ISO 50001-conformant Energy Management Systems

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Value of Energy Management

- Energy efficiency improvements with very favorable payback periods often ***do not get implemented*** due to competing organizational priorities
- Even projects that <u>are</u> implemented may ***not be sustained*** due to lack of supportive operational and maintenance practices

Problem: ***Energy efficiency is not integrated into daily management practices.***

Solution: ***Staff at all levels in an organization need to be engaged in the management of energy on an ongoing basis.***

Energy management requires an organization <u>to shift</u> from a project-by-project approach to one of <u>continual improvement in energy performance</u>

ISO 50001- Energy management systems

New international best practice in energy management leading to:

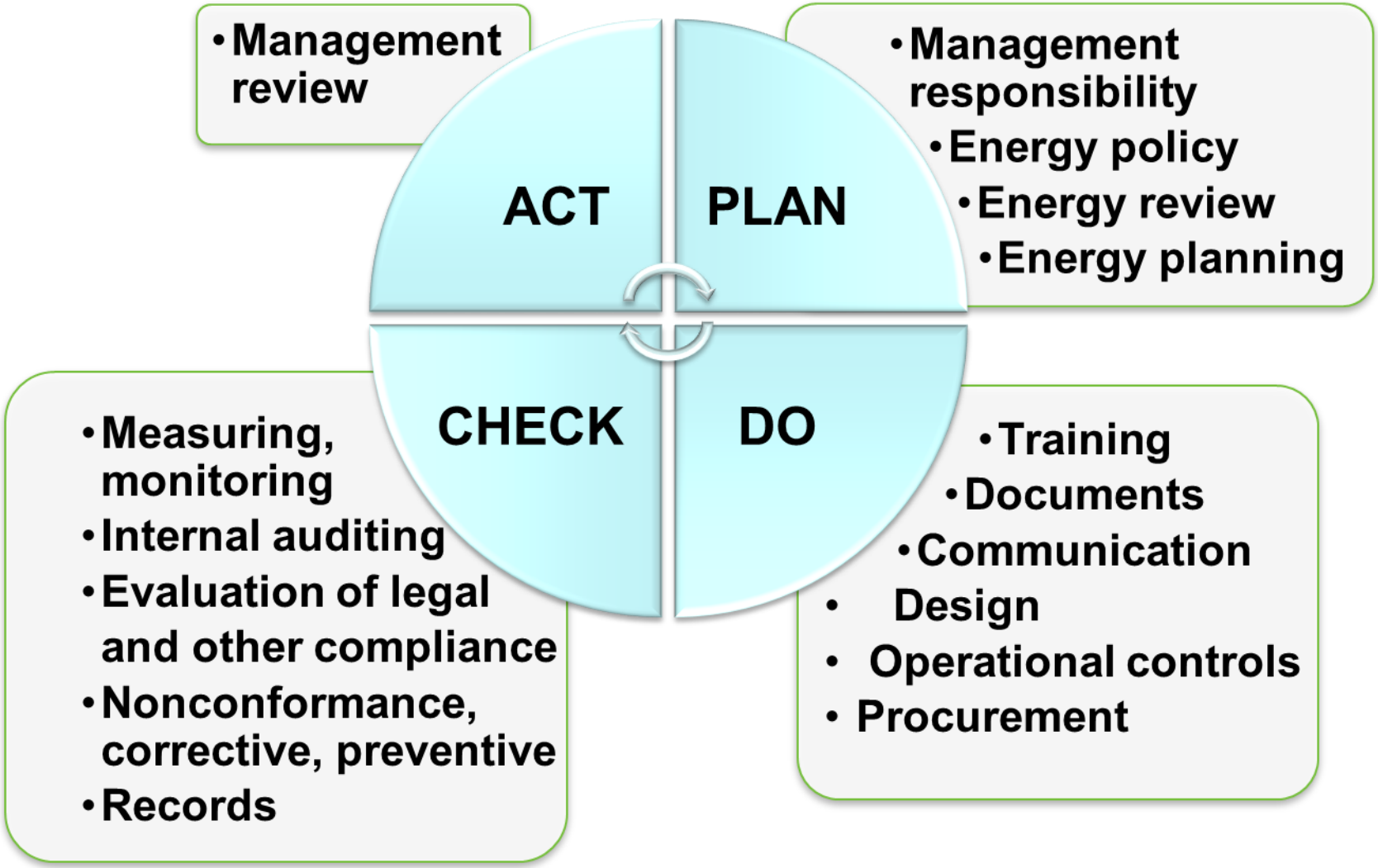
- ***continual improvement*** of energy performance;
- ***greater reliability*** of sustained energy savings;
- ***better utilization*** of energy data in making decisions;
- more ***strategic deployment*** of energy efficient technologies (e.g. advanced monitoring systems), and
- integration of ***energy efficiency practices*** into daily organizational operations.

ISO International Organization for Standardization

- American National Standards Institute & Department of Energy led development
- Published in 2011, including input from 56 countries

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

ISO 50001
Plan-Do Check-Act Cycle



Project Purpose

ISO 50001- Energy management system standard is already demonstrating that it can produce ***deeper and more sustainable energy savings*** in industrial facilities, even those with ongoing energy efficiency programs.[1]

Problem Statement:

Determine whether existing commercial buildings:

1. Are likely to experience similar positive results from implementing ISO 50001
2. Can be expected to achieve full conformance to ISO 50001, or is a less rigorous approach needed
3. Find value in third-party certification of ISO 50001 conformance

1 See US DOE's www.superiorenergyperformance.net

Project Approach

Objectives:

Determine whether existing commercial buildings:

1. Are likely to experience similar positive results from implementing ISO 50001
2. Can be expected to achieve full conformance to ISO 50001, or is a less rigorous approach needed

Approach:

- 8 pilot sites were identified through the Clean Energy Ministerial
- Pilot sites
  - received training and technical assistance
  - decided whether to pursue ISO 50001 or a less rigorous approach (EnMS elements)
  - provided information on resource requirements and overall experience

Pilots and Selected Pathway

1. ISO 50001 Certification Track

- General Service Administration
  - Denver Federal Center (50+ bldgs)
  - Ronald Reagan Office Building (very large multi-function office building)
- J.W. Marriott Hotel (upscale hotel)
- Massachusetts Institute of Technology (entire campus)

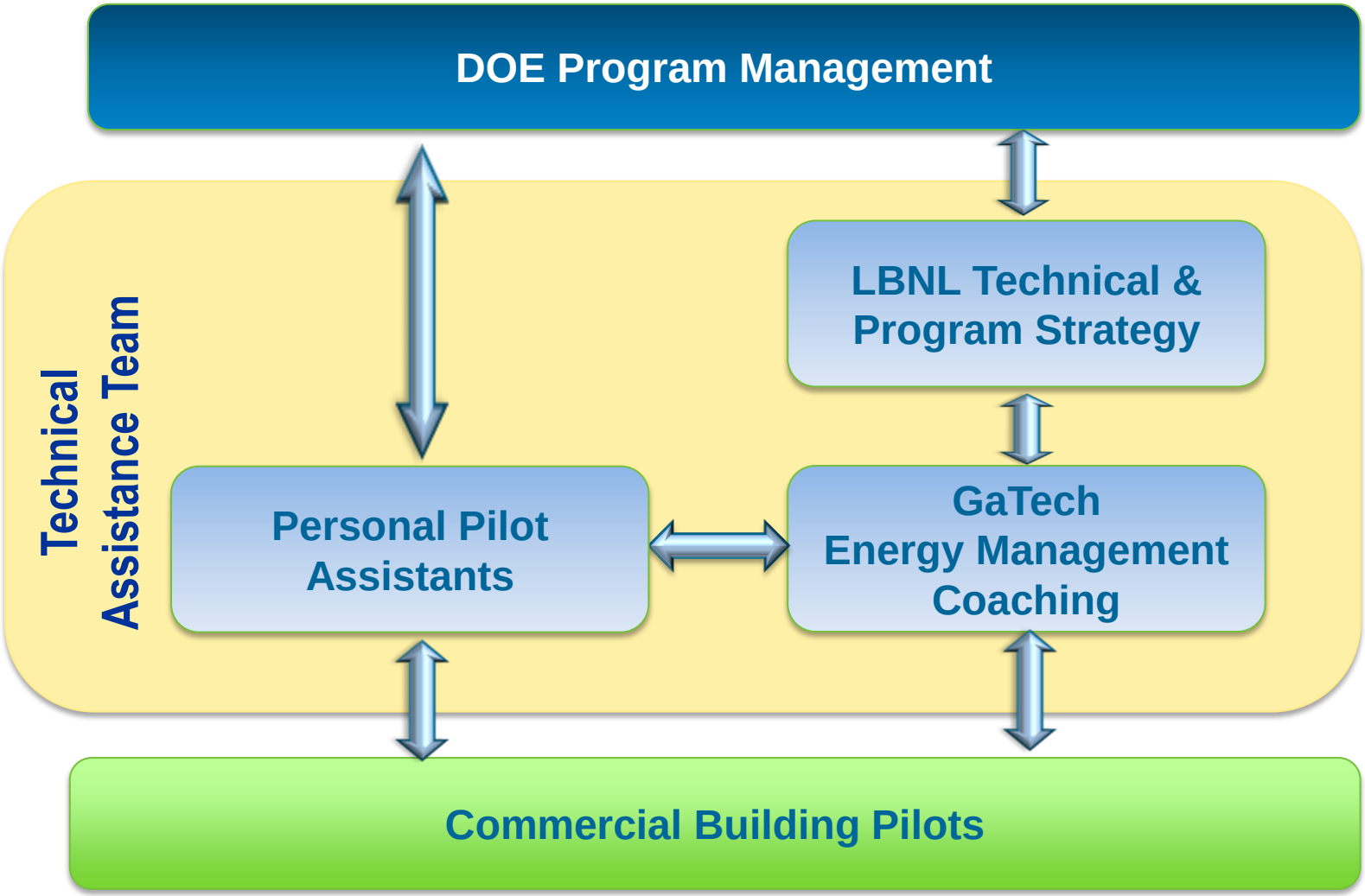
2. Energy Management System Track

- Aetna/NGKF (3rd party- managed office building)

3. Targeted Technical Assistance Track

- Cleveland Clinic (hospital)
- Target (2 stores)
- Walmart

Pilot Organization



Technical Assistance Team

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PPAs

- Manage Relationship w/Pilots
- Monitor Pilot Deliverables
- NREL & LBNL Building EE Experts

LBNL

- ISO 50001 Implementation Strategy
- Program Design
- Certification Cost Analysis
- Manage GaTech Contract

GaTech

- ISO 50001 Implementation Experts
- EnMS Implementation Coaching, Training, Tools
- Document Review & Feedback
- Internal Audit Training

Technical Assistance
April 2012- March 2013

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Regular Coaching Calls

(focused on EnMS implementation)

Off-Site Document Review & Feedback

(using e-mail and e-meetings)

Delivered by Project Technical Assistance Team with participation/inputs from the pilots

(including work plan deliverables & draft documents)

Training Webinars & Technical Resources

(Implementation & Internal Audit topics, e-Guide tools and other implementation resources)

On-Site Internal Audit Training & Practice Audit

(ISO 50001 track only)

EnMS Implementation Tool -Sample

PROJECT DELIVERABLES CHECKLIST					
ISO 50001 ELEMENT	**check if completed**	**PROJECT DELIVERABLES**	**ROLES/ RESPONSBILITIES DEFINED? (yes/no)**	**NEEDED DOCUMENTS COMPLETED ? (as applicable) (yes/no)**	**NEEDED RECORDS UNDER CONTROL? (yes/no)**
1. Management Responsibility		Management representative appointed			
		Energy team established			
		Scope and boundaries defined and documented			
		Importance of energy management communicated by top management			
		Energy objectives and targets approved and resourced			
		EnPIs reviewed and approved			
		Energy management responsibilities and authorities defined and communicated			
		Energy performance incorporated into long term planning			
2. Energy Policy		Energy policy developed and approved			
		Energy policy communicated across the scope			
3. Legal and Other Requirements		Applicable legal and other requirements identified and access established			
		Process for consideration of legal and other requirements in the EnMS established			
		Evaluation of compliance for legal and other requirements completed			
4. Energy Review		Energy sources identified			
		Current energy data collected and analyzed			
		Past energy data collected and anlayzed			
		Significant energy uses (SEUs) determined			
		Variables affecting SEUs identified			
		Current performance of SEU-related facilities, equipment, systems and processes determined			
		Future energy use estimated			
		Energy performance improvement opportunities identified and prioritized			

EnMS Training Webinars

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Building connections to maintain the EnMS

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- Systematic management of energy and continual improvement in performance depends on maintenance of the EnMS, especially ongoing CHECK and ACT processes
- Tracking energy performance requires up to date information and data
- Keeping the EnMS up to date and relevant is critical to embedding energy management into business processes

2 | Industrial Technologies Program © GTRC and

What provides the foundation for updating?

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- Clearly defined intervals for routine reviews
- Clearly assigned roles and responsibilities
- Effective change management
- Effective management reviews

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Onsite Internal Audit Training

GSA Ronald Reagan Building

Massachusetts Institute of Technology

Potential Project Impact

- ISO 50001 implementation in US industrial facilities is yielding verified facility-wide energy performance improvements of 5-25%
  - 77% from operational improvements (no-cost, low-cost)
  - 23% capital projects[1]
- Target large commercial buildings for ISO 50001 certification
  - Roughly 50% of the floor space, 100,000 buildings (~5% total)
- if only 10% of this target group initially participated
  - increasing their energy performance by just 8% over 3 years
  - the annual energy cost savings would be ~ $280 million[2]

1) Assessing the Costs and Benefits of the Superior Energy Performance Program, 2013 ACEEE Summer Study for Industry Paper by LBNL, DOE, Energetics

2) Analysis of Third-Party Certification Potential for Superior Energy Performance for Commercial Buildings, DOE Internal Report prepared by LBNL & DEKRA 2011

Alignment with BTO Goals

Goal: Reduce the energy required to operate existing commercial buildings by 40 percent, at less than the cost of the energy saved. Bring needed technologies and practices to market

ISO 50001 implementation in commercial buildings

- Will result in deeper and more sustainable energy savings
- Build greater management awareness of energy efficiency benefits
- Create opportunities for a new category of energy management professionals
- Provide a structured approach to energy efficiency that can be coupled with M&V processes to create energy savings with market value

Project Budget & Deliverables

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- **FY 12** Total: $459K
  - Subcontracted: $238K (GaTech, DEKRA)
  - Deliverables:
    - Reconfigured Program Design
    - Certification Strategies Analysis
    - ISO 50001 Implementation Assistance for 8 Pilot Organizations
- **FY 13** $18K Additional
  - FY 12 Remaining: $167K
  - In Subcontract: $154K (GaTech)
  - Deliverables:
    - ISO 50001 Implementation Assistance, including onsite training
    - Final Report, Lessons Learned & Recommendations

Next Steps and Future Plans

- Develop internal report summarizing lessons learned
- Apply findings to inform a nationally scalable approach including:
  - Modify / enhance eGuide and other technical assistance tools and resources for this market
  - Expand Certified Practitioner in Energy Management for professionals implementing ISO 50001 in commercial buildings
- Explore ways that ISO 50001 certification can
  - Align with LEED credits
  - Support utility incentives for broader range of EE actions
  - Be combined with verified energy performance improvement

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http://www1.eere.energy.gov/energymanagement/