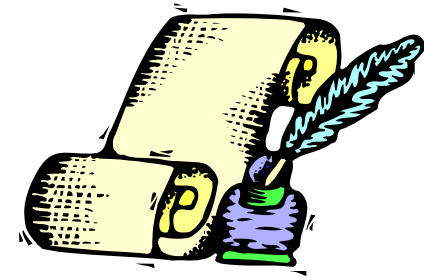


US EPA ARCHIVE DOCUMENT

Finding Opportunities for Better Energy Management



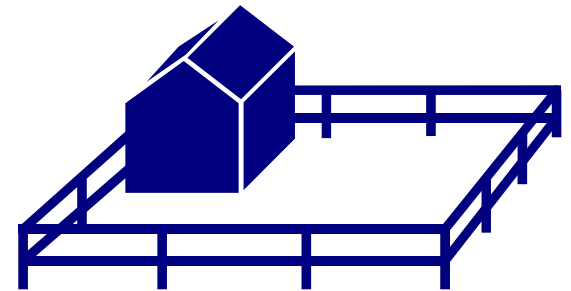
Energy Policy



- Why do you need a policy?
 - Allocation of resources
 - Interdepartmental cooperation
- What needs to be in the policy?
 - Visionary but realistic goal statements
 - Consistency with business and stakeholder goals
- Who needs to know about it?
 - Everybody

Fenceline

- Fenceline: scope of operations for your energy improvement program
 - Entire operation?
 - Pumping plant only?
 - Lighting?
 - Heating and cooling?



Energy Management Team

- Energy Manager
 - Organize and plan
 - Delegate and collaborate
- Energy Team
 - Knowledge of operations
 - Problem solving capabilities
 - Communication skills
- Existing teams, organizations?



What have you already done?

Worksheet of Previously Implemented and Planned Energy Improvement Projects

Energy Use [type]	Projects completed	Results (\$, gallons, kWh, normalized if possible)	Who did you communicate results to?	Were there associated SOPs, training, records?	Current activities in planning	How will you measure results?	Who could you communicate results to?	What SOPs, training and records will be needed?

Identify Operations & Energy Use

Activity	Operation or Location	Type of Energy Used	Current Use and Costs
Heating, Ventilation, and Air Conditioning (HVAC)	Operations Building (Heating)	Natural Gas	<ul style="list-style-type: none"> • 150 MMBTU/year • \$1,500/year
	Operations Building (Cooling, Ventilation)	Electricity	<ul style="list-style-type: none"> • 10,000 kWh/year • \$1,000/year
Lighting	Operations Building	Electricity	<ul style="list-style-type: none"> • 24,000 kWh/year (4 kWh/ft², 6,000 ft²) • \$2,400/year
Vehicle Use	Service Trucks	Diesel Fuel	<ul style="list-style-type: none"> • 1,000 gallons/year • \$2,500/year
Equipment			
Pump #1	Treatment Building	Electricity	<ul style="list-style-type: none"> • 400,000 kWh/year • \$40,000/year
Pump #2	Treatment Building	Electricity	<ul style="list-style-type: none"> • 480,000 kWh/year • \$48,000/year
Pump #3	Treatment Building	Electricity	<ul style="list-style-type: none"> • 280,000 kWh/year • \$28,000/year
Pump #4	Treatment Building	Electricity	<ul style="list-style-type: none"> • 160,000 kWh/year • \$16,000/year

Identifying Opportunities

- In addition to ideas from your operations staff, ideas for energy efficiency can come from:
 - EPA Guidebook
 - EPA Region 9 website
 - WWT journals
 - Professional workshops
 - Energy audits
 - ...and other sources...

High Energy Use Operations (from Guidebook, page 36)

High Energy Using Operations	Energy Saving Measures
Pumping	<ul style="list-style-type: none">• Reduce load• Manage load• Water to wire efficiency• Pump selection• Motor and drive selection• Automated control
Aeration	<ul style="list-style-type: none">• Fine bubble• Improved surface aerators• Premium motors• High efficiency motor drive• Blower Variable Frequency Drives (VFDs)• Automatic DO control
Dewatering	<ul style="list-style-type: none">• Replace vacuum systems• Premium motors• VFDs for plant water pump
Lighting	<ul style="list-style-type: none">• Motion sensors• T5 low and high bay fixtures• Pulse start metal halide• Indirect fluorescent• Super efficient T8s• Comprehensive control for large buildings
Heating, Ventilation, Air Conditioning (HVAC)	<ul style="list-style-type: none">• Water source heat pumps• Prescriptive incentives for RTUs• Custom incentives for larger units• Low volume fume hood• Occupancy controls• Heat pump for generator oil sump

From a PG&E energy audit

TABLE ES-1 SUMMARY OF ENERGY EFFICIENCY OPPORTUNITIES SAVINGS AND COSTS

EEO No.	Description	Potential Energy Conserved	Demand Savings (kW)	Potential Savings (\$/yr)	Implem. Cost (\$)	Simple Payback (years)
No-Cost Measures						
1.	Repair Domestic Aeration Blower Air Leaks	9,933* kWh/yr	1.1	848	0	0.0
Low-Cost Measures						
2.	Install Premium Efficiency Motors When the Existing Motors Wear Out or Require Rewinding*	11,038 kWh/yr	1.0	1,209	1,866	1.5
Investment Grade Measures						
3.	Install a Dissolved Oxygen (DO) Control System and Adjustable Speed Drives on the Domestic Aeration System Blowers	512,008 kWh/yr	58.4	54,566	126,000	2.3
4.	Install a Dissolved Oxygen (DO) Control System and Adjustable Speed Drives on the Industrial Aeration System Mechanical Aerators	269,460 kWh/yr	30.8	28,729	143,500	5.0
Total Electrical Energy Savings		802,439 kWh/yr				
Total Demand Savings			91.3 kW			
Total Cost Savings				\$85,352		
Total Implementation Cost					\$271,366	
Simple Payback Period						3.2 years

* Two year incremental savings

Exercise: Identify operations and their related energy use

- Select an activity and complete the table
 - type of energy
 - amount used
 - cost
- What problems did you face in completing the table?
- How will you address these problems?

Activity	Operation or Location	Type of Energy Used	Current Use and Costs
Activity 1			
Activity 2			
Activity 3			
Activity 4			