



Amber Kinetics Inc. Flywheel Energy Storage Demonstration

Project Description

Amber Kinetics is developing a flywheel system from sub-scale research prototype to full-scale mechanical flywheel battery and will conduct a commercial-scale demonstration. The goal is to deliver a cost-effective prototype flywheel system that can be grid connected and electrically charged and discharged. The flywheel stores energy in a spinning rotor that is connected to an electric motor that converts electrical energy into mechanical energy. To recover the energy, the motor is electrically reversed and used as a generator to slow down the flywheel converting the mechanical energy back into electrical energy. Amber Kinetics will improve the traditional flywheel system by engineering breakthroughs in three areas, resulting in higher efficiency and radically reduced cost: bearings, low-cost rotor, and high-efficiency motor generator. This technology can also be used to optimize existing infrastructure.

Goals/Objectives

- Deliver a prototype system that can be grid connected and electrically charged and discharged
- Develop a commercial-scale prototype of the flywheel technology
- Provide a plan to scale the system to cost-effective price points
- Achieve energy storage efficiencies greater than 85 percent

Key Milestones

- Proof spin tested (September 2011)
- Long term material fatigue testing completed (September 2012)
- Commercial Scale flywheel system design completed (June 2013)
- Commercial Scale flywheel system spin testing completed (December 2014)
- Commercial Scale system installed and data collected (June 2015)
- System Testing and Data collection reviewed (September 2015)

Benefits

- Green job creation
- Electricity costs lowered
- Renewable energy integration
- U.S. energy security strengthened
- Greenhouse gas emissions reduced



CONTACTS

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PARTNERS

Test Devices Inc.
San Diego Gas and Electric

PROJECT DURATION

3/1/2010–12/31/2014

BUDGET

Total Project Value
\$7,457,591

DOE/Non-DOE Share
\$3,694,660/\$3,762,931

EQUIPMENT

Power Electronics
Motor-Generator
Rotor/Bearings
Vacuum Enclosure

DEMONSTRATION STATES

California

CID: OE0000232

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