



SustainX Inc Isothermal Compressed Air Energy Storage

Project Description

SustainX is developing and demonstrating a modular, market-ready energy storage system that uses compressed air as the storage medium. SustainX uses a crankshaft-based drivetrain to convert electrical energy into potential energy stored as compressed air.

SustainX's ICAES system captures the heat from compression in water and stores the captured heat until it is needed again for expansion. Storing the captured heat eliminates the need for a gas combustion turbine and improves efficiency. SustainX achieves isothermal cycling by combining patented innovations with a design based on mature industrial components and principles. The system is designed for a 20-year lifetime. It achieves full power output from start-up in less than one minute, and it does not use toxic chemicals.

Goals/Objectives

- Demonstrate the viability of isothermal compressed air technology to provide cost-effective energy storage
- Validate scalability for applications in both low- and medium-voltage distribution or sub-transmission grids

Key Milestones

- Pilot 40 kW prototype design and testing Completed (March 2011)
- Crankshaft installation (January 2013)
- Start-up testing (2nd Half of 2013)
- MW-scale pilot test completion (December 2013)
- Submit final technical report (March 2015)

Benefits

- Substitutes for transmission and distribution upgrades
- Supports the delivery of variable renewables
- Maintains the stability of the grid
- Reduces the need for gas-fired peaker units
- Increases grid efficiency through new grid managements strategies
- Reduces greenhouse gas emissions
- Reduces electricity costs
- Uses no toxic chemicals



CONTACTS

Ronald Staubly

Project Manager
National Energy Technology Laboratory
3610 Collins Ferry Road
Morgantown, WV 26507-0880
304-285-4828
Ronald.Staubly@netl.doe.gov

Benjamin Bollinger

Principal Investigator
SustainX Inc
72 Stard Rd.
Seabrook, NH 03874
603-601-7805
bbollinger@sustainx.com

PARTNERS

MAN Diesel and Turbo SE
Creare
The Hope Group
MTechnology

PROJECT DURATION

06/15/10–12/31/14

BUDGET

Total Project Value
\$13,046,588

DOE/Non-DOE Share
\$5,396,023/\$7,650,565

EQUIPMENT

Omegadyne PX319 Pressure Sensors
Nanmac Thermocouples
Tenma 72-6628 DC Power Supply
Dynaload DLVP 50-300-3000A

DEMONSTRATION STATES

New Hampshire

CID: OE0000231

*Managed by the National Energy
Technology Laboratory for the Office of
Electricity Delivery and Energy Reliability*