### US DOE Two-Step Approach for ISO 50001 Market Adoption

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**Program Name**
- US developed program for ISO 50001 certification

**Validation with QE²ST Protocol**
- Market Allies recognized by US DOE

**Superior Energy Performance (SEP)**
- Accredited certification bodies recognized by US DOE
United States Strategy for ISO 50001

Response to US Climate Commitments

“50001 Ready”
Resources to increase adoption of ISO 50001 structure within all sectors of US economy

Step 1:
Self-declared Implementation of
ISO 50001

US Technical Approach
- Step by step guide to self-directed ISO 50001 implementation using Guide for Energy Management (GEM) tool
- Calculator to determine energy and emissions savings through top-down regression analysis using Qualified Energy and Emissions Savings Tool (QE²ST)
- QE²ST Protocol for validation and consistency of results

Step 2:
Validation of energy and emissions reductions
ISO 50001 Conformant Plants Outperforms Peers

3M and Schneider Electric SEP and ISO 50001 certified facilities show greater energy savings than non-certified facilities.

Savings at certified facilities greater on average compared to non-ISO facilities:

- **3M: 62% greater over 3 years**: 18 ISO 50001 certified sites across 7 countries; 2 US SEP, 1 Korea SEP certified; 257 non-ISO5001
- **Schneider Electric: 65% greater over 4 years**: 20 ISO 50001 certified in North America; 16 US SEP certified; 30 non ISO50001
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

**Professional Certification Body:**

**Institute for Energy Management Professionals**

(Accredited by ANSI in accord with ANSI/ISO/IEC 17024)

Deliver exams and certify personnel

**Professional Training Organization:**

**Georgia Tech and UL DQS**

(Use training license from U.S. DOE)

Deliver training courses in preparation for exam
SEP Measurement & Verification

SEP energy performance is demonstrated by:

1. Top-down, whole facility SEP EnPI ("SEnPI")

\[ SEnPI = \frac{BTU_{Tot \ actual}}{BTU_{Tot \ expected}} \]

Where \( BTU_{Tot \ expected} = f(X1, X2, \ldots, Xn) \)

2. Bottom-up sanity check
   Project-specific energy saving estimates based on engineering calculations give confidence in top-down result
Recertified Facilities Show Continual Energy Performance Improvement

Normalized Facility Energy Consumption (source energy)

Nissan – Smyrna, TN facility
Initial Growth of ISO 9001, 14001, & 50001

Global - Initial 26 Years

Years Since Introduction of ISO Standard

Number of Global Certifications

- ISO 9001*
- ISO 14001
- ISO 50001
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.

For each of the following professionals:
- CP in EnMS
- SEP Auditor
- SEP Performance Verifier
- ISO 50001 Lead Auditor

Training and exams administered through selected organizations.

Professional Certification Body
(Accredited by ANSI in accord with ANSI/ISO/IEC 17024)
DOE is refining SEP to improve and simplify the program based on experiences and feedback to date. Improvements include:

- **Single, unified scoring system and qualification pathway** combines best features of the Energy Performance and Mature Energy Pathways
- Provide **flexibility in setting facility baseline year to align with corporate or enterprise**; enable companies to more easily expand SEP participation across facilities
- **Motivate plants to enhance energy management programs** though use of the Scorecard at Gold and Platinum levels
- For recertification, provide **practical and flexible energy performance improvement requirement** that is sustainable over multiple certification cycles

Certification to updated program design anticipated by Fall 2016
- SEP standards and protocols to be updated and peer reviewed
- Current program will continue to be available during a transition period
### SEP - Initial Certification

- ISO 50001 certification
- Verified energy performance improvement

#### Performance Levels

<table>
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<tr>
<th>Achievement period</th>
<th>Bronze</th>
<th>Silver</th>
<th>Gold</th>
<th>Platinum</th>
</tr>
</thead>
<tbody>
<tr>
<td>12-36 months (1-3 yrs)</td>
<td>1%</td>
<td>N/A</td>
<td>5%</td>
<td>N/A</td>
</tr>
<tr>
<td>37-48 months (~3-4 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>7%</td>
<td>N/A</td>
</tr>
<tr>
<td>49-60 months (~4-5 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>8%</td>
<td>N/A</td>
</tr>
<tr>
<td>61-72 months (~5-6 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>10%</td>
<td>N/A</td>
</tr>
<tr>
<td>73-84 months (~6-7 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>12%</td>
<td>N/A</td>
</tr>
<tr>
<td>85-96 months (~7-8 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>13%</td>
<td>N/A</td>
</tr>
<tr>
<td>97-108 months (~8-9 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>15%</td>
<td>N/A</td>
</tr>
<tr>
<td>109-120 months (~9-10 yrs)</td>
<td>N/A</td>
<td>N/A</td>
<td>16%</td>
<td>N/A</td>
</tr>
</tbody>
</table>

**Recertification**: Same requirements except energy performance improvement is:

- **Bronze**: 1% over most recent 3 years
- **Silver, Gold, Platinum**: 3% over most recent 3 years for all achievement periods

**ISO 50001**: Verified energy performance improvement

**ISO 50001**: Recertification

**ISO 50001**: + 40 SEP Scorecard credits, including:

- 35 points for Energy Management System
- 20 points for Energy Performance

**ISO 50001**: + 60 SEP Scorecard credits, including:

- 10 points for Advanced Practices
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

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

Certified SEP Audit Team Members

- **SEP Performance Verifier**
  - CP EnMS + additional SEP Performance Verifier Exam required
  - Can be one cross-qualified person

- **SEP Lead Auditor**
  - 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
The Manufacturer shall demonstrate that its supplier facilities or enterprises have each individually achieved any one or a combination of the following:

**Part A.** Third party certification to ISO 50001 or a nationally adopted version of ISO 50001

**Part B.** Improved energy performance by at least 5% in the most recent 3 years (calendar or fiscal) or that it has improved energy performance by at least 1.67% in the most recent year. The energy performance improvement shall be verified through a third party, accredited, verification body or qualified auditor. The energy performance shall be normalized using key relevant variables within the scope of the program (e.g., production volume, building occupancy, and weather)

**Part C.** Third party certification to an energy performance program e.g. US DOE Superior Energy Performance (SEP) program at the Silver achievement level or greater, Korea SEP program, or a nationally adopted version that meets the requirements of the SEP program
Energy Exchange: Federal Sustainability for the Next Decade

Venn Diagram of Crossover of Apple, Dell and HP suppliers

- Breakdown of suppliers:
  - 84% unique
  - 10% shared by two of the three Manufacturers
  - 6% shared by all three Manufacturers
Top countries in Apple’s supply chain:
1. China: 45%
2. Japan: 16%
3. USA: 10%
4. Taiwan: 5%
Top countries in Dell’s supply chain:
1. China: 78%
2. Taiwan: 8%
3. Malaysia: 5%
Top countries in HP’s supply chain:
1. China: 49%
2. Malaysia: 8%
3. Czech Republic: 8%
4. USA: 6%
5. Singapore: 6%
6. Mexico: 6%

*The population of facilities does not include HP’s commodity and component suppliers (38 companies). The country of origin is not provided for this subset of HP’s suppliers.
Supply Chain: Apple, Dell and HP Consolidated

Number of Facilities per Country
1,001 Facilities

- China 506 (50%)
- Japan 127 (13%)
- USA 77 (8%)
- Taiwan 55 (5%)
- Malaysia 36 (4%)
- Korea 29 (3%)
- Singapore 24 (2%)
- Thailand 21 (2%)
- Philippines 21 (2%)
- Vietnam 19 (2%)
- Brazil 11 (1%)
- Mexico 18 (2%)
- Germany 11 (1%)
- Netherlands 6 (1%)
- UK 6 (1%)
- France 4 (0%)
- Turkey 1 (0%)
- Norway, India 1 (0%)
- Poland 1 (0%)
- Hungary 1 (0%)
- Ireland 2 (0%)
- Belgium 2 (0%)
- Czech Republic 8 (1%)
- Austria 3 (0%)
- Indonesia 4 (0%)

Energy Exchange: Federal Sustainability for the Next Decade