

Proposed Amendment between California Energy Commission and Gas Technology Institute (GTI)

Title: Integrated Waste Heat and Wastewater Recovery DOME for Food Processing Applications
Amount: \$0.00
Term: 3 months
Contact: Richard Sapudar
Committee Meeting: 2/22/2011

Recommendation

Approve this amendment to grant PIR-09-004 with GTI to revise the rate schedule in the project budget and authorize a no-cost time extension. Once amended, this agreement will provide a technology demonstration of an integrated waste heat and wastewater recovery system at an industrial scale food processing facility. Staff recommends placing this item on the consent calendar of the Commission Business Meeting.

Issue

The purpose of this amendment is to revise the rate schedule in the project budget and extend the term at no additional cost to allow the work to be completed. The executed grant agreement requires revision of the GTI assigned project staff, job classifications, maximum rates to be billed, and subcontractor name and rates in Budget Workbook Exhibit B - Budget Details - Direct Labor - Unloaded Hourly Rates to maintain consistency with the project proposal originally submitted by GTI in response to the competitive solicitation. This current inconsistency between the proposed project budget and the actual project budget in the executed agreement was not determined during review, signature and approval of the agreement. Without this amendment, the grantee will eventually have to stop work because the current agreement classifications, rates and subcontractors will not allow the use of contractor staff necessary to complete the project.

Background

This proposal resulted from PON-08-007 for "Improving Energy Efficiency in California's Food Processing and Dairy Processing Industry". This RD&D grant solicitation was a competitive grant solicitation sponsored by the PIER Industrial/Agriculture/Water Program to solicit technologies and/or scientific advances that will significantly reduce energy and water use in California's food processing and dairy processing industries. Outcomes of research projects from recommended grant awards will be publicly available and serve as a model for food and dairy processors to adapt to their own specific situations. This will improve production efficiencies and enhance their competitiveness in this California industrial sector.

The development of low temperature waste heat recovery technology was identified as a top priority in the 2007 PIER Industrial End-Use Energy Efficiency RD&D and Implementation Plan. However, the direct use of low temperature waste heat directly in the process, either in cooking or the generation of steam, is difficult due to the low quality of the waste heat stream. Using low temperature waste heat to clean wastewater in water intensive activities increases the efficiency of the overall process. GTI indicates on average that up to 20% of a typical waste heat stream could be used to reclaim water.

Enforcement of wastewater discharge regulations and associated salinity problems have forced the food processing industry to look for cost-effective technologies to reduce water usage and wastewater.

Total annual California water and energy use in the fruits and vegetable sector alone amounts to 30 billion gallons of water, 300-400 million therms of natural gas and 600-800 million KWh of electricity.

The original proposal submitted by the grantee in response to the competitive solicitation contained the correct budget information that was not, unfortunately, carried over to the currently executed agreement.

Proposed Work

GTI was awarded a \$400,000 grant under the Food Processing and Dairy Processing Grant solicitation (PON-08-007) competitive solicitation. The proposed research will develop, demonstrate and determine the cost-benefit of the DOME technology (DOME is the name of the process and is not an acronym), which is based on integrated waste heat and wastewater recovery. The DOME technology uses a distillation vessel to capture waste heat that is then used to evaporate and recover food processing wastewater. The distillation vessel is designed such that the clean condensed recovered water created by the vessel is drawn down by gravity and creates a slight vacuum in the vessel space behind it. This lowers the boiling point of the wastewater in the DOME device and improves the efficiency of the distillation process. The project will be conducted at the Gill's Onions processing facility located in Oxnard (Ventura County) California.

The potential savings to the state with 100% market penetration of DOME are significant, totaling some 440 million gallons per year of clean water from state water supplies, 30 million therms of natural gas per year, 185 million kWh of electricity and associated green house gas emissions. Assuming 100% DOME market penetration in California's Food and Dairy processing industries, carbon dioxide savings of 155,000 tons per year are expected. These savings are assumed to consist of a reduction of 95,000 tons of carbon dioxide per year from lower natural gas combustion and a reduction of 55,000 tons of carbon dioxide per year from lower electricity generation in 35% efficient gas turbines or power plants. NOx savings of 14 tons per year in California are expected along with the carbon dioxide reductions from decreased fuel combustion.