in NJ was discussed. Given the cost of the NJ Nuclear Power Plants and how the rule is constructed, the MOPR Rule will have no effect on nuclear power in the State, and little or no effect on renewables. It did create controversy in the wholesale power marketplace. His firm did an analysis of how this will affect PJM markets overall and impacts were found to be negligible.

Mr. Bowering noted that prices have dropped as a result of COVID-1, which could have hopefully only short-term impacts on nuclear suppliers. As economic activity rebounds, prices will come back up. We are seeing truly a dramatic decline in prices compared to 2019.

Clarification was offered in response to Chairman Amann's question off-shore wind, they would not be allowed to bid-in at less than their net cost of new entry, which is the 20-year levelized cost of the asset including all costs – rate of return on capital, depreciation, etc. Even with the most favorable estimates, wind generators have been unable to show they can clear the PJM capacity market. The cost is around \$300. - \$400. per megawatt-day for new entry, compared to the highest prices in NJ that run about \$200. The question remains whether NJ would be better off leaving the capacity market so they can have off-shore wind, or should it stay and use the benefits from staying in the competitive market to pay for the off-shore side. It may make more sense to pay for it directly and stay in the competitive market.

Mr. Bowering noted that offshore wind will influence the energy market due to low marginal costs, and its ability to flood the grid with power when the wind is blowing. NJ would benefit from resulting lower prices. He described the net and gross costs of new entry which is spread out over 20 years to calculate lifecycle costs of wind, Net costs result when you subtract revenues. Revenue calculations cannot include any subsidies from the State, and they will not affect the new entry calculation to keep the playing field fair.

Mr. Grant asked whether NJ could experience problems like what happened during the California blackout if NJ becomes predominantly reliant on renewables. Mr. Bowering noted that there is so much roof-top solar in CA that they must back-down the utility-scale solar to allow all the roof-top solar onto the grid. The solar resources in NJ are not as high, so he does not expect that sort of problem to happen. Then there is the question of resilience. Systems with a lot of points of energy output are much more resilient than systems with a single source. Princeton did well during Superstorm Sandy because they had a microgrid and produced their own power, and if Princeton's power plant has an issue, they can rely on the regional grid. The idea of microgrids and building up the distribution system to make it more resilient provides greater ability to respond to and survive big disruptions. He does not see there being enough renewables in NJ in the near future for it to affect grid reliability. Gas-fired combined cycle plants generating 100 megawatts is completely available to the grid as a power source, whereas 100 megawatts of renewables are discounted down to about 30% available to the power grid. The reason they are discounted is because they cannot provide 100% availability all the time and to accommodate peak demand if it occurs at a cloudy or windless time. If all the grid capacity comes from renewables, 3 times as much generation capability will be needed to ensure peak demand is met to meet energy reliability rule requirements. Therefore, in California, they routinely back-down solar and wind power during peak generating periods. The need for thermal generation sources such as gas-fired and nuclear power plants will never go away because of their ability to be ramped-up quickly to off-set renewable shortfalls. NJ will be able to make significant strides toward renewables but will always need thermal generation resources to provide reliability unless cost-effective, efficient battery storage becomes available. NJ could end up eventually exporting a lot of cheap renewable power to the PJM grid, and potentially out-compete other generation sources and subsidizing power for other parts of the grid. Mr. Grant noted that if the PJM Grid includes thermal generation sources, it can address any black start needs NJ might have if a problem was to occur when renewables become the dominant NJ power source.

Mr. Bowering noted that another topic being discussed is the concept of a carbon price. If you believe carbon is a pollutant and that fossil fuel power generation is a source of that, economists agree that a carbon price may be an efficient and effective way to address this. The price level would be determined by the State and could make renewable generation look much more cost effective. He noted that NJ recently re-joined RGGI and the revenues (\$80 million in the first year) go back to the State. The RGGI price is currently about \$5 per ton of carbon whereas the social costs of carbon have been estimated to be as high as \$50 per ton. Ms. Lazer noted that there is a scientific consensus that carbon from human activity is a pollutant contributing to climate change. At a personal level, Mr. Bowering indicated that he believes carbon is a pollutant.

Mr. Foose pointed to the sulfur dioxide credits that were traded back in the 1980s in the U.S. reaching over \$200 per ton at one point, and asked Mr. Bowering to explain how companies dealt with this back then. He spoke about reliability pricing and underlying economic issues.

Mr., Bowering noted that if we had a carbon price, it would become a marginal cost of generation and therefore it would change pricing from fossil fuel power plants, which is happening right now. Years ago, when sulfur and nitrogen oxide were considered pollutants markets were created to manage it that were similar to carbon cap-and-trade. The cost for permits were very high and were rolled into the cost of generation, and people realized there

were more cost-effective ways to reduce these pollutants than simply pay to pollute. Investments were made to power plants to reduce emissions, showing that markets can be a very effective way of reducing air pollution. Mr. Foose said that this led to a lot of pipelines being built to increase access to natural gas from shale, which was cleaner burning than some of the prevailing fuels. Mr. Foose noted that yesterday that crude oil traded negative, and everyone was shocked by that, but if everyone agrees that carbon is a pollutant, let the market sort it out, stating that legislation that tries to do what the capital markets do naturally leads to disaster. He believes this led to the cleaner fuel mix of today. Ms. Lazer noted that the markets if left unregulated can lead to financial disaster, which is what happened in 2008. She stated that thoughtful regulation is essential to protect the public. Mr. Bowering in his capacity as market monitor agreed with Ms. Lazer that rules are needed, and within those rules, markets are a very effective way of organizing things. He used the amount of money spent in NJ on solar and renewable energy credits as an example. The price of carbon is implied by the price of SRECs in NJ. It's been as high as \$300 - \$400 per ton, which is much higher than what the market would have valued it at. If you give the market targets, it can work very effectively. Mr. Knox noted that it appears many are assuming we are not going to develop the battery storage systems needed to support an all-renewable system. He pointed to Samsung's announcement in London last week that they now have a 900-kWh energy density achieved with a solid-state battery that does not involve lithium ions, which he views as a fantastic leap in battery capability. Mr. Bowering agreed that with the right incentives, innovators can potentially come up with workable storage solutions, and pointed out the technology advances made in the last 3 to 4 years. Currently At the moment, the economics of battery storage is not that good, but this is evolving, they are becoming more cost effective over time.

Mr. Bowering spoke about the impacts of solar when the grid goes down, distinguishing again between the local versus regional grid. Regarding solar, the grid is the battery. Facilities with solar installations are not really serving their own load. Solar generation is going onto the grid, which provides all the advantages such as frequency control. When the grid goes down, facilities with solar lose power unless they have microgrid capabilities that include battery storage, which requires a significant investment.

Mr. Amann referenced a Princeton report concerning grid modeling based on 100% renewable and battery storage. It showed that overproduction of renewable energy, when output generation does not match the load profile was a huge problem, and the necessity of having clean "Firm" generation sources in the mix. He asked whether in Mr. Bowering's opinion, there is the possibility of creating enough clean firm generation necessary to get the load profile and supply profile to match. Mr. Bowering noted that natural gas is currently the cleanest dispatchable source there is (by using it to displace, coal, PJM has achieved significant carbon reductions). He agreed there needs to be flexible resources that can be ramped up when renewable generation is low. Gas powered combined cycle generation has gotten cleaner over time, and may continue to improve, but there are still carbon emissions. Mr. Knox asked about the new generation of smaller nuclear power plants that are starting to be used in Europe. They have safety features that allow them to run safely cost-effectively for a very long time. They do not have the ramping speed and capability that gas facilities have, and therefore are not a viable substitute. Pumped hydro is a viable option if you have the geography & resources. Mr. Bowering pointed out that the other way to address this is to make buildings, appliances and transportation (vehicles) smarter and more efficient. Reducing demand and using storage from batteries in cars and appliances as a ramping resource could become a solution in the future if

the right incentives and regulations are provided to develop two-way capabilities and improve the efficiencies of buildings and appliances.

Mr. Bowering talked about PJM's Black Start Program. It has generation units that are disconnected from the grid, which can be added and turned on for up to 16 hours to provide the cranking power to get the other units started. PJM customers are paying approximately \$65 million per year for re-starting the grid. In PSE&G's territory, the proportion of the cost is about \$4 million. Mr. Grant asked if this system has ever been tested. Mr. Bowering indicated he does not think it has. PJM has never been in a complete blackout. The resources are there in the event it should happen. It would be a couple-day process to get the grid going if it was entirely blacked-out.

Mr. Dondiego raised a question regarding the cost of transmission associated with offshore wind, and if transmission costs will rise due to this, noting that transmission costs are very high. Mr. Bowering replied by indicating transmission costs have been rising. In 2019, the total cost of power was approximately 60% energy, 20% capacity and 20% transmission. Transmission will be expensive for connecting offshore wind and transmission costs will go up. He described Order 1000, which is intended to make transmission providers more competitive. There is an ongoing need for transmission, more will be built, and greater competition on the transmission side should help to hold down costs.

In response to a question about the potential to establish a power authority in NJ, Mr. Bowering indicated that they are in the process of completing an analysis of FRR that considers a range of scenarios, which will be submitted to NJBPU for consideration. Power authorities can serve useful functions. It is not clear if it will add anything to the market. The PJS auction in NJ was described, and it is not clear whether having a power authority would result in any advantages, since from his perspective the auction has been effective in keeping costs down for customers. There is one in Illinois, but it is not clear whether it is effective in keeping costs down for customers. Mr. Foose noted that we are in year 14 or 15 of the PJS auction which has been successful from a market perspective. Mr. Bowering agreed that within a set of rules markets do operate effectively and efficiently, through which incentives can be provided to spur creativity for coming up with solutions that can drive down costs. Mr. Grant and Chairman Amann concluded this part of the meeting by thanking Mr. Bowering again for sharing his insights with the group.

### **Approval of the February 18, 2020 Meeting Minutes**

A motion to approve the February 18, 2020 meeting minutes without changes was submitted by Ms. Perantoni and seconded by Ms. Lazer. All others approved and the motion carried.

### **Chairman's Comments**

Chairman Amann stated that he is hoping everyone is staying healthy during the pandemic, and it is not causing anyone too much stress.

### **New Business (Continued)**

**Resiliency, Sustainability and Economic Opportunities Matrix:** Chairman He noted that the current focus of the Freeholders and the Somerset County Business Partnership's top current concern is how to help the economy to recover from the pandemic. He noted that Ms. Kratina sent out a spreadsheet that tracks NJ policies and legislation which can be used to stimulate

thoughts and recommendations from the Energy Council as to potential economic development opportunities that can be implemented in Somerset County that align with these. This is the group's new task. Mr. Lane elaborated by noting that at the recent County Recovery Subcommittee meeting, he had suggested that the County take a look at this wave of emerging state policies, regulations and programs centered on energy and climate resiliency in terms of which can potentially dovetail with recovery efforts in the County. Green job training for energy efficiency and renewable energy could be an opportunity to re-position displaced workers due to COVID-19, and other economic growth opportunities tied to improving sustainability and resiliency in the County. This fits into the charge that has been given to the Long-term Economic Recovery Taskforce being led by Freeholder Sooy. She, Freeholder Marano and others are interested in seeing how the County can position itself to take advantage of funding sources and incentives tied to the state initiatives that align with the County's resiliency goals while also growing the County's economy. Chairman Amann asked for everyone's help identifying where resources, stimulus monies, etc. coming out of these initiatives can be leveraged to advance the County's goals. Freeholder Marano is looking at agricultural roundtable meeting to look at the supply chain and distribution issues resulting from COVID. Demand for certain products has been scaled back due to the closure of school cafeterias, restaurants, etc. On the flip side, there is a need for food supplies more than ever. We are trying to figure out how the supply chain can be modified so foods make it to people's tables and farmers are compensated fairly. She supports the idea of growing green jobs in the County by offering training programs at RVCC and the VoTec School. She recognized the need to have the talent in the County needed to attract employers from green industries. Mr. Lane noted the County's Recovery Taskforce is anticipated to evolve into a committee that will lead the CEDS update.

Steve Mr. Goldenberg commented that he was the author of the Energy Infrastructure Public Private Partnership Act (S 2958), which was passed by the legislature unanimously in January only to be pocket-vetoed in January by the Governor. We are reformulating the bill by putting the jurisdiction for this in the Infrastructure Bank. It comprises a stimulus measure that could provide some opportunities for the County going forward. Work on a final version underway in collaboration with the bank is anticipated to be completed in a week or so. He may be able to provide an advance copy to the group. This proposal would allow government entities to take advantage of new funding sources for implementing energy projects. This proposal provides resources that are needed since the economic situation changed due to COVID. Mr. Amann agreed it is a way to get projects moving and therefore jobs in the County. Mr. Goldenberg noted the Infrastructure Bank is a well-run, well-staffed organization. It started out finding water infrastructure projects primarily, the was expanded to include transportation projects. This bill will give them ability to fund energy projects. Its board includes DCA, EDA and BPU leaders. It has a good reputation. The bill may move forward as part of a proposed state recovery bill package. Mr. Grant agreed this would be helpful if the addition of battery storage to solar projects and combined heat and power facilities for resiliency purposes could be funded, which would make dealing with emergencies more manageable. Mr. Goldenberg noted that a provision in the bill resolves the contiguity requirement issue that make microgrids hard to implement under the existing law by providing needed flexibility and partnership opportunities. Chairman Amann agreed the contiguity restrictions are a big roadblock for projects in Somerset County.

### **Old Business**

## **Committee Chair Reports** – Chairman

**Education and Awareness:** Ms. Kratina noted that she has prepared a draft of the Council's 2019 annual report and apologized for the delay. It is under review by Chairman Amann and Mr. Lane. Once she has their feedback, she will circulate it for additional review and comment, then submit it to the Graphics Dept. for layout and other improvements. Chairman Amann brought up the Climate Change Policy Statement this committee has been working on. It is still very verbose and needs to be cut down to key elements. He invited others to help with this. Ms. Lazer offered to help streamline the introductory portion. Chairman Amann said he would work with her on completing this. Mr. Grant expressed interest in reviewing the draft annual report, which will be provided by Ms. Kratina.

**Renewable Energy & Technology:** Mr. Grant said he would try to get his committee together for a meeting in May.

**Resilience and Sustainability:** No Report

**Public Policy:** No Report

**Ad-Hoc Energy Aggregation Committee:** No Report

**Upcoming Meetings and Events:** The next meeting of the Council is June 16, 2020

### **Public Comment**

Mr. Horowitz complemented the presentation by Mr. Bowering and thanked the Council for the opportunity to attend.

### **Adjournment**

A motion to adjourn was submitted by Mr. Lane and seconded by Mr. Dondiego at approximately 8:00 pm.