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

Industrial Energy Efficiency Program

U.S. Department of Energy

Webinar – Sept. 27, 2011

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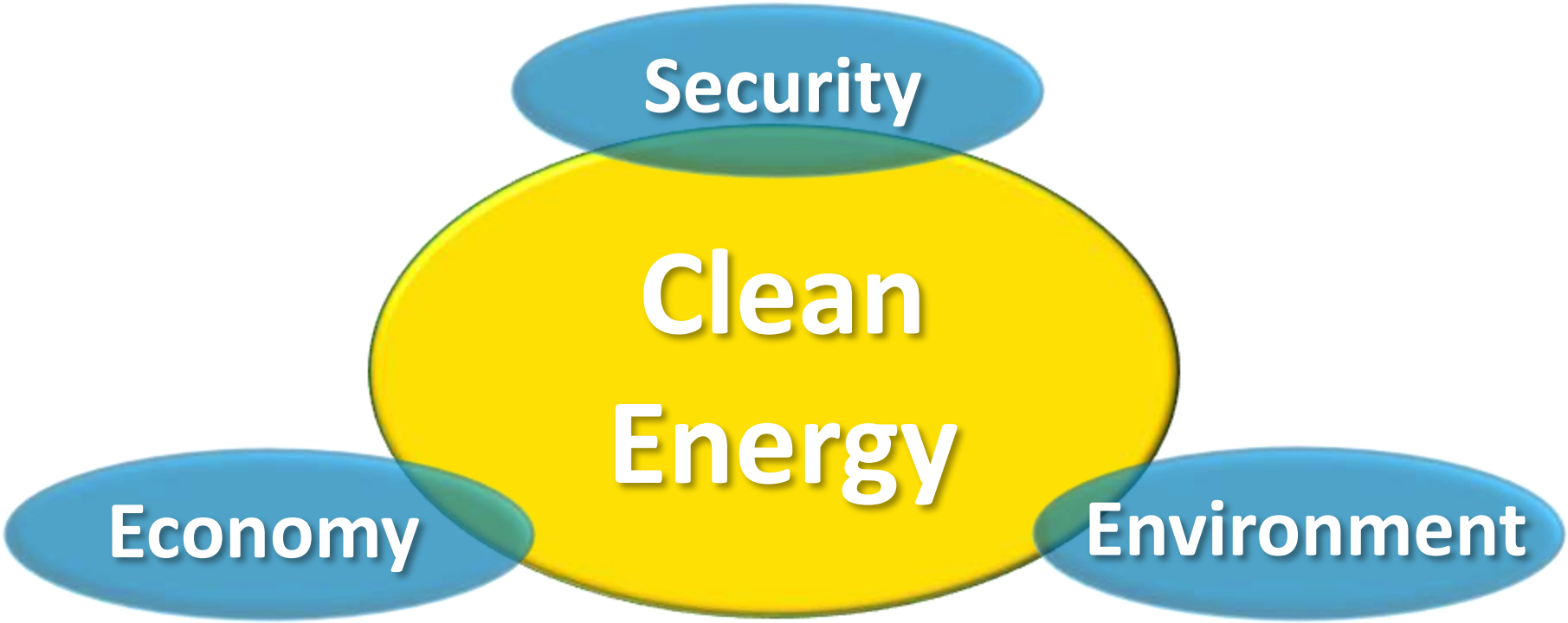
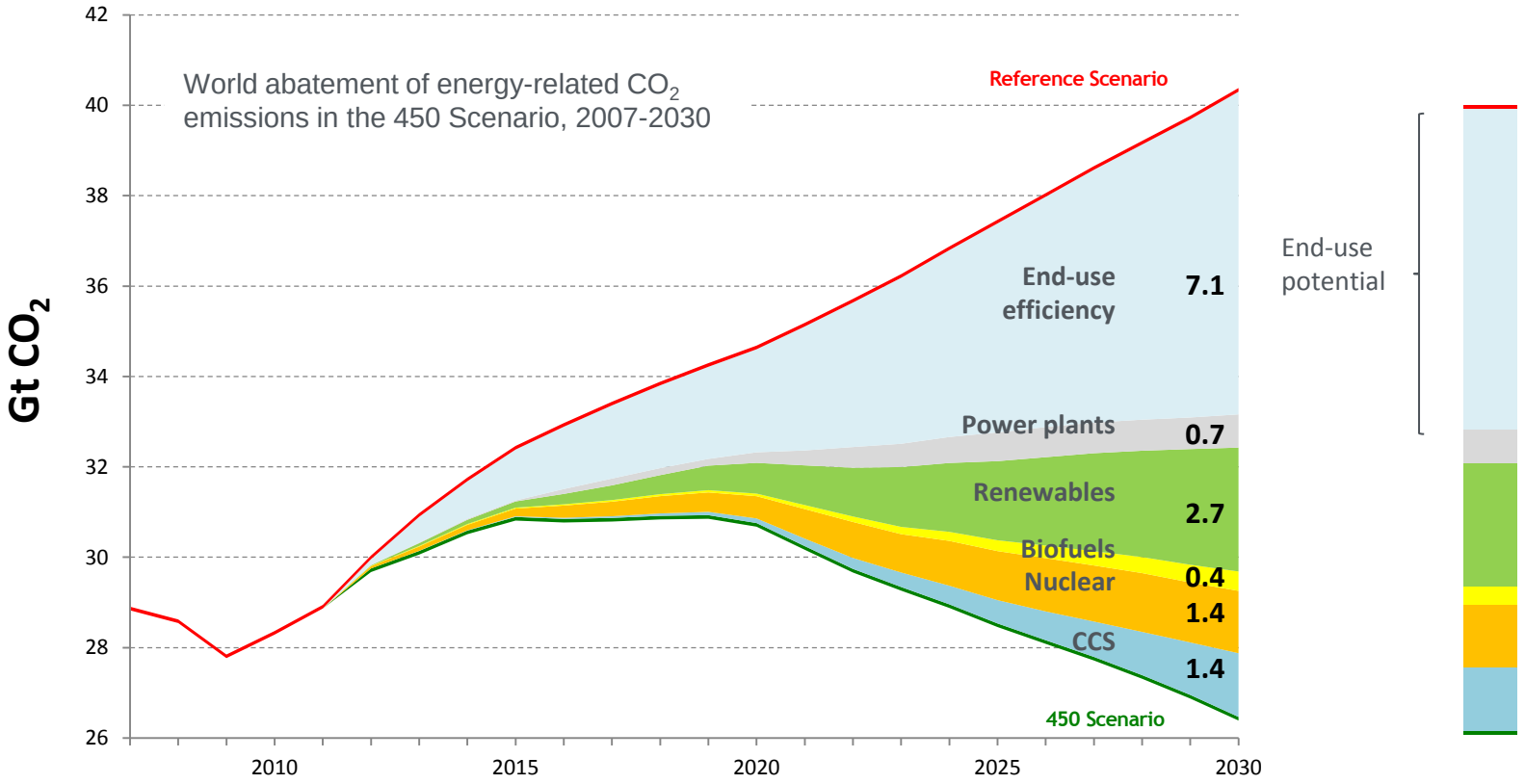
Global Energy Challenges



Energy links major global challenges

Role of Energy Efficiency

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

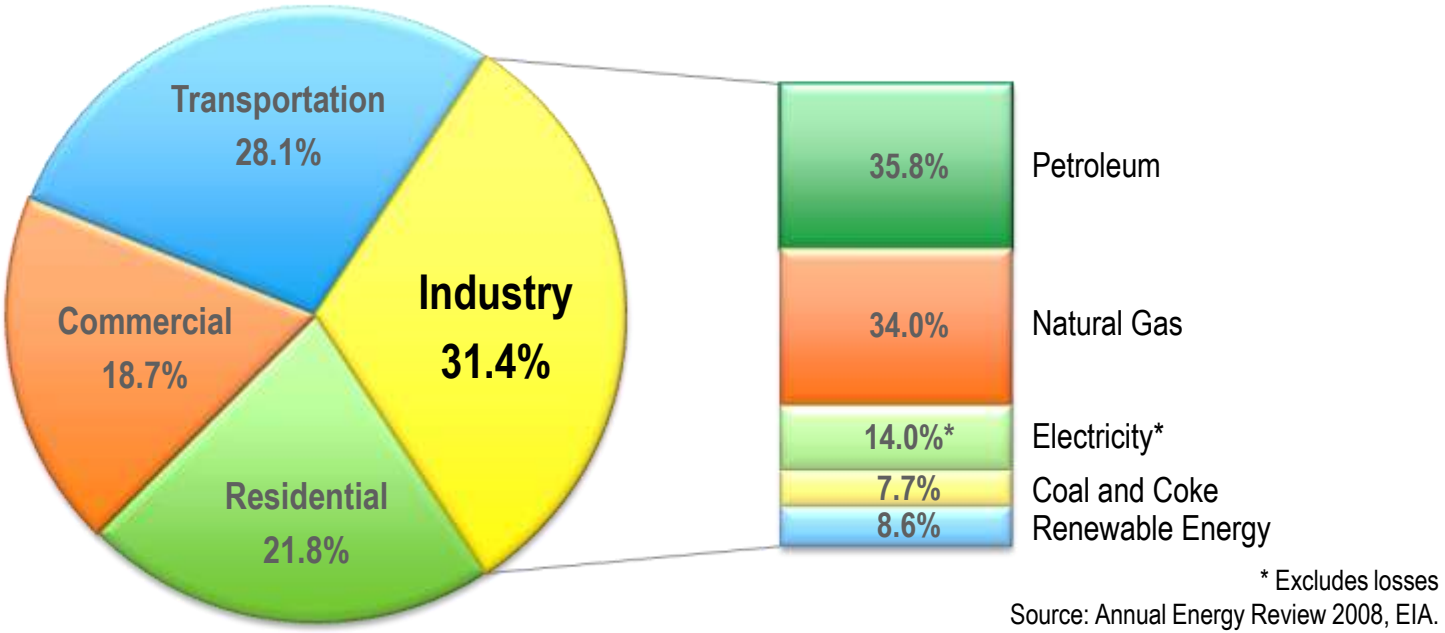


Notes: Gt refers to gigatons of carbon dioxide.
"End-use efficiency" includes Buildings, Appliances, Lighting, Transportation, and Industry.
OECD/IEA 2009 , 2009
Source: OECD/IEA 2009, *World Energy Outlook 2009*.

U.S. Industry Energy Use

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.

DOE's Industrial Technologies Program

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Mission:

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

Objectives:

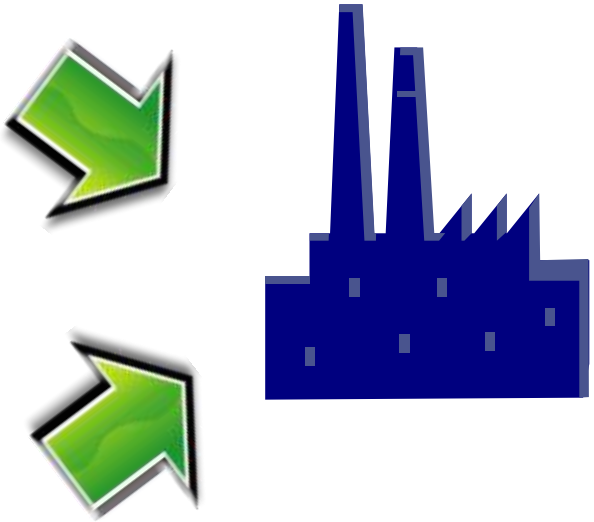
- Develop innovative technology to improve energy diversity, resource efficiency, and carbon mitigation
- Accelerate adoption of today's energy-efficient technologies and practices
- Harness scientific ingenuity, expand resources, and extend our outreach through strategic partnerships

Advanced Manufacturing Solutions

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.

Advanced Manufacturing Partnership

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

Energy Management & Technology Deployment Resources

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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:

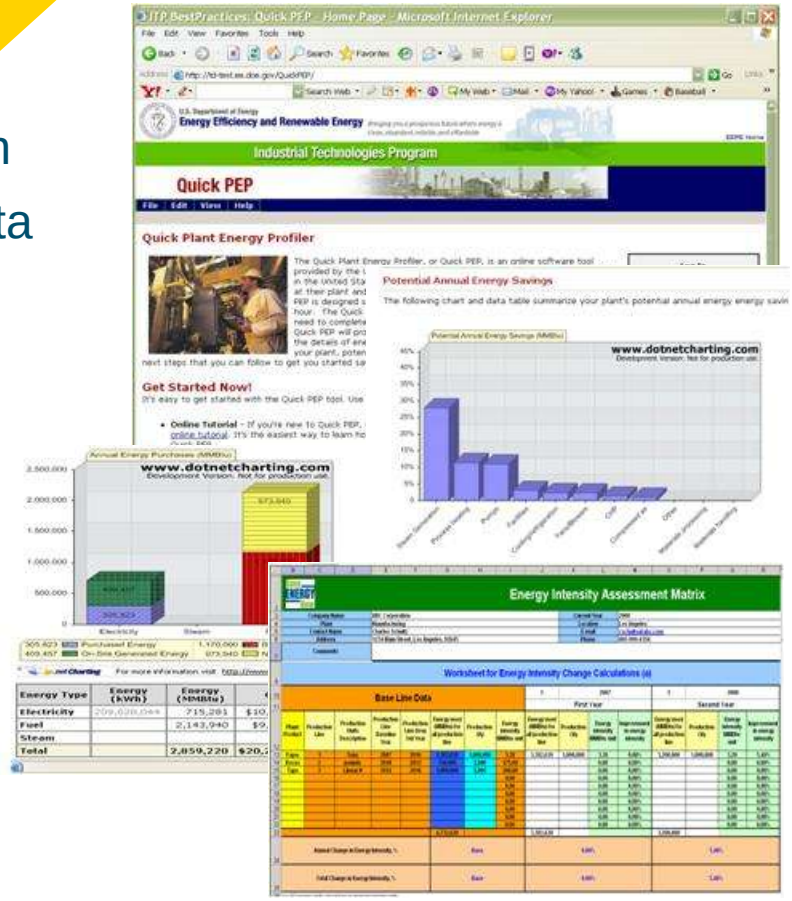
- Steam
- Process Heating
- Pumps
- Fans
- Compressed Air
- Motors
- Data Centers

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 for Manufacturers

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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)***

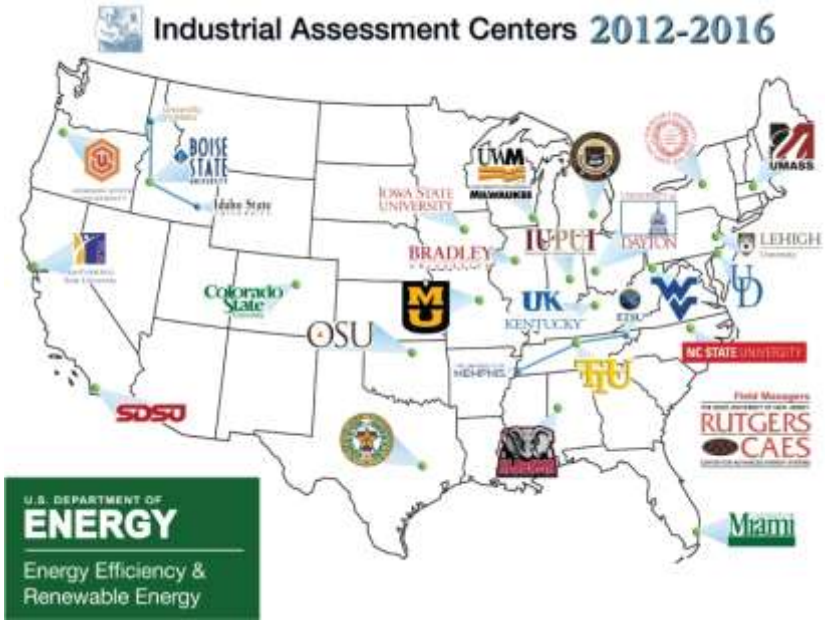
Advanced/Qualified Specialist Training ***(3 days)***

Data Center workshops

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

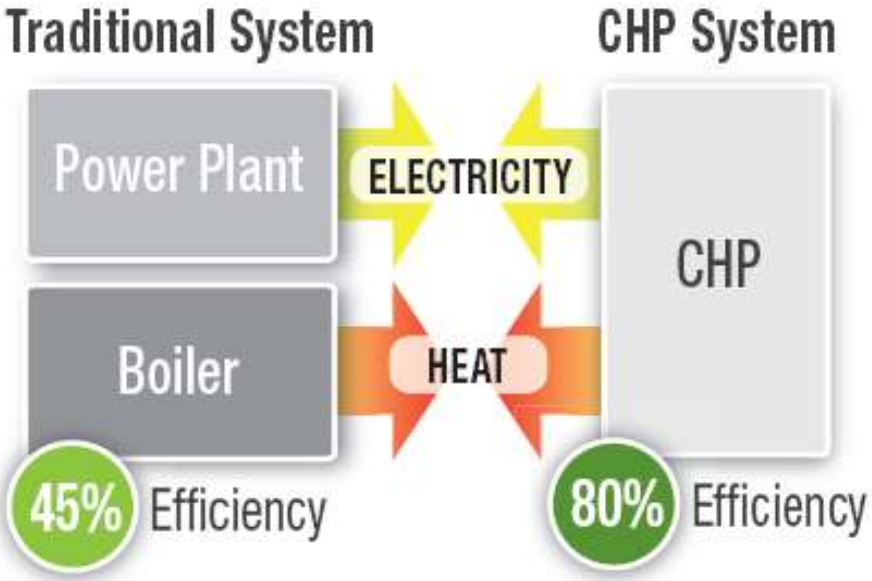
DOE's 24 University-Based IACs

- 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.



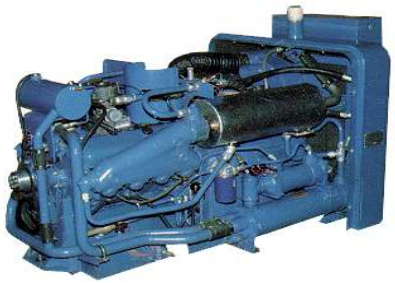
Combined Heat & Power (CHP):

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



Information Resources

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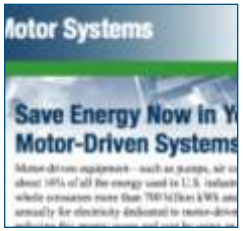
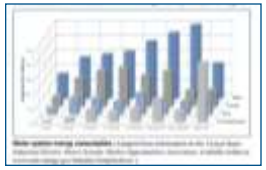
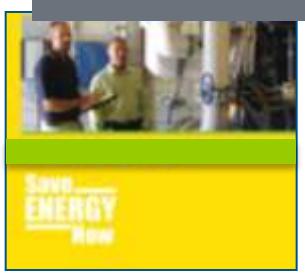
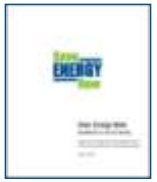
Technical



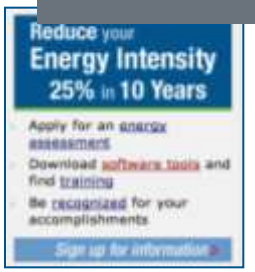


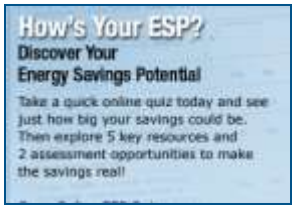
Outreach





Web Sites





www.eere.energy.gov/industry

Energy Management Standard

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

ISO International Organization for Standardization

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

Superior Energy Performance

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

ANSI Accredited Certification Program

ANAB

ISO 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

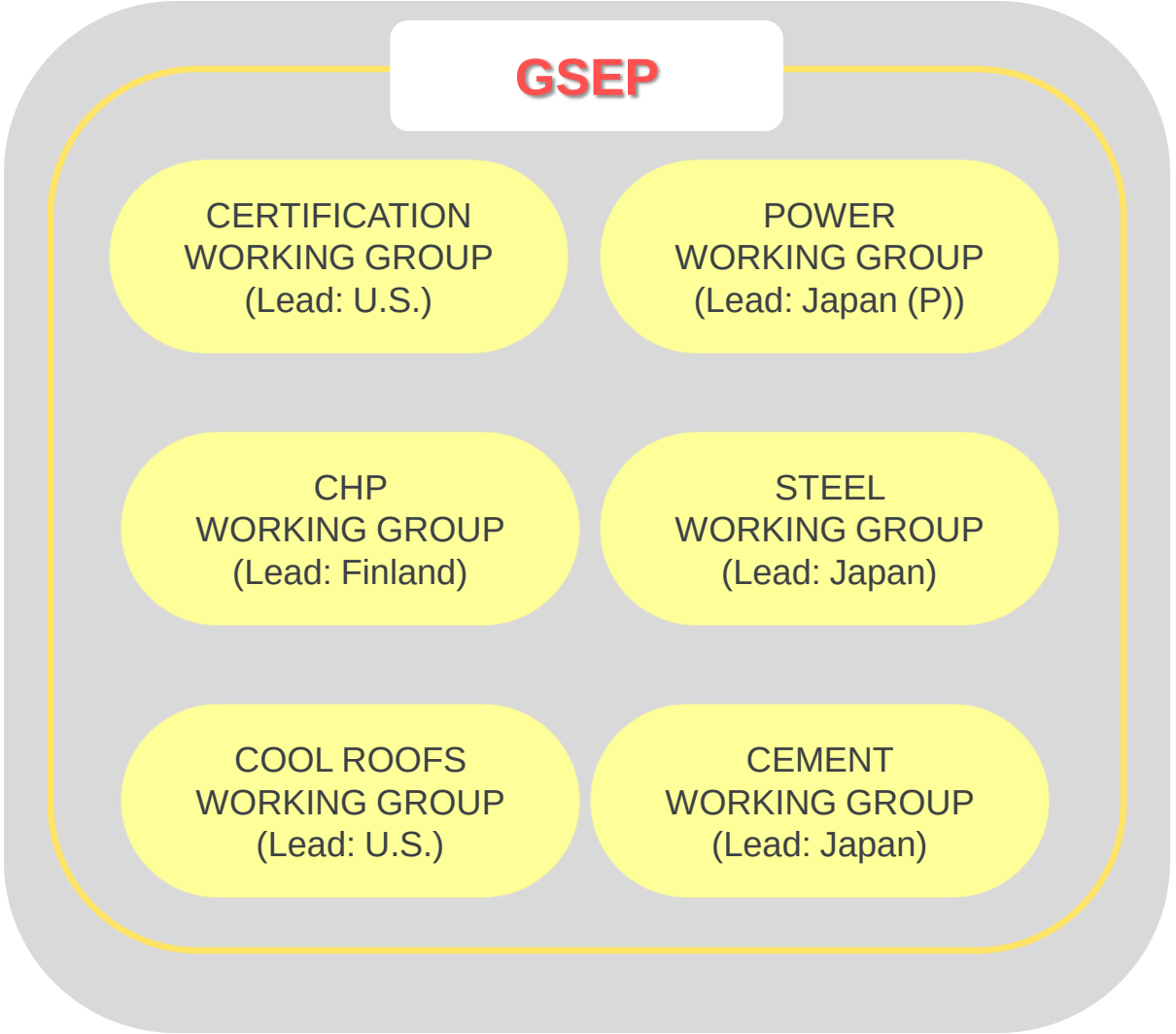
Industrial Energy Global Partnerships

- 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!

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