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

Superior Energy Performance™

Certifying Increased Energy Productivity under ISO 50001

Overview

September 2014

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Energy Management and ISO 50001

Energy Management System (EnMS)

Scope of an Energy Management System:

Facilities | **Equipment** | **Personnel** | **Systems** | **Processes**

- Embeds into normal business systems: **policies, procedures, and tools** to systematically track, analyze, and improve energy efficiency
- Can **increase energy efficiency by 15% or more** in industrial facilities via operational changes alone
- Effectively communicates energy management **roles and responsibilities** across an organization
  - Top management support
  - Organizational change in culture
- Leads to **continual improvements** in energy and cost performance.

Involves shift from a project-by-project approach to one of continual improvement in energy performance

ISO 50001–Energy Management Systems

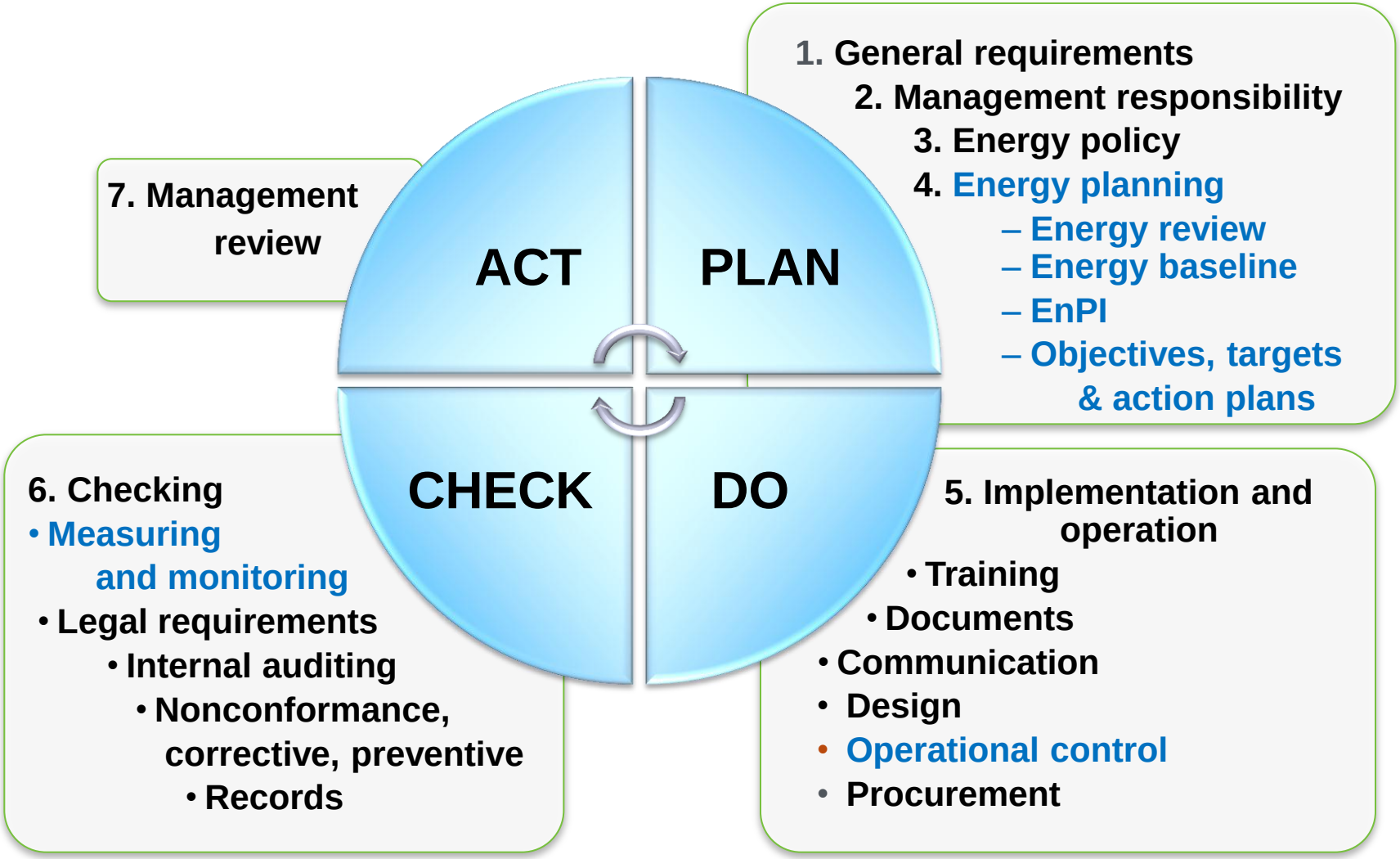
New international standard codifies best practices in energy management:

- **Data-driven** approach
- More **strategic deployment** of energy efficiency technologies (e.g. advanced monitoring systems)
- Integration of **energy efficiency practices** into daily organizational operations
- **Continual improvement** of energy performance
- **Greater reliability** of sustained energy savings

- Developed with input from 56 countries
- Many countries now adopting ISO 50001 as national standard.

www.iso.org/iso/home/standards/management-standards/iso50001.htm

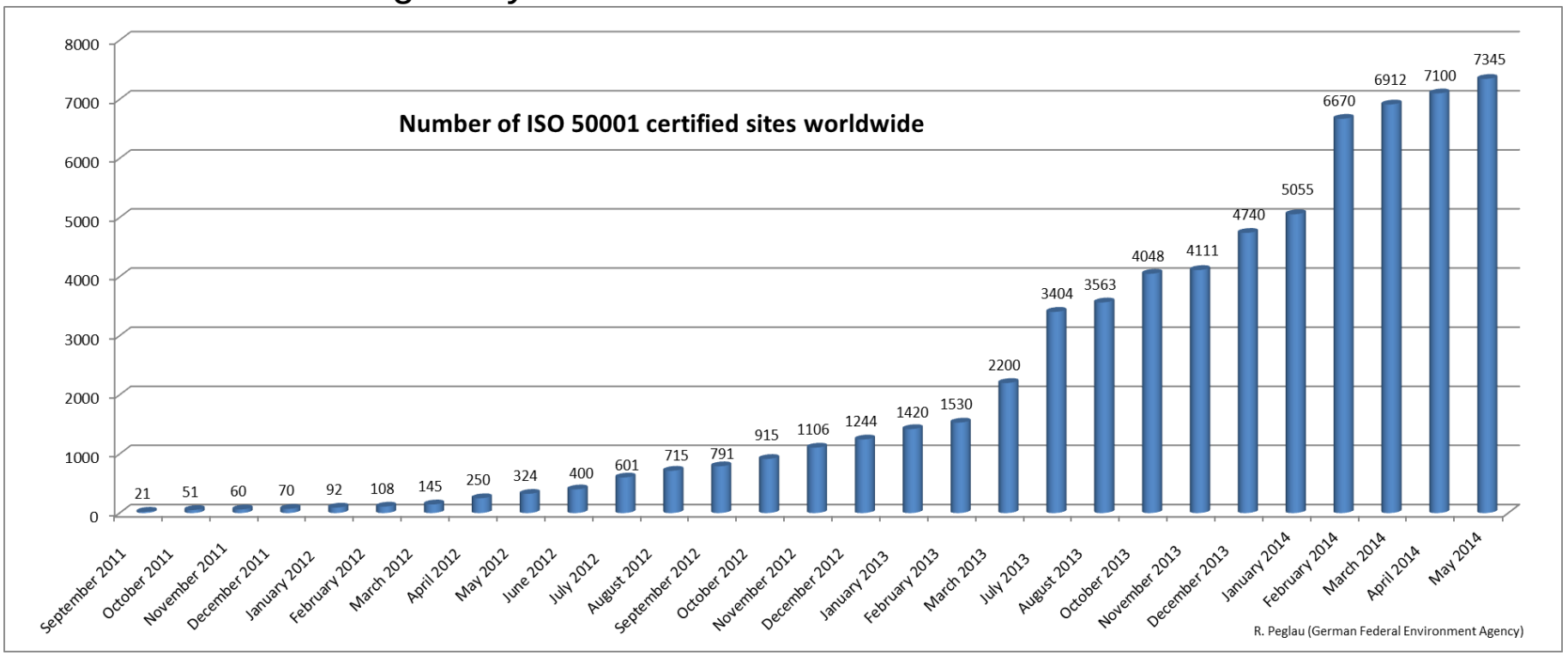
ISO 50001: Plan-Do-Check-Act



Blue text represents new data-driven sections in ISO 50001 that are not in ISO 9001 & ISO 14001

ISO 50001 Certifications Worldwide

Nov. 2011 through May 2014



7,345 certified sites worldwide as of May 30.

Number of global ISO 50001 certified sites has increased by 234% over the past 14 months (March 2013 to May 2014).

ISO 50001 Adoption: 3 Years Since Publication

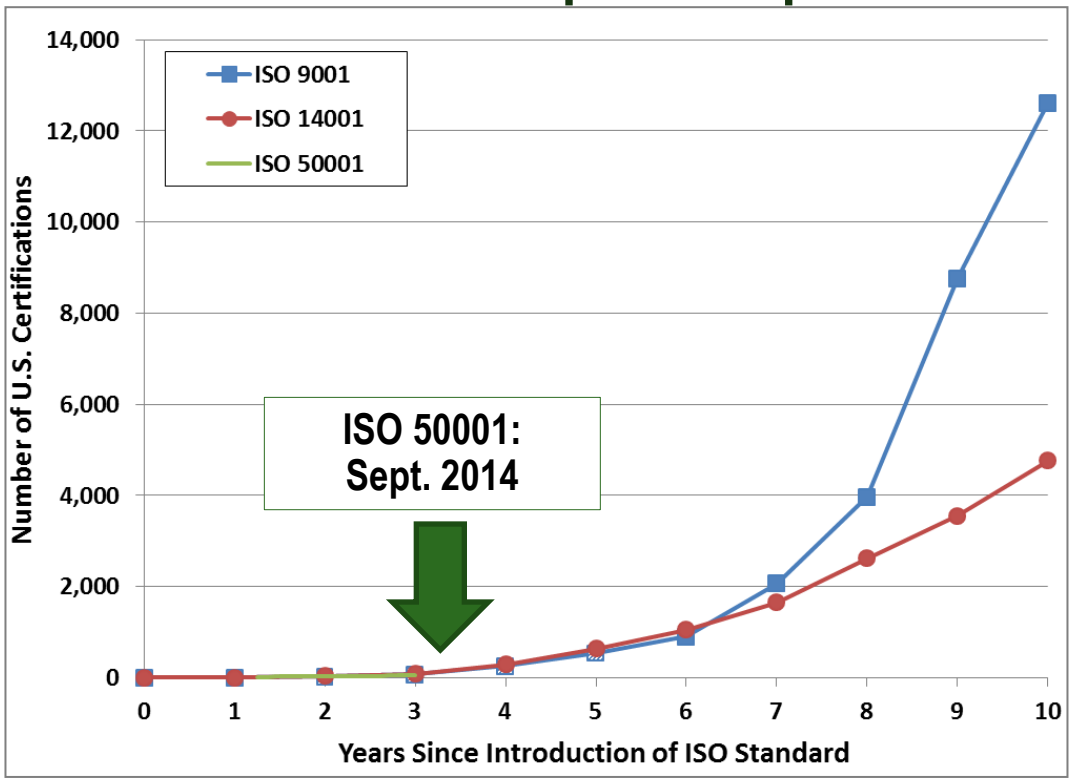
U.S. interest is increasing.

Country	ISO 50001 Certifications (May 30, 2014)	ISO 50001 Certified Sites (May 30, 2014)
Global	**3,518**	**7,345**
Germany	1,812	3,441
France	74	973
Netherlands	22	408
United Kingdom	80	355
Italy	207	245
Spain	178	227
Sweden	96	224
India	118	161
Korea	42	123
Turkey	84	120
United States	43	62

Source: Reinhard Peglau, German Federal Environment Agency

U.S. uptake of ISO 14001 and ISO 9001 did not accelerate until 5 to 7 years after introduction.

Accelerated U.S. Uptake Expected



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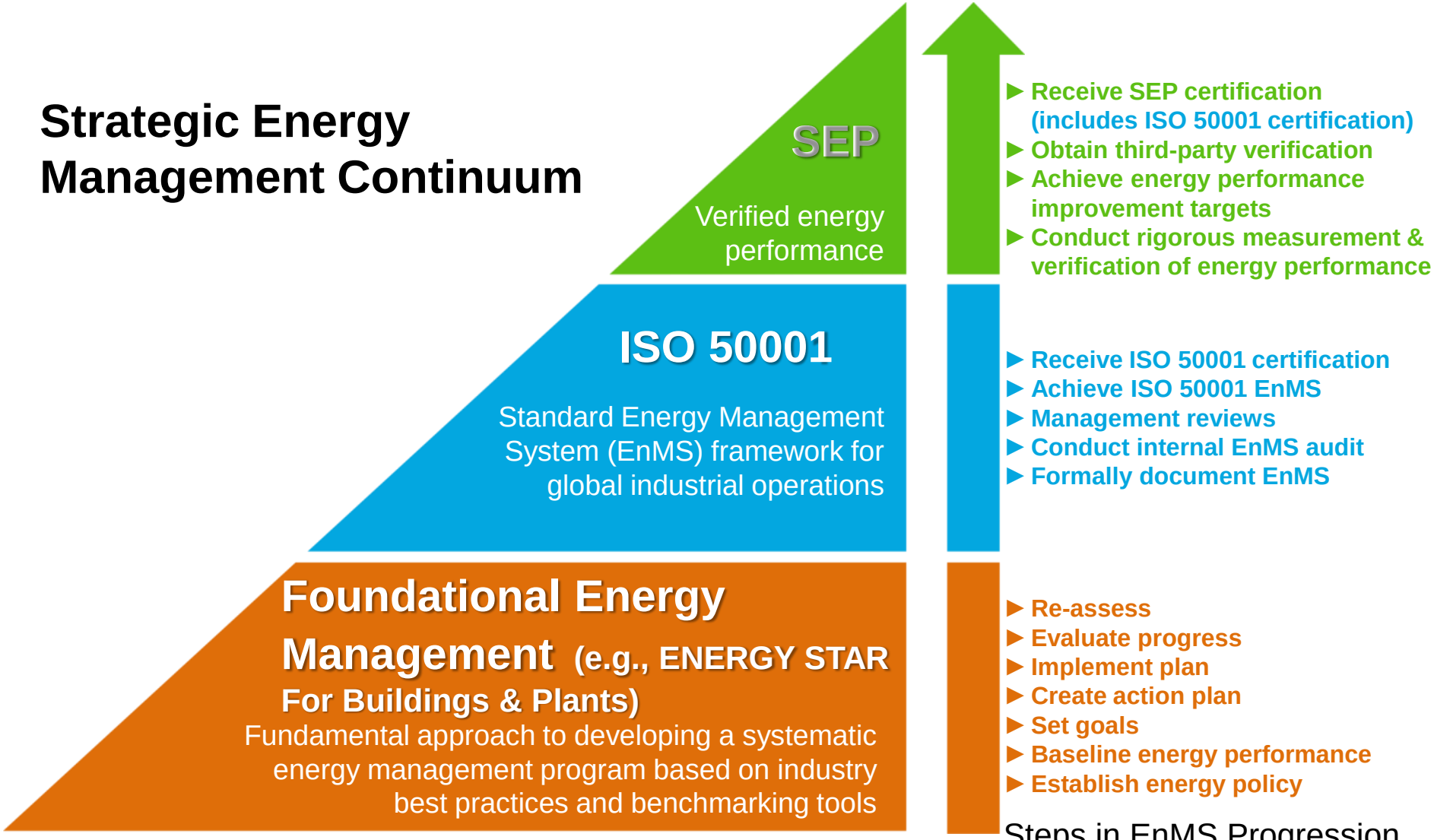
Strategic Energy Management

Strategic Energy Management Continuum



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Superior Energy Performance™

Superior Energy Performance™ (SEP)

Certification program to recognize industrial facilities that demonstrate energy management excellence and sustained energy savings.
Facilities implement ISO 50001 and undergo third-party audit to verify energy performance improvement.

- Rigorous, data-driven approach
  - New insights & opportunities
- Includes ISO 50001 certification
- Third-party verification by ANSI-ANAB accredited entity
- Savings persist and grow, even as operations change
- High-level credibility and DOE recognition

iStock photo: 16418416

SEP Certification Requirements

SEP requires plants to meet the ISO 50001 energy management standard and verify the savings they achieve.

ISO 50001

Components in place:

- Top Management
- Energy Team
- Policy
- Planning
- Baseline
- Performance Metrics

Superior Energy Performance

Builds upon ISO 50001 to help organizations achieve deeper, more sustained energy and cost savings.

ISO 50001 certification

Verified energy performance improvement

ANSI Accredited Certification Program

ANAB

"External verification and validation is critical. Certification adds to the confidence in calculations and savings."

Nissan,
Smyrna, TN

Criteria for Achieving SEP Performance Levels

Facilities can pursue either of two pathways to achieve SEP certification at the Silver, Gold, or Platinum level.

Performance Characteristics		Silver	Gold	Platinum
Energy Performance Pathway	**Energy Performance Improvement**	Meets a specified energy performance threshold over the last **3** years:		
		5%	**10%**	**15%**
Mature Energy Pathway Uses Best Practice Scorecard to earn points for energy management best practices and energy performance improvements.	**Energy Performance Improvement**	Meets **15%** energy performance improvement threshold over the last **10** years.		
	Score on Best Practice Scorecard (out of 100 total points)	• **At least 35 points** • Minimum of 30 points for energy management best practices	• **At least 61 points** • Minimum of 40 points for energy management best practices and 10 points for energy performance (beyond 15% over the last 10 years)	• **At least 81 points** • Minimum of 40 points for energy management best practices and 20 points for energy performance (beyond 15% over the last 10 years)

Shorter time periods may be used if specified criteria are met.
See SEP Measurement and Verification Protocol, Section 3.5.2.

Industrial Facility Best Practice Scorecard

- The **Industrial Facility Best Practice Scorecard** provides facilities on the Mature Energy Pathway with:
  - Framework to earn credits to qualify for silver, gold, or platinum designation
  - Approaches that can be implemented to earn the credits
- A tool will be available to help users apply the scorecard.

Credits are awarded in seven major categories:

Energy Management Credits[1]:

1. Energy data, monitoring, and measurement
2. Significant energy uses
3. Energy supply
4. Management of energy projects
5. System sustainability

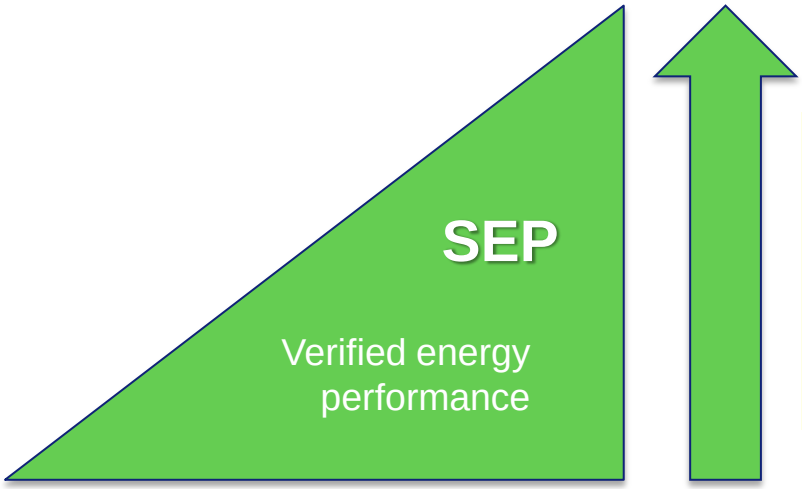
Energy Performance Credits:

6. Energy performance improvement credits
7. Innovation credits for energy performance

[1] Activities, processes, or procedures that exceed the requirements of ISO 50001.

Latest version available: http://energy.gov/eere/amo/downloads/superior-energy-performance-industrial-facility-best-practice-scorecard

SEP Measurement & Verification Protocol



SEP requires a facility to determine its energy performance improvement with the

SEP Measurement and Verification Protocol for Industry

The SEP M&V Protocol offers a best practice methodology to:

1. Verify the results from a facility's implementation of ISO 50001
2. Track energy performance changes over time
3. Document energy performance normalized to production and other relevant variables

The SEP M&V Protocol is used by:

- Facilities – to conduct data collection, analysis, and documentation to show conformance with SEP requirements
- The SEP Audit Team – to confirm a facility's conformance to SEP requirements

SEP Results

Superior Energy Performance Certified Plants

Energy Performance Improvement Achievement Period

3 years

Facility Name	Sector	Improvement*
Volvo Trucks, NA *Dublin, VA*	Transp. Equipment	**25.8%**
Dow Chemical Company *Texas City, TX:*	Chemicals	**17.1%**
HARBEC Inc. *Ontario, NY*	Plastics & Rubber	**16.4%**
Schneider Electric *Seneca, SC*	Electrical Equipment	**15.6%**
Schneider Electric *Smyrna, TN*	Electrical Equipment	**15.3%**
3M Canada Company *Brockville, Ontario*	Forest Products	**15.2%**
CCP Composites US LLC *Houston, TX*	Chemicals	**13.0% - recertification**
Cummins *Rocky Point, NC*	Machinery Manufacturing	**12.6%**
General Dynamics *Scranton, PA*	Fabricated Metals	**11.9%**
Allsteel *Muscatine, IA*	Furniture & Related Products	**10.2%**
Cooper Tire *Texarkana, AR*	Plastics & Rubber	**10.1%**
Olam Spices *Gilroy, CA*	Food and Beverage	**9.8%**
Owens Corning *Waxahachie, TX*	Nonmetallic Minerals	**9.6%**
Schneider Electric *Cedar Rapids, IA*	Electrical Equipment	**8.8%**
Dow Chemical Company *Texas City, TX: Energy sys.*	Chemicals	**8.1%**

List continues on the next slide

Superior Energy Performance Certified Plants (continued)

Energy Performance Improvement Achievement Period

	Facility Name	Sector	Improvement*
3 years	**Nissan, NA** *Smyrna, TN*	Transp. Equipment	**7.2%**
	Schneider Electric *Lexington, KY*	Electrical Equipment	**6.8%**
	Freescale Semiconductor, Inc. *West Austin, TX*	Computers & Electronics	**6.5%**
	Schneider Electric *Lincoln, NE*	Electrical Equipment	**6.5%**
	3M Company *Cordova, IL*	Chemicals	**6.2%**
10 years	**Mack Trucks** *Macungie, PA*	Transp. Equipment	**41.9%**
	Bridgestone Americas Tire *Wilson, NC*	Plastics & Rubber	**16.8%**

Nissan: >$900K Savings, 4 Month Payback

- **SEP Silver Certified**: Smyrna, TN vehicle assembly plant
- 7.2% improvement in energy performance over 3 years
- $938,000 total annual energy savings
- 4 month payback
- Used the DOE EnPI Tool to measure and track improvements

"SEP adds rigor, analysis, and gives good guidance. It's one thing to have a target and objective, but SEP gives tools that empower you to be more disciplined and prove the impact certain activities have."

-Nissan North America Energy Team

View this and other SEP case studies at:
http://superiorenergyperformance.energy.gov/successes_and_testimonials.html

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General Dynamics Case Study: >$950K Savings, 6 Month Payback

- **SEP Gold Certified**: Scranton, PA facility. First U.S. defense contractor to be SEP and ISO 50001 certified
- 11.9% improvement in energy performance over 3 years
- $956,000/year operational savings
- $255,000 cost to implement SEP
- 6 month payback

"SEP brought to light many energy intensity savings opportunities that were previously hard to justify. With the EnMS system in place and metering instruments installed, it is much easier to justify improvement projects, and management is more receptive to these proposals."

- Stephen Cannizzaro, Sustainability Manager

See the case study at:
http://superiorenergyperformance.energy.gov/successes_and_testimonials.html

HARBEC Inc.

HARBEC Inc. President, Bob Bechtold, and Energy Team Amy Bechtold and Jeff Eisenhauer at their Ontario, NY, facility.

"We are wary of statements of intent, but third-party verification under SEP provides evidence of proven energy savings. Without verification, stated savings are just a nice statement."

- Bob Bechtold, President

- **SEP Platinum Certified**: Ontario, NY, facility
- Improved energy performance by 16.5%
- EnMS implementation resulted in $52,000 in annual savings through operational improvements ***with no capital investment***
- SEP is the organizing framework in driving the company's goal to be a ***carbon-neutral company***
- Adopted a CHP system and two wind turbines
  - ISO 50001/SEP strengthens management of this equipment, increasing the benefits gained

CCP Composites US LLC

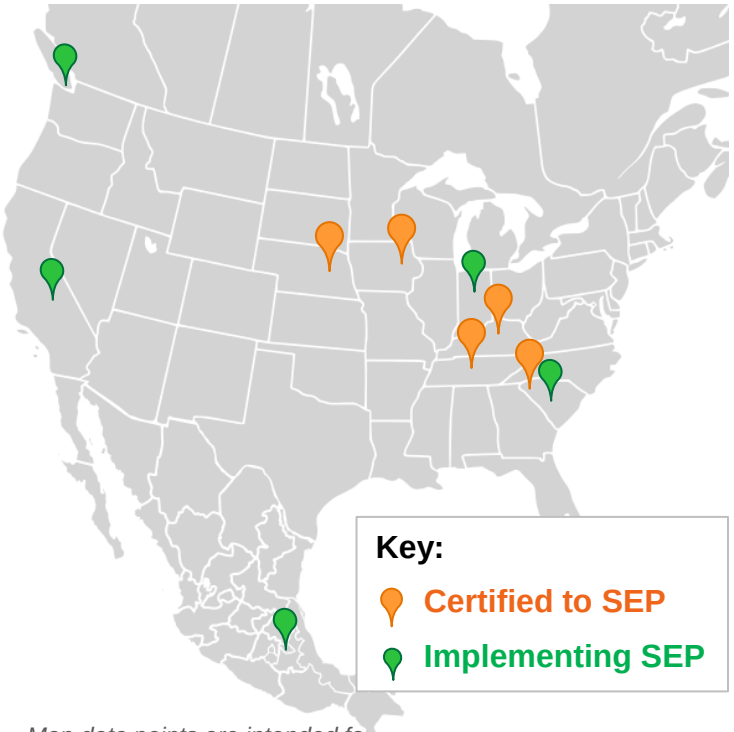
Energy Team at CCP Composites US LLC in Houston, a synthetic resin manufacturing plant

"Nearly all our energy efficiency projects are now at least influenced, if not initiated as a result of SEP participation. Prior to SEP, we would not have thought to be more energy efficient; it was not part of our corporate culture.

- CCP Composites US LLC

- **SEP Gold Certified:** Houston, TX, facility (CCP was SEP Certified Gold in 2010, and recertified in 2013)
- Improved energy performance by 13.0% over 3 years
- EnMS implementation resulted in $87,000 in annual operational improvement savings ***with no capital investment***
- Energy management is now a key part of the company corporate culture
  - Energy cost savings provide competitive edge in a low-margin industry

Schneider Electric: Smyrna, TN & Beyond



Map data points are intended for illustrative purposes only.

- **SEP Platinum Certified**: Smyrna, TN facility
- Improved energy performance by 15.3% over 3 years
- Facility did not add any staff to support SEP implementation.
- Smyrna's success is driving Schneider Electric to ***implement SEP across 9 additional facilities:***
  - United States: 7
  - Canada: 1
  - Mexico: 1

"At first, we didn't appreciate the value of third party verification, but our facility has evolved to value third party verification as critical. Any facility can claim energy savings, but a third party verification proves the savings to be real."

- Schneider Electric, Smyrna, TN

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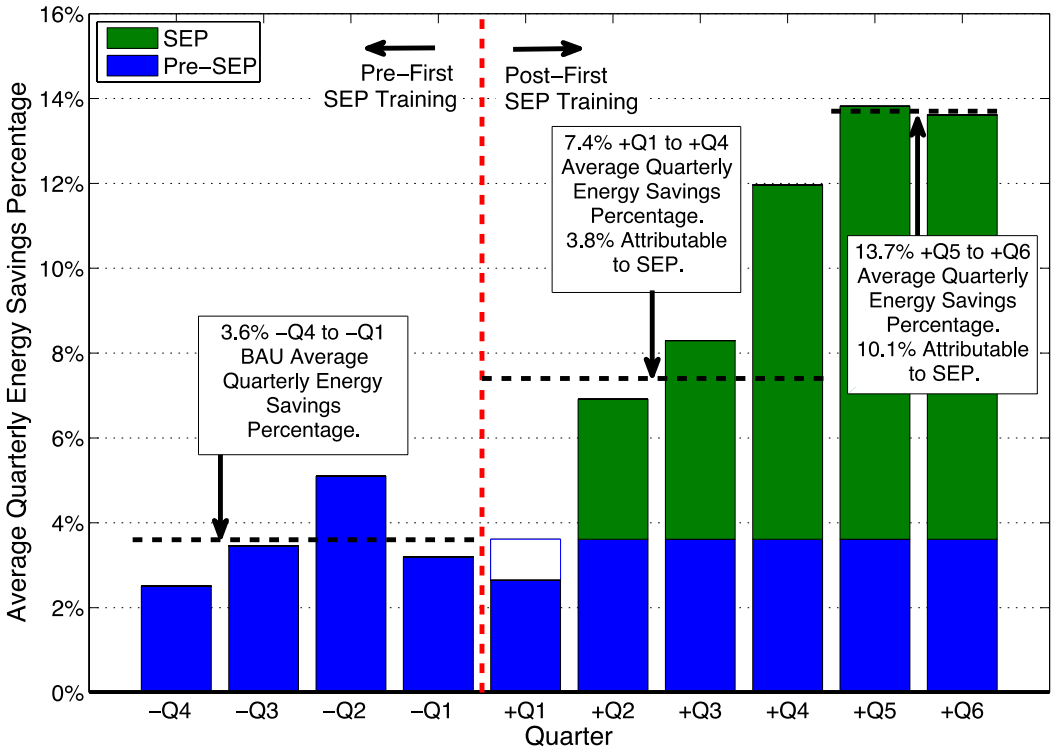
Cost Benefit

Data and Metrics: Making the Business Case

Recently published study:

Nine industrial facilities certified to Superior Energy Performance:

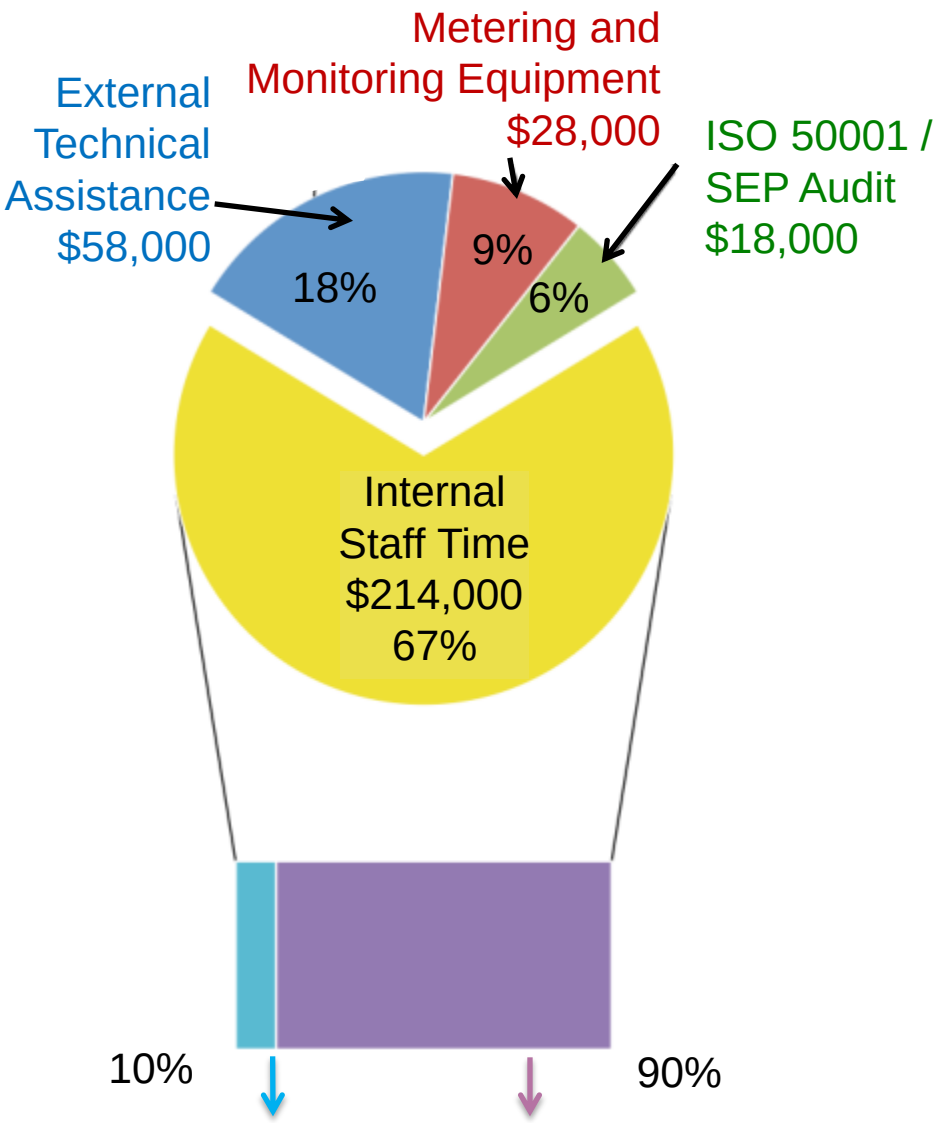
- Improved their energy performance by an average of 10% and saved over $500,000 per year over business-as-usual in the first 18 months of SEP implementation.
- Saved an average of $503,000 per year from operational improvements (low/no cost investment) attributable to SEP.



Average quarterly percentage energy savings as a function of average quarterly baseline energy consumption for all nine facilities. Results are aligned across facilities so that the first quarter starts when the facilities received their first SEP training. Subtracting the BAU quarterly energy savings percentage from quarterly post-first training energy savings percentages reveals savings attributable to SEP.

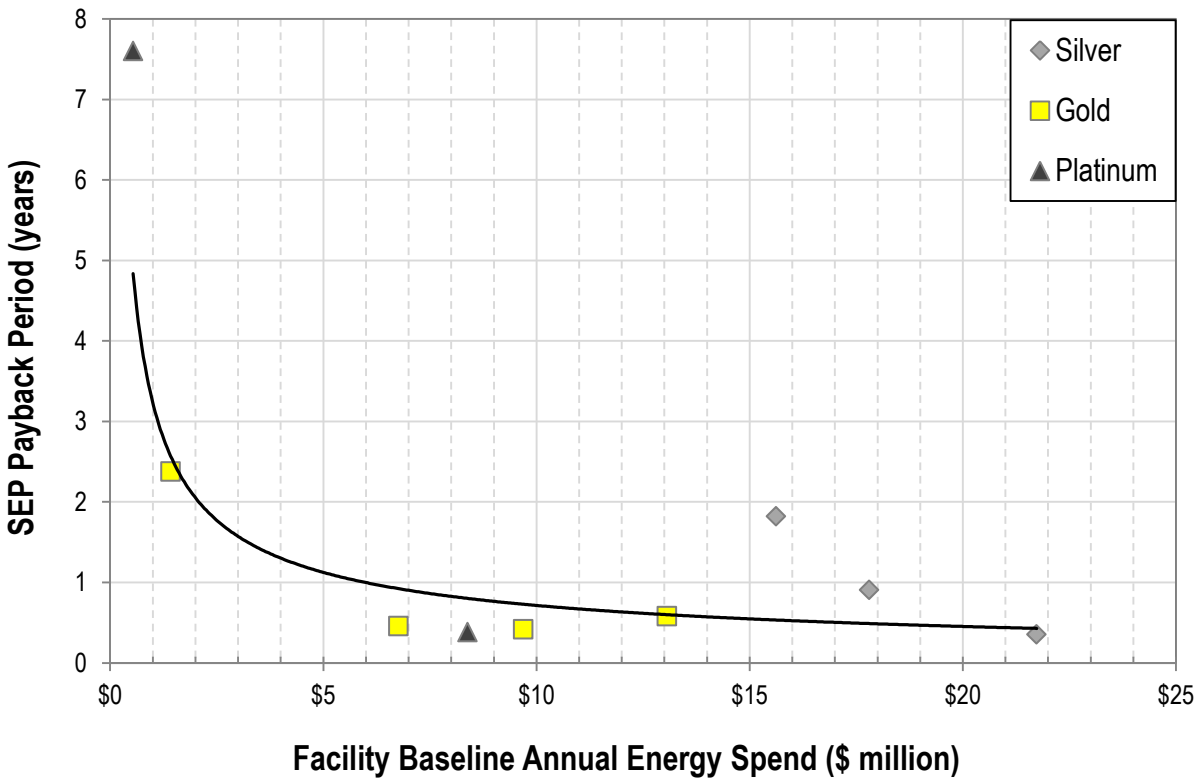
View full study at: http://eetd.lbl.gov/sites/all/files/aceee_sep_paper.pdf

Data and Metrics: Making the Business Case (continued)



- Participation costs included: Staff Time, Technical Assistance, EnMS Monitoring/Metering Equipment, and 3rd Party Certification
- Cost of ISO 50001 and SEP certification marginally higher than ISO 50001 alone and comparable to other standards (e.g., ISO 14001)
- Facilities noted cost of third party certification was small and outweighed by the benefits

SEP Payback



Analysis of 9 SEP certified plants:

- **Improved their energy performance**
  - Between 6.2% and 25.8% over three years
  - Facility average 11.7% over three years
- **Less than 2 year payback** for facility with a baseline annual energy spend of > $2M

$$\text{Marginal Payback} = \frac{\text{Plant's SEP costs* (not including capital project costs)}}{\text{Associated SEP operational energy savings beyond business-as-usual operational energy savings prior to SEP}}$$

*SEP costs include internal staff time, including staff already employed.

Certification Process

SEP Certification Process

1. Enroll
Enroll in SEP, no matter how far along you are in the process. There is no commitment involved.

2. Prepare
Implement an EnMS in your facility using the various available resources and work towards meeting SEP requirements.

3. Apply
Once ready, submit an application to the SEP Administrator. When it is approved, the application will be sent to your selected SEP Verification Body.

4. Verify
The SEP Verification Body will used certified audit personnel to verify your facility's conformance to SEP requirements.

5. Maintain and Recognize Achievement
SEP certification is valid for three years, as long as your facility completes the annual surveillance audits to confirm continued EnMS maintenance (a requirement of ISO 50001). Your facility will receive recognition from the SEP Administrator, currently the U.S. DOE.

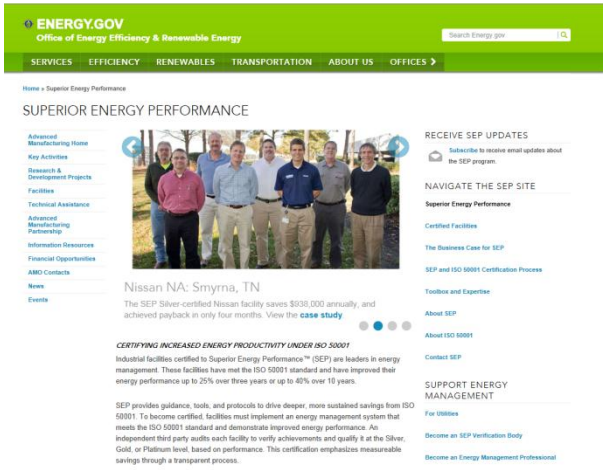
6. Recertify
SEP Certification lasts for 3 years. In order to maintain certification, your facility will have to apply for recertification and undergo a recertification audit, similar to the initial certification audit, to show that the requirements are still met.

http://energy.gov/eere/amo/sep-and-iso-50001-certification-process

SEP Certification Process: Enroll

Enroll with the SEP Administrator and streamline the SEP implementation process

- Gain access to program updates, tips, and phone support.
- **No fees or commitment are required.** Simply provide some basic facility and contact information to stay connected to the latest information on ISO 50001 and SEP.
- Download the enrollment form from the SEP website and sign up today.
- Learn more about SEP and ISO 50001: http://energy.gov/eere/amo/superior-energy-performance



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SEP Certification Process: Prepare

Prepare your facility to establish an EnMS that meets ISO 50001

- Implement an EnMS using the DOE eGuide and other technical resources available on the SEP website
- The DOE eGuide is a web-based toolkit that provides step-by-step guidance, checklists, templates, forms, and examples to assist your team throughout the EnMS implementation process https://ecenter.ee.doe.gov/EM/SPM/Pages/Home.aspx
- Review SEP certification requirements
- Access the SEP standards and protocols

SEP Certification Process: Apply

Apply when your facility meets SEP requirements and is ready for the audit

- Currently, no fees are charged for applying to SEP
- Download the SEP Application form from the SEP website and submit it to the SEP Administrator.
- The SEP Administrator will review applications to assure completeness and notify you when the application is approved.
- Approved applications are sent to the SEP Verification Body designated by the facility.

SEP Certification Process: Verify

Verification involves the audit process to become certified to SEP

- The SEP Verification Body that you selected will send an audit team to conduct the two-stage audit.
  - Stage 1: readiness review to confirm preparedness (conducted on-site or remotely)
  - Stage 2: an SEP Lead Auditor and SEP Performance Verifier(s) will visit the facility to determine whether its EnMS conforms to ISO 50001 and SEP requirements and to verify the energy performance improvement
- Post-audit: SEP and ISO 50001 certificates are issued.
- SEP certification is valid for 3 years

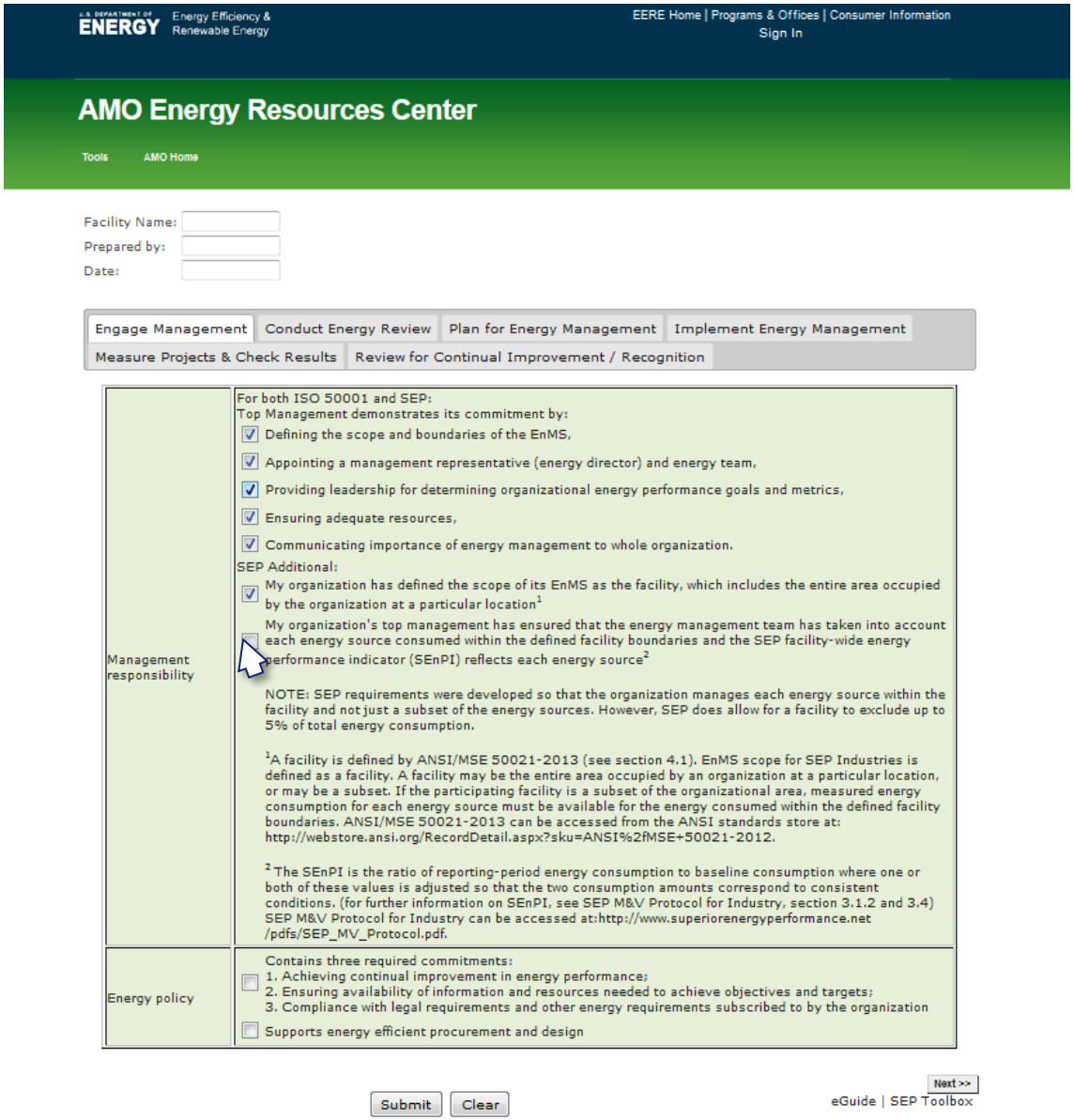
SEP Tools and Resources

Tools and Resources for SEP

A range of implementation resources available:

- **DOE eGuide:** Use this web-based toolkit to implement an EnMS consistent with ISO 50001, https://ecenter.ee.doe.gov
- **Certified Practitioners in EnMS**: Hire a CP EnMS to assist with implementing ISO 50001 and preparing for SEP certification. Or send internal staff to the training to build this expertise in house. Find a CP EnMS: http://ienmp.com/pro_search/index.php?action=1
- **EnPI Tool:** Enter energy consumption data and easily adjust for variables to receive a normalized view of energy performance and calculate SEP metrics, http://ecenter.ee.doe.gov/EM/tools/Pages/EnPI.aspx
- **Strategic Energy Management Checklist**: Conduct a high-level assessment to determine readiness for SEP or ISO 50001 and define practical next steps, http://superiorenergyperformance.energy.gov/intro_resource_energy_management.html
- **Tools and Training**, available from DOE's Advanced Manufacturing Office: Access a wider array of resources and tools on specific energy systems, webinars on energy management, and more.
- **ENERGY STAR tools:** Use these tools and resources to build effective programs that improve energy performance, includes best practice guides and benchmarking tools for facilities in specific industrial sectors and buildings, www.energystar.gov/industry

Strategic Energy Management Checklist



- High-level assessment to determine readiness for SEP or ISO 50001.
- Click on energy management activities that your facility has implemented.
- The checklist generates a report of ISO 50001 and SEP elements that your facility has completed and those that remain to be implemented.

DOE eGuide

- Meant for organizations that have at least some experience with energy management and that have an energy management system in place.
- Toolkit designed to help organizations improve their current energy management approach and prepare them for becoming ISO 50001 certified. A variety of DOE and EPA resources are available.
- Includes forms, checklists, templates, examples and guidance to assist the Energy Champion and Energy Team throughout the implementation process.
- 7 steps takes the user from the decision to utilize an energy management system, through implementation and into system maintenance.
- Uses a proven continual improvement process and ISO 50001.
- Organizations that complete the eGuide will have a clear understanding of the framework that ISO 50001 establishes for pursuing continual energy improvement.

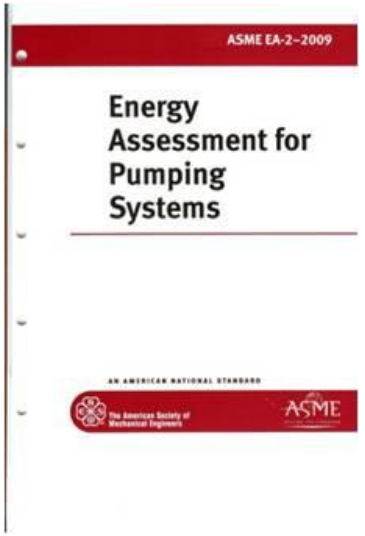
https://ecenter.ee.doe.gov

System Assessment Standards

Assessment standards for specific energy systems provide immediate opportunity for energy performance improvement in many facilities.

Use of the standards is **not** required for SEP certification but will help plants define a pathway for achieving energy savings.

Initial Standards:
- Compressed Air
- Pumping
- Process Heating
- Steam



Standards address:
- Organizing an assessment
- Conducting an assessment
- Analyzing the data collected and developing efficiency recommendations
- Reporting and documentation

Purchase standards and guidance documents (print or digital) for $35:

- https://www.asme.org/kb/standards?cm_re=Shop%20ASME-_-Left%20Navigation-_-Standards#des=EA

Certified Professionals that Support SEP & Personnel Certification Infrastructure

Certified Professionals that Support SEP

Superior Energy Performance™ is building workforce capacity for industrial energy management implementation and measurement & verification.

Training and skill are required for appropriate application of the ISO 50001 and SEP standards, and to conduct the SEP certification audit.

- **Certified Practitioners in Energy Management Systems:** Assist facilities in implementing an energy management system that conforms to ISO 50001 and preparing facilities to meet SEP requirements.
- **SEP Lead Auditors:** Assess a manufacturing plant's management system conformance to ISO 50001 and additional SEP requirements
- **SEP Performance Verifiers:** Assess a manufacturing plant's conformance to the (1) measurement and verification protocols and (2) energy performance improvement levels defined by the SEP program.

http://energy.gov/eere/amo/become-energy-management-professional

Certification for SEP Professionals Ensures High Quality

The professional credentialing programs for SEP are ANSI ISO/IEC 17024 accredited:

- Scientifically developed exam and strict controls on conflict of interest provides greater assurance that individuals will have the necessary knowledge and skills to be competent

Elements:

- Certification Scheme
- Scope and Job Task Analysis (Blueprint)
- Both training and professional exam are based on the Scope and Blueprint
- ANSI requires a firewall between training and professional qualification exams

- **Personnel Certification Body (PCB):** The **Institute for Energy Management Professionals** develops and manages professional qualifications and associated exams.
- **Personnel Training Organization (PTO):** DOE licensed two organizations to provide training: **Georgia Tech** and **UL DQS**.

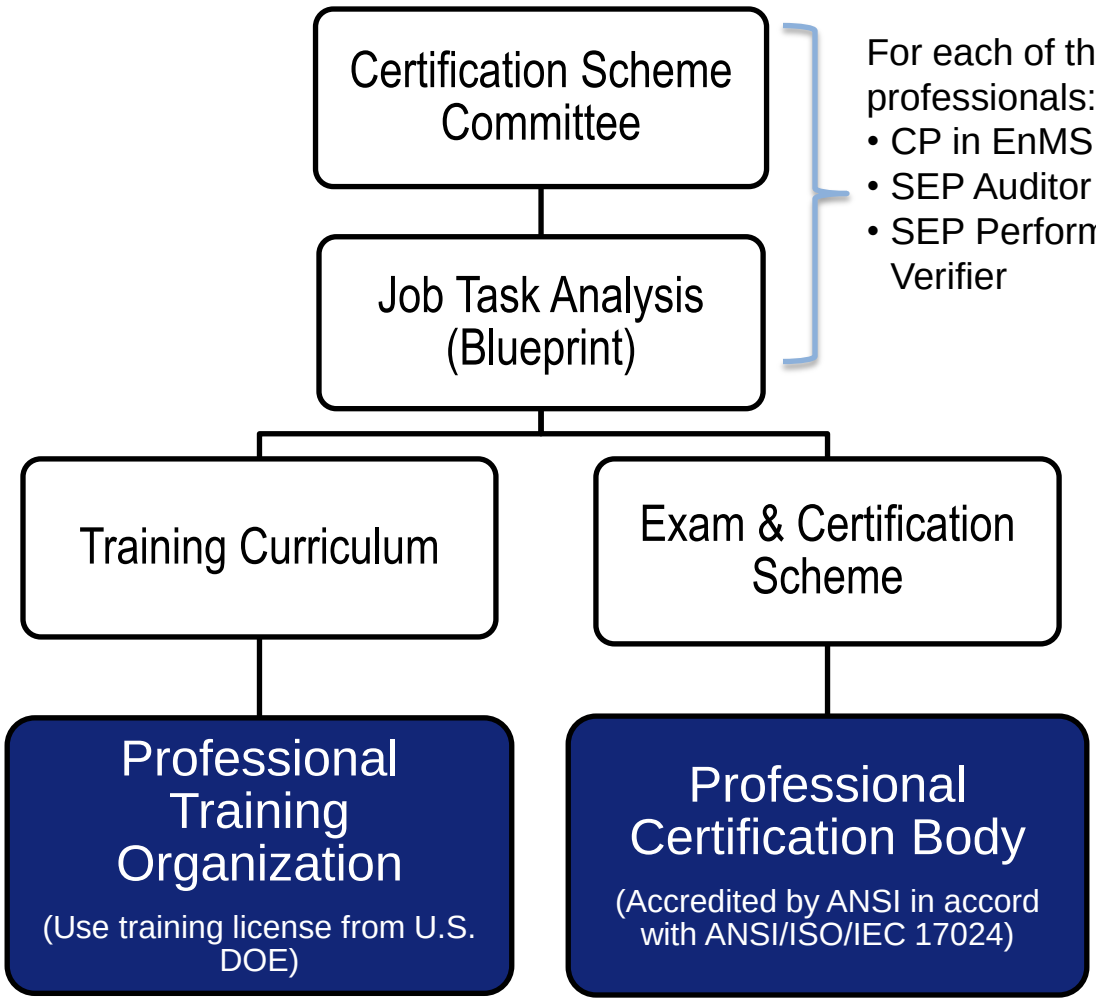
Professional Certification Framework

Committees of experts were developed for each type of professional

List of required knowledge and performance topics (skill set) were defined and reviewed by a separate expert group

Training and exam based on Job Task Analysis (JTA) Blueprint

Training and exams administered through selected organizations



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SEP Verification Bodies & Certified Personnel

ANSI/MSE 50028
(Requirements for Verification Bodies)

Verification Bodies
(governed by ANSI/MSE 50028 requirements)

Verification Bodies will be accredited by ANSI and ANAB, based on requirements of the MSE 50028 standard.

ANSI-ANAB Accreditation includes:

- Off-site review of the VB candidate's documented management system
- Observations of the candidate's audit team
- Assessment of the recordkeeping and competence of candidate's office personnel
- Annual verification of continued conformance

Accredited Verification Bodies conduct SEP audits using certified *SEP Lead Auditors* and *SEP Performance Verifiers*.

Certified SEP Audit Team Members

SEP Performance Verifier

SEP Lead Auditor

Can be one cross-qualified person

CP EnMS + additional SEP Performance Verifier Exam required

CP EnMS & ISO 50001 Lead Auditor + additional SEP Lead Auditor Exam required

Certified Practitioner in Energy Management Systems (CP EnMS)

Certified ISO 50001 Auditor
(U.S. National Exam)

Note: CP EnMS requires sector-specific certification

All Certified Personnel must meet **ANSI/ISO/IEC 17024 accredited certification requirements**, including education, experience, and standardized exam

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SEP Verification Bodies

To become certified, facilities must conform to ISO 50001, improve energy performance, and undergo an SEP audit from an ANSI-ANAB accredited SEP Verification Body. **DOE encourages ISO 50001 Certification Bodies to pursue ANSI-ANAB accreditation to conduct SEP audits.**

Authorized SEP Verification Bodies are ANSI-ANAB Accredited and recognized by the SEP Administrator

- DEKRA Certification
- UL DQS Inc.

Applicant Verification Bodies conduct SEP audits witnessed by an ANSI-ANAB assessment team as part of the accreditation process

- Advanced Waste Management, Inc.
- LRQA

SEP Accelerator Initiative

SEP Accelerator

The Industrial SEP Accelerator is part of the Better Buildings initiative to transform markets for accelerated energy efficiency.

Purpose: DOE is exploring ways to make SEP certification easier and more affordable for industrial facilities.

- **SEP Enterprise-wide Accelerator**: Companies are testing strategies to benefit from economies of scale.
  - 27 participating facilities from 5 companies:
  - 3M Company, Cummins, General Dynamics, Nissan North America, Schneider Electric,
  - Located in U.S., Canada, Mexico
- **SEP Ratepayer-funded Program Accelerator**: Utilities and program administrators are testing SEP as an offering for their industrial customers.
  - Bonneville Power Administration, Efficiency Vermont, Northeast Utilities

http://www.eere.energy.gov/buildings/betterbuildings/accelerators/

Example of SEP Enterprise-Wide Implementation

Example Corporation with 8 facilities

Scope of Enterprise: 4 participating in SEP

- ISO 50001 certification at Enterprise-wide level: covers each facility pursuing SEP certification.
- ISO 50001 conformance audited at enterprise level and only sampled at facility level; requirement is mostly met at enterprise level.
- SEP performance verification conducted at each participating facility.

Facility 1 SEP certified

Facility 3 SEP certified

Facility 2 SEP certified

Facility 4 SEP certified

Facility 5 not participating in SEP

Facility 7 not participating in SEP

Facility 6 not participating in SEP

Facility 8 not participating in SEP

Enterprise ISO 50001 central office requirements

- **Management system requirements:**
  - Energy policy
  - Enterprise-wide system documentation and system changes authorized by the central office
  - Management review, as compiled from all sites
  - Evaluation of corrective actions
  - Internal audit planning and evaluation of the results
  - Legal and other requirements
- **Energy performance requirements:**
  - Consistent energy planning process
  - Consistent criteria for determining and adjusting baselines, relevant variables and energy performance indicators (EnPIs)
  - Consistent criteria for establishing objectives and targets and site action plans
  - Centralized processes for evaluating applicability and effectiveness of action plans and EnPIs
  - Energy performance data is centrally aggregated

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DOE Better Plants and Superior Energy Performance™ programs

Better Plants and Superior Energy Performance

DOE Advanced Manufacturing Office has two complementary programs:

Better Plants

- **Corporations** set a goal, establish baseline, track energy use, and report data
- Corporations report to DOE on an annual basis on a portfolio of facilities.

Superior Energy Performance (SEP)

- **Facility-level** certification and recognition program to demonstrate energy management excellence and sustained energy savings.
- Energy performance improvement is verified by a third party SEP verification body retrospectively in past 3 to 10 years.

Better Plants & SEP: Complementary Programs

DOE's Better Plants

Corporate-wide Recognition
Aspirational Focus:
Pledge to improve energy performance by
25% in the next 10 years

Superior Energy Performance

Facility-level Certification
Achievement Focus:
Energy performance improved
5% or more
over the past 3 to 10 years

Better Plants Helps SEP Participants

- Provides structure for corporate-wide energy efficiency goals
- Fosters replication of SEP at other facilities

SEP Helps Better Plants Partners

- Helps individual plants to accelerate energy savings that contribute toward corporate goal
- Provides rigor of energy performance measurement at the facility level

Conclusions

Conclusion: Benefits of SEP Noted by End Users

- **Rigor:**
  - Improves measurement of energy performance by manufacturing processes
  - Helps uncover new savings opportunities, including those that are low/no cost
- **Focus of process energy savings:**
  - Engages process engineers in energy management
  - Raises awareness of energy savings potential on the process vs. equipment side of manufacturing
- **The business case:**
  - Gives plant managers top-level metrics on the bottom-line business value
  - Yields accurately calculated and validated savings numbers that plant managers can present to management with confidence.

More User Testimonials

"Any facility can claim energy savings, but a third party verification proves the savings to be real."

Schneider Electric, Smyrna, TN

"Third-party certification removes any potential of "green washing" and provides credibility to savings."

General Dynamics, Scranton, PA

"SEP has helped justify expenditures to management. The measurement and verification requirement helps to ***identify real cost savings***, allowing us to reinvest those savings into additional energy projects."

Cooper Tire, Texarkana, AR

"The verification was more important than the management standard, because it provides a performance metric.

SEP provides the ability to have proven performance metrics to quantify actual savings, giving both internal and external credibility to savings claims."

Volvo Trucks, Dublin, VA

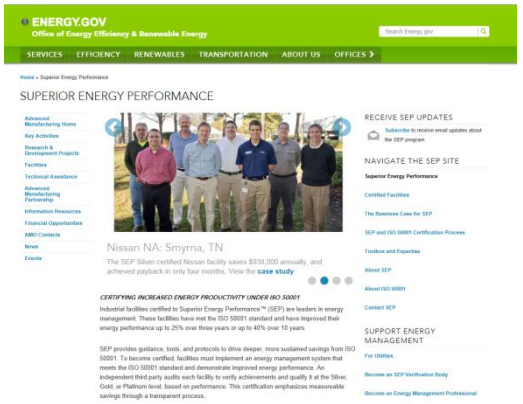
Unexpected Findings

Working with SEP-certified facilities, DOE gained valuable insights that challenged initial assumptions.

- **Industry values third-party verification:**
  - Facilities were not hesitant to pursue a third-party audit.
  - Credibility from third-party verification was a key motivation for pursuing SEP certification.
  - The results provided more value internally within the company on the value of EnMS.
- **Prior management system experience has a greater influence on a facility's success with ISO 50001 and SEP:**
  - Experience with energy efficiency was not the only factor for success with SEP.
  - Plants with existing ISO management systems, but nascent energy programs, were also successful with achieving SEP certification.

Take the Advantage:

Superior Energy Performance



Enroll: Open to any U.S. **industrial facility** at any stage of the SEP implementation process

Apply: Any U.S. industrial facility may submit an application for certification when ready for its SEP audit.

Visit: **www.superiorenergyperformance.energy.gov**

Better Plants

Join:

- **Corporations** sign a voluntary pledge to reduce energy intensity 25% over 10 years across the enterprise
- Designate a corporate energy manager and develop internal energy management plan within a year
- Annually report energy data, number of plants involved, and progress.

Visit: **www.energy.gov/eere/amo/better-plants**

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http://energy.gov/eere/amo/superior-energy-performance

http://energy.gov/eere/amo/advanced-manufacturing-office

http://energy.gov/eere/amo/technical-assistance-activities

Back up slides

M&V and Continual Energy Performance Improvement

- SEP M&V Protocol includes

  Familiar approaches

  – Regression

  – Energy accounting

  and new elements

  – Focus on continual improvement in energy performance

  – More than a collection of actions or projects
- ISO 50001 requires organization to “plan operations and maintenance activities which are related to its significant energy uses”
- Not all activities *related to operational control* of significant energy uses will require action plans- they are ongoing

SEP M&V Protocol Provides Quality Control

Superior Energy Performance: Measurement and Verification Protocol for Industry (Nov. 19 2012)

- 3.2 Calculating Adjusted Consumption;
- 3.3 Calculations for a Facility;
- 3.4 Model Validity for Calculating Adjusted Consumption;
- 3.6 Using Adjustment Model Application Methods to Determine Energy Performance Improvement Relative to a Baseline;
- 3.8 Calculating Consumption;
- 3.9 Data Quality

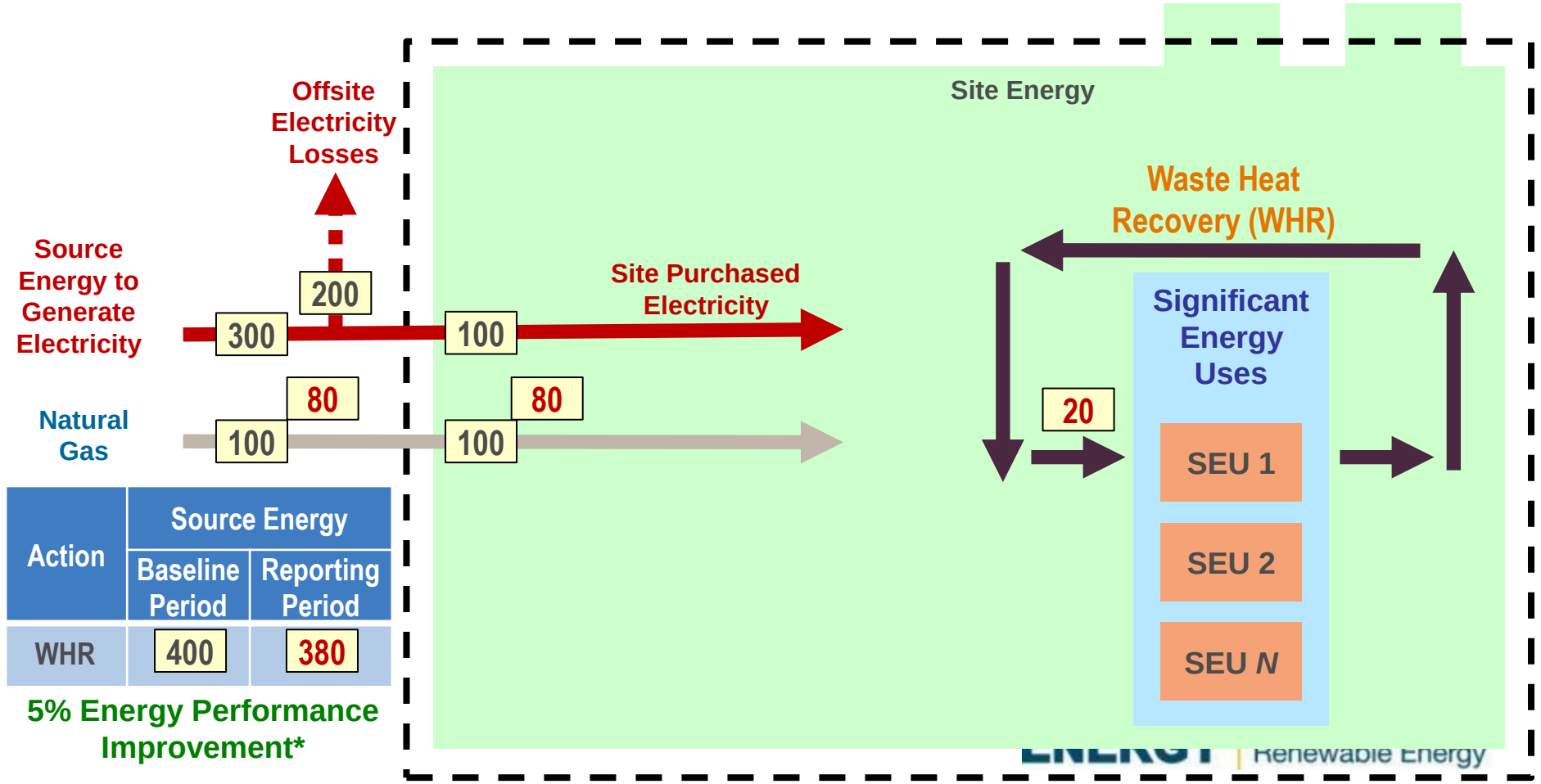
Evaluation, Measurement, and Verification

Superior Energy Performance: Measurement and Verification Protocol for Industry (Nov. 19 2012)

- 3.3.3 Totaling Energy Sources;
- 3.7.1 Conversion of Electricity to Primary Energy

SEP Energy Accounting

- ISO 50001 EnMS and SEP help to identify facility Significant Energy Uses (SEUs)
- SEP determines energy performance improvement by the whole facility
- SEP uses Source energy accounting
- Energy savings from a mix of no-cost/low-cost improvements and capital projects

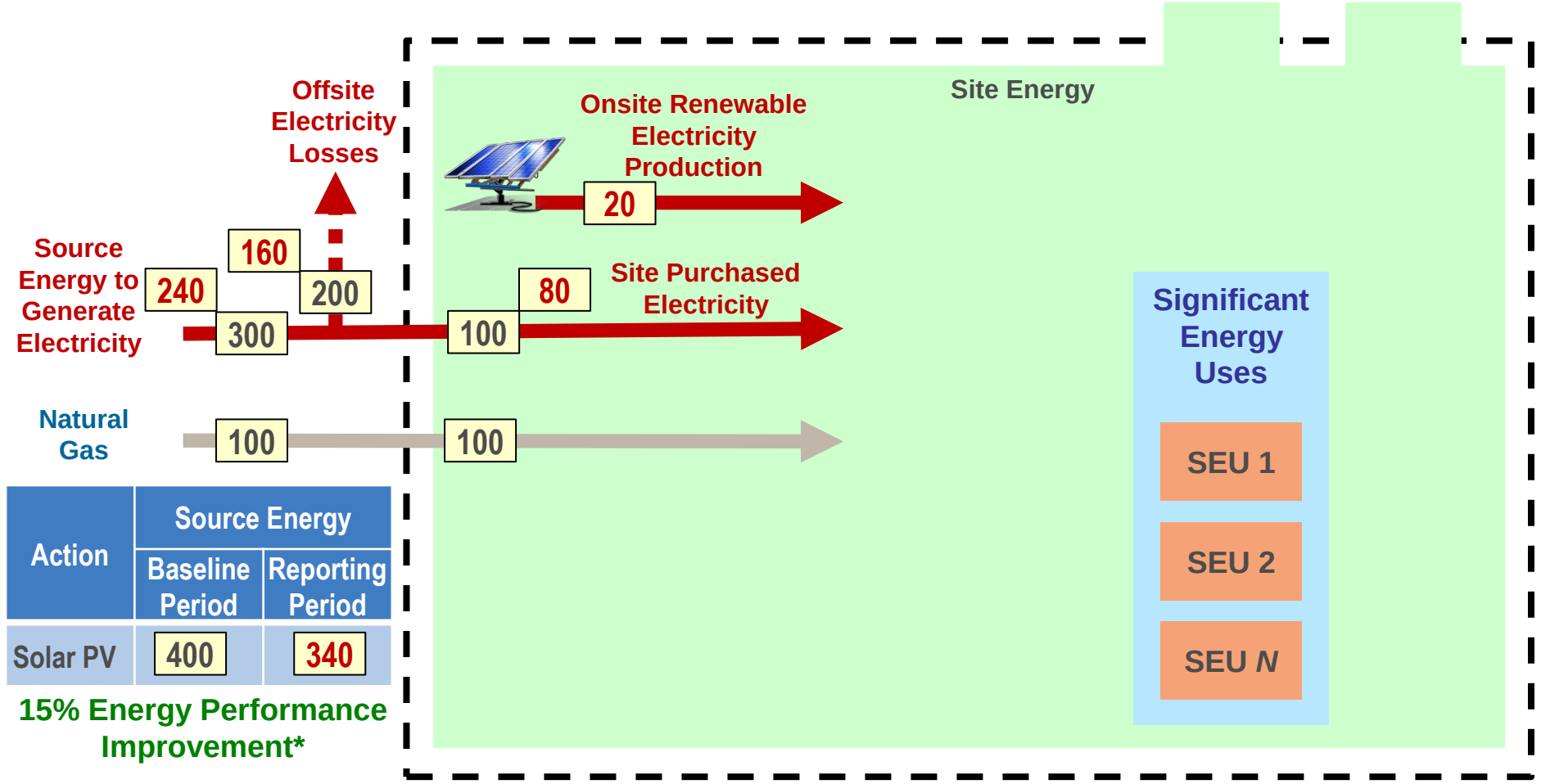


Action	Source Energy	
	Baseline Period	Reporting Period
WHR	400	380

5% Energy Performance Improvement*

*assuming no change in production & other variables

SEP Energy Accounting: Renewable Energy Generation



Action	Source Energy	
	Baseline Period	Reporting Period
Solar PV	400	340

15% Energy Performance Improvement*

*assuming no change in production & other variables

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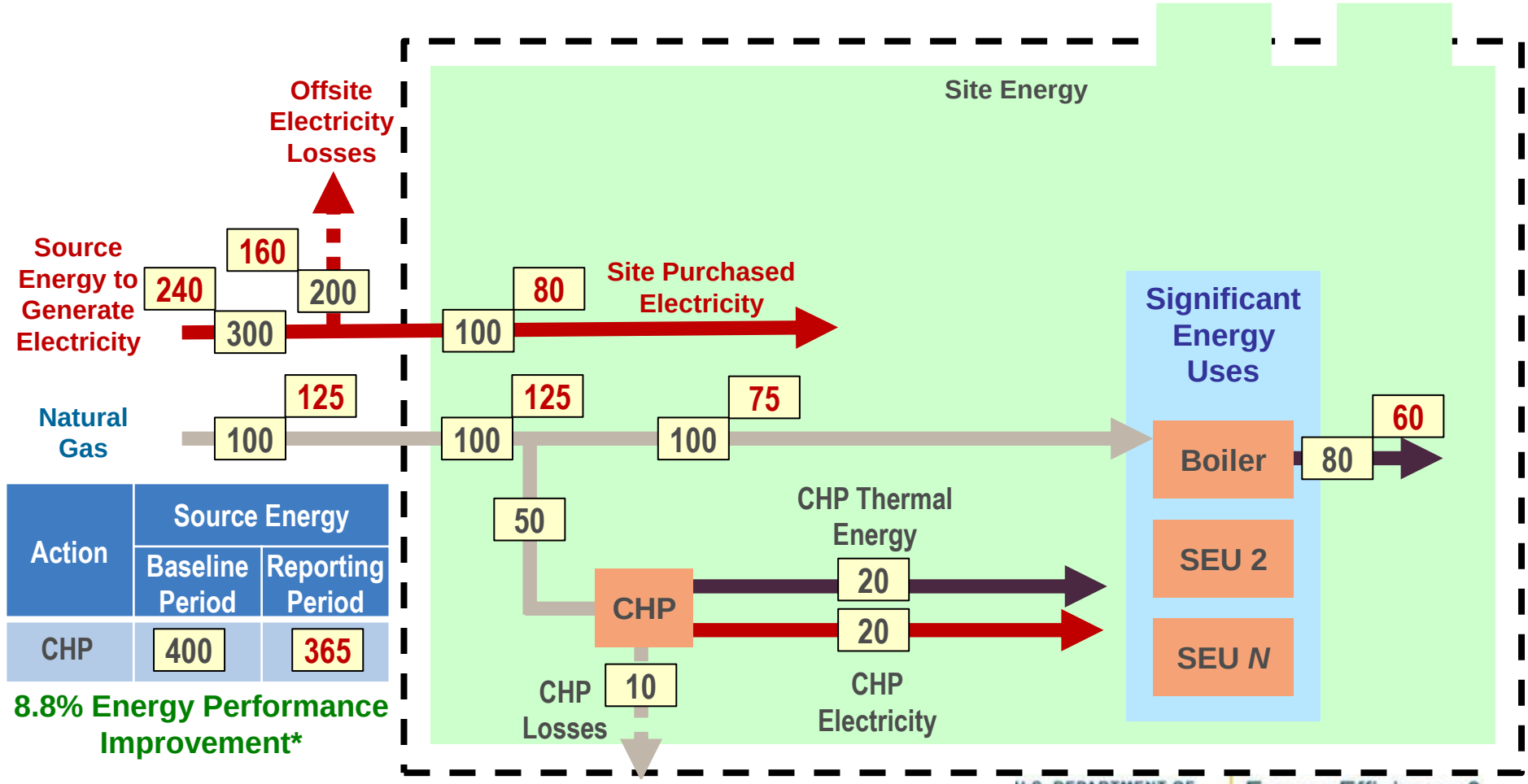
SEP Energy Accounting: Combined Heat and Power (CHP)



Action	Source Energy	
	Baseline Period	Reporting Period
CHP	400	365

8.8% Energy Performance Improvement*

*assuming no change in production & other variables

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