

*Exceptional service in the national interest*



Sandia  
National  
Laboratories

# *Sandia National Laboratories*

## ARP Ae Summit 2012



Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

## Increase Building & Industrial EFFICIENCY

## Modernize the GRID

Solid-state lighting is an emerging technology with the potential to reduce energy consumption for lighting by a factor of

**3.6  
TIMES**

Sandia is helping to modernize Vermont's electric grid, working with DOE & the utilities to bring smart grid technologies to

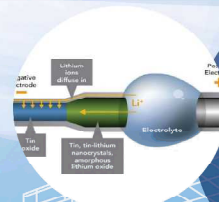
**85%  
of VERMONT  
CUSTOMERS**

Sandia's Smart Outlet is an autonomous intelligent electrical outlet for controlling loads for power grids with a high percentage of renewable resources



The BATLab is equipped with 4 mechanical abuse test systems to perform a variety of puncture, impact, or crush tests that can deliver up to

**120,000 LBS  
OF APPLIED LOAD**



World's Smallest Single  
**NANOWIRE BATTERY**  
study inside a transmission electron microscope and consists of a single nanowire which is **1/7,000**  
the thickness  
of a human hair!

The Sandia  
**COOLER** has  
**3.6  
TIMES**  
lower thermal resistance than  
a conventional CPU cooler

High Temperature  
**SiC Power Module**  
reduces the size and volume of  
power electronic systems by an  
order of magnitude over present  
state-of-the-art silicon-based  
solutions while simultaneously  
reducing  
energy loss by  
greater than  
**50%**



## Deploy Clean ELECTRICITY

Microsystems-Enabled  
Photovoltaic uses  
microfabrication  
to produce solar  
cells as small as  
3-20 microns thick  
that require  
less  
semiconductor  
material

**30  
TIMES**

## Increase VEHICLE EFFICIENCY

The Combustion Research  
Facility has been working  
closely with U.S. engine  
manufacturers for more  
than

**30  
YEARS**



In the past 5 years  
Sandia has won  
**23  
AWARDS**



## Deploy Alternative FUELS

## ELECTRIFY the Fleet