

DOCKETED

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Improving modeling efforts to reflect real world conditions, constraints, and opportunities

Additional submitted attachment is included below.

17-EPIC-01 – Development of the California Energy Commission Electric Program Investment Charge 2018 to 2020 Triennial Investment Plan

Improving modeling efforts to reflect real world conditions, constraints, and opportunities

We applaud the CEC for releasing this aggressive investment agenda. Our comments on the initiatives proposed revolve around three themes.

First, we commend the CEC for recognizing that existing models are inadequate in their treatment of California as one block, not to mention their **treatment of institutional and behavioral constraints** as virtually irrelevant. In addition to recognizing modeling efforts with greater spatial resolution, we ask the CEC to favor efforts that go beyond basic benefit cost analysis in their integration of the social sciences. There are many methods in political economy and institutional research that are amenable to these topics, but so far they, for the most part, have not been applied—with the result that much research in this area could end up focusing on ideal or stylized policy solutions and options that do not reflect real world conditions, constraints, and opportunities.

This point is especially salient in Initiative 7.1.1 (Integrated Pathways for Energy Futures: Tools and Science-Based Research for Holistic Energy Decision Making), though other initiatives risk ignoring these issues in their pursuit of least-cost optimization. Models that disregard these non-economic constraints generate poor recipes for controlling risk and uncertainty, and impede decision-making.

Only one initiative, 7.1.2 (Applied Social Science to Inform Technology Development and Adoption for Deep Decarbonization of the Energy System), is dedicated to the behavioral constraints to technology adoption. We believe that at least one more behavioral initiative is needed. In addition to 7.1.2, which focuses on demand response and energy efficiency, one initiative should seek to address the challenge of electric vehicle adoption. While academicians have studied demand response and energy efficiency, it remains unclear how the use of electric vehicles could be radically expanded. It is also unclear where society's attitudes to electric vehicles stand, given their growing psychological availability, and how public perceptions of their risks and benefits have evolved over the past five years. These could be highly consequential for generation expansion and electric system operations, and warrant further study.

Second, when it comes to initiatives focused on identifying and analyzing the institutional challenges facing emergent technologies, we believe that the CEC should favor proposals with **highly structured approaches to eliciting these challenges**. For example, in the wrong hands, Initiatives 2.2.1 (Advance Microgrids to the Tipping Point of Broad Commercial Application) and 2.3.1 (Development of Customer's Business Proposition to Accelerate Integrated Distributed Storage Market) risk becoming either shallow, qualitative assessments or market analyses that only tangentially address the fundamental role of institutions in advancing and retarding innovation in the electricity sector.

We believe that proposers who wish to undertake these two initiatives must prove process rigor in addition to having the capacity to convene workshops. The more structured the workshops are, the more useful their insights are to policymakers. There must be rigorous preparation, including prior research conducted by the organizers, to ensure that time at the workshop is devoted not to discussing widely known challenges to adoption, but to expounding on their implications and developing strategies for overcoming them. Proposers must ensure that both workshop structure and expert selection are informed by the latest findings from the academic literature. We support these initiatives, and would like to see them executed to the highest standards.

Third, it is clear from this agenda that the CEC recognizes the benefits of **targeted investments in the electric grid**, and that they are our best chance to avoid an overbuilt system that will face large economic and political headwinds, not to mention public opposition. This is apparent in descriptions of Initiative 3.3.4 (Provide Visibility into DER Responses to Weather and Other Variables and into the Effects of DER on Gross Load), Initiative 3.4.1 (Assessment and Simulation Study of California Grid with Optimized Grid-Level Energy Storage), and Initiative 7.2.2 (Clarify Interactions Between Renewable Electricity Systems and Climate Change to Ensure an Effective, Resilient Transition to Low-Carbon Energy in California). We fully support this, and urge the CEC to carefully assess the metrics that groups adopt for judging the viability of these investments in their proposals. Do the methods optimize for best resource and least cost, or do they go beyond these approaches to evaluate targeted investments across multiple attributes? For these initiatives to inform policy design, the CEC must interrogate investigators on the issue of attribute selection, and ensure that they do not succumb to the weaknesses that plague the current generation of models. Thinking more carefully about how multiple stakeholders would be impacted by these investments—a dash of concern for political economy and institutional considerations, in other words—would go a long way to solving these problems.

Given the aggressive deep decarbonization timeline adopted by the state of California, it is crucial that the work performed under these initiatives represent not an evolutionary change but a radical improvement in modeling and energy policy analysis. Modeling efforts should start treating political and behavioral constraints endogenously as a matter of course, and investments should be judged across a range of attributes, as opposed to the usual metrics of least cost or social welfare. Where workshops are necessary, these must be highly structured with concrete goals in mind. We look forward to seeing the fruits of this effort.