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March 9, 2012

Attn: Mr. Bryan Neff
California Energy Commission
1516 Ninth St, MS-43
Sacramento, CA 95814-5512

Dear Mr. Neff:

DOCKET

12-IEP-1D

DATE MAR 09 2012

RECD. MAR 12 2012

On behalf of the U.S. Department of Energy Pacific Region Clean Energy Application Center (Pacific CEAC), we respectfully provide these comments in response to the February 16th 2012 California Energy Commission ("Commission") workshop on "Combined Heat and Power to Support California's AB 32 Climate Change Scoping Plan."

I currently serve as Director of the Pacific CEAC and work with my colleagues at the University of California – Berkeley, the University of California – Irvine, San Diego State University, and San Francisco State University to provide education and outreach and direct project assistance for combined heat and power (CHP), district energy, and waste heat-to-power solutions for the Pacific Region of California, Nevada, and Hawaii. The Pacific CEAC appreciates the opportunity to make these comments.

The primary comment that we would like to offer in response to the workshop is that there seems to be disconnect between state policy for expanded CHP by 2020 and 2030, and the current policy environment for the installation of new CHP in California. Current state-level goals include: 1) the installation of 4 GW (for 6.7 Mton/year reduction) of new CHP by 2020 as identified in the AB32 Global Warming Solutions Act Scoping Plan, and 2) the 6.5 GW new CHP goal for 2030 in the more recent Governor Jerry Brown's "Clean Energy Jobs Plan." Despite the recent progress on CHP policy in California that were highlighted in the February 16 workshop, the rules that have been established for the "cap-and-trade" program to implement AB32 raise concern. While we applaud the overall goals of the program, we believe the way the rules are structured may negatively impact future investment in CHP in California.

We note that the issue of treatment of CHP under the cap and trade program was addressed in the "California Cap-and-Trade Program Resolution 11-32," adopted by the California Air Resources Board on October 20, 2011 (page 7, emphasis added):

"Electricity rates should create the appropriate incentives for electricity conservation, greenhouse gas efficient technologies, and efficient distributed electricity generation such as combined heat and power;"

"Carbon pricing is an important function of the cap-and-trade regulation, and that it is equally important that if allowance value provided to electric distribution utilities for ratepayer benefit is returned directly to customers it is consistent with State efforts to promote energy efficiency and energy conservation;" and

"Incentives created by the cap-and-trade program should motivate investment and innovation in clean technology."

Building on the above statements in the Resolution, we offer the following comment on the current rules:

The cap-and-trade program would require that CHP installations at sites that do not receive free allocations and that increase a given site annual emission level of carbon dioxide (CO₂) to over 25,000 metric tons per year to purchase

credits for their emissions. These would have to be purchased for not only the amount of emissions over the 25,000 limit, but for all emissions at the site including older “legacy” emissions that were occurring before the installation of the new CHP plant (e.g. from existing boilers and other sources) that otherwise would have been included only through upstream capture through natural gas fuel providers after 2015.

To illustrate the potential impact of this requirement, below is an example showing “simple payback” for an example CHP project at a hospital with a 4.6 MW gas turbine with a heat rate of 8,863 BTU/kWh based on industry data. If the turbine achieves a high capacity factor (95% assumed for 8300 hours per year of operation) it would push the host site above 25,000 metric tons per year of emissions, and would then necessitate the direct purchase of carbon allowances.

Using this example CHP project, the following table shows the effect on project economics of average carbon dioxide allowance prices of \$20, \$40, and \$50 per ton (reflecting the “starting mid-case,” “average mid-case through 2030” and “average high-case through 2030” prices shown in the 2012 ICF market assessment report (in Figure 29).¹ Values shown are in reference to “pre-cap case” as well as a “cap threshold avoidance case” where if site emissions can be kept below the threshold, emission credits are alternately covered upstream through natural gas fuel providers, adding a projected 7% to the cost of natural gas.² As shown, this has a modest impact on project economics (just 0.2 months of extended payback) compared with the impacts of direct coverage under the cap for facilities that exceed the threshold. The key findings are:

- Starting mid-case - \$20/ton: Impact on project economics would be fairly modest - adding approximately 18 months to the 5.3 year “pre-cap case” project simple payback.
- Average mid-case through 2030 - \$40/ton: Impact on project economics would be severe – extending the payback by 4.2 years to 9.3 years, which could make the project viability highly questionable.
- Average high-case through 2030 - \$50/ton: Impact on project economics would be dramatic – extending the payback by 6.7 years to 11.8 years, making the project viability highly questionable.

Example CHP Installation Case: 4.6 MW Gas Turbine at a California Hospital Site

Case	Annual Project Costs	Annual Project Benefits	Net Annual Project Benefits	Approx. Simple Payback
<u>Starting mid-case - \$20/ton price:</u>				
Pre-cap case				
Cap threshold exceedance case	\$2,716,657	\$4,905,028	\$2,188,371	5.1 years
Cap threshold avoidance case	\$3,216,657	\$4,905,028	\$1,688,371	6.6 years
	\$2,823,532	\$4,905,028	\$2,081,495	5.3 years
<u>Average mid-case - \$40/ton price:</u>				
Pre-cap case				
Cap threshold exceedance case	\$2,716,657	\$4,905,028	\$2,188,371	5.1 years
Cap threshold avoidance case	\$3,716,657	\$4,905,028	\$1,188,371	9.3 years
	\$2,823,532	\$4,905,028	\$2,081,495	5.3 years
<u>Average high-case - \$50/ton price:</u>				
Pre-cap case				
Cap threshold exceedance case	\$2,716,657	\$4,905,028	\$2,188,371	5.1 years
Cap threshold avoidance case	\$3,966,657	\$4,905,028	\$938,371	11.8 years
	\$2,823,532	\$4,905,028	\$2,081,495	5.3 years

Notes: Base case – no carbon costs; Cap exceedance case – project must purchase allowances for 25,000 Mtons/year of CO2 emissions; Cap avoidance case – project pays 7% adder for natural gas costs but avoids costs of allowances.

Economic assumptions: 4.6 MW gas turbine project; \$2,415/kW installed system cost net of discounted value of federal investment tax credit and California SGIP (ICF, 2012); natural gas = \$4.50 MBTU; O&M at \$0.01/kWh (ICF, 2012); value of electricity displaced = \$0.12/kWh; 95% capacity factor; 6% project interest rate; 30 year project life.

¹ ICF International (2012), “Combined Heat and Power: Policy Analysis and 2011 – 2030 Market Assessment,” CEC-200-2012-002, February.

² CARB (2010), “Proposed Regulation to Implement the California Cap-and-Trade Program - Staff Report: Initial Statement of Reasons Appendix N: Economic Analysis.” Note: in the study, average commercial and industrial gas prices are projected to rise from 7% to over 10% depending on carbon allowance prices, so the actual economic impact may be slightly higher than with the assumed 7% increase.

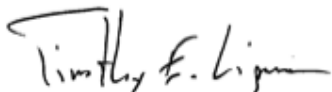
Based on this example impact on a CHP project, which we want to make clear is a simplified but illustrative example, the cap and trade program could have a distortionary effect on the California CHP market in three ways:

- The financial burden on projects where the 25,000 metric ton per year threshold is exceeded is likely to alter the design of such projects if not completely prevent them from moving forward unless the local utility acts to offset this with favorable utility rate treatment for the CHP system;
- Projects may be designed to operate just under the emissions threshold which may result in sub-optimal system performance; and
- CHP installations at sites other than for industries that are eligible for free allocations are likely to be disadvantaged at least until utility rate tariffs and other rules to “level the playing field” are put in place.

Given these issues and the current California goals for CHP, the Pacific CEAC recommends that the Commission work with the Air Resources Board and the California Public Utilities Commission to consider options to address these issues and achieve the state goals. For example, a set of guidelines for the IOUs and municipal utilities that could effectively offset the economic impacts of the cap and trade program on CHP generators that are net-GHG reducing but that increase onsite emissions could be considered.

In summary, we applaud California for its cap-and-trade program but are concerned about the impact of the rules as currently written on the potential for new CHP in California to help meet state environmental and economic goals. We look forward to working with the Commission and other stakeholders to address these issues and ensure California meets its CHP goals.

Respectfully submitted on behalf of the Pacific CEAC,



Timothy Lipman, PhD

Note: The Pacific CEAC is operated by UC Berkeley, UC Irvine, San Diego State University and San Francisco State University, for the U.S. Department of Energy and the California Energy Commission. Principal researchers include Dr. Tim Lipman and Prof. Dan Kammen (UC Berkeley), Dr. Vince McDonell and Prof. Scott Samuelsen (UC Irvine), Prof. Asfaw Beyene (SDSU), and Prof. Ahmad Ganji (SFSU).