



Considering the Human Element in Efficiency

There is increasing awareness that electrical system capacity gained by implementing energy efficiency programs is less expensive than developing new generation capacity. In the commercial and industrial sector, companies are attracted to utility incentives that help them pay for the cost of new equipment, hardware or control systems that lower energy use but still meet operational needs. But it is imperative that businesses follow up with Energy Management Programs that ensure the energy reductions and savings are sustained over time if energy efficiency is to be used as an alternative to generation.

Commercial Case Study

- ▶ 4-story, 400,000 square-foot office building
- ▶ Constructed with energy efficiency measures:
 - 100% outside air economization for “free cooling”
 - Automated, integrated building controls with occupancy sensors and time of use settings
 - Hot water recovery system that recovered waste heat from adjacent factory
- ▶ The building's systems were fully commissioned and the project received utility funding for energy efficiency measures



Problem

Two years after construction, the original design team discovered that the economization and time of use settings had been manually disabled to suit the comfort needs of individual occupants. The problem was not detected because there was no sub-metering and no accountability. Maintenance staff was not properly trained on the controls so they didn't understand the larger impact of overriding controls.

Impact: Approximately \$200,000 in lost energy savings over the first 2 years

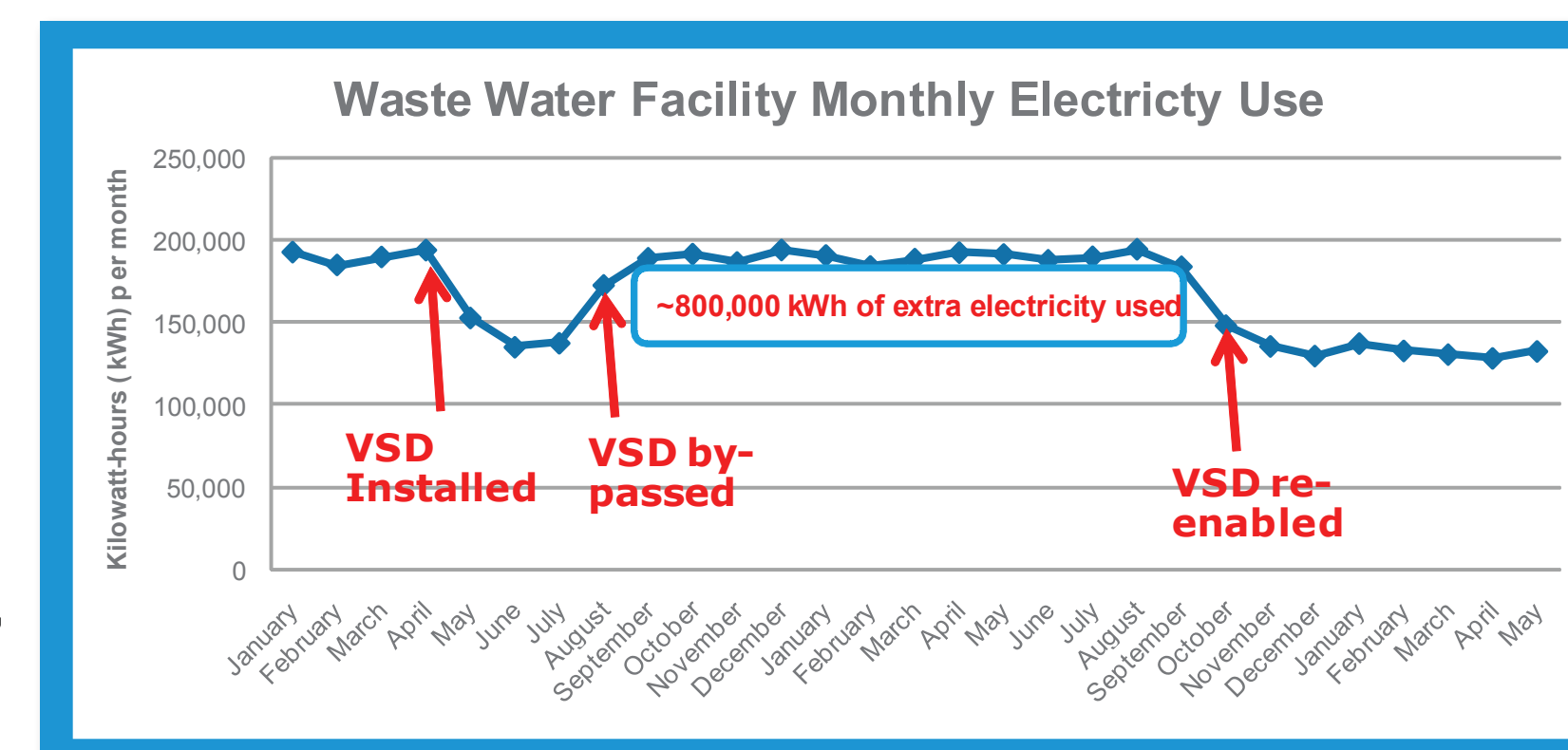
Conclusion

To effectively manage the human element of energy efficiency upgrades, measures should be regularly monitored after installation.

- ▶ Implement an active and effective Energy Management Program with top-down support to:
 - Verify persistence of energy savings
 - Determine that measures are performing as intended
 - Have tools and resources to make corrective actions if necessary
- ▶ Program is cost-effective; ensures real energy savings and facilitates additional savings over time

Industrial Case Study

- ▶ This large food processing facility is equipped with its own wastewater treatment facility, which features a large, multi-stage air blower to oxygenate the water
- ▶ The facility obtained utility incentives to replace the blower inlet damper flow control (choke flow) with a variable speed drive (VSD) motor control



Problem

A few months after VSD was installed, an operator noticed the water's oxygen levels weren't high enough and bypassed the VSD in order to manually reset the blower to full power. Instead of resetting it, the VSD was bypassed for over a year without anyone noticing. When the facility organized an Energy Management Program, an internal audit discovered the bypass, and the VSD was returned to operation.

Impact: Approximately 800,000 kWh in wasted energy over 14 months

CONTINUOUS ENERGY IMPROVEMENT

By combining continuous education and training with innovative solutions, Ecos helps clients to significantly reduce their energy consumption. The end result: proven kWh and therm savings, verifiable greenhouse gas (GHG) reduction, and an attractive return on investment.



Mike Bailey, P.E.

Mike is the Engineering Manager for Ecos commercial and industrial programs, working on energy efficiency solutions for both existing facilities and new construction. Mike is currently working with multiple client facilities to provide technical and business direction to reduce energy costs and improve overall plant productivity using continuous improvement and lean manufacturing strategies. Mike is actively engaged in Ecos projects with distributed generation (combined heat and power, geothermal, solar hot water, wind and photovoltaic).

m Bailey@ecosconsulting.com
503 525-2700 x146