Dr. Brad Borum
Indiana Utility Regulatory Commission
101 West Washington Street, Suite 1500 East
Indianapolis, Indiana 46204-3419

March 8, 2022

Re: NIPSCO's 2021 Integrated Resource Plan

Dear Dr. Borum,

Indiana Advanced Energy Economy ("Indiana AEE") respectfully submits this letter of comment regarding NIPSCO's 2021 Integrated Resource Plan ("IRP") to the Indiana Utility Regulatory Commission ("Commission").

Advanced Energy Economy ("AEE") is a national business association representing leaders in the advanced energy industry. AEE supports a broad portfolio of technologies, products and services that enhances U.S. competitiveness and economic growth through an efficient, high-performing energy system that is clean, secure, and affordable. AEE has been operating in the Hoosier state as Indiana AEE since 2016. In Indiana, AEE aims to drive the development of advanced energy by identifying growth opportunities, removing policy barriers, encouraging market-based policies, establishing partnerships, and serving as the voice of innovative companies in the advanced energy sector.

Indiana AEE appreciates the stakeholder process that NIPSCO ("the Company") held with regard to this IRP. The Company was responsive to stakeholder input and engaged with feedback in a timely and thorough manner. Overall, NIPSCO has developed a strong IRP based on sound analysis and many industry best practices, including extensive modeling of customer-owned distributed energy resources ("DERs") and electric vehicle demand ("EV") across a range of adoption scenarios, examination of how customer behavior may impact peak load projections, and retirement pathways analyses. We appreciate NIPSCO's addition of new metrics related to lower-cost opportunities, assessment of the value of energy savings on an hourly basis, exploration of sub-hourly ancillary service value for fast response resources, and commitment to net-zero portfolio pathways. Additionally, the Company carefully considered federal energy

policies related to technology tax credits and carbon regulations, and Midcontinent Independent System Operator ("MISO") rules related to resource adequacy, seasonal reserves, capacity credits, Federal Energy Regulatory Commission Order 841 implementation, and more.

Indiana AEE continues to support the direction NIPSCO has taken its resource planning, maintaining its commitment to retire all of its coal generation no later than 2028 and replace the capacity with cost-effective advanced energy resources. This includes portfolio additions of 100-250 MW of new solar, 135-370 MW of new energy storage, 68 MW of demand-side management at summer peak, and related transmission upgrades and projects to facilitate lower cost energy production and delivery.

Finally, NIPSCO's inclusion of an IRP element that considers and supports an equitable energy transition is laudable.

In sum, NIPSCO continues to demonstrate to its peers how to balance reliability, flexibility, adaptability and affordability while pursuing an ambitious, but responsible transition to clean advanced energy resources.

In these comments, we offer three main considerations:

1. NIPSCO should further develop its energy efficiency and demand response programs, especially in light of its ongoing investment in advanced metering infrastructure and anticipated capacity shortfall;
2. NIPSCO should delay its proposed 300 MW natural gas combustion turbine as long as possible and explore resource alternatives; and
3. AEE supports further study of strategically sited DER opportunities to defer substation and other distribution system investments, and encourages NIPSCO to consider both utility and non-utility ownership models.

NIPSCO should further develop its energy efficiency and demand response programs, especially in light of its ongoing investment in advanced metering infrastructure and anticipated capacity shortfall.

Demand side resources, including energy efficiency, are still the most cost-effective energy options for Indiana ratepayers. Especially given NIPSCO's ongoing investment in advanced metering infrastructure ("AMI") across its service territory, it has the opportunity to capitalize on the enhanced functionality of AMI, including the collection and use of granular customer meter data to create innovative programs that help shape load, reduce peak demand, improve integration of DERs, and enhance opportunities for greater energy efficiency achievement. Improved management and integration of demand side resources can help NIPSCO make better

use of existing generation, transmission, and distribution system resources, improve reliability, and avoid or defer the need for investments in new generation, transmission and distribution resources.

Right now, energy efficiency is one of the most cost-effective ways to meet energy demand with an average levelized cost of saved electricity for program administrators of just $0.016/kWh in Indiana.[1] NIPSCO has performed well compared to many of its peers both within and outside of Indiana, reporting incremental annual residential energy savings as a percentage of residential sales in 2019 of 1.78%, and incremental commercial energy savings as a percentage of commercial sales of 1.82%. It has also improved its consideration of energy efficiency within this IRP by assessing the value of energy savings on an hourly basis and evaluating energy efficiency on a more level playing field with supply-side resource. Nevertheless, we encourage the Company and the Commission to pursue all cost-effective energy efficiency, which includes levels beyond the 2021 market potential study's realistically achievable potential.[2] Notably, analysis of Energy Information Administration Form 861 data illustrates that reasonably aggressive energy efficiency programs do not appear to have increasing costs per unit of savings for either residential or commercial sales, at least into the range of 3% per year incremental savings.[3]

We also note here that meter-based pay-for-performance program designs, particularly when enabled by AMI, can enhance the value of energy efficiency and other DERs by increasing the ability of utilities to rely on them to meet grid needs.[4] However, recent studies from Lawrence Berkeley National Laboratory have found that even passive peak load reductions from energy efficiency programs can be substantial. The levelized cost of saving peak demand for residential lighting is just $94/kW; for residential Heating, Ventilation, and Air Conditioning ("HVAC") it is $249/kW; and for commercial and industrial prescriptive rebates, it is $148/kW. This demonstrates that energy efficiency programs are a "relatively low-cost way for utilities to meet peak demand, compared to the capital cost of other resources."[5]

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[1] The Cost of Saving Electricity Through Energy Efficiency Programs Funding by Utility Customers: 2009-2015. Hoffman, Ian, Charles A. Goldman, Sean Murphy, Natalie Mims, Greg Leventis and Lisa Schwartz. Lawrence Berkeley National Laboratory. June 2018. Available at: https://www.swenergy.org/Data/Sites/1/media/lbnl-cse-report-june-2018.pdf

[2] Integrated Resource Plan Appendix B: Demand Side Management Market Potential Study. NIPSCO. 2021. Available at: https://www.nipsco.com/docs/librariesprovider11/rates-and-tariffs/irp/2021-nipsco-irp-appendix-b.pdf?sfvrsn=6

[3] Comments to Duke Energy Indiana regarding Energy Efficiency in DEI's 2021 Integrated Resource Plan. Advanced Energy Economy and 5 Lakes Energy. October 2021. Available at: https://info.aee.net/hubfs/Advanced%20Energy%20Economy%20on%20DEI%20IRP%20Energy%20Efficiency%20.pdf

[4] Time-Sensitive Value of Efficiency: Use Cases in Electricity Sector Planning and Programs. Lawrence Berkeley National Laboratory. Frick, Natalie Mims, and Lisa C Schwartz. 2019. Available at: https://emp.lbl.gov/publications/time-sensitive-value-efficiency-use

[5] Peak Demand Impacts from Electricity Efficiency Programs. Lawrence Berkeley National Laboratory. Frick et al. p. 15. 2019. Available at https://emp.lbl.gov/publications/peak-demand-impacts-electricity.

NIPSCO's demand response capacity may be somewhat constrained by the significant industrial demand from Rate 831[6] customers who do not participate in utility demand management program; however, we appreciate the Company's effort to craft new demand response, residential smart thermostat, residential water heater, medium and large commercial and industrial load curtailment programs, and new residential and small commercial and industrial dynamic rates.

Programs that shave peak loads or shift demand to off-peak hours, including through time-varying rates, have proven to be a low-cost strategy to save electric ratepayers money. Indeed, Indiana AEE's February 2018 report showed that pursuing cost-effective peak demand reduction strategies along with energy storage would produce net benefits for Indiana electric ratepayers (total savings minus costs) ranging from $448 million to $2.3 billion over 10 years.[7] One effective strategy to unlocking these benefits from the residential sector is to engage households at scale. For example, with the installation of AMI, and utilizing an opt-out program design, behavioral demand response can turn every residential household (including renters) into grid assets through behavioral nudges alone. Layering price signals on top of the behavioral nudges would have the effect of driving larger peak reductions and load shifting. Behavior-based solutions are delivering peak reduction and load shifting in some of the most constrained parts of the country,[8] and NIPSCO's AMI deployment enables it to be used as a resource in Indiana as well.

NIPSCO should delay its proposed 300 MW natural gas combustion turbine as long as possible and explore resource alternatives in front of and behind the meter.

While we recognize that the energy transition introduces new uncertainties regarding future technologies, and that one intent of this IRP is to remain flexible and responsive to changing economic and policy conditions, we caution NIPSCO against the specific inclusion of new natural gas peaking resources in the near-term. Deploying alternatives to such peaking resources, in front of and behind the meter, would be in NIPSCO and its ratepayers' best interest because 1)

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[6] Rate 831 is available to large industrial customers taking service at the transmission or subtransmission voltage level, located adjacent to electric facilities with capacity sufficient to meet the customer's needs, and with contracts for electric demand greater than 10,000 kW. More details can be found here: https://www.nipsco.com/docs/librariesprovider11/rates-and-tariffs/electric-rates/2020-current-rates/table-of-contents/831.pdf?sfvrsn=2

[7] Peak Demand Impacts from Electricity Efficiency Programs. Lawrence Berkeley National Laboratory. Frick et al. 2019. Available at https://emp.lbl.gov/publications/peak-demand-impacts-electricity.

[8] In 2019, CPS Energy expanded a pilot program that relied upon behavioral demand response, smart thermostats, and commercial and public customer engagement to 300,000 customers. They achieved 40 MW of additional demand response at peak periods. More information can be found here: https://www.prnewswire.com/news-releases/cps-energy-recognized-as-thought-leader-for-public-engagement-301098990.html, and a thorough evaluation of earlier iterations of the program can be found here: https://www.sanantonio.gov/Portals/0/Files/Sustainability/STEP/CPS-FY2020.pdf.

there is a significant risk in adding 300 MW of capacity instead of investing in and gaining experience with cost-effective, reliable advanced energy resources, especially those that can be added incrementally or that may receive additional federal support in the near future; and 2) a newly built fossil resource adds significant fuel price and stranded asset risk, which can be avoided with a different set of resource addition and retirement strategies.

In support of our recommendation, we note that customer DER adoption will grow over time. NIPSCO's IRP modeling shows that by 2030, cumulative customer-owned solar installations could reach up to 200 MW, and customer-owned storage installations up to 20 MW with a cumulative energy impact approaching 250,000 MWh.[9] We believe this estimate is low, especially given growing customer interest in pairing at-home storage with rooftop solar systems, and given the proliferation of electric vehicles that will be able to serve as a battery resource. NIPSCO may have to adjust these predictions upward as it prepares the grid for impacts. DER participation via aggregation services in wholesale markets, including the Midcontinent Independent System Operator ("MISO"), will create new value streams for DERs that may further accelerate adoption.[10] Indiana AEE recommends that the utility begin preparing to engage with aggregation services in the near term, and viewing these services as a way to incrementally meet the Company's approximate need of 300 MW of capacity in a way that is also consistent with the Company's clean energy and net-zero emissions trajectory.

New research is demonstrating that customer actions and choices related to distributed energy resources, energy efficiency, vehicle and appliance electrification, and demand management can have a measurable aggregate impact on energy sector emissions. [11] And by promoting these clean and distributed technologies, NIPSCO may be able to avoid the need to add new generation capacity and gain experience managing a system with greater amount of distributed energy resources. It may also protect the utility and its customers against over-investment if the expected load never fully materializes.

Additionally, studies continue to show that advanced energy resources more broadly, including large-scale solar, wind, and energy storage, when used together and paired with utility programs and rates that encourage smart and managed electricity usage and demand flexibility, can replace most, if not all, of the fossil fuel generation currently serving electric customers.[12] A newly

[9] 2021 Integrated Resource Plan. Northern Indiana Public Service Company LLC, p. 51. November 2021. Available at :https://www.nipsco.com/docs/librariesprovider11/rates-and-tariffs/irp/2021-nipsco-integrated-resource-plan.pdf?sfvrsn=6
[10] As required by FERC Order 2222 (2020).
[11] The Customer Action Pathway to National Decarbonization. Sanem Sergici, Ryan Hledik, Michael Hagerty, Ahmad Faruqui, and Kate Peters. Brattle. September 2021. Available at: https://www.oracle.com/a/ocom/docs/industries/utilities/customer-action-pathway-report.pdf
[12] *2035: The Report*. Goldman School of Public Policy at the University of California Berkeley. June 2020. Available at: http://www.2035report.com/wp-content/uploads/2020/06/2035-Report.pdf?hsCtaTracking=8a85e9ea-4ed3-4ec0-b4c6-906934306ddb%7Cc68c2ac2-1db0-4d1c-82a1-65ef4daaf6c1

published report from the National Renewable Energy Laboratory found that high storage penetration scenarios, often accompanied by high variable generation, "successfully operate with no unserved energy and low reserve violations, showing no concerns about hourly load balancing through the end of 2050."[13] It also finds:

> On an annual basis, storage effectively provides time-shifting and peak-load reduction services in all configurations and grid mixes. Although storage has a low annual capacity factor, which is inherently limited by its need to charge, it has a very high utilization (in many cases over 75%) during the top 10 net load hours across scenarios and years–when the system needs capacity and energy the most–indicating a strong contribution to the system's resource adequacy.[14]

Utilities around the country are finding that energy storage resources are increasingly competitive (including when paired with solar and wind resources), flexible to operate, and prudent to invest in. For example, in early 2019, Arizona Public Service announced that it would procure 850 MW of battery storage to meet peak demand and replace natural gas peaking capacity.[15]

Importantly, these resources may also receive additional federal support in the near future; the Infrastructure Investment and Jobs Act (2021) includes funding for energy storage projects that enhance grid resilience and demonstrations of long-duration storage technologies and "second-life applications" of electric vehicle batteries. And while congressional negotiations around "Build Back Better," or a climate-focused budget reconciliation bill, are ongoing, previous versions of the legislation have included provisions for an energy storage tax credit, which may also be fully refundable or eligible for direct pay.

We also note that new gas plants carry both fuel and stranded asset risks. Just recently, global natural gas prices have spiked as demand rises disproportionately to supply, and some believe that these prices mark a longer-term upward trend.[16] A new gas plant that is intended to operate for decades means that customer bills will continue to be exposed to these market trends. At the same time, the new plant is at risk of becoming operationally stranded as it becomes cheaper to build and operate new advanced energy resources that can serve the same need. A new report

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[13] Storage Futures Study: Grid Operational Impacts of Widespread Storage Deployment, p. viii. A. Jennie Jorgenson, Will Frazier, Paul Denholm, and Nate Blair. National Renewable Energy Laboratory. January 2022. Available at: https://www.nrel.gov/docs/fy22osti/80688.pdf

[14] *Id*.

[15] APS to install 850 MW of storage, 100 MW of solar in major clean energy buy. Gavin Bade. Utility Dive, February 2019. Available at: https://www.utilitydive.com/news/aps-to-install-850-mw-of-storage-100-mw-of-solar-in-major-clean-energy-buy/548886/

[16] The Era of Cheap Natural Gas Ends as Prices Surge by 1,000%. Anna Shiryaevskaya, Stephen Stapczynski, and Ann Koh. Bloomberg, August 2021. Available at: https://www.bloomberg.com/news/articles/2021-08-06/the-era-of-cheap-natural-gas-ends-as-prices-surge-by-1-000

from RMI[17] found that if renewable energy costs continue to decline at their current pace, a portfolio of clean energy resources would outcompete 80% of currently proposed combustion turbines by their in-service date. Even without clean energy resource costs declines, if you incorporate the value of securing firm gas supply, clean energy portfolios become competitive with 92% of combustion turbines. Higher gas prices make clean energy portfolios competitive with nearly 90% of proposed gas plants. Already, over half of the proposed gas combustion turbine plants expected to enter into service in 2018, 2019 and 2020 have been canceled because of shifting economics and increasing support for clean energy.[18]

And finally, while green hydrogen will likely have a role in any clean energy future, gas turbine conversion to green hydrogen (included in Preferred Pathway I) is speculative at this time, and there is still a heightened risk of asset stranding if the technology either does not materialize or materializes at a cost that is not competitive with alternatives.

Given the foregoing, Indiana AEE urges NIPSCO to consider other resource options, especially those that could meet the same capacity needs incrementally, and/or consider delaying a decision to procure this natural gas capacity. The longer it is able to do so, the more attractive the alternative options, which will be better for Hoosiers over the next several decades, will become.

AEE supports further study of strategically sited DER opportunities to defer substation and other distribution system investments, and encourages NIPSCO to consider both utility and non-utility ownership models and technology services.

The distribution grid is the backbone of a reliable electricity system and plays a critical role in integrating new distributed technologies. In order to continue to provide reliable and cost-effective electric service while leveraging developments in technology and customer preferences, utility planning will need to be more nimble, transparent, and integrated with other planning processes. To that end, we appreciate that NIPSCO has included elements of distribution system planning within this IRP and is exploring non-wires alternatives ("NWAs") to defer distribution system upgrades. In its IRP, NIPSCO proposes approximately 10 MW of utility-owned DERs with the largest distribution cost deferrals. We recommend expanding this initiative to include different ownership models to allow the Company to gain experience working with DER aggregators and other providers that are already capable of providing grid services.

Competitive NWA needs-based solicitations that include third-party ownership and service-based solutions can maximize customer value and can be streamlined to provide a more expedited sourcing process to meet targeted grid needs. This method allows the utilities to find

[17] Headwinds for US Natural Gas Power: 2021 Update on the Growing Market for Clean Energy Portfolios. Lauren Shwisberg, Alex Engel, Caitlin Odom, and Mark Dyson, RMI, December 2021. Available at: https://rmi.org/insight/clean-energy-portfolios-pipelines-and-plants/.
[18] *Id*.

the least-cost, best-fit DER or service solutions based on market response, and to ensure that the benefits of competition accrue to all customers. Such needs-based solicitations would not presuppose the exact technology solution, but instead leverage the competitive energy industry to come forward with solutions based on needs identified by the utility via the distribution system planning process and the implementation of those plans. Utilities should be encouraged to procure one or more solutions to meet the need provided that the NWA solutions would yield greater net benefits than a comparable wired solution. For example, a specified need could be met using multiple contracts with DER providers and aggregators – some of which may be providing load reduction via targeted energy efficiency deployment while others may be aggregating distributed storage and distributed generation. Any NWA framework should also include appropriate compensation mechanisms that incorporate localized incentives targeted at areas of the grid where DER can provide the most value.[19] And finally, solicitations should include specific performance requirements to ensure the non-wires solution reliably meets system needs.

In the case of certain grid needs for which a NWA solicitation may not be appropriate, NIPSCO can pursue pilot programs that align with the overarching goals of NWA investments. These newer approaches to small grid challenges should evolve via an iterative "test, learn, and adapt approach" over a sufficient period to ensure that DER services can similarly solve reliability issues in a cost-effective manner that minimizes adverse impact to customers. All industry participants, stakeholders, and local jurisdiction authorities can learn from those efforts, and learning from other jurisdictions should also help accelerate this process.

Conclusion

Indiana AEE believes that on the whole, NIPSCO's IRP and preferred portfolio offers a flexible, well-considered pathway forward, in addition to being cost-effective and reliable. By recognizing the potential of advanced energy technologies in the short-term, NIPSCO is doing well by its customers.

Nevertheless, over the past three years, economic and technological conditions have changed dramatically. Three years from now, IRP modeling results will likely look different again as advanced energy resources continue to evolve and state and federal laws and regulations change.

[19] To evaluate DERs on a level playing field with traditional resources and infrastructure investments, a regulatory structure should be developed to properly value and source services from DERs. We recommend consulting the National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources, which provides a comprehensive framework to help policymakers design cost-effectiveness tests that fully consider the costs and benefits of various DERs. Rate designs for DERs, and utility programs for compensating DERs for the services they provide are also being used and refined in various jurisdictions, and should also be considered in conjunction with comprehensive benefit-cost analysis ("BCA") and distributed resource planning. *See The National Standard Practice Manual for Benefit-Cost Analysis of Distributed Energy Resources. National Energy Screening Project. August 2020. Available at: https://www.nationalenergyscreeningproject.org/wp- content/uploads/2020/08/NSPM-DERs_08-24-2020.pdf*

Above all, NIPSCO and the Commission should be especially mindful of potential investment decisions that would lock the utility into expensive infrastructure that could soon become obsolete, and instead look to leverage new and existing technologies, rates, programs, and services to meet the same grid opportunities and challenges.

Respectfully submitted,

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