

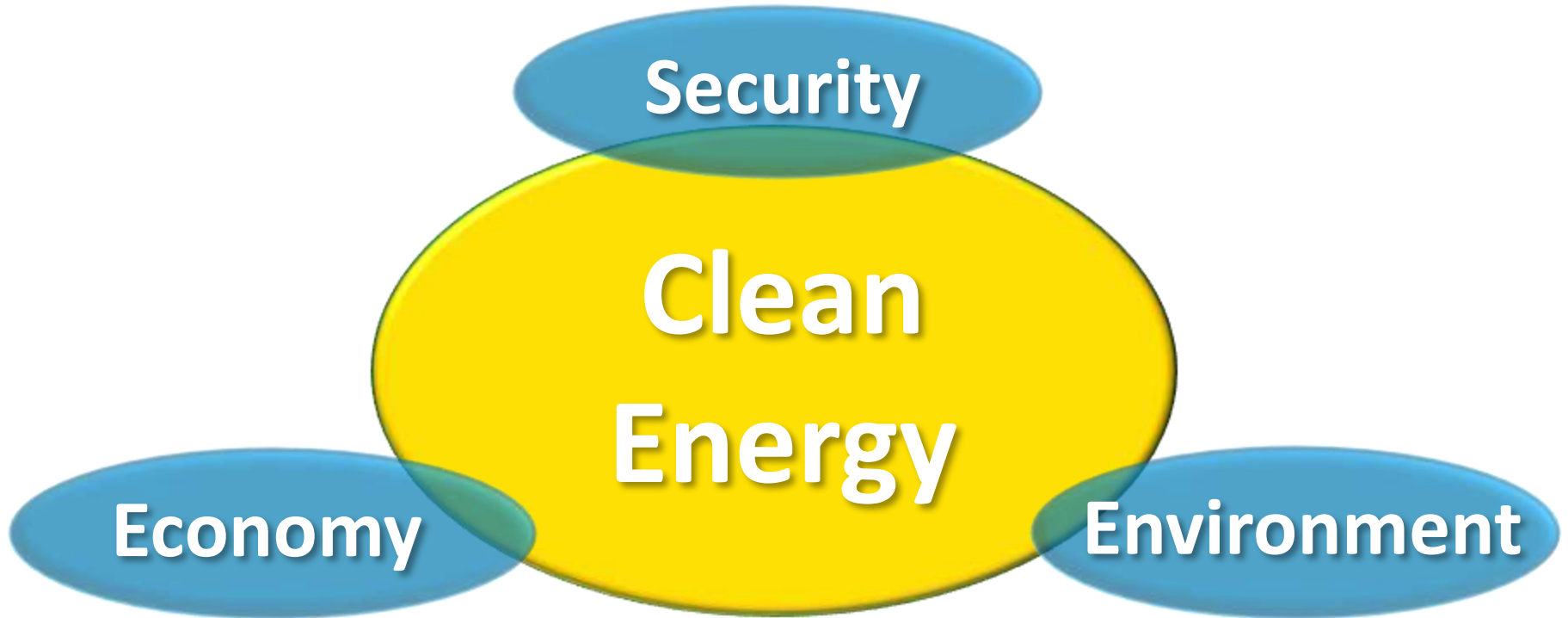
Industrial Energy Efficiency Program

U.S. Department of Energy



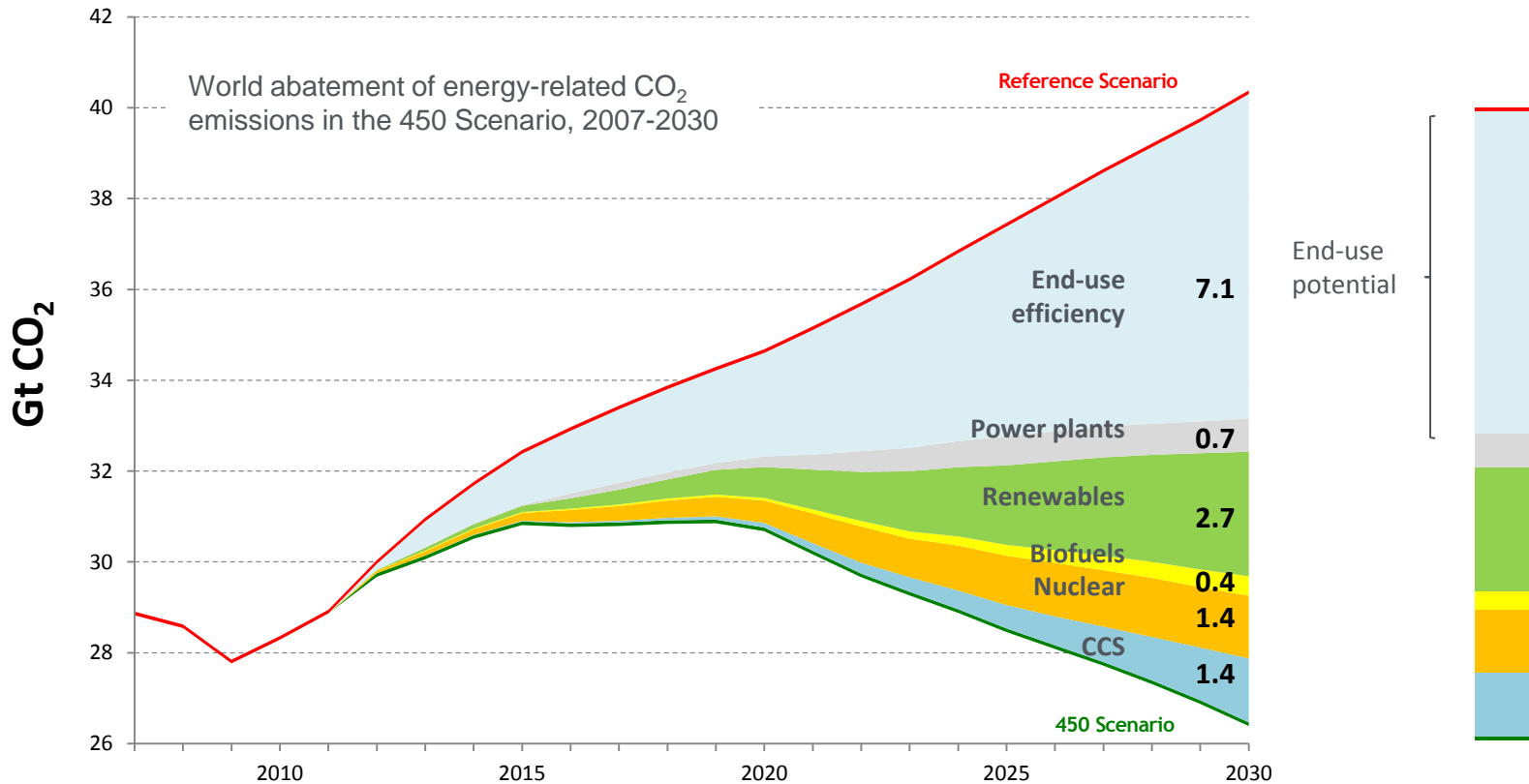
Webinar – Sept. 27, 2011

James Quinn,
U.S. Department of Energy



Energy links major global challenges

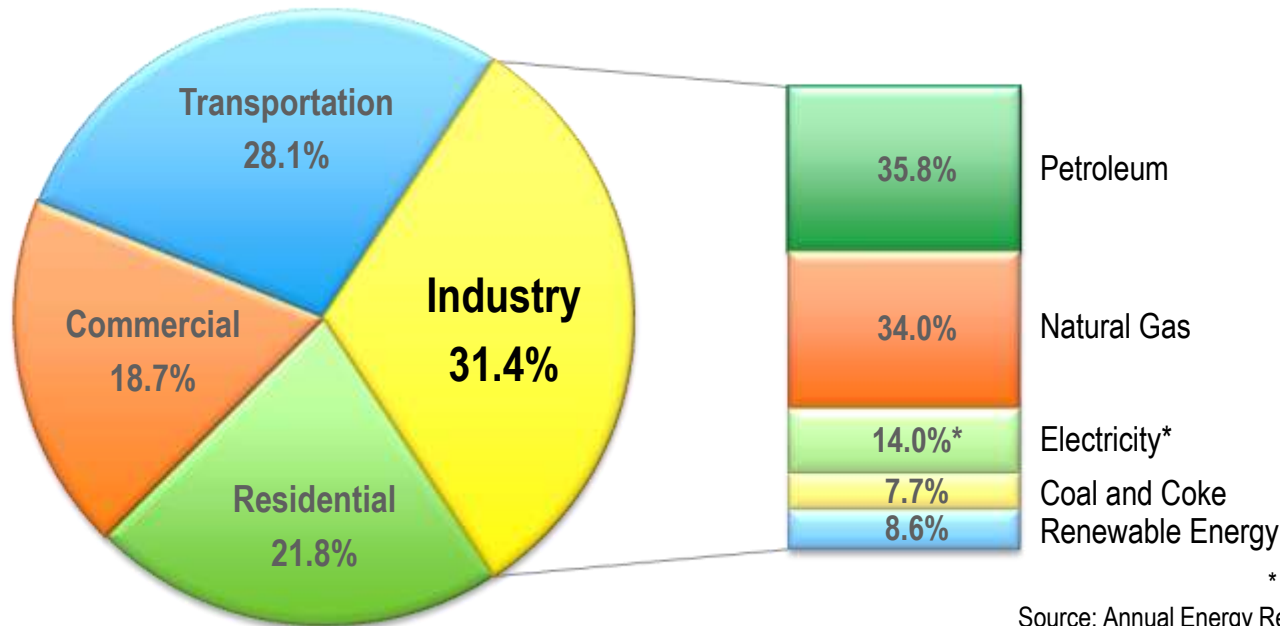
End-use efficiency is a key component of GHG emissions abatement potential



Notes: Gt refers to gigatons of carbon dioxide.
 "End-use efficiency" includes Buildings, Appliances, Lighting, Transportation, and Industry.
 OECD/IEA 2009, 2009
 Source: OECD/IEA 2009, *World Energy Outlook 2009*.

U.S. industry accounts for about one-third of all U.S. energy consumption.

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



* Excludes losses
Source: Annual Energy Review 2008, EIA.



Mission:

Reduce industrial energy and carbon intensity by partnering with industry to research, develop, and deploy advanced manufacturing technologies and energy management practices.

Objectives:

- Develop innovative technology to improve energy diversity, resource efficiency, and carbon mitigation
- Accelerate adoption of today's energy-efficient technologies and practices
- Harness scientific ingenuity, expand resources, and extend our outreach through strategic partnerships



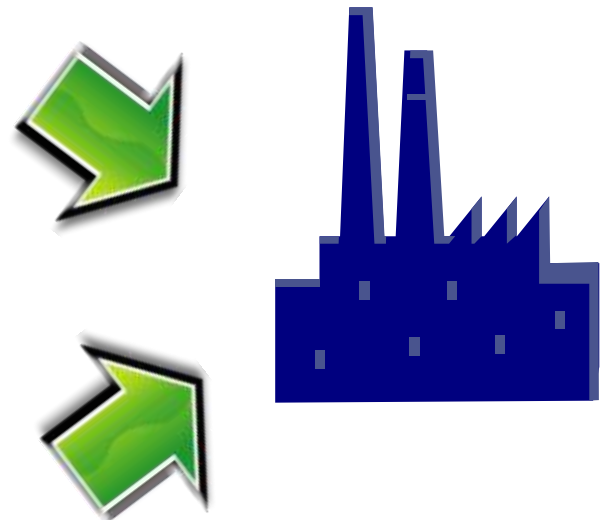
Research & Development (R&D)

Develop and demonstrate – at a *convincing scale* – new, energy-efficient manufacturing processes.

Develop and demonstrate – at a *convincing scale* – new, energy-efficient materials technologies

Energy Management and Technology Deployment

Establish scalable approaches to identify, deploy, certify and reward effective energy management practices and individuals.



Innovative Manufacturing Initiative – Announced as a key component of President Obama’s Advanced Manufacturing Partnership (launched June 24, 2011) to develop transformational manufacturing technologies and innovative materials that could enable manufacturing facilities to dramatically increase their energy efficiency.

Manufacturing Processes

- Broadly applicable
- Reduce energy intensity
- Efficiently direct energy to creating the product
- Examples: additive manufacturing, selective heating

Materials technologies

- Pervasive
- Reduce life-cycle energy requirements
- Result in low-cost, high-performance products
- Focus on high-value industries (e.g., renewable energy industry)
- Examples: low-cost carbon fiber, & composites, low-cost nanotechnology coatings

Resources to help manufacturers reduce energy use and carbon emissions *today* — and *continuously improve*.

Technical Assistance

- Tracking and managing energy intensity
- Project feasibility analysis
- Resource referrals

Tools

- Energy and carbon baselining
- Software tools for energy management

Training

- Awareness
- Tool User
- System /Topic
- Qualified Specialists
- Energy Management

Assessments

- Energy savings assessments
- Industrial Assessment Centers
- States/utilities

Standards

- Superior Energy Performance (SEP) 
- ISO 50001 
- Assessment standards, protocols, and metrics

Information

- Tip sheets, case studies
- Website, webcasts, databases
- EERE Information Center
- Supply chain guidance

Energy Management Tool Suite

Upgrades to proven tools and integration with new protocols and standards to facilitate energy management.

Basic and Advanced Levels:

- Steam
- Process Heating
- Pumps
- Fans
- Compressed Air
- Motors
- Data Centers

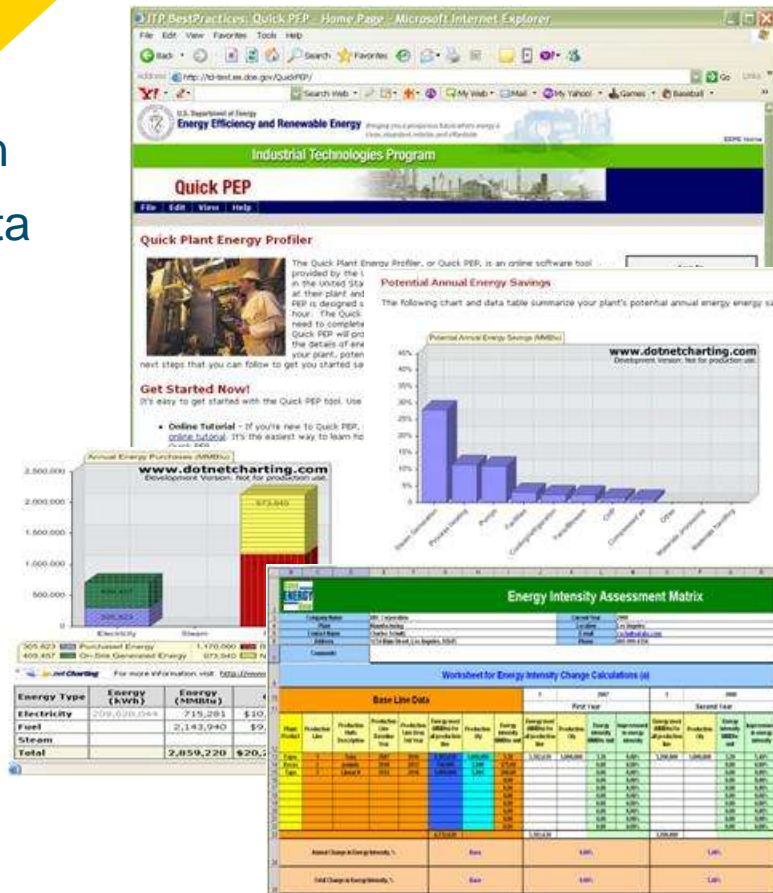


www.eere.energy.gov/industry/

Plant Energy Profiler (PEP)

INPUTS

- Plant description
- Utility supply data
- Energy use information



- Overview of plant energy
- Energy cost distributions
- Preliminary assessment
- Areas for improvement
- Energy reduction potential

OUTPUTS

http://www1.eere.energy.gov/industry/quickpep_ml

Training at several levels for:



**Energy Management
Training Seminars**



**Online Introductory
courses on Energy
System Tools**



**ISO 50001 Webinars and
Additional Energy
Management Topics
(1-2 hours)**



**Awareness Workshops
(1-2 hours)**



**End-User Best Practice
Training
(1 day)**



**Advanced/Qualified
Specialist Training
(3 days)**



Data Center workshops

**Between FY 2009 and FY 2011-Q2,
there were 4,333 who attended ITP-
sponsored trainings**

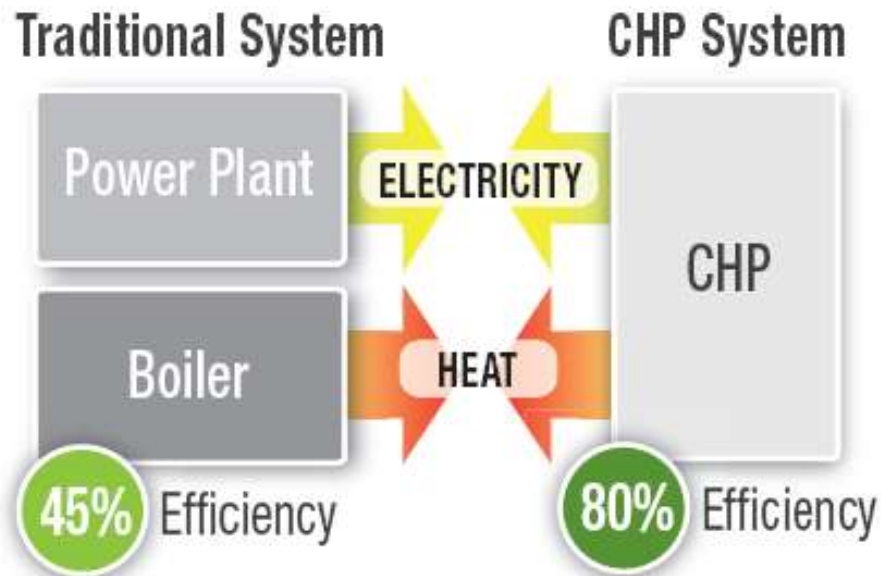
DOE's 24 University-Based IACs

- Provide assessments to small and medium-sized plants (energy costs <\$3 million/yr)
 - Identify \$175,000 to \$200,000 in potential annual energy savings per plant, with an average implementation rate of 35% to 45%
- Train engineering students for careers in industrial energy efficiency
- Help university professors stay connected to the technical needs in manufacturing
- Maintain database of recommendations to help other facilities identify opportunities.



Combined Heat & Power (CHP):

An integrated set of technologies for the simultaneous, *on-site* production of electricity and useful heat.



CHP *simultaneously*

- Reduces GHG emissions
- Promotes use of secure domestic and renewable energy sources
- Reduces exposure to energy price hikes and volatility



Technical

Save Energy Now
Longest-Serving Active Plant Uncovers New Ways to Save Significant Natural Gas Savings Achieved

Improving Process Heating Performance
A Handbook for Industry

Motor Systems
Save Energy Now in Your Motor-Driven Systems

Motor-driven equipment—such as pumps, air compressors, and fans—uses about 38% of all the energy used in U.S. industry, while consuming more than 700 billion kWh annually for electricity dedicated to motor-driven equipment.

Save Energy Now Case Study
STEEL

During the three-day assessment, employees can learn how to use the software tools for ongoing system analysis and use in other facilities. After completing the analysis, the Energy Expert shows the findings with employees and management and provides recommendations for improvement, including the associated potential savings for each.

Determine Cost Effective Recommendations
To help companies determine which Save Energy Now assessment recommendations will be economically feasible, DOE Energy Experts estimate high and low values of the capital costs for implementing each identified savings opportunity. The higher values are then used to estimate payback periods, which in steel cases, is two years or less.

Total potential energy cost savings identified:	\$105 million
Total potential avoided carbon emissions:	736,000 metric tons
Number of identified recommendations with a payback of 9 months or less:	44%
Total energy cost savings implemented:	\$8 million

Outreach

Save Energy Now
Industrial Technologies Program

Save Energy Now

ENERGY CHAMPION PLANT
2007 **Save Energy Now** 2007 **ENERGY CHAMPION PLANT**

Energy-Saving Opportunities for Manufacturing Enterprises

ISOHERMAL MELTING

First out how to...
Save Energy Now

Partnering with U.S. Industry

Collaborative R&D Best Practices

- Innovation Energy Technology
- Software Development and Software Tools
- Financial Assistance

Web Sites

Reduce your Energy Intensity 25% in 10 Years

Apply for an energy assessment
Download software tools and find training
Be recognized for your accomplishments
Sign up for information

How's Your ESP? Discover Your Energy Savings Potential

Take a quick online quiz today and see just how big your savings could be. Then explore 5 key resources and 2 assessment opportunities to make the savings real!

Energy Assessment	
Cost Savings	\$1 million
Natural Gas Savings	154,000 MMBtu
System Type	Steam
Industry	Forest Products

Ask an energy expert
An Energy Expert: Optimizing Industrial Fan Systems
Industrial equipment to power fans for mines and air distribution consumes a third amount of energy in industrial plants. Read the Ask an Energy Expert column to find out how to identify inefficient fans and determine the best way to optimize your fan system. [More](#)

Industrial Technologies Program
About the Program | Program Areas | Information Resources | Financial Opportunities | News

Financial Opportunities

Active Solicitations
To explore current financial opportunity solicitations, click on the arrows in the column.

Sort by: Technology
Sort by: State

Industry: Save Energy Now
Save Energy Now U.S. Department of Energy Program

Save Energy Now

Assessment Process

Energy Assessment: Assessment Process

Energy Assessment: To Get to Energy Savings

Print | Apply | Participate | Register | Download

NEW! Steel Case Study

Find out how Save Energy Now energy assessments revealed new opportunities to reduce costs and energy use. Read the case study (PDF, 353 KB). Download Adobe Reader.

www.eere.energy.gov/industry

ISO 50001: a new energy management standard for buildings and industry



Potential impacts:

- Could influence up to 60% of the world's energy use across many economic sectors

Companies will implement the standard in response to:

- Corporate sustainability programs
- Energy cost reduction initiatives
- Demand created along the manufacturing supply chain
- Carbon and energy legislation and international climate agreements



A market-based, ANSI/ANAB-accredited certification program that provides industrial and commercial facilities with a roadmap for continual improvement in energy efficiency while boosting competitiveness.

- Develops a transparent system to validate energy performance improvements and management practices
- Encourages broad participation throughout industry
- Supports and builds the energy efficiency market and workforce
- Uses the ISO 50001 standard as a foundational tool for energy management



International
Organization for
Standardization

Superior Energy Performance
for industry will be launched
nationwide in 2012.

Global Superior Energy Performance
announced at Clean Energy Ministerial in July 2010

Results

- Since 2006, DOE has **identified >\$1.6 billion in potential annual savings** from energy assessments conducted at 1,016 large plants and 2,178 small- and medium-sized facilities (July 2011)
 - **Plants *implemented* projects to achieve annual cost savings of about \$300 million:**
 - **Recognition has been provided to 1,014 plants** that implemented (within 1-2 years) energy-saving technologies and practices identified through assessments:
 - **211 Energy Champion Plants:** Saved >250 billion Btu or 15% of total energy use
 - **383 Energy Saver Plants:** Saved >75 billion Btu or 7.5% of total energy use

Sources: LBNL Large Energy Users Database, Version 2, 2006. LBNL data may not reflect all of the current large industrial energy consumers or changes in ownership of companies due to mergers and acquisitions since 2006; *Save Energy Now* Assessment Results. ESAMS Database. Oak Ridge National Laboratory. 1 July 2011.

Better Buildings, Better Plants Challenge

Part of President Obama's Better Buildings Initiative, with the goal of making buildings 20% more efficient by 2020 and saving \$40 billion for U.S. organizations.

- ITP is in the process of transitioning the framework and components of several of its energy management offerings for industry (e.g., *Save Energy Now* LEADER) to comprise the expanded Better Plants portion of the Better Buildings Challenge.

Key program elements

- Companies agree to 10-year, 25% energy intensity improvement target
- Companies establish baseline year and any progress made toward the target to-date
- Companies report annually on their progress
- DOE provides tools, training and assistance as needed
- DOE provides national recognition for their achievements

Industrial Energy Global Partnerships

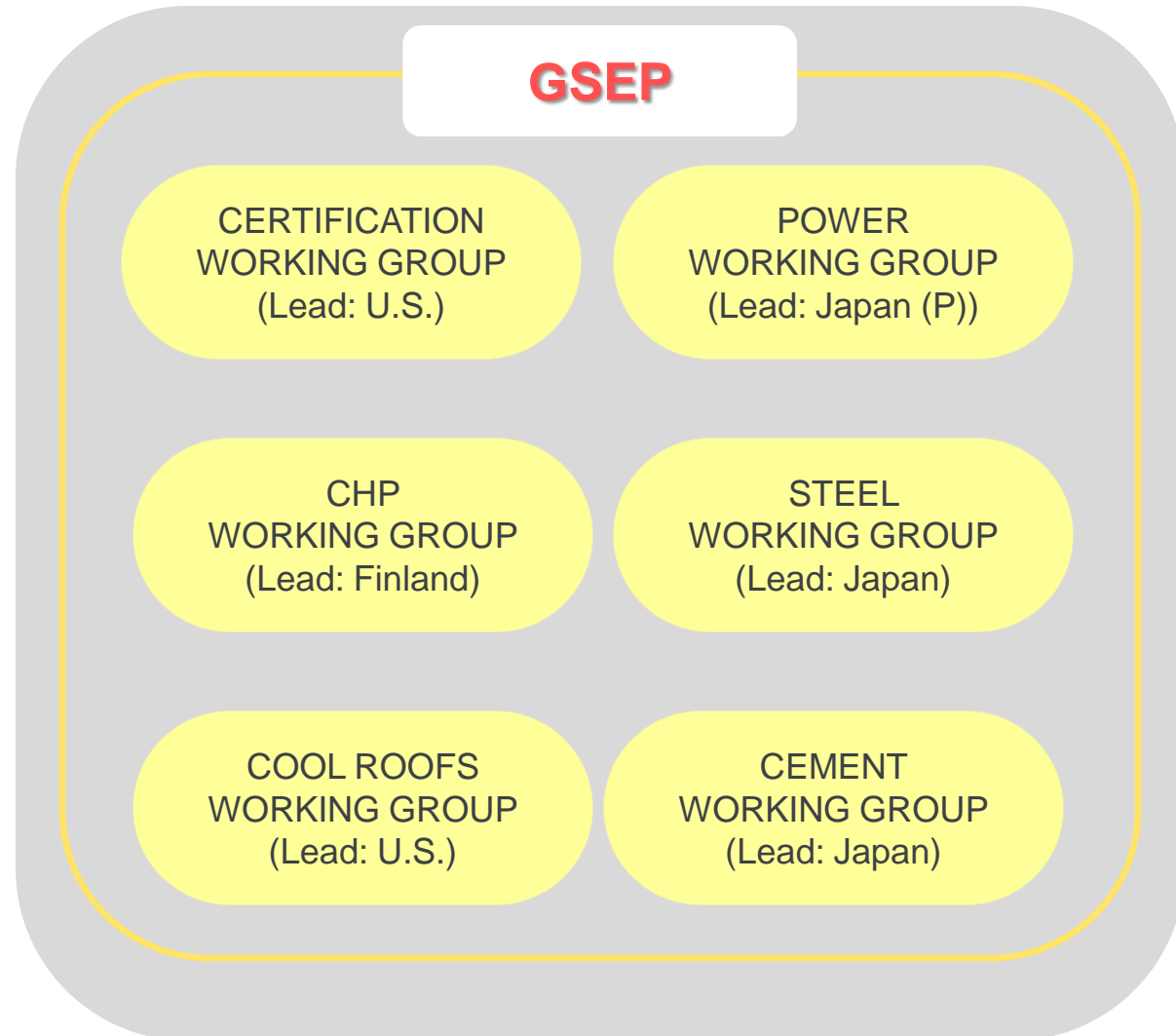
- Work with other countries and organizations to provide tools, training, technical information, and technical assistance to improve industrial energy efficiency.
- Share DOE's assessment software tools and protocols for international use.
- Foster replication of university-based assessment model to identify opportunities for energy savings and train the next -generation workforce.
- Partnership examples:
 - International Partnership for Energy Efficiency Cooperation
 - International Energy Agency
 - Bilateral Agreements with India, China, Russia, Brazil, Kazakhstan, Argentina



Global Superior Energy Performance (GSEP) Objective and Organizational Structure

GSEP Objective is to reduce global energy use by:

- Encouraging industrial facilities and commercial buildings to pursue continuous improvements in energy efficiency
- Promoting public-private partnership





Thank You!

James Quinn

james.quinn@ee.doe.gov

Industrial Technologies Program
Energy Efficiency and Renewable Energy

U.S. Department of Energy



U.S. DEPARTMENT OF
ENERGY