Southern California
REGIONAL ENERGY NETWORK

SoCalREN
Public Agency Program

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What is SoCalREN?

The County of Los Angeles/Southern California Regional Energy Network (SoCalREN) was created to harness the collective power of residents, businesses and the public sector to achieve an unprecedented level of energy savings across Southern California.

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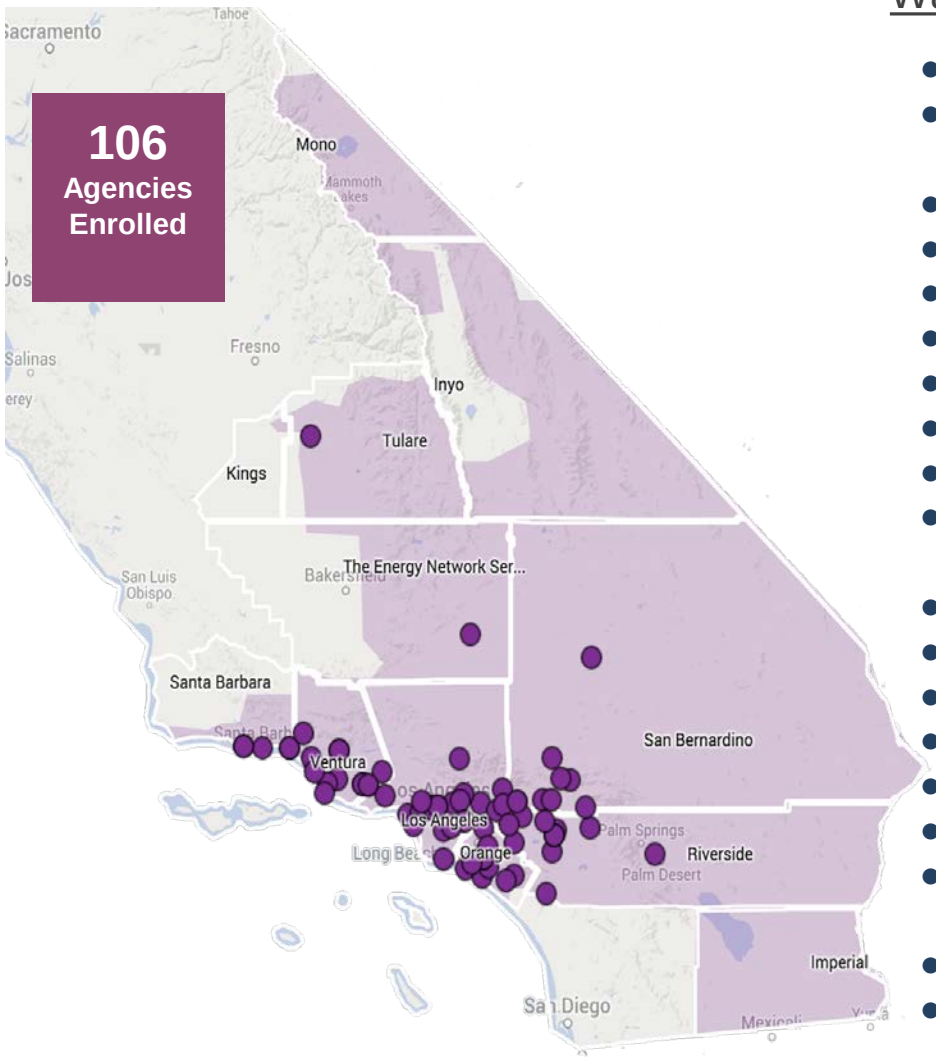
Who's in the Network?



Water/Wastewater District Enrollments

- Carpinteria Sanitary District
- Channel Islands Beach Community Services District
- City of Barstow
- Coachella Valley Water District
- Cucamonga Valley Water District
- Eastern Municipal Water District
- Goleta Sanitary District
- Idyllwild Water District
- Inland Empire Utilities Agency
- Lake Arrowhead Community Services District
- Las Virgenes Municipal Water District
- Ojai Valley Sanitary District
- Orange County Sanitation District
- Pleasant Valley County Water District
- Running Springs Water District
- United Water Conservation District
- W. Riverside County Rgl. Wastewater Authority
- Western Municipal Water District
- Yucaipa Valley Water District

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How Can SoCalREN Support?

Services include:

- Energy Planning
- Energy Use Analysis
- Investment Grade Audits
- Technical Scope of Work
- Incentive and Financing Support
- Financial Analysis
- Procurement Assistance
- Bid Analysis
- Construction Management Support
- Project Management

CUSTOMIZATION

COORDINATION

FASTER RESULTS

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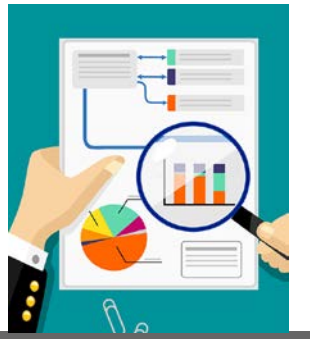
A Tailored Project Delivery Approach

A dedicated SoCalREN Project Manager supports a project at every stage

Enrollment



Audit

Procurement

Construction

Completion

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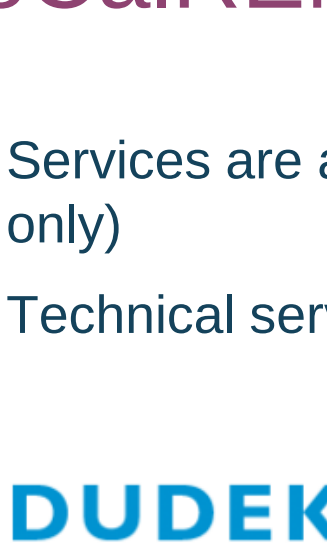
SoCalREN is Cost-Effective!

- Services are at no cost (agencies pay for construction costs only)
- Technical services provided by highly trained consultants



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Incorporating Whole Building Opportunities

Lighting:

- High performance LEDs**
- Occupancy sensors
- Bi-level lighting controls
- Comprehensive control strategies
- Daylight harvesting

Mechanical:

- Compressed Air System Modifications
- High efficiency furnace and heat pumps
- HVAC upgrades**
- Variable Frequency Drives (VFDs)
- Energy monitoring and controls systems

**SoCalREN identifies & coordinates with utility programs offering special incentives

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Portfolio Energy Analysis Services

Portfolio-level analysis services support project identification & benchmarking efforts

1. SoCalREN's Comparative Energy Analysis (CEA)
2. Energy Star Portfolio Manager (ESPM) services

Did you know?
AB-802 will require benchmarking reporting through ESPM for all buildings >50,000 sf

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SoCalREN's Value Add

- **Access to Financial Advisor (PFM) & coordination for Energy Project Lease Financing**
- **Evaluation of multiple funding & financing strategies**

- **Alignment with your agency's procurement approach**
- **Simplified procurement option through National Joint Powers Alliance (NJPA)**

- **SoCalREN is here to help you celebrate your project success!**

Questions? Please Contact

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Achieving Excellence

Agencies Who Lead by Going Beyond

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Demonstrating Energy Leadership

Level 1: Established/Legacy Practice, Outdated Equipment	Level 2: Code/Common/Industry Standard Practice	Level 3: Above Code, New Technology
Efficiency losses due to age, condition, inability to scale. Simplistic control system. Inflexible to demand fluctuations.	Improved efficiency based on better equipment performance. Indirect feedback control of process parameters.	Efficiency exceeding ISP/code due to process flexibility & responsiveness. Direct real-time control of process parameters.
Examples: Manual on/off control, fixed speed fans & pumps, positive displacement blowers, operator-maintained process monitoring	**Examples:** DO-based aeration, inlet throttled blowers, SCADA flowrate & parameter monitoring, flow equalization	**Examples:** Ammonia-based aeration control, Fan/pump VFD, pump sequencing, direct drive turbo blowers, SCADA-based live energy monitoring/submetering, pulsed bubble mixing, high SOTE diffuser systems

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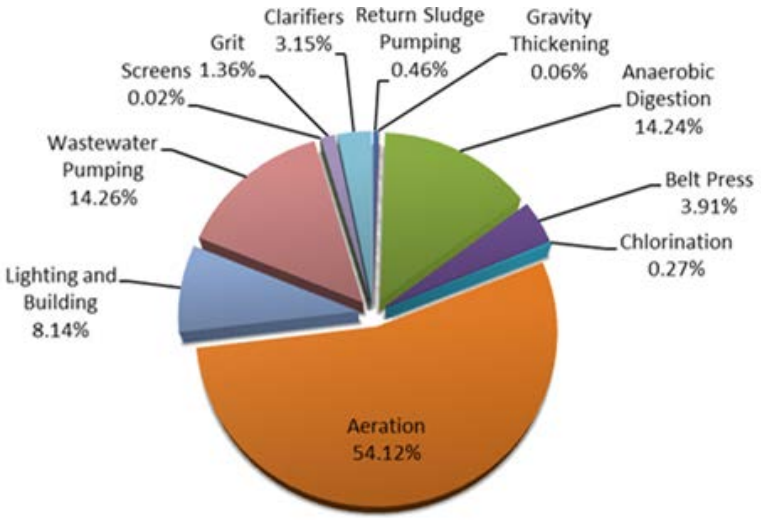
Understanding Energy Use in your Plant

Assess Plant Energy Consumption by End Use

- Utilize submetering and SCADA systems to determine energy usage profile for your plant processes.

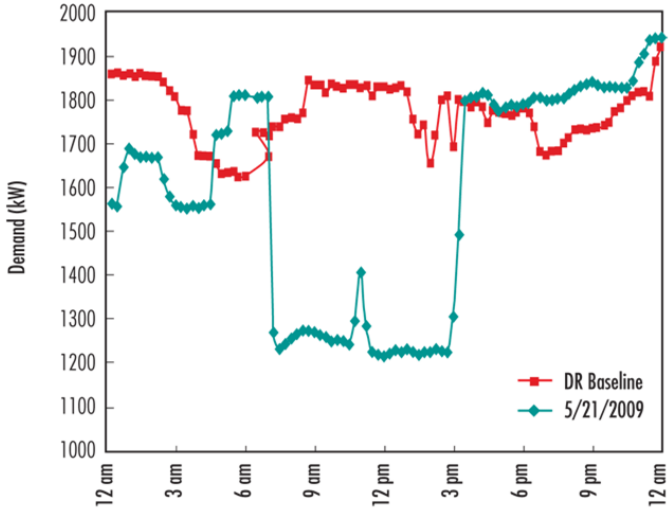


Evaluate Relationships Between Process Load, Energy Usage, and Time-of-Use Rates

- When system loading and subsequent energy usage coincide with peak demand periods, costs can compound quickly.

Benchmarking Plant Performance

- Comparison of energy usage intensity against energy benchmarks for similar plants can reveal inefficiencies and waste.



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Improving Energy Efficiency of your Plant

Understand SCE incentives and available technical assistance

- SCE offers rebates, technical assistance and incentives to help identify energy efficiency opportunities and to advance the adoption and implementation of such projects. SoCalREN offers additional support to coordinate applications and ensure projects comply with incentive programs.

Prioritize measures

- Prioritizing component projects and then process efficiency opportunities helps establish long-term budgets and strategies for full system transformation.

Establish a long-term investment plan

- Leverage capital investment plans as well as operation and maintenance budgets to drive energy efficiency investments. This will help develop additional revenue streams by reducing electric utility costs and bringing in utility incentives to further invest in efficiency projects.

Integrate EE into wastewater operations

- Actively monitoring the energy performance of your wastewater plant will allow you to identify and address reductions in energy performance.

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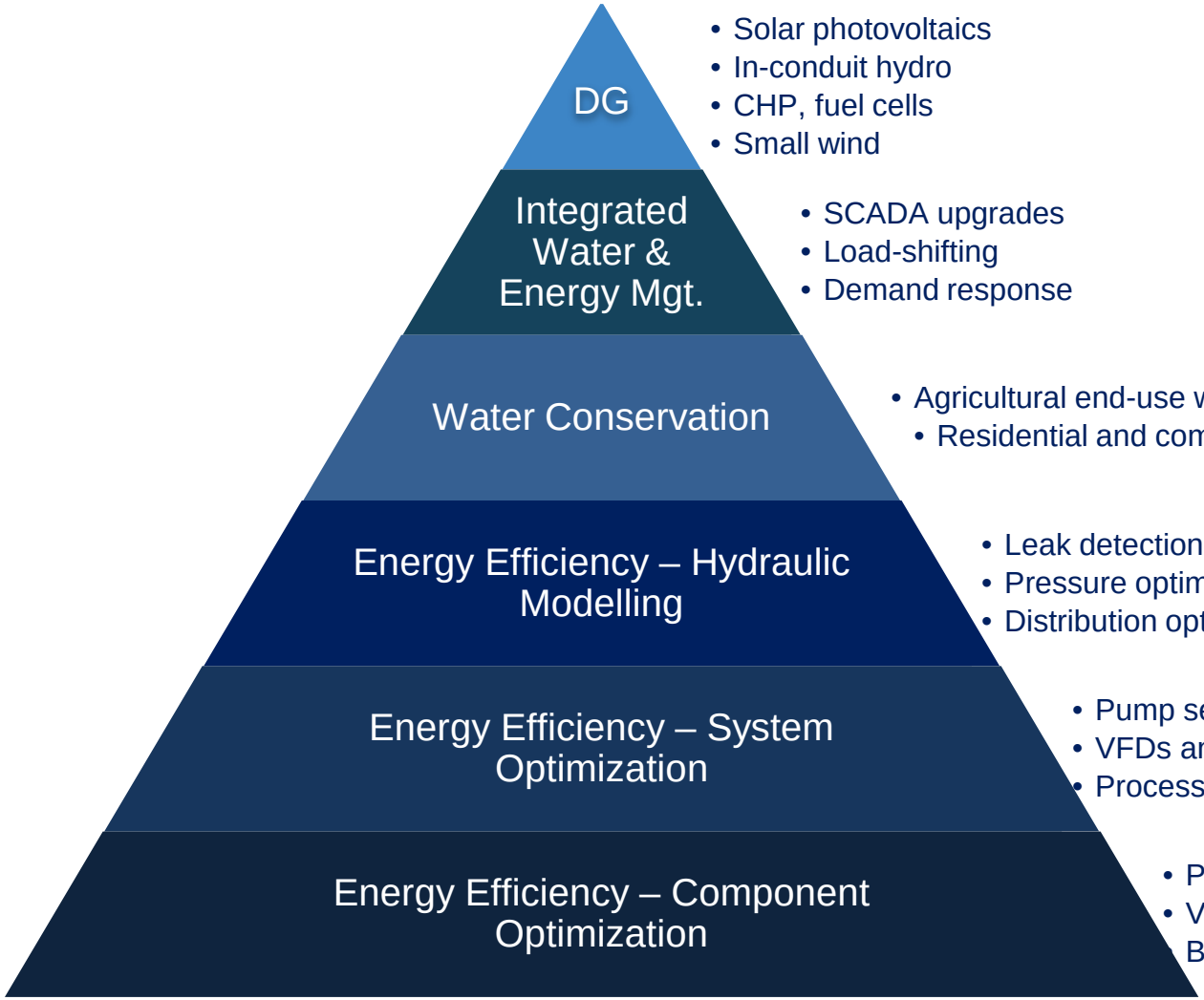
Prioritizing Energy Measures



- Solar photovoltaics
- In-conduit hydro
- CHP, fuel cells
- Small wind

- SCADA upgrades
- Load-shifting
- Demand response

- Agricultural end-use water conservation programs
- Residential and commercial conservation

- Leak detection and repair
- Pressure optimization
- Distribution optimization

- Pump sequencing
- VFDs and controls
- Process optimization

- Pump efficiency improvement
- Valve replacements

Blower efficiency improvement

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Highlighting Success

United Water Conservation District

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Efficiency & Optimization Opportunities

- Two-Phased Pump Overhaul - 5 wells
- Pump Sequencing Optimization - 17 wells
- Well Pump VFD
- Exterior LED Lighting

IOU Approved Annual Energy Savings	3 Million kWh >250 kW
Annual Cost Savings	>$400,000
Utility Incentives Reserved	>$190,000

Coordinated approach with WISE™ Program

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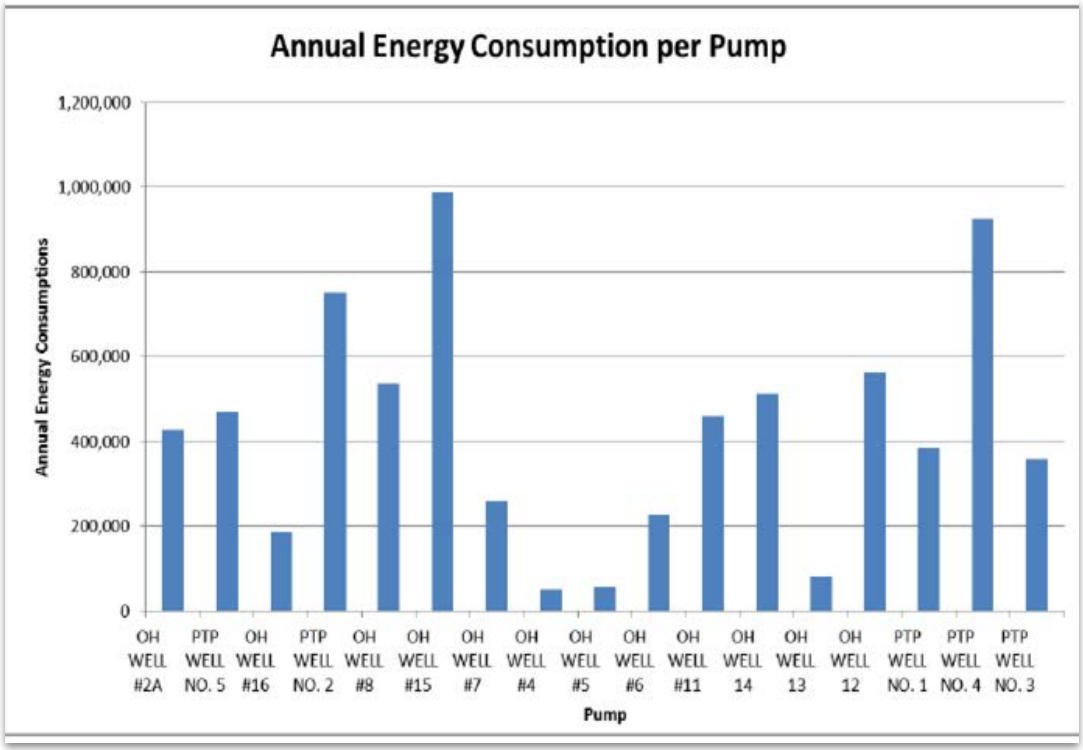
Identifying Inefficiencies

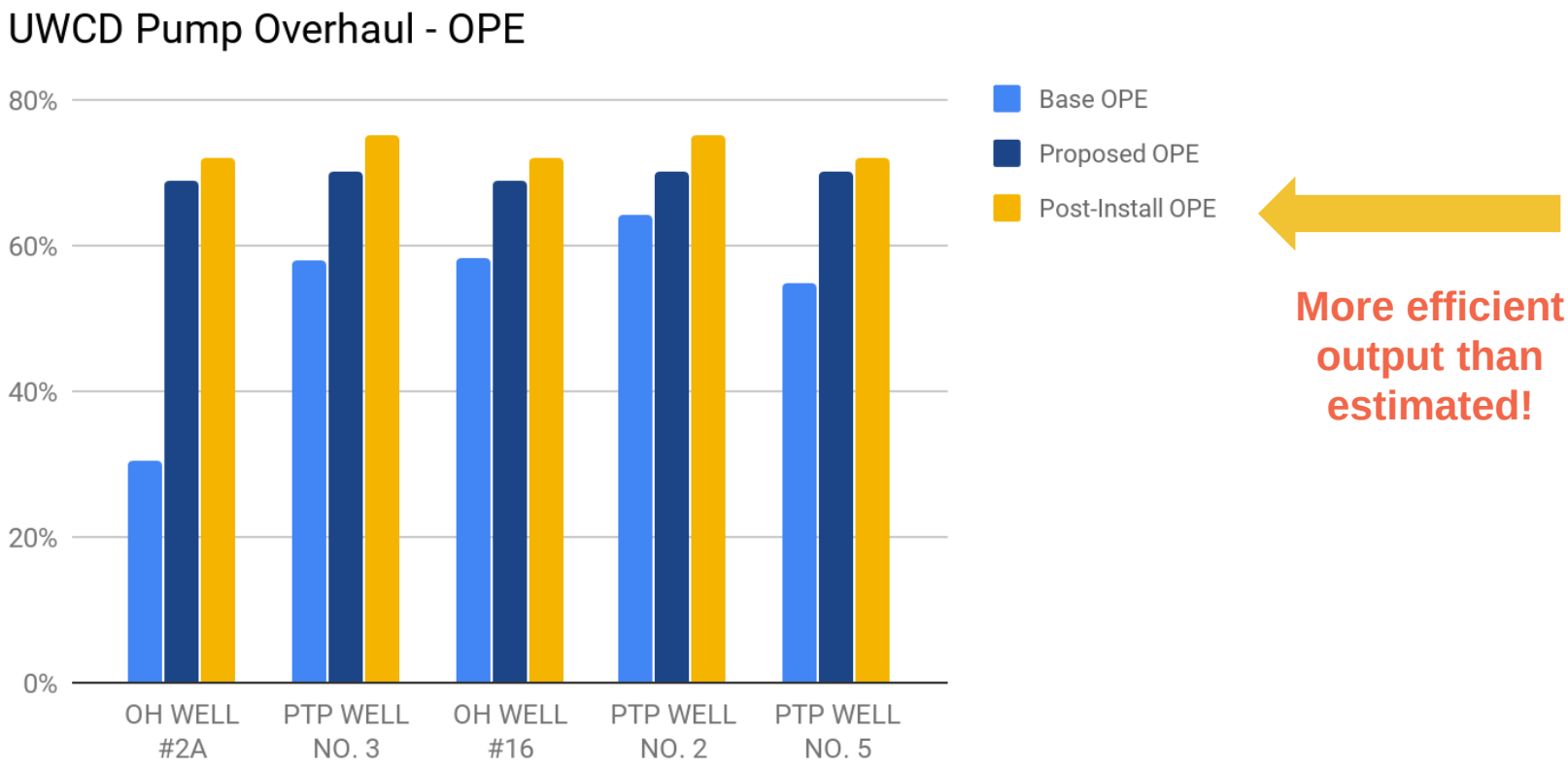
5 pumps with poor OPE (Overall Pumping Efficiency) identified by WISE through review of pump test data.



Pump Station Name	Pump Type	Motor HP	Base OPE	Proposed OPE	Post-Install OPE
OH WELL #2A	TW	100	30.4	69.0	72.1
PTP WELL NO. 3	TW	250	57.8	70.0	75.0
OH WELL #16	TW	100	58.3	69.0	71.9
PTP WELL NO. 2	TW	250	64.1	70.0	75.0
PTP WELL NO. 5	TW	300	54.9	70.0	71.9

Pump overhauls implemented in 2 phases

Significant OPE and well production improvements



Well Pump Rehabilitation

Before

Photo: coordinated retrofit approach with WISE™ program

After

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Pump Sequencing Optimization

Completed in November!

Sequencing project solution developed & installed by UWCD Staff:

- OH and PTP pump sequencing- 17 wells 100HP – 500 HP
- Automated pump sequencing system adjusts for water quality constraints
- Energy savings of 1.7 million kWh/year
- Estimated simple payback period of only 8 months
- $72,850 in incentives captured

More efficient result than estimated!

Additional Savings through LED Lighting Retrofits

- Exterior fixtures
- Maintenance Yard, Lake Piru Parking Lot

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Highlighting Success

Goleta Sanitary District

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Efficiency & Optimization Opportunities

- Blower replacement
- ORP sensors
- Pump sequencing optimization
- Process evaluation
- Air compressor replacement
- LED lighting retrofits

IOU Approved Annual Energy Savings	946,274 kWh 117 kW
Annual Utility Cost Savings	$108,251
Utility Incentives Reserved	$84,558

Coordinated approach with SCE WISE Program

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Highlight: Goleta Sanitary District

	Energy Efficiency Measure	Current kWh Savings	Decommissioning kWh Savings	Current Est. SCE Incentive	Decommissioning Est. SCE Incentive
✓	**EEM1: Optimize Grit Chamber System**	**74,051**	**-**	**$7,826**	**-**
	EEM2: Optimize Wastewater Treatment Process	**30,109**	**-**	**$5,099**	**-**
	EEM2a:Biofilter Decommissioning	-	170,419	-	$16,552
✓	EEM2b: Pony Blower Installation	30,109	-	$5,099	-
	EEM3: Sensor Control on Blowers	**155,020**	**-**	**$14,372**	**-**
	EEM3a :Aeration Basin Decommissioning	-	295,043	-	$28,318
✓	EEM3b: ORP Sensors Installation	155,020	-	$14372	-
✓	**EEM4: Pump Sequencing Optimization**	**12,426**	**-**	**$994**	**-**
	TOTALS	**271,606**	**465,462**	**$28,292**	**$44,870**

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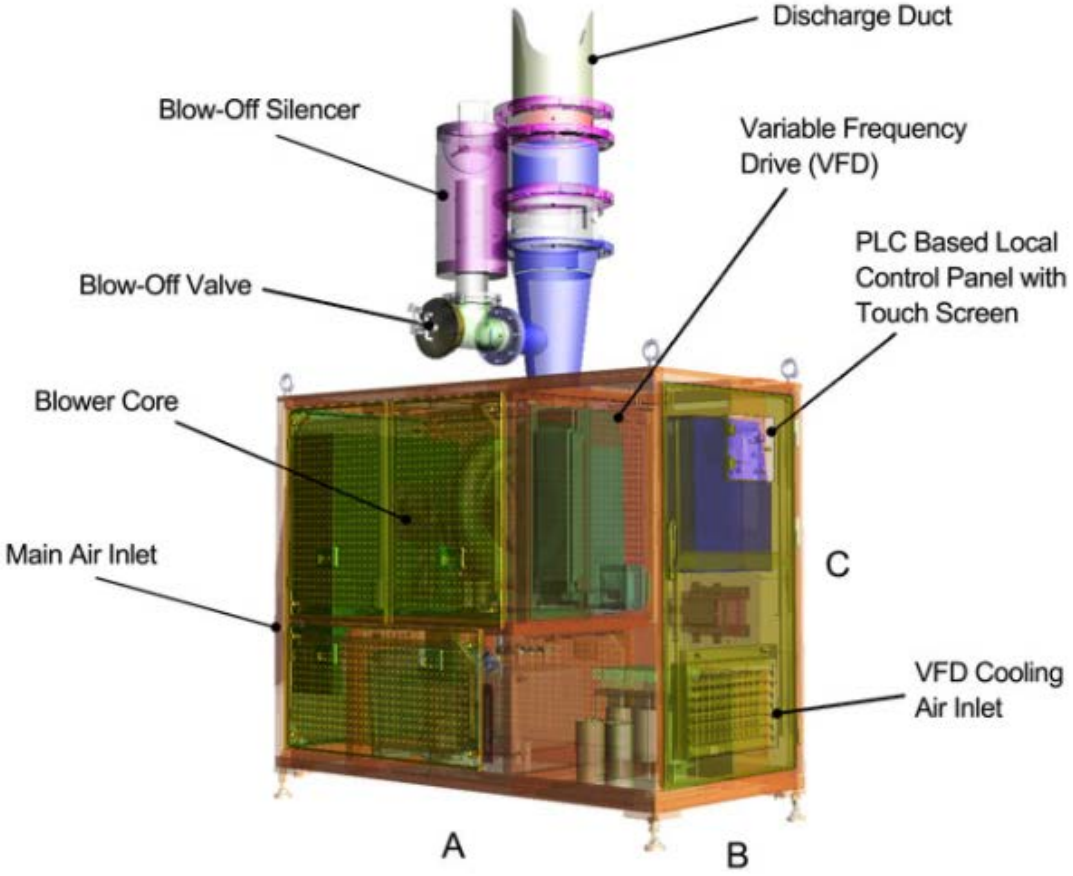
Highlight: Goleta Sanitary District



- High volume aeration blowers have a large energy demand and are key areas to evaluate for potential overhaul or retrofit
- 100 hp high speed turbo blower replaces 150 hp centrifugal blower
- District selected turbo blower manufactured by APG Neuros

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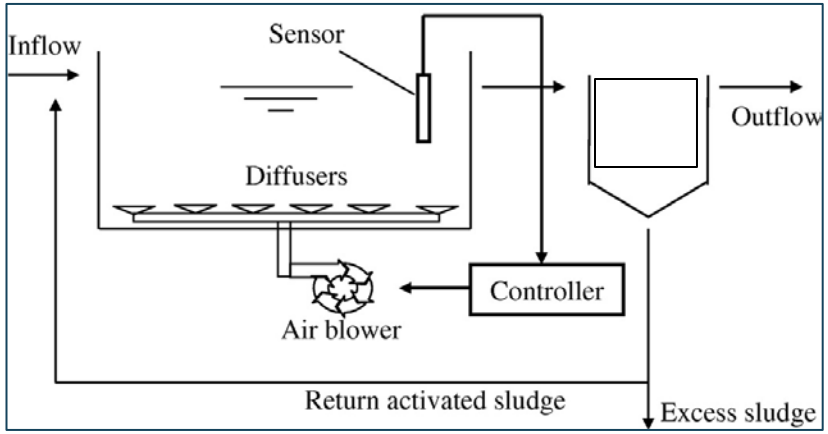
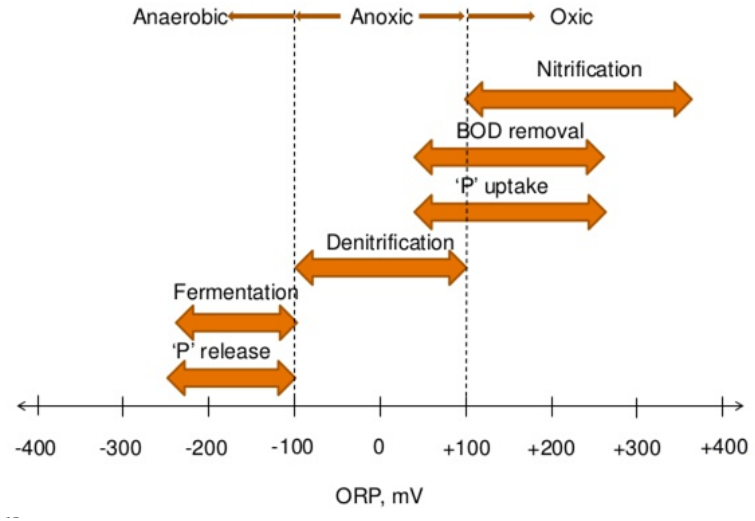
Highlight: Goleta Sanitary District

ORP Sensor Installation

- ORP = Oxidation-Reduction Potential
- DO sensors only tell part of the story - how *much* oxygen is present
- ORP sensors detect the *effectiveness* of the oxygen present
- Controller receives ORP data and adjusts blower speed to reach target ORP set point





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Highlighting Success

Inland Empire Utilities Agency

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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Success with SoCalREN

Energy & Environmental Benefits

Over **3 million kWh** saved annually

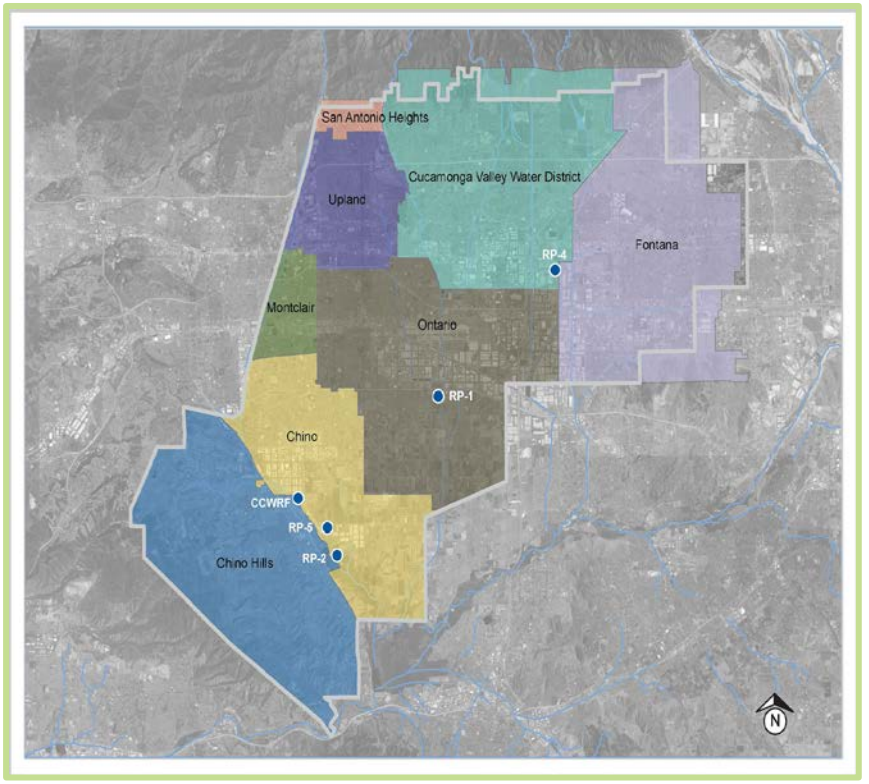
Over **250 kW** annual demand reduction

Equates to **235 metric tons GHG** avoidance

Operational Benefits

Over **$300,000** utility bill savings annually

Over **$270,000** in utility incentives captured



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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Situation Analysis

In anticipation of utility incentives retiring, IEUA was driven to implement pump upgrades at an accelerated rate. Parallel implementation of multiple projects district-wide was the approach taken to ensure maximum EE benefits.

Key Projects

- Multiple phases of pump efficiency upgrades
- 2 phases of LED lighting retrofits

SoCalREN + WISE Program Services Leveraged

- Project Identification
- Audit Commissioning
- Financial Feasibility Analysis
- Project Management
- Utility Incentives Support through WISE Program

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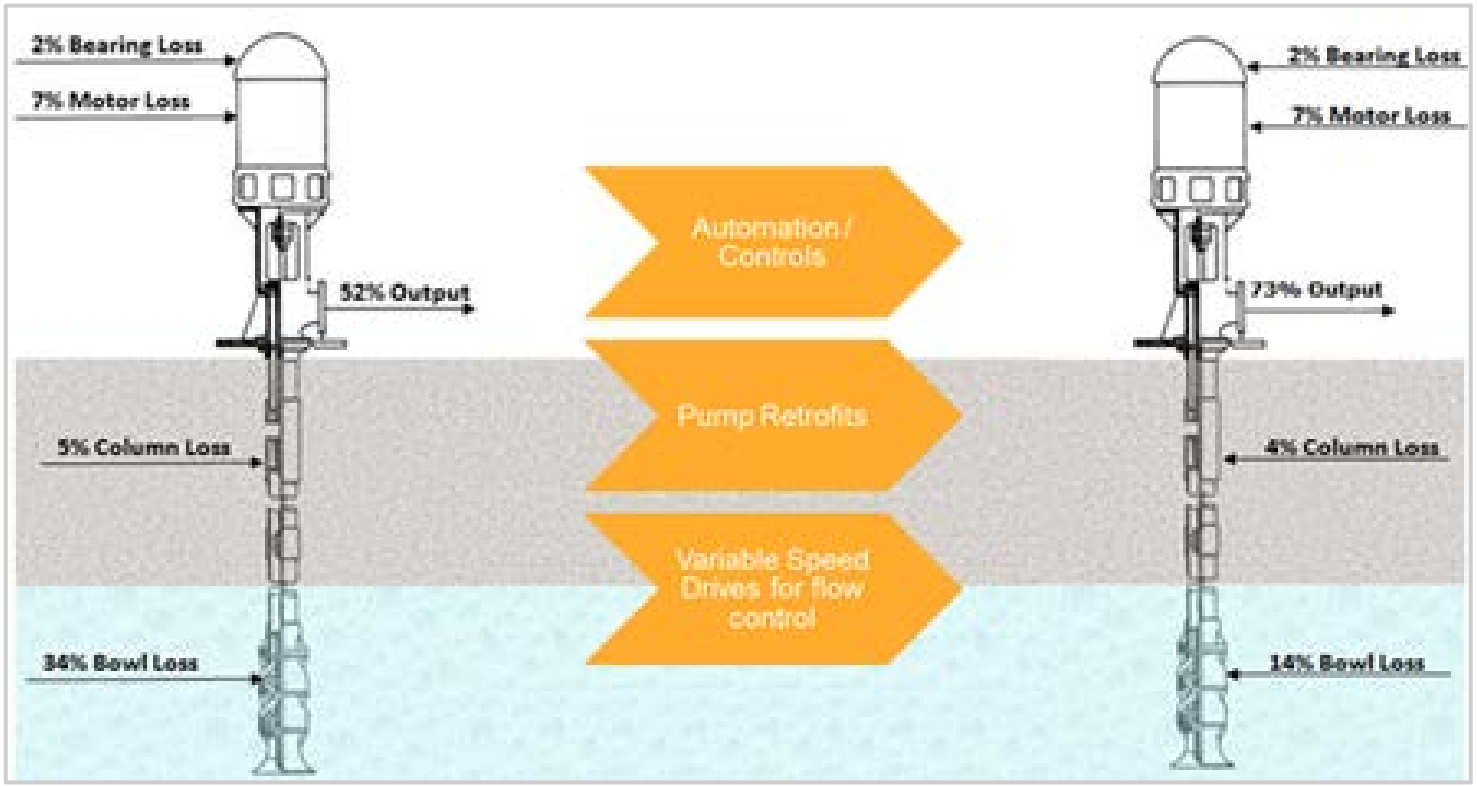
Pump Efficiency Optimization

District Wide Pumping Projects:

Range of overhaul, replacement opportunities identified through comprehensive audit co-funded by SoCalREN + WISE



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Pumping Project Development Insights

Pumps with payback <6yrs prioritized for upgrade

- 18 pumps met criteria; Multiple project phases developed
- Expedited project schedule to capture retiring utility incentives
- First project addressing 5 pumps completed in early 2017 at IEUA's Carbon Canyon Water Recycling Facility

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Lighting Project Development Insights

District-Wide Lighting Retrofits in 2 phases

- Projects covered 5 treatment facilities + IEUA Headquarters
- Retrofitting interior + exterior fixtures to LED has captured >1 Million kWh in savings!

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Inland Empire Utilities Agency
A MUNICIPAL WATER DISTRICT

Going Beyond Efficiency

- IEUA Headquarters awarded LEED Platinum certification in 2003
- IEUA has been recognized as a regional leader in both environmental stewardship and energy management by adopting a business goal of achieving peak power independence by 2020.

"SoCalREN has assisted IEUA by identifying energy efficiency opportunities and prioritizing projects that meet IEUA's adopted Business goals and proposed Energy Management strategy."

-Pietro Cambiaso, Supervisor - Environmental Compliance & Energy, IEUA

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SoCalREN-WISE Coordinated Approach

Phase	Added Value Through SoCalREN
Project Management	Customized & coordinated support driving project execution
Benchmarking	Comparative Energy Analysis
Audit	Construction Feasibility ♦ Gas Equipment & Facility Evaluation
Incentive/OBF & Project Approvals	Support Agency Staff Reports ♦ Presentation to Board/Councils
Design & Cost Proposal	Procurement Support ♦ NJPA Cooperative Procurement Review of Contractor Cost Proposals
Installation	Construction Management Support
Project Closeout	Coordination for Commissioning/Handoff

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SoCalREN-WISE Collaboration: Inland Empire Utilities Agency

Measures Implemented

- **MLR & RAS process optimization, Ammonia sensors**
- **Pump efficiency upgrades & replacements**
  - **Phase I complete, Phase II underway**
- **LED interior/exterior fixture retrofits at 5 plants and HQ building**

IR Approved Energy Savings	**over 3 Million kWh over 260 KW**
Annual Cost Savings to IEUA	**nearly $300,000**
On Bill Financing	**over $1 Million**
Incentives to IEUA	**nearly $300,000**

"SoCalREN has assisted IEUA by identifying energy efficiency opportunities and prioritizing projects that meet IEUA's adopted business goals and proposed energy management strategy."

-Pietro Cambiaso, Supervisor - Environmental Compliance & Energy, IEUA

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Thank you!

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