

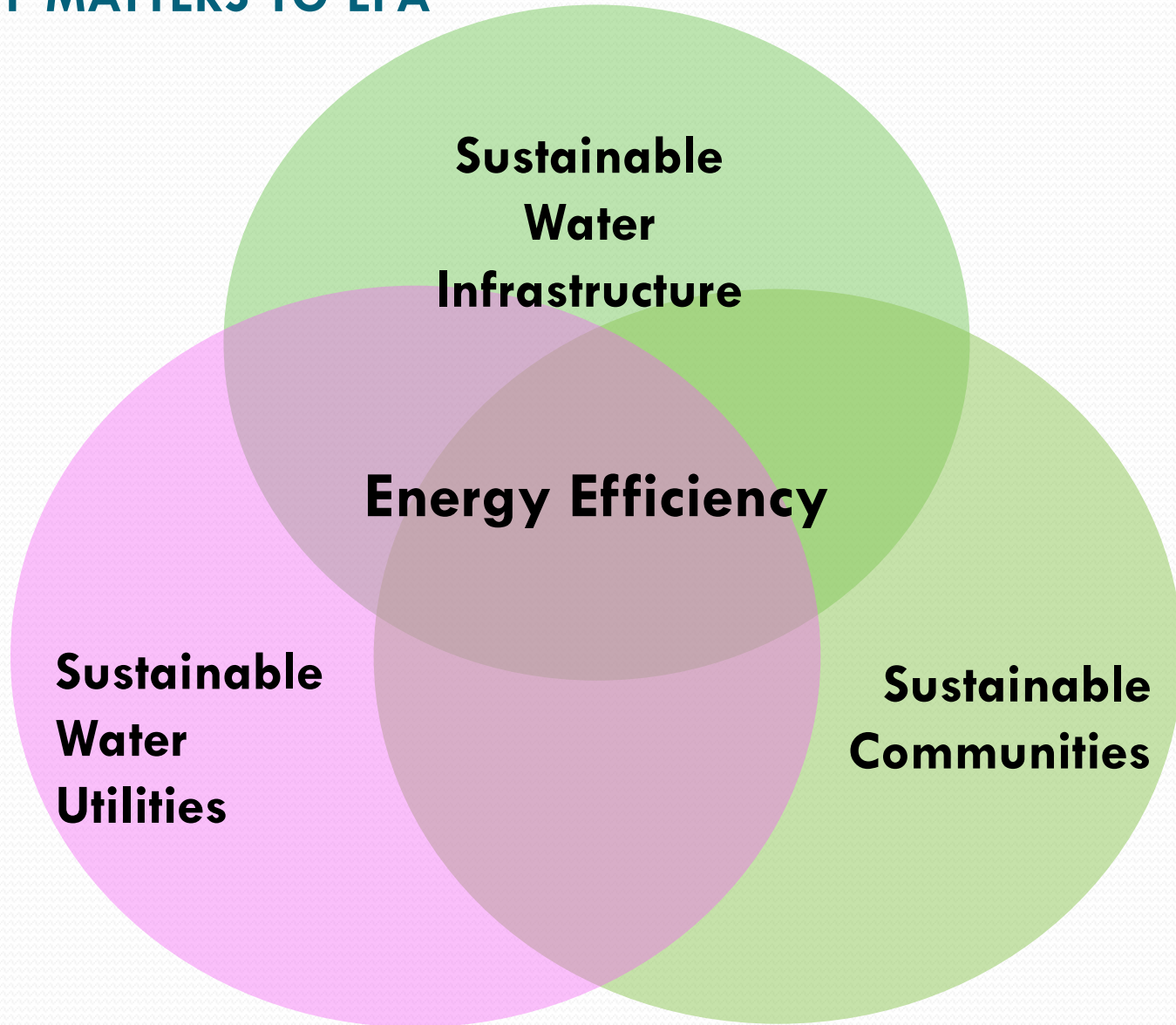
# Energy Management: A Big Step on The Road to A Sustainable Utility

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Office of Wastewater Management**

# Significance

- Electric use for moving and treating water and wastewater in the US
  - 25-30% of total plant O&M Cost
  - Often 30-40% of community's energy costs
  - Consumption and costs expected to continue to rise
- Approx. 80% of WWTPs treat less than 1 mgd—equates to 10,000 people served
- 17% are between 1-10 mgd—remainder treat more than 10 mgd, but serve over 60% of the population
- Current use of energy for wastewater treatment results in significant GHG emissions.
- Basic improvements in energy efficiency can show significant results (equipment, lighting, pumps)
- Several plants are becoming/approaching energy self sufficiency (net zero energy use)
  - Many plants in the US (Sheboygan, WI; East Bay MUD, CA, several others)
  - Internationally (Many plants - WERF Study: Strass WWTP, Austria)
  - Most will not be fully self-sufficient—and may not need to be

# THE 3 DIMENSIONS OF WATER SECTOR SUSTAINABILITY--WHY ENERGY EFFICIENCY MATTERS TO EPA

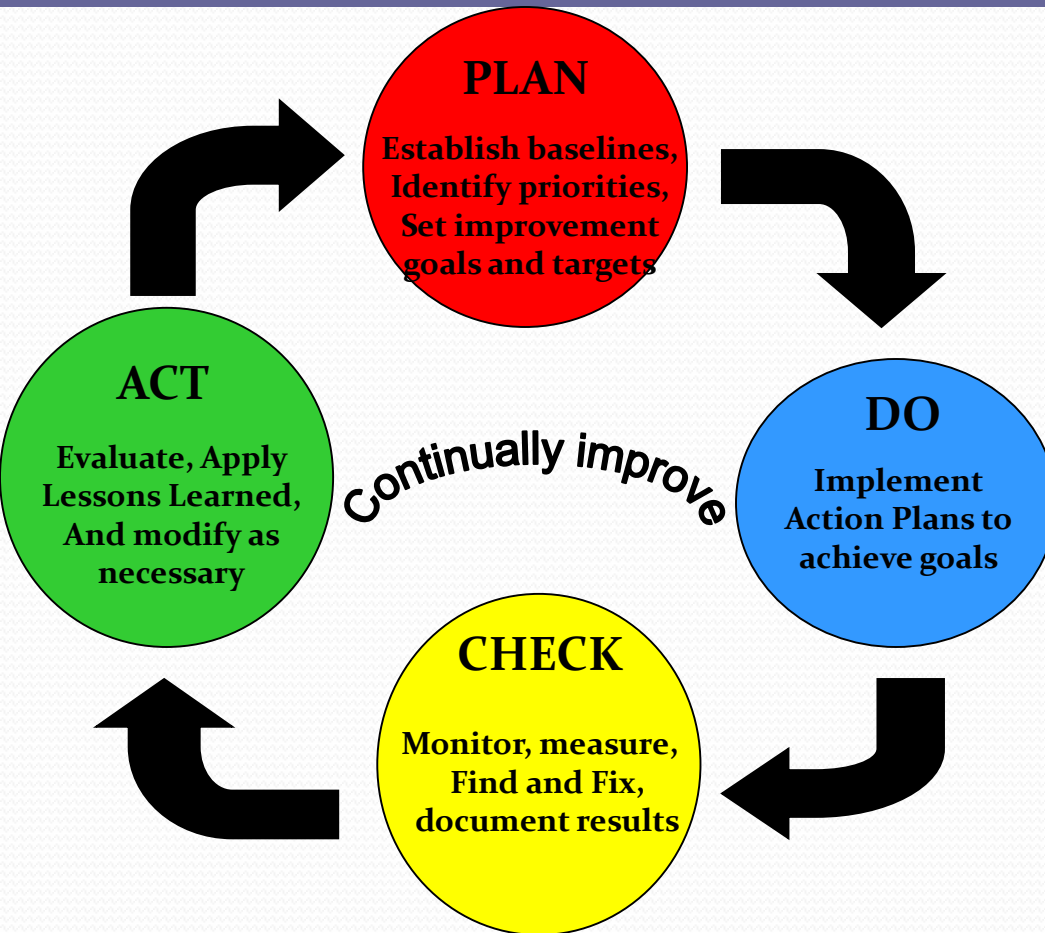


# The Path to Energy “Nirvana”

- Management motivation to implement energy efficiency initiatives—efficiency first!
- Integrated into utility’s overall vision and plan
- Empowerment of staff
- Buy in from local officials (Communicate!)
- Tolerance for risk
- Audit & energy management plan
- Process optimization & operator education
- Measurable goals (linked to vision and plan)
- High level of automation and process analysis tools
- Flexible and efficient designs
- ECMs
- Anaerobic digestion &:
  - Combined Heat & Power
  - pre-treatment
  - Co-digestion
- Enhanced primary sedimentation
- Nutrient recovery and side stream flow equalization or treatment
- Thermal biosolids processes
- Solar
- Wind



# The Plan-Do-Check-Act Approach



- Allows utilities to systematically assess energy usage and opportunities for efficiency
- Doesn't give you the answer—helps you get to the right answer for you!
- Very similar to ISO 50001

# Where to Start

1. **Create energy team and assess energy consumption**
    - Examine and analyze bills
    - Plot energy consumption and demand for each process (recommend meters for each unit process)
    - Develop consumption baselines and compare to similar facilities, where feasible
  2. **Assess energy savings opportunities (DO AN AUDIT!)**
    - Evaluate process energy consumption and operational procedures
    - Evaluate operation of each significant piece of equipment
      - Can it be turned off or run efficiently at lower capacity?
      - Are new pieces of equipment much more efficient?
      - What will it cost and where will I get the money??
      - How do I convince local decision makers??
  3. **Develop and implement energy conservation plan** starting with “low hanging fruit” projects
    - Who are my partners (energy utilities, ESCOs, gov’t funders?)
1. **Measure** progress, get some **success** under your belt, and **keep moving!**  
**THIS IS NOT A ONE SHOT DEAL!**

# EPA is Heavily Invested in Energy Efficiency

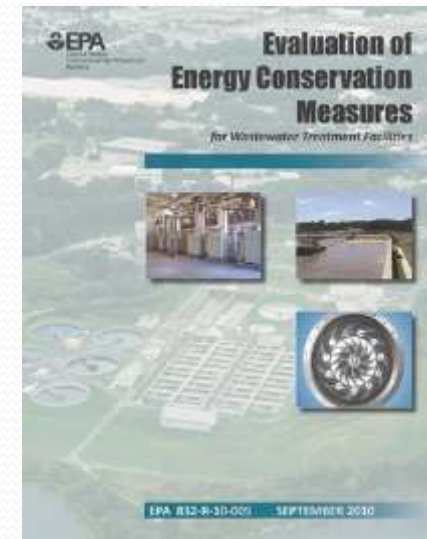
Ensuring a Sustainable Future:  
An Energy Management Guidebook  
for Wastewater and Water Utilities



JANUARY 2008



Energy Use Assessments at  
Water and Wastewater Systems  
Guide



<http://water.epa.gov/infrastructure/sustainable/waterefficiency.cfm>

# Actions and Results

- Sponsored over 20 workshops with approx. 2000 participants
- Worked with over 200 utilities, mainly smaller ones
- Collected information on benefits (cost savings, GHG reductions, etc.)
- Partnered with states and others
- **Now forging a partnership with Department of Energy**
- Results have been impressive
- Subset of 84 utilities has yielded:
  - > \$6 million in cost savings
  - > 43 MTCO<sub>2</sub> of GHG reductions
- EPA support and tools well received
- Clear that the management systems approach (like ISO 50001) works well for utilities



# Important Lessons Learned

- Don't rush the solution—let the process help it!
- Focus on practical benefits of EE—like saving money!
- Energy assessments and audits are CRITICAL!
- Encourage utilities to communicate and partner with others (states, energy providers, ESCOs, etc.)
- Technology is important, but not the main barrier—resources and communications with decision makers are
- Energy self-sufficiency is a laudable goal, but not the only goal—incremental progress is fine
- Communicate results and build on success!
- **BIGGEST CHALLENGE FOR THE U.S. WATER SECTOR: DEPLOYMENT OF EXISTING TOOLS—NOT MORE TOOLS!**

# So, What's Next?

**DEPARTMENT OF ENERGY (DOE)**

**OFFICE OF ENERGY EFFICIENCY AND RENEWABLE ENERGY (EERE)**

**STATE ENERGY PROGRAM 2015 COMPETITIVE AWARDS**

**Funding Opportunity Announcement (FOA) Number**

**“DE-FOA-0001222”**



**WE WANT YOU!**



THANKS FOR YOUR TIME TODAY

JIM HORNE

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