UNITED STATES OF AMERICA
BEFORE THE
FEDERAL ENERGY REGULATORY COMMISSION

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Inquiry Regarding the Commission's	)	Docket No. PL19-3-000
Electric Transmission Incentives Policy	)	
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COMMENTS OF ADVANCED ENERGY ECONOMY

Pursuant to the Federal Energy Regulatory Commission's ("Commission" or "FERC"),[1] Notice of Inquiry dated March 21, 2019,[2] Advanced Energy Economy ("AEE") respectfully submits these comments regarding potential reforms and improvements to the Commission electric transmission incentives regulations and policy. AEE applauds the Commission for opening this inquiry, and for its focus throughout the NOI on how its transmission incentives policies and regulations can be reshaped to encourage the use of advanced energy technologies and advanced transmission technologies, including technologies and operational practices that improve system utilization and efficiency. As the business voice of the advanced energy industry and its supply chains with a diverse membership united in creating an energy system that is clean, secure, and affordable, AEE strongly supports efforts by the Commission to reform its transmission incentives regulations and policy to encourage innovation in the provision of transmission services and the adoption of advanced energy technologies to meet transmission needs.

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[1] 18 C.F.R. §§ 385.206(f) (2018).
[2] *Inquiry Regarding the Commission's Electric Transmission Incentive Policy*, 166 FERC ¶ 61,208 (2019) ("NOI").

I. EXECUTIVE SUMMARY

As discussed in more detail below, AEE encourages the Commission to consider reforming its transmission incentives policies to:

1) Reset the framework for how it considers whether transmission projects should be encouraged through incentive ratemaking treatment, in particular to move away from the current "risks and challenges" framework to one focused on evaluating incentive rate proposals based on the expected consumer benefits of the projects they will support;
2) Consider the utilization of certain Performance-Based Regulation ("PBR") concepts to ensure that incentives are directed to projects that produce beneficial outcomes for consumers and the grid, and to encourage innovative incentive ratemaking proposals beyond the limited set of incentives that is currently utilized;
3) Announce clear policy goals that it intends to achieve through transmission incentives, to give the market and investors greater certainty. As a starting point, AEE suggests that the Commission clearly announce its intent to focus incentives the following types of projects for which there is a demonstrable need today, and which will deliver significant consumer and grid benefits:
    a. Bulk transmission needed to ensure that low-cost energy can get to load centers, especially inter-regional transmission projects needed to unlock access to location-constrained low-cost renewable energy;
    b. Projects that use advanced transmission technologies and improved operating practices to make better use of the existing transmission system, including the

adoption of Dynamic Line Rating and standardization of line rating practices; and

c. Projects that utilize advanced transmission technologies and "non-wires alternatives" to avoid the need to construct more costly and disruptive traditional transmission infrastructure.

4) Provide specific incentives designed to encourage advanced transmission technologies and "non-wires alternatives" (i.e., alternatives to the construction of traditional transmission infrastructure), including advanced transmission technologies and operating practices that increase the efficiency of the existing system; and

5) Before granting incentives, strengthen review of how advanced transmission technologies and non-wires alternatives such as energy storage, DERs, and other advanced energy technologies were considered in the transmission planning process, and provide greater clarity with regard to how these alternatives and technologies can provide transmission and other wholesale market services.

II. ADVANCED ENERGY ECONOMY ("AEE")

AEE is a national association of businesses dedicated to making our energy system more secure, clean, and affordable. AEE and its state and regional partner organizations, which are active in 27 states across the country, represent more than 100 companies and organizations that span the advanced energy industry and its value chains. Technologies represented include energy efficiency, demand response, solar photovoltaics, solar thermal electric generation, wind generation, storage, biofuels, electric vehicles, advanced metering infrastructure, transmission and distribution efficiency, distributed generation technologies, fuel cells, hydro power, advanced nuclear power, combined heat and power, and enabling software. Used together, these technologies and services will create and maintain a higher-performing energy system—one that is reliable and resilient, diverse, cost-effective, and clean—while also improving the availability and quality of customer-facing services.[3] Nationwide, the advanced energy industry AEE represents generates $238 billion in revenue, on par with aerospace manufacturing.[4]

AEE's membership includes utility-scale renewable generation reliant on large-scale transmission, advanced transmission technologies that differ from traditional transmission investments, advanced energy technologies that can be non-wires alternatives, and other services crucial to reliability. AEE believes that thorough consideration of all applicable technologies will improve the transmission development process, reduce the cost of transmission, reduce the price of wholesale power, and improve grid reliability.

III. COMMENTS

A. The Commission Should Move Away From the "Risks and Challenges" Framework, and Instead Assess Transmission Incentive Proposals Based on the Expected Consumer Benefits of Transmission Projects.

In Q1, the Commission asks an important foundational question: "Should the Commission retain the risks and challenges framework for evaluating incentive applications?" AEE believes that the answer is no, and that a new framework for evaluating transmission incentives applications is needed.

Such a new framework is necessary because, as the Commission suggests in Q2, the risks and challenges of a transmission project are not an appropriate proxy for whether that project will provide benefits to consumers and the grid.[5] The current risks and challenges framework requires that an applicant show how its requested incentives are tailored to the risks and challenges of its

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[3] AEE, *This is Advanced Energy*, available at http://info.aee.net/this-is-advanced-energy
[4] AEE, *Advanced Energy Now 2019 Market Report*, available at https://www.advancedenergynow.org/aen-2019-market-report.
[5] NOI at P 15.

proposed project.[6] This provides very little information about the value of a transmission project to consumers or the grid, however; it only tells the Commission how hard the project is to complete. Many, if not all, traditional transmission projects face a variety of risks and challenges, typically in siting, routing, obtaining rights-of-way, and raising the large amount of capital needed for such projects. Applicants under the Commission's current risks and challenges framework have necessarily focused their requests on these types of risks. But other kinds of transmission projects – particularly those that utilize advanced energy technologies – do not face these kinds of risks. The Commission's current risks and challenges framework does not provide a clear path for such projects to seek incentives, and in fact may even bias incentive applications toward traditional transmission projects with typical "risks and challenges" given that the Commission's policy requires applicants to show how incentives are related to risks and challenges.[7]

Given the inherent limits of the risks and challenges framework, AEE strongly encourages the Commission to use this inquiry as an opportunity to develop a new framework focused on <u>the consumer benefits that will be produced by transmission projects that receive incentives</u>. Such a framework would be fully consistent with Section 219 of the Federal Power Act ("FPA"), which requires the Commission to "establish, by rule, incentive-based (including performance-based) rate treatments for the transmission of electric energy in interstate commerce by public utilities *for the purpose of benefitting consumers* by ensuring reliability and reducing the cost of delivered power by reducing transmission congestion."[8]

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[6] *See Promoting Transmission Investment Through Pricing Reform*, 141 FERC ¶ 61,129 at P 10 (2012) ("2012 Policy Statement").

[7] This is not to suggest that risks and challenges won't be a relevant consideration in some cases. For example, the large inter-regional bulk transmission projects needed to access low cost energy supplies, especially location-constrained renewables, that are discussed in Section III.C.1 below may face more typical risks and challenges that may be relevant considerations in setting the ROE or considering incentives. Addressing these challenges should not be the framework for considering all incentives, however.

[8] 16 U.S.C. § 824s(a) (emphasis added).

In the NOI, the Commission asks specifically whether incentive requests should instead be based on expected project benefits[9] or, in the alternative, particular project characteristics.[10] AEE suggests that, under a consumer benefits framework for assessing transmission incentive applications, the Commission could both evaluate expected project benefits as presented by applicants and also set forth certain project characteristics that the Commission has predetermined can be expected to provide consumer benefits. Consumer benefits from transmission projects – including traditional "poles and wires" investments as well as advanced transmission technologies and non-wires alternatives – can take a variety of forms, including ensuring reliability and reducing the delivered cost of power (as identified by Congress in FPA section 219), reducing costly congestion, providing access to new sources of low-cost renewable energy increasingly preferred by customers, and producing cost savings by investing in alternatives to traditional transmission infrastructure. Applicants should have the opportunity to demonstrate that their particular project will produce benefits that exceed the costs of the project (with rate incentives included). To ensure that any given incentive is just and reasonable, the Commission must of course apply its judgement to the record developed on any given application to determine whether the benefits are sufficient to warrant the costs of the incentive, whether the incentive is needed for the project, and (as discussed below) whether all reasonable options for use of advanced technologies and less costly non-wires alternatives were considered. But allowing applicants flexibility to make a demonstration that the benefits of their project to consumers will outweigh its costs would set a framework that encourages greater innovation when compared to today's rigid risks and challenges framework.

[9] NOI at P 16.
[10] NOI at P 18.

At the same time, however, the Commission can also ensure that future transmission-related investment is focused on projects that will deliver consumer benefits by setting forth clearly the characteristics of transmission projects that it believes are needed to ensure that consumers benefit. As discussed below, setting forth clear policy objectives to guide investments that will produce beneficial outcomes is a best practice that the Commission should adopt in its incentive ratemaking program. AEE and its members believe the Commission could establish now, based on the current state of the electricity system as a whole and demonstrable transmission needs, certain project characteristics that it believes will produce consumer benefits. However, the Commission could also conduct technical conferences or workshops to further explore such characteristics and could also revisit those characteristics from time to time as consumer and grid needs change.

B. Adopting Performance-Based Regulation ("PBR") Concepts Could Encourage Additional Innovation in Transmission Technologies and Provide Greater Benefits to Consumers at Lower Cost.

In FPA section 219, Congress directed the Commission to "establish, by rule, incentive-based (*including performance-based*) rate treatments for the transmission of electric energy."[11] While the Commission declined to adopt performance-based regulation or performance-based ratemaking (collectively "PBR") in its initial rulemaking (Order No. 679), in Q43 of the NOI the Commission asks whether there are forms of PBR that it should consider adopting for transmission.[12]

AEE has significant experience and expertise regarding PBR approaches. While AEE's work has focused primarily on efforts that state regulators and utilities can take to use PBR to better align retail utility incentives and the retail utility business model with state policy goals and

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[11] 16 U.S.C. § 824s(a) (emphasis added).
[12] NOI at P 29.

consumer benefits, many of the concepts underlying these PBR approaches can be applied by the Commission to improve its transmission incentives regulations and policies. PBR is, in short, "an alternative regulatory framework designed to better align the financial interests and actions of regulated . . . utilities with public interest objectives and consumer benefits."[13] The directive of Congress in FPA section 219 to provide dedicated incentives for the construction of transmission "for the benefit of consumers" can similarly be thought of as a PBR approach.

With this in mind, attached to these comments as Exhibit A is an Issue Brief prepared by AEE in 2018 that describes PBR, its evolution, the core concepts underlying it, and the steps to implement it. To be sure, many of the PBR tools described in Exhibit A are offered in the context of distribution utility regulation or require a vast overhaul of the entire ratemaking structure applied to utilities. Given the focus here on the Commission's project-based approach to transmission incentives, such broad-based reforms may not be applicable. However, the Issue Brief, and other AEE resources, set forth a framework and describe PBR concepts that could be applied by the Commission to encourage transmission owners and investors to direct their infrastructure spending toward projects and technologies that will provide maximum benefits for consumers.

For example, Exhibit A offers several suggestions for effectively implementing PBR, identifying several important PBR concepts that the Commission could incorporate into its policies for implementing transmission incentives, including:

1. **Setting Clear Policy Objectives to Guide Regulated Entities** – A key feature of PBR mechanisms is the specification of outcomes (reduced costs, increased performance in key metrics, etc.) sought by policymakers, utilities, and stakeholders. While the Commission's

[13] Advanced Energy Economy, 21st Century Electricity System Issue Brief, "Performance-Based Regulation: Aligning utility incentives with policy objectives and consumer benefits," at 2 (attached here as Exhibit A).

2012 Policy Statement sought to identify certain types of projects that face the kinds of "risks and challenges" that it believed at that time would require incentives,[14] it has never clearly identified specific policy objectives that it has sought to achieve by awarding incentives. Moving away from the "risks and challenges" framework as suggested above would allow the Commission to set clear objectives for the consumer and grid benefits that it seeks to achieve through the use of transmission rate incentives. Establishing such clear objectives would bring certainty to the market and transmission developers regarding the types of projects the Commission seeks to encourage with incentives. In Section III.C below, we suggest certain policy objectives for achieving beneficial consumer outcomes that the Commission could set now to guide transmission system investments.

2. **Stakeholder Engagement** – AEE's PBR Issue Brief also highlights the importance of utilizing transparent stakeholder processes to establish critical aspects of a PBR plan, including the performance and outcomes sought to be achieved and the appropriate incentives to obtain that outcome. The Commission's existing approach to awarding transmission incentives has undoubtably suffered from a lack of support from customers and states, who have frequently expressed concern about the costs of incentives and whether those incentives are achieving beneficial outcomes.[15] The Commission should consider engaging stakeholders to define the policy objectives it seeks to achieve through incentives, especially the states whose own policies (such as Renewable Portfolio Standards and other environmental objectives) will be more cost-effectively achieved

[14] 2012 Policy Statement at PP 20-23.

[15] *See, e.g.,*, Letter from Organization of MISO States (OMS to Chairman Neil Chatterjee, December 18, 2018, *available at* https://www.misostates.org/images/stories/Filings/FERC/2018/ROE_Incentive_Letter_to_FERC_12-18-18_final_with_signature.pdf; Letter from New England States Committee on Electricity to Chairman Neil Chatterjee, December 20, 2018, *available at* http://nescoe.com/resource-center/tx-incentiverates-dec2018/; Electricity Consumers Resource Council (ELCON), "Transmission Incentives", *available at* https://elcon.org/transmission-incentives/ (visited June 25, 2019).

through an optimized transmission system, and the consumers who pay the costs (and often feel the land use impacts) of traditional transmission infrastructure. The initiation of this Inquiry is a good first step, but taking additional steps to ensure that the views of these stakeholders are accounted for could help the Commission achieve its policy objectives and reduce opposition to transmission investment.

3. **The Importance of Planning** – Finally, because PBR in the context of transmission is most likely to focus on "input incentives" (that is, rewarding capital invested in certain types of assets),[16] it is critical to ensure that planning processes are utilized that consider all the reasonable alternatives for various investment and operating choices. In other words, the Commission should ensure that incentives are awarded to a project only after that project has been found to be the most beneficial and cost-effective alternative for consumers. The Commission has long presumed that transmission projects developed in Commission-approved local or regional transmission planning processes ensure reliability or reduce the delivered cost of power as required by FPA section 219, and thus qualify to receive incentives.[17] However, the Commission has not conducted a more searching review to ensure that the transmission planning process in question considered, for example, advanced transmission technologies or non-wires alternatives. As discussed below, to fully achieve the objectives of Congress and ensure that consumers receive the most value possible from investments that receive incentives, the Commission should put a greater

[16] The Commission could certainly also design "output incentives" that condition the award of incentives (or impose penalties) based on the results achieved by transmitting utilities. See Exhibit A at 7. However, as noted above, doing so could require a more expansive overhaul of all of the Commission's existing transmission ratemaking policies than is contemplated here.

[17] *See, e.g.*, *The Potomac Edison Company*, 165 FERC ¶ 61,168 at P 3 (2018), *citing Promoting Transmission Investment through Pricing Reform,* Order No. 679, FERC Stats. & Regs. ¶ 31,222 (Order No. 679), *order on reh'g,* Order No. 679-A, FERC Stats. & Regs. ¶ 31,236 (2006), *order on reh'g,* 119 FERC ¶ 61,062 (2007).

focus on ensuring that these alternatives were carefully considered before decided to invest in traditional transmission infrastructure.

The Commission can also look to PBR approaches from the United Kingdom and Australia that may have some application to transmission investment incentives here in the U.S. For example, the U.K.'s "RIIO" model includes shared savings mechanisms along with dedicated funding for pilots of advanced transmission technologies.[18] In addition, as discussed below and in the comments of The WATT Coalition, Australia's "Service Target Performance Incentive Scheme (STPIS)" includes a component (called the "network capability component") intended to incentivize low cost projects to increase transmission capability, which can encourage the adoption of advanced transmission technologies.[19]

C. To Provide Guidance and Direct Incentives Towards the Most Beneficial Projects, the Commission Should Announce Clear Policy Objectives for Future Transmission Development.

As noted above, a key component of PBR schemes that the Commission should adopt in its own transmission incentives regulations and policies is the clear articulation of policy objectives to be achieved by awarding incentive rate treatment. Based on current industry conditions and trends, AEE suggests that the Commission establish the following policy objectives: (1) ensuring sufficient bulk transmission needed to deliver low-cost energy to load centers, especially inter-regional projects needed to unlock access to low-cost renewable energy with insufficient access to existing transmission infrastructure; (2) improving the efficiency and use of the existing transmission system; and (3) prioritizing projects that use advanced technologies as "non-wires

[18] *See* Coley Girourd, Advanced Energy Economy, "UK RIIO Sets Out to Demonstrate How a Performance-Based Regulatory Model Can Deliver Value", June 6, 2019 (describing the main components of RIIO), *available at* https://blog.aee.net/uk-riio-sets-out-to-demonstrate-how-a-performance-based-regulatory-model-can-deliver-value

[19] *See, e.g.*, Australia Energy Regulator, FINAL DECISION, Powerlink Transmission Determination 2017-22, Attachment 11, p. 11-6 (June 2017), *available at* https://www.aer.gov.au/system/files/AER%20-%20Powerlink%202017-22%20-%20Attachment%2011%20%20Service%d20target%20performance%20incentive%20scheme%20-%20April%202017.docx

alternatives" and "non-transmission alternatives" to avoid the need to construct more costly and disruptive traditional transmission infrastructure. As noted above, stakeholder engagement is key to the success of any PBR or similar incentive approach like that called for FPA section 219, and AEE encourages the Commission to take input from stakeholders regarding these and other potential policy objectives; our comments here explain why we believe that these three objectives warrant inclusion in a future transmission incentives policy.

1. Ensuring Sufficient Bulk Transmission to Deliver Low-Cost Energy to Load Centers, Especially Inter-Regional Transmission Projects.

The Commission asks in Q44, "Should the Commission use incentives to encourage the development of interregional transmission projects?" and in Q45, "If the Commission should use incentives to encourage interregional transmission projects, should all interregional projects be eligible or should it be based on some other criteria?"[20] Relatedly, in Q47, the Commission asks, "Should the Commission use incentives to encourage the development of transmission projects that will facilitate the interconnection of large amounts of resources?" The NOI points out that "interconnection queues in many regions of the country have expanded considerably," and notes that "many of the potential resources [are] clustered in specific geographic areas with limited transmission access."[21]

AEE agrees that the available evidence and industry data supports these observations, and that steps should be taken to ensure that investment in bulk transmission infrastructure is directed to ensuring that currently location-constrained and low-cost power can be delivered to consumers. This is particularly true for renewable resources; geographies with the strongest resource potential are often located far from load centers and lack sufficient bulk transmission to deliver those low-

[20] NOI at P 26-27.
[21] NOI at P 27.

cost resources to load. Gaining access to these resources—which, being reliable, low-cost, and carbon free, bring many consumer benefits—and using them to their full potential will require targeted buildout of the bulk transmission system. AEE therefore recommends adopting as a guiding policy principle a focus on transmission projects, including interregional transmission projects, that will enable greater utilization of low-cost energy from resources, especially renewable energy resources, that currently lack access to markets.

A simple comparison of the geographies of renewable energy resource potential and electricity demand growth suggests that transmission upgrades and expansion are needed to take full advantage of our nation's strongest renewable resource potential, and studies of future renewable penetration scenarios clearly confirm this conclusion. Fully 88% of U.S. wind technical potential is contained within 15 central states that are home to just 30% of projected electricity demand in 2050.[22] Indeed, an analysis by the National Renewable Energy Laboratory found that achieving the Department of Energy's *Wind Vision* scenario of 35% wind penetration and 12% solar penetration would not cause reliability issues but would require transmission expansion. Specifically, NREL found that, in a system with no transmission constraints, the 35% wind penetration scenario results in only 0.5% curtailment; however, without any transmission investments, curtailment would be as high as 15.5%. By targeting the most impactful transmission investments, significant curtailment can be avoided; 10.5 GW of new transmission (four proposed transmission projects) would reduce curtailment of wind resources by 50% (to 7.8%) according to NREL's analysis.

[22] *See* A Renewable America, "Transmission Upgrades and Expansion: Keys to Meeting Large Customer Demand for Renewable Energy" (January 2018), *available at* https://windsolaralliance.org/wp-content/uploads/2018/01/WEF-Corporate-Demand-and-Transmission-January-2018.pdf.

Prioritizing transmission projects that connect regions with high renewable energy potential could yield significant customer savings. The Brattle Group estimated that buildout of 130 GW of new renewable energy[23] in regions with the highest resource potential instead of regions with average or low resource potential could yield $30 billion to $70 billion in *net* savings from reduced capital investment in new generating capacity, accounting for the capital cost of long distance transmission.[24]

Unfortunately, interregional transmission planning processes have not adequately addressed the need for increased transmission capacity across RTO/ISO regions and multiple utility service territories to capture these consumer benefits. While each region undertakes a different transmission planning process that reflects its own unique needs, the processes for assessing the need for and benefits of multi-region projects has been ineffective. Existing processes have generally stalled over lack of consensus around the benefits that come from high voltage grid expansion, the appropriate scale and configuration of transmission solutions, and the right allocation of costs among customers. Ultimately, these disagreements delay investments in renewable energy projects.

In Order No. 1000, FERC required RTOs/ISOs and public utility transmission owners to put interregional planning processes in place. However, the structure of these interregional processes require that a prospective interregional project first be selected in each individual region's transmission plan and then be jointly evaluated and selected a *third time* in the

[23] This figure was chosen based on resource needs to achieve Renewable Portfolio Standard and Clean Power Plan compliance; however, the cost savings would scale up or down if this estimated resource buildout were changed.
[24] WIRES, "Well-Planned Electric Transmission Saves Customer Costs: Improved Transmission Planning is Key to The Transition To A Carbon Constrained Future" (June 2016), *available at* https://wiresgroup.com/docs/reports/WIRES%20Brattle%20Report_TransmissionPlanning_June2016.pdf

interregional transmission planning coordination process.[25] This lengthy and burdensome multi-layer process serves as a significant barrier to moving beneficial interregional projects forward.

The Commission should establish a clear policy objective that makes construction of these projects a priority and should consider whether there are incentives or other policy mechanisms that would encourage transmission owners and developers to develop new approaches to more efficiently consider potentially beneficial interregional transmission projects. Order No. 1000 provides only baseline requirements, and these entities could potentially be encouraged to do more to move such projects forward. One way to develop such incentives may be to convene transmission planning authorities, transmission developers, and other stakeholders to explore new approaches, consistent with AEE's recommendation above of increasing stakeholder engagement.

2. Making Better Use of the Existing Transmission System.

In addition to targeted investments in new bulk long-distance transmission to unlock location-constrained low-cost renewable generation, the Commission should establish a policy objective of making better use of the existing transmission system. Ensuring efficient use of existing assets has the benefit of reducing congestion and avoiding or deferring costly investment in new traditional transmission infrastructure, yielding savings for ratepayers while achieving equivalent or improved reliability outcomes.

As noted in the NOI and discussed further below, FPA section 219(b)(3)[26] already directs the Commission to "encourage investments in technologies and other measures that increase the capacity and efficiency of existing transmission facilities and improve the operation of those facilities." The Commission asks in Q41 whether utility costs associated with grid management

[25] *See Transmission Planning and Cost Allocation by Transmission Owning and Operating Public Utilities*, Order No. 1000, 76 Fed. Reg. 49,842 (Aug. 11, 2011), FERC Stats. & Regs. ¶ 31,323 at P 435-436 (2011).
[26] 16 U.S.C. § 824s(b)(3).

technology, including dynamic line rating technology, should be considered as a regulatory asset; it further asks in Q43 whether it should include "improvements that are not historically considered part of the transmission system, such as, for example, software upgrades, technologies that allow for faster ramping, or other innovative measures that achieve the same goals as new transmission facilities."[27] Consistent with our recommendations above, AEE strongly encourages the Commission to focus on such technologies and measures and support their deployment by announcing a clear policy goal prioritizing better use of the existing transmission system.

Adopting a broad policy goal around improved utilization of existing infrastructure, supported by PBR mechanisms or other new incentives beyond those currently offered, would allow otherwise overlooked technologies or solutions to provide cost-effective improvements to the transmission system. For example, the Commission mentions Dynamic Line Rating (DLR), a technology that adjusts the amount of throughput that occurs as a result of temperature changes or seasonal electric demand, allowing more electricity to flow through existing lines. DLR has been shown to provide significant system benefits, at a low capital cost, by increasing capacity on existing transmission lines.[28] In addition to DLR, making investments to standardize line rating practices could reduce balkanization of the grid and make more transmission capacity available, improving access for new sources of supply including low-cost renewable energy.

Despite their benefits and cost-effectiveness, DLR, line rating standardization, and similar technologies to improve utilization of existing transmission have seen slow adoption rates. This is at least in part because, as the Commission recognizes in the NOI, the low capital

[27] NOI at P 25-26.
[28] *See, e.g.*, Entergy, "Entergy Practices – Dynamic Line Ratings", Presentation to Entergy Regional-State Committee, July 18, 2018; *see also* WATT Coalition Resources page, *available at* https://watt-transmission.org/resources/.

costs of the technology improvements means transmitting utilities earn less return on them as compared to large capital cost projects like new traditional transmission infrastructure. This dynamic creates a perverse incentive for transmission providers to select more costly traditional capital investments even when DLR or similar technologies could achieve the same objective while delivering ratepayer savings. As explained in more detail in Section III.D., below, an incentive (such as a shared savings framework) focused on a policy objective of increased utilization of the existing transmission system would enable DLR, standardization of line ratings, software upgrades, and other technologies and operational practices to compete more equally to deliver needed transmission improvements.

3. Prioritizing Investments in Projects or Measures that Utilize Advanced Energy Technologies, Advanced Transmission Technologies, and Innovative Operating Practices.

Advanced energy technologies available and in use today can deliver multiple benefits to the transmission system at low cost, yet they are generally not in widespread use as transmission assets, and many still face barriers to entry. However, just as demand response and energy efficiency can serve as alternatives to electricity generation for meeting system needs (as the Commission has long recognized), many advanced energy technologies and services are perfectly viable alternatives to traditional transmission investments, and in some cases even perform better at a lower cost. These technologies can be divided into two broad categories:

- **Advanced transmission technologies,** such as high-temperature low-sag conductors, phasor measurement units, and advanced power flow control technologies, can provide cost savings and create competitive pressure within the transmission market. They can also be deployed to increase utilization or capacity to deliver electrons, deferring the need for traditional transmission upgrades.

- **Non-Wires Alternatives** can play a similar role by solving grid needs through means other than constructing capital intensive traditional transmission infrastructure. By their very proximity to load, distributed resources such as rooftop solar and energy efficiency avoid the need to transmit power across bulk power system infrastructure.[29] Other technologies, such as demand response, fuel cells, and storage can act as a grid resource some of the time, and provide a transmission service (*e.g.*, ancillary services) at other times.

In addition to meeting new load, many transmission projects are undertaken for reliability reasons. The planning processes undertaken in response to an announced power plant retirement, for example, may show a need for transmission upgrades triggered by a retirement. But the need identified in that planning process can sometimes be met instead by advanced transmission technologies or non-wires alternatives like energy storage, and these solutions should be given comparable consideration for solving transmission-related reliability needs.

Given the benefits of advanced transmission technologies and non-wires alternatives and the barriers these technologies still face to adoption as transmission assets, AEE urges the Commission to establish a policy priority focused on encouraging their deployment. In addition to immediate cost and performance benefits, accelerated deployment of advanced energy technologies and advanced transmission technologies will contribute to lowering the cost and improving the performance of these technologies over time, making the grid more diverse, reliable, and resilient. Given the pace of change in the electricity system and the increasing need for ramping and other ancillary services, along with the Commission's focus on ensuring the resilience

[29] *See, e.g.,* Julia Pyper, "Californians Just Saved $192 Million Thanks to Efficiency and Rooftop Solar", Greentech Media (May 31, 2016), *available at* https://www.greentechmedia.com/articles/read/californians-just-saved-192-million-thanks-to-efficiency-and-rooftop-solar#gs.ljna5h.

of the bulk power system, the proliferation and improvement of new distributed energy technologies and better operating practices to address these challenges is a necessary goal.

Finally, failing to ensure that advanced transmission technologies and advanced energy technology non-wires alternatives are adequately considered could cause transmission rates that to become unjust and unreasonable by triggering construction of more costly and ultimately unneeded traditional transmission infrastructure. In just one example, California Independent System Operator Corporation ("CAISO") found in its 2015-2016 transmission expansion plan that it could cancel $192 million in planned transmission projects in the Pacific Gas & Electric territory alone due to increased deployment and reliance on distributed energy resources.[30] Further, failure to ensure adequate consideration of advanced energy technology alternatives creates barriers to market entry, which the Commission has previously found can cause rates that are unjust and unreasonable.[31]

D. The Commission Should Establish Stand-Alone Incentives to Encourage the Adoption of Advanced Transmission Technologies and Technologies and Operating Practices That Increase the Efficiency and Usage of the Existing Transmission System.

In Q40, the Commission asks whether it should "provide a stand-alone, transmission technology-related incentive."[32] AEE submits that the Commission should develop a stand-alone incentive targeted at advanced transmission technologies and technologies that increase the capacity and efficiency of the existing transmission grid. When Congress directed the Commission to establish an incentive rate program in the Energy Policy Act of 2005, it put a clear emphasis on encouraging widespread adoption of such technologies. For example, FPA section 219(b)(3)

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[30] *Id.*
[31] *Cf. Electric Storage Participation in Markets Operated by Regional Transmission Organizations and Independent System Operators*, Order No. 841, 162 FERC ¶ 61,127 at P 19 (2018).
[32] NOI at P 29.

directs the Commission to "encourage deployment of transmission technologies and other measures to increase the capacity and efficiency of existing transmission facilities and improve the operation of the facilities."[33] In addition, the law directed FERC to "encourage, as appropriate, the deployment of advanced transmission technologies."[34] "Advanced transmission technologies" is defined broadly to include a number of technologies including distributed energy resources ("DERs") like solar photovoltaics and fuel cells, energy storage, power electronics and software, controllable loads, and monitoring and sensing equipment.[35]

To date, the Commission's transmission incentives regulations and policies have not succeeded in encouraging the use of advanced energy technologies on the transmission grid, or in significant deployment of technologies and measures to improve efficiency and usage. The Commission has also never publicly explored how to specifically implement the directive of Congress to encourage deployment of advanced transmission technologies.[36] While the Commission previously offered a targeted return on equity ("ROE") incentive for use of advanced technologies, that incentive was largely ineffective and was discontinued by the Commission in 2012.[37] This is not surprising given that the current suite of incentives available (*e.g.*, higher ROEs, recovery of construction work in progress and abandoned plant, hypothetical capital structure, etc.) are most useful for incenting large capital investments that will be included in a utility's rate base. Investments in advanced energy technologies and technologies and practices that improve operational efficiency are generally much less costly, and may not even be included in rate base. For example, as opposed to the hundreds of millions or even billions of dollars typically required

[33] 16 U.S.C. § 824s(b)(3).
[34] 42 U.S.C. § 16422.
[35] *Id.*
[36] *Id.*
[37] 2012 Policy Statement at P 23.

for large-scale traditional bulk transmission projects, targeted deployments of energy storage or DERs to solve transmission constraints might cost in the millions, and investments in practices like DLR, standardization of line ratings, use of advanced power controls, or other operational efficiency measures are in the hundreds of thousands or less. Higher ROEs and the other rate base related incentives typically offered by the Commission do not give transmitting utilities added incentive to pursue these kinds of small but impactful investments, since the overall earnings on them are small. The time and expense of filing an application with the Commission may outweigh any incentive that is provided.

To remedy these problems and fully comply with the intent of Congress, the Commission should develop incentives that are targeted directly to encouraging the use of advanced transmission technologies (relying on the definition of advanced transmission technologies provided by Congress) and practices that increase the efficiency and use of existing transmission infrastructure. Developing clear targeted incentives (and as noted above, a clear transparent policy objective supporting deployment of advanced transmission technologies) will provide market certainty for transmission owners and utilities to make investments in advanced transmission technologies and operating practices.

The Commission, working with stakeholders and reviewing the record developed in response to this NOI, should consider a wide range of incentives for advanced transmission technologies and improved efficiency and operations. The WATT Coalition, in comments filed in this proceeding, details an approach for providing incentives to small projects that increase the efficiency and capacity of the existing transmission system. This suggested approach uses a "shared savings" incentive, under which a utility would be permitted to include in rate base and recover a portion of the cost savings (including production and capacity cost savings, as determined by the planning authority) achieved by implementing measures that increase the capacity and efficiency of existing transmission assets. AEE agrees with The WATT Coalition that a shared savings framework would provide strong additional incentives for the adoption of such measures, as Congress intended. In fact, shared savings approaches are a PBR mechanism that, consistent with our recommendations above, should be considered more broadly by the Commission.

Other stand-alone targeted incentives may be appropriate as well. For example, the Commission could allow utilities to seek pre-approval (including a pre-approved incentive) to invest in bundles of advanced transmission technologies that it shows, through appropriate studies and planning, can provide reliability and consumer benefits and be deployed quickly as needs arise. This suggestion draws on portions of Australia's "Service Target Performance Incentive Scheme", which is described above and in more detail in The WATT Coalition's comments. The Commission could also develop more streamlined application processes for advanced transmission technologies (including those already identified by Congress in 42 U.S.C. §16422) or establish mechanisms to allow utilities to include future investments in such technologies in their formula rates (subject to the usual challenge procedures).

Consistent with AEE's recommendation above regarding the use of PBR concepts, we encourage the Commission to engage with stakeholders to examine these and other ideas to ensure that they will provide a workable incentive and deliver value to consumers. AEE and its member companies welcome the opportunity to engage in further stakeholder proceedings. We emphasize, however, that a clear policy signal from the Commission that it will provide stand-alone targeted incentives for advanced transmission technologies and measures to increase the capacity and efficiency of the existing transmission system would be a major step forward in achieving the goals of Congress and the Commission to see these technologies deployed.

E. The Commission Should Take Steps to Ensure that Non-Wires Alternatives Are Fairly Considered in Transmission Planning and Competitive Transmission Project Solicitation Processes, and to Provide Certainty That Advanced Energy Technologies May Provide Transmission Services.

Advanced energy technologies like energy storage, DERs, power flow controls, and other advanced energy and advanced transmission technologies are often technically and operationally capable of meeting reliability needs and delaying, deferring, or even fully addressing transmission needs in lieu of more costly and disruptive traditional "poles and wires" transmission infrastructure. The Commission has long recognized this and has required or encouraged that these technologies be considered on a comparable basis in FERC-jurisdictional planning processes; in Order Nos. 890 and 1000, the Commission required that local and regional planning processes consider non-transmission solutions on a comparable basis to traditional transmission solutions.[38] In addition, while some transmission needs (like access to low-cost energy such as location-constrained renewable energy) can only be met with traditional bulk transmission infrastructure, the Commission has recognized that transmission services (like relieving congestion, addressing overloads, providing reactive support, etc.) can be solved by deploying advanced energy technologies like energy storage.[39] Congress has likewise recognized that a broader suite of advanced energy technologies (defined in 42 U.S.C. § 16422) can provide valuable transmission services or substitutes for transmission service.

As noted above, while the Commission requires that applicants for transmission incentives demonstrate that their project was approved in a local or regional transmission planning process

[38] Order No. 1000 at P 148, 153-156; *Preventing Undue Discrimination and Preference in Transmission Service*, Order No. 890, 72 Fed. Reg. 12,266 (Mar. 15, 2007), FERC Stats. & Regs. ¶ 31,241 at P 479 (2007).
[39] *See, e.g.*, *Western Grid Development, LLC*, 130 FERC 61,056 (2010).

or by a state commission, it does not conduct a more searching inquiry into how non-transmission or non-wires alternatives were considered on a comparable basis to the proposed project. Given the significant cost savings that can be achieved through the use of advanced transmission technologies and advanced energy technology non-wires alternatives, the Commission should ensure that transmission planning processes have fully considered them before approving incentives for capital intensive traditional transmission investments. Doing so would ensure that transmission rates remain just and reasonable and avoid adding additional costs to already difficult to resolve local and regional cost allocation challenges. To do this, the Commission should require applicants to provide more details on how these technologies and alternatives were considered, including relevant study parameters and assumptions, opportunities for stakeholders to provide technical information on proposed solutions, and other relevant data.

Finally, while the Commission has appropriately recognized that energy storage can be classified as a transmission asset and receive cost-based rate recovery, it has not provided clear guidance on how energy storage and other advanced energy technologies that provide transmission service and receive cost-based rates for that service, but are also capable of providing other FERC-jurisdictional services at market-based rates, may do so without raising market impact or cost-recovery concerns. While the Commission issued a 2017 Policy Statement on this subject with regard to energy storage,[40] the guidance offered there was immediately in dispute[41] and has not provided market participants with sufficient certainty to pursue business models involving the provision of both cost-based and market-based services. Additional guidance on how to structure such arrangements in a way that the Commission would find just and reasonable would resolve

[40] *Utilization of Electric Storage Resources for Multiple Services When Receiving Cost-Based Rate Recovery*, Policy Statement, 158 FERC ¶ 61,051 (2017).
[41] *See id.* (LaFleur, Comm'r, dissenting).

market barriers to the participation of advanced energy technologies (enhancing competition and ensuring that jurisdictional markets produce just and reasonable rates) and provide benefits to consumers. With energy storage and DERs proliferating in both wholesale and retail markets, providing greater clarity and guidance in this area would help ensure that these assets are fully utilized, reducing total system costs for both asset owners and consumers.

IV. CONCLUSION

AEE appreciates the Commission's initiation of this Inquiry, and for its attention in the NOI to the role of a broad range of advanced energy and advanced transmission technologies in providing reliable, resilient, and economically-efficient transmission service to consumers. For the reasons discussed herein, AEE urges the Commission to reset the framework under which it considers transmission incentive proposals to move away from "risks and challenges" and focus on consumer benefits, to utilize PBR concepts to ensure that transmission investments are directed to projects that will bring the most benefits to consumers and the grid, and to adopt new incentives and new requirements to ensure that cost-effective advanced energy technologies and advanced transmission alternatives are considered to meet transmission and grid needs.

Respectfully submitted,

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Exhibit A

PERFORMANCE-BASED REGULATION

Aligning utility incentives with policy objectives and customer benefits

A 21st Century Electricity System Issue Brief

By Advanced Energy Economy

June 5, 2018 (Updated)

San Francisco | Washington D.C. | Boston
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ABOUT ADVANCED ENERGY ECONOMY

Advanced Energy Economy (AEE) is a national association of businesses and business leaders who are making the global energy system more secure, clean and affordable. Advanced energy encompasses a broad range of products and services that constitute the best available technologies for meeting energy needs today and tomorrow. AEE's mission is to transform public policy to enable rapid growth of advanced energy businesses. AEE and its State Partner organizations are active in 26 states across the country, representing roughly 1,000 companies and organizations in the advanced energy industry. Visit www.aee.net for more information.

ABOUT THIS ISSUE BRIEF

The U.S. utility sector has entered a period of foundational change not seen since the restructuring of the late 1990s. Change is being driven by new technologies, evolving customer needs and desires, environmental imperatives, and an increased focus on grid resiliency. With these developments come challenges, but also new opportunities to create an energy system that meets the changing expectations of consumers and society for the coming decades. We call this the *21st Century Electricity System:* a high-performing, customer-focused electricity system that is efficient, flexible, resilient, reliable, affordable, safe, secure, and clean. A successful transition to a 21st Century Electricity System requires careful consideration of a range of interrelated issues that will ultimately redefine the regulatory framework and utility business model while creating new opportunities for third-party providers and customers to contribute to the operation of the electricity system.

To support this transition, Advanced Energy Economy (AEE) has prepared several issue briefs that are intended to be a resource for regulators, policymakers, and other interested parties as they tackle issues arising in the rapidly evolving electric power regulatory and business landscape.[1] This issue brief on **Performance-Based Regulation (PBR)** describes this emerging regulatory approach, provides various performance incentive design options, and lays out recommended steps to follow to implement PBR.[2]

SUMMARY

Performance-based regulation (PBR) is an alternative regulatory framework designed to better align the financial interests and actions of regulated investor-owned utilities with public interest objectives and consumer benefits. A PBR framework rewards utilities for achieving well-defined outcomes (performance metrics) as opposed to incentivizing capital investment (inputs), which is the primary driver today of utility revenue and profits. Regulatory reforms, such as PBR, have the potential to change how utilities, customers and third-party providers generate, deliver, and use energy.[3]

AEE believes that PBR, in its various forms, can serve as a foundational regulatory framework of the electricity grid of the future. Future infrastructure investments must be evaluated in light of technological innovations and judged on the basis of the value delivered by and through those investments. In this regard, AEE supports regulatory mechanisms that enable value creation, long-term viability of the utility business model, and deployment of the modern technologies that will form the basis of a 21st century electricity grid. In support of these goals, this issue brief lays out the basic concept of performance-based regulation, considers different performance incentive design options, and offers implementation recommendations.

INDUSTRY & REGULATORY EVOLUTION

The U.S. utility sector is in a period of significant change, driven largely by information technology and falling costs for distributed energy resources (DER)[4] and renewable energy technologies At the same time, U.S. electric investor-owned utilities continue to invest on the order of $100 billion annually, as aging infrastructure is replaced and modernized.[5] Those investments must be consistent with the evolving needs of customers and must be guided by regulators to ensure long-term compatibility with the grid of the future.

The energy infrastructure and markets of the future will be more complex, will include a greater number and variety of actors, and will present technical challenges (such as managing two-way power flows over the electricity distribution system and a much larger number of interconnected devices) as well as business challenges (such as the long-term viability of a utility business model now built around increasing capital deployment and rising energy sales). With these developments come challenges, but also new opportunities. If managed successfully, these changes present opportunities for greater customer choices and engagement, the creation of a more efficient and resilient energy system, and opportunities for utilities to embrace new business concepts that will sustain them in the decades to come.

AEE views new regulatory approaches as necessary for enabling a modern energy infrastructure. Traditional regulatory approaches have supported a rigorous evaluation of investments to control costs of service provision. However, utilities and regulators alike note that these traditional approaches are not designed to foster grid evolution. A future grid characterized by greater intelligence, two-way flow of information and electricity, technological innovation, and high penetration of DERs requires changes to regulatory decision-making. PBR is one option to consider, as it enables utilities to earn incentives for achieving specific outcomes that will be essential to creating the grid of the future.

CORE CONCEPT

The electric utility industry is one of the most capital-intensive industries in the world. Historically, cost-of-service based regulatory frameworks have developed and evolved to provide a stable business environment to promote healthy capital spending by utilities to meet the energy and reliability needs of customers. PBR represents an evolution from this traditional regulatory approach in which regulatory goals, utility earnings opportunities, capital investment incentives, and regulatory processes are adjusted to focus on performance. In addition to continuing to provide for the recovery of investments needed for a reliable, low cost grid to serve consumers and businesses, PBR provides an alternative approach to incentives to invest in new technologies or to establish new market structures. Table 1 below contrasts traditional and PBR frameworks.

Regulatory agencies establish PBR by creating links between regulated utility financial incentives[6] and desired outcomes. These outcomes are tied to an index of performance in addition to, or in place of, the cost of providing services. PBR also can include other elements of regulatory reform, such as revenue decoupling and multi-year forward-looking rate plans. Used together, these enhancements to cost-of-service regulation can better align regulated utility earnings with desired outcomes.

PBR frameworks can also accelerate the way regulation reacts to market dynamics. Traditional regulatory processes can lag industry developments. This regulatory lag may unintentionally limit economic growth potential, slow technological advances and deployment, and negatively impact utility financial performance.

Table 1 – Core PBR Concepts Compared to Traditional Regulation

	Traditional Regulation (Cost of Service)	Performance-based Regulation
Goals	Focus on reliability, affordability, adequacy of highly centralized electricity delivery systems. Consumers are protected from monopolistic power through reasonable rates and careful regulatory oversight.	Focus on traditional regulatory goals, as well as specific outcomes defined by policymakers, utilities, and stakeholders. Consumers receive reliable services. Facilitates opportunities for customer and third-party value creation and innovation.
Incentives for Utilities	Revenues (expenses + depreciation + taxes + return on rate base) are designed to match costs. Regulators approve costs, which are recovered in rates, often based on per-unit (volumetric) energy usage. The utility is incentivized to increase usage to drive up revenues.	Revenues are earned through a variety of rates and programs. Incentives are designed, communicated, and evaluated. More sophisticated rates are designed to facilitate reliable services and technology deployment. Utility earnings incentives are aligned with policy outcomes rather than increased usage.
Earnings	Regulators evaluate prudent cost of expenditures for services, with the level of capital expenditure primarily driving earnings.	Utilities optimize total expenditures (capital and operating) and regulators reward valued outcomes. Regulated earnings remain, but can be enhanced based on performance against specific metrics.
Timescale	Short-term focus on cost minimization with a traditional long-term capital planning process.	Balanced focus on short-term cost minimization/near-term grid reliability investments and longer-term investment in future grid architecture, improving performance and achieving public policy goals.

IMPLEMENTING PBR

There is no one-size-fits-all solution for successful PBR deployment. Nevertheless, experience suggests that the following basic framework can be used to help policymakers and utilities design and implement changes that best fit their specific needs and circumstances.

ESTABLISHING AUTHORITY TO IMPLEMENT PBR. When evaluating PBR, stakeholders must operate within the jurisdiction's unique circumstances, including legal, institutional, utility, and financial market considerations. In many states, the utility regulator is uniquely positioned, and has statutory authority, to act related to PBR objectives. However, it must be clear which governmental entity has authority to define what PBR means for the state. This includes a clear ability to act on utility incentives, including valued outcomes. Incentives that align utility revenues and cost recovery with effective performance encourage utilities to invest in a wider array of programs and technologies than they might otherwise consider under existing cost-of-service regulation. When designed appropriately, PBR can enhance traditional regulation of rates and costs with innovation in energy services and technologies and improved performance.

Case Study from Illinois' Smart Grid Act

In October 2011, Illinois passed the Energy Infrastructure Modernization Act (EIMA), which became law as Public Act 097-0616.[7] As part of the broader act, the legislation required Commonwealth Edison and Ameren Illinois to file multi-year metrics to achieve performance goals over a 10-year horizon. This requirement ultimately led to the establishment of tracking and performance measurement on an array of categories, including reliability indices, peak demand reductions, renewable energy adoption, greenhouse gas reductions, reductions in estimated bills, and the adoption of new smart grid technologies.

It is important to identify opportunities and limitations that may impact a PBR framework. Many states have strong foundations that can serve as a basis for establishing PBR. For example, many state regulatory commissions already have authority to connect outcomes (e.g., performance on reliability indices, customer satisfaction metrics, or demand-side management goals) to utility financial opportunities. However, there may be authority that is limited, requiring either scoping a few areas of PBR, or seeking additional authority from lawmakers to pursue additional areas.

STAKEHOLDER ENGAGEMENT. Stakeholder input is crucial to PBR success. To increase transparency and stakeholder involvement, regulatory processes should ensure stakeholders are part of establishing the critical aspects of PBR plans – such as setting performance targets and incentives. Utilities might understandably try to set achievable targets, whereas a regulatory body or other stakeholders may argue for targets that seemed unachievable. Engaging in a collaborative process, with the overarching policy objectives guiding the discussion, is more likely to result in a set of targets and incentives that will promote success and achieve meaningful outcomes.

For example, in Massachusetts, utility-sponsored energy efficiency programs have a strong performance component. An independent Energy Efficiency Advisory Council, made up of a variety of stakeholders, helps set energy efficiency targets and the associated incentive levels. The Massachusetts program is a good start that provides useful real-world experience with a successful program that is large, is embraced by the state's utilities, and combines PBR principles with other complementary polices (such as revenue decoupling), and could in the future apply to a wider range of utility activities.

DEFINING PERFORMANCE. To implement PBR, legislators, regulators, and stakeholders should work together to define, prioritize, and incentivize desired performance. Performance objectives may be specific to a given jurisdiction. Examples of broad categories of performance include customer empowerment, operational reliability and efficiency, environmental sustainability, and market innovation. Specific metrics that can assess performance across these categories are then defined (see *Establishing Metrics and Incentives* below).

The level of incentive is another important consideration. For PBR to be successful, incentives must be large enough to have the desired effect on utility behavior, but capped to protect consumers. In the UK, where they have implemented a comprehensive PBR framework,[8] incentive levels are relatively large (+/- 300 basis points) but subject to an overall revenue cap, which prevents the utility from "gold plating" investments to drive up earnings without providing incremental benefits to customers. In New York State, which recently implemented a more modest version of PBR as an overlay to cost-of-service regulation, incentives are limited to a maximum of 100 basis points (positive only), but without a revenue cap. In situations where there is no revenue cap, we recommend converting incentives from basis-point adders to an absolute dollar figure, to avoid the situation where the utility may seek to drive up its rate-base investments to increase profits from PBR. For example, in Massachusetts, the incentive levels within its energy efficiency program are set at specific dollar amounts for specific levels of achievement.

ESTABLISHING METRICS AND INCENTIVES.

Generally, performance targets and metrics should be designed around the most important, forward-looking assumptions that impact the business case of a proposed utility investment. Although metric categories should be similar for all utilities in a jurisdiction, actual targets can vary from utility to utility to reflect differences in the customer base, system condition, or other factors.

While each jurisdiction should develop metrics most relevant to its goals, below are examples of specific metrics that are consistent with the evolving nature of the electricity system.

- **Safety & Reliability:** SAIDI[9], SAIFI[10], or other indices, if not already subject to performance requirements.
- **Data access:** Consumer access to standardized and actionable energy consumption data; third-party access to system data.
- **Energy efficiency:** Quantifiable reductions in total electricity usage.
- **Peak load reduction**: Targeted demand reductions during peak periods – a primary driver of utility costs.
- **Third-party resource deployment:** Distributed energy resource deployments by third parties (including on behalf of customers).
- **Interconnection:** Volume and processing speed of filling requests to connect resources to the electricity system.

PLANNING IN THE PBR CONTEXT.

Incentives are provided when a utility achieves certain goals (outputs); however, these new output incentives need to be considered in the context of the input incentives under which utilities currently operate. Broadly, output incentives are rewards for achieving certain outcomes, which are the result of a combination of investments, management, and operational decisions (and potentially the decisions of customers and other actors), while input incentives focus on rewarding the capital invested in certain types of assets. When it comes to investments, utilities have short, medium, and long-term considerations. PBR should not lead utilities to focus on short-term gains at the expense of future performance. Any form of PBR must therefore include planning that provides insight on the impacts of the inputs over all time frames. An important foundation for effective PBR is thus a planning process that can show the reasonable alternatives for various investment and operating choices. This enables effective target-setting against the metrics developed in the PBR framework.

OPTIMIZING BETWEEN CAPITAL AND OPERATING EXPENSES. One goal of a PBR framework is to put operating expenses on a more equal footing with capital investments, particularly when non-capital spending can provide a superior solution.[11] This could be, for example, in procuring load reductions from customers and third parties deploying DER in lieu of a traditional distribution infrastructure upgrade. Another example could be incentivizing permanent peak reduction with targeted energy efficiency investments by building owners that help with near-term operational needs. Under a PBR framework, which does not just reward utilities for capital investment, utilities look at a broader array of potential solutions knowing that those based on operating expenses (e.g., contracts for demand response services, administration of energy efficiency programs) also provide earnings opportunities. For example, in New York, Consolidated Edison is earning on energy efficiency incentives and recovering those costs as a regulatory asset over a period of 10 years, recognizing that the investment provides benefits to all customers for more than just one year. Furthermore, incentives and rates could be adjusted regularly pursuant to a review of utility performance and service quality metrics. In some cases, regulators may consider additional fees on certain O&M expenses to provide some earnings equivalence to encourage non-capital solutions.

PRIORITIZING METRICS AND LEARNING. The foregoing discussion suggests that there are many potential metrics and incentive structures from which to choose. Thus, some prioritization is necessary to make the implementation of PBR manageable. Regulators and other stakeholders should focus performance objectives where there is most need for improvement, where there are opportunities to pursue regulatory priorities, and where there is opportunity for change.

It is important to provide utilities with a reasonable set of initial metrics to gain experience with PBR. Experience in other states with PBR suggests beginning with a few, clear metrics.[12] While metrics should obviously be aligned with regulatory policy priorities, we suggest two other basic criteria in developing a recommended list of initial metrics. These are (i) the ability for near-term implementation and (ii) the ability of individual metrics to inform multiple areas of performance within the broad categories of interest.

COMPLEMENTARY POLICIES. When considering PBR, regulators and policymakers should consider various complementary policies that can make PBR more effective. These are generally targeted at countering the utility bias toward increasing capital investment, which can be an obstacle in making a shift toward rewarding performance. These include:

- **Revenue decoupling**, which removes the disincentive for utilities to reduce volumetric sales.
- **Multi-year forward looking rate plans**, in which base rates are set based on an approved multi-year investment plan but are reconciled annually with actual investment.
- **Comprehensive benefit-cost analysis**, which is used as a basis for developing multi-year rate plans.

CONCLUSION

PBR offers the potential to achieve policy objectives and improve public welfare while also retooling the utility business model for success in meeting those objectives. Experience shows that, with thoughtful design processes, rewarding performance can work well. Implementing PBR in each jurisdiction needs to be considered in the context of a utility system that is becoming increasingly complex. This suggests that a move toward introducing a PBR framework should also involve considerations of adjustment to the regulatory process as a whole. This should include greater involvement by interested stakeholders that will ultimately play an integral role in the utility being able to meet its performance targets.

To support PBR as described in this issue brief, utilities and regulators will also need to agree on a form of advanced planning that can better identify the benefits that come from all advanced technologies.

ENDNOTES

[1] http://info.aee.net/21ces-issue-briefs

[2] Advanced Energy Economy (AEE) is comprised of a diverse membership. As such, the information contained herein may not represent the position of all AEE members.

[3] PBR as a regulatory framework applies mainly to investor-owned utilities, although some of the concepts may also apply to public power entities such as municipal utilities and cooperatives.

[4] DER is defined broadly to include distributed generation of all types, demand response, energy efficiency, energy storage, microgrids and electric vehicles, and as such, includes options for generating and managing electricity.

[5] Edison Electric Institute. *Delivering America's Energy Future: Electric Power Industry Outlook.* February 8, 2017. URL: http://www.eei.org/resourcesandmedia/industrydataanalysis/industryfinancialanalysis/Documents/Wall_Street_Briefing.pdf

[6] Incentives can be positive (rewards) or negative (penalties). Positive-only incentives may get greater buy-in from all stakeholders and may be more suitable for performance metrics that are not core service requirements, such as safety and reliability.

[7] http://www.ilga.gov/legislation/publicacts/97/097-0616.htm

[8] Known as RIIO, which stands for Revenue = Incentives + Innovation + Outputs

[9] System Average Interruption Duration Index which is the average outage duration for each customer served.

[10] System Average Interruption Frequency Index which is the average number of outage interruptions for each customer served.

[11] For more see our Issue Brief on Optimizing Capital and Service Expenditures http://info.aee.net/21ces-issue-briefs

[12] For example, New York selected four metrics for initial inclusion in its "Earnings Adjustment Mechanisms" as part of its Track 2 Order in the Reforming the Energy Vision proceeding (Order Adopting a Ratemaking and Utility Revenue Model Policy Framework. New York Public Service Commission, May 19, 2016. Proceeding 14-M-0101).