

State of California  
AIR RESOURCES BOARD

Resolution 05-18  
February 24, 2005

Agenda Item No.: 05-2-3

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 05-29, entitled "Innovative Means To Minimize Electric GSE Charging Infrastructure Costs", has been submitted by Electric Transportation Engineering Corporation 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 05-29, entitled "Innovative Means To Minimize Electric GSE Charging Infrastructure Costs", by Electric Transportation Engineering Corporation, for a total amount not to exceed \$120,250.

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 05-29, entitled "Innovative Means To Minimize Electric GSE Charging Infrastructure Costs", by Electric Transportation Engineering Corporation, for a total amount not to exceed \$120,250.

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 \$120,250.

I hereby certify that the above is a true  
and correct copy of Resolution 05-18, as  
adopted by the Air Resources Board.

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Lori Andreoni, Clerk of the Board

## ATTACHMENT A

Innovative Clean Air Technologies (ICAT) Grant Proposal:

### **“Innovative Means To Minimize Electric GSE Charging Infrastructure Costs”**

#### **Background**

ETEC has developed an electronic controller that allows battery charging infrastructure for electric pushback tractors to be installed without the need to install a new power supply circuit for the charger. The ETEC Bridge Power Manager (BPM) allows the power supply circuit for the passenger bridge at each gate of an airport to also supply power for a battery charger located at or near that passenger gate. Sharing an existing power supply can greatly reduce the cost of electrifying pushback tractors.

#### **Objective**

The project should show allow the electric pushback tractor to be recharged from the power supply that serves the passenger bridge without compromising the service of either the tractor or the bridge.

#### **Methods**

The BPM will be installed at San Francisco International Airport at a passenger gate operated by United Airlines. An electric for a period of 6 months. Data will be collected during the operating period to validate proper operation of the BPM. Upon completion pushback tractor and BPM will be operated of the demonstration period, the capacity of the electric pushback propulsion battery will be tested to verify that the BPM has provided sufficient electrical power to maintain the battery capacity.

#### **Expected Results**

The project should show that both the pushback tractor and the passenger bridge can share a single power supply without compromising the performance of either device.

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

The technology would reduce the cost of airlines' compliance with the ARB/SCAQMD/EPA/industry memorandum of understanding about the reduction of diesel PM emissions.

**Applicant:** Electric Transportation Engineering Corporation (Phoenix, Arizona)

**Project Period:** February 18, 2005, to October 18, 2005

**Principal Investigator:** Donald Karner, President

**ICAT Funding:** \$120,250

**Co-funding:** \$141,180

**Past Experience with This Principal Investigator:**

ETEC had a previous ICAT grant that was conducted successfully and professionally.

**Prior ICAT Funding to 2005**

Year	2004	2003	2002
Funding	0	0	0

## BUDGET SUMMARY

Electric Transportation Engineering Corporation

**“Innovative Means to Minimize Electric GSE Charging Infrastructure Costs”**

<b><u>Direct Costs and Benefits</u></b>	<b><u>ICAT</u></b>	<b><u>Total</u></b>
1. Labor	\$ 68,434	\$ 68,434
2. Employee Fringe Benefits	\$ 7,309	\$ 7,309
3. Subcontractors	\$ 2,000	\$ 47,480
4. Equipment	\$ 0	\$ 12,500
5. Travel and Subsistence	\$ 12,000	\$ 12,000
6. Materials and Supplies	\$ 4,130	\$ 11,330
7. Other Direct Costs	<u>\$ 0</u>	<u>\$ 76,000</u>
Total	\$ 93,873	\$235,053
 <b><u>Indirect Costs</u></b>		
1. Overhead	\$ 26,377	\$ 26,377
2. Other Indirect Costs	<u>\$ 0</u>	<u>\$ 0</u>
Total	<u>\$ 26,377</u>	<u>\$ 26,377</u>
<b>Total Project Costs</b>	<b>\$120,250</b>	<b>\$261,430</b>