From: Gravely, Mike@Energy

Sent: 9/18/2013 7:14:58 PM

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Bcc:

Subject: Project Advisory Committee Meeting for LLNL) Study Final Report - Using High Speed Computing to Estimate the Amount of Energy Storage and Automated Demand Response Needed to Support California's RPS.

Dear Project Advisory Committee Members,

This message is to invite you to the final Program Advisory Committee (PAC) Meeting of the California Energy Commission Contract with Lawrence Livermore National Laboratory (LLNL) - *Using High Speed Computing to Estimate the Amount of Energy Storage and Automated Demand Response Needed to Support California's RPS.* The meeting details are as below:

Location: **Pacific Gas & Electric Company**

77 Beale Street, Room 303-304

San Francisco, CA 94105

Proposed Date: October 16, 2013 (from 10 A.M. to 1 P.M.)

I will send out an agenda early next week.

We greatly appreciate your participation in this meeting. The PAC members will review

the LLNL presentation on the project background, methodology, summary results, and conclusions of the study. Thank you again for your input at our interim meetings held in 2012 and early 2013. We modified our study in an attempt to address the comments you provided at these meetings. After the final meeting, the LLNL will complete and the Energy Commission will publish the final report. I remind everyone that during these meetings early in the process, we agreed as a PAC on the assumptions and how the analysis would be done (i.e. based the analysis on CA ISO and IOU accepted processes vs. using new unproven processes) so the results are based on real world examples and not based on new undeveloped or unproven assumptions that would highlight the value of energy storage or automated DR. This decision did limit some of the analysis that LLNL was able to perform, but it also makes the results more relevant now. We can modify those assumptions in the future if the PAC feels future efforts are warranted and if we can identify the appropriate funding for these new activities.

As a reminder, this contract is follow-on to the study the Energy Commission funded a few years back with KEMA entitled: *"Research Evaluation of Wind Generation, Solar Generation, and Storage Impact on the California Grid".*

This LLNL effort represents several extensions to the KEMA study. First they looked at energy storage, auto demand response and natural gas generation to determine the best mixture (cost is one of the key elements) to support the uncertainty generated by the increase of renewables in 2020. Second, they used high performance computing which allows them to greatly expand the variables and data we apply to the research. Third, they were able to apply much more realistic weather information to better predict the weather impact on the renewable generation and load.

The ultimate goal of both the KEMA and LLNL efforts is to gain real analytical data on the amount of energy storage needed to meet the State's 33% Renewable Portfolio Standard by 2020, and how automated demand response can work in partnership with energy storage to expand our intermittency response capability at much lower system costs.

Since this is the final report, we will want to hear from each PAC member on the value of this effort and if the increased capabilities from using high performance computers provided an equivalent increase in information gained. I will be interested in the thoughts of PAC members on what is the appropriate next steps.

If possible, please confirm your attendance by September 30, 2013 so that we can be sure the proposed conference room will meet our needs for the PAC.

We will plan on using WebEx for this meeting so if you have other attendees who would like to listen in, please send me their email address and I will forward them the link. Unfortunately, space is somewhat limited and I will have to restrict the attendance in person to the PAC members or their designated replacements.

Please let me know if I can provide any additional information prior to the meeting.

Michael Gravely

Deputy Division Chief

Energy Research and Development Division

California Energy Commission

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