

State of California  
AIR RESOURCES BOARD

RESEARCH PROPOSAL

Resolution 08-5

January 24, 2008

Agenda Item No.: 08-1-2

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 research proposal, number 2644-258, entitled "Developing a California Inventory for Industrial Applications of Perfluorocarbons, Sulfur Hexafluoride, Hydrofluorocarbons, Nitrogen Trifluoride, Hydrofluoroethers, and Ozone Depleting Substances," has been submitted by the Institute for Research and Technical Assistance, in response to RFP No. 07-313;

WHEREAS, the Research Division staff has reviewed and recommended this proposal for approval; and

WHEREAS, the Research Screening Committee has reviewed and recommends for funding:

Proposal Number 2644-258 entitled "Developing a California Inventory for Industrial Applications of Perfluorocarbons, Sulfur Hexafluoride, Hydrofluorocarbons, Nitrogen Trifluoride, Hydrofluoroethers, and Ozone Depleting Substances," submitted by the Institute for Research and Technical Assistance, for a total amount not to exceed \$199,840.

NOW, THEREFORE BE IT RESOLVED, that the Air Resources Board, pursuant to the authority granted by Health and Safety Code section 39703, hereby accepts the recommendation of the Research Screening Committee and approves the following:

Proposal Number 2644-258 entitled "Developing a California Inventory for Industrial Applications of Perfluorocarbons, Sulfur Hexafluoride, Hydrofluorocarbons, Nitrogen Trifluoride, Hydrofluoroethers, and Ozone Depleting Substances," submitted by the Institute for Research and Technical Assistance, for a total amount not to exceed \$199,840.

BE IT FURTHER RESOLVED, that the Executive Officer is hereby authorized to initiate administrative procedures and execute all necessary documents and contracts for the research effort proposed herein, and as described in Attachment A, in an amount not to exceed \$199,840.

I hereby certify that the above is a true and correct copy of Resolution 08-5, as adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

## ATTACHMENT A

### **“Developing a California Inventory for Selected Applications of Perfluorocarbons, Sulfur Hexafluoride, Hydrofluorocarbons, Nitrogen Trifluoride, Hydrofluoroethers, and Ozone Depleting Substances”**

#### **Background**

With the passage of the California Global Warming Solutions Act of 2006 (AB 32) the California Air Resources Board (ARB) is charged with developing and implementing mitigation strategies to enable the State of California to reach its goal of reducing carbon dioxide equivalent (CO<sub>2</sub>E) greenhouse gas (GHG) emission reductions to 1990 levels by 2020. As a starting point, the Climate Action Team (CAT) report, which was developed by several agencies through a stakeholder process, identified a suite of strategies for reducing the six Kyoto pollutants (i.e., CO<sub>2</sub>, methane, nitrous oxide, perfluorocarbons, hydrofluorocarbons, and sulfur hexafluoride). Other efforts, including the development of early actions under AB 32, have revealed additional opportunities to reduce emissions of GHGs, and it has become apparent to ARB staff that significant high-global warming potential (GWP) GHG emissions reductions are possible, particularly if ozone depleting substances (ODS) are considered.

#### **Objective**

The objectives of the project are to quantify emissions rates (during production and use), application growth rates, chemical substitution rates, banks, and end-of-life disposal emissions (if applicable) for each high-GWP GHG in each application. Mitigation strategies, such as emissions reductions associated with chemical substitutes, alternatives, and technology or process changes will be examined in terms of costs and benefits. The costs and benefits of recovery and/or destruction of high-GWP GHGs in each application will be estimated.

#### **Methods**

Inventory development methods include literature review and the design of survey instruments that focus on estimating high-GWP GHG production, installation, use, banks, and emissions in California, from the above-specified end-use-categories.

#### **Expected Results**

A detailed, bottom-up inventory for high-GWP GHG production, use, and banks in California is the end product expected from this project. Additionally, estimates of emissions and banks in a current year and in the year 2020 under a BAU scenario and under alternative scenarios will be provided. The alternative scenarios will describe, at a minimum, the impacts of the following measures on CO<sub>2</sub>E emissions over the lifecycles of the chemicals of interest: 1) high-GWP GHG control during production, installation, and lifetime; 2) high-GWP GHG substitutions, recovery, process changes and/or not-in-kind technologies where feasible; and 3) end-of-life management measures including recovery and destruction.

#### **Significance to the Board**

AB 32, the Global Warming Solutions Act of 2006, codifies in law targets to reduce CO<sub>2</sub>E GHG emissions to 1990 levels by 2020. Controlling high-GWP GHG emissions can lead to significant, cost-effective GHG reductions.

The development of a high-GWP emission inventory is a critical part of creating strategies to reduce GHG emissions; regulations cannot be enacted to reduce refrigerant emissions in a cost-effective manner without inventory development. The research proposed in this

project will produce a heretofore non-existent high-GWP GHG emission inventory for California, which will form the basis of ARB's future emissions reductions policies and allow California to meet its 2020 GHG emissions target.

**Contractor:**

Institute for Research and Technical Assistance (IRTA)

**Contract Period:**

24 months

**Principal Investigator (PI):**

Katy Wolf

**Contract Amount:**

\$199,840

**Indirect Cost Rate:**

IRTA is not charging indirect costs on this project.

**Past Experience with this Principal Investigator:**

Past experience with Katy Wolf within the Research Division and Stationary Sources Division has been positive; staff who have worked with Dr. Wolf note her diligence and commitment to delivering a quality project; Dr. Wolf also is known to complete tasks on time, within budget.

**Prior Research Division Funding to IRTA:**

Year	2007	2006	2005
Funding	\$0	\$200,000	\$0

## BUDGET SUMMARY

Contractor: Institute for Research and Technical Assistance

“Developing a California Inventory for Selected Applications of Perfluorocarbons, Sulfur Hexafluoride, Hydrofluorocarbons, Nitrogen Trifluoride, Hydrofluoroethers, and Ozone Depleting Substances”

### **DIRECT COSTS AND BENEFITS**

1.	Labor and Employee Fringe Benefits	\$ 191,550 <sup>1</sup>
2.	Subcontractors	\$ 0
3.	Equipment	\$ 0
4.	Travel and Subsistence	\$ 5,950
5.	Electronic Data Processing	\$ 0
6.	Reproduction/Publication	\$ 1,800
7.	Mail and Phone	\$ 540
8.	Supplies	\$ 0
9.	Analyses	\$ 0
10.	Miscellaneous	<u>\$ 0</u>
	Total Direct Costs	\$199,840

### **INDIRECT COSTS**

1.	Overhead	\$ 0
2.	General and Administrative Expenses	\$ 0
3.	Other Indirect Costs	\$ 0
4.	Fee or Profit	<u>\$ 0</u>
	Total Indirect Costs	<u>\$0</u>

### **TOTAL PROJECT COSTS**

**\$199,840**

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<sup>1</sup> The majority of the budget is devoted to reasonable salaries for the PI, Staff Scientist, and Administrator. No fringe benefits are requested, and the rest of the budget consists of modest travel and administrative expenses.