

State of California
AIR RESOURCES BOARD

Resolution 05-68

December 9, 2005

Agenda Item No.: 05-12-3

WHEREAS, the Air Resources Board has been directed to carry out an effective research program in conjunction with its efforts to combat air pollution, pursuant to Health and Safety Code Sections 39700 through 39705;

WHEREAS, a proposal Number 05b-07, entitled "Integrated CHP Using Ultra-Low-NOx Supplemental Firing," has been submitted by the Gas Technology Institute in response to the 2005 Innovative Clean Air Technologies (ICAT) Program solicitation;

WHEREAS, the proposal has been independently reviewed for technical and business merit by highly qualified individuals; and

WHEREAS, the Research Division staff and the Executive Officer and Deputy Executive Officers have reviewed and recommend for funding:

Proposal Number 05b-07, entitled "Integrated CHP Using Ultra-Low-NOx Supplemental Firing," submitted by the Gas Technology Institute, for a total amount not to exceed \$249,274.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code Section 39703, hereby approves the following:

Proposal Number 05b-07, entitled "Integrated CHP Using Ultra-Low-NOx Supplemental Firing," submitted by the Gas Technology Institute, for a total amount not to exceed \$249,274.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and agreements for the efforts proposed herein, and as described in Attachment A, in an amount not to exceed \$249,274.

I hereby certify that the above is a true and correct copy of Resolution 05-68, as adopted by the Air Resources Board.

Lori Andreoni, Clerk of the Board

ATTACHMENT A

Innovative Clean Air Technologies (ICAT) Grant Proposal: “Integrated CHP Using Ultra-Low-NOx Supplemental Firing”

Background

The Gas Technology Institute and its partners have developed a novel supplemental burner with reburning technology that can be used on combined heat and power applications. The burner uses a unique combination of stage combustion and internal recirculation to create a reburning zone that reduces NOx and NOx precursors in the turbine exhaust gas. The advanced burner can be used to meet future NOx and CO emission standards for combined heat and power applications without the use of catalytic emission control technologies.

Objective

The ICAT project would attempt to demonstrate the ability of the low-NOx burner to achieve NOx emission levels of less than 0.07 pounds per megawatt hour in combined heat and power applications.

Methods

A 10 million BTU per hour version of the burner will be tested in a laboratory using simulated turbine exhaust gas. The burner will then be demonstrated in the field on a 5 megawatt gas turbine manufactured by Solar Turbines. It is expected that the burner size for this application will be about 50 million BTU per hour. As part of the field demonstration, long-term reliability data will be collected.

Expected Results

It is expected that the burner will be able to achieve an emissions level of less than 0.07 pounds of NOx per megawatt hour in combined heat and power applications.

Significance to the Board

A successful demonstration would provide a technology that could be used to meet ARB’s standards for distributed generation applications.

Applicant: Gas Technology Institute

Project Period: December 9, 2005, to June 30, 2007

Principal Investigator: Rick Knight

ICAT Funding: \$249,274

Co-funding: \$2,201,006

Past Experience with this Principal Investigator:

This principal investigator has successfully completed a previous ICAT project.

Prior ICAT Funding to 2005

Year	2004	2003	2002
Funding	0	0	0

BUDGET SUMMARY

Gas Technology Institute

“Integrated CHP Using Ultra-Low-NOx Supplemental Firing”

<u>Direct Costs and Benefits</u>	<u>ICAT</u>	<u>Total</u>
1. Labor	\$ 70,571	\$599,265
2. Employee Fringe Benefits	\$ 26,111	\$109,460
3. Subcontractors	\$137,050	\$633,075
4. Equipment	\$ 0	\$ 0
5. Travel and Subsistence	\$ 15,542	\$ 87,654
6. Materials and Supplies	\$ 0	\$ 81,305
7. Other Direct Costs	<u>\$ 0</u>	<u>\$ 6,144</u>
Total	\$249,274	\$1,516,903
<u>Indirect Costs</u>		
1. Overhead	\$ 0	\$502,570
2. Other Indirect Costs	<u>\$ 0</u>	<u>\$430,807</u>
Total	<u>\$ 0</u>	<u>\$933,377</u>
Total Project Costs	\$249,274	\$2,450,280