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Ms. Lucille VanOmmering
California Air Resources Board
Office of Climate Change
1001 I Street
Sacramento, CA 95814

October 2, 2009

RE: Combined Heat and Power (CHP) in a Cap-and-Trade Program

Dear Ms. VanOmmering:

Capstone Turbine Corporation submits these comments on the CARB workshop on Combined Heat and Power (CHP) in a Cap-and-Trade Program, held September 9, 2009.

Capstone Turbine Corporation is a San Fernando Valley-based manufacturer of microturbine and turbine energy systems that can be deployed in CHP applications. We are the world's leading manufacturer of ultra-clean microturbine energy systems. All of our products are designed, engineered and manufactured/assembled in our facilities in Chatsworth and Van Nuys, California. We manufacture a CARB-certified microturbine that complies with the CARB 2007 emissions standard for sale in California. Our systems can be "carbon neutral" when running off of biogas from digesters or landfills, or can reduce GHGs by 25-50% when running on natural gas, as compared to the utility grid.

I. CHP is an Essential Tool for GHG Abatement

The ARB AB 32 Scoping Plan set a goal of adding 4,000 megawatts of new CHP capacity by 2020 to achieve 6.7 million metric tons of GHG reduction. CHP has been widely recognized as a relatively low-cost GHG reduction solution; very notably by groups such as the U.S. Department of Energy Oak Ridge National Laboratory, the International Energy Agency, and the McKinsey Consultancy.

The December 2008 DOE Oak Ridge Laboratory report (Combined Heat and Power – Effective Energy Solutions for a Sustainable Future," http://www1.eere.energy.gov/industry/distributedenergy/pdfs/chp_report_12-08.pdf) stated that if the United States were able to generate twenty percent of its electricity from CHP, the effects would be:

- Reducing CO2 emissions by 800 million tons, equaling the CO_2 savings of removing 154 million cars off the road;
- Reduce energy usage by 5.3 quadrillion BTUs annually, the equivalent of half of all U.S. residential energy usage;
- Generate $234 billion in new investments; and
- Create a million jobs.

The December 2007 McKinsey report ("Greenhouse Gas Emissions: How Much at What Cost?" http://www.mckinsey.com/clientservice/ccsi/greenhousegas.asp) states the CHP can provide GHG abatement at a "negative cost," compared to many renewable generation technologies such as solar PV and wind power that provide abatement but at significant societal cost. The McKinsey report goes on to point out that theoretical cost effectiveness has not been sufficient to drive significant levels of deployment and that many barriers exist that are preventing CHP from reaching its potential.

Lastly, the International Energy Agency information paper ("Combined Heat & Power and Emissions Trading: Options for Policy Makers," http://www.iea.org/textbase/papers/2008/chp_ets.pdf) identifies CHP as "an important tool available for policymakers to bring about significant reductions in carbon emissions." However, the paper goes on to argue that including CHP in an emissions trading scheme is problematic because onsite emissions will increase although global emission will decrease. The IEA's verdict is that only a "double-benchmarking" system that gives credit for reductions achieved through production of both electrical and thermal energy against a predetermined set of baselines, in conjunction with other supportive measures will result in fair treatment of CHP under a cap-and-trade.

II. Commercial CHP Faces Additional Barriers

Capstone has shipped over 5,000 microturbines to date, mostly to commercial customers such as retailers, small businesses, hospitals, schools and universities, water treatment plants, and hotels. According to ICF Consulting, there are 1,716 MW of commercial CHP in California, approximately one fifth of the total CHP base ("ICF CHP Market Assessment" from July 23 CEC workshop, http://www.energy.ca.gov/2009_energypolicy/documents/2009-07-23_workshop/2009-07-15_ICF_CHP_Market_Assessment.pdf). Commercial CHP systems face additional barriers based on their size that warrant an exemption from regulation of GHG emissions. Such barriers to smaller CHP systems include:

- Small businesses have a host of other priorities, such as meeting code and safety requirements and focusing their cash on their core business expertise.
- Putting cash down (or financing, which ties up credit for other needs) has risks, some of which are outside of the businesses' control – such as the future price of electricity and natural gas, whereas continued reliance on the local electric utility requires no financial commitment up front.
- Compliance costs can negatively impact smaller entities more than larger entities.
- Commercial entities, which usually require smaller CHP systems, are oftentimes in close proximity to public spaces, living quarters, etc., and therefore often have more stringent air quality and building codes.
- Operating CHP systems can exceed the capability and business focus of smaller entities which lack the engineering capability that typically exists at a large, industrial site.

Adding another barrier to the deployment of commercial CHP – like subjecting users to compliance with a GHG cap – will endanger California's success in reaching the CHP potential of commercial customers. ICF Consulting calculates that there is nearly 9,000 MW of CHP potential in the state. Reaching the ARB Scoping Plan target depends on a significant contribution from commercial CHP.

III. The Solution

Commercial CHP systems represent a critical GHG reduction resource for the State and should be exempt from the cap-and-trade program.

A precedent for regulating only large industrial users and centralized power facilities has been set by the Kyoto Protocol, which does not regulate entities that generate less than 20 MW of electricity. The emission allowance trading scheme of the EU includes all combustion plants with more than 20 MW, refineries, coke plants, the production of steel, cement, mineral products and paper and pulp. CHP systems below 20 MW are therefore not subject to the cap.

In the United States, the American Clean Energy and Security Act (H.R. 2454), sponsored by Congressmen Waxman and Markey, took a similar approach by exempting all CHP systems under 25 MW as long as the systems did not sell more than a third of their electrical output.

The ARB's current approach of setting a threshold of 25,000 MT/yr of CO_2e will regulate much smaller systems than do the EU system or the H.R. 2454 proposal. This would include many commercial CHP customers. In the instance of Capstone's products, five C1000 systems, having a total output of 5 MW, would produce 26,423 MT/yr of CO_2 at baseload operation on natural gas. In other words, a 4.7 MW Capstone system would break the 25,000 MT threshold set by ARB. Any technology with a similar CO_2 emissions rate – in Capstone's case, 1,330 lbs/MWh – would experience similar results. For diesel-fired engines and turbines, even smaller systems would exceed the threshold.

Although Capstone's installed base of projects does not currently contain any systems above 3 MW, in Capstone's view the 25,000 MT/yr threshold is too low. A preferred approach would be to follow the lead in the EU and federal legislation and make the threshold higher in order to allow more commercial CHP systems to avoid the cap. The lowest we recommend setting the threshold would be to double the current proposal – 50,000 MT/yr.

Capstone is grateful for the opportunity to comment on this important issue and we look forward to remaining a stakeholder in these discussions.

Sincerely,

Justin Rathke
Director, Policy and Distributor Development