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# Superior Energy Performance in US Industry

Aimee McKane  
UNIDO Expert

**Industrial Energy Efficiency Improvement Project  
in South Africa  
18 September 2009  
Johannesburg**



## *Criteria for Superior Energy Management*

- Top management support
- Suitable Resources
- Well-defined goals, metrics and project plans
- Organizationally Integrated
- Continual Improvement Structure
- Sustainable!





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## *Superior Energy Performance*

A U.S. industry initiative that provides industrial facilities with a road map 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



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## *Superior Energy Performance Strategy*

- Foster an organizational culture of **continuous improvement** in energy efficiency in U.S. manufacturing facilities
- Develop a **transparent** system to validate energy intensity improvements and management practices (conformance with ISO 50001)
- Create a **verified record** of energy source fuel savings and carbon reductions with potential value in state, regional, national and international markets





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## 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 the **Superior Energy Performance**

**NAM** National Association of Manufacturers



**EASTMAN**

**SSAB**



**3M**

Save **ENERGY**  
Now



**TOYOTA**



**NIST**

National Institute of Standards and Technology



## ***Benefits of ANSI-accredited SEP Certification to Manufacturing Plants***

- Establishes systematic framework to achieve continuous improvement based on application of an energy management standard
  - Initially, the US energy management standard American National Standards Institute (ANSI) MSE 2000-2008, to be supplanted by ISO 50001 energy management in early 2011
  - American Society of Mechanical Engineers (ASME) system assessment standards (compressed air, process heating, pumping, and steam)
  - Tools and resources to assist implementation and validation of energy performance improvement



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## ***Benefits of ANSI-accredited SEP Certification to Manufacturing Plants***

- Certified plants receive recognition from:
  - Public – recognized leader in sustainable use of energy resources (local and financial community)
  - Supply chain – customer gives preferred supplier status
- Increases access to external financial incentives
  - Energy efficiency programs (electric utility & others)
  - Carbon credits – state, region and national



# ***Superior Energy Performance Supports and Builds the Industrial Energy Efficiency Market***

Implementation of an energy management system and independent validation of energy intensity improvements can provide benefits to:

|               |  |
|---------------|--|
| Utilities     | <ul style="list-style-type: none"> <li>Empowers a plant-wide, systems-oriented approach</li> <li>Helps justify industrial energy efficiency program investments, including permanent operational changes,</li> </ul> |
| ESCOs         | <ul style="list-style-type: none"> <li>Builds greater credibility with public utility commissions</li> </ul>   |
| Supply Chains | <ul style="list-style-type: none"> <li>Provides a proactive turnkey program for major OEMs and retailers to request their suppliers to meet the program requirements</li> </ul>                                      |



# SEP 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 Organizations for Professionals

Energy Management  
Practitioners

System Assessment  
Practitioners

Certified SEP Program  
Validation Specialists

Participating  
SEP program  
Manufacturing  
Plants



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# Getting Certified for Superior Energy Performance



Certified by ANSI-accredited Certifying Body (initially KEMA in 2009, then others in 2010) in two areas:

1. **Energy Management System Conformance** -  International Organization for Standardization  
ANSI MSE 2008 standard and eventually ISO 50001 standard
2. **Validated Energy Performance Improvement** – Third party measurement & verification to meet minimum SEP energy intensity performance improvement requirements



## *Performance Validation for SEP Program*

The 3-tiered program accommodates:

- Maturity of plant's energy management program
- Level of external validation desired
- Business climate/cycle

**PARTNER**  
*Self-declaration*

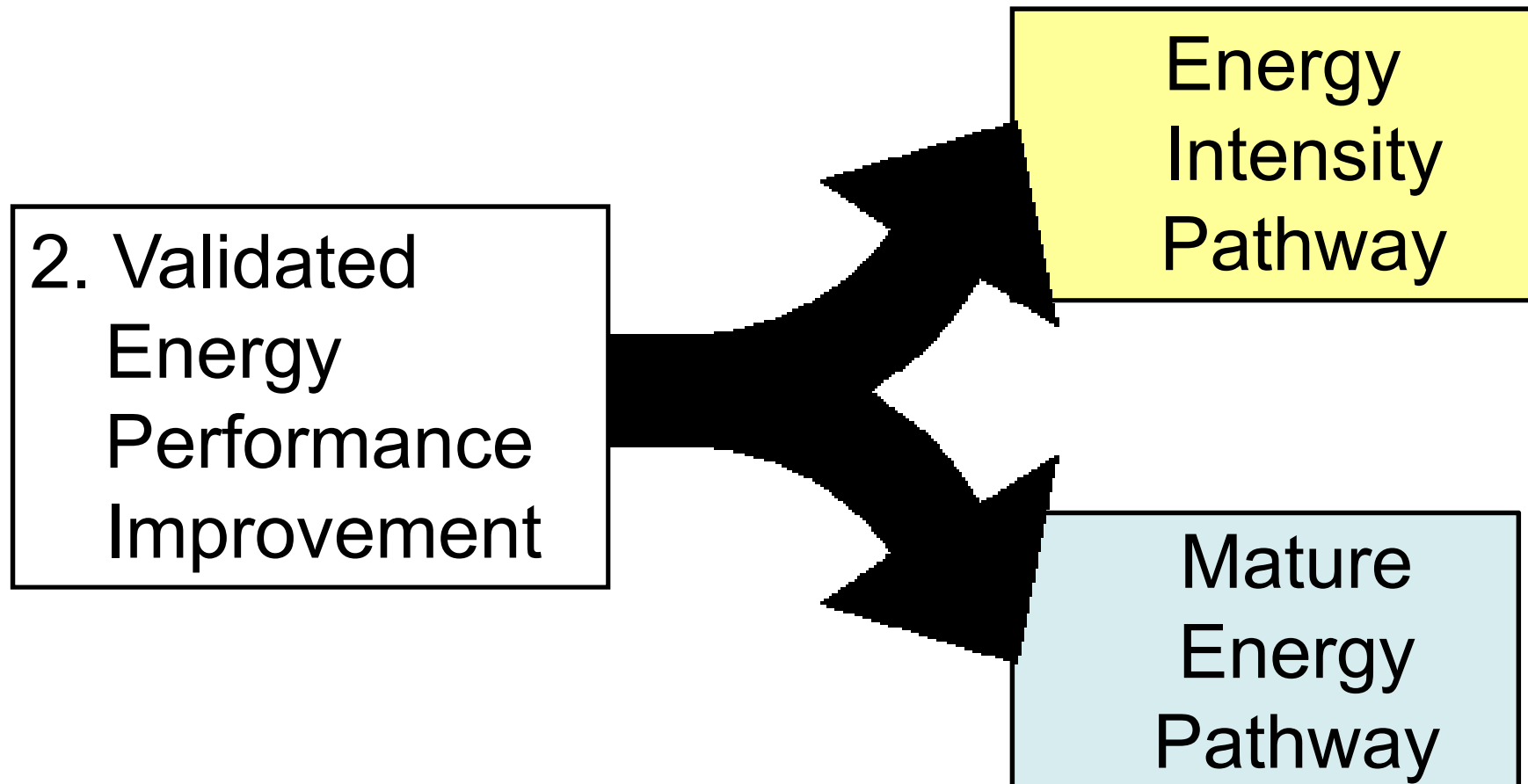
**REGISTERED  
PARTNER**  
*Third party  
remote verification*

**CERTIFIED  
PARTNER**  
*ANSI-accredited  
certification*





## *Two Validated Performance Pathways*





## Draft SEP Performance Levels

|                             |  | Performance Levels Option B   |   |   |
|-----------------------------|--|---|---|---|
| Performance Characteristics |  | Silver  | Gold  | Platinum  |
| EI Pathway                  | Energy Intensity Improvement   | Meets <b>5%</b> EI improvement threshold over the last 3 years.                                 | Meets <b>10%</b> EI improvement threshold over the last 3 years.                                | Meets <b>15%</b> EI improvement threshold over the last 3 years.                                |
|                             | Energy Intensity Improvement   | Demonstrates an EI improvement of 15% or more over the last 10 years.                           | Demonstrates an EI improvement of 15% or more over the last 10 years.                           | Demonstrates an EI improvement of 15% or more over the last 10 years.                           |
| Mature Energy Pathway       | Score on Best Energy Management Practices <sup>1</sup><br><i>Includes additional energy intensity improvement heavily weighted in scorecard.</i> | Meets a score of at least <b>w</b> out of 100 total points for Best Energy Management Practices | Meets a score of at least <b>y</b> out of 100 total points for Best Energy Management Practices | Meets a score of at least <b>z</b> out of 100 total points for Best Energy Management Practices |
|                             |  |   |   |   |

<sup>1</sup> The Best Energy Management Practices Scorecard scores for silver, gold and platinum (X<Y<Z) are yet to be defined. **Modified 8/26/2009**



## *Defining Energy Intensity Improvement*

Energy Intensity Improvement  
Key Performance Indicator (KPI)

EI-KPI

= Current Energy Usage / Baseline Usage

Baseline usage is the usage that would have occurred in the absence of energy efficiency improvements

$$\text{EI-KPI} = \text{BTU}^*_{\text{Current}} / \text{BTU}^*_{\text{Base}}$$

$\text{BTU}^*_{\text{Current}}$  &  $\text{BTU}^*_{\text{Base}}$  are normalized values



## *General Steps*

- Requirement: Demonstrate an energy intensity improvement of  $> 5\%$  over the previous 3 years
- Step 1. Establish baseline intensity at the beginning of the 3 years
  - Based on 1 year of data
- Step 2. Demonstrate improvement relative to the baseline 3 years later
  - Based on 1 year of data at the end of the 3 years
- Energy Intensity Improvement can be calculated in one of three ways:
  - Default, Backcast, or Standard Conditions



## *Variations for Calculating EI-KPI*

- Default
  - Actual current usage compared to estimated usage under baseline conditions
- Backcast
  - Actual baseline usage compared to estimated usage under current conditions
- Standard Conditions
  - For a standard set of production levels and external factors, compare estimated current usage with estimated baseline usage



## Major Milestones: 2009-2013

- **Oct. 2009:** Request applications from five Texas plants
- **Nov. 2009:** M&V protocol ready for pilot plant application
- **Nov 2009:** First plant applies to SEP program
- **Feb. 2010** Complete first plant on-site audit and review of conformance to SEP program requirements
- **June 2010:** Select SEP Program Administrator by conducting DOE solicitation
- **July 2010:** First (five) plants certified through ANSI-accredited Certifying Body
- **Sept 2010:** Establish accredited Certified Practitioner professional certification organizations for energy management and SEP
- **Nov. 2010:** Establish accredited Certified Practitioner professional certification in four system areas
- **Nov. 2010:** Begin training Certified Practitioners in energy management and SEP validation specialists through ANSI-accredited professional certifiers
- **Mar. 2011:** Begin training Certified Practitioners in four system areas through ANSI-accredited professional certifiers
- **Apr. 2011:** ISO 50001 Energy Management Standard published; replaces ANSI standard
- **June 2011:** National launch of Superior Energy Performance Program



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## *For more information*

Superior Energy Performance  
[www.superiorenergyperformance.net](http://www.superiorenergyperformance.net)

Energy Management Standards and System  
Standards

<http://industrial-energy.lbl.gov/node/94>

ISO 50001

<http://www.unido.org/index.php?id=o86084>

<http://www.iso.org/iso/pressrelease?refid=Ref1157>

[atmckane@lbl.gov](mailto:atmckane@lbl.gov)