

Energy Audits and Process Changes Can Reduce Energy Usage



**Without Sacrificing
Water Quality**

Someone Has to Care

- As a supervisor with a Block Allocation for O&M budget, reduction of utilities means more money for products you need
- Get to know your energy supplier
- Ask about new opportunities to reduce costs from the experts
- Demand Response program came from this information

Staff Buy In (Good Operator Practices)

- Provide the best possible water quality at a reasonable price
- Any design no matter how well intentioned can be improved to optimize the finished product
- Operators should always be aware that improvements are possible
- Often time these improvements can be accomplished with existing staff at a reasonable cost

Track Usage

- Get copies of your bills
- Understand your bill
- Look for trends or inconsistencies
- Ask about any changes, (price increases)
- Develop a “normal” yearly profile
- If any month is out of normal profile try to find out why

Process Optimization

- Keep current in your field through networking, associations and literature
- Look for ideas used elsewhere that might prove beneficial to your operation
- Really get to know your process
- Look for areas that can provide the most savings (backwash water triple pumped)

Process Changes

- Identify process areas
- Try not to change too many parameters at the same time
- Verify final changes to staff
- Change written SOP's if needed
- Review energy usage after process changes to confirm the changes did reduce energy
- Make sure you look at KW usage and not just cost (price increases could mask benefits)
- All changes tested to determine that they did not effect water quality

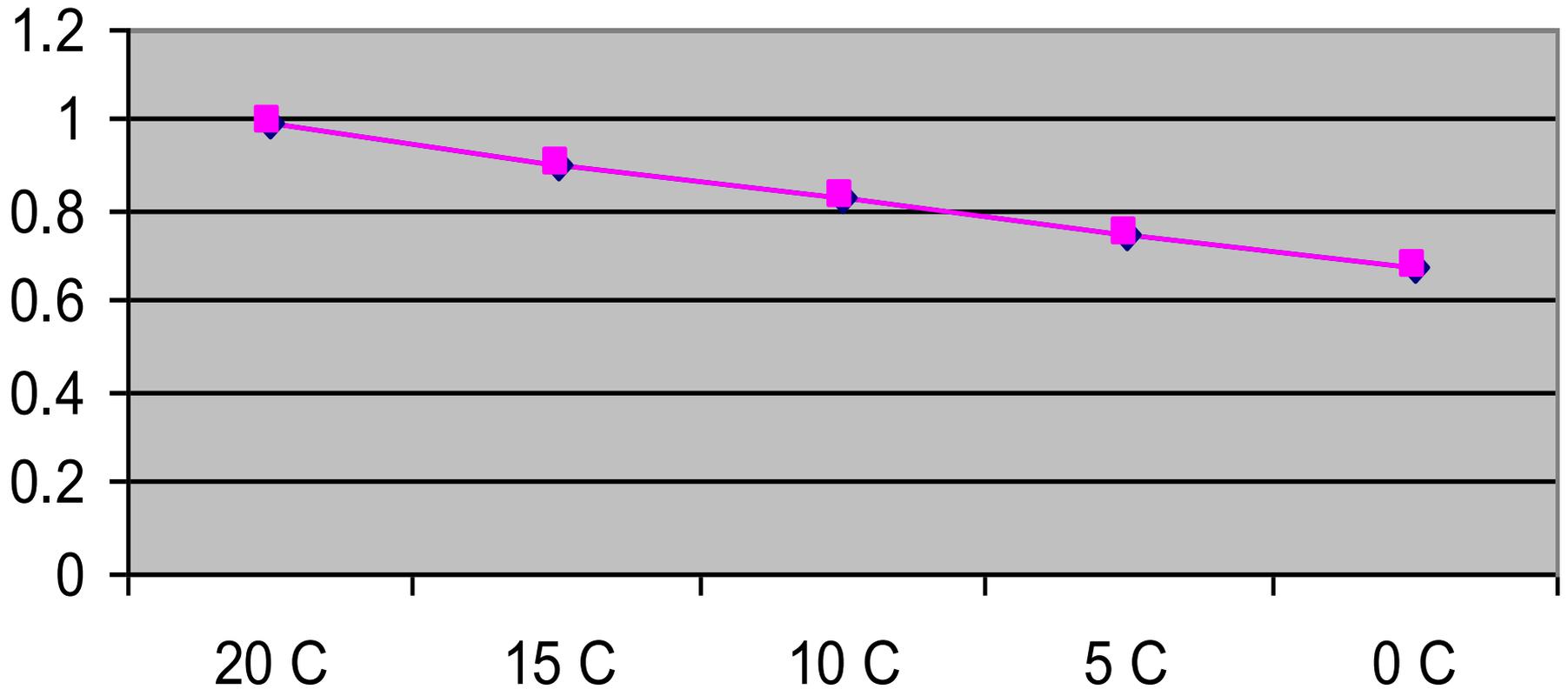
Review Filtration Process

- Review drawings
- Evaluate condition of equipment especially instrumentation
- Review backwash parameters
- Review filter performance
- Evaluate filter effluent water quality

Benefits of Filter Surveillance

- Prevent loss of filter media
- Improve water quality
- Lengthen filter run times
- Save backwash water
- Reduce cost of filter backwash
- Identify performance problems and potential problems before they get worse

Backwash Water Rates Based On Temperature (20 gpm/square feet filter area)







First Energy Audit

- Initial audit by Holden Municipal Light found savings by understanding peak demand was based on max 15 minute
- Identified changing incandescent bulbs to LED or fluorescent
- Motion detection for lighting areas

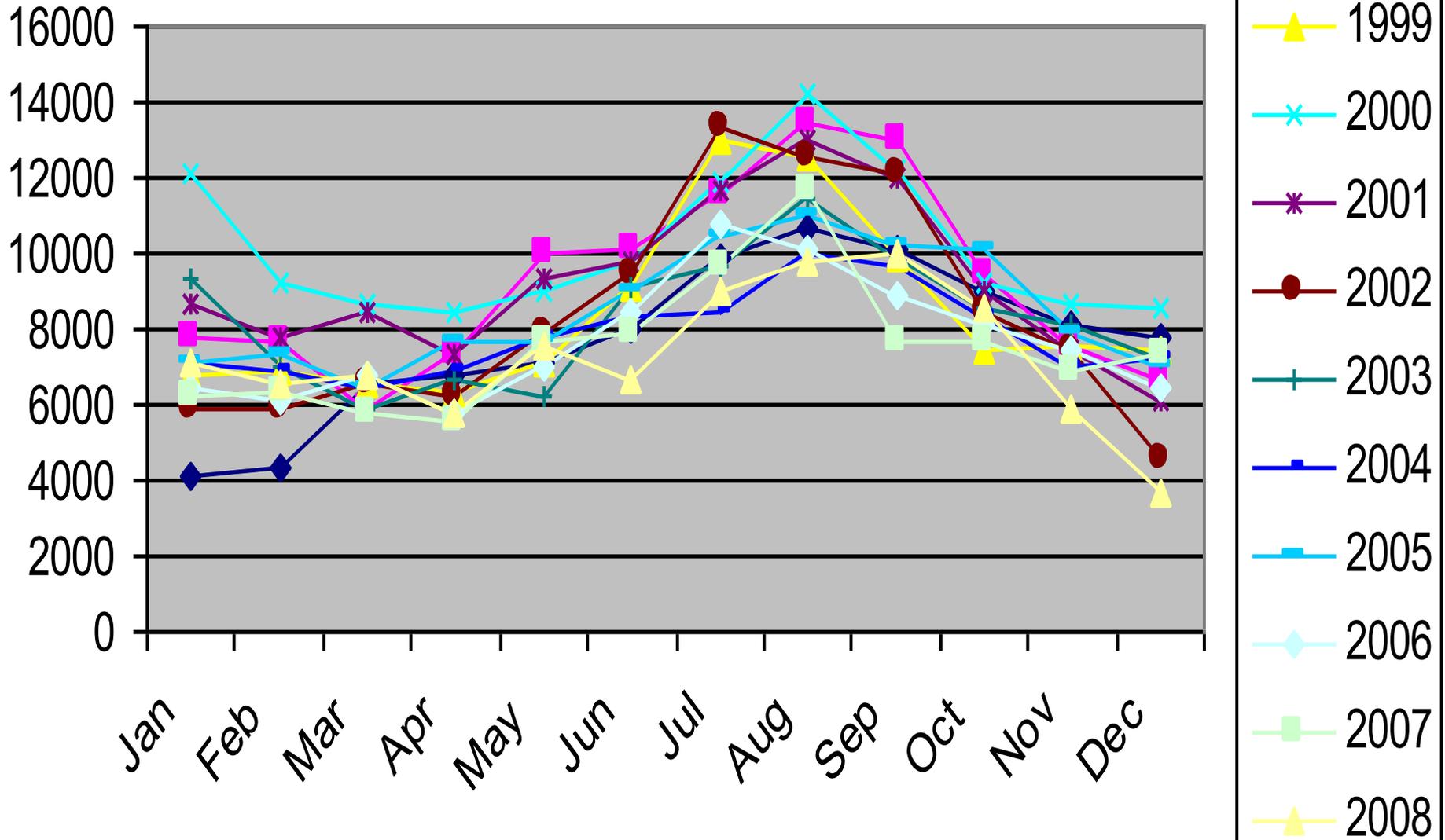
Process Changes Instituted

- Reduced backwash flow rate based on density of water (25% reduction in cold water conditions)
- Reduced length of backwash based on turbidity profile
- Discovered half plant operation improved filtration run times (50% of flocculation motors turned off in cold water conditions)
- Reduced rapid mixers from high speed to low speed setting
- Reduced Air Scour Blower on backwash from 15 min to 5 min (from energy audit “ah ha”)

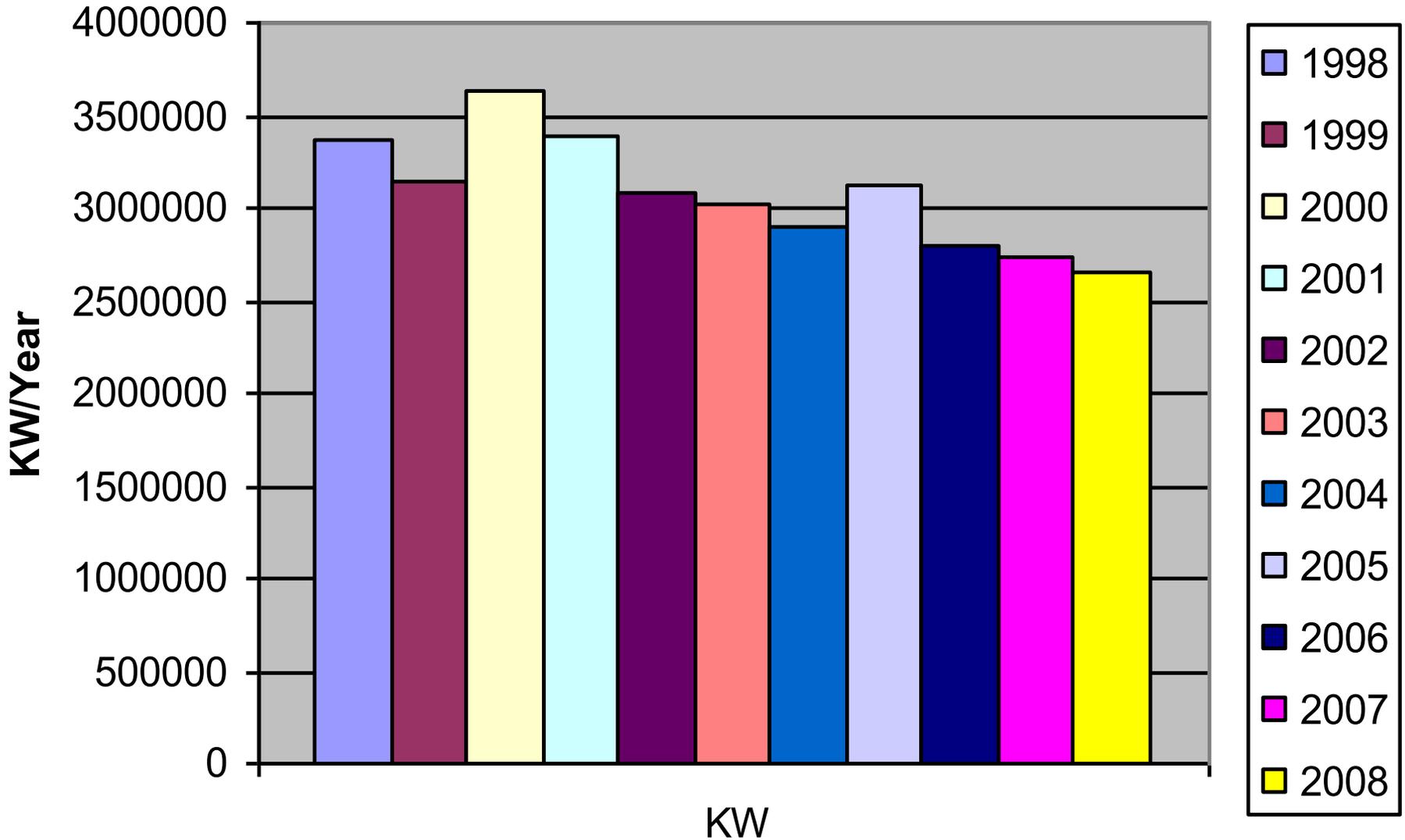
Second Energy Audit

- Identified HVAC improvements and recommended Computerized energy management system
- Hydroelectric potential 50 KW/hr
- Solar Photovoltaic 160 KW/hr
- Initial \$45000 grant to GZA to complete hydroelectric feasibility study
- Working with Stantec to determine solar potential
- All three projects potentially on stimulus bill due to renewable energy savings
- Average KW/hr 2008, 305 KW/hr therefore potentially over 50% of energy usage could be from renewable energy

WWFP KW/day



Worcester WFP KW/Year





STAINLESS STEEL

WESTCOT

Comparable Savings

Average KW/Year first four years 3377700

Average KW/Year last four years 2825700

Cost of KW 1998 0.07/KW \$243518/year

Cost of KW 2008 0.12/KW \$298158/year

Using first four years average KW/year at current price
yearly cost would have been \$405324/year

Savings \$107166 in 2008, alone

New Energy Projects

- Solar project Initiated due to completed pilot DEP energy audit program
- Funded by DEP through the SRF grant program using Federal money designated for renewable energy projects
- HVAC improvements completed this summer
- Hydropower project put on hold due to impact on treatment plant operation
- Working on new ground mount solar location









