FTA

FEDERAL TRANSIT ADMINISTRATION

REPORT SUMMARY

U.S. Department of Transportation
Federal Transit Administration

Transit Investments for Greenhouse Gas and Energy Reduction Program: Second Assessment Report

Background

In 2009, the U.S. Department of Transportation's Federal Transit Administration (FTA) implemented a new program to promote energy savings and sustainable technologies to the transit industry. The Transit Investments for Greenhouse Gas and Energy Reduction (TIGGER) Program made funds available for capital investments over a three-year period from 2009 through 2011 that would reduce greenhouse gas (GHG) emissions or lower the energy use of public transportation systems.

Over the next few years, data will be collected, compiled, and analyzed on each project to determine the overall impacts and assess how each project has contributed toward meeting overall program goals. To aid in the analysis, FTA entered into an interagency agreement with the National Renewable Energy Laboratory (NREL) to provide a third-party assessment. NREL is working with the TIGGER project partners to gather the data and information needed for the assessment.

Objectives

The purpose of this report is to provide an overview and preliminary analysis of the TIGGER Program. The report outlines the program history, goals, and technologies being implemented. It also provides analysis of energy and GHG savings estimates. The report also provides a description and current status of each project awarded in the program. This report is the second assessment report on the program and includes results from the data collected through March 2014.

Findings and Conclusions

Annual cost savings for reduced fuel and electricity use by the reporting projects totals more than $3 million, and overall cost savings for agencies providing data is $1.22 per TIGGER dollar awarded.

Under the TIGGER program, nearly $225 million in total grants have been awarded to 88 competitively-selected projects implementing a wide variety of technologies including building efficiency improvements, solar installations, wind technology, wayside energy storage for rail, and purchase of technologically innovative energy efficient buses. The awarded projects are geographically diverse, covering 35 states and 68 different transit agencies in both urban and rural settings.

The projects awarded under the program are progressing. As of the end of March 2014, 59% of the TIGGER projects had been completed (51 of 86). The majority (34) of those completed projects have provided a full year of data. The

lifetime savings and per TIGGER dollar amounts will be recalculated once all data are collected. To date, these projects represent a combined annual energy savings of 107,753 million British thermal units (MBtu), or 24,801,896 kilowatt-hours (kWh), and a reduction in GHG emissions (carbon dioxide equivalent, CO_2^e) of 30,863 tons.

Based on actual annual savings attributed to the technologies used, the program has resulted in the following:

- Bus efficiency projects have reported savings totaling more than 16,921 MBtu and 1,594 fewer tons CO_2^e emissions.
- Rail projects completed to date have resulted in an energy reduction of 16,887 MBtu.
  Facility efficiency projects have shown the most promise in reducing energy use, resulting in a combined reduction in annual energy use of 73,945 MBtu and 29,270 fewer tons CO_2^e emissions.
- Solar projects reported an annual energy savings of 17,230 MBtu.
- Wind projects reported an annual energy reduction of 505 MBtu.
- Geothermal projects reported a 97-ton decrease in CO_2^e emissions.

Benefits

The annual cost savings for reduced fuel and electricity use by the reporting projects totals more than $3 million using the average cost of fuel and electricity in 2011 provided by the Energy Information Agency. The calculations for the per-TIGGER-dollar savings use the expected lifetime of the technology, the annual cost savings and the TIGGER award amount. The overall cost savings for the agencies that have provided data is $1.22 per TIGGER dollar awarded. Some of these projects provided a partial data set; however, the total TIGGER award to the agency was used to calculate this amount. Once complete data sets are submitted, this number should increase.

NREL quantified GHG emission reductions (CO_2^e) using the Social Cost of Carbon (SCC) estimates published by the Environmental Protection Agency. These costs are used in this report to quantify the social benefits, or avoided costs, of GHG emissions reductions achieved by the TIGGER projects. The CO_2^e emission reductions have resulted in the following:

Annual Social Cost of CO2, 2015–2050 (in 2011 $)

Year	Discount Rate and Statistic			
	5% Average	3% Average	2.5% Average	3% 95th Percentile
2015	$369,537.60	$1,200,997.20	$1,878,482.80	$3,572,196.80
2020	$400,332.40	$1,416,560.80	$2,094,046.40	$4,218,887.60
2025	$461,922.00	$1,539,740.00	$2,278,815.20	$4,711,604.40
2030	$523,511.60	$1,693,714.00	$2,463,584.00	$5,235,116.00
2035	$615,896.00	$1,847,688.00	$2,617,558.00	$5,758,627.60

Project Information

FTA Report No. 0064

This research project was conducted by Leslie Eudy, Melanie Caton, and Matt Post of the National Renewable Energy Laboratory. For more information, contact FTA Project Manager Matthew Lesh at (202) 366-0953, matthew.lesh@dot.gov. All research reports can be found at **www.fta.dot.gov/research**.