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Comments Upon Natural Gas Sector Climate Resilience

Additional submitted attachment is included below.



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June 4, 2019

Dear Dr. Wilhelm and the Energy-Related Environmental Research Team:

Thank you for the opportunity to comment on a forthcoming solicitation on Natural Gas Sector Climate Resilience. Today I am providing comments based on my role as the Energy Sector Science lead for Cal-Adapt, but also as a potential applicant, and as a member of the research community. If disambiguation of these perspectives is needed, I am happy to follow up with you as you deem appropriate.

1. Which of the proposed research gaps are highest priorities?

Providing climate information at the temporal and spatial resolution desired by IOUs and other natural gas system stakeholders remains a difficult technical and scientific challenge. Expectations for coming years are for ultra-local (2km) spatial resolution and hourly timesteps for climate information. This exceeds the resolutions produced by international climate modelers, and also national efforts to downscale climate model output. For that reason it is critical the Energy Commission provide funding for the production of high resolution climate information at the scale sought by IOUs. Both of the following discussed gaps would serve to address this critical need: (1) High resolution historical reanalysis for major weather variables governing climate-related risks to energy systems and (2) Analysis of sub-daily historical observed precipitation data.

2. What other research gaps might be higher priority for fostering natural gas sector resilience?

There exists an unmet need for climate data aimed at energy sector engineering and design problems. Production of data from current climate projections and historical products that are actionable by IOUs would be of direct benefit to ratepayers. Methods could be generated with the intention of applying to downscaled data and climate scenarios for the next generation of climate products. Such an effort has the potential to be of high value for low cost (relative to cost of producing reanalysis products).

The next generation of climate models (CMIP6) that will be used to produce climate projections for California's energy sector are beginning to be made [publicly available](#). The expectation of IOUs and other stakeholders is that the next generation of downscaled projections will be hourly. It is therefore of some concern that a majority of model runs, variables and scenarios lack hourly (0.04% currently available compared to monthly timepoints), or in some cases, 3 hourly (0.90% available) / 6 hourly (1.40% available) timepoints. Methods to faithfully reproduce the temporal structure and variability of California's microclimates will be needed to fill this gap, and ultimately meet stakeholder expectations.

3. What specific suggestions would you make to improve the research scope and/or focus?

Improving the historic high resolution data available could take many forms:

Science. Statistics. Data.



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- Improving the accuracy in regions of critical concerns, for both center and extreme conditions. Reducing errors and biases across the state is good; products that focus and improve accuracy in regions where ratepayers are consuming energy is better.
- Improving the spatial resolution to actionable scales for IOUs.
- Improving the temporal resolution to accurately reflect peaks or extremes (i.e. gridded atmospheric datasets are often temporally smoothed, underestimating short timescale peak events which are of critical importance).

Ideally a call for proposals would allow for researchers to propose a wide range of tactics to address these high resolution concerns, and other means for improvement of historical observations. A very specific call could exclude an exciting new but unexpected idea that could improve natural gas system resilience.

Improved understanding of compound events can help improve energy system resilience. This work could lead naturally to stress-test scenarios appropriate for testing infrastructure. However in order to make such research actionable, simplified proxies for concurrent climate related risk would need to be produced so as to be made understandable through Cal-Adapt (or similar tools for dissemination and visualization).

Atmospheric Rivers are a current “hot” topic in the atmospheric science and climate science communities, and are currently the focus of federal funding opportunities, as well as some funding opportunities from other State agencies (i.e. Water Resources). I am slightly concerned that overlap with federal funding opportunities would reduce the benefits to ratepayers. I encourage this topic to be narrowed to ensure research is focused on aspects of extreme precipitation in California that are under-represented in similar federal studies.

4. How should IOUs be involved to ensure the science is actionable? Possibilities include:

- a. Partnering in crafting the solicitation (not eligible to apply).**
- b. Advising on technical advisory committee.**
- c. Applying for grants (not eligible to work on solicitation).**
- d. Partnering on applications with other researchers as lead.**

Including IOUs in crafting the solicitation and reviewing proposals could lead to applications proposing research that is of greater relevance to the Natural Gas sector. However, including IOUs in the process may lead to some unintentional conflicts of interest, and lead to challenges for non-IOU entities to generate Letters of Support.

1. IOUs applying for funding would have a conflict of interest in supplying letters of support for non IOU entities.
2. IOUs could choose not to provide letters of support to some applicants, but provide letters of support to partners, reducing the potential for competitive applications from non-partnered applicants.
3. IOUs who participate in the review process, may decline to offer letters of support, reducing the potential for applicants to secure letters of support.
4. IOUs reviewing applications could produce unintentional biases, supporting research they provide letters of support to.



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5. Many natural gas IOUs have long standing, pre-existing relationships with research partners. It can be a challenge for disadvantaged or small businesses to secure letters of support from IOUs that have pre-existing relationships.

For the above reasons, CEC should consider waiving the requirement of producing letters of support for this GFO.

5. What additional considerations should be incorporated into the Grant Funding Opportunity to facilitate funding of research that has a measurable impact?

California has a robust community of climate and environmental scientists and environmental engineers. A very small percentage of this group participate in solicitations such as these, to the detriment of progress, and ultimately ratepayers. Small steps that the Energy Commission takes that makes the funding opportunities more approachable are:

- (1) Broadening wording of solicitations calls to be open to research ideas and topics that are currently unfamiliar to Energy Commission staff, but potentially helpful to the natural gas sector.
- (2) Creating the opportunity for relatively small awards, that encourage new applicants to submit. Such small awards could include shorter narratives, and less documentation, encouraging applications from a wider audience.

Putting together a proposal requires a large outlay of effort. Larger institutions such as IOU applicants have significant resources to call upon to support development of application. This could conflict with the Energy Commissions stated goals to increase disadvantaged communities and small businesses participation in the grant process.

Thank you for the opportunity to provide public comment on this pending solicitation.

Sincerely,

Owen Doherty PhD