

**BEFORE  
THE OHIO POWER SITING BOARD**

In the Matter of the Application of Firelands Wind, )  
LLC for a Certificate of Environmental Compatibility )  
and Public Need to Construct a Wind-Powered ) Case No: 18-1607-EL-BGN  
Electric Generation Facility in Huron and Erie )  
Counties, Ohio. )

**DIRECT TESTIMONY OF**

**Deepesh Rana  
Senior Manager, Transmission & Interconnection  
Apex Clean Energy Inc.**

**on behalf of  
Firelands Wind, LLC**

**October 15, 2020**

/s/ Christine M.T. Pirik

Christine M.T. Pirik (0029759)  
(Counsel of Record)  
Terrence O'Donnell (0074213)  
William Vorys (0093479)  
Jonathan R. Secrest (0075445)  
Madeline Fleisher (0091862)  
DICKINSON WRIGHT PLLC  
150 East Gay Street, Suite 2400  
Columbus, Ohio 43215  
(614) 591-5461

James M. Lynch (PHV 21869-2020)  
Adam N. Tabor (PHV 21870-2020)  
K&L Gates LLP  
925 Fourth Avenue, Ste. 2900  
Seattle, Washington 98104  
(206) 370-7652

1   **1.     Please state your name, current title, and business address.**

2       Deepesh Rana, Apex Clean Energy Inc. (“Apex”), 310 4th St. NE, Suite 300,  
3       Charlottesville, VA 22902.

5   **2.     Please summarize your educational background and professional experience.**

6       See the copy of my resume submitted as Attachment DR-1: Resume of Deepesh Rana for  
7       my educational and professional experience. I currently hold the position of Senior  
8       Manager, Transmission & Interconnection at Apex. In my current position, I am  
9       responsible for managing the interconnection portfolio and associated studies for Apex’s  
10      portfolio of generation resources in multiple independent system operator (“ISO”) regions,  
11      including PJM Interconnection (“PJM”). My specific responsibilities include: reviewing,  
12      managing and negotiating Interconnection Agreements and associated technical studies,  
13      including Feasibility and System Impact Studies; providing strategic, regulatory  
14      compliance, technical and financial input on grid integration of renewable projects to  
15      Construction Project Management and Executive Management on transmission and  
16      interconnection-related matters; and filing interconnection request applications and  
17      tracking their progress through the project life-cycle of an interconnection queue. Prior to  
18      joining Apex, I worked at Enel Green Power as a Grid Connection Specialist from Oct  
19      2016 to July 2018. During my time at Enel, I was the single point of contact for all  
20      interconnection issues for the company’s renewable energy projects during their  
21      engineering, construction, and commissioning, with the responsibility of ensuring that all  
22      regulatory compliance, reliability, and utility requirements were satisfied for each project  
23      prior to declaration of commercial operation.

25   **3.     On whose behalf are you offering testimony?**

26      I am testifying on behalf of the Applicant in the case, Firelands Wind, LLC (“Applicant”  
27      or “Firelands Wind”) in support of the Emerson Creek Wind Project (“Project”).

29   **4.     Have you previously provided testimony in support of siting energy projects in Ohio  
30      or other jurisdictions?**

31      I provided testimony before the New York State Board on Electric Generation Siting and

1 the Environment in Case No. 16-F-0546 in support of the Heritage Wind Project  
2 Application.

3  
4 **5. What is the purpose of your testimony?**

5 To rebut the testimony offered by Dennis Schreiner on behalf of the Local Resident  
6 Intervenors.

7  
8 **6. Can you describe your experience with PJM Interconnection and transmission grid  
9 reliability?**

10 During my employment at Apex, I have directly participated in not only managing and  
11 reviewing the interconnection studies for projects proposed to interconnect to the PJM  
12 transmission grid, but also ensuring that projects meet and exceed the minimum regulatory  
13 requirements that reinforces the post-project reliability of the bulk power system consistent  
14 with regional and national reliability standards.

15  
16 **7. What are the entities that oversee reliability of the transmission grid at the point of  
17 interconnection for the Emerson Creek project?**

18 The Emerson Creek project interconnects into the transmission grid via transmission  
19 infrastructure owned by American Transmission Systems Inc. (“ATSI”), the regional  
20 transmission utility (and a subsidiary of FirstEnergy Corporation), but under the control of  
21 PJM as the regional transmission organization (“RTO”). As the connecting utility, the  
22 Emerson Creek project must comply with ATSI’s *Requirements for Transmission*  
23 *Connected Facilities*.<sup>1</sup>

24  
25 As an RTO, PJM coordinates the movement of wholesale electricity across several states,  
26 including Ohio, with a mission of ensuring the safety, reliability and security of the bulk  
27 electric power system. To efficiently operate a competitive wholesale electricity market,  
28 PJM’s first goal is to maintain reliable operations. To facilitate reliable operations, PJM

---

<sup>1</sup> FirstEnergy Energy Delivery Planning and Protection, *Requirements for Transmission Connected Facilities* (Oct. 3, 2016), available at <https://www.firstenergycorp.com/content/dam/feconnect/files/wholesale/Requirements-for-Transmission-Connected-Facilities-10-03-2016.pdf>.

1 maintains multiple manuals, some of which focus on the operational and reliability  
2 requirements that all generating entities that connect to the PJM system must comply with.

3  
4 And finally, an entity called the North American Electric Reliability Corporation  
5 (“NERC”) develops and enforces reliability standards for the bulk power system across  
6 North America, including the United States, subject to oversight by the Federal Energy  
7 Regulatory Commission (“FERC”). To achieve this goal, NERC monitors the bulk power  
8 system, assesses resource adequacy, and audits generation and transmission owners and  
9 operators for compliance with the relevant reliability standards. NERC itself is subject to  
10 audit by FERC.

11  
12 The Emerson Creek project must comply with all the above guidelines and reliability  
13 standards as a condition of its request to connect to the transmission system. I would also  
14 point out that both ATSI’s and PJM’s guidelines and manuals, where applicable, reference  
15 the relevant NERC Reliability Standards as the minimum interconnection standard for  
16 resources interconnecting to the ATSI owned and PJM controlled transmission grid. As  
17 noted in the ATSI’s *Requirements for Transmission Connection Facilities*, “By submitting  
18 a request to connect transmission, generation and/or end-user facilities to the FE  
19 [FirstEnergy] Transmission System or a request to modify an existing connection of such  
20 facilities to the FE Transmission System, the Connecting Party agrees to comply with these  
21 Requirements, applicable NERC and RF [ReliabilityFirst] standards, the PJM Open Access  
22 Transmission Tariff, the PJM Amended and Restated Operating Agreement and other  
23 applicable PJM agreements, manuals and documents.”

24  
25 **8. How do PJM and NERC prevent interconnection of resources from causing reliability**  
26 **violations?**

27 As indicated in my prior answer, both PJM and NERC promulgate rules, procedures, and  
28 reliability standards that are designed to ensure the reliability of the bulk power system,  
29 nationwide. PJM oversees the interconnection of generation resources on the transmission  
30 system to ensure that a given resource will not cause violations of applicable NERC  
31 standards, as well as PJM’s own reliability safeguards. Accordingly, PJM will conduct a

1 Feasibility Study and a subsequent System Impact Study for a generation resource to assess  
2 the resource's feasibility to interconnect to and impact on the transmission grid. These  
3 studies evaluate compliance with applicable reliability criteria and identify transmission  
4 network upgrades that are necessary to address any reliability violations as a result of the  
5 resource's interconnection to the grid. An interconnection customer must pay for network  
6 upgrades to prevent violations of reliability criteria before proceeding with interconnection  
7 of its generation resource.

8  
9 **9. Has the Emerson Creek Project gone through the PJM process to protect system**  
10 **reliability?**

11 Yes. As described in the Project Application, PJM has undertaken a Feasibility Study and  
12 System Impact Study for the Project. The System Impact Study tests the compliance of the  
13 project with applicable NERC and PJM reliability criteria under the base case as well as  
14 multiple transmission contingency (outages/faults) criteria. The result of the System  
15 Impact Study indicated that no transmission mitigations were required for the project and  
16 that the project did not result in transmission tripping (disconnection) and was able to  
17 withstand all studied contingencies. In lay terms, the System Impact Study conducted by  
18 PJM determined that the interconnection of Firelands, based on PJM queue position AC2-  
19 103, would not cause any negative impacts to grid reliability.

20  
21 **10. Mr. Schreiner's testimony asserts that "[e]verywhere renewables are implemented,**  
22 **they drive up costs and drive down reliability" (LR Ex. 1, page 10, lines 13-14). Will**  
23 **the Emerson Creek project negatively impact the reliability of the grid?**

24 No. The PJM study process described above provides ample evidence that no transmission  
25 mitigations were required for the project and that the project did not result in transmission  
26 tripping (disconnection). The project was able to withstand all studied contingencies and  
27 able to ride through all studied faults. Additionally, and on top of previously studied  
28 compliance with reliability standards determined by PJM, the project will have to further  
29 demonstrate and reinforce its compliance with these and other operational reliability  
30 standards during its commissioning process. The commissioning test results will need to  
31 be submitted to and approved by control room operators in both PJM as well as ATSI

1 before the project can operationally interconnect to the transmission grid.

2  
3 **11. Will the Emerson Creek Project “drive up costs” in PJM’s wholesale market?**

4 No. Though the project is a generation resource interconnecting into the PJM system which  
5 operates wholesale energy markets, the bulk of the project’s energy output has already been  
6 contracted for sale to specific buyer(s) at a fixed price, and hence, does not influence price  
7 formation in the wholesale markets.

8  
9 Even to the extent the project participates in the wholesale markets, Mr. Schreiner’s  
10 assertion that renewables drive up costs everywhere is not supported by any facts.  
11 Wholesale price formation in PJM is a complex process resulting from transactions within  
12 the framework of PJM’s applicable tariffs. Mr. Schreiner has not analyzed how a small  
13 incremental amount of generation from the Emerson Creek project might affect wholesale  
14 market prices in the face of numerous other factors. Moreover, Mr. Schreiner does not  
15 recognize that PJM’s wholesale markets operate pursuant to FERC oversight to determine  
16 whether they will produce just and reasonable rates.

17  
18 **12. In Mr. Schreiner’s testimony, he asserts that intermittent resources “connecting and**  
19 **disconnecting from the grid introduces an opportunity for a failure of a power source**  
20 **or a transient load condition” (LR Ex. 1, page 6, lines 9-11). What requirements do**  
21 **NERC and PJM interconnection requirements and/or operating manuals contain**  
22 **regarding “connecting and disconnecting from the grid” that would be applicable to**  
23 **the Project?**

24 As mentioned in above responses, there are multiple entities that are responsible for  
25 overseeing regional as well as national grid reliability, each having multiple guidelines,  
26 reliability standards, and manuals that govern the compliance requirements for generation  
27 resources interconnecting to the grid. Specific to Mr. Schreiner’s assertion, there are very  
28 specific NERC standards that govern the criteria when generators can connect or  
29 disconnect from the grid irrespective of whether they are producing any power. Just  
30 because a wind project is not producing power during low wind conditions does not mean  
31 this it will disconnect from the grid. I would like to reference NERC Reliability Standard

1 PRC-024 and Standard PRC-025. PRC-024 and PRC-025 govern the minimum generator  
2 frequency, voltage protection, and load-responsive settings generator owners  
3 interconnecting to the bulk power system must incorporate and comply with through the  
4 lifetime of their operation.

5  
6 PRC-024 requires the project to set its operational parameters and electrical relays such  
7 that the project and its turbines remain connected to the grid during defined frequency and  
8 voltage excursions, generally understood as power spikes. To comply with PRC-024, the  
9 project is required to perform desktop studies as well as operational testing and maintain  
10 documentation of such studies and tests as evidence of its compliance for NERC audits.  
11 Additionally, the operational capabilities must be demonstrated to PJM control room  
12 operators in real-time during the commissioning process.

13  
14 PRC-025 requires the project to incorporate load-responsive protective relays associated  
15 with generation Facilities at a level to prevent unnecessary tripping of generators during a  
16 system disturbance. Compliance with PRC-025 supports the system during the transient  
17 phase of a disturbance, and establishes criteria for the project to set load-responsive  
18 protective relays such that individual turbines may provide Reactive Power within their  
19 dynamic capability during transient time periods to help the system recover from the  
20 voltage disturbance.

21  
22 **12. Can you describe your experience with the California ISO (“CAISO”)?**

23 I have not actively managed a project through the CAISO Interconnection process but am  
24 familiar with CAISO’s market structure and its similarities and differences with other  
25 RTOs.

26  
27 **13. Are there differences between how CAISO and PJM manage the impacts of**  
28 **intermittent resources?**

29 Yes, but the differences are centered around the broader market activities of the two RTOs,  
30 as well as their respective mix of intermittent resources which significantly affects the  
31 concept of Resource Adequacy in each RTO. There are no material differences in reliability

1 standards applicable to intermittent resources since all RTOs must comply with NERC and  
2 regional reliability standards with the aim of achieving the same goal of maintaining grid  
3 reliability within their respective Resource Adequacy constructs.

4  
5 From a generation mix perspective, solar accounts for ~31% of the CAISO generation mix  
6 while wind accounts for ~2% of the CAISO generation mix. In PJM, solar accounts for  
7 ~1.7% of the PJM generation mix while wind accounts for ~5%. As can be inferred, not  
8 only does CAISO have a much higher percentage of renewable resources compared to  
9 PJM, but it is almost all comprised of solar. PJM, on the contrary, has a relatively higher  
10 percentage of wind resources than solar and both are only a fraction of the overall  
11 generation mix in PJM. Because of the stark differences between each RTO's generation  
12 mix, this affects the concept of Resource Adequacy in each and one can't be equated with  
13 the other.

14  
15 From a market standpoint, PJM operates regional organized markets under a dedicated  
16 footprint and is therefore responsible for maintaining and scheduling resources within a  
17 defined territory. CAISO runs an "energy imbalance market" that consists of multiple  
18 balancing authorities that includes portions of Arizona, California, Idaho, Nevada, Oregon,  
19 Utah, Washington, and Wyoming among others. This is materially different than PJM  
20 because it means CAISO's markets are available for imports and exports to and from  
21 entities outside of its ISO territory. As a result of the EIM, CAISO may be reliant on  
22 imports from other balancing authorities during peak demand hours whereas PJM serves  
23 its peak demand using resources within its ISO territory.

24  
25 Due to CAISO's resource mix and reliance on imports from other balancing authorities  
26 during peak demand hours, comparing CAISO to PJM in relation to intermittent resources  
27 and reliability is inappropriate and inaccurate.

28



1   **14.   Mr. Schreiner’s testimony describes “blackouts” in California. Is information about**  
2       **blackouts in California applicable to an analysis of the impacts of the Emerson Creek**  
3       **Project in PJM?**

4       No. Consistent with my explanation above, PJM’s generation mix, its overall market  
5       structure, and Resource Adequacy operations are different than that of CAISO. Therefore,  
6       events in California that may lead to blackouts there do not readily translate to PJM or to  
7       any other RTO.

8  
9   **15.   Does this conclude your testimony?**

10      Yes. However, I reserve the right to update this testimony to respond to any further  
11      testimony, reports, and/or evidence submitted in this case.

**CERTIFICATE OF SERVICE**

The Ohio Power Siting Board's e-filing system will electronically serve notice of the filing of this document on the parties referenced in the service list of the docket card who have electronically subscribed to this case. In addition, the undersigned certifies that a copy of the foregoing document is also being served upon the persons listed below via electronic mail this 15<sup>th</sup> day of October, 2020.

/s/ Christine M.T. Pirik

Christine M.T. Pirik (0029759)

Counsel/Intervenors via email:

[werner.margard@ohioattorneygeneral.gov](mailto:werner.margard@ohioattorneygeneral.gov)  
[brett.kravitz@ohioattorneygeneral.gov](mailto:brett.kravitz@ohioattorneygeneral.gov)  
[katherine.walker@ohioattorneygeneral.gov](mailto:katherine.walker@ohioattorneygeneral.gov)  
[norwichtwp1339@gmail.com](mailto:norwichtwp1339@gmail.com)  
[richardwiles@willard-oh.com](mailto:richardwiles@willard-oh.com)  
[rstrickler@huroncountyohprosecutor.com](mailto:rstrickler@huroncountyohprosecutor.com)  
[jstephens@huroncountyohprosecutor.com](mailto:jstephens@huroncountyohprosecutor.com)  
[ggross@eriecounty.oh.gov](mailto:ggross@eriecounty.oh.gov)  
[heather@hnattys.com](mailto:heather@hnattys.com)  
[jvankley@vankleywalker.com](mailto:jvankley@vankleywalker.com)  
[pjleppla@leplaw.com](mailto:pjleppla@leplaw.com)  
[michael.gerrard@arnoldporter.com](mailto:michael.gerrard@arnoldporter.com)  
[hwa2108@columbia.edu](mailto:hwa2108@columbia.edu)  
[baanc@aol.com](mailto:baanc@aol.com)  
[missyeb3@gmail.com](mailto:missyeb3@gmail.com)  
[r\\_ladd@frontier.com](mailto:r_ladd@frontier.com)  
[aesposito@flynnpykruse.com](mailto:aesposito@flynnpykruse.com)

Administrative Law Judges via email:

[jay.agranoff@puco.ohio.gov](mailto:jay.agranoff@puco.ohio.gov)  
[michael.williams@puco.ohio.gov](mailto:michael.williams@puco.ohio.gov)

## **Attachment DR-1**

CV

## EDUCATION

### Drexel University

Bachelor and Master of Science in *Electrical Engineering*  
Certification in *Engineering Management*  
Honors: Magna Cum Laude, Dean's List Scholar

Philadelphia, PA  
Class of 2013

## PROFESSIONAL EXPERIENCE

### Apex Clean Energy

*Senior Manager, Transmission & Interconnection*

Charlottesville, VA  
July 2018 to Present

- Manage the interconnection portfolio and transmission studies for Apex assets in multiple ISOs - PJM, SPP, MISO, ISO-NE, NYISO, ERCOT, and other non-RTO/ISO balancing authorities
- Review, manage, and negotiate Interconnection Agreements, E&P Agreements, and associated technical exhibits
- Provide strategic, regulatory, technical, and financial input to Executive Management, Development, Legal, Finance, Business Development, Engineering & Construction, and Asset Management
- Supervise regulatory compliance of Apex assets during the construction and commissioning project stages with specific emphasis on utility interconnection standards, reliability compliance studies, and RTO grid integration checklists
- File interconnection application packages and track queue progress with consistent internal and external stakeholder follow-up

### Enel Green Power

*Grid Connection Specialist – Engineering & Construction*

Andover, MA  
October 2016 to July 2018

- Performed due diligence and managed grid connection requirements for Enel's renewable fleet in the US and Canada
- Managed all critical grid requirements during commissioning, pre-energization testing, synchronization, and commercial operation to comply with NERC, RTO, Utility, and PPA specific requirements
- Initiated and led interconnection process improvements for increased and efficient collaboration across Business Development, Engineering & Construction, Energy Management, Operations & Maintenance, and Regulatory Affairs
- Managed consultants and OEMs, prepared interconnection requests, tracked tariff changes, and collaborated with RTOs & TOs on technical due diligence during project commissioning

### RCM Technologies

*Electrical Engineer – Energy Services*

Pennsauken, NJ  
March 2014 to October 2016

- Provided electrical design and technical subject matter expertise to generation owners on interconnect projects for utility scale power and energy delivery
- Collaborated with utilities and RTOs to execute Power Purchase Agreements (PPA)
- Performed site investigations of electrical systems and worked with station personnel to validate field conditions
- Lead Electrical Engineer for a 485MW Natural Gas Combined Cycle power plant in Connecticut

### Shah & Associates, Inc.

*Electrical Engineer*

Gaithersburg, MD  
August 2013 to March 2014

- Designed large-scale electrical systems for wastewater treatment facilities involving conceptual and detailed design
- Performed short circuit, coordination and arc flash studies to maintain system reliability
- Enhanced team efficiency through a 20% reduction in time allocated for standards assurance

## SKILLS

Grid Analysis and Integration, Interconnection Agreement Negotiation, Regulatory Compliance, Project Management, Process Improvement, Engineering Design, Power Flow Analysis, AutoCAD Drafting, Public Speaking

## PROFESSIONAL DEVELOPMENT/COURSES/HOBBIES

- Harvard Program on Negotiation
- Financial Management
- Managerial Statistics
- Management Communications
- Solar Energy Engineering

**This foregoing document was electronically filed with the Public Utilities**

**Commission of Ohio Docketing Information System on**

**10/15/2020 6:32:38 PM**

**in**

**Case No(s). 18-1607-EL-BGN**

Summary: Testimony of Deepesh Rana electronically filed by Christine M.T. Pirik on behalf of Firelands Wind, LLC