

Save Energy Now Leader Initiative in the U.S. Dept. of Energy's Industrial Technologies Program

Energy Management Action Network Workshop

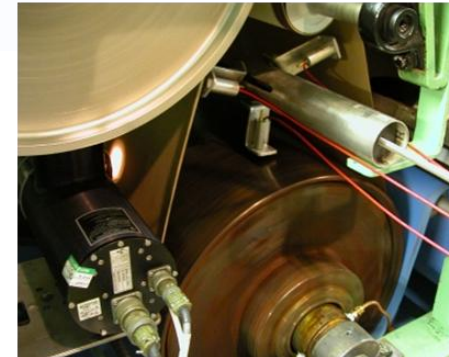
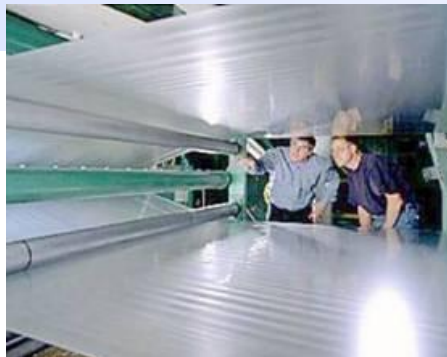
January 27, 2010



James Quinn

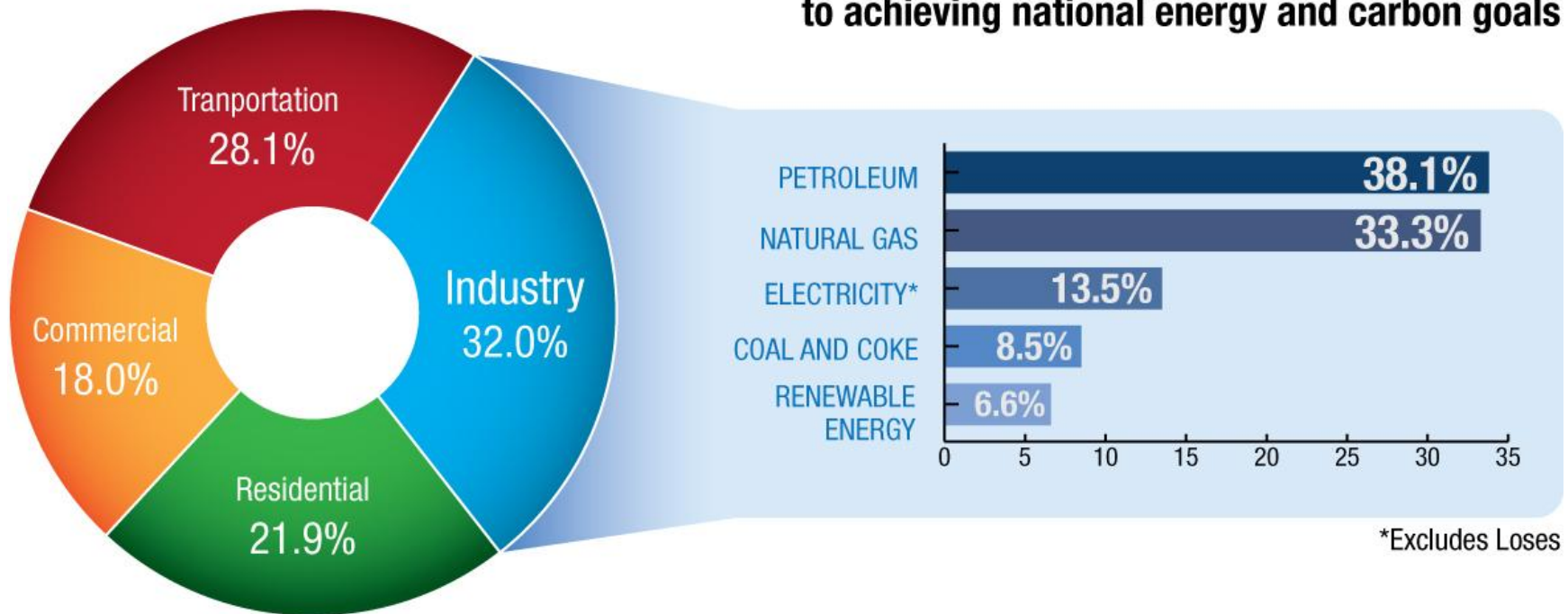
Industrial Technologies Program
Energy Efficiency and Renewable Energy
U.S. Department of Energy

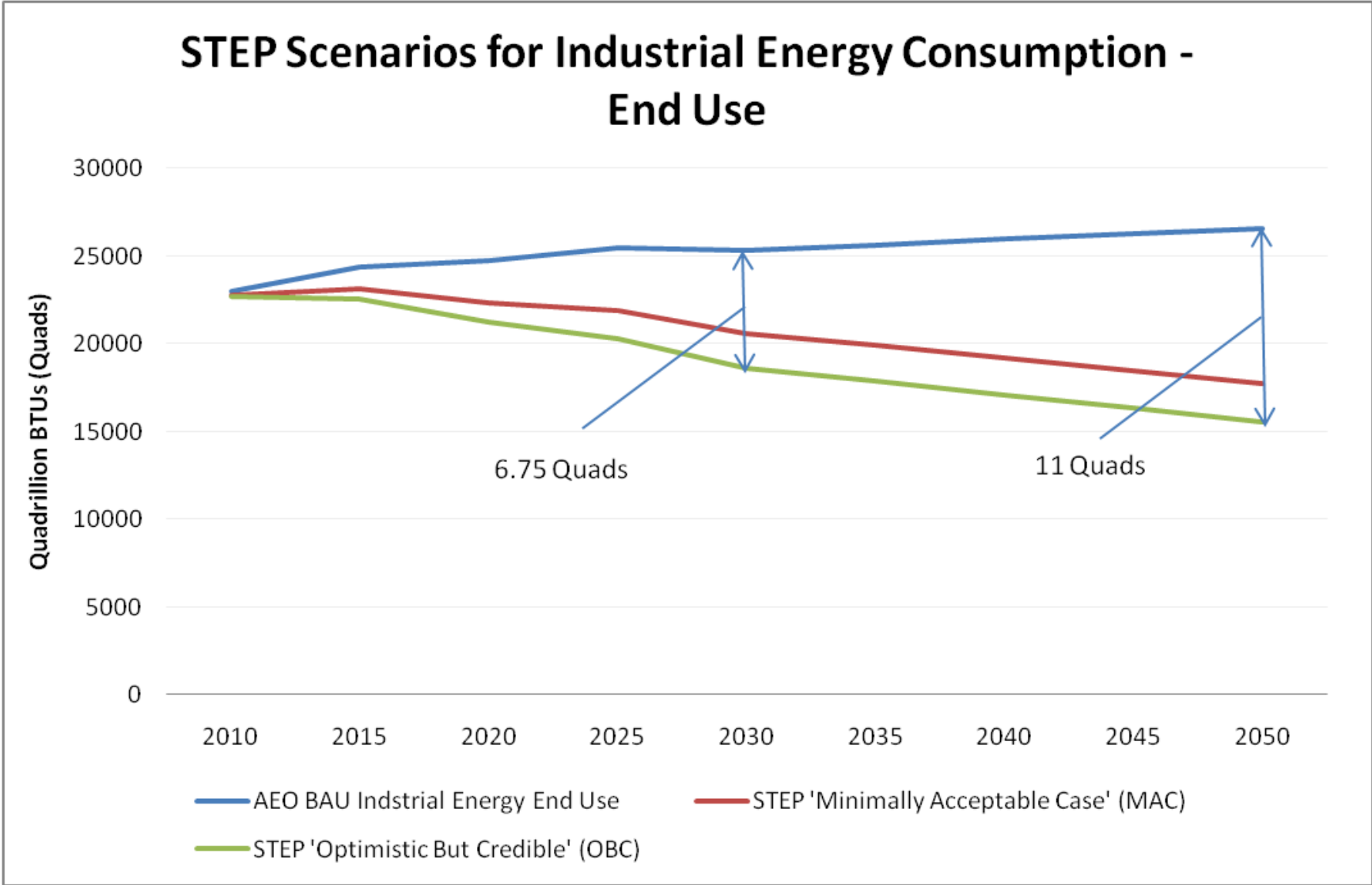
Item 3-2



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

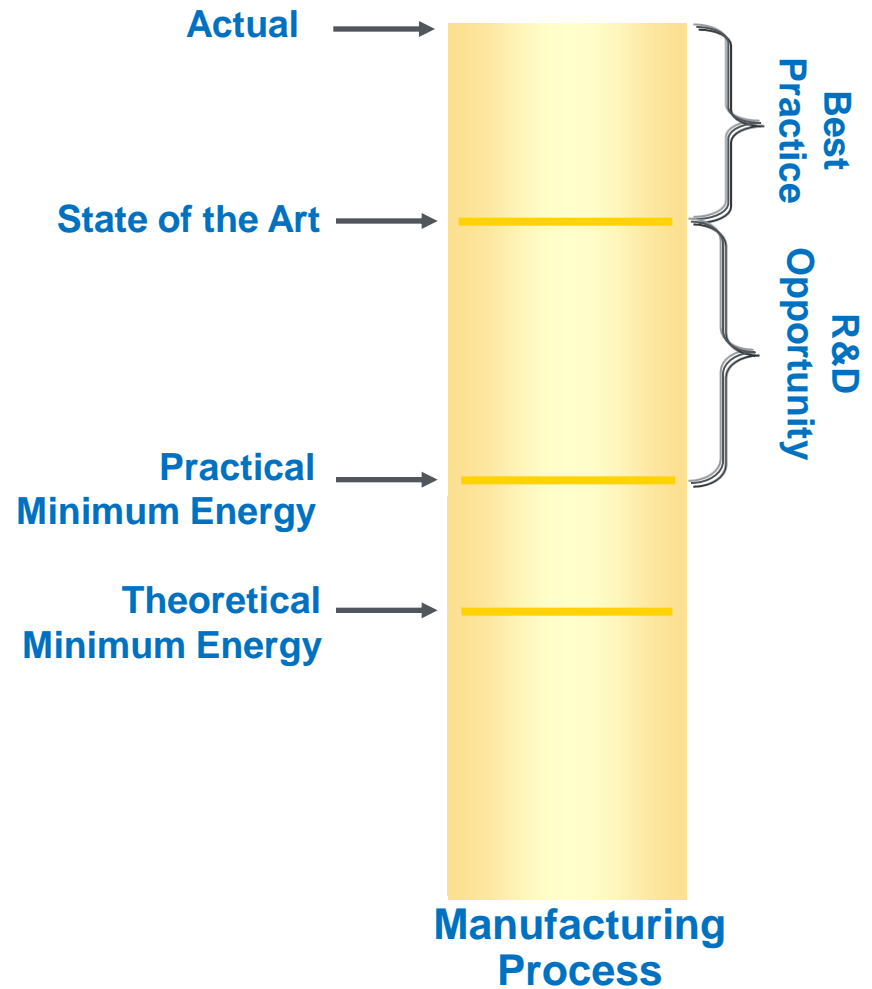
Reducing U.S. industrial energy intensity is essential to achieving national energy and carbon goals





Energy Bandwidth Analysis Clarifies Potential

- Provides snapshot of opportunity for energy savings through R&D and Best Available Technologies
- Quantifies differences among:
 - Theoretical minimum energy required for a process
 - Practical minimum energy required for a process
 - Actual energy requirement for a process based on average values in today's manufacturing environment



Energy Efficiency R&D



Develop cross-cutting technologies addressing the top energy savings opportunities across industry



- Industry Specific R&D
- Crosscutting R&D
- Enabling Materials

Technology Delivery



Help plants save energy today by assessing opportunities and facilitating adoption of best energy management practices and efficient new technologies



- Energy Assessments
- Best Practices
- Energy Management
- Tools and Information
- Deployment

Industry-Specific

- Aluminum
- Chemicals
- Forest and Paper Products
- Metal Casting
- Steel

***Advanced technologies
for specific, energy-
intensive industries***

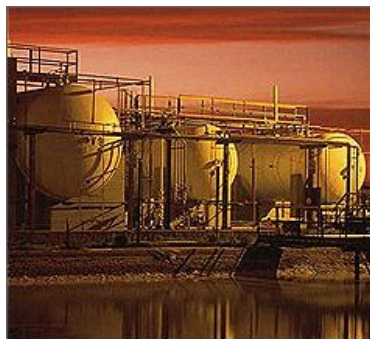
Crosscutting

- Distributed Energy (CHP and Reciprocating Engines)
- Nanomanufacturing
- Energy Intensive Processes
- Fuel and Feedstock Flexibility
- Materials
- Combustion, Sensor, IT

***Technologies to use energy
more productively across diverse
manufacturing sectors***

Next Generation Manufacturing

- *Replace conventional manufacturing processes in the most energy intensive industries*



Energy Intensive Processes

- *Reactions & Separations*
- *High-temperature Processing*
- *Waste Heat Minimization & Recovery*
- *Sustainable Manufacturing*



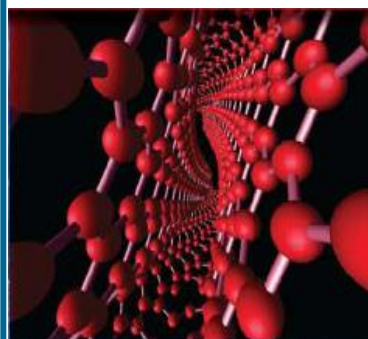
Advanced Materials

- *Thermal & Degradation Resistant Materials that increase lifetime at least 10x*
- *Materials for Energy Systems that improve performance (by at least 50%) of energy production and energy transfer equipment*

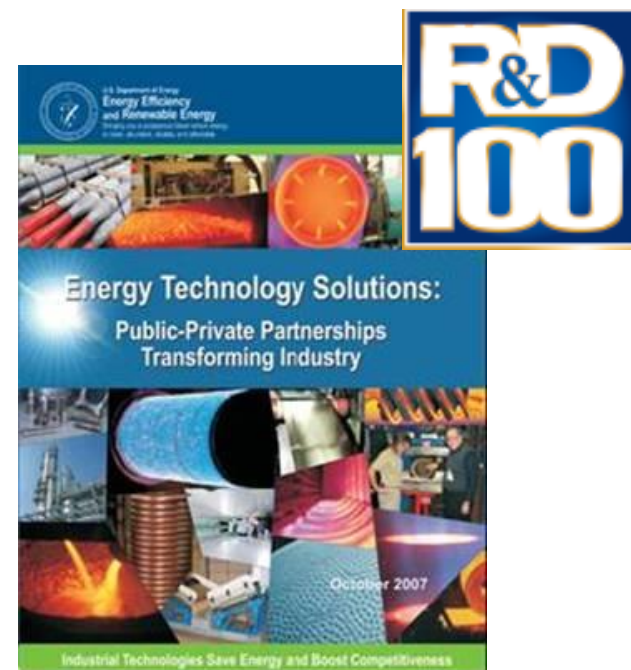


Industrial GHG Emissions Reduction

- *Advanced manufacturing technologies*
- *Innovative enabling technologies*
- *Sensors and controls, catalysis, nanotech, micro-manufacturing, and other areas*



- **48 *R&D 100* awards** between 1991 and 2008
- **Over 220 technologies** commercialized since program inception
- **5.7 quads** of energy saved
- **103 MMTc**e avoided





- Encourage industry to voluntarily reduce its energy use
- Work with a wide range of industrial stakeholders to engage industry in improving energy management
- Create momentum to foster energy management and significantly improve energy efficiency practices and throughout the manufacturing sector

Energy Assessment Results (2006-2009)



Total Plants Assessed:	2,181
Identified Cost Savings:	\$1.2 billion (1,925 reporting)
Identified Energy Savings:	146.9 trillion Btu
Identified CO₂ Savings:	10.5 million metric tons

Average plant found ways to reduce energy bill by about 8%

Implemented approximately 1/6 of cost savings

Approximately 1/3 is in progress and planned

Save Energy Now Assessment Recognition Program

- Rewards companies that implement energy-saving technologies and practices identified through the assessments to achieve a high level of energy efficiency

- **Awards to date:**

157 Energy Champion Plants:

Saved > 250,000 MMBtu or 15% of total energy use

290 Energy Saver Plants:

Saved > 75,000 MMBtu or 7.5% of total energy use

**Realized savings:
23 TBtu and \$157 million in
energy savings**



Awardees include:

- | | |
|--------------------------------|--------------------------------|
| • Shaw Industries | • Trojan Battery Co. |
| • Molson Coors | • Republic Engineered Products |
| • CROWN Closures Americas | • Pennex Aluminum Co. |
| • Ocean Spray Cranberries Inc. | • CertainTeed |
| • US Steel | • Alcan Packaging |
| | • Northrop Grumman |

ITP's National Industrial Initiative: *Save Energy Now*

GOAL: Drive a 25% reduction in industrial energy intensity by 2020



- The Energy Policy Act of 2005 encourages DOE to enter into voluntary agreements with large industrial firms to reduce their energy intensity over 10 years.
- An industrial firm becomes a Save Energy Now LEADER by voluntarily pledging to reduce its energy intensity by 25% in 10 years.
- LEADERS receive priority access to technical assistance and public recognition.

Save Energy Now LEADER Requirements

- Pledge to reduce energy intensity 25% or more over 10 years
 - Designate an energy manager
 - Develop an energy intensity baseline
 - Develop an energy management plan
- Take steps to reduce energy intensity and reduce carbon emissions
- Report energy intensity data and achievements to DOE annually
- Assess operational and financial feasibility



Pledge Form

Save Energy Now LEADER
Voluntary Pledge



_____, voluntarily agrees to become a Save Energy Now LEADER.

We pledge to adopt a goal to reduce energy intensity by 25% or more over 10 years.

- Within 12 months, complete the following:
 - Establish an energy use and energy intensity baseline
 - Develop an energy management plan
 - Designate an energy leader or energy manager
- Take steps to reduce energy intensity and the associated carbon emissions
- Report energy intensity, energy use data, and achievements annually to DOE.

Through the Save Energy Now initiative, DOE will provide:

- Tailored technical assistance to assist in developing the energy baseline and energy management plan, plus ongoing access to an energy management expert
- Priority access to energy system assessments on multiple industrial systems
- Waived fees for training workshops on financing options, advanced technology, energy-analysis software, energy management, and other topics
- Easy access to proven, energy-analysis software tools and other technical resources from DOE and partner organizations
- National recognition for pledge participation and achieving reported energy savings
- Additional recognition for validated energy savings.

This pledge is a voluntary agreement. It is strictly for internal management purposes and is not legally enforceable and shall not be construed to create any legal obligation on the part of either party. This agreement can be terminated at any time without prior notification, penalties, or further obligation. DOE agrees to not comment publicly regarding a withdrawal of an agreement. This agreement does not authorize or obligate any party to expend, exchange, or reimburse funds, services or supplies, or transfer or receive anything of value. Companies and plants agree that they will not claim or imply that their participation in the Save Energy Now LEADER pledge program constitutes federal government approval or endorsement of anything other than its commitment to energy efficiency and will not make statements or imply that DOE endorses the purchase or sale of products and services or the organization's views. All agreements herein are subject to, and will be carried out in compliance with, all applicable laws, regulations, and other legal requirements.

On behalf of _____
the undersigned company representative understands and agrees to
the terms of the Save Energy Now LEADER pledge.

Company _____ U.S. Department of Energy _____
Printed Name _____ Printed Name _____
Position _____ Position _____
Date _____ Date _____

 Energy Efficiency &
Renewable Energy

Save Energy Now Leader Process

Save Energy Now LEADER Seven Steps to Success

Step 1: Take the
Save Energy Now
LEADER Pledge

Step 2: Conduct Initial
Evaluation and
Develop a Roadmap

Step 3: Develop an Energy
Intensity Baseline and Energy
Management Plan

Step 4: Begin to
Save Energy Now

Step 5: Implement
Energy-Saving Projects

Step 6: Report Energy Data
and Progress Annually

Step 7: Publicize
Commitments and
Achievements

Step 1: Take the *Save Energy Now* LEADER Pledge


- Sign the Pledge and commit to reduce industrial energy intensity by 25% or more by 2020
- Designate an energy leader/manager and share the designated representatives' contact information with DOE
- Determine the scope of energy intensity reductions to be at a single facility, a subset of facilities, or for the entire corporation

Step 2: Initial Evaluation and Roadmap Development

- A DOE-assigned Technical Account Manager will assist in determining support needs
- Levels of support is determined by largest energy intensity improvement potential and implementation ability through leveraged cost-share
- A roadmap is established based on the outcome of the evaluation including planned services toward meeting the Pledge goal
- Access to electronic information portal that will provide an easy way to track progress, store energy intensity information and details regarding planned and implemented

Step 3: Develop and Energy Intensity Baseline and Energy Management Plan

- Establish a baseline to measure and track progress and write a plan as a corporate blueprint for energy reduction
- Determine the boundaries for their baseline by defining what is included and what is not
- Develop and maintain up-to-date energy management planning for internal use only
- Fill out the *Energy Intensity Assessment Matrix* to track energy intensity by product group and changes in energy intensity

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
	<div><div></div><div>Energy Intensity Assessment Matrix</div></div>																
2																	
3	Company Name					ABC Corporation					Current Year		2008				
4	Plant					Manufacturing					Location		Los Angeles				
5	Contact Name					Charles Schultz					E-mail		cschultz@abc.com				
6	Address					1724 Main St east, Los Angeles, 92645					Phone		(951) 999-4356				
7	Comments																
8																	
9	Worksheet for Energy Intensity Change Calculations (a)																
10	Base Line Data									2007		2008					
11										First Year					Second Year		
12	Plant Product	Production Line	Production Units Description	Production Line Baseline Year	Production Line Drop Out Year	Energy used kWh/hrs for all production line	Production Qty	Energy intensity kWh/hrs unit	Energy used kWh/hrs for all production line	Production Qty	Energy intensity kWh/hrs unit	Energy used kWh/hrs for all production line	Production Qty	Energy intensity kWh/hrs unit	Energy used kWh/hrs for all production line	Production Qty	Energy intensity kWh/hrs unit
13	Paper	1	Term	2007	2016	3,983,620	1,000,000	3.98	3,382,620	1,000,000	3.38	0.00%	3,700,000	1,000,000	3.70	0.00%	0.00%
14	Boxes	2	packaging	2010	2012	100,000	2,000	175.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
15	Tape	3	Linear B	2012	2016	1,000,000	5,000	0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
16						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
17						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
18						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
19						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
20						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
21						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
22						0.00		0.00	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00	0.00%	0.00%
23							8,770,620		3,382,620		3,700,000						
24	Annual Change in Energy Intensity, %							Base		0.00%		0.00%				5.00%	
25	Total Change in Energy Intensity, %							Base		0.00%		0.00%				5.00%	

Step 4: Identify Energy-Saving Opportunities

- Utilize software tools, training, case studies, and other technical assistance to reduce energy intensity
- Onsite assessments available to identify energy-saving measures
- DOE will collaborate with industry, associations, universities, and other stakeholders to fund R&D projects that seek breakthroughs in new technologies, manufacturing platforms, and industrial processes

Step 5: Implementing Energy-Savings Projects

- Apply for financial incentives and other partnering opportunities offered by ITP, state grants and other funding opportunities under the American Reinvestment and Recovery Act

Tools <ul style="list-style-type: none">• Plant Energy Profiler• Process Heating• Steam Systems• Motors & Pumps• Fans, and more 	Training <ul style="list-style-type: none">• Tool End-User• Topical• Qualified Specialists 
Assessments <ul style="list-style-type: none">• Large Plant Assessments• Industrial Assessment Centers (IACs)• State/Partner Assessments 	Information <ul style="list-style-type: none">• Tip Sheets• Case studies• Source Books• Website/webcasts• E-Bulletin• States Website 

Pledge Annual Reporting Form

Save Energy Now LEADER Pledge Annual Reporting Form
Please provide data requested in white cells only. Shaded cells are calculated based on your input.

Company Name: _____
Company Contact Name: _____
Address: _____
Phone: _____
Email Address: _____
NAECs of Participating Plants: _____
Year of reported data: _____
Base Year: _____

Is this portion of the pledge entry located in the US? ☐ Yes ☐ No

	Baseline Year	Current Year
Number of Participating Plants Included in Current Year of Pledge:		
Primary Energy Consumed, MMBtu/yr:		
Electricity		
Natural gas		
Distillate or Light Fuel Oil (H, 2, 3, 4)		
Residual or Heavy Fuel Oil (H, 5, 6, Navy Special & Bunker C)		
Coal		
Crude		
Black Petroleum Gas		
Wood/Waste		
Other Gas (please specify)		
Other Liquid (please specify)		
Other Solid (please specify)		
Total Primary Energy Consumed, MMBtu/yr:	0	0
Adjustment for Baseline Primary Energy, +/- MMBtu/yr:		
Adjusted Baseline of Primary Energy, MMBtu/yr:	0	
Current Year Energy Savings for Cumulative Action Since Baseline Year, MMBtu/yr:		0
Annual Change in Energy Intensity for Current Year, %:		
Total Change in Energy Intensity, %:		

*Please refer to the Energy Intensity Matrix for a calculator to determine changes in intensity.

Justification for baseline adjustment for the current year (500 word max):

Description of energy efficient technologies, strategies, and practices employed during year to decrease intensity (500 word max):

OMB Control No. 1910-5141

Step 6: Report Energy Data and Progress Annually

- Submit the Pledge Annual Reporting Form Annually
- Download DOE's *Steps for Developing a Baseline*
- Access DOE's *Energy Intensity Assessment Matrix*
- Read the FAQs
- Contact your TAM to request no-cost assistance from a DOE energy expert

Step 7: Publicize Commitments and Achievements

- *Save Energy Now* LEADER Companies receive national recognition at national, state, and local events; in industry and DOE publications; and at DOE award ceremonies
- Participate in events and co-brand with the *Save Energy Now* LEADER logo
- Be recognized as an energy and environmental industrial leader through promotional materials, advertising guidelines, and templates

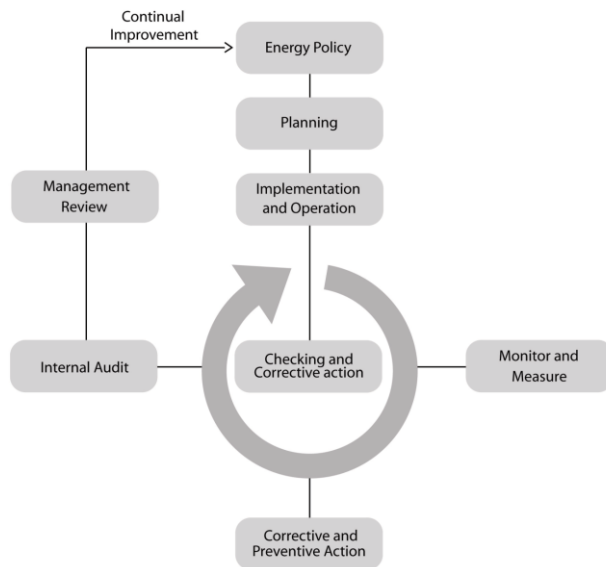


- Time and again, industrial energy efficiency has been demonstrated to be *cost effective* while having a positive effect on productivity
- Despite this, energy efficiency improvements with very favorable payback periods often *do not get implemented*
- Even projects that are implemented may *not be sustained* due to lack of supportive operational and maintenance practices
- Energy efficiency is still viewed during hard times as *a luxury that industry can't afford*, rather than a strategic investment in future profitability

Problem: Energy efficiency is not integrated into daily management practices

Solution: Top management needs to be engaged in the management of energy on an ongoing basis.

Energy management is the process of monitoring, controlling, and conserving energy in an industrial facility



Key elements of an energy management system framework

- Upper-management endorsed energy efficiency goal
- Energy management plan
- Cross divisional management team with assigned responsibility
- Energy policies and procedures
- Implemented projects
- Identification of key performance indicators
- Periodic reporting to management, and
- Management review and corrective action

ISO 50001 Energy Management Standard



The ISO 50001 energy management standard will establish a framework for industrial plants, facilities, and organizations to manage energy.



Potential impacts:

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

Uptake of ISO 50001 will be driven by companies seeking an internationally recognized response to:

- Corporate sustainability programs
- Demand created along the manufacturing supply chain
- National cap and trade programs; carbon or energy taxes; increasing market value of “green manufacturing” / reduced carbon footprint
- International climate agreements

Committee Chair:

American National Standards Institute (ANSI)
(supported by US DOE EERE)

Committee Secretariat:

American National Standards Institute (ANSI)
Associação Brasileira de Normas Técnicas (ABNT)

Additional leadership roles:

British Standards Institute (BSI)
Standardization Administration of China (SAC)

Status of ISO 50001:

- Draft International Standard by April 2010
- Ready for publication by early 2011

A U.S. industry initiative that provides industrial facilities with a roadmap for achieving continual improvement in energy efficiency while maintaining competitiveness.

Superior Energy Performance goals:

- Encourage broad participation through tiered approach
- Use ISO 50001 standard as foundational energy management system
- Drive continual performance improvement in energy intensity

Strategy:

- Foster a corporate culture of **continuous improvement** in energy efficiency
- Develop a **transparent** system to validate energy intensity improvements and good management practices (conformance with ISO 50001)
- Create a **verified record** of energy efficiency/intensity improvement.
- Potentially create value for energy savings and carbon reductions in utility, state, regional, national, and international trading markets



U.S. Council for Energy-Efficient Manufacturing

- Champion of U.S. industry in implementing and achieving national energy efficiency policy goals
- Seeks to improve the energy intensity of U.S. manufacturing through a series of initiatives
- Guides development of **Superior Energy Performance** program



Weyerhaeuser



Superior Energy Performance Planned Infrastructure

Standards & Protocols



International
Organization for
Standardization

Energy
Management
Standard



International
Organization for
Standardization

System Assessment
Standards



Measurement &
Verification
Protocol

SEP Program Administrator

ANSI-accredited
Certifying Bodies (TBD)

Certifying Orgs.
For Professionals
(TBD)

Practitioner
Training Orgs.
(TBD)

Energy Management
Practitioners

System Assessment
Practitioners

Certified SEP Program
Validation Specialists

Participating
SEP program
Manufacturing
Plants





Save 
ENERGY 
Now