BEFORE THE PUBLIC UTILITIES COMMISSION
OF THE STATE OF CALIFORNIA


Rulemaking 14-08-013
(Filed August 14, 2014)

And Related Matters

Application 15-07-002
Application 15-07-003
Application 15-07-006
(Filed July 1, 2015)

In the Matter of the Application of PacificCorp (U901E) Setting Forth its Distribution Resource Plan Pursuant to Public Utilities Code Section 769.

Application 15-07-005
(Filed July 1, 2015)

And Related Matters

Application 15-07-007
Application 15-07-008

COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC. ON DISTRIBUTED ENERGY RESOURCE GROWTH SCENARIOS AND DISTRIBUTION LOAD FORECASTING

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COMMENTS OF THE INTERSTATE RENEWABLE ENERGY COUNCIL, INC.
ON DISTRIBUTED ENERGY RESOURCE GROWTH SCENARIOS
AND DISTRIBUTION LOAD FORECASTING

The Interstate Renewable Energy Council, Inc. (“IREC”) provides these comments on distributed energy resource (“DER”) growth scenarios and forecasting, pursuant to the Assigned Commissioner’s February 27, 2017 Ruling (“ACR”)1 and the Administrative Law Judge’s June 22, 2017 Ruling (“ALJ Ruling”).2 The ACR directed the investor-owned utilities (“IOUs”) to develop a Draft Assumptions and Framework Document (“Forecast Draft”) with “load and DER adoption assumptions and a Trajectory/Most Likely scenario to be used for local area planning.”3

3 ACR at 3.
The IOUs circulated this Forecast Draft on April 7, 2017. After five working group meetings, the IOUs filed a revised document (“Revised Forecast Proposal”) on June 9, 2017 and Addenda to that document on June 28, 2017.

The ALJ Ruling posed two sets of questions regarding these documents and the ongoing growth scenario and forecasting process. IREC’s comments address those questions, as well as overarching issues relevant to the DER forecasting sub-track of the Distributed Resource Planning (“DRP”) proceeding.

IREC is a 501(c)(3) non-partisan, non-profit organization, working nationally to increase consumer access to sustainable energy and energy efficiency through independent fact-based policy leadership, quality workforce development and consumer empowerment. In service of our mission, IREC works to increase the adoption of policies and regulatory reforms that expand access to and streamline grid integration of distributed energy resources to optimize their widespread benefits. The scope of IREC’s work includes incorporating DER growth into utility distribution system planning and operations. IREC has a strong interest in creating a regulatory framework that optimizes use of all DER services and continues to enhance customer choice.

I. INTRODUCTION

The growth scenarios and forecasting framework are foundational to California’s efforts to identify situations where DERs can advance state policy goals and result in cost savings and additional benefits for ratepayers. The overarching goal of distribution-level forecasting is to provide a reasonable estimate of anticipated growth and where it will occur, so the benefits of DERs to the grid can be optimized, and utilities can make any necessary upgrades and other investments. The Track 3 Ruling deprioritized the forecasting sub-track because the IOUs

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ALJ Ruling at 3-5.

See Assigned Commissioner’s Ruling on Track 3 Issues, R.14-08-013 (filed Oct. 21, 2016) (“Track 3 Ruling”) at 1, 3-5.

See Administrative Law Judge’s Ruling Requesting Answer to Stakeholder Questions Set Forth in the Energy Division Staff Proposal on a Distribution Investment Deferral Framework, R.14-
already do forecasting as part of their distribution planning process (“DPP”). However, the rigor of the entire DRP process and associated tools turn on the reliability of the forecasts. Indeed, information presented at the DER Growth Scenarios and Distribution Load Forecasting workshop on February 10, 2017, as well as recent staff proposals, clarifies that DER forecasts will drive the rest of the DRP process, including the Integrated Capacity Analysis (“ICA”), the Locational Net Benefit Analysis (“LNBA”), grid modernization investments, and potential deferral of those investments.  

The IOUs agree in the Revised Forecast Proposal’s summary of use cases, which notes that the DER forecasts will influence the DPP, which in turn will drive the investment deferral screening process. The forecasts will also serve as inputs into the LNBA and ICA. Accordingly, it is absolutely critical that DER forecasts be as accurate as possible, and appropriately tailored to the use cases envisioned for them.

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10 Track 3 Ruling at 8.
12 Revised Forecast Proposal at 50.
13 Revised Forecast Proposal at 50-51.
The DRP Guidance directs the IOUs to develop three ten-year scenarios that project the expected growth of DERs through 2025, down to the feeder level:

- Scenario 1: Adapts IEPR “Trajectory” case
- Scenario 2: Adapts IEPR “High Growth” case and incorporates information from Load Serving Entities, third party DER owners, and DER vendors
- Scenario 3: Projects very high potential growth of DERs to achieve energy and greenhouse gas policy goals.\(^{14}\)

In combination, these three scenarios are intended to capture the foreseeable spectrum of potential DER growth. Scenario 1 will offer a more conservative depiction of autonomous DER growth, while Scenario 3 will explore the many ways directed DER growth may be used to further state objectives. To date, the IOUs have only begun to address Scenario 1. However, DPP will not succeed in identifying optimal locations for deploying DERs\(^ {15}\) unless it incorporates the other two scenarios and fully explores the use cases for these scenarios.

II. WORKING GROUP PROCESS

At the workshop on February 10, 2017, the IOUs noted, “A working group may be the right vehicle to provide guidance on deviations/adaptations and other issues that are specific to distribution planning use cases.”\(^ {16}\) The IOUs proposed that they develop a Draft Assumptions and Framework document with DER adoption assumptions and a Trajectory/Most Likely scenario to be used for local area planning.\(^ {17}\) Then, a series of working group meetings would address “DER inputs/divergence from statewide planning assumptions” and “Disaggregation methods.”\(^ {18}\)


\(^{15}\) Pub. Utilities Code § 769(b).

\(^{16}\) DER Growth Scenarios and Distribution Load Forecasting Workshop (Feb. 10, 2017), IOU Presentation, Panel 1 – Growth Scenarios – Purpose and Application, slide 9.

\(^{17}\) DER Growth Scenarios and Distribution Load Forecasting Workshop (Feb. 10, 2017), IOU Presentation, Panel 3 – Locational Disaggregation of Growth Preparation for CPUC Workshops, slide 8.

\(^{18}\) DER Growth Scenarios and Distribution Load Forecasting Workshop (Feb. 10, 2017), IOU Presentation, Panel 3 – Locational Disaggregation of Growth Preparation for CPUC Workshops, slide 8.
The ACR largely adopted this proposal.\textsuperscript{19} It described an actively engaged working group, “tasked with clarifying the use cases, proposing the methodology and assumptions for DER adoption scenarios, and developing approaches to disaggregate forecasts to the circuit level.”\textsuperscript{20} It also recommended a set of “guiding principles” to direct the working group’s efforts.\textsuperscript{21}

IREC representatives attended each of the five working group meetings held from April 17, 2017 to May 24, 2017. At these meetings, staff directed the working group to focus on understanding how DER growth scenarios are developed. The IOUs generally limited their presentations to their approaches to forecasting DER growth for the 2017-2018 planning cycle. While stakeholders responded with questions and feedback, they did not have an opportunity to proactively “propos[e] methodology and assumptions for DER adoption scenarios” or “develop[] approaches” for disaggregation.\textsuperscript{22}

The IOUs made clear that their forecasts were developed on a condensed timeline to serve the planning cycle that will begin this summer and fall. Stakeholders repeatedly requested information about the IOUs’ plans for future iterations of the growth scenarios, but the IOUs reiterated that their focus was only on this planning cycle. Stakeholders requested that the IOUs’ revised document capture points raised in the working group, but the IOUs stated that the Commission had not directed them to produce a consensus document, document the working group’s activities, or address next steps in this process. Accordingly, the Revised Forecast Proposal has limited discussion of the working group and the document does not represent the views of the working group.

IREC’s comments are informed by presentations and discussion in the working group sessions, as well as IREC’s experience in grid modernization proceedings throughout the United States, including New York, Minnesota, Maryland, and more recently, Illinois.

\section*{III. SUMMARY}

Several key points are clear at this stage. California is subject to quickly changing energy markets and technology. The IOUs have imperfect data characterizing these changes, and this significantly impacts their ability to produce reliable DER forecasts, especially for newer

\textsuperscript{19} ACR at 3.
\textsuperscript{20} ACR at 3.
\textsuperscript{21} ACR at 4.
\textsuperscript{22} See ACR at 3.
technologies like energy storage. In addition, data imperfections may be compounded in the disaggregation process when the IOUs assign projected growth to particular locations. At this juncture, none of the utilities nor the working group stakeholders have identified an optimal DER forecasting methodology that can accurately capture quickly changing DER markets and technologies, and a one-size-fits-all approach may not produce consistently accurate results for each utility.

Accordingly, at this time, IREC supports allowing the IOUs to use the best available information to drive their forecasts, provided that the forecasting process includes sufficient oversight, as discussed further below. The Commission’s Track 3 decision should prioritize transparency, both with regard to methodology and justification for the IOUs’ approach to forecasting, and the use cases the forecasts serve.

A. The Commission’s Forthcoming Ruling Should Provide for Additional Working Group Sessions to Address Details Omitted from the IOUs’ 2017-2018 Proposal.

The Revised Forecast Proposal recognizes that significant work on forecasting issues is still needed, but it does not identify clear next steps. For example, IREC agrees with the IOUs that “careful study and testing of the methods and results of analysis should be performed to inform continuous improvement.” However, the IOUs have not proposed a mechanism for this study and testing. These types of details are critical for building confidence in the IOUs’ forecasts and ensuring that they will serve as a reasonable basis for other DRP processes and tools.

Because the working group did not address these broader issues, IREC proposes that the July ruling immediately initiate another round of working group meetings to continue executing the group’s original directives: “clarify[] the use cases, propos[e] the methodology and assumptions for DER adoption scenarios, and develop[] approaches to disaggregate forecasts.” If the next phase of work on forecasting does not begin promptly, there is a risk that the remaining substantive issues will not be addressed in time to inform the 2018-2019 planning cycle.

Like the ICA and LNBA working groups, the forecasting working group could produce a report with substantive recommendations to inform the Commission’s Track 3 decision and/or

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23 GSAF at 32.
24 ACR at 3.
future guidance. While IREC recognizes that a condensed timeline would likely limit this working group’s scope and activities in the near term, it would nonetheless be beneficial for the IOUs and stakeholders to engage further with the broader issues presented in this sub-track prior to the Commission’s decision.

**B. The Forecasts Should Serve Specific Use Cases and Incorporate All Three Growth Scenarios.**

The ACR indicates that the Track 3 decision will “establish annual deadlines for the parties to continue to refine methodologies, use cases, and to develop additional DER scenarios in future iterations.” These three components of the forecasting process cannot and should not be disconnected. There is no point in forecasting solely for the sake of forecasting—the forecasts will only be useful if they directly serve clearly articulated use cases. In addition, the conservative Scenario 1 alone will not help the IOUs and stakeholders identify the full range of optimal locations for deployment of DERs. Thus, the use cases must be the driver of the forecasting process, and all three growth scenarios must be incorporated. The forecasts will be most useful when their underlying methodologies and data are as robust as possible, and evolve over time to incorporate additional experience and information.

It is particularly important that the forecasts be refined promptly because the latest Track 3 staff proposal envisions “a new focus on cost-effective DER integration” in distribution planning and investment processes. Staff proposes that these planning and investment processes will center on an annual Grid Needs Assessment (“GNA”) that characterizes grid needs and potential deferral and investment opportunities. The DER forecasts will be a fundamental input into the GNA, so it is critical that they capture the full range of potential growth as accurately as possible.

**C. Ongoing Oversight of the Forecasting Process Is Necessary to Assure Transparency.**

Because DER forecasting is an emerging area, in which best practices are not yet apparent, especially for newer DER technologies, transparency is especially important to ensure

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25 ACR at 3.
26 Proposed Distribution Investment Deferral Framework at 5.
27 Proposed Distribution Investment Deferral Framework at 5; see also Opening Comments of IREC on Staff White Paper on Grid Modernization, R.14-08-013 (filed June 19, 2017) (“IREC Grid Mod Opening Comments”) at 3.
28 Proposed Distribution Investment Deferral Framework at 5.
the Commission and stakeholders understand the IOUs’ approaches, and have a forum through which improvements can be considered and adopted. Transparency is also necessary to ensure that the forecasts are meeting the needs of all identified use cases as well as possible, and to identify areas that need improvement. Moreover, as discussed further below, if the IOUs are allowed to deviate from the IEPR, which is subject to stakeholder vetting and rigorous review, then additional oversight is required to ensure their deviations are justified and will improve the accuracy of their forecasts.

Transparency concerns also follow in part from the mismatch between the IOUs’ business model and financial incentives and California’s energy policy goals. So long as the IOUs’ earnings and return on investment are directly connected to their capital investments, they have little incentive to avoid such investments, since it would be working against their financial interests. While this concern will persist until addressed more comprehensively, it is particularly acute with respect to the proposal to rely on the IOUs’ Scenario 1 forecast to inform investment deferral decisions. While Scenario 1 forecasts are more likely to err on the conservative side, forecasts developed under the other two scenarios would demonstrate that a range of potential DER growth is possible and could allow for better identification of high-benefit and/or low-cost opportunities to meet future grid needs with DERs (which may replace capital investments made by the IOUs).

Accordingly, the Commission should establish robust transparency measures. These measures could include an ongoing working group process or an extension of the Distribution Planning Advisory Group (“DPAG”) proposed as part of the investment deferral framework. IREC suggests that the forecasting working group could serve as a forum for the discussion and development of appropriate transparency and oversight measures going forward.

IV. RESPONSES TO QUESTIONS

A. 2017-2018 Forecasts

1. Are the sources used for the system forecast of each of the following Distributed Energy Resources (DERs) reasonable? If not, which IOUs’ source data is not reasonable and why not?
   a. Energy Efficiency;
   b. Behind-the-Meter Distributed Generation;

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29 See Proposed Distribution Investment Deferral Framework at 23-27.
c. Load-modifying Demand Response;
d. Electric Vehicles; and
e. Energy Storage.

IREC generally supports the IOUs’ proposal to use the most appropriate public document unless there is good cause to deviate, provided that this approach is coupled with substantial transparency measures to ensure the IOUs explain their deviations. The oversight mechanisms should be capable of ensuring that the annual DPP reflects the most accurate available information and remains responsive to changing market conditions.

In addition, while it may not currently make sense to artificially constrain forecasts purely for the sake of consistency, the forecasting framework the Commission establishes should place limits on deviations from public documents over time. For example, the IOUs should not repeatedly rely on the same justifications for deviations; under the proposed framework, planning processes feed each other, so differences should be reconciled within one to two years.

IREC also agrees with the IOUs that the appropriate forecasting methodology should be determined for each DER. DERs vary significantly in historical adoption rates, potential grid services, and other DER-specific factors, so there is no reason to expect their individual growth trajectories to align. In the working group, the IOUs and stakeholders appeared to agree that it is not reasonable or necessary to develop perfect feeder-level forecasts for every DER at every location. Rather, the goal should be to identify the level of granularity that best balances uncertainty and other current forecasting constraints, including lack of data, and the level of disaggregation required for relevant use cases. This balance will likely change over time and should be revisited in each forecasting and planning cycle.

However, there are several shortcomings in the proposed forecasts. First, the IOUs are inconsistent in their incorporation of policy mandates and changes in system forecasts. Decisions to exclude the impacts of these policy changes is not a simple omission—it is equivalent to assuming that the policies will have zero impact on DER growth. The odds that this is a reasonable assumption are slim, even for the more conservative Scenario 1.

In addition, the IOUs make a case for relying on historic data for some DERs, but not others, without a clear rationale to support this approach. While the system forecasts proposed for 2017 do not appear unreasonable, it is not clear how and when the IOUs will decide to

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30 Revised Forecast Proposal at 6-7.
change their approaches to historic data in the future. A feedback mechanism for assessing the accuracy of forecasts based on historic data would improve the rigor of this approach. It would also help clarify whether a more consistent approach across IOUs would be appropriate in the future.

The proposed system forecasts also lack information about certainty. The Revised Forecast Proposal identifies uncertainties in general terms, but these uncertainties are not quantified or captured in the forecasts themselves. If the forecasts addressed the three growth scenarios included in the DRP Guidance, this could provide a sufficient range of predictions. However, because the forecasts are limited to Scenario 1 and do not include margins of error, stakeholders cannot assess the reliability of the forecasts or likely range of actual deviation.

Finally, while IREC recognizes that the IOUs do not currently have a system in place for incorporating relevant data from third-party providers and other entities, such as local governments (e.g., local plans to encourage particular DER growth in certain areas), this information should be included in future iterations of the forecasts, as envisioned for Scenario 2. Further discussions within the forecasting working group about relevant data and the best pathways for obtaining it, as well as the other shortcomings discussed above, would be helpful.

2. **What are the implications, if any, of the IOUs’ aligning their DER growth scenario forecast with different Transmission Planning Process cycles?**

No comment at this time.

3. **The IOUs developed new forecasts for DG and EVs, which have been submitted for consideration for the Integrated Energy Policy Report (IEPR) 2017 demand forecast and which may be incorporated into the IEPR by the CEC in late 2017. Are the IOUs’ models, methods and forecasts reasonable, based on the information provided in the Assumptions and Framework document?**

See response to question A.1.

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31 *See, e.g.*, Revised Forecast Proposal at 42-43 (discussing high-level uncertainties associated with DG adoption, including unknown future policies and market conditions at the system level, and inherent uncertainty in prediction customer adoption at the feeder level, and referencing general principles in the IOUs’ “Future State Vision” to guide future efforts, but not identifying specific mechanisms to quantify and address these uncertainties).
4. Please comment on the IOU’s approach to locational disaggregation of their DER forecasts.

a. Is the methodology for the forecast disaggregation for each of the above DERs reasonable? If not, identify specifically for which IOU(s) DER(s) the methodology is unreasonable and explain why not; and

The IOUs have not adequately explained the relationship between top-down and bottom-up forecasting, and how system-level forecasts are reconciled with data and information regarding DER growth rates at specific locations. It is generally reasonable for the system-level forecasts to drive location-based forecasts, because system-level forecasts tend to have higher certainty levels, at least at the current time. However, where there is reliable local information, it is important that this information be incorporated into the forecasts; in other words, system-level forecasts should be adjusted based on reliable local information whenever possible.

Similarly, the IOUs have not demonstrated that they have a plan for dealing with large projects that cause “lumpiness” in data, that is, large, discrete jumps in growth forecasts. The forecasts should incorporate information available from interconnection applications, as well as permitting and planning processes, and provide supplemental information about uncertainties associated with such projects.

b. What are the implications, if any, of the IOUs’ application of different disaggregation methodologies?

At this stage, it is not unreasonable for the IOUs to apply different methodologies. As DER forecasting is a relatively new art, it is not clear that one methodology is superior to another, and, as noted above, methodologies may vary across DERs. However, over time, the IOUs should learn from each other and, as appropriate, adopt new methodologies that are proven to effectively support a reliable and transparent planning process. Thus, the forecasting framework should include mechanisms for assessing the quality of forecasts and ensuring that the IOUs share and incorporate best practices in the coming years. Ultimately, over time, this should lead towards more consistency across IOUs as best practices emerge, and relevant data is more uniformly gathered and available.

5. Please provide any additional comments concerning the development and adoption of DER growth scenarios for the 2017-18 Distribution Planning Process.

Given that this is the first round of this process, and the IOUs proposed these forecasts on a condensed timeline, the Commission should essentially treat this planning cycle as a pilot for
transparency, benchmarking, and accountability measures in the forecasting framework. Specifically, the Commission should direct the IOUs to compare actual annual outcomes with their forecasts and to describe their process for adjusting the next round of forecasts based on these outcomes. Such information could also inform future working group discussions and help to guide any suggestions from the working group about how to improve the IOUs’ DER forecasts, and how these changes may impact the forecasts’ utility within the identified use cases.

B. Future Growth Scenario Updates

1. Please comment on the process for future updates to the growth scenario forecasts. Do updates need to be formally or informally vetted? What issues need to be considered?

IREC appreciates the explanations of uncertainties in the Revised Forecast Proposal. Uncertainty is inherent in all forecasting, however, and must always be acknowledged and addressed in the planning process. The Revised Forecast Proposal does not propose an approach for addressing these DER-specific uncertainties. To ensure that the framework includes clear steps for future updates, the “future state vision” should be revised to include specific timelines, transparency mechanisms, and benchmarking/assessment mechanisms to help the Commission and stakeholders better understand the uncertainties and issues and pathways for mitigating them.

In addition, the forecasting process should be monitored by a working group or other oversight body (such as the DPAG), to ensure the forecasts that feed the GNA are reliable, with ultimate oversight by the Commission. As currently proposed, the GNA would identify grid needs based on growth scenarios. If the GNA merely includes the results of the forecasting process, but the process itself receives no scrutiny, there is a risk that the entire DRP process could undermined by inaccurate or misleading forecasts. Accordingly, meaningful oversight is a critical component of the ongoing forecasting process.

In particular, the oversight body should review the IOUs’ assessment of the previous year’s forecasts and the justification for any divergence from public forecasts. As the other growth scenarios are developed, the oversight body should also ensure that forecasts adequately and accurately incorporate third-party information and policy mandates. In addition, the

32 See, e.g., Revised Forecast Proposal at 35 (EE).
33 Revised Forecast Proposal at 49.
34 Proposed Distribution Investment Deferral Framework at 5.
oversight body should review any changes in disaggregation methods, including changes in reliance on historical data.

2. **Are consistent methodologies necessary across IOUs for system forecasts? If so which method should be adopted?**

As noted above, it is not unreasonable for the IOUs’ methodologies to vary in the short-term, provided that there is sufficient transparency built into the forecasting process, there is a clear process for benchmarking and updates, and the focus remains on identifying best practices, which the IOUs should adopt over time, thereby becoming more consistent in their approaches.

3. **What are the implications if the DER growth scenario forecasts used in DRP differ from the forecast used in TPP?**

No comment at this time.

4. **Are consistent methodologies necessary across IOUs for locational disaggregation of the forecast?**

See response to question B.2.

5. **Under what conditions should the IOUs use different sources than the IEPR demand forecast to inform the DER growth scenarios? Address both the IEPR forecast year and the IEPR update year.**

See response to question A.1.

6. **If the IOUs use different sources or develop new methodologies for the DER growth scenarios, what parameters are necessary to ensure that the forecasts are reliable?**

As noted throughout these comments, it appears that it is too early in this process to identify clear best practices for all DERs, so the initial focus of the forecasting framework should be transparency.

In particular, it is critical that the forecasts be explicitly linked to use cases. The IOUs should specify how the forecasts will be used (and/or what steps are necessary to make the forecasts useful), how the forecasts will fit into the overall planning process, and how the forecasts will be reconciled with system planning that accounts for large building projects, solicitations, other pricing mechanisms, policy mandates, etc. Where there are disconnects between system and local forecasts, the IOUs should explain why and how they may be reconciled.

The forecasting framework should support identification of best practices to be used in forecasting. To develop this framework, the IOUs must provide specific information to stakeholders (e.g., through a working group or other oversight group); without specific
information about underlying assumptions, stakeholders and the Commission cannot assess the quality and reliability of forecasts or propose alternatives. For example, where forecasts are the product of several combined assumptions, the IOUs should quantify the portion of the forecast driven by each assumption. The IOUs should also specify the precision and certainty levels for each forecast.

As noted above, an immediate concern is how the IOUs will test the accuracy, usefulness, and fitness of the framework. While the IOUs note that forecasting will be an iterative process, they provide no specifics. The IOUs should report on the outcomes of their forecasts, so over time stakeholders will be able to assess the validity of the IOUs’ approaches and where improvements may be necessary. In particular, the IOUs should explicitly state how the 2017-2018 forecasts will be assessed and how the IOUs will adjust their next round of forecasts based on these results.

Finally, the IOUs should specifically identify known long-term modifications needed in the forecasts and specific timelines for delivery. In the working group meetings, the IOUs identified numerous areas that are known to need improvement. For example, the uncertain policy framework for storage makes valuation very difficult. In another example, PG&E is building a hybrid model for forecasting energy efficiency, but it will not be ready for use for two to three years. In addition, there are data gaps in forecasts; to address these gaps, the IOUs need to describe the gaps and identify data that would be most useful for distribution planners or other use cases. These known future tasks should be documented and have deadlines assigned.

V. CONCLUSION

IREC appreciates this opportunity to comment on the forecasting framework and urges the Commission to ensure that DER forecasts will be sufficiently robust to serve as the anchor for the rest of the DRP process.
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Respectfully submitted,

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