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**CLEAN GRID ALLIANCE’S and AMERICAN WIND ENERGY ASSOCIATION’S
COMMENTS REGARDING
NORTHERN INDIANA PUBLIC SERVICE COMPANY LLC’S
2018 INTEGRATED RESOURCE PLAN**

Dear Ms. Earls and Mr. Borum:

Enclosed are Clean Grid Alliance’s and American Wind Energy Association’s comments regarding Northern Indiana Public Service Company LLC’s (“NIPSCO”) integrated resource plan filed on October 31, 2018 (“Plan”). Our comments address the following six points: [1] NIPSCO’s current wind cost assumptions are valid; [2] NIPSCO should use verified third-party data sources in future cost and performance assumptions; [3] NIPSCO should continue to use an all-source RFP and do so on an annual basis; [4] NIPSCO should procure a balanced mix of renewable resources; [5] NIPSCO should offer a well-designed green tariff program; [6] NIPSCO is correct to focus on MISO’s ongoing changes to renewable resource capacity factors because these values will likely affect the value stream of resources they select after 2023; [7] NIPSCO should continue planning transmission expansion to deliver electricity from its forecasted generation to its customers at the lowest overall production cost of electricity.

Respectfully submitted,

/s

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/s

Hannah Hunt
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COMMENTS

Clean Grid Alliance and American Wind Energy Association applaud the Short Term Action Plan NIPSCO has laid out – to retire its Schahfer units and replace them with a combination of wind, solar and battery storage resources. Moreover, NIPSCO has been quick to implement its plan by entering, in the early part of 2019, into two power purchase agreements for energy from 700 MW of wind projects and joint ownership of another 102 MW of wind resources. CGA and AWEA submit the following recommendations for the Commission’s and NIPSCO’s consideration.

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1. NIPSCO’S CURRENT WIND COST ASSUMPTIONS ARE VALID

As a result of reviewing third-party sources and incorporating its All-Source Request for Proposals (“RFP”) results into its Integrated Resource Plan (“IRP”) input assumptions, NIPSCO’s current wind cost assumptions are valid. NIPSCO took an appropriate first step in screening third-party sources for new resource cost and operational parameter estimates. In particular, the National Renewable Energy Laboratory (“NREL”) Annual Technology Baseline (“ATB”) is one of the

most comprehensive, and accurate, resources for energy resource inputs, and is used by regional transmission organizations (“RTO”) including the Midcontinent Independent System Operator (“MISO”) in their planning processes.¹ ATB data should continue to be used as an input for estimating NIPSCO’s cost and performance assumptions. NREL uses location-specific resource data to estimate a range of potential cost and performance scenarios. That means ATB data is far more accurate for the purposes of estimating NIPSCO’s regional wind profile in comparison to using cost and performance assumptions that would be provided in, for example, other utility integrated resource plans with significantly different wind regimes. For future IRPs, NIPSCO should consult screen data compiled by the Lawrence Berkeley National Laboratory (“LBNL”) for the U.S. Department of Energy (“DOE”) in their Annual Wind Technologies Market Reports.² LBNL collects annual data on wind energy power purchase agreement (“PPA”) prices nationwide and provides regional average prices for the Great Lakes and Interior regions that would be comparable to NIPSCO’s regional wind profile.

NIPSCO also acted prudently in conducting an All-Source RFP process to further inform the IRP. RFP results provide up-to-date information on the cost and performance characteristics of wind energy available in the regional market. With those results NIPSCO was able to evaluate multiple configurations for renewable resources with different performance levels and pricing assumptions. Further, the RFP results reduced uncertainty associated with any significant cost assumption ranges that showed up in the third-party screening. As the IRP itself states, much of the cost information in the RFP results was “relatively consistent with the third-party data review, but renewable offers were at the low end of the estimates observed in the literature,” indicating

¹ National Renewable Energy Laboratory, “NREL Annual Technology Baseline.” 2018. <https://atb.nrel.gov/>.

² Lawrence Berkeley National Laboratory, “2017 Wind Technologies Market Report”, 2018. <https://emp.lbl.gov/wind-technologies-market-report>.

that “technology change and developer activity in a competitive process are dynamic forces that influence the costs of resource options for NIPSCO in the future.”³

NIPSCO developed multiple cost tranches based on the RFP results, including two PPA tranches for standalone wind projects, one PPA tranche for wind/solar/storage projects, one asset sale tranche for standalone wind projects, and one asset sale tranche for wind/solar/storage projects. The two cost assumptions for standalone wind PPAs were \$25.54/megawatt hour (“MWh”) and \$38.11/MWh, with \$28.68/MWh assumed for hybrid projects. All assumptions are based on being available to serve customers by 2023 and account for use of the federal Production Tax Credit (“PTC”). LBNL reports taking advantage of the 100% PTC value reduces onshore wind levelized cost of energy (“LCOE”) by approximately \$15-\$19/MWh.⁴ This cost reduction is reflected in the LBNL Annual Wind Technologies Market Report, which shows the national average price for wind PPAs signed in 2017 to be less than \$17/MWh.⁵ In the Great Lakes region, including MISO Local Resource Zone 6, recent PPA prices average \$33/MWh. This price aligns with the midpoint between the two PPA tranches identified by NIPSCO for standalone wind projects. In addition, NIPSCO assumed a \$1,486/kW asset sale price for standalone wind projects, with \$1,406/kW assumed for hybrid projects. This assumption is consistent with third-party sources. The 2018 NREL ATB reports an average capital cost of \$1,579/kW for U.S. onshore wind projects installed in 2018.⁶ The average capital cost can be considered a proxy for asset sale price,

³ NIPSCO, “2018 Integrated Resource Plan.” 2018. <https://www.nipSCO.com/docs/default-source/default-document-library/2018-nipSCO-irp.pdf>, 56.

⁴ Lawrence Berkeley National Laboratory, “An Analysis of the Costs, Benefits, and Implications of Different Approaches to Capturing the Value of Renewable Energy Tax Incentives.” May 2014. <https://emp.lbl.gov/sites/all/files/lbnl-6610e-ppt.pdf>.

⁵ Lawrence Berkeley National Laboratory, “2017 Wind Technologies Market Report”, 2018. <https://emp.lbl.gov/wind-technologies-market-report>, 59.

⁶ National Renewable Energy Laboratory, “2018 ATB.” 2018. <https://atb.nrel.gov/>. Onshore data derived from the “low” value for land-based wind techno-resource group (“TRG”) 6. The TRG 6 “low” value is most aligned with Indiana resources.

as it incorporates all expenditures required to achieve commercial operation, including wind turbine materials, balance of system, and financial costs.

2. NIPSCO SHOULD USE VERIFIED THIRD-PARTY DATA SOURCES TO INFORM ITS FUTURE COST AND PERFORMANCE ASSUMPTIONS

NIPSCO clearly recognizes the value of acting quickly to benefit from the federal PTC. Its IRP confirms that procuring wind resources by 2020, in order to secure the 100% PTC, will be “important to achieve the lowest portfolio costs for customers,” and it has taken steps to procure said resources, announcing plans this year to procure 800 megawatts (“MW”) of wind capacity from three separate wind projects in Indiana.⁷ However, NIPSCO must also look ahead to potential resource additions after the 100% PTC is no longer available, either at reduced levels or at no level at all. RFP results will not account for future cost reductions expected in installed costs, operations and maintenance costs, or other inputs. As such, NIPSCO should use verified third-party data sources to inform its future cost and performance assumptions for wind and other potential resource additions. For reasons discussed above, the NREL ATB data should be considered as a primary screening tool prior to collecting RFPs for future IRP analyses. The Energy Information Administration’s (“EIA”) Annual Energy Outlook (“AEO”) should not be used, because the custom learning rates that EIA applies to generation technologies in order to calculate future cost and performance assumptions have historically proven inaccurate for renewable energy, leading EIA to repeatedly underestimate future deployments across the country.⁸

⁷ NIPSCO, “NIPSCO Announces Addition of Three Indiana-Grown Wind Projects.” February 2019. <https://www.nipSCO.com/docs/default-source/press-releases-docs/nipSCO-announces-new-wind-energy-projects-coming-to-indiana.pdf>.

⁸ EIA, “Electricity Market Module.” April 2018. <https://www.eia.gov/outlooks/aeo/assumptions/pdf/electricity.pdf>.

Currently, NIPSCO evaluates potential resource additions after 2023 using a generic set of installed cost assumptions, including installed capital costs and fixed operations and maintenance costs. The installed wind cost assumption starts at \$1,670/kW in 2018, decreasing to \$1,333/kW by 2023 and reaching \$1,251/kW by 2030.⁹ However, installed wind costs are expected to decline at a faster rate than NIPSCO assumes in its IRP. The NREL ATB estimates that capital costs for U.S. onshore wind projects in wind regimes similar to MISO Local Resource Zone 6 will fall from approximately \$1,579/kW to \$1,316/kW by 2023, eventually falling to \$834/kW by 2030.¹⁰ MISO incorporates ATB data into its planning processes, confirming in its Transmission Expansion Plan process that the capital cost curve for wind will continue a significant downward trend over the next decade.¹¹ NIPSCO's fixed operations and maintenance costs are approximately aligned with NREL ATB estimates.

The generic capital costs NIPSCO uses for utility-scale solar resources are high for 2018 and in the later years – near 2030. The installed capital cost that NIPSCO uses for solar starts at \$1,379/kW in 2018, decreasing to \$1,006/kW by 2023 and reaching \$873/kW by 2030.¹² Installed utility-scale solar costs are expected to decline at a faster rate than what NIPSCO assumes in its IRP. With anticipated advancements in PV technology the NREL ATB low estimates for utility-scale solar PV capital costs near Chicago should be used for the early analyses prior to collecting RFPs. That data projects 2018 installed capital costs of solar near Chicago to be approximately

⁹ NIPSCO, "2018 Integrated Resource Plan." 2018. <https://www.nipsco.com/docs/default-source/default-document-library/2018-nipsco-irp.pdf>, Appendix D at 520.

¹⁰ National Renewable Energy Laboratory, "NREL Annual Technology Baseline," Onshore Wind tab. 2018. <https://atb.nrel.gov/>.

¹¹ MISO, "MTEP19 Futures Development." February 2018. <https://cdn.misoenergy.org/20180214%20PAC%20Item%2003a%20MTEP19%20Futures%20Development125886.pdf>.

¹² NIPSCO, "2018 Integrated Resource Plan." 2018. <https://www.nipsco.com/docs/default-source/default-document-library/2018-nipsco-irp.pdf>, Appendix D at 520.

\$1,250/kW in 2018, decreasing to \$1,020/kW by 2023, and falling at a rate faster than what NIPSCO projects, to approximately \$807/kW by 2030.¹³

Continued cost reductions combined with capacity factor improvements will apply downward pressure on wind's and utility-scale solar's levelized cost of energy ("LCOE") as federal tax credits phase out. That being said, wind and solar energy are already cost-competitive without the federal tax credits in many geographic and technological scenarios.

Lazard Associates' LCOE Analysis Version 12.0 reports a \$29-56/MWh LCOE without subsidies or incentives for U.S. onshore wind projects brought online in 2018, making it the lowest cost source of new generation compared to all other resources including natural gas combined cycle at \$41-\$74/MWh and nuclear at \$112-\$189/MWh.¹⁴ Consistent with that data, the NREL ATB reports a \$33-\$54/MWh LCOE without incentives for 2018 U.S. onshore wind projects.¹⁵ Looking ahead, the NREL ATB projects that LCOE without incentives for U.S. onshore wind projects will fall from \$33-\$54/MWh in 2018 to \$27-\$41/MWh by 2023 alone. Renewable suppliers agree prices will continue to decline. NextEra Energy Resources Chief Executive Officer Jim Robo recently said that, due to continued turbine price reductions, "without incentives, early in the next decade wind is going to be a [\$20-\$25 per MWh] product."¹⁶

For utility-scale solar resources, Lazard reports a \$36-\$44/MWh LCOE without subsidies or incentives for projects brought online in 2018.¹⁷ The NREL ATB low forecast reports a slightly higher LCOE without incentives for the Chicago area in 2018 than Lazard, at approximately

¹³ National Renewable Energy Laboratory, "NREL Annual Technology Baseline," Solar – Utility PV tab. 2018, using an annual inflation rate of 2.5%. <https://atb.nrel.gov/>.

¹⁴ Lazard, "Lazard's Levelized Cost of Energy Analysis – Version 12.0." November 2018. <https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf>, 8.

¹⁵ National Renewable Energy Laboratory, "NREL Annual Technology Baseline." 2018. <https://atb.nrel.gov/>.

¹⁶ Recharge News, "NextEra expects US tax overhaul to translate into cheaper turbines." January 29, 2018. <https://www.rechargenews.com/wind/1422041/nextera-expects-us-tax-overhaul-to-translate-into-cheaper-turbines>.

¹⁷ Lazard, "Lazard's Levelized Cost of Energy Analysis – Version 12.0." November 2018. <https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf>, 8.

\$48/MWh.¹⁸ Looking ahead, however, the NREL ATB low data projects that the LCOE without incentives for utility-scale solar projects near Chicago will fall from that \$48/MWh in 2018 to approximately \$29/MWh by 2030.¹⁹

Technological advances will continue to drive cost reductions and performance improvements for wind and solar projects. The use of taller turbine towers and longer turbine blades significantly increases the amount of energy that can be captured, improving project performance and reducing final costs. The LBNL Annual Wind Technologies Market Report documents how the average onshore wind turbine rotor diameter has increased from approximately 80 meters in 2008 to 113 meters today.²⁰ Since the area swept by the turbine blades, and therefore the energy captured, is proportional to $\pi*r^2$, this corresponds to a nearly 100% increase in swept area and energy capture. The industry has also transitioned towards taller towers. Approximately 37% of all wind turbines installed in 2017 had hub heights of at least 90 meters, a significant shift away from the 80-meter hub height used in recent years.²¹ These technologies allow turbines to access higher, steadier wind speeds, unlocking a greater range of viable wind project sites, and it is expected that wind turbines will continue to grow in size and performance. A real-world example of this can be found in Indiana. The Meadow Lake VI wind project, brought online at the end of 2018 in White County, Indiana, is utilizing 136-meter rotor diameters and 105-meter hub heights.²²

¹⁸ National Renewable Energy Laboratory, “NREL Annual Technology Baseline.” 2018, after adjusting for inflation using an annual inflation rate of 2.5%. <https://atb.nrel.gov/>.

¹⁹ Ibid.

²⁰ Lawrence Berkeley National Laboratory, “2017 Wind Technologies Market Report.” 2018. <https://emp.lbl.gov/wind-technologies-market-report>.

²¹ Lawrence Berkeley National Laboratory, “2017 Wind Technologies Market Report.” 2018. <https://emp.lbl.gov/wind-technologies-market-report> 27.

²² EDP Renewables North America, “Meadow Lake Wind Farm.” Accessed February 2019. <http://meadowlakewindfarm.com/>.

3. NIPSCO SHOULD ISSUE AN ALL-SOURCE RFP ON AT LEAST AN ANNUAL BASIS

NIPSCO conducted an All-Source RFP solicitation as part of its IRP process for the first time in 2018. Its goals were to minimize future cost trend uncertainty and to identify transactable projects to serve near-term capacity needs.²³ In response to the RFP, project developers submitted bids for 59 individual projects spread across 5 states representing over 13 GW of installed capacity, with multiple bids including variations on pricing structure and term length. As stated above, NIPSCO found the RFP results were “relatively consistent with the third-party data review, but renewable offers were at the low end of the estimates observed in the public literature,” indicating that “technology change and developer activity in a competitive process are dynamic forces that influence the costs of resource options for NIPSCO in the future.”²⁴

It is commendable that NIPSCO conducted an RFP process to inform the IRP. Looking ahead, NIPSCO expects it will conduct another All-Source RFP to fill the remainder of its capacity needs through 2023.²⁵ No details are given on the future RFP guidelines, but a similar structure is presumed. In this regard, NIPSCO should increase its commitment and issue future All-Source RFPs on at least an annual basis. The RFP results would provide up-to-date information on the cost and performance characteristics of renewable energy available in the market. The results would also allow NIPSCO to evaluate multiple configurations for renewable resources with different performance levels and pricing assumptions.

²³ NIPSCO, “2018 Integrated Resource Plan.” 2018. <https://www.nipSCO.com/docs/default-source/default-document-library/2018-nipSCO-irp.pdf>, 54.

²⁴ NIPSCO, “2018 Integrated Resource Plan.” 2018. <https://www.nipSCO.com/docs/default-source/default-document-library/2018-nipSCO-irp.pdf>, 56.

²⁵ Ibid, 6.

Wind, solar, and storage costs are falling rapidly. Wind's costs have fallen by 69% since 2009 alone and technology advancements are opening up new viable project sites every day.²⁶ An annual RFP would provide NIPSCO with project-specific pricing and performance characteristics, supplementing information provided by the NREL ATB and other sources. It would be most informative to issue an annual RFP for resources not just located in Indiana, but to all resources with deliverability to MISO Local Resource Zone 6. Both asset purchases and PPAs should be considered as potential ownership arrangements. NIPSCO should continue to use the collected information to inform its IRP processes, incorporating the data into its resource cost and performance assumptions. There is no downside to issuing an RFP. If the RFP responses indicate that renewable resources are uneconomic, then those resources will not be procured and there is no harm to ratepayers. However, if the results do reveal economic resources, then pursuing those options will provide net benefits to ratepayers. An RFP ensures fair and low rates for customers by putting all resources, both utility-owned and third-party, on the same competitive playing field.

4. NIPSCO SHOULD PROCURE A BALANCED MIX OF RENEWABLE RESOURCES

NIPSCO's preferred procurement plan includes 600 MW of incremental wind capacity additions by 2020, growing to a total of 1,049 MW of incremental additions by 2021.²⁷ These additions are supplemental to two PPAs currently in place with wind projects in South Dakota and Iowa worth a total of 100 MW. These PPAs will terminate in 2024 and 2029, respectively. The preferred plan also includes 2,290 MW of incremental solar capacity additions in 2023, growing to a total of 3,001 MW by 2038. No solar capacity is currently being procured by NIPSCO.

²⁶ Lazard, "Lazard's Levelized Cost of Energy Analysis – Version 12.0." November 2018. <https://www.lazard.com/media/450784/lazards-levelized-cost-of-energy-version-120-vfinal.pdf>, 8.

²⁷ NIPSCO, "2018 Integrated Resource Plan." 2018. <https://www.nipSCO.com/docs/default-source/default-document-library/2018-nipSCO-irp.pdf>, 1,760.

NIPSCO developed and evaluated six resource replacement portfolios to determine the IRP’s final preferred portfolio. Each replacement portfolio was evaluated according to individual cost and risk factors against a stochastic distribution of potential future market outcomes. NIPSCO ultimately selected Portfolio F as its preferred plan, noting that replacement portfolios with renewable additions emerged as the most economic options.²⁸

We certainly commend NIPSCO for acting quickly to procure wind resources by 2020, evidenced by its recent announcement to procure 800 MW of wind capacity from three separate wind projects in Indiana.²⁹ However, we also encourage NIPSCO to be vigilant in procuring a balanced mix of renewable resources over its long-term planning horizon. NIPSCO’s preferred plan – with a 20-year time horizon – concludes with net installed solar capacity (3,001 MW) outweighing net installed wind capacity (1,049 MW) by a factor of 3:1. Of course, NIPSCO’s appropriate renewable energy mix should not be measured according to installed capacity alone. NIPSCO will need to consider dynamic and changing peak load conditions, technology performance, technology costs, commodity prices, and policy drivers, among other factors, and will need to undergo countless hours of modeling work and data validation.

In these efforts, NIPSCO should study the various benefits and limitations of its current modeling software and pursue products that accurately evaluate both the capacity and energy services provided by renewable resources. As a result, the modeling results would recommend NIPSCO’s appropriate renewable energy mix over its long-term planning horizon. The 2018 IRP portfolio optimization analysis was completed using AURORA software.³⁰ In 2017, Puget Sound

²⁸ NIPSCO, “2018 Integrated Resource Plan.” 2018. <https://www.nipSCO.com/docs/default-source/default-document-library/2018-nipSCO-irp.pdf>, 174.

²⁹ NIPSCO, “NIPSCO Announces Addition of Three Indiana-Grown Wind Projects.” February 1, 2019. <https://www.nipSCO.com/docs/default-source/press-releases-docs/nipSCO-announces-new-wind-energy-projects-coming-to-indiana.pdf>.

³⁰ NIPSCO, “2018 Integrated Resource Plan.” 2018. <https://www.nipSCO.com/docs/default-source/default-document-library/2018-nipSCO-irp.pdf>, 13.

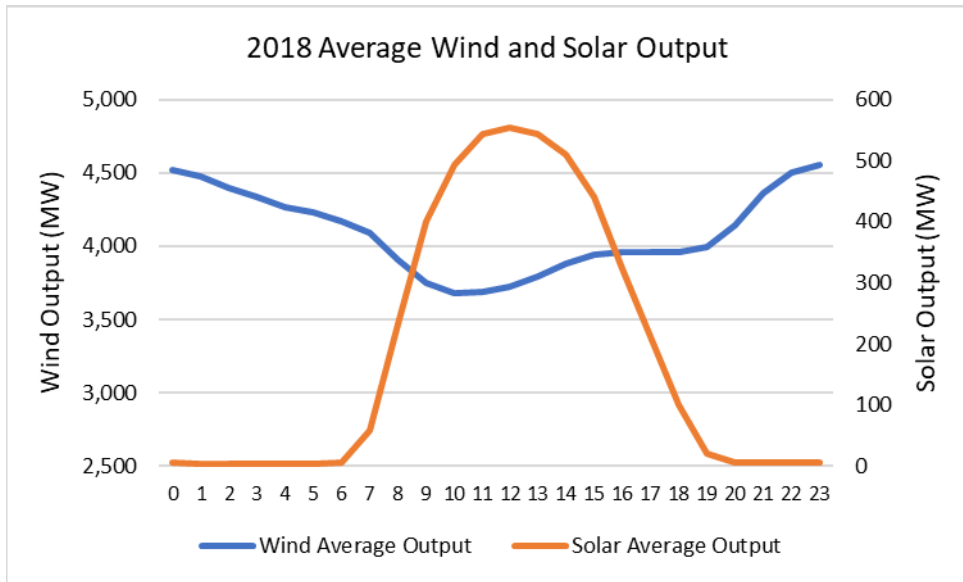
Energy chose to use a combination AURORA and Plexos software in its IRP processes, highlighting the benefits of using Plexos.³¹ AURORA is a capacity-centric modeling product focused on hourly capacity-based operations. Plexos, on the other hand, is able to evaluate sub-hourly operational capabilities. Such flexibility is exceptionally important for evaluating renewable resources that provide sub-hourly ramping capabilities. Appalachian Power recognized wind and solar’s energy contributions in its 2017 IRP, noting that renewables made a “fairly modest” capacity contribution, according to PJM’s Capacity Performance rules, but that wind energy, in particular, provided a significant volume of energy and would help to lower customer costs and lower exposure to volatile energy markets.³² NIPSCO should similarly evaluate energy services and verify that its modeling software is capable of doing so. Methodologies that over-prioritize capacity resources, such as reliance on unforced capacity (“UCAP”) calculations, should be closely evaluated.

Of course, a balanced renewable energy portfolio provides additional value. NIPSCO would benefit from wind and solar energy’s complementary production profiles, with seasonal and diurnal output patterns balancing particularly well. From a seasonal perspective, wind energy generation tends to be strongest in the winter, spring, and fall months; solar generation is strongest during the summer. On a diurnal basis, wind generation tends to be strongest at night; solar generation ramps up to its highest levels in the middle of the day. The chart below illustrates average daily wind output in MISO and PJM in 2018 as well as average daily solar output in PJM

³¹ Puget Sound Energy, “2017 PSE Integrated Resource Plan.” Accessed February 2019. Available at <https://www.pse.com/pages/energy-supply/resource-planning>, 3-12.

³² Appalachian Power, “Integrated Resource Planning Report to the Commonwealth of Virginia State Corporation Commission.” May 1, 2017. <https://www.appalachianpower.com/global/utilities/lib/docs/info/projects/APCOIntegratedResourcePlans/2017APCOVAIRPPublicVersion04262017.pdf>, ES-12.

in 2018.³³³⁴ Over the course of 24 hours, wind generation complements solar generation, particularly in the late-night hours when solar generation ramps down. These output changes can be forecasted and planned well in advance as grid operators have the technology and experience necessary to forecast and prepare for hour-to-hour variability. In fact, today’s weather forecasting technology makes changes in wind and solar energy output rather predictable.

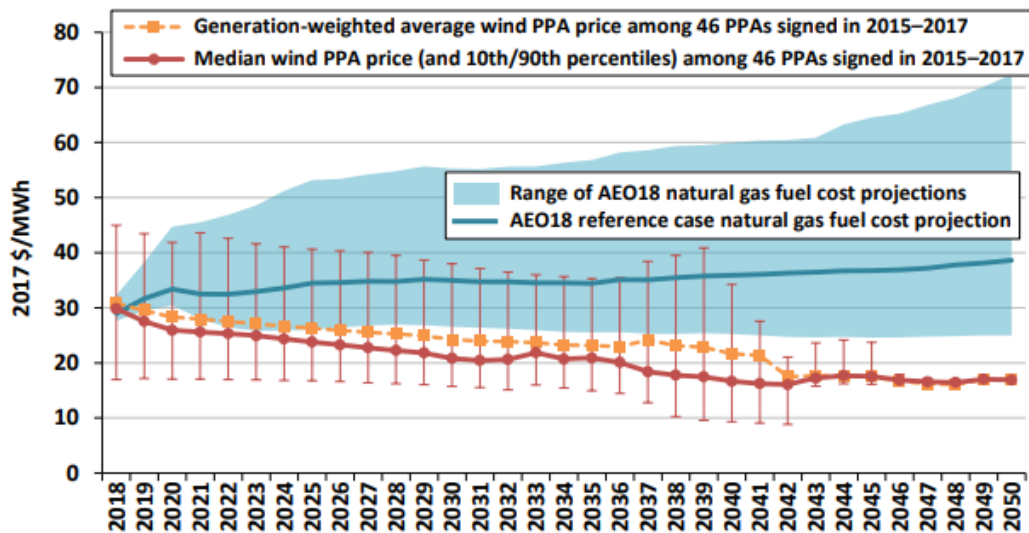


Weather patterns also tend to produce complementary wind and solar energy production profiles. Solar output is typically highest when a high-pressure system is present. High-pressure systems are marked by cloudless days and more intense periods of sunshine. Wind output is typically lower during these systems but improves in low-pressure systems with increased wind speeds and cloud cover. NIPSCO should take advantage of wind and solar energy’s complementary production profiles by procuring a balanced mix of these resources.

³³ PJM, “Markets and Operations.” Accessed February 2019. https://dataminer2.pjm.com/feed/gen_by_fuel. Data derived from all 24-hour periods in 2018.

³⁴ MISO, “Historical Hourly Wind Data.” Accessed February 2019. [https://www.misoenergy.org/markets-and-operations/market-reports/#nt=%2FMarketReportType%3ASummary%2FMarketReportName%3AHistorical%20Hourly%20Wind%20Data%20\(csv\)&t=10&p=0&s=MarketReportPublished&sd=desc](https://www.misoenergy.org/markets-and-operations/market-reports/#nt=%2FMarketReportType%3ASummary%2FMarketReportName%3AHistorical%20Hourly%20Wind%20Data%20(csv)&t=10&p=0&s=MarketReportPublished&sd=desc).

In the long term, renewable energy continues to provide portfolio diversity and to hedge against fuel price volatility. The LBNL Annual Wind Technologies Report includes the chart below showing how current wind costs are projected to sit below a future wide range of expected natural gas generation costs, with wind providing even larger savings in higher gas price scenarios.³⁵ The median wind contract price actually declines over time because inflation reduces the contracts' fixed costs.³⁶



5. NIPSCO SHOULD OFFER A WELL-DESIGNED GREEN TARIFF PROGRAM

Customers in Indiana and across the country have made their commitment to purchase renewable energy very clear, with a growing number of companies setting renewable energy and energy-related sustainability targets. 63% of the Fortune 100 companies have set one or more renewable energy targets, with 48% of the Fortune 500 making similar commitments.³⁷ 162

³⁵ Lawrence Berkeley National Laboratory, *2017 Wind Technologies Market Report*, 2018. <https://emp.lbl.gov/wind-technologies-market-report>.

³⁶ Commonwealth of Virginia State Corporation Commission, “Transcript of Proceedings.” September 2017. <http://www.scc.virginia.gov/docketsearch/DOCS/3%240s01!.PDF>, 4.

³⁷ Ceres, “REPORT: Fortune 500 Companies Accelerating Renewable Energy, Energy Efficiency Efforts.” April 2017. <https://www.ceres.org/news-center/press-releases/report-fortune-500-companies-accelerating-renewable-energy-energy>.

companies have signed the RE100 commitment to procure 100% renewable electricity to power their operations, including Indiana employers General Motors, Nestlé, Walmart, Iron Mountain, Johnson & Johnson, and others.³⁸ Importantly, companies are following through with these commitments. Since 2013, U.S. companies have purchased over 15 GW of renewable energy from offsite projects, procuring wind energy more than any other resource.³⁹ Renewable energy access has become an important factor for many corporate customers in deciding where to site large facilities like data centers. In announcing plans to build a 400,000 square foot, \$1.3 billion data center Apple CEO Tim Cook said Iowa's renewable energy resource was "paramount for us" and "if we couldn't [procure renewables], we would not be here."⁴⁰

Most renewable energy purchases from offsite projects are facilitated through PPAs or utility-offered green tariff programs. This reflects a preference for direct renewable energy purchases over taking the minimum action to purchase renewable energy credits ("REC"). Six corporate customers procured 478 MW of Indiana wind power capacity through the end of 2018 through PPAs alone. The following table summarizes those purchases:

³⁸ RE100, "Companies." 2019. <http://there100.org/companies>.

³⁹ Business Renewables Center, "BRC Deal Tracker." Accessed February 2019. <http://businessrenewables.org/corporate-transactions/>.

⁴⁰ Radio Iowa, "Iowa's wind power 'paramount' to Apple's decision on new data centers." August 2017. <https://www.radioiowa.com/2017/08/24/iowas-wind-power-paramount-to-apples-decision-on-new-data-centers/>.

Contracted Capacity (MW)	Power Purchaser	Project Name	Project Developer	Year Announced
149.50	Amazon Web Services	Amazon Wind Farm (Fowler Ridge)	Pattern Energy Group, Inc.	2015
75.00	Cummins	Meadow Lake VI	EDP Renewables North America	2017
139.00	Facebook	Headwaters II	EDP Renewables North America	2018
5.00	Iron Mountain	Meadow Lake III	EDP Renewables North America	2018
49.95	Nestlé	Meadow Lake VI	EDP Renewables North America	2018
60.00	Walmart	Headwaters II	EDP Renewables North America	2018

NIPSCO could satisfy this growing customer demand with a well-designed green tariff program allowing eligible customers to buy a bundled renewable energy product from specific renewable energy projects. As of October 2018, there were no Indiana utilities offering green tariff programs.⁴¹ NIPSCO currently offers the Green Power Program, in which participating customers pay a surcharge on their retail electricity bill to cover 25%, 50%, or 100% of their monthly electricity demand with Green-E Certified RECs purchased by NIPSCO.⁴² This program, however, does not offer customers the opportunity to purchase a bundled renewable energy product, or to realize the benefits that would come from said product, such as being able to enter into a long-term contract that hedges against future fuel price volatility.

As such, it is recommended that NIPSCO offer a well-designed green tariff program. The Corporate Renewable Energy Buyers’ Principles, signed by multiple Indiana companies, confirm

⁴¹ World Resources Institute, “Emerging Green Tariffs in U.S. Regulated Electricity Markets.” October 2018. https://wriorg.s3.amazonaws.com/s3fs-public/emerging-green-tariffs-in-us-regulated-electricity-markets_1.pdf?_ga=2.134860018.208984116.1549575612-548565371.1531225968.

⁴² NIPSCO, “2018 Integrated Resource Plan.” 2018. <https://www.nipsco.com/docs/default-source/default-document-library/2018-nipsco-irp.pdf>, 189.

customer interest in working with their local utilities “to design and develop innovative programs and products that meet our needs.”⁴³ These companies also prefer purchasing renewable energy from new projects “within reasonable proximity to their facilities,” specifically on their local electricity grid.”⁴⁴ Eligible customers have procured a total of 1,906 MW of renewable energy via green tariff programs to date, with an additional 950 MW currently under negotiation.⁴⁵ This represents significant recent interest, as 99% of the 1,906 MW were signed since the beginning of 2015 alone. General Motors, in particular, shared in its blueprint “Accelerating and Scaling Corporate Renewable Energy” that they view green tariff programs “as a significant part” of their renewable energy procurement strategy moving forward.⁴⁶ NIPSCO should align with these corporate strategies by offering a green tariff program and procuring additional renewable energy in anticipation of this demand.

Since 2013, 23 green tariff programs have been proposed or approved across 17 states. These programs vary significantly in terms of program design, but best practices do exist that could be replicated at NIPSCO. It will be critical to solicit information from eligible customers on their specific needs and preferences. In general, design aspects that best serve customer needs include but are not limited to:

- **Offering bundled renewable energy products:** The Corporate Renewable Energy Buyers’ Principles confirm companies’ desire for bundled renewable energy products. The ability to procure energy, capacity, and associated

⁴³ Corporate Renewable Energy Buyers’ Principles, “The Principles.” Accessed February 2019. <http://buyersprinciples.org/principles/>.

⁴⁴ Ibid.

⁴⁵ World Resources Institute, “Grid Transformation: Green Tariff Deals.” Accessed February 2019. <https://www.wri.org/resources/charts-graphs/grid-transformation-green-tariff-deals>.

⁴⁶ General Motors, “Accelerating and Scaling Corporate Renewable Energy.” 2017. https://www.generalmotors.green/product/public/us/en/GMGreen/energy_efficiency_detail.html/content/Pages/news/us/en/gm_green/2017/1114-blueprint.html, 4.

environmental attributes is preferred over unbundled REC purchases, as those “do not deliver the same value and impact as directly procured renewable energy from a specific project or facility.”⁴⁷ In particular, a bundled product can provide economic value to the customer and hedge against future fuel price volatility. The ability to claim the environmental attributes associated with a renewable energy project is also a threshold requirement for most corporate purchasers. All 23 green tariff programs proposed or approved to date include an energy-pricing component and some form of environmental attribute management. In most cases, the customer retains rights to the RECs or the RECs are retired by the utility on behalf of the customer.

- **Using a transparent and competitive market solicitation process to secure renewable energy supply for the program:** A competitive bidding process allows project selection on the basis of both price and non-price factors as determined by utilities and regulators, identifying the best available projects to meet specific needs.⁴⁸ For example, Dominion Energy’s recently approved Rate Schedule RG will be supplied in part through a market solicitation process to be conducted by the utility.⁴⁹ Importantly, the solicitation will allow bids for both asset purchases and PPAs from third-party suppliers. A competitive procurement process is relatively standard procedure for electric utilities and allows renewable energy supply to be selected on the basis of cost-effectiveness. It also ensures

⁴⁷ Corporate Renewable Energy Buyers’ Principles, “The Principles.” Accessed February 2019. <http://buyersprinciples.org/principles/>.

⁴⁸ National Renewable Energy Laboratory, “Procurement Options for New Renewable Electricity Supply.” December 2011. <http://www.nrel.gov/docs/fy12osti/52983.pdf>.

⁴⁹ Billingsley, James, “Direct Testimony.” December 1, 2017. <http://www.scc.virginia.gov/docketsearch/DOCS/3%24jx01!.PDF>, 41.

third-party supplier awareness, assuming it is well-advertised and made public. NIPSCO is familiar with competitive market solicitations, as it conducted an All-Source RFP process to inform this IRP.

- **Ensuring all customer charges are cost-based with a market-based billing structure, if applicable, and that additional fees do not exceed actual administrative costs:** Voluntary renewable energy customers expect to pay fair, market-based prices for renewable energy while holding nonparticipating customers harmless. A green tariff program must therefore ensure that customers will pay fair, market-based prices, with pricing provisions directly linked to the customer's retail bill in a transparent manner. Omaha Public Power District's Rate 261M prices the energy component of the participating customer's retail bill at Southwest Power Pool's hourly market rate.⁵⁰ Schedule RG charges customers according to the price of the renewable energy project selected to meet their needs and credits customers according to the wholesale price for renewable energy and capacity associated with that project.⁵¹ In addition, voluntary renewable energy customers are willing to pay administrative fees associated with renewable energy programs to ensure that nonparticipating customers are held harmless. That being said, additional fees should not exceed the actual cost to the utility of arranging and administering such programs and should be distributed fairly among participants.

⁵⁰ Omaha Public Power District, "Electric Rate Schedules and Service Regulations." Accessed February 2019. <https://www.oppd.com/media/207840/oppd-rate-manual.pdf>, 44.

⁵¹ Virginia Electric and Power Company, "Schedule RG Renewable Generation Supply Service." December 11, 2018. <https://www.dominionenergy.com/library/domcom/media/large-business/renewable-energy-programs/schedule-rg/compliance-filing-schedule-rg.pdf?la=en>.

- **Providing an option for customers to directly negotiate and execute contracts with third-party suppliers:** While utilities do have significant experience soliciting and contracting energy supply, they do not have perfect insight into customers’ specific needs and preferences. They also do not have the same incentive as the customer to minimize risk. Many customers have specific renewable energy and/or greenhouse gas emissions goals, and they understand how to meet these goals best. The companies themselves are best positioned to negotiate and execute PPAs in a cost-effective manner that maximizes their preferences. For example, Rocky Mountain Power’s Schedule 32 tariff allows eligible customers to both select their preferred renewable energy generators and to directly negotiate contract terms with the supplier.⁵² The Public Service Company of New Mexico’s (“PNM”) Original Rider 47 also allows PNM and eligible customers to work together to “(i) determine when it makes the most sense to bring new renewable resources into service to match ... projected load; (ii) identify and evaluate the costs and benefits of new renewable energy resources available to satisfy that growth; and (iii) determine the site(s) of those Additional Renewable Energy Procurements at locations that will avoid constraints on PNM’s transmission system.”⁵³ The attractive terms of the Green Energy Rider convinced Facebook to triple the size of its Los Lunas data center in

⁵² Rocky Mountain Power, “Electric Service Schedule No. 32.” April 1, 2015. https://www.rockymountainpower.net/content/dam/rocky_mountain_power/doc/About_Us/Rates_and_Regulation/Utah/Approved_Tariffs/Rate_Schedules/Service_From_Renewable_Energy_Facilities.pdf.

⁵³ Public Service Company of New Mexico. July 8, 2016. <http://164.64.85.108/infodocs/2016/7/PRS20226214DOC.PDF>, 6.

New Mexico, sourcing future demand from the Rider and creating \$2 billion in total economic impact for the state.^{54,55}

- **Using a clearly defined program evaluation process that includes participating customers and other interested persons:** It is critical for participating customers and other interested persons to have the opportunity to provide feedback on approved and enacted programs. Feedback would provide valuable information on the quality of the green tariff program, including its ability to help customers achieve their renewable energy and/or greenhouse gas emissions goals. The evaluation process would solicit information on how well the program meets the expectations of participating customers, using the input to guide a discussion of whether to propose, for Commission approval, an expansion or modification of the program. Ameren Missouri’s recently approved Renewable Choice Program includes an initial program cap of 400 MW. However, assuming total demand is met before the program ends, Ameren Missouri plans to host a meeting in which eligible and participating customers discuss the potential for continuing the program beyond 400 MW. Participants will discuss how well the Program meets the expectations of participating customers and the utility. Based on this information, Ameren will facilitate a discussion of whether to propose an expansion or modification of the program.
- **Including a clearly defined re-enrollment process for participating customers:** It is reasonable to expect that participating customers would have an

⁵⁴ Lenninger, Sasha, “Los Lunas Facebook Data Center will triple in size.” November 14, 2017. <http://www.koat.com/article/los-lunas-facebook-data-center-will-triple-in-size/13569398>.

⁵⁵ Facebook, “Designing and implementing renewable energy tariffs.” April 4, 2017. <https://www.facebook.com/notes/green-on-facebook/designing-and-implementing-renewable-energy-tariffs/1645979022084014/>.

interest to re-enroll in a well-design program at the end of their contract terms. A re-enrollment option would give customers more opportunity to reach their renewable energy and/or greenhouse gas emissions goals and would provide better understanding to potential customers as they decide whether to initially enroll in the program. Consumers Energy’s Voluntary Large Customer Renewable Energy Pilot Program allows customers to re-enroll in the program in either three-year or 20-year increments.⁵⁶ Xcel Energy Colorado’s Schedule RC allows customers to sign up for one of three subscription options: a month-to-month subscription, a five-year subscription, or a 10-year subscription.⁵⁷ Customers are automatically re-enrolled for subsequent subscriptions unless the customer notifies the utility that it wishes to terminate.

- **Enabling flexible term options for customers while ensuring renewable energy supplier needs are met:** Project developers often require long-term contract certainty to secure project financing. At the same time, customers place a high value on contract term length flexibility. Green tariff programs offer an opportunity to provide a range of term options to customers while ensuring that developers are able to secure financing. NIPSCO’s contracts with suppliers would not need to align perfectly with customer commitments. For example, NIPSCO could sign a long-term contract with a project, allowing customers different term options if they are willing to pay extra for a shorter-term length. The full range of options could need to be explored based on the needs of potential participants.

⁵⁶ Consumers Energy, “MPSC Case No. U-18393.” May 12, 2017. <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/068t0000001UYTBAA4?casenum=18393>, 22.

⁵⁷ Xcel Energy, “Public Service Company of Colorado Electric Tariff Index.” 2018. <https://www.xcelenergy.com/staticfiles/xcel/PDF/Regulatory/CO-Rates-&-Regulations-Entire-Electric-Book.pdf>, 157.

- **Allowing multiple customers to procure renewable energy from a larger renewable energy project:** Smaller customers are often denied access to cost-effective renewable resources as it can be difficult, for contractual and logistical reasons, for suppliers with large-scale resources to sign multiple PPAs with a single project. As a result, smaller customers must often look to smaller projects with cost-prohibitive pricing. These more expensive terms can ultimately prevent a PPA from being executed. NIPSCO’s ability to aggregate electricity demand from smaller customers would allow those customers to benefit from greater economies of scale. Multiple green tariff programs aggregate demand from multiple customers. For example, Georgia Power’s Commercial and Industrial Renewable Energy Development Initiative (“REDI”) Schedule aggregates demand from eligible customers that have an annual peak demand of at least 3,000 kW.⁵⁸
- **Allowing customers to aggregate accounts to meet minimum eligibility thresholds:** Numerous prospective customers will have more than one metered account in NIPSCO’s service territory, including retail customers. Without a provision to allow meter aggregation, a green tariff program will inevitably exclude these customers, either because their individual facilities fail to meet minimum eligibility thresholds, or because the administrative hassle for the customer will add costs and logistical challenges. Dominion Energy’s Rate Schedule RG allows meter aggregation to all commercial and industrial customers that have a combined annual

⁵⁸ Georgia Power, “Commercial & Industrial REDI Schedule: CIR-1.” 2017. <https://www.georgiapower.com/content/dam/georgia-power/pdfs/business-pdfs/rates-schedules/ci-redi-tariff.pdf>.

electricity demand equaling or exceeding the output from a 1,000 kW or greater renewable energy resource.⁵⁹

6. CAPACITY RESOURCE PLANNING FOR NON-DISPATCHABLE RESOURCES

NIPSCO is correct to consider the capacity credit afforded renewable resources in MISO.⁶⁰ As more renewable resources are added to the grid, MISO will need to adopt policies that optimize the efficiency of the grid in light of the changing resource mix; making its grid more flexible. NIPSCO is correct to focus on MISO’s ongoing work to change the load carrying capacity and seasonal capacity payments for wind and solar resources. Changes in these values will likely affect the value stream of resources they select after 2023. In addition to the aforementioned changes, MISO may implement rules relative to hybrid interconnections.

One way to manage the variability of renewable resources is through locational diversity. Having power purchase agreements with wind or solar resources outside of Indiana can expand the energy production profile of your portfolio of those resources, reduce the variability of your portfolio and minimize the need for spot market purchases.

7. USE OF NIPSCO’S TRANSMISSION CONGESTION STUDY

NIPSCO is correct to consider transmission upgrades that would be needed to efficiently and reliably deliver electricity when considering its generating plant retirements and additions.⁶¹ Conducting such a study should give NIPSCO transmission expansion proposal to include in

⁵⁹ Virginia Electric and Power Company, “Schedule RG Renewable Generation Supply Service.” December 11, 2018. <https://www.dominionenergy.com/library/domcom/media/large-business/renewable-energy-programs/schedule-rg/compliance-filing-schedule-rg.pdf?la=en>.

⁶⁰ NIPSCO 2018 IRP at 176-177 §9.3.4.

⁶¹ NIPSCO 2018 IRP at 177-178 §9.3.4.

MISO transmission expansion plans so as to improve reliability and lower the overall cost of the production of electricity delivered to its customers.

CONCLUSION

WHEREFORE, Clean Grid Alliance and American Wind Energy Association request that the Commission and NIPSCO adopt the recommendations contained herein.

Respectfully submitted,

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