How Industrial Energy Efficiency Can Support State Climate and Energy Planning

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

About this Presentation

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This short presentation is intended give states and their stakeholders a vision for what it would look like to include industrial energy efficiency in their climate and energy plans.

Industrial Energy Efficiency as an Emission Reduction Approach

Possible Leads
- State Energy Offices (SEOs)
- Utilities / Program Administrators
- Industrial End-Users
- ESCOs

E-Savings
- Metered electricity savings after installing measures or making operational and behavioral changes compared to project start

Potential Program Components
- Strategic Energy Management (SEM)
- ISO50001
- Superior Energy Performance (SEP)

Activities	EM&V
Energy Savings Approaches	
• SEOs, program administrators, industrial end users, ESCOs generate energy savings from: – Energy management – Energy management system – Training – Metering – Technical assistance – Capital improvements	• Third-party verification of savings occurs within Superior Energy Performance in accordance with Superior Energy Performance EM&V Protocol • Forthcoming resources: - Library of common industrial EE projects/practices and accepted savings calculation methodologies - Uniform Methods Project Protocols for Strategic Energy Management/Superior Energy Performance (Summer 2016)
State Policy Options	
• Could include: - Energy efficiency resource standard (EERS) - Registry of energy savings from ISO50001 certification or Superior Energy Performance	
Low Income Opportunities	
• Possible if facility located in a low income community	

What Is Included in Industrial Energy Efficiency?

- Industrial energy efficiency can be improved through equipment, process, or organizational changes. A wide range of approaches are available:
  - Individual facilities make **project-by-project** capital investments to improve the energy efficiency of one process or piece of equipment at a time.
  - Partners in DOE's **Better Plants** Initiative pledge a 25% reduction in energy intensity across their facilities over 10 years; how they determine which investments to make and how to measure the improvements varies
  - Some utilities offer **Strategic Energy Management (SEM) programs** to support facility-level energy efficiency. Most SEM programs conduct billing analyses to track savings.
  - **ISO 50001** provides an international best practice standard for structuring a strategic energy management system that takes a systematic view across the organization, in addition to the processes.
  - DOE's **Superior Energy Performance** (SEP) program requires implementation of ISO 50001 and adherence to DOE's SEP EM&V protocol to create and measure continual and persistent energy savings for all types of fuels, including electricity.
- Significant cost-effective opportunities (less than two-year payback) are available for industrial facilities that adopt ISO 50001 and SEP.

Why ISO 50001 and Superior Energy Performance?

Purpose of ISO 50001 and Superior Energy Performance (SEP)

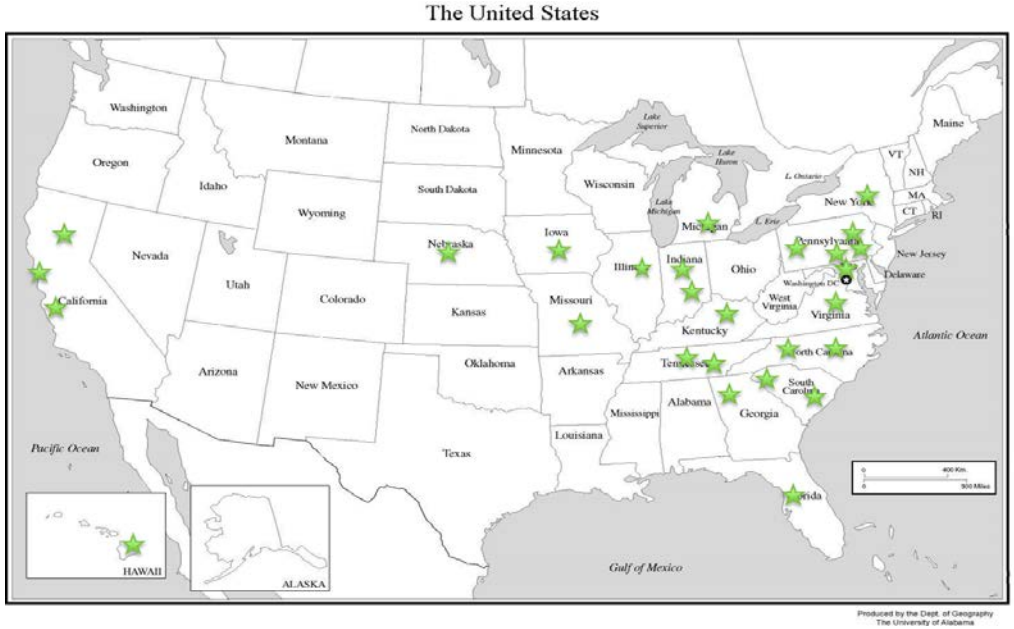
- Provide structured approach to establishing an energy management system facility-wide (ISO 50001)
- Result in continual energy performance improvements
- Quantify savings via credible, third-party verification by accredited entity (SEP)
- Reduce costs for any industrial facility, building, or complex with over $1 million in annual energy bills; likely to see payback in under two years.

Benefits of ISO 50001 & SEP

- Average energy savings from SEP-certified facilities is **12%** within the first 18 months of program implementation; achieving up to $1 million in annual savings per facility
- On average, three-fourths of SEP savings come from operational improvements; remaining from capital investment
- Reduces electricity and other fuel uses with third-party verified energy performance improvement

Current Status of SEP™ & ISO 50001

- ISO 50001 certification: estimated 3,850 facilities/buildings in US
- SEP Certification: 28 U.S. facilities (17 states & DC), 4 Mexico, 2 Canada



SEP partners:

State and Local Role in ISO 50001 and SEP

ISO 50001 and SEP can be supported by state and local action

Policy Actions

- Public utility commissions can facilitate ISOSEP expansion by:
  - Promoting inclusion of ISOSEP in ratepayer-funded efficiency programs
  - Approving the energy savings from ISO-SEP audited results, both as part of mandated efficiency programs and those conducted voluntarily
  - Developing a statewide registry of ISOSEP facilities and energy savings
- State and local policymakers can facilitate ISOSEP expansion by:
  - Leading by example and pursuing ISOSEP in state and local facilities
  - Advancing ISOSEP as part of economic development and large energy user engagement/retention strategy

Implementation Actions

State and local implementation can be supported through:

- Providing technical assistance, tools, and incentives to encourage end users to adopt SEP
- Providing support for training and certification of Certified Practitioners in Energy Management Systems (CP EnMS), SEP Lead Auditors, and SEP Performance Verifiers

Best Practices for SEP

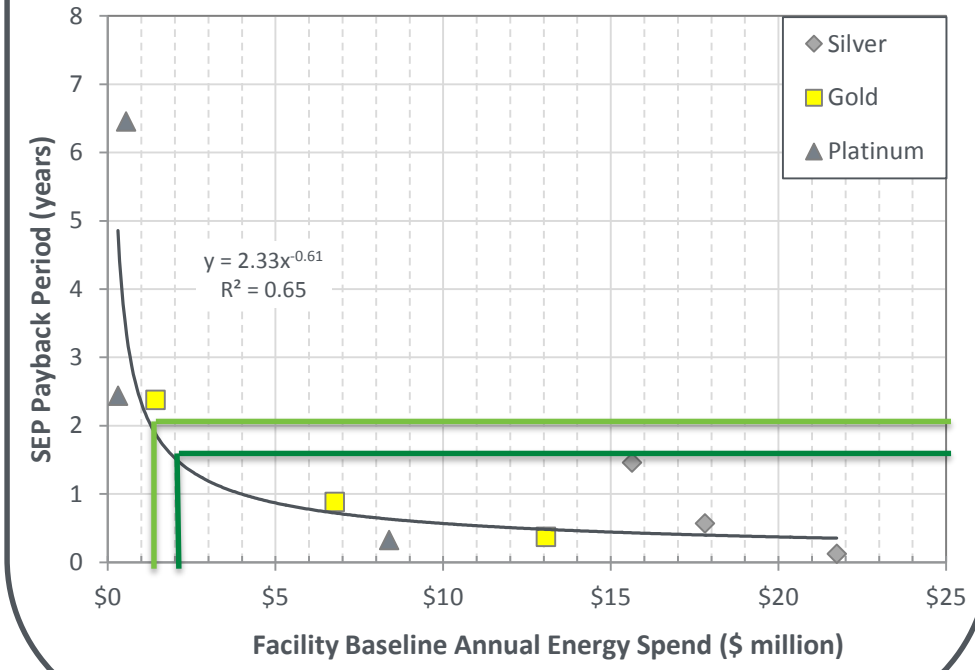
- **Follow the SEP Certification Protocol**
- **Find a Certified Practitioner in Energy Management Systems (CP EnMS)**. A CP-EnMS can help facilities implement an ISO 50001 energy management system and prepare to meet SEP requirements.
- **Hire an ANAB-accredited SEP Verification Body**: To certify savings, an ANAB-accredited verification body will audit the facility(ies) to ensure it meets SEP requirements.

SEP Is Cost-effective for Large Facilities

Short Payback Periods:

Less than 2 year payback for facility with a baseline annual energy spend greater than $1M

Less than 1.5 year payback for facility with a baseline annual energy spend greater than $2M



2015 study of 10 SEP-certified facilities found:

- 12% average reduction in energy costs within 15 months of starting to implement SEP
- Average facility saved over **$430,000/year** from **low/no cost operational improvements**
- SEP also results in valuable data to analyze potential capital investments in energy efficiency

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EM&V Methods for SEP program

SEP Measurement & Verification protocol forms the basis for quantifying energy savings across an ISO 50001 or SEP facility.

EM&V steps include:

1. Industrial end user gathers energy consumption data and develops normalized energy savings compliant with SEP M&V protocol
2. Third-party, ANAB-accredited SEP verification body reviews and approves that SEP facility energy numbers meet SEP M&V protocol
3. Third-party sends verified energy savings report to DOE

Forthcoming resources (2016) will expand EM&V resources beyond SEP:

- Library of common industrial EE projects/practices and accepted savings calculation methodologies
- Uniform Methods Project Protocols for Strategic Energy Management/Superior Energy Performance

DOE Support and Tools

Superior Energy Performance
U.S. DEPARTMENT OF ENERGY

Technical Tools & Support (for facilities)

- **eGuide tool**: Comprehensive, step-by-step online toolkit
- **EnPI tool**: Supports quantifying facility-wide energy performance improvement
- **Energy Footprint Tool**: Helps gather energy bills; identify all fuel consumption and costs; determine where energy is going
- **Energy System Tools**:
  - Steam System Modeler Tool
  - Process Hearing Modeler Tool
  - Pump System Assessment Tool
  - Fan System Assessment Tool
  - Compressed Air Master
- **Industrial Assessment Centers**: Provides energy assessments for facilities across the country
- **Case studies**: Facilities describe their SEP implementation and lessons

Program Design Tools (for EE programs)

- **Program Planning Guide**: Step-by-step guide for effective program plans and reports for SEP offerings
- **Cost-Effectiveness Screening Tool**: Estimate expected benefits and costs of SEP projects for a state/utility territory
- **Program Template**: Form designed to facilitate development of SEP offerings
- **Transition Tables**: Information on level of effort required to move from offering a traditional, industrial incentive program to Strategic Energy Management, ISO 50001, or SEP
- **Presentation Materials**: Separate introductions to ISO 50001 and SEP for customers, participants, and EE program administrators

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On the Horizon

- Enterprise scaling, allowing for multiple facilities in an organization to be certified
- Launch of ½ day importance of energy management training
- DOE-developed energy system trainings *(ongoing through 2020)*

- New resources (Summer 2016):
  - Library of common industrial EE projects/practices and accepted savings calculation methodologies
  - Uniform Methods Project Protocols for Strategic Energy Management/Superior Energy Performance
  - New version of eGuide tool
  - Revision of the DOE energy system tools *(ongoing through 2020)*

New Release from SEE Action

Guide for States: Energy Efficiency as a Least-Cost Strategy to Reduce Greenhouse Gases and Air Pollution, and Meet Energy Needs in the Power Sector

- For state air regulators and other state policy makers / administrators and their stakeholders
- Practically-oriented, covering:
  - Established policy and program options to advance demand-side energy efficiency (both ratepayer-funded and non-ratepayer-funded)
  - Case studies of existing regional, state, and local policies and programs with sources for where to go for more information
  - Tools and methods that allow states to understand the range of expected savings from energy efficiency and common protocols for documenting savings