Science and Engineering Solutions for Industrial Energy Efficiency Applications

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

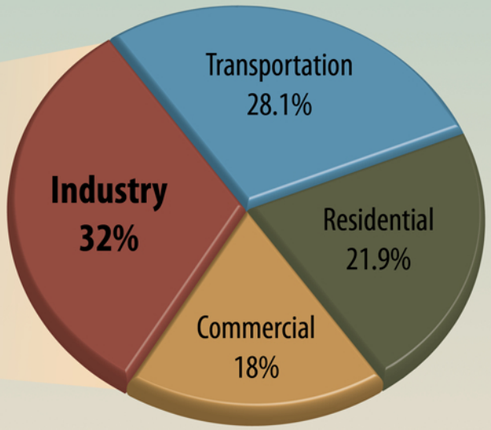
Mission: Improve our nation's energy security, climate, environment, and economic competitiveness by transforming the way U.S. industry uses energy.

Opportunity: U.S. Industry consumes 32 Quads/yr, produces ~25% of global manufacturing, employs 15 million people and supplies >60% of U.S. Exports

Reducing U.S. industrial energy intensity is essential to achieving national energy and carbon goals

Petroleum	38.1%
Natural Gas	33.3%
Electricity*	13.5%
Coal and Coke	8.5%
Renewable Energy	6.6%

*Excludes losses



www1.eere.energy.gov/industry

OAK RIDGE NATIONAL LABORATORY | U.S. DEPARTMENT OF ENERGY

Industrial Technologies Program

Save ENERGY Now

- 718 Assessments performed during 2006 – 2008
- ORNL support for assessments completed in 2006 – 2008
  - Technical review of reports
  - Training of assessment experts
- ORNL leads team that will deliver assessment and support resources to industrial customers
  - Enhanced assessments
  - Support for improved assessment implementation
  - Technical assistance
  - Improved outreach for industrial plants

Research Projects at ORNL

ADVANCED MATERIALS – For Clean Energy Technologies

http://www.ornl.itp.govtools.us/ActiveRD.aspx#A3

- Novel Refractory Materials for high-temperature, high-alkali environments
- Advanced Membrane Separations Technology
- Nanocoatings and nanocomposites for wear resistance
- AFA & CF8C-Plus stainless steels for structural applications
- Ti heat exchangers from new powders
- Shear rolling of Mg sheet
- Commercialization of carbon fiber materials
- Materials and processing for advanced batteries
- Photovoltaic materials

ENERGY EFFICIENT PROCESSES – Reducing Industrial Energy Intensity

www.ornl.itp.govtools.us/ActiveRD.aspx#A1

- Flexible Hybrid Friction Stir Joining Technology
- High Magnetic Processing – a heat-free, heat-treating method
- Improving heat recovery in biomass-fired boilers
- Near net shape manufacturing of new, low-cost titanium powders for industry

NANOMANUFACTURING – Enhanced material properties for energy savings, energy production and energy storage

www.ornl.itp.govtools.us/ActiveRD.aspx#A2

- Superhydrophobic coatings
- Nanocatalysts for refining and emission reduction
- Nanostructured carbon for water treatment
- Nanoscale interpenetrating phase composites
- Nanofermentation of quantum dots

Supporting Technologies at ORNL (www.ornl.itp.govtools.us)

- Corrosion-resistant materials
- Materials for waste heat recovery
- Materials for energy storage
- Materials for next generation photovoltaics
- Novel energy efficient joining
- Wear resistant nanostructured materials
- Combined Heat and Power (CHP)
- Sensors, information and communications technology
- Advanced Refractory Materials

ORNL HAS WORLD CLASS TECHNICAL COMPETENCIES AND FACILITIES

- Nation's largest concentration of open source materials research
- Nation's most diverse energy portfolio
- World's most powerful open scientific computing facility
- 4,400 employees
- 3,900 research guests annually

KEY STRENGTHS

- Advanced Materials
- Energy Technology
- Computing Science and Engineering
- Nuclear Science, Engineering and Technology
- Biotech and Environmental Sciences and Technology

HOW WE CAN WORK TOGETHER

- Work with you on cooperative R&D projects
- Subcontract with you
- Perform work for you under contract
- Make facilities available for your use
- Host your personnel via visiting research appointments
- License technology to you
- Consult for you

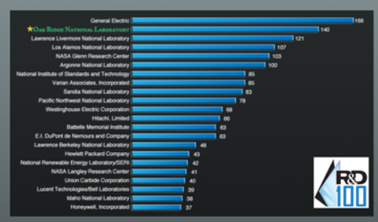
HIGH TEMPERATURE MATERIALS LAB

A User Facility for Materials

- Characterization
- Synthesis
- Testing

SPALLATION NEUTRON SOURCE

- The world's most powerful accelerator-based neutron source
- Center for Nanophase Materials Sciences
- UT-ORNL Joint Institute for Neutron Sciences



TOP WINNERS AS OF 2008