



Better Plants

U.S. DEPARTMENT OF ENERGY

**TECHNICAL ASSISTANCE:
REVIEW OF OPTIONS FOR BETTER PLANTS
WATER AND WASTEWATER PARTNERS
Quarterly Webinar #1**

September 10, 2015

Introductions/Structure

- DOE Staff & TAMs
- Partners

- Part 1: DOE Technical Assistance Overview

- Part 2: Structured Dialogue

- Concluding Remarks

Water/WWT Better Plants Partners

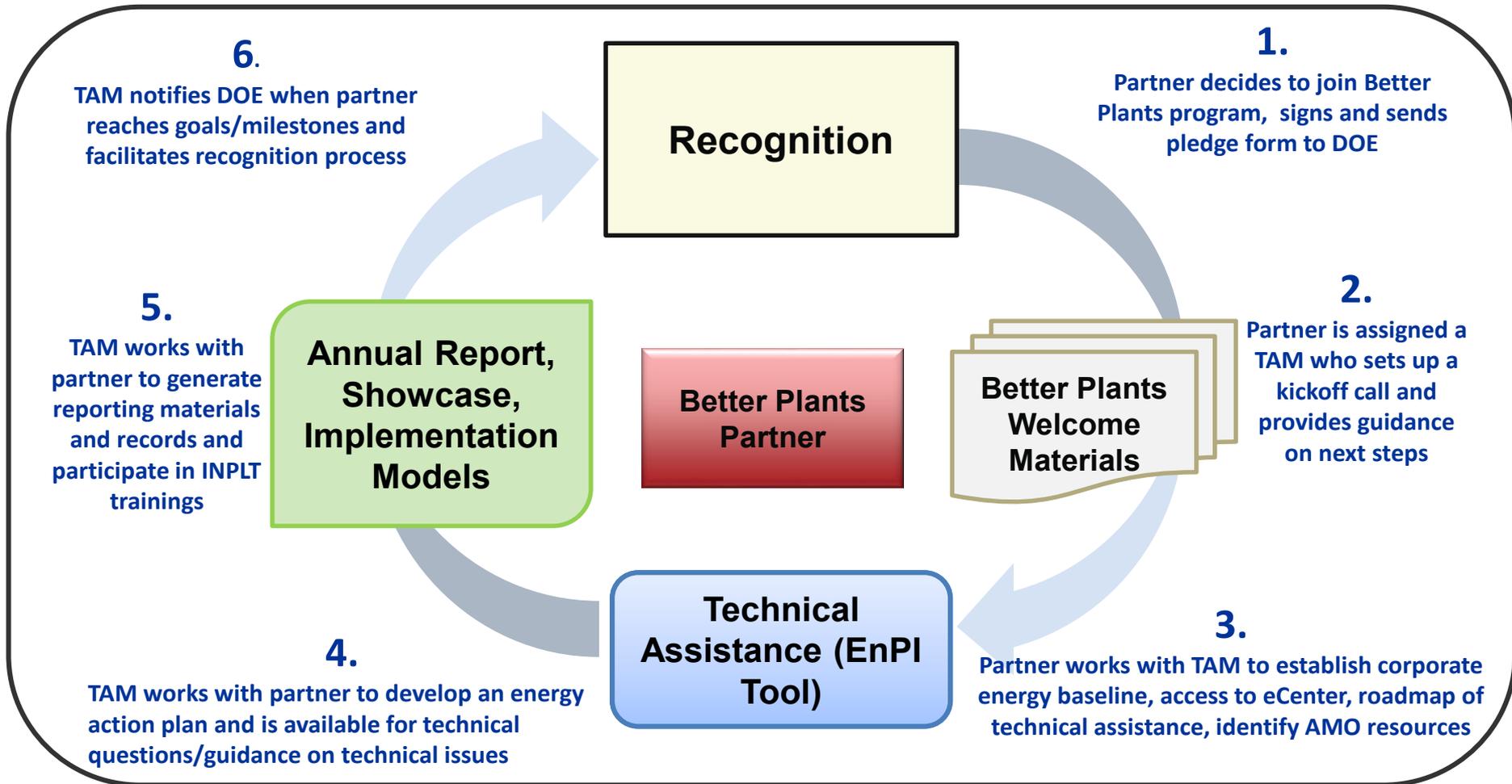
- Twelve organizations have joined
- 4 at Challenge level
- 4 are participating in SEP
- DOE will work with this sector to understand key challenges, refine metrics, and share solutions



Technical Assistance Options

- Technical Account Manager support
 - Programmatic support
 - Baselines
- In Plant Trainings/Software Tools
- Industrial Assessment Center (IAC) assessments
- CHP
- Energy Management

TAM Support Overview



TAM Programmatic Support

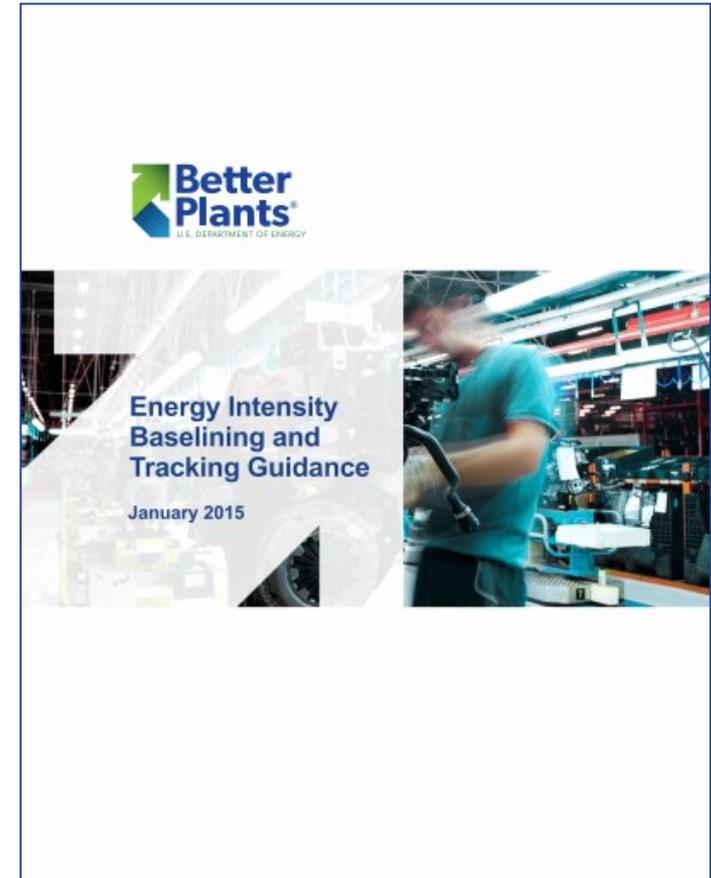
- Technical Account Managers (TAMs) work with Better Plants Partners to identify:
 - Current energy uses
 - Energy efficiency efforts and accomplishments to date
 - Resources that could provide value to partners in helping them achieve their goal(s)
- TAMs facilitate access to AMO resources
- TAMs help partners develop a roadmap for achieving their goal(s) and identify the technical assistance needed to facilitate goal achievement

TAM Programmatic Support

- TAM assistance includes:
 - technology deployment information
 - Obtaining IAC assessments
 - Hosting/attending INPLT trainings
 - Awareness of Energy Management
 - Information on state and utility partnerships and financial resources

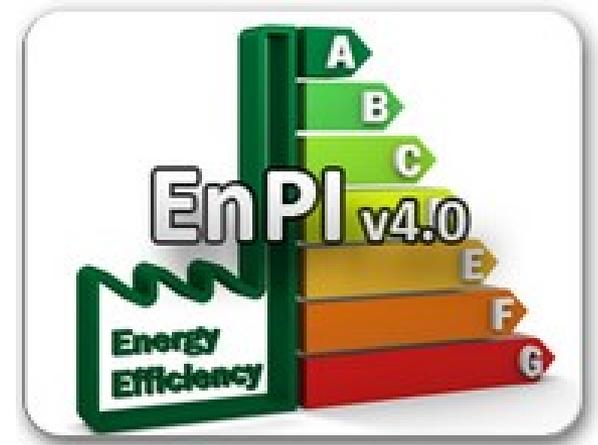
TAM Support for Baselines

- Help with energy baselines and data tracking/reporting
- Data collection protocols with better details and examples
- Guidance for DOE's EnPI 4.0 tool, updated to include GHG calculations
- Webinars on baselining available to Better Plants Partners



Benefits of Regression Analysis

- Accurate, “apples-to-apples” comparisons, holding for critical variables:
 - Weather
 - Production factors
- Validates energy savings
- Facilitates energy manager’s efforts to report EE impacts
- Improves comparative analyses for benchmarking
- Helps strategic planning



In Plant Trainings

- Teach participants how to conduct assessments, use DOE tools, and implement projects
- Open to employees from host plant, peer companies, suppliers
- ~60 INPLTs covering steam, compressed air, process heating, pumps, and fans since 2011
- ~850 participants
- Identified > 3 TBTu and \$14 million in energy savings
- Pre-INPLT webinars available on program website



<http://energy.gov/eere/amo/better-plants/>

INPLT Concept

- Better Plants partners apply to host an INPLT targeting steam, process heating, or motor-driven systems
- Trainings typically range from 3–4 days depending on the amount and complexity of the material to be addressed
- During the training, a DOE Energy Expert
 - Explains how to conduct specific energy assessments
 - Describes how DOE software tools are used to identify opportunities
 - Helps the attendees determine requirements to successfully implement energy-saving opportunities, at host facility and at other sites
- Submitting a winning application is necessary, in the past 5-10 awards made twice annually

Sharing of Information and Experience

- Host company can invite individuals from other manufacturing plants to participate
 - Industry peers
 - Suppliers
 - State energy office representatives
 - Utility account managers, and others interested parties
- Diversity of group allows for collaborative learning, peer-to-peer networking, and open exchange of energy efficiency solutions
- Outside participants can lend new perspectives to overcoming barriers and adopting best practices

INPLT: Key Points

1. Submit application - higher scores will improve the likelihood of approval.
2. Preference given to companies that have not yet received an INPLT.
3. Preference given to companies that include cost-share.
4. DOE will only award INPLTs to partners that are current with their Better Plants annual reporting requirements.
5. Most In Plant trainings revolve around one or more of AMO's system software tools (SSAT, PHMT, AIRMaster+, PSAT, FSAT)

New INPLT option: Strategic Energy Management

SEP

Verified energy performance and ISO 50001

ISO 50001

Standard Energy Management System (EnMS) framework for global industrial operations

Foundational Energy Management (e.g., ENERGY STAR For Buildings & Plants)

- High level introduction to Energy Management
- Uses eGuide as a learning tool
- Introduces ISO 50001-based EnMS, related tools and SEP

eGuide

FOUNDATIONAL ENERGY MANAGEMENT | ISO 50001 ENERGY MANAGEMENT | SEP™ ENERGY MANAGEMENT | STATUS TRACKER | RESOURCES AND TOOLS



Be part of the energy solution.
Boost your bottom line with effective energy management.

Why energy management? How can eGuide help? What part of eGuide is right for me?

How does eGuide work?

All comments and feedback on the eGuide Tool are welcome. Please send feedback to eGuidefeedback@ee.doe.gov

Concept for New INPLT: Water/WWT

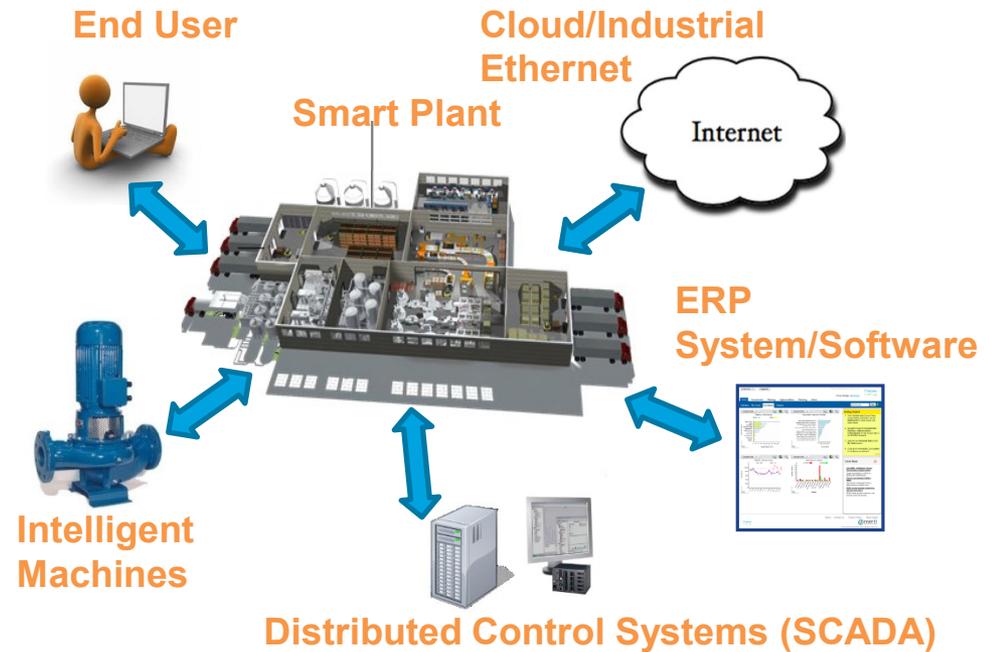
Water/Wastewater Treatment-Specific Training

- Water/wastewater treatment systems (pumping, aeration)
- Utilizing anaerobic digester gas (CHP)
- Relevant metrics and baselining
- Key challenges (regulatory barriers) and opportunities



Concept for New INPLT: Smart Manufacturing

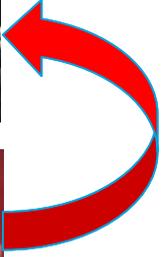
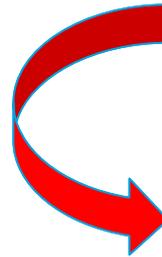
- Leveraging convergence between intelligence in operational technologies and ICT
- Potential for \$15 Billion in energy savings by 2035
- Energy intensity average reduction potential of ~20%
- Improved decision-making
- Potential to reduce WIP & scrapped parts



Concept for New INPLT: Treasure Hunts

Energy Treasure Hunts

- Combine greater classroom instruction with field work to provide needed context
- Leverage baseline guidance, sourcebooks & system assessment standards
- Relevance for Better Plants/SEP – energy action plans
- Possible 2-day format



What are Energy Treasure Hunts?

- Multi-day events with teams of employees “hunting” through the facility for opportunities to save energy
- Usually teams are cross-functional, and include operations, engineering, maintenance, and potentially others
 - Often, when facilities invest capital to implement energy savings projects, the operators and maintenance are not as involved.
 - Energy treasure hunts bring these disciplines into the process, and engage them by asking them to take part in the event
 - Expands organizational energy knowledge, motivates staff to find ways to reduce energy use, and establishes a culture of working in teams to reduce energy use.
 - Also helps create a focus on finding low cost options, as opposed to relying on capital projects to save energy.
- Intent is to engage employees to save energy

Treasure Hunt Concept

- Usually target low or no cost measures to save energy
 - compressed air leaks, uninsulated piping, lights on in areas without employees
- Large capital projects are not usually the focus, although capital projects may be identified
- A significant benefit is to engage employees in saving energy
- For more information, see the EPA's guide: *Energy Treasure Hunt Guide: Simple Steps to Finding Energy Savings* (<http://www.energystar.gov/buildings/tools-and-resources/energy-star-treasure-hunt-guide-simple-steps-finding-energy-savings>)

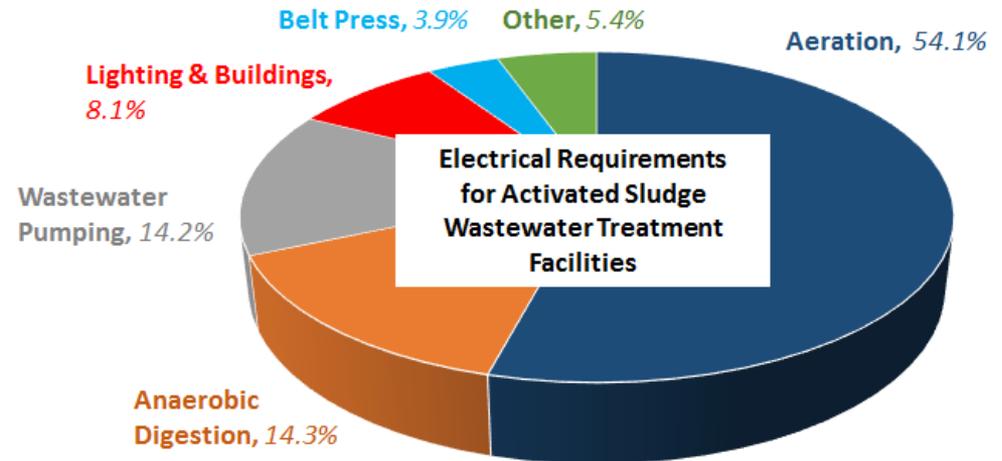
Industrial Assessment Centers

- Background
 - U.S. Department of Energy initiative
 - Operating since 1976
 - Located at Engineering universities
- Process
 - Faculty staff and students conduct studies
 - Energy & water use assessments
 - No fee for assessment
- Purpose
 - Support small and medium-sized manufacturers
 - Reduce energy use
 - Increase productivity/competitiveness



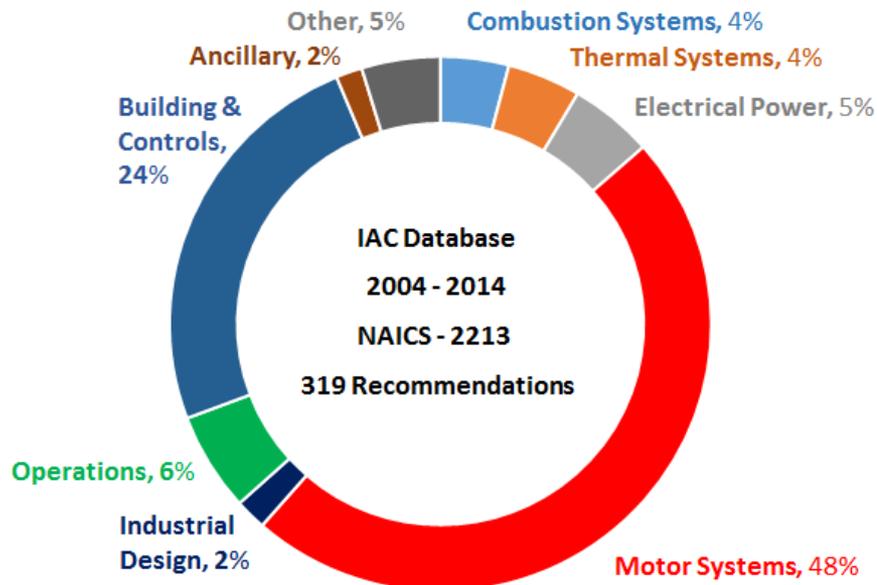
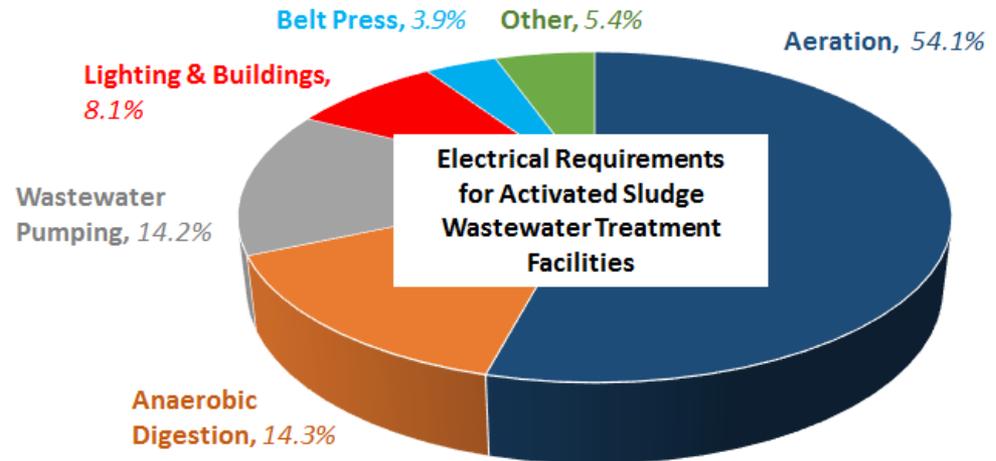
IAC Water & Wastewater

- Main energy users
 - Aeration;
 - Influent pumping;
 - Anaerobic digestion;
 - Buildings (lighting etc.,)



IAC Water & Wastewater

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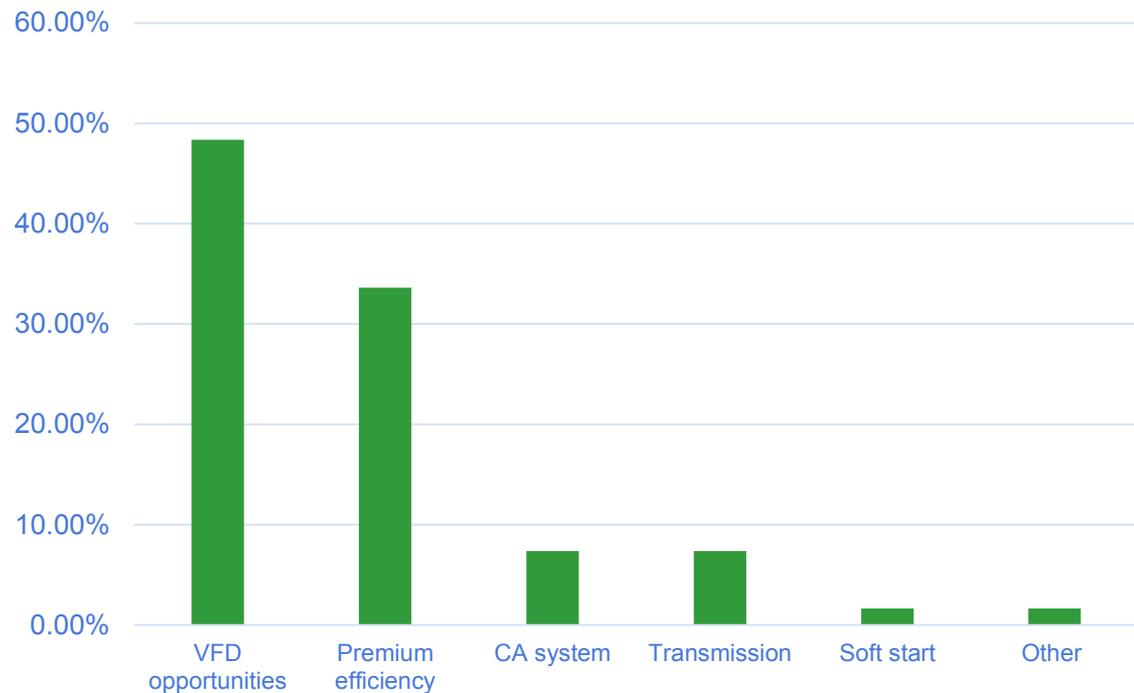
- Primary IAC recommendations

- Motor systems;
- Buildings;
- Operations;

IAC Water & Wastewater Summary

- 30 water & wastewater plants assessed
 - Size range from 1.6 MGD – 115 MGD
- Annual utility bills range
 - \$107,361 - \$5,009,337
- Total potential cost savings
 - \$232,000 (average/plant)
- Actual average cost savings
 - >\$47,000/year

IAC Water & Wastewater Recommendations Sample (Motor Systems)



Qualifying for an assessment

- Facility must apply for assessment to IAC
- IAC assessment criteria:
 - Water treatment plant >5 MGD
 - Wastewater treatment plant >2 MGD
 - Annual utility bills between \$250,000 and \$2.5M
 - Location generally with a day's driving distance from campus
- IAC team will
 - Visit your plant
 - Analyze utility bills
 - Analyze energy and water systems
- Outcome is an audit report, including:
 - ECM list
 - Productivity improvement recommendations
 - Financial details (costs and payback)



Mid-Atlantic Industrial Assessment Center
Departments of Electrical/Computer Engineering and Mechanical Engineering
Center for Energy and Environmental Policy

A Program Sponsored by the U.S. Department of Energy

**Industrial Assessment Report
For
Kent County Wastewater Treatment Facility**

Report Number:	DL0109
Assessment Date:	May 7, 2013
Plant Location:	Milford, DE, 19963
Principal Products:	Wastewater
SIC Code:	4952
NAICS Code:	221320
Report Date:	July 7, 2013

Dr. Keith Goossen, Director	Ralph Nigro, Assistant Director
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University of Delaware
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Qualifying for an IAC Assessment: Distances

- Encina 30 miles to SDSU
- Bucks County 35 miles to Lehigh University
- IAWWTF 55 miles to Syracuse University
- Delta Diablo 50 miles to SFSU
- Narragansett 90 miles to U Mass Amherst
- New York City 100 miles to Lehigh University
- LA Bureau of Sanitation 127 miles to SDSU
- LADWP 144 miles to SDSU
- Victor Valley 149 miles to SDSU
- Pima County 395 miles to SDSU
- St. Petersburg 260 miles to U of Miami

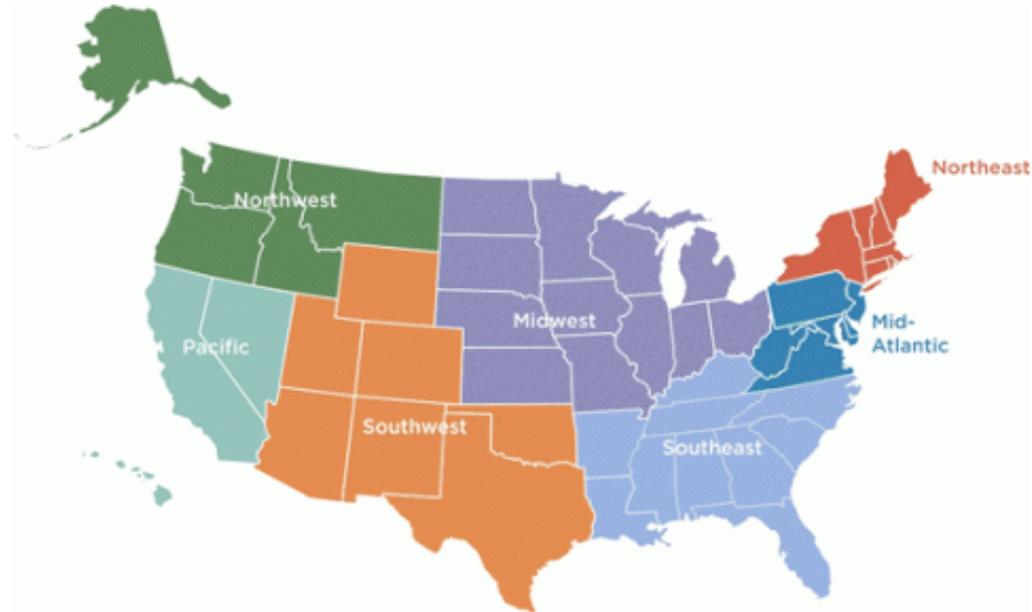
IAC Summary

- Provides a more comprehensive examination of opportunities around all end uses at small to medium sized host site
- Focus is on the assessment, does not include hands on training of DOE tool(s) and learning how to identify and evaluate opportunities
- Minimal employee engagement
- Requires little time and effort from host plant and organization to help with assessment

CHP Deployment

7 CHP Technical Assistance Partnerships provide:

- Market Opportunity Analysis
- Education and Outreach
- Technical Assistance



Better Plants Partners receive priority access to free CHP support – Contact your TAM if interested

CHP Deployment

DOE's AMO CHP Deployment Program assists industrial plants to accelerate investment in energy-efficient CHP. Program activities include:

- **Market Analysis and Tracking**
 - [CHP Market Study](#)
 - [DOE/ICF CHP Installation Database](#)
- **Publication of fact sheets, reports, project profiles:**
 - [Waste Heat to Power Market Assessment](#)
 - [Combined Heat and Power: A Clean Energy Solution](#)
 - [CHP Project Profile Database](#)
- **Regional CHP expertise** through the 7 CHP Technical Assistance Partnerships (CHP TAPs)
- **Stakeholder Partnerships** with Better Building/Better Plants Partners, other federal agencies, associations and other industry groups, Climate Action Champion (CAC) cities, enterprise accounts, etc.

What do the CHP TAPs Do?

DOE's AMO CHP Deployment Program's *CHP Technical Assistance Partnerships (CHP TAPs)*:

- Regional CHP expertise
- Fact-based, un-biased information on CHP:
 - Technologies
 - Project development
 - Project financing
 - Local electric and natural gas supplier interfaces
 - State best practice policies
- Vendor, fuel, and technology neutral assessments of CHP viability.



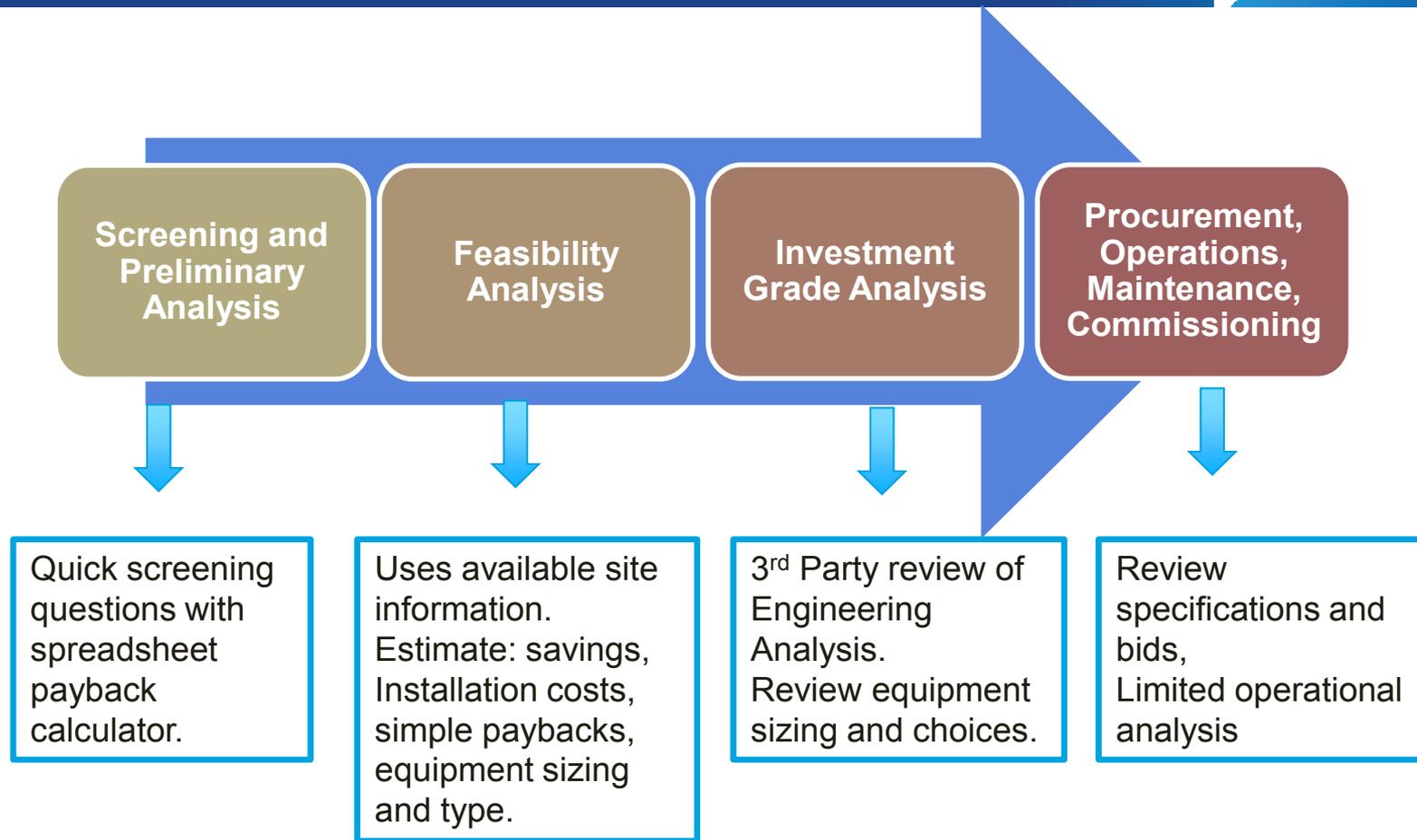
Key Activities:

Market Opportunity Analysis: Supporting analyses of CHP market opportunities for industrial end users.

Education and Outreach: Information on energy and non-energy benefits and applications of CHP to state and local policy makers and utilities.

Technical Assistance: Technical assistance to end-users and stakeholders to advance CHP, waste heat to power, microgrids adoption.

CHP TAP Technical Assistance

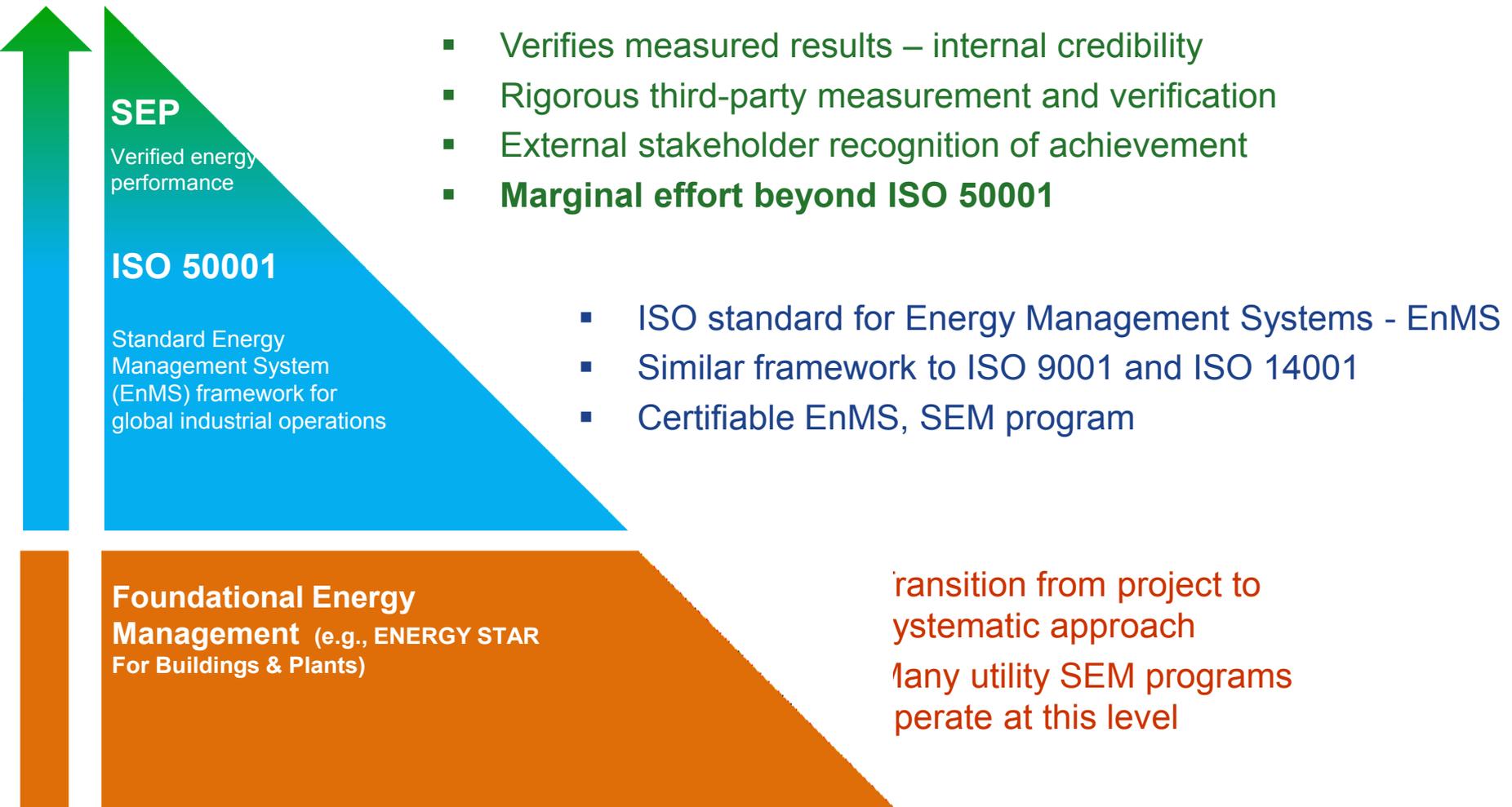


Energy Management

Key Questions:

- What does it mean to have an effective energy management system?
- What software tools are available to assist with energy management?
- What are other partners doing with energy management systems?
- How does ISO 50001/SEP fit?

DOE: Strategic Energy Management



DOE Energy Management Training and Tools

Training

- ▶ **Certified Practitioners in EnMS:** http://ienmp.com/pro_search/index.php?action=1

A range of resources available:

- ▶ **DOE eGuide:** <https://ecenter.ee.doe.gov/eGuide>
- ▶ **EnPI Tool:** <http://ecenter.ee.doe.gov/EM/tools/Pages/EnPI.aspx>
- ▶ **Strategic Energy Management Checklist:**
http://superiorenergyperformance.energy.gov/intro_resource_energy_management.html

What Other Partners are doing with Energy Management



“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

- ▶ **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

View this and other SEP case studies at:

http://superiorenergyperformance.energy.gov/successes_and_testimonials.html

What Other Partners are doing with Energy Management



Map data points are intended for illustrative purposes only.

“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

- ▶ **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 certification *and implementation SEP across 11 additional facilities:*
 - United States: 8
 - Canada: 1
 - Mexico: 2



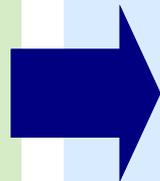
ISO 50001 and SEP

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



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

Nissan,
Smyrna, TN

Structured Dialogue

- Understanding DOE's Technical Assistance
 - Was anything in this presentation new/different?
 - What types of technical assistance not currently offered would be valuable?
- In Plant training
 - Thoughts on new topic concepts
 - Format – how likely is a 4-day training?
- Future webinar topics?
- Other questions?

Concluding Remarks

- Key Takeaways

- DOE technical assistance seeks to offer value
- Multiple types of technical assistance resources
- New resources being planned
- Open to new ideas/things that may have been overlooked
- Anything else



- Nearly 200 solutions tested and proven by Partners – 100 more in 2015
- Find solutions by topic, building type, solution type, building size, sector, technology, location, and more.

energy.gov/bbsc

2016

SAVE THE DATE

BETTER BUILDINGS SUMMIT

WASHINGTON, DC ■ MAY 9-11

