

**Proposed Amendment between California Energy Commission  
and  
Gas Technology Institute**

**Title:** Waste Heat Recovery from Corrosive Industrial Exhaust Gases  
**Amount:** \$0.00  
**Term:** No term change  
**Contact:** Kiel Pratt  
**Committee Meeting:** 11/09/2010

**Recommendation**

Approve this amendment with Gas Technology Institute (GTI) for \$0.00. Staff recommends placing this item on the consent calendar of the Commission Business Meeting.

**Issue**

This amendment would modify certain language in the Scope of Work and remove two Key Partners:

Thorock Metals

Because of the recent economic downturn, one Key Partner (Thorock Metals) no longer operates its Compton aluminum re-melting facility continuously. This makes the facility unsuitable as a technology demonstration site. Thorock Metals has been an excellent partner in previous projects, but this project's technology will require continuous operation at an aluminum re-melting facility to generate data necessary to prove its benefits. A new demonstration site needs to be found.

Language in Task 3 of the Scope of Work that explicitly mentions Thorock Metals will be modified. The work called for in this Task will be identical except that the new language will specify that the demonstration site is yet to be determined.

Eclipse Inc.

Eclipse Inc. is the other Key Partner. In fact, the only mention of this company in the contract is on the Key Partners list in the Scope of Work. The contractor explained to the project manager that Eclipse Inc. intended to be a product licensing partner during the technology transfer phase of this project.

Recently, the contractor informed the project manager that a company more suitable as a licensing partner was found. Thermal Transfer Corporation's experience with heat transfer products makes it a better licensing partner for this project's technology than Eclipse Inc. Consequently, the contractor requested that Eclipse Inc. be removed from the Key Partners list.

Thermal Transfer Corporation will be added as the product licensing partner for the technology transfer phase of this project.

**Background**

Amendment:

Because of the recent economic downturn, one Key Partner (Thorock Metals) no longer operates its Compton aluminum re-melting facility continuously. This makes the facility unsuitable as a technology demonstration site. Thorock Metals has been an excellent partner in previous projects, but this project's technology will require continuous operation at an aluminum re-melting facility to generate data necessary to prove its benefits. A new demonstration site needs to be found.

The other Key Partner (Eclipse Inc.) will be removed as a key partner and Thermal Transfer Corporation will be added as a product licensing partner. Eclipse Inc. partnered successfully with the GTI in the past, but this project's team determined that Thermal Transfer Corporation's experience with heat transfer products makes it a more suitable licensing partner than Eclipse Inc.

## **Proposed Work**

### Project Background:

The GTI Gas Guard Recuperator (GGR) uses a guard bed of sodium minerals that scour chlorine and fluorine from exhaust gas. Hot, clean gas then passes through a conventional heat exchanger that preheats air for heat transfer to the burners. The only furnace modification is to operate burners on preheated air instead of ambient air. The guard bed materials are readily available, low-cost minerals, so that the guard bed can be replaced when necessary.

### Project Scope of Work:

Phase 1 - Work has involved thermodynamic and kinetic analyses of the guard bed. An engineering design of a laboratory-scale guard bed has been prepared. This unit was assembled and tested in the GTI laboratories in tests replicating temperatures, pressures, and gas compositions similar to those anticipated in aluminum remelt furnace exhaust gas. Long-term survivability will also be evaluated. A full report of calculations, analyses, test results, and projections for the demonstration unit to be built and tested in Phase 2 will be presented to sponsors for review and consideration.

Phase 2 - With the Energy Commission approval after Phase 1, GTI will choose a host site and assemble a demonstration unit. This unit will be used to preheat some or all the air needed for one or more furnace burners at the demonstration site. Results will be analyzed. A preliminary engineering design and estimated cost of a commercial guard bed system will be prepared based on demonstration unit results. A full report will be presented to the sponsors containing demonstration unit results and design and cost estimates of a commercial guard bed system. Work will be undertaken in Phase 2 to begin commercialization of this technology.

## **Justification and Goals**

Supports California's goal to the 2008 Program Plan and Funding Request as approved by the CPUC.

This project supports California's goal in relation to the 2008 Program Plan and Funding Request as approved by the CPUC. The project also facilitates the adoption of additional natural gas and electric efficiency programs and standards to reduce the reliance on natural gas for various end uses per the Energy Action Plan 2005 by:

- Improving energy efficiency, which will benefit California's metals reprocessing sector by decreasing fuel consumption and the associated expenses.
- Promoting early adoption, which will benefit California industry by providing a competitive advantage.

This will be accomplished by:

Demonstrating a practical, robust, and affordable technology to recover useful waste heat from corrosive industrial exhaust gases.