

## ENERGY STORAGE DEMONSTRATION FOR RAIL TRANSIT VEHICLE OPERATION

**AGENCY:** Federal Transit Administration (FTA), DOT

**ACTION:** Notice for Request for Applications (RFA)

**SUMMARY:** *Protect the Environment and Promote Energy Independence* is one of FTA's five Strategic Research Goals. Under this goal, FTA has set forth objectives to identify, analyze and demonstrate cost-effective energy conservation technologies for rail transit systems. A technology area with substantial promise is regenerative braking combined with efficient energy storage. Rail systems have the potential for recovering lost kinetic energy through regenerative braking of rail cars. Recovered energy can be directed to the third rail or catenary to be used by nearby trains, or stored in on-board or wayside energy storage devices. Regenerative braking combined with energy storage technologies could increase the efficiency of rail propulsion systems by substantially reducing energy losses. This RFA seeks applications to demonstrate regenerative braking and energy storage technologies (on-board or/and wayside) for rail transit propulsion systems.

**DATES:** Applicants must submit proposals electronically to <http://www.grants.gov> by October 3, 2008 for consideration. All potential applicants are advised to begin the <http://www.grants.gov> registration process immediately, if they have not previously submitted Federal assistance applications through <http://www.grants.gov>, in order to be able to meet the deadline. FTA expects to award funds through a cooperative agreement in January 2009. In the event of a system problem or technical difficulty with the application submittal, applicants should contact the FTA Project Manager for delivery instructions.

**ADDRESSES:** The website <http://www.grants.gov> allows applicant organizations to electronically find and apply for competitive opportunities from all Federal agencies that award Federal assistance. This website is the single access point for over 1000 Federal assistance programs administered by 26 Federal agencies.

**FOR FURTHER INFORMATION CONTACT:** Technical, program management and administrative questions should be directed to Roy Chen, Office of Technology (TRI-20), Room E43-440, Federal Transit Administration, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, Washington, D.C. 20590; email address: RoyWeiShun.Chen@dot.gov, or by phone at 202-366-0462.

### SUPPLEMENTARY INFORMATION:

#### Background

FTA's research activities are authorized by 49 USC 5312, Research, Development, Demonstration, and Deployment Projects. *Protect the Environment and Promote Energy Independence* is one of FTA's five Strategic Research Goals. Under this goal, FTA has set forth objectives to identify, analyze and demonstrate cost effective energy conservation technologies for rail transit systems.

There are a total of 11,110 heavy rail vehicles and 1,645 light rail vehicles in revenue service across the country, according to 2007 APTA Public Transit Factbook. Respectively, they consumed an estimated 3,768,605 MWh and 570,718 MWh of electricity annually. A substantial percentage of the life cycle energy use is for the operation of the rail vehicles, particularly the propulsion system.

Bay Area Rapid Transit (BART), Pacific Gas & Electric Company (PG&E) and BASE Energy Inc. conducted and published an “Energy Efficiency Assessment of Bay Area Rapid Transit Train Cars” in November 2007 (<http://www.bart.gov/docs/BARTenergyreport.pdf>). The study identified and analyzed eight different energy saving technologies that could potentially save an estimated 43.1% of BART cars’ total electrical usage, with a projected cost savings of over \$13M per year (cost saving calculations included P&G incentive or cash rebate program). One of the opportunities identified in the study is to retrofit existing rail cars with regenerative braking systems and on-board untracapacitor energy storage devices. In addition, industry stakeholders commenting on the FTA’s Electric Drive Strategic Plan have voiced their support for rail transit demonstration projects in the area of energy storage as an important area of research.

### **Objectives**

This RFA seeks applications to demonstrate regenerative braking and energy storage technologies (on-board or/and wayside) for rail transit propulsion systems.

### **Project Description**

FTA seeks to fund a rail energy storage demonstration project to provide data about the reliability of regenerative braking and energy storage technologies, and document the energy savings and expected return on investment (ROI) of the technologies demonstrated.

The selected proposal shall include a transit agency operating an existing rail system. Project partners shall work with the transit agency, or vice versa, to identify and select the technologies to be retrofitted to the existing rail transit system, make any adjustments to operating procedures, safety standards and guidelines, install the system, conduct training, and perform and evaluate the system demonstration.

FTA involvement will include approving key decisions and activities, attending review meetings, review interim and final reports, maintaining frequent contact with the project manager and redirecting activities if needed.

All proposed research project must:

- 1) Establish the scope of the demonstration project (types of regenerative braking/energy storage configurations and technologies, types of rail systems involved, number of regenerative braking systems and on-board and/or wayside energy storage systems, projected demonstration track miles, length of demonstration, revenue service demonstration or test track demonstration, etc) , and partners involved.
- 2) Establish a data collection and evaluation plan.

- 3) Establish a project management plan.
- 4) Perform ROI analysis of the demonstration (equipment cost, maintenance cost, installation cost, energy savings, etc).

**Award Information**

FTA may fund one application under this notice. Funding for the cooperative agreement under this notice will range from \$200,000 to \$300,000. The total available funding is \$300,000. Future funding will depend on Appropriations.

**Cost Sharing or Matching**

Federal transit funds are available to research projects at up to 100 percent of the project cost. However, cost sharing is an evaluation criterion.

**Eligibility Information**

Eligible recipients include State and local government agencies, public and private transit agencies, universities, non-profit organizations, consultants, legally constituted public agencies, operators of public transportation services, and private for-profit organizations. All proposals must include a transit agency partner operating an existing rail transit system (an existing rail system is one carrying passengers in revenue service). Rail transit systems include heavy rail, light rail, street cars, electric trams, and commuter rail systems. .

**Proposal Content**

This announcement includes all of the information that you need to apply. The following form is available in grants.gov and is required to be completed:

1. SF 424 Mandatory

SF 424 Mandatory

Most of SF424 is self explanatory. The application should answer the following items as follows:

- 1a – application
- 1b – annual
- 4a – Leave blank
- 4b – 26

Other Attachments Form:

1. The application should attach a pre-application (not more than 15 pages in length) as outlined in Chapter II (Item 9.b) of FTA Circular 6100.C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines. [http://www.fta.dot.gov/laws/circulars/leg\\_reg\\_4121.html](http://www.fta.dot.gov/laws/circulars/leg_reg_4121.html)

This pre-application should also address the six criteria laid out below in the Application Review Information section. The project budget justification should include identification of any matching funds and their source. The Formal Application described in the Circular is not being requested at this time.

2. The application should attach information on the qualifications of key personnel, including biographies.

Anyone intending to apply should initiate the process of registering on <http://www.grants.gov> and submit the application by October 3, 2008 for consideration. All potential applicants are advised to begin the <http://www.grants.gov> registration process immediately, if they have not previously submitted Federal assistance applications through <http://www.grants.gov>, in order to be able to meet the deadline.

### **Application Review Information**

A review panel will be convened to review each proposal. Project proposals will be evaluated based on the following criteria;

1. Proposed Research, which includes the applicability of the proposed research to the requirements, the uniqueness of the research approach or the need for the research, and the expected results. Projects should be narrowly defined to demonstrate regenerative braking and energy storage technologies (on-board and/or wayside) for rail transit systems. Proposals should explain and quantify how the technology and system will increase the efficiency of rail transit operations. The proposal must include the number of vehicles and wayside energy storage devices, projected demonstration miles, a description of demonstration miles (i.e., revenue service, test track, etc.), and any connections to similar or existing projects.
2. Qualifications of Key Personnel, which includes knowledge of and prior experience with regenerative braking systems, transit rail vehicle design and manufacturing, energy storage design and manufacturing, rail transit operations and maintenance, and energy assessment studies.
3. Technical Management Plan, which includes the management approach for planning, scheduling, administering, coordinating and conducting the work effort.
4. Past Performance on activities relevant to the proposed work.
5. Cost, Cost Sharing and industry partnerships
6. Plan for evaluation and data collection. The proposal must address how success will be measured, including ROI analysis of the demonstration (a plan to provide objective analysis of the energy storage technology and system performance).

**Award Administration Information**

The notification date for successful applications is expected to be during the November of 2008. Following receipt of the notification letters, the successful entities will be required to submit the Formal Application as outlined in Chapter II (Items 10-25) of FTA Circular 6100.C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines [http://www.fta.dot.gov/laws/circulars/leg\\_reg\\_4121.html](http://www.fta.dot.gov/laws/circulars/leg_reg_4121.html) through the FTA Transportation Electronic Award Management (TEAM) system website.

FTA will manage the cooperative agreement through the TEAM system. Before FTA may award Federal financial assistance through a Federal grant or cooperative agreement, the entity must submit all certifications and assurances pertaining to itself and its project as required by Federal laws and regulations. FTA has consolidated the various certifications and assurances that may be required of its awardees and the projects into a single document published in the Federal Register. Fiscal year 2008 Annual List of Certifications and Assurances for FTA Grants and Cooperative Agreements and guidelines was published in the Federal Register and posted on the FTA Web site at: [http://www.fta.dot.gov/funding/apply/grants\\_financing\\_7411.html](http://www.fta.dot.gov/funding/apply/grants_financing_7411.html) .

Recipients will be required to manage their projects in accordance with FTA Circular 6100.C: Transit Research and Technology Programs: Application Instructions and Program Management Guidelines: [http://www.fta.dot.gov/laws/circulars/leg\\_reg\\_4121](http://www.fta.dot.gov/laws/circulars/leg_reg_4121) . This includes requirements for project management and administration, including quarterly reporting, financial management, and payments.