



November 28, 2017

Submitted electronically to customerchoice@cpuc.ca.gov

Subject: American Wind Energy Association California Caucus Comments on Customer Choice in California

Dear California Customer Choice Staff:

Thank you for the opportunity to provide comments on the California Customer Choice Project. We appreciate the forum for discussion of a topic that is creating dramatic changes in California's already dynamic energy markets.

The American Wind Energy Association (AWEA) California Caucus (ACC) is comprised of global leaders in utility-scale wind energy development, ownership, and operations, all of whom seek to direct the economic and environmental benefits of utility-scale wind energy to California customers, while affordably and reliably supporting state energy goals. Many ACC members also develop and own other energy infrastructure such as transmission lines, utility-scale solar, and energy storage.

ACC appreciates the many factors that have led us to this current state, and we see many potential benefits to increased customer and retail choice. However, California's aggressive statewide goals and the complexities of our energy markets continue to necessitate an overarching planning framework for procurement, transmission, as well as uniform accounting and monitoring systems. The CPUC must ensure that the increased options to customers do not result in a lack of progress toward our statewide climate and clean energy goals. Investments in utility scale resources are the most cost-effective way of meeting the state's environmental goals, and it is not clear whether the transition to retail choice is facilitating or will facilitate these investments. The recent growth of retail choice in California appears to correspond with recent decrease in the rate of investments in *new* utility-scale renewable resources. Similarly, the Commission must work closely with the California Independent System Operator (CAISO) to plan for new transmission developments to bring these cost-effective investments to the California market, and to ensure that decentralized procurement decisions do not compromise system reliability.

Furthermore, ACC notes that the discussion at the May 19th Retail Choice En Banc and during the October 31 California Customer Choice Workshop, focused heavily on behind-the-meter resources, storage, and solar PV, but included little mention of other components needed to facilitate a diverse portfolio, such as utility-scale wind energy. If customers are looking for a low-cost source of renewable energy but not considering new utility-scale wind, California ratepayers will miss an opportunity to better integrate our existing portfolio with a low-cost resource. Further, there is a

fleeting opportunity to obtain these resources at even lower costs due to the limited availability of the federal production tax credit (PTC).

ACC understands and supports the CPUC's efforts to examine the future roles, structures, and functions of the three large California electric IOUs. We also support the Commission's examination of different retail market and customer choice structures to ascertain the best practices that should be applied in California given our unique set of public policy goals. These are big challenges for the state. ACC agrees that greater oversight and certainty are needed to resolve these issues and ensure a smooth transition to a low-carbon future.

ACC Responses to White Paper Scoping Questions

1. The California Customer Choice project has three principles and eight key questions when considering customer choice (see below) in California and other markets. Are there any additional questions that the project should be considering? Why?

ACC agrees with the principles of affordability, decarbonization, and reliability posed by the California Customer Choice project. We note, however, that market certainty is a critical underpinning of a robust energy system that will allow for cost-effective procurement of zero-carbon technologies for a reliable grid. We look to the State agencies to ensure this level of certainty on behalf of all Californians, despite the level of choice provided to communities. Beyond emphasizing the need for continued statewide oversight, we agree with the questions posed by the California Customer Choice Project.

2) The California Customer Choice Project is reviewing several markets as key examples of how customer choice operates under different regulatory frameworks. These markets include New York, Texas, Illinois, and the United Kingdom. Are there other markets, either domestic or international, that you think would be an important model for California to consider as a regulatory framework option? Why?

ACC does not suggest consideration of any other markets, but we do think it's important to consider the similarities and differences between the markets analyzed and California.

3) What published resources do you recommend the California Customer Choice team review in addressing key questions for evaluated markets?

ACC calls attention to Lazard's Levelized Cost of Energy 2017 to ensure that all energy providers are aware of the relative costs – both subsidized and unsubsidized - of various sources of energy, and the dramatic price reductions of utility-scale wind and solar technologies.¹

¹ Lazard's Levelized Cost of Energy Analysis 2017. Version 11.0. 2 Nov 2017.
<https://www.lazard.com/perspective/levelized-cost-of-energy-2017/>

ACC also suggests that the Customer Choice team review the Department of Energy's information on the Renewable Energy Production Tax Credit (PTC) with particular attention to provisions that define the commencement of construction.² Understanding the ratepayer savings potential of utility-scale wind that is eligible for 100% or 80% PTC is critical to resolving some issues that are currently creating uncertainty in procurement, which could jeopardize California customers' opportunities for achieving carbon-free generation at lowest cost. ACC also offers an analysis from its consultant, Energy Strategies, Attachment A, which describes the potential relative savings that could result from high capacity-factor utility scale wind eligible for the PTC, if procured in 2018 or very early in 2019 to meet IRS milestones to capture the full value of the PTC.

4) What specific statutes should the California Customer Choice team review when considering customer choice as discussed during the workshop?

ACC suggests that the California Customer Choice team review Public Utilities Code Sections 380(k) 454.52(a)(1) regarding the requirements of LSEs to file Integrated Resource Plans to ensure that each LSE is meeting statewide objectives. These statutes were codified in SB 350 (de Leon, 2015), which requires an integrated, statewide planning approach that replaces the existing resource planning paradigm that focuses solely on the portfolios of the three investor-owned utilities ("IOUs"). IOUs, POU and CCAs are all subject to the requirements of the IRP, and logic dictates that the IRP modeling and analysis, and the planning guidance must be based on common planning assumptions among all Commission-jurisdictional LSEs and must likewise incorporate and integrate all LSE portfolios.

Market Perspectives: ACC offers more general feedback on the overall tone of the discussion and market trends, rather than a point-counterpoint response to individual presenters during the market perspectives panel.

1) What are the most compelling examples of successful implementation of customer choice that you heard during the Market Perspectives panel?

Wholesale utility-scale energy is a critical piece of any low-carbon future. Ignoring the current and potential role that wind and solar generation in the grid of the future would run counter to the principles of affordability, decarbonization, and reliability outlined above, as well as several of California's statewide policy objectives (e.g. carbon targets and the Renewable Portfolio Standard). ACC is concerned that the discussion around choice has missed one of the most obvious choices; that of low-cost, commercially viable, flexible carbon-free electricity. To optimize our reliance on low cost renewables, we need diversity in technology and geography; this will require statewide planning of both generation and transmission resources. Several of the most recent statewide

² U.S. Department of Energy. Renewable Energy Production Tax Credit.
<https://energy.gov/savings/renewable-electricity-production-tax-credit-ptc>

analyses, including the 2016-2017 CAISO Transmission Planning Process³ and the Renewable Energy Transmission Initiative 2.0⁴, find significant benefits associated with new transmission to access high-value out-of-state renewables; California needs to take steps to select the appropriate transmission developments soon to access the lowest-cost, highest capacity-factor resources from the western region.

2) *Given some of the pitfalls illustrated by the panelists, how might California best avoid or mitigate these issues?*

ACC noted a few points raised by Mark Pruitt of the Illinois CCA Network and the Former Director of the Illinois Power Agency. First, his recharacterization of ‘cost savings’ into ‘cost shifting’ was helpful and illustrative. The same can be said for planning, where California stakeholders tend to discuss “departing load” as if it were leaving the state, rather than “load-shifting” from one California-based LSE to another. Mr. Pruitt also emphasized the need for continued statewide oversight in long-term planning. While ACC understands that this remains a sensitive issue among LSEs, we do see a need for the state energy agencies to work together to ensure that future *statewide* demand for renewable energy – whether it is for CCA, POU, IOU, or ESP customers, is accounted for in both RPS compliance and Integrated Resource Planning. This will provide market certainty to market participants such as independent generators, who can market new wholesale renewable energy to the LSEs, and will inform the California Independent System Operator (CAISO) and other balancing areas who need to study near-term and longer-term transmission needs to appropriately develop transmission to access needed renewable resources.

To illustrate the need for continued compliance monitoring and statewide energy procurement and transmission planning, ACC points to the recently released Renewables Portfolio Standard Annual Report, submitted to the Legislature earlier this month.⁵ The report includes findings that the state’s three-largest Investor-Owned Utilities’ (IOUs) aggregated forecasts project that they will meet the 2030 RPS requirement of 50% by 2020, 10-years ahead of time. Similarly, CCAs report compliance with current RPS requirements and forecast that they will meet or exceed the 2020 33% RPS requirement. The RPS Annual Report does not define which entities will procure resources on behalf of customers of future or nascent CCAs, nor does it address the uncertainty of load-shifting between CCAs and IOUs. These questions require the attention of both the Commission in review

³ California Independent System Operator. 50% RPS Special Study – Out-of-state Portfolio Results and Next Steps. 2016-2017 Transmission Planning Process Stakeholder Meeting (presentation).

<https://www.caiso.com/Documents/Presentation-2016-2017TransmissionPlanUpdate.pdf>

⁴ Renewable Energy Transmission Initiative 2.0 Plenary Report. Final Report. 23 February 2017.

http://docketpublic.energy.ca.gov/PublicDocuments/15-RETI-02/TN216198_20170223T095548_RETI_20_Final_Plenary_Report.pdf

⁵ California Public Utilities Commission. Renewables Portfolio Standard Annual Report. November 2017.

http://www.cpuc.ca.gov/uploadedFiles/CPUC_Website/Content/Utilities_and_Industries/Energy/Reports_and_White_Papers/Nov%202017%20-%20RPS%20Annual%20Report.pdf

of all IOU, CCA, and ESP IRPs, but also of the California Energy Commission (CEC) in development of the statewide Demand Forecast and review of individual POU IRPs.

California needs new investments in large-scale renewables and associated transmission. The Commission should ensure that sufficient investments are made in a just and reasonable manner to satisfy LSE obligations.

3) What are the motivations and entities driving customer choice in California? How are they similar or different from the other markets?

ACC is not a driver, per se, of customer choice in California, so is not in a position to directly respond to this question. However, as a market participant, ACC's goal is to ensure that the concept of "choice" does not result in foregone conclusions regarding specific technologies. In other words, we want to ensure that increased customer choice doesn't become synonymous with picking winners of specific resource technology types. While ACC realizes that some choice models seem aligned with innovative behind-the-meter technologies, new utility-scale wind can help hedge against additional solar PV and some of the newer technologies that may cost more in the short-term or present grid management challenges as they reach higher penetrations. Investments in wholesale renewables to satisfy statewide need should remain on the table regardless.

Shark Tank: Again, ACC offers feedback on the overall discussion and market trends, rather than a point-counterpoint response to individual presenters during the market perspectives panel.

1) After reviewing the "shark tank" presentations, what are the "must haves" as California considers regulatory framework options to manage the transition associated with customer choice? What is the most compelling vision of customer choice as presented in the shark tank?

ACC is confident that what California needs – and what California customers desire - is a diverse portfolio of clean, affordable resources to reduce pollution and combat climate change. Achievement of this end-goal requires a foundation of wholesale renewables, with storage and distributed technologies supporting a clean, flexible, technologically mature, low-cost fleet of renewables. A shift toward innovative, distributed resources and storage is attractive, but will still require investment in low-cost wholesale renewables to ensure reliability and to keep the total portfolio costs down. Utility-scale wind – particularly from a diverse set of locations throughout the west – can complement California's solar-heavy portfolio by generating electricity in the morning and evening, decreasing the need to idle in-state gas plants and keeping electricity costs down for ratepayers.

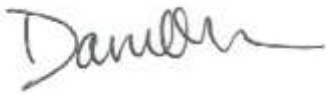
2) As California considers potential updates to its regulatory framework on customer choice, it is possible that certain existing rules or statutes may need to be reconciled. Are there any "must change" and/or "must not change" statutes? What are these rules and statutes and why?

LSEs, third-party providers, and other market participants (e.g. generators) need certainty regarding the level of state oversight and management of Integrated Resource Planning, procurement, transmission planning and development, and overall control and management of the system. As energy providers offer more choice to California customers, statewide energy agencies need to ensure that all Californians have access to affordable, reliable, and safe electricity. To do this, the CPUC, CEC and CAISO must monitor and oversee LSEs in the context of long-term resource planning proceedings.

Conclusion

ACC appreciates the Commission's focus on these important questions and looks forward to continued discussions among California's energy stakeholders to determine not only the appropriate level of retail choice, but to ensure that at any level, California customers are informed and able to make important decisions to cost-effectively and reliably work toward a decarbonized electricity system. The Commission, in close coordination with the CEC, CARB, and CAISO, should provide sufficient oversight to prevent market disruption and to continue to ensure that all the options presented to all Californians move us toward a cleaner, brighter future.

Sincerely,

A handwritten signature in black ink, appearing to read "Danielle", with a long horizontal flourish extending to the right.

Danielle Osborn Mills

Director

American Wind Energy Association California Caucus

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ATTACHMENT A

TO: Danielle Osborn Mills, Director, AWEA California Caucus

FROM: Caitlin Liotiris, Partner, Energy Strategies

DATE: October 16, 2017

SUBJECT: Relative Value of the Full Production Tax Credit for Wind Resources (Updated)

The AWEA California Caucus (ACC) requested that Energy Strategies perform an assessment of the value of the federal Production Tax Credit (PTC) for wind energy. The PTC is currently scheduled to phase out over the next several years; though, if timely procurement decisions are made, opportunities remain for California’s load-serving entities (LSEs) and, ultimately, ratepayers to capture the full benefit of these federal tax credits. Energy Strategies analyzed the impacts on the levelized cost of energy (LCOE) for wind facilities that obtain the full (100%) PTC, compared to wind projects that do not receive these federal tax incentives. To support the assumptions regarding PTC eligibility and the timing of these hypothetical resources, a summary of the relevant Internal Revenue Service (IRS) rules is also included below.

The analysis focused on wind projects that achieve commercial operation in two timeframes: 2020 and 2026. As described below, some wind projects achieving commercial operation in 2020 will be able to capture 100% of the PTC. In contrast, projects reaching commercial operation in 2026 are unlikely to be eligible for federal PTCs. Thus, comparing the costs of wind projects coming online in 2020 and 2026 allows for an assessment of the relative difference in the cost of wind energy with full federal PTCs and without PTCs.¹

While the PTC began to phase-down by 20% per year at the end of 2016, wind projects under development can still receive 100% of the federal PTC. According to IRS requirements, wind projects that began construction by December 31, 2016 are eligible for the full value of the PTC.² Project developers can demonstrate the commencement of construction several ways, including the “physical work test” or the 5% safe harbor (which is frequently accomplished through the purchase of turbines). In order for projects to remain PTC qualified, the project developers must demonstrate the continuous nature of their efforts through the commencement of commercial operations. One straightforward method for demonstrating the continuous nature of efforts on a PTC-eligible wind project is to place the project in service within four years of the year in which construction started (i.e. by the end of 2020 for projects which commenced construction in 2016).³ Thus, the analysis focuses on a 100% PTC-qualified

¹ 2026 also aligns with the procurement timeframes being evaluated in RESOLVE and would, almost certainly, be past the time wind resources might qualify for reduced PTCs (such as 80%, 60% or 40%).

² https://www.irs.gov/irb/2016-23_IRB/ar07.html

³ See IRS Notices 2013-29, 2013-60, 2014-46, 2015-25, 2016-31 and 2017-4.

project which comes online in 2020, as compared to a project commencing operation in 2026, which is not eligible for PTCs.⁴

Several 100% PTC-eligible projects are available to California ratepayers, but will require near-term contracting in order to achieve 100% PTC eligibility. While there is a narrow window in which procurement decisions need to be made for wind project developers to qualify for the full PTC in order to meet all necessary IRS eligibility milestones, project developers have flexibility in tailoring contracts to align with LSE needs. For instance, a wind project may be able to enter into a Power Purchase Agreement (PPA) with a utility in the 2018 timeframe, while the PPA may provide for delivery of power at the time the need arises, even if the need does not arise until the early 2020s. While there may be a risk premium added to the PPA price for delivery post-2020, the following analysis demonstrates the significant LCOE cost savings that can be achieved by locking in full federal tax incentives through PPAs executed in time to meet the necessary IRS milestones.

The analysis summarized below illustrates the high-level benefits associated with procuring full-tax benefit eligible wind compared to procuring wind at a time when these tax benefits have expired, demonstrating the economics of the tax and procurement concepts discussed above. The assessment focuses on high-capacity-factor wind from New Mexico and Wyoming. In order to perform this analysis, Energy Strategies utilized version 6.2 of the California Public Utilities Commission (CPUC) Renewable Portfolio Standard (RPS) Calculator⁵ with updated assumptions on capital cost and capacity factor taken from the July 2017 RESOLVE documentation of the inputs and assumptions for the CPUC 2017 Integrated Resource Plan (IRP).⁶ Specifically, the RPS Calculator's pro forma cash tool was used to calculate the LCOE of wind resources in several scenarios, while using the average capital cost of Wyoming and New Mexico wind from the RESOLVE IRP inputs and assumptions. Although the LCOE values produced by the RPS Calculator may not reflect actual, confidential prices contained in PPAs, the RPS Calculator has been widely vetted in various CPUC proceedings and provides a sound platform for analyzing the *relative change* in the cost of wind energy with and without federal tax incentives.⁷

The analysis considered several scenarios. Each scenario is designed to compare the relative changes in LCOE between a wind project that can achieve commercial operation in 2020, and obtains the full PTCs, and a wind project that achieves commercial operation with no PTCs. The wind project scenarios are described below and summarized in Table 1.

⁴ Projects coming online after 2020 may still be able to qualify for the full PTC. This will require commencement of construction by December 31, 2016 and demonstrating to the IRS the continuous nature of work from commencement of construction through commercial operation, based on the relevant facts and circumstances.

⁵ Version 6.2 of the RPS Calculator was used, because version 6.3 has not been made available on the CPUC's website.

⁶ RESOLVE documentation for capital cost and capacity factors used in the analysis is available here:

http://www.cpuc.ca.gov/uploadedFiles/CPUCWebsite/Content/UtilitiesIndustries/Energy/EnergyPrograms/ElectPowerProcurementGeneration/irp/17/RESOLVE_CPUC_IRP_Inputs_Assumptions_2017-07-19_redline.pdf

⁷ Note that while interconnection costs were assumed for these wind projects, no additional transmission costs were added for any of the wind projects evaluated. While transmission costs would likely be necessary for delivery of significant amounts of regional wind energy, the analysis is focused on isolating the relative value of the PTC. Excluding transmission costs from all projects evaluated allows for a comparison of the relative value of the PTC.

- (1) Scenario 1 (Default RESOLVE/RPS Calculator Inputs): This scenario uses the default assumptions from the RPS Calculator, including updated capacity factors and capital cost assumptions from the RESOLVE documentation for inputs and assumptions used in the 2017 CPUC IRP. Capital costs reflect the simple average between Wyoming and New Mexico costs, which were sourced from RESOLVE inputs.
- (2) Scenario 2 (Higher Capacity Factor): Scenario 2 uses the same inputs and assumptions as Scenario 1, except that a higher capacity factor (52%) is used to align with the capacity factor of recent a wind project in New Mexico.⁸
- (3) Scenario 3 (Higher Capacity Factor and Cost Reductions): Scenario 3 uses the same inputs and assumptions as Scenario 2, except the project that comes online in 2026 has a lower capital cost to reflect potential technological advancements. The capital cost has been reduced from the 2020 value by 7.7%, which is in line with the largest proportional capital cost reductions seen between 2020 and 2030 in the U.S. Department of Energy’s Wind Vision analysis.⁹

TABLE 1: SCENARIO SUMMARY

	Commercial Operational Date (COD)	100% PTC Eligible?	Capacity Factor	Capital Cost (2016 \$/kW)	Other Financial Assumptions ¹⁰
Scenario 1: Default RESOLVE/RPS Calculator Inputs	2020	YES	44%	Based on RESOLVE (July '17)	Consistent with CPUC documentation for RESOLVE and RPS Calculator 6.2/6.3
	2026	NO			
Scenario 2: Higher Capacity Factor	2020	YES	52%	Based on RESOLVE (July '17)	
	2026	NO			
Scenario 3: Higher Capacity Factor and Cost Reductions	2020	YES	52%	2026 only reduced 7.7% from 2020 RESOLVE value	
	2026	NO			

⁸ See testimony seeking approval of PPAs for the Sagamore Wind project in New Mexico here: <https://www.xcelenergy.com/staticfiles/xe-responsive/Company/Rates%20&%20Regulations/Regulatory%20Filings/NM-Filings-Riley-Hill-NM-Direct.pdf>

⁹ See *Wind Vision: A New Era for Wind Power in the United States*, U.S. Department of Energy, March 12, 2015, Appendix H, Table H-4, available here: <https://energy.gov/eere/wind/maps/wind-vision>

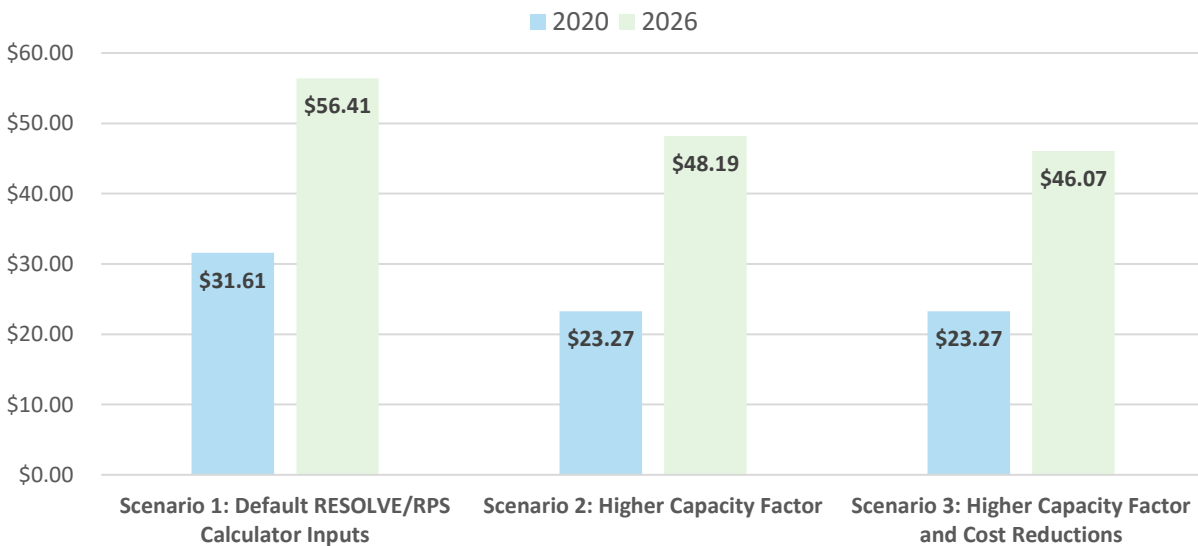
¹⁰ The RPS Calculator includes functionality to optimize the debt-equity ratio. Because the goal of this assessment was to isolate the relative value of the PTC, the debt-equity ratio for each project was held constant at 50/50.

The relative impact on the LCOEs in each scenario were compared. Table 2 summarizes the results of the assessment. Figures 1 and 2 illustrate the savings that can be achieved by securing the full benefit of the PTC.

TABLE 2: LEVELIZED COST OF ENERGY (2016 \$/MWH) AND RELATIVE SAVINGS ACROSS SCENARIOS¹¹

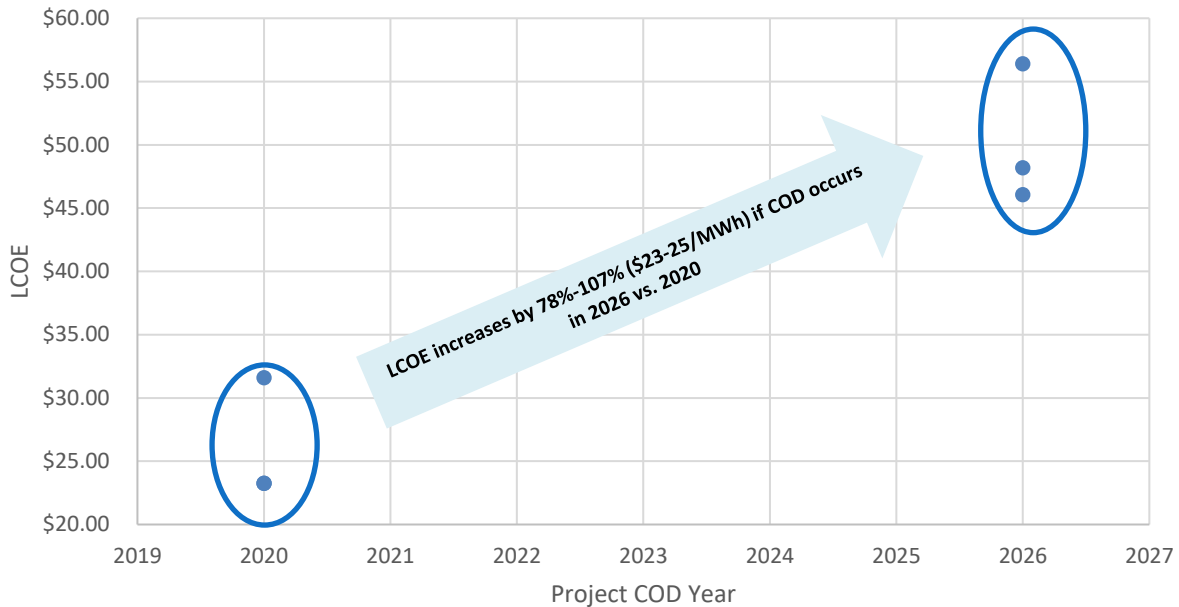
COD Year	Scenario 1: Default RESOLVE/RPS Calculator Inputs	Scenario 2: Higher Capacity Factor	Scenario 3: Higher Capacity Factor and Cost Reductions
2020	\$31.61	\$23.27	\$23.27
2026	\$56.41	\$48.19	\$46.07
<i>Delta</i>	<i>\$24.80</i>	<i>\$24.92</i>	<i>\$22.80</i>
Relative savings (%) due to timely procurement	44%	52%	49%

FIGURE 1: LEVELIZED COST OF ENERGY (2016 \$/MWH) COMPARISON



¹¹ The delta in the LCOE in Table 2 results from comparing LCOEs, as calculated by the RPS Calculator, of the two projects in each scenario. The RPS Calculator calculates LCOE using the net present value of the cash flows and the net present value of the energy and, among various other assumptions, the LCOE is grossed up for taxes. Note that the LCOE from the RPS Calculator may differ from actual PPA prices.

FIGURE 2: LEVELIZED COST OF ENERGY BY COD FOR ALL SCENARIOS (2016 \$/MWH)



This analysis demonstrates that the LCOE benefits of obtaining the full PTC, in the scenarios studied, can be between \$23-25/MWh or 44-52% lower than the LCOE of wind energy that comes online in 2026. While these values may not be reflective of actual, confidential PPA prices, they demonstrate the relative value of the PTC and the potential for lower cost wind resources that might be achieved with timely procurement decisions.

To put the total approximate value of the PTC into perspective, Energy Strategies assessed the net present value of the PTC for 1,000 MW and 3,000 MW of regional wind. The net present value of the PTC for these wind projects was calculated using a discount rate of approximately 8%.¹² For wind with a 44% capacity factor, the net present value of the PTC provided to the project, over the project life, is \$657M for 1,000 MW and \$1.97B for 3,000 MW. Regional wind with a 52% capacity factor has higher PTC benefits. The net present value of the PTC, over the project life, for 52% capacity factor wind is \$777M for 1,000 MW and \$2.33B for 3,000 MW. Also note that the simple (undiscounted) sum of the PTC for 1,000 MW of regional wind with a 44% capacity factor is \$990M and \$1.2B for 1,000 MW of wind with a 52% capacity factor.

But the value of actual PTCs received by the generation developer, and discussed above, are less than the total savings that can accumulate to ratepayers. The total value that can accumulate to ratepayers will vary depending on the specifics of the PPAs that might be signed. But if the LCOE values in this analysis are used as a proxy for relative and levelized PPA prices, then the total ratepayer savings associated with 1,000 MW of wind that receives the full PTC over twenty-years can be estimated to be between \$1.9 and \$2.3B for the three scenarios studied here.

¹² The discount rate for the net present value is the same as the weighted average cost of capital (7.96%) that was used in analyzing the various wind projects studied in this analysis.