



Water Infrastructure and System Efficiency Program

as an Innovative Utility & Public Partnership to Leverage Energy Efficiency

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- Agenda



Introduction

WISE™ & achievements

Program Implementation

Benefits

Case Studies

- Introduction

Established in 2003

Offices in:

- Tempe, AZ
- Monrovia, CA
- San Diego, CA
- Emeryville, CA



- Lincus

- Work with IOUs to offer technical assistance and incentive programs to their Customers.
- Comparative energy engineering analyses.
- Objective third-party technical reviews.
- Provide environment solutions such as carbon and GHG emission management.
- Full coordination with utility representatives throughout the incentive process.



-The Need

- Rising water production and distribution costs
- Water and wastewater pumps that are not energy efficient.
- Energy bills are 30-40% of a municipality's expenses
- Reduce GHG emissions
- Lack of funding creates sub-optimal systems
- Assistance with the utility's incentive process

Across the United States...

The water/wastewater segment consumes ~\$23 billion worth of energy per year, roughly 5% of the Utilities Load.

This annual energy consumption is equivalent to:

- 17.1 billion Metric Tons CO₂
- 38 million passenger vehicles
- 19.13 million homes

The Barriers

A photograph of a water treatment facility. In the background, there are several tall, cylindrical metal tanks. In the foreground, there is a complex network of blue metal pipes and structural beams, likely part of a filtration or distribution system. The sky is overcast.

For all water and wastewater system primary goal is to provide clean water, not energy efficiency,

and operators often face these six common barriers.

- Lack of time and resources
 - Aversion to risk
 - Funding
 - Complex decision making process
 - Lack of support for selling project to upper management
 - Lack of knowledge in getting projects out to bid
 - Lack of understanding of utility incentive process
-
- **Significant opportunity to reduce energy consumption and GHG emissions in California**
 - **Water and Wastewater agencies: Partners in achieving the State's goals.**

The WISE™ Program



The Water Infrastructure and System Efficiency (WISE™) Program

is designed to specifically assist Water and Wastewater customers in identifying energy efficiency projects and securing incentives to offset installation costs and engineering services.

WISE™ Achievements

Electric Bill Reduction = \$10.1 million

Customer Incentives = \$8.5 million

GHG Reduction = 63,000 metric tons

Equivalent Cars Removed = 13,340

Annual Energy Reduction = 84 million kWh

Direct and Indirect Water Savings = 80 million gallons per year

- Why leverage WISE™?

- Lincus has a thorough understanding of Electric Utility qualified measures
- Develop energy savings calculations and fully manage the utility incentive process
- Maximize utility incentives and associated energy savings
- Process applications for 0% On-Bill Financing (OBF) loans
- Program and engineering services are at **NO COST** to our customers.

WISE™ Approaches



**SOURCE WATER
PUMPING (WSO)**



**WATER TREATMENT
(WTP)**



**WATER DISTRIBUTION
(WSO)**



**WASTEWATER
TREATMENT (WWTP)**

- Attend all segments in the urban water use lifecycle.
- Includes:
 - Source water pumping
 - Water treatment
 - Water distribution
 - Wastewater treatment
- Approaches:
 - Water System Optimization (WSO): System and component level analysis
 - WTP/WWTP: Process optimization

Water System Optimization



SOURCE WATER PUMPING (WSO)



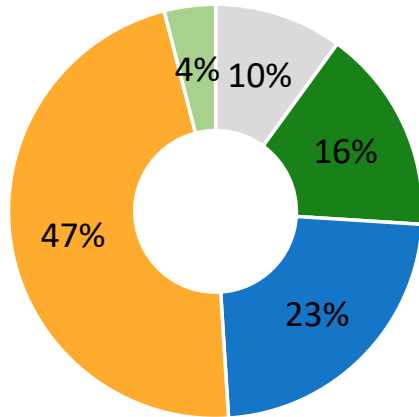
WATER TREATMENT (WTP)



WATER DISTRIBUTION (WSO)

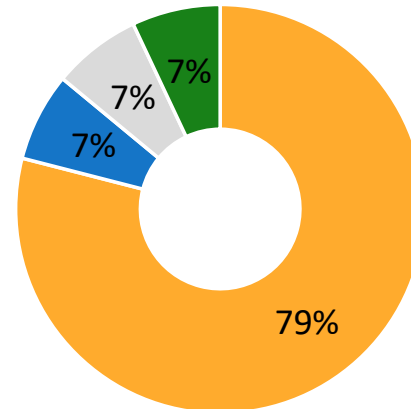


WASTEWATER TREATMENT (WWTP)



Pump Size Distribution

- <=25HP
- 25 HP – 50 HP
- 51 HP – 100 HP
- 101 HP – 200 HP
- >200 HP



Flow Control Mechanism

- On/Off Control
- Throttle Valve Control
- Variable Speed Drive
- Not Available

WTP/WWTP



SOURCE WATER PUMPING (WSO)



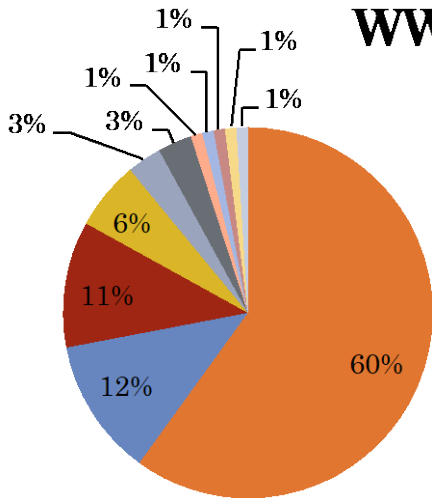
WATER TREATMENT (WTP)



WATER DISTRIBUTION (WSO)

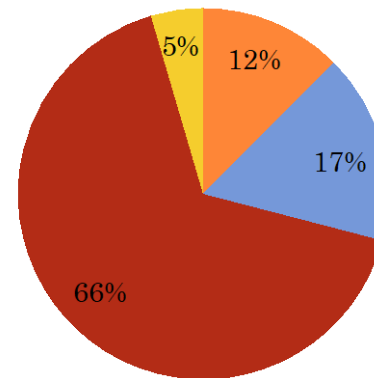


WASTEWATER TREATMENT (WWTP)



WWTP

- Aeration
- Wastewater Pumping
- Anaerobic Digestion
- Lighting and Buildings
- Belt Press
- Clarifiers
- Chlorination
- Gravity Thickening
- Grit Removal
- Return Sludge Pumping
- Screen



WTP

- Compressed Air
- Influent Pumping
- Effluent Pumping
- Backwash

The Program Approach

Phase 1

Preliminary Assessment

- Data Collection
- Preliminary Site Walk
- Preliminary List of EEMs

Phase 2

Detailed Assessment

- Energy Audit (if required)
- Additional Data Collection
- Project Feasibility Study and Calculations
- Incentive Application










Phase 3

Implementation Support

- Solicitation and Contracting Support
- Project Management Support
- M&V of savings
- Final Documentation to Utility



The IOU Process

- 1** WISE Program Agreement is signed 
- 2** Preliminary Assessment and Measures are made 
- 3** Project Feasibility Study (PFS) is considered 
- 4** PFS and Application(s) are submitted to IOU and pre-inspection occurs 
- 5** IOU Notice to Proceed (NTP) is submitted 
- 6** Installation of Measures is completed 
- 7** Installation Report (IR) is submitted to IOU 
- 8** The IOU performs the Post-Inspection and reviews the IR 
- 9** IOU issues Incentive payment and OBF 

Celebrate



EE Measures

Energy Efficiency Measure

Typical Savings Range

Pump Overhaul	10-20%
Pump VFD Control	15-20%
Pump Sequencing	5-10%
Blower Overhaul	10-15%
High Efficiency Blower Replacement	10-15%
Ammonia/Nitrate Control	5-10%
Efficient Mixing	5-10%
High Efficiency Diffusers	10-15%

- Non-Energy Benefits of EE

- Higher process reliability
- More stringent enhanced controls
- Additional compliance control if the customer is dealing with contaminants
- Increased productivity
- Additional flexibility in running their systems during emergencies
- System redundancies
- Increased equipment life

WISE™ Program Success Story 1

Process Optimization Strategies - WWTP

Measures pursued:

- Aeration blower inlet valve wastewater sensor control
- Ammonia analyzers, DO and nitrate sensors
- Centrifuge operation optimization
- Solids feed sensor

Annual Energy Savings	Annual Cost Savings	Verified Utility Incentives
545,258 kWh	\$54,500	\$64,600

WISE™ Program Success Story 2

Water System Optimization Strategies

Measures pursued:

- Various pump overhauls and replacements
- Well and booster sequencing

Annual Energy Savings	Annual Cost Savings	Verified Utility Incentives
4.2 million kWh	\$544,000	\$264,000



Questions?



Contact

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Thank you