BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA

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Order Instituting Rulemaking to Revisit Net Energy Metering Tariffs Pursuant to Decision D.16-01-044, and to Address Other Issues Related to Net Energy Metering.	R-20-08-020 (Filed August 27, 2020)

FOUNDATION WINDPOWER, LLC PROPOSAL FOR SUCCESSOR TO CURRENT NET ENERGY METERING TARIFF

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Pursuant to Administrative Law Judge Kelly A. Hymes' January 28, 2021 Email Ruling Introducing White Paper, Noticing Workshop on White Paper, and Providing Instructions for Successor Proposals ("Ruling") in R-20-08-020, Foundation Windpower, LLC ("Foundation") hereby submits this Proposal for Successor to Current Net Energy Metering Tariff (the "Foundation Proposal"). Steve Sherr (steve.sherr@foundationwindpower.com) will present at the March 23-24 workshop.

I. PROPOSAL SUMMARY

Foundation appreciates the substantial efforts by the California Public Utilities Commission (the "Commission"), staff, consultants and parties have already made to develop a net energy metering ("NEM") successor tariff consistent with Assembly Bill (AB) 327, and looks forward to contributing to those efforts through the duration of this proceeding.

Genesis & Limited Scope of the Foundation Proposal: The Foundation Proposal derives primarily from Foundation's experience developing behind-the-meter ("BTM") ≥ 1MW wind energy facilities for medium/large commercial, industrial and agricultural ("MLCIA") customers. These customers include entities that are substantial drivers of California's rural/industrial sector, including produce & livestock processors, municipal water treatment plants, grocery distribution centers, cement and aggregate plants, bottling facilities, state prisons, and tribal enterprises. Each of these MLCIA customers also shares the following characteristics with respect to their on-site generation profile:

- Each has installed BTM wind energy facilities operating under NEM 1.0, NEM 2.0 or pursuant to a non-export configuration.
- Each customer's electricity demand exceeds 500 kW**.**
- Each customer's otherwise-applicable metered rate schedule ("OAS") includes substantial fixed and demand charges.
- Under Interconnection Rule 21, each customer bears the substantial cost of interconnection upgrades often required for ≥ 1MW BTM generators.

Significantly, no party, either in this proceeding or in the NEM 2.0 proceeding (R-14-07-002), has identified this particular MLCIA class of customers as a source of a cost shift from

participating customers to non-participating customers under the RIM test, or as source of cost inefficiency by any other measure. Nor can any such conclusion be derived from the Verdant Net-Energy Metering 2.0 Lookback Study ("Verdant Study") and the related model ("Verdant Model"). To the contrary, the Verdant Model, as applied to this class of customers, demonstrates a compelling alignment between the cost and value of current NEM tariff and, by extension, the Foundation Proposal.

Foundation Proposal: Foundation proposes that MLCIA customers with demand greater than 500kW taking service under an OAS with fixed and demand charges who install BTM wind energy facilities sized at 1MW or greater be eligible to elect between (a) remaining on the current NEM tariff or (b) opting in to any new compensation framework adopted as a successor to the current NEM tariff. Foundation further proposes that the Commission find that wind energy facilities sized at 1MW or greater do not have significant impact on the distribution grid solely because the generation capacity of such facilities exceed the size of onsite load, provided that the compensation paid for net excess generation does not exceed its value to the grid. The Commission should also take this opportunity to rule, as Foundation proposed in the prior NEM 2.0 proceeding, that any currently installed wind energy generation facilities that have been de-rated from the manufacturer's original nameplate capacity down to 1.0 MW in order to comply with NEM 1.0 limitations be permitted to operate at their intended nameplate capacity provided that doing so causes no significant impacts to the distribution grid.

The Foundation Proposal is limited in scope and does not purport to supplant other well-crafted proposals focused on solar and its growth among residential customers in disadvantaged communities as well as other residential customers, and smaller commercial and industrial facilities. Rather, if adopted, the Foundation Proposal would be discretely focused on maintaining and enhancing the benefits of BTM wind for all and would co-exist with any other successors to the current NEM tariff the Commission ultimately adopts.

Conformity with AB 327. By allowing MLCIA customers to continue to deploy and operate ≥ 1MW BTM wind energy facilities pursuant to the current NEM tariff, the Foundation Proposal assures growth of a sector that is sustainable over the long term. Public Utilities Code §2827.1(b)(1). Ever-increasing efficiencies in wind generation are available for future projects due to advances in materials technology enabling development of larger turbine blades that capture more available wind resource, which makes the deployment of wind energy facilities in

areas with only low-to-medium wind resource (ave. wind speed = 12 mph) feasible. As discussed in greater detail below, the cost/benefit measures also tilt firmly in favor of the Foundation Proposal. §2827.1(b)(3) & (4). Because the wind resource in California is particularly robust during crucial peak demand periods (e.g., 4pm – 9pm), the grid and all ratepayers served by it stand to benefit with each new deployment of a BTM wind energy facility. It is also undisputed that MCLIA customers deploying ≥ 1MW BTM wind energy facilities pay substantial fixed and demand charges under their OAS and, under Rule 21, pay for the cost of interconnection applications, studies and upgrades, which satisfies interconnection cost requirements under AB 327 and further assures against potential cost shifts to non-participating customers. §2827.1(b)(5).

Similarities & Differences re White Paper. The Foundation Proposal shares much in common with the Alternative Ratemaking Mechanisms for Distributed Energy Resources in California published by E3 (the "White Paper") by including the use of fixed charges and demand charges. And while the Foundation Proposal retains the option under the current NEM tariff for generation by MCLIA customers to be compensated at their retail energy rate, it also includes an option for these customers to elect to be compensated under any new compensation structure ultimately adopted by the Commission. In this way, the Foundation Proposal seeks to preserve what is working best under the current NEM tariff while not foregoing the potential realization of even greater benefit for all ratepayers under a new structure.

Important Statutory, Policy or Practical Issues. MCLIA customers deploying ≥ 1MW BTM wind energy facilities increasingly encounter very long interconnection timelines. Some projects take up to three (3) years from the filing of an interconnection application to achieve permission to operate – with financial security for the interconnection (which can cost millions of dollars) posted in advance. As such, it would be inequitable for the Commission to alter the applicable NEM tariff for any such customer who has already applied for interconnection and paid for an interconnection study before the Commission issues its final decision in this proceeding.

II. DETAILED DISCUSSION OF PROPOSAL

A. Background - Behind-the-Meter Wind in California

Before turning to the details of the Foundation Proposal a few notes about the unique characteristics of behind-the-meter wind need to be highlighted.

- ***Costs and Benefits Are Aligned Through Continued Application of the Current NEM Tariff to MCLIA Customers' Use of Wind Energy.***

Because they already pay substantial fixed and demand charges and are required to pay their own way for interconnection, MCLIA customers deploying ≥ 1MW BTM wind energy facilities have not been identified as a source of cost shifts to non-participating customers. While these customers, perhaps due to their being limited in number, were not a particular focus of the Verdant Study, nor of the White Paper, application of the Verdant Model confirms that the benefits of this particular class of customers using wind energy clearly outweigh the costs. [1]

By way of illustration, Foundation ran the Verdant Model using inputs that are as close to realistic as possible within the parameters defined in the model. Those inputs included a MCLIA customer in PG&E territory where the OAS is PG&E's B-19 rate. The customer, in this version, deploys a single 2.8 MW wind turbine and is located in the Sacramento region. The model generates the following benefit/cost ratios: RIM = 1.32; TRC = 1.97; sTRC 2.12; and PA = 9,760. A print-out of the "Inputs" and "ProFormaResults" tabs from this modeled case is attached hereto as Exhibit A. While the Verdant Model does not permit perfect alignment with real-world conditions where MCLIA customers might deploy BTM wind energy, based on observations of the model's sensitivities, it is mathematically unlikely, if not impossible, that the model would ever generate benefit/cost ratios of less than 1.0 under any of the four cost-effectiveness tests.[2]

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[1] Although some successor tariff proposals may attempt to include all classes of customers in a single tariff structure, this result is not necessarily well-advised and is, by no means, directed by the Legislature. In fact, in AB 327, the Legislature anticipated that the interaction with the net metering tariff by various classes of customers might yield varying outcomes and, as a result, directed the Commission to study "who benefits from, and who bears the economic burden, if any, of, the net energy metering program authorized by Section 2827, ***and to determine the extent to which each class of ratepayers and each region of the state receiving service under the net energy metering program is paying the full cost of the services provided to them*** and the extent to which these customers pay their share of the cost of public purpose programs*."* Public Utilities Code §2827.3(a) (emphasis added). Accordingly, adoption of a tariff that fails to account differentially for participating customers who are paying the full cost of services provided to them might not square well with the intent behind AB 327.

[2] We note here that the Verdant Study does report a weighted average RIM benefit/cost ratio of 0.92 for "Wind" in PG&E's service territory. See Verdant Study, p. 81-82 & Table 5-4. While this ratio does present a relatively

We certainly acknowledge and share some of the concerns other parties have raised about the Verdant Model understating benefits and overstating costs. That being said, any revision of the Verdant Model to address these concerns would likely only provide further support for concluding that the currently applicable NEM tariff – as used by MCLIA customers deploying ≥ 1MW BTM wind energy facilities - does not result in a cost shift to non-participating customers and that, by any measure, the benefits of this program outweigh the costs.[3]

The Commission also should take note that the cost-of-service analysis in the Verdant Study concludes that both before and after NEM 2.0 system installation, the average nonresidential NEM 2.0 customer pays more in their utility bills than the estimated cost for the utility to provide them service. Verdant Study, pp. 10 & 98, Table 5-11. Interestingly, this exceedance of utility billing over cost-of-service is maintained regardless of the size of the DER system relative to consumption precisely because "[n]onresidential rates have fixed fees and demand charges that help maintain the relationship between the cost of service and customer bills." *Id.* pp. 100-01. If anything, the cost-of-service analysis would likely tilt more in favor of MCLIA customers deploying ≥ 1MW BTM wind energy facilities if they were considered separately. One reason for this is that the Verdant Study cost-of-service analysis includes on the utility cost side of the ledger those costs "associated with NEM 2.0 interconnection and distribution upgrades influenced by NEM 2.0 customers." Verdant Study, p. 49. However, as previously mentioned, under Interconnection Rule 21, MCLIA customers deploying ≥ 1MW BTM wind energy facilities, and not the utility, are responsible for paying the often very substantial cost of interconnection and distribution upgrades.

- ***Wind Energy Provides Highly Valuable Peak Period Production***.

Wind energy facilities in California typically produce energy at all hours of the day. Most importantly, however, is the fact that the bulk of this production occurs between 5PM and 1AM, when demand is peaking and after solar energy generation has waned. This effect is most

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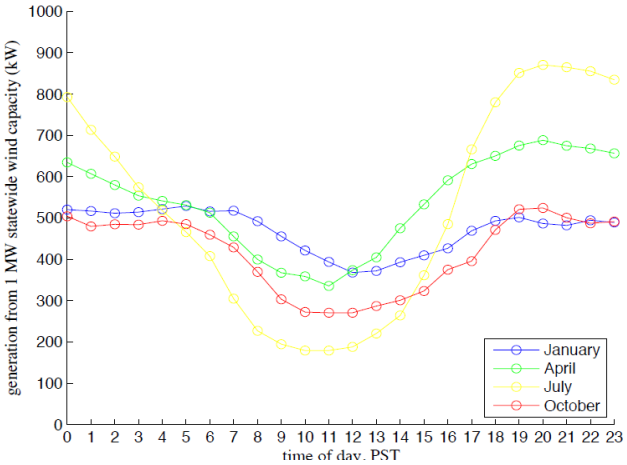
favorable profile for wind on average, it understates the benefit/cost ratio for the customers covered by the Foundation Proposal. Because we do not have access to the dataset incorporated into the result presented in Table 5-4, we can surmise that this figure may include customers deploying BTM wind turbines that are < 1MW and/or whose OAS does not include substantial fixed and demand charges. Neither of these particular customer groups are within the scope of the Foundation Proposal.

[3] For instance, the model assumes that the customer only incurs $800 in interconnection costs when, in reality, these costs are typically measured in the hundreds of thousands of dollars and, in some cases, will run into millions of dollars.

pronounced during summer months, when the generation is needed most. The baseline wind energy output distribution by hour and by season is represented in the graphic below:



G. Hoste, M. Dvorok, M. Jacobsen, *Matching Hourly and Peak Demand by Combining Different Renewable Energy Sources – A Case Study for California in 2020* (Stanford University 2009), p. 8, Figure 7. While the aim of this Stanford study was to chart a path for a 100% renewable generation future in the state, we cite it here to underscore the fact that wind energy in California is particularly well-suited to help alleviate the late-day peak demand that occurs when energy usage remains high but solar output drops precipitously. To be clear, solar self-generation, particularly when paired with storage, can and should also play a meaningful role in the equation. That said, for most of California's peak periods, wind generation can perform these functions without being tied to on-site storage. Accordingly, it will be important for the Commission's decision in this proceeding to ensure that MCLIA customers deploying ≥ 1MW BTM wind energy facilities are not unwittingly grouped with other generation resources that have a different production profile and improperly called upon to address a cost shift they have not caused.

- ***Advances in Wind Turbine Blade Technology Necessarily Increases the Scale and Potential Geographic Scope of Behind-the-Meter Wind.***

Due to advances in materials science and blade construction technology, the smallest commercially available General Electric turbine is now 2.0 MW, with the bulk of major turbine manufacturers' product lines moving well beyond this threshold. With every new technical

advance, the wind-swept area – and, thus, the potential energy to be captured from a single turbine - expands substantially. Wind turbines equipped with these larger/longer blades have also enabled expansion of wind energy generation into geographies previously deemed to have insufficient wind resource for wind project viability.

These advances have important implications for the design of any successor to the current NEM tariff. Specifically, because the vast majority of wind turbines suited to serve the large loads of MCLIA customers will likely be no smaller than 2.0 MW in the future, it will be increasingly difficult to perfectly match wind energy generation to on-site load. While a turbine's Supervisory Control and Data Acquisition (SCADA) system can be programmed so that the turbine operates at a lower nameplate capacity, this should only be done in rare circumstances so as to avoid undue wear-and-tear on the machine. Foundation currently operates seven (7) wind turbines at artificially constrained 1.0 MW settings, for a total nameplate capacity loss of 4.55 MW**,** which translates to an estimated 8,700 lost MWhs and over 4,000 tons of avoidable CO2 emissions annually. These legacy NEM 1.0 limitations should be revisited and removed, and any wind turbines installed behind-the-meter in the future should be allowed to operate at their intended nameplate capacity provided doing so causes no significant impacts to the grid.

- ***LCMIA Customers' Wind Energy & Host Communities***

It is not commonly understood that, unlike certain other energy assets, wind energy enjoys no property tax exemption in California. Although this issue may have been beyond the scope of the Verdant Study, it is important to mention here. While the property tax obligation introduces an economic hurdle to the development of an otherwise viable BTM wind energy facility, it also means that local governments and the ratepayers they serve stand to materially benefit from the project's revenue. To put this in perspective, on average, an owner of a BTM wind energy facility can expect to pay possessory interest property taxes between $250,000-$320,000 per installed MW over the useful life of a project – and even more if the project is "re-powered" by replacing the turbine or some of its components with more advanced technology during or at the end of the useful life of the initial turbine.

It should also be emphasized that MLCIA customers using BTM wind energy are located in California's rural industrial regions where access to predictably priced renewable energy can help support an economic foundation on which to create and maintain job opportunities for some

of California's most economically underserved communities. Any development of wind assets creates new construction jobs while the facility is being built, but use of on-site wind energy makes a long-term contribution to the economic stability of LCMIA customers – some of California's largest employers – that is both persistent and impactful.

B. Details of the Foundation Proposal.

The Foundation Proposal consists of the following three elements.

(1) MLCIA customers with demand greater than 500kW who are taking service under an OAS with fixed and demand charges who install BTM wind energy facilities sized at 1MW or greater are eligible to elect between the following two options:

(a) Remain on current NEM tariff (with existing retail rate TOU compensation structure); or

(b) Opt into any new compensation framework adopted as a successor to the current NEM tariff.

(2) The Commission make a finding that that wind energy facilities sized at 1MW or greater do not have significant impact on the distribution grid solely because the generation capacity of such facilities exceeds the size of onsite load provided that the compensation paid for excess generation does not exceed its value to the grid.

(3) The Commission rule that any currently-installed wind energy generation facility which has been de-rated from the manufacturer's original nameplate capacity down to 1.0 MW in order to comply with NEM 1.0 limitations be permitted to operate at the manufacturer's original nameplate capacity provided that doing so causes no significant impacts to the distribution grid.

C. The Foundation Proposal Conforms with The Commission's Guiding Principles.

The Foundation Proposal aligns well with the CPUC's Successor Tariff Guiding Principles. As discussed in Section I above, it complies with PUC Section 2827.1's provisions promoting sustainable growth, equity among customers, and customer responsibility for the cost of interconnection of ≥ 1MW BTM wind energy facilities. And, as discussed in Section II.A. above, the Foundation Proposal complies with all statutory and cost-effectiveness mandates. This is primarily due to the fact that MCLIA customers with demand greater than 500kW taking

service under an OAS pay substantial fixed and demand charges with or without deployment of a BTM wind energy facility. The parties to this proceeding and the prior NEM 2.0 proceeding have not contested this. Nor are there any contrary indications in the White Paper, the Verdant Study, or the Verdant Model which, as discussed above, expressly validates the cost effectiveness of the Foundation Proposal.

The Foundation Proposal is also consistent with the balance of the Guiding Principles. As MCLIA customers are all business customers, the concerns for consumer protection are generally inapplicable. While any technology sharing the generation profile and other characteristics of ≥ 1 MW BTM wind energy facilities, (*e.g.*, ≥ 1 MW solar combined with storage serving ≥ 500 kW MCLIA load) could be approved to operate as outlined in the Foundation Proposal, Foundation is not qualified to opine on those systems. The Foundation Proposal is also consistent with State policy insofar as it applies to MCLIA customers and their load, is understandable and transparent, can apply in the service territories of all IOUs, is competitively neutral to all load serving entities and, by providing for use of larger turbines where doing so does not result in negative impacts on the grid, maximizes value of behind-the-meter generation to all customers and to electrical system.

III. PROPOSAL IMPLEMENTATION PLAN/TIMELINE

Because the Foundation Proposal leverages the best of the currently applicable NEM tariff with only modest modifications, no additional implementation phase required and the IOUs can issue advice letters for tariffs to take effect immediately - - and there is particular urgency in doing so because unless construction begins on or before December 31, 2021, the current 18% federal investment tax credits for > 100 kW wind energy systems will no longer be available and, in fact, will be eliminated entirely. For those MCLIA customers electing to opt into an alternative compensation structure that may emerge from this proceeding, the tariffs should provide for such customers whatever amount of time is offered to other customers who have such an option.

IV. CONCLUSION

We appreciate the Commission's and all parties' consideration of the Foundation Proposal. We believe it best captures what is best about the deployment of wind energy behind-the-meter in California and welcome any questions and collaborations in service of its clarification and/or improvement.

Respectfully submitted,

By: /s/

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EXHIBIT A

Simulation inputs (Input Tab)

Model Inputs VERDANT

NEM 2.0 Lookback Study Model - Version 1/21/2021

Prepared with assistance from Itron, Inc.

Load Shape Input	
Select Load Shape ID:	PGE_C_CZ_12_XXL

Utility Rate Inputs		
Utility	PG&E	
IOU Baseline Territory / Climate Zone	R - CZ 12	
Sector	Industrial	
Customer Fuel Mix	B	
Retail Rate Escalator (Nominal)	4.0%	
CCA? (% reduction energy commodity rate)	Yes	5%

Utility NEM Costs	
One-Time NEM Costs ($/kW$_{DC}$)	$0.00
One-Time NEM Costs ($ / Customer)	$1,056.00
Ongoing NEM Costs ($/yr)	$0.00
Ongoing NEM Cost Escalator	2.00%
Participant Interconnection Cost	$800.00

B-19

Retail Rate Inputs	Year ->	1	2	3	4	5	6
Non-DER Baseline Rate		B-19	B-19	B-19	B-19	B-19	B-19
NEM DER Rate		B-19	B-19	B-19	B-19	B-19	B-19

B-19

Global Technology Inputs		
Technology Type	Wind	
NEM Generator Size (kW$_{DC}$)	2,800.00	
NEM Generator Upfront Cost ($/kW$_{DC}$)	$3,125.00	
NEM Generator Useful Life (Yrs)	20	
Partial Equip. Replacement Cost	$	-
Partial Equip. Replacement Time (Yr)	13	
NEM Gen. Degradation Rate (Pct. kWh / yr)	0.10%	
O&M Cost ($/kWh$_{DC}$)	$0.00	
O&M Cost Escalator (Nominal)	2%	

Wind Turbine Technology Inputs	
Hub Height (m)	80

Model Output	
Enter Case Description:	Case_1

Weather Inputs (Lookups)	
Weather File Name	CA_SACRAMENTO-EXECUTIVE-AP_724830S_CTZ22.csv

Current Directory
C:\Users\Kevin\Desktop\NEM\NEM\NEM2_LookbackModel\NEM2_LookbackModel_Output_Model

Run Case | Run Batch Mode

7	8	9	10	11	12	13	14	15	16	17
B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19
B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19	B-19

Tax Inputs	
Federal Tax Rate	21.0%
State Tax Rate	8.84%
Federal MACRS Term (yrs)	1
State MACRS Term (yrs)	5 + Bonus
Apply Tax Credit?	N

Financing and Insurance Inputs	
Percent Financed with Equity	30%
Financing Period (Years)	18
Years of Debt Service in DSRF	-
Cost of Debt	5.00%
Cost of Equity	16.60%
Insurance Expense Mult.	0.50%
Insurance Escalator	2.00%

State DER Incentive (SGIP) Inputs	
Apply SGIP Incentive (Y/N)?	Y
Storage Incentive Amount ($/Wh$_{AC}$)	$0.00
Generation Incentive Amount ($/W$_{AC}$)	$2.00
Incentive Payment Mechanism	5-Year PBI

Renewable Energy Credit (REC) Inputs	
Sell RECs (Y/N)?	N

Other Discount Rate Inputs	
Weighted Average Cost of Capital (Nominal)	7.50%
Utility Discount Rate (Nominal)	7.00%
Societal Discount Rate (Nominal)	5.00%

Other Financial Inputs	
Societal Air Quality Adder (2020 $/MWh)	$ 6.00
Escalator (Air Quality & Fixed Value)	2.00%
NEM Export Valuation	1 - Retail Rate (Default)

Simulation Result (ProFormaResults tab)

Results	
Internal Rate of Return (IRR)	16.60%
Modified IRR (MIRR)	4.53%
Participant Cost Test (PCT) Ratio	1.70
Program Administrator (PA) Test Ratio	9760.93
Total Resource Cost (TRC) Test Ratio	1.97
Societal Total Resource Cost (sTRC) Test Ratio	2.12
Ratepayer Impact (RIM) Test Ratio	1.32
User Defined Test Ratio	0.80
LCOE	$0.01
LCOE - PreTax	$0.01
CF_{DC} - First Year	28.9%
Payback Year (Averaging)	13.0