

Proposed Amendment between California Energy Commission and CMC-Engineering

Title: Packaged Microturbine / Boiler CHP System
Amount: \$0.00
Term: No term change
Contact: Mike Kane
Committee Meeting: 6/1/2010

Recommendation

Approve this agreement with CMC-Engineering (CMCE) for \$0.00. Staff recommends placing this item on the consent calendar of the Commission Business Meeting.

Issue

The original scope of work for PIER Grant PIR-07-005, Packaged Microturbine/Boiler combined heat and power (CHP) System Project, includes designing, fabricating and demonstrating a 100kWe simple-cycle microturbine generator (MTG) integrated with a 100 lbm/hr firetube boiler at a districting heating plant in San Francisco that complies with California Air Resources Board (ARB) 2007 distributed generations (DG) emission standards. The MTG was to be purchased by the host site and comprised 90 percent of the projects \$152k in match funding. Due to changes in ownership and tightening of Bay Area Air Quality Management District emissions standards, the host site and primary source of match funding has withdrawn from the project. CMC-Engineering has subsequently identified a potential replacement host/match partner willing to consider installing a MTG in a scheduled system upgrade to the new emissions standards if the unit is under warranty. However, the only warranted MTGs currently on the market are recuperated rather than simple-cycle. Additionally, the Cohen silo burner originally specified for this project will not be able to meet the new emission standards and an new burner from ST Johnson has been identified that can meet local requirements of the proposed new site. CMCE is therefore requesting that the scope be modified to permit the use of a recuperated MTG and an alternate burner so that it can secure a host site/match partner and continue with the project.

Background

This microturbine/boiler CHP System project was of one of six grant awards totaling \$5,521,833 under a September 2007, Combined Cooling, Heating and Power (CCHP) Systems competitive solicitation. The item was approved in a Business Meeting in June, 2008 and this particular project was awarded \$535,954. The solicitation targeted projects to advance the science, technology, and California market penetration of grid-connected CCHP systems.

Small and large CHP systems could provide important energy savings to industrial, residential, and commercial users. Use of a simple-cycle MTG was originally proposed for this project because it represented the best opportunity to reduce capital and operation and maintenance costs and increased return on investment for installed units. Though cost considerations remain important, the greater need is that industry continues to demonstrate the benefits of higher combined CHP efficiency in a variety of industrial and commercial settings while simultaneously responding to ever changing emission performance requirements. Enabling the grantee to substitute a recuperated MTG for a simple-cycle unit benefits this greater need to the extent that it facilitates the securing of a host site for demonstration and the match funding required if the project is to continue.

Proposed Work

The revised work statement adds language to identify and secure a host site that will require compliance with the new boiler emission regulations and will agree to consider a CHP assembly-based on the proposed technology. The project equipment specification will be broadened to permit possible use of a Capstone C-65 microturbine (or equivalent) as required to secure participation of an appropriate host site. The microturbine-generator will be provided by the host site as originally agreed. The project team will secure an air permit from the appropriate Air Quality Management District, including any applicable waivers or relaxation of permit limits based on the experience gained under PIR-03-037. ST Johnson and CMCE will supply match funds to provide a new NOXmatic™ burner for the project at no cost to the Energy Commission. Overall match funding by CMCE, ST Johnson and the host site will not be less than \$152,000 regardless of equipment selection and host site. Finally, CMCE will install and demonstrate the CHP assembly on an industrial packaged boiler in California.

Justification and Goals

This project "[will develop, and help bring to market] advanced electricity generation technologies that exceed applicable standards to increase reductions in greenhouse gas emissions from electricity generation, and that benefit electric utility customers" (Public Resources Code 25620.1.(b)(3)), (Chapter 512, Statutes of 2006)); and supports California's goal to encourage the development of environmentally-sound combined heat and power resources and distributed generation projects per the Energy Action Plan 2005.

This will be accomplished by:

- demonstrating overall fuel to useful energy (electricity + thermal) conversion to as high as 82% .
- achieving the CHP system emissions better than required by CARB 2007 DG emission standard and reducing the greenhouse gas emissions.