

Energy Saving Achieved by WaterOne using Derceto Energy Management Software

Build Green Conference

April 2, 2009

Introduction

- 💧 WaterOne spent \$5.5 million per year on electricity for pumping (2003 Actual Costs)
 - 💧 \$1.7 million intake and preseds (BPU)
 - 💧 \$3.0 million Facility 1 and Facility 2 (BPU)
 - 💧 \$0.8 million distribution pump stations (KCP&L)

Opportunity for Demand Charge Reductions

- 💧 The Production Facilities are charged for demand during daytime hours under BPU Rates.
- 💧 The Distribution Pump Stations are charged for demand regardless of time of day under KCP&L Rates.
- 💧 If demands during the daytime at the Production Facilities are reduced, significant savings result.

Rate Structure Example

- 💧 **BPU - Large Power Service Rate - E 400**
 - 💧 Applies to Missouri River intake and presed and Hansen Treatment Plant
 - 💧 Charges are based on the total energy usage throughout the month
 - 💧 Cost of energy is dependent on the “Billing Demand in kW” incurred during the month (more later)
 - 💧 Energy consumption for the month is separated into two blocks with different prices per kWh
 - 💧 The number of kWh in each block is determined by the ‘billing demand’ measured in kW

Rate Structures Continued

💧 BPU Tariff Components

💧 Billing Demand

- 💧 the greatest average kilowatt demand measured in any 30min period between the hours of 10:00am and 8:00pm excluding weekends and holidays
- 💧 During winter, the billing demand is the larger of the contract demand or 70% of the largest billing demand during the summer months
- 💧 There is presently no contract demand

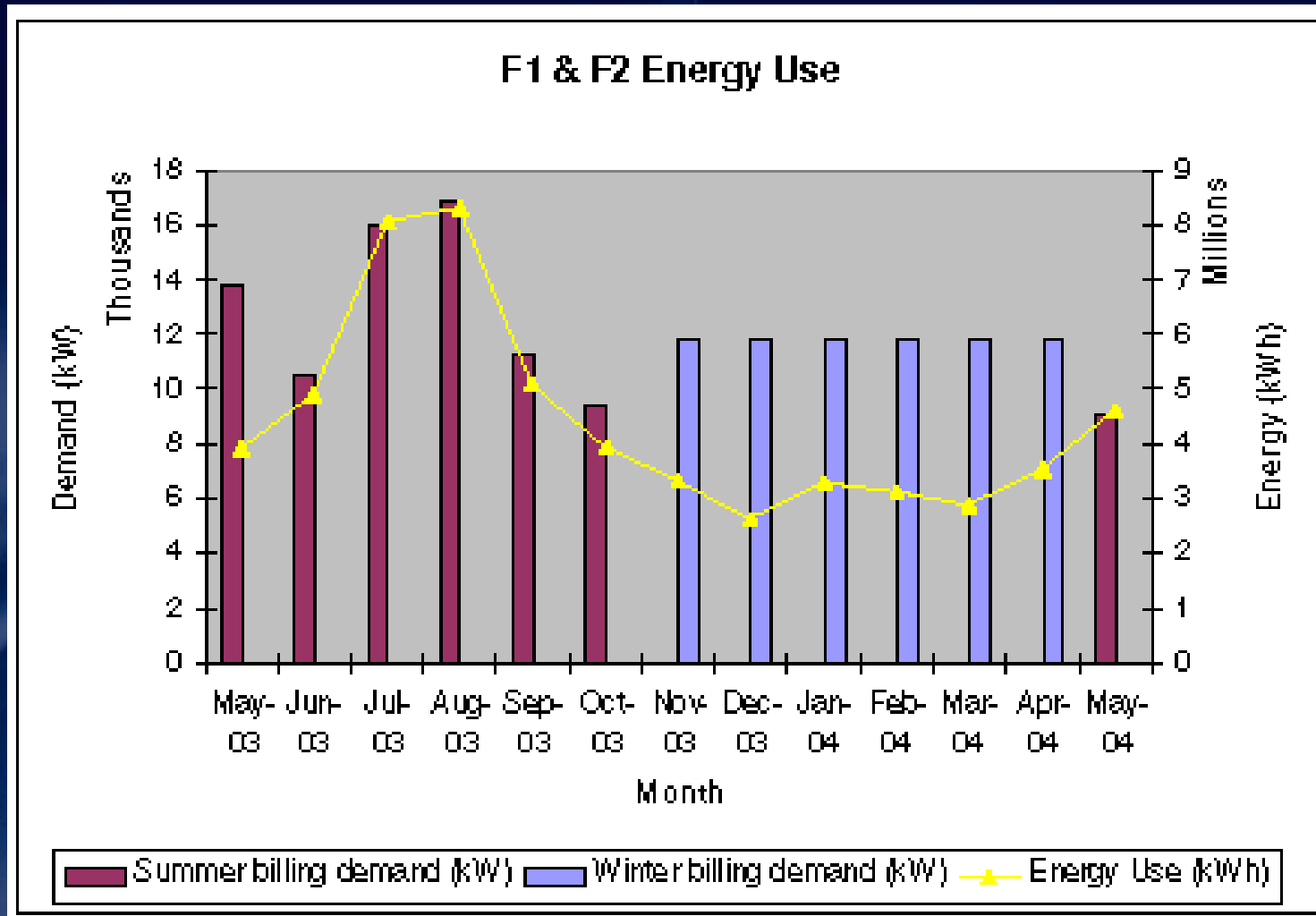
💧 Facilities Demand

- 💧 the highest metered demand in KW recorded in the preceding 12 months

Rate Structures Continued

- 💧 Winter Demand Charges
- 💧 Of particular interest is the way in which demand is calculated during the winter months as the greater of actual demand or 70% of the highest billing demand during summer

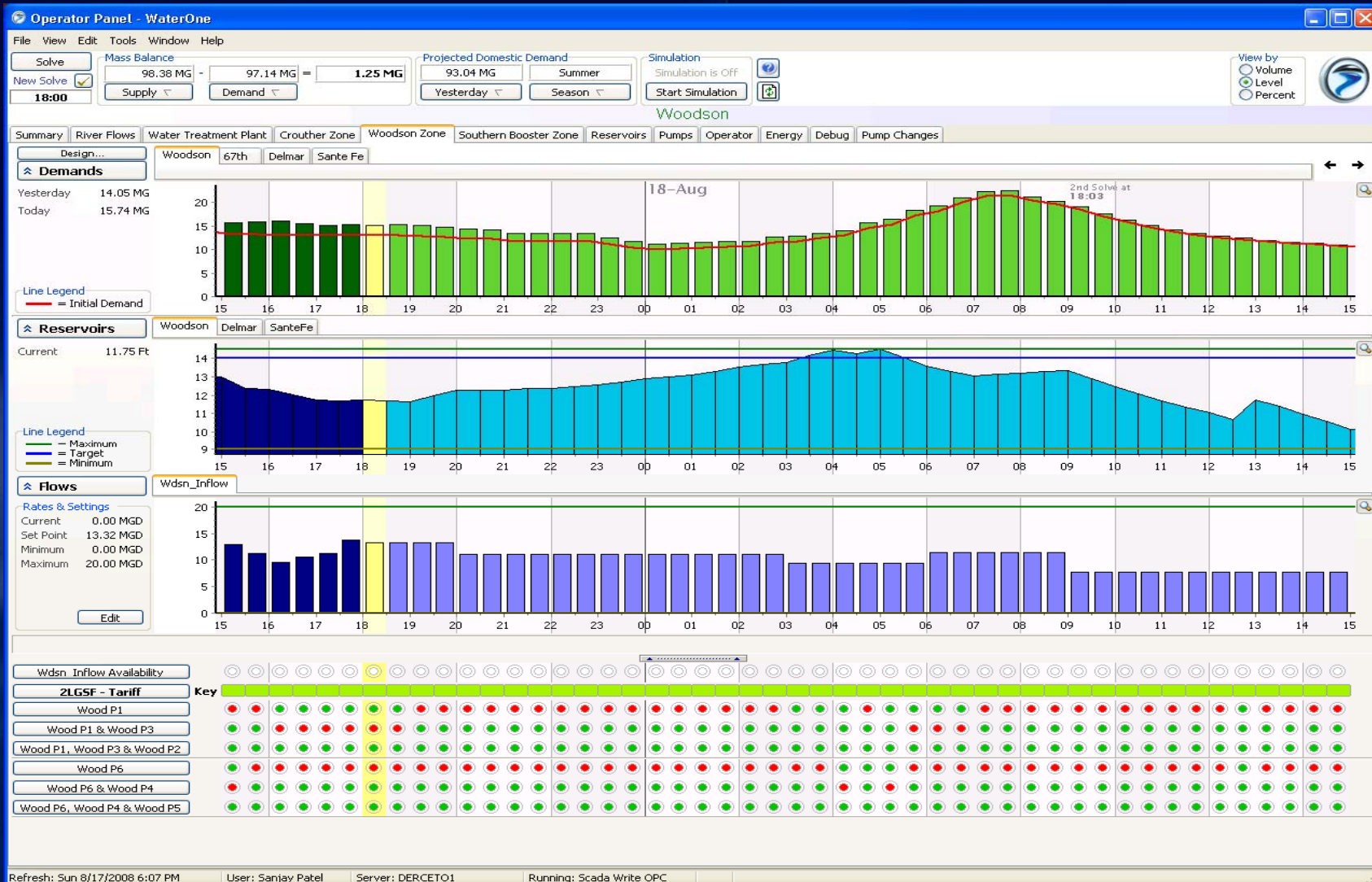
Rate Structures Continued



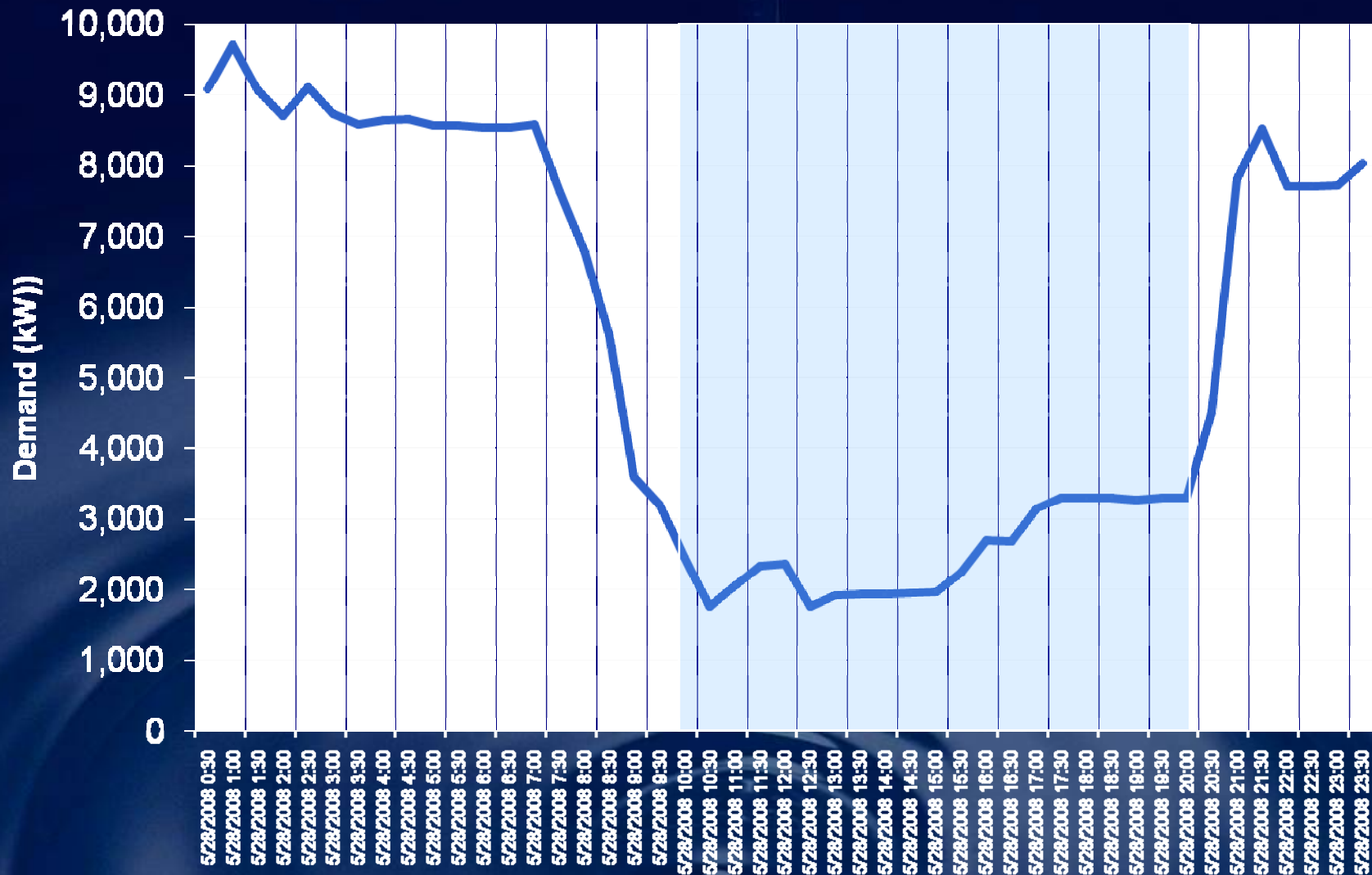
Control Systems to Manage Energy

- 💧 WaterOne engaged Derceto to study the opportunities to reduce demands and save on energy costs.
- 💧 The study concluded at least \$800,000 could be saved by implementing its energy management software.
- 💧 The software was implemented in May, 2006.
- 💧 Each year the savings achieved has increased.

Derceto Software



Typical Daily Treatment Plant KW Demand Curve



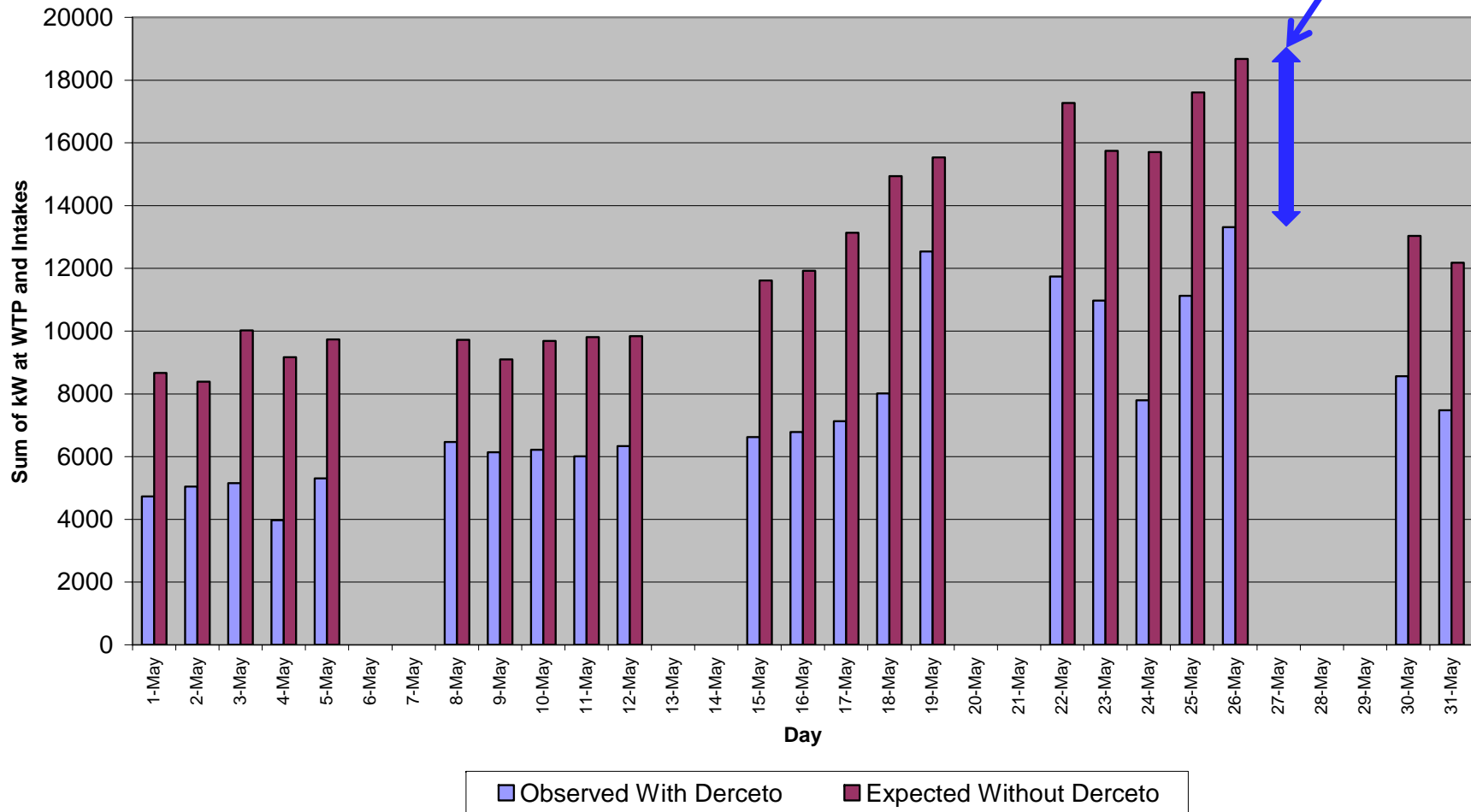
Operational Issues

- 💧 Flow changes
 - 💧 Chemical Feeder Settings
- 💧 Emergencies
 - 💧 Turning Derceto On and Off
- 💧 Out of Service
- 💧 Maintenance Activities
 - 💧 Testing pumps and valves

Demand Reduction

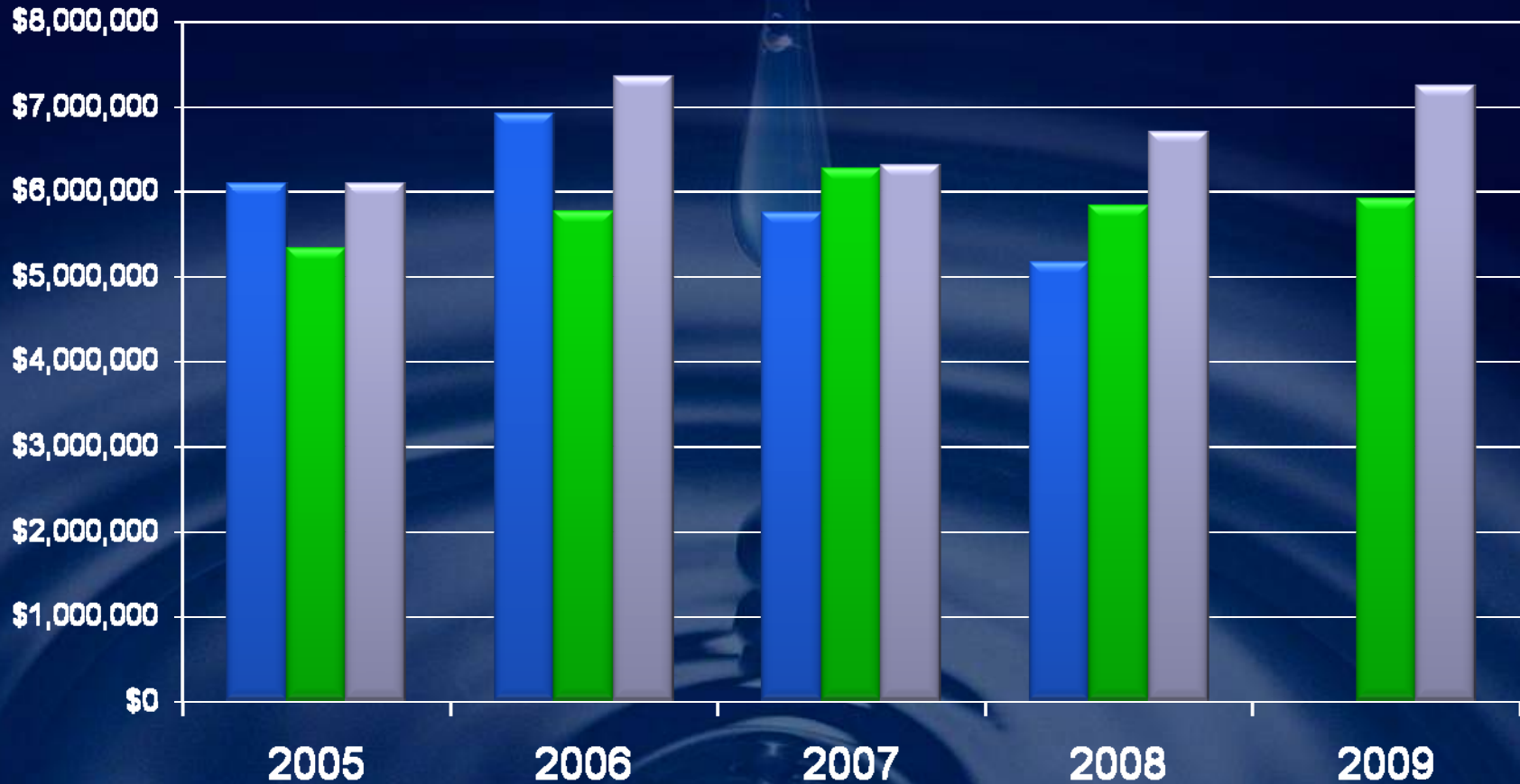
Max Peak-Time kW (May 2006)

5 MW Reduction

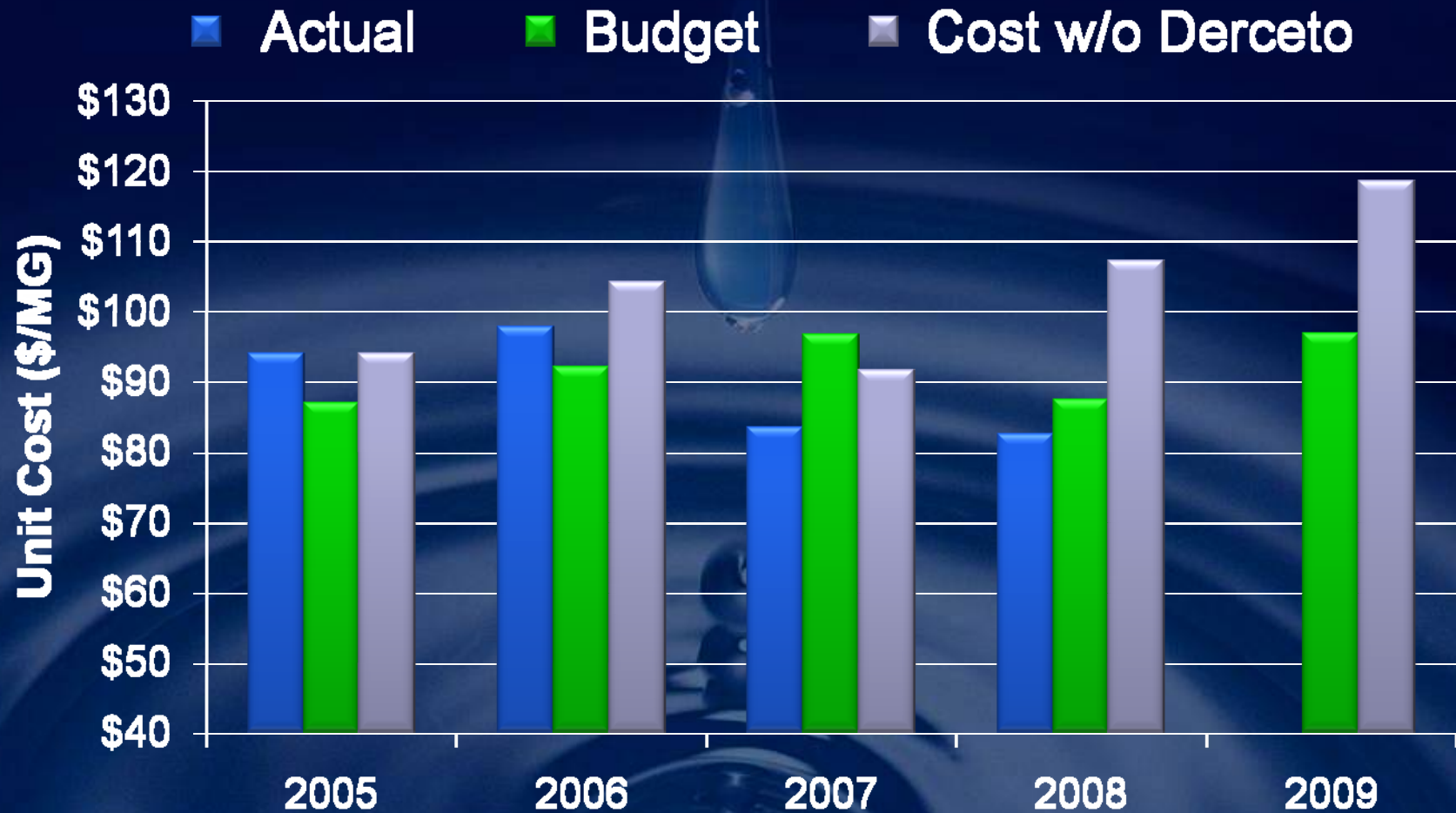


Power Cost

■ Actual ■ Budget ■ Cost w/o Derceto



Unit Power Cost



Carbon Footprint Reduction

Source of CO2 data

WaterOne	Board of Public Utilities (BPU)	US Environmental Protection Agency's Acid Rain Program	2005
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CO2 emissions rate per MWh

Customer System	Plant Operator Name	Selection Criteria in eGRID Database	CO2 Emissions (Tons/MWh)
Water District Number 1 of Johnson County (WaterOne), Kansas KS	Board of Public Utilities, Kansas City Power & Light Co	power control area	0.845

Aquadapt efficiency gains and CO2 reductions

Customer System	Average MWh per Year	Average Efficiency Gain under Aquadapt	EPA eGRID 2004 CO₂ Emissions (Tons/MWh)	Extrapolated CO₂ Reduction per Year (Tons)
WaterOne	94,000	6.00%	0.845	4,800

Questions / Discussion