

ENERGY STAR®
Portfolio Manager
Energy Performance Rating System
For Wastewater Treatment Facilities

*Jason Turgeon
US Environmental Protection Agency
CEE Program Meeting
6/12/2008*

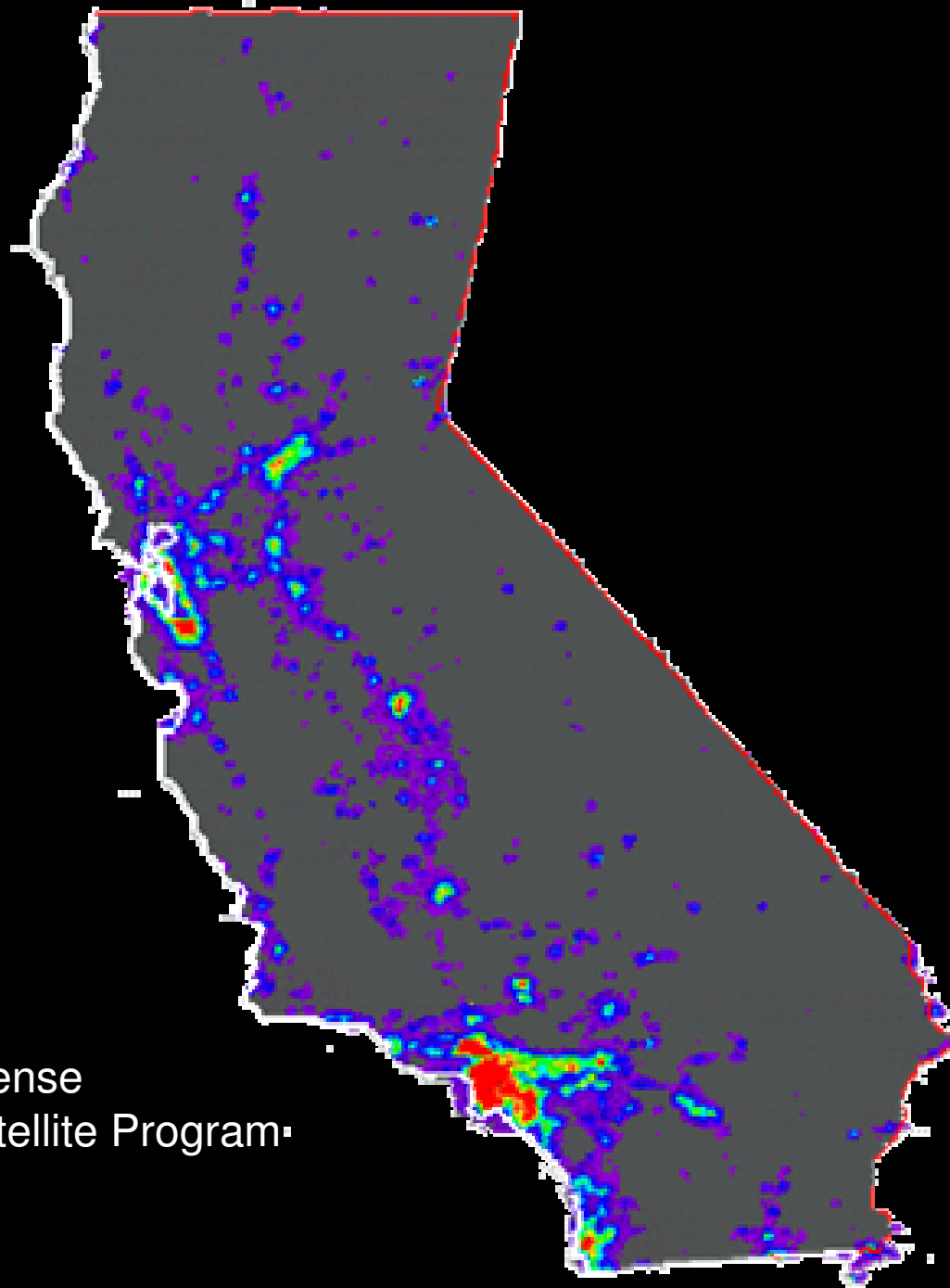
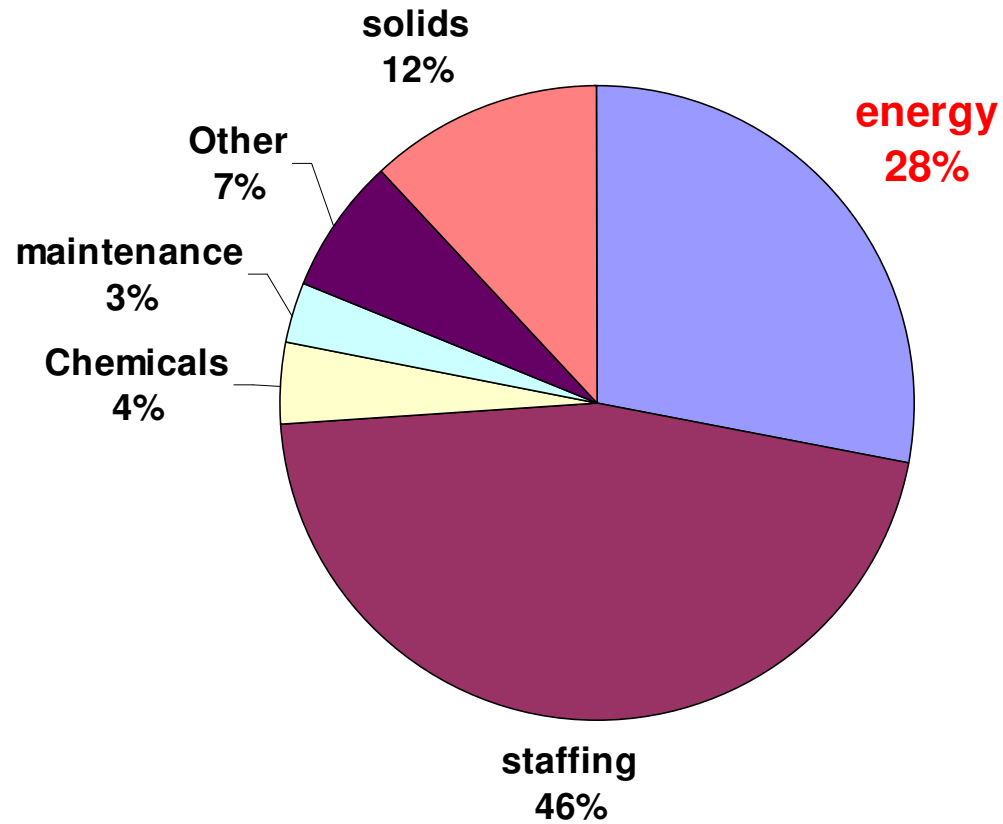


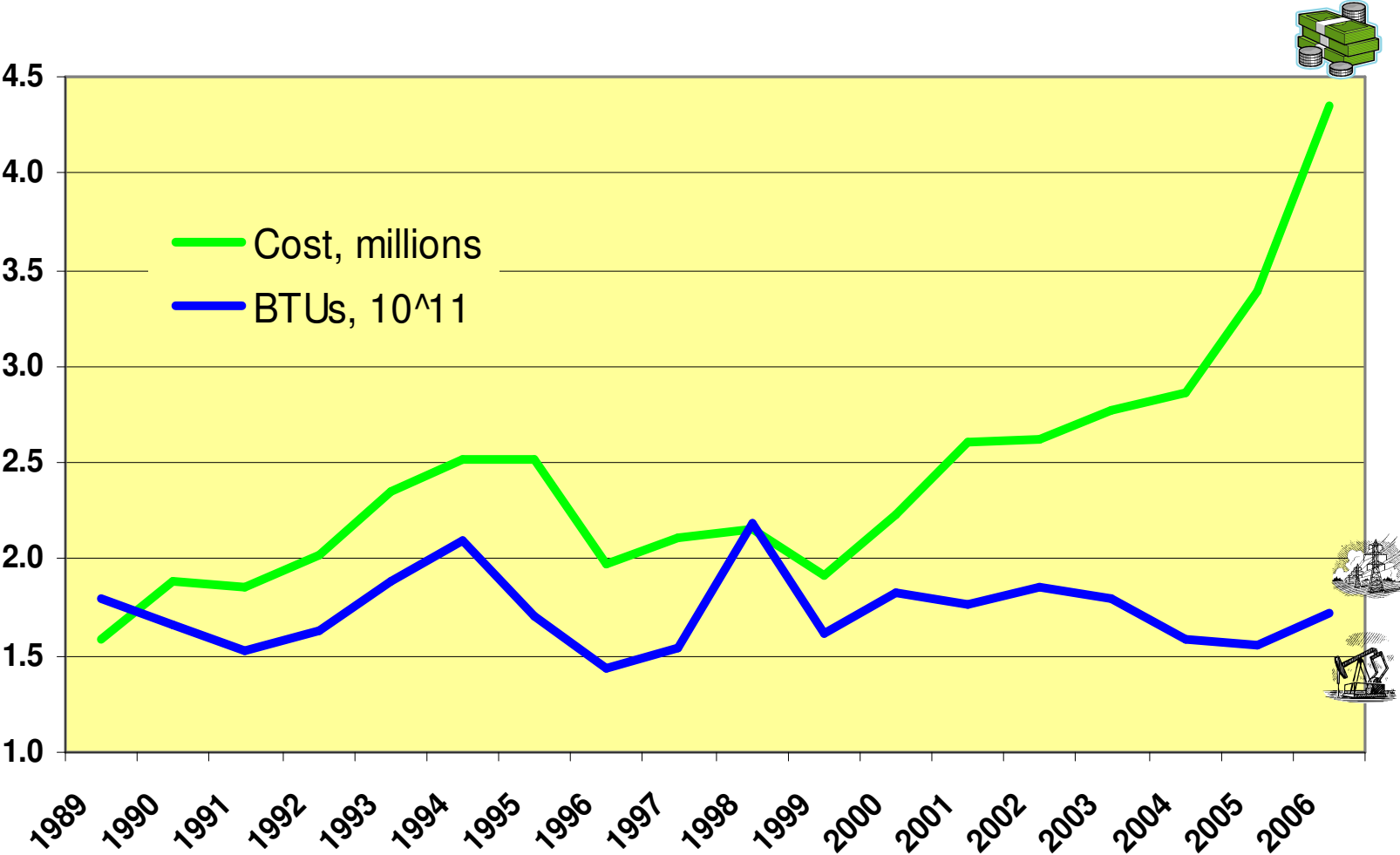
Image: USAF Defense
Meteorological Satellite Program

Industry Average O&M Budgets

Wastewater Plant



Hartford WPCF Energy Cost vs. Use





**New Regulations May
Drive Energy Use**

Successful Energy Management



Portfolio Manager



Eligible Building Types



Hotels



Office Buildings



Courthouse



Schools



Medical Offices



Hospitals



Dormitories



Grocery Stores

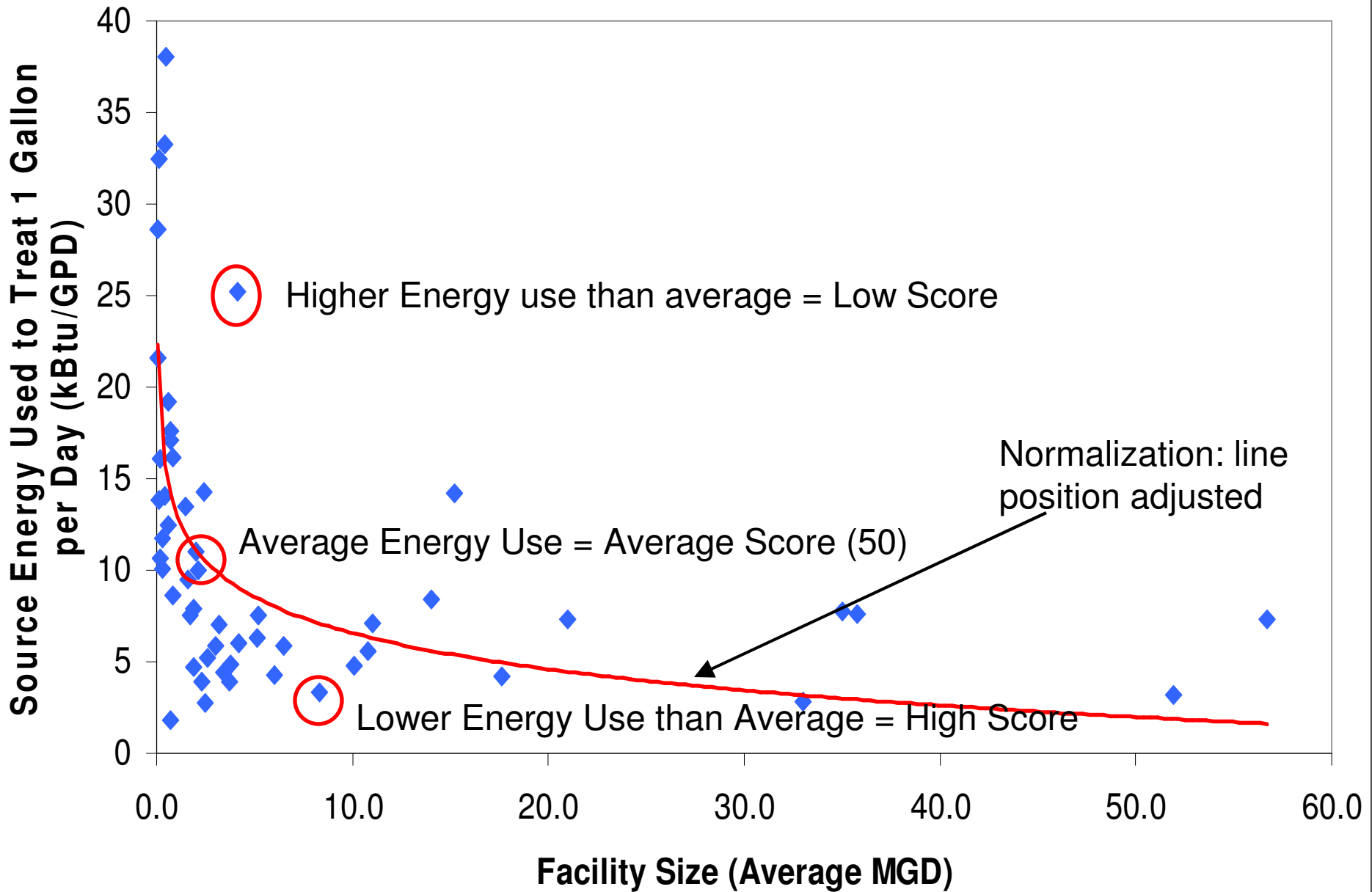


Warehouses

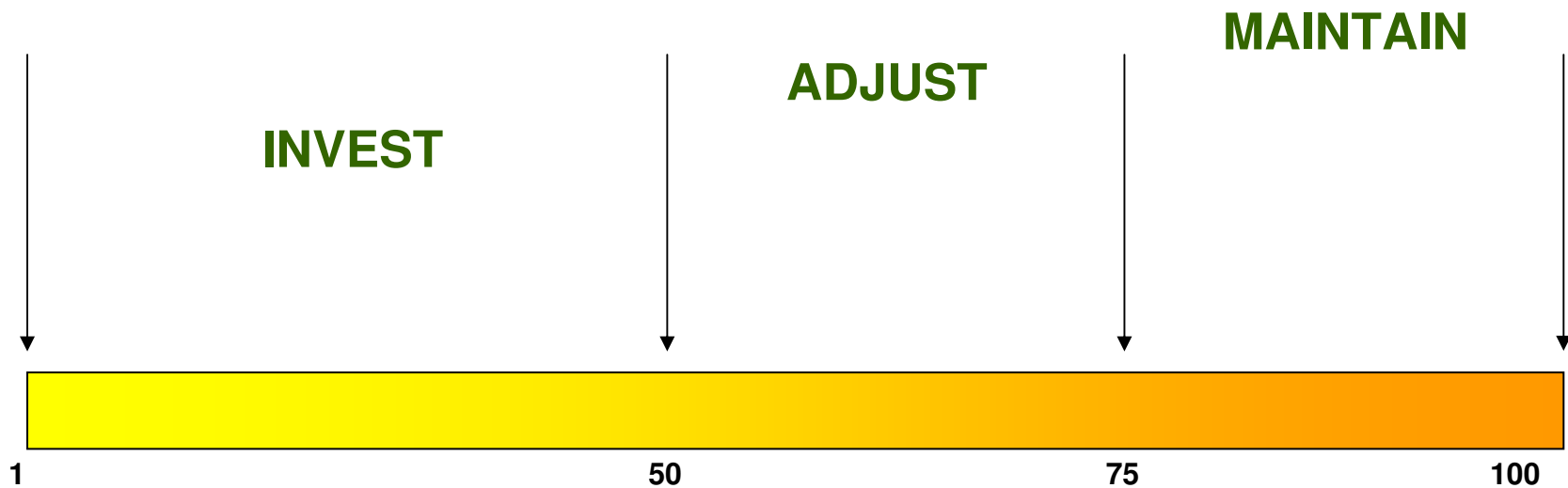
What Does it Do?



Energy Use per Flow vs. Facility Size



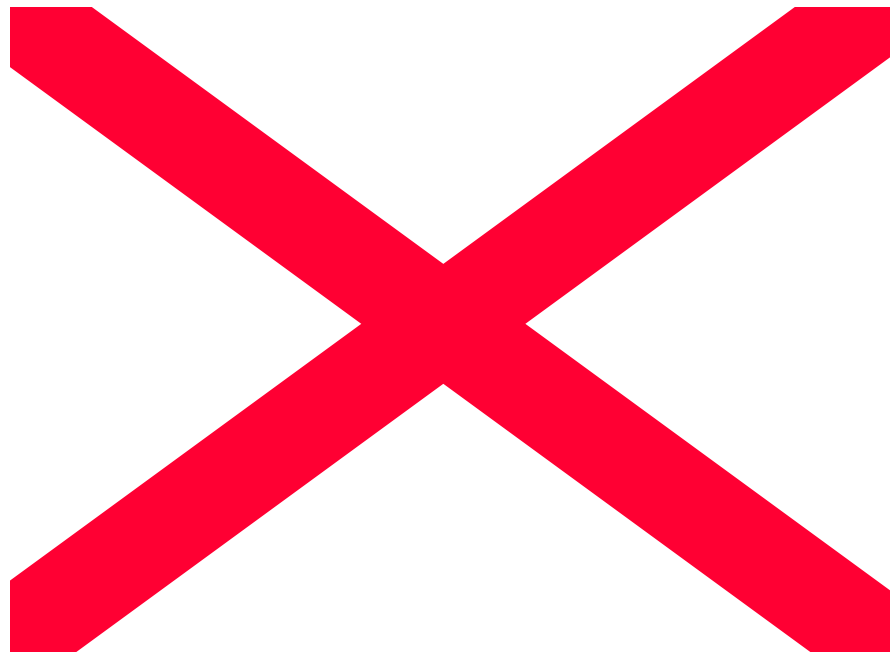
Now What?



ENERGY PERFORMANCE RATING

Facility Name	Current Rating (1-100)	Average Flow (MGD (million gallons per day))	Current Source Energy per Flow (kBtu/gallons per day)	Annual Energy Cost (US Dollars (\$))	Influent BOD5 (mg/l (milligrams per liter))	Effluent BOD5 (mg/l (milligrams per liter))
	84	5.1	6.271	\$439,991	210	3
	96	8.3	3.2994	\$322,792	180	8
	90	33	2.825	\$1,360,891	154	5.8
	53	51.9	3.2169	\$1,497,978	136	13
	72	35	4.7255	\$1,962,705	157	10
	28	35	7.774	\$3,028,851	157	10

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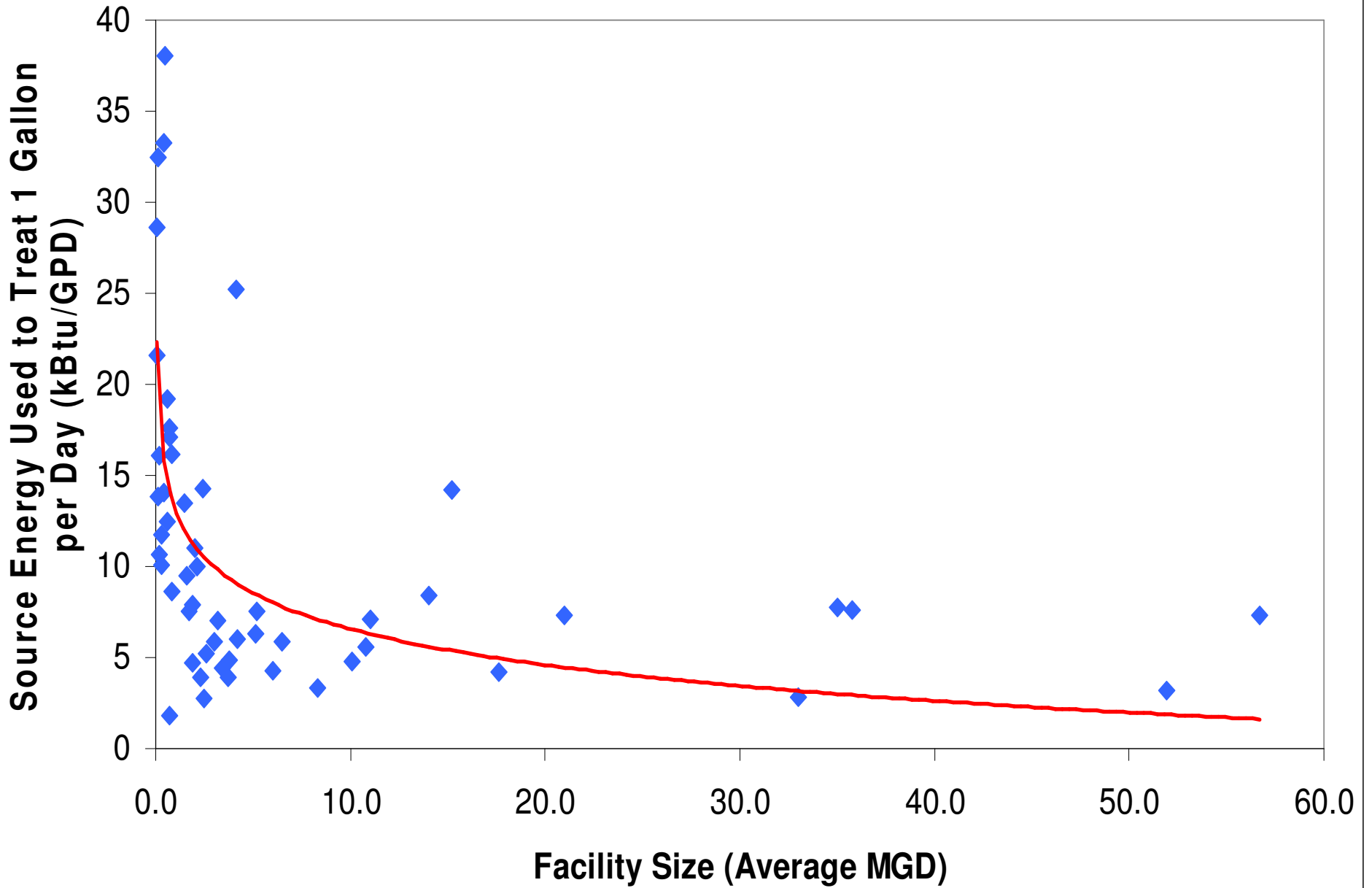


Case Study 1: A Tale of Two Plants

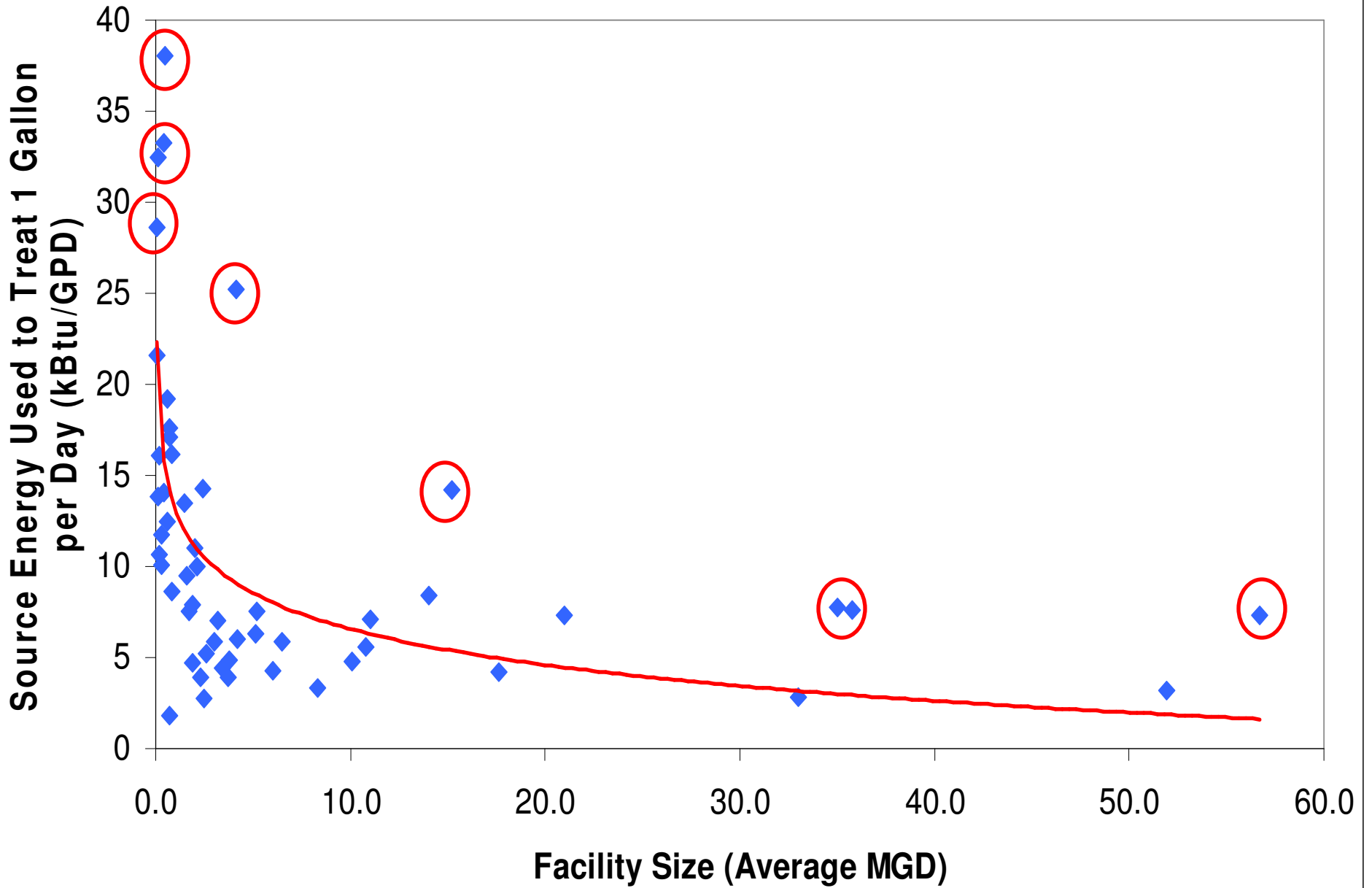
Plant	Treatment Electricity Use (kWh)	Treatment Natural Gas Use (therms)	Average Influent Flow (MGD)	BOD Removal %	Nutrient Removal	Source EUI (kBtu/gpd)	Rating
Plant A	20,632,500	368,596	35.84	91.5%	No	7.59	11
Plant B	6,930,000	61,909	33.00	96.2%	No	2.59	90

- Plant A spent \$2,969,000 on electricity and \$474,000 on natural gas for 2006. Total energy bill = **\$3.43 million**
- Plant B spent \$1,286,000 on electricity and \$74,000 on natural gas for the same year. Total energy bill = **\$1.36 million**
- Plant B spent **\$2.1 million LESS** on energy to treat nearly the same volume of water.

Energy Use per Flow vs. Facility Size



Energy Use per Flow vs. Facility Size



Existing Efforts – Coverage is indicated by shaded area

Energy Conservation Measures		PG&E	BC Hydro	EPA End-User Guide	WI – Focus on Energy
Water	<i>Use Elevated storage to shift pumping off-peak</i>				
	<i>Off-peak back-wash pumping</i>				
	<i>Track pump efficiency (kWh/MG or KW/MGD)</i>				
	<i>Demand limiting via backwash pump scheduling</i>				
	<i>Source Selection</i>				
Both Water and Waste Water	<i>Operate most-efficient pump</i>				
	<i>Use VFD's instead of throttling valve</i>				
	<i>Use VFD's instead of recirculation</i>				
	<i>Install pony pumps</i>				
	<i>Install multiple pumps</i>				
	<i>Coat interior pump surfaces</i>				
	<i>Improve control of disinfection equipment UV disinfection</i>				
	<i>Instrumentation and Controls/ SCADA</i>				
	<i>Efficient Motors</i>				
	<i>Monitor and Analyze Demand Profile (Loadshifting)</i>				
	<i>Water Cons. and System Leak Detection and Repair</i>				
	<i>Pump Alignment Measure</i>				
	<i>Pump Discharge Throttling</i>				
Waste Water	<i>VFD Blowers/High efficiency Blowers</i>				
	<i>Fine-bubble diffused air system</i>				
	<i>Dissolved Oxygen Control</i>				
	<i>Efficient Effluent Pumping</i>				
<i>Others</i>					

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- Calculator: Tube Design
- Changed Priorities: redvers
- Padlock: Zebble
- Dial 1-100: Leo Reynolds
- Swiss Army Knife: Kaptain Kobold

Contact Info

If it's not energy efficient ...



...it's not sustainable

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