OPERATIONS AND MAINTENANCE

Our mission at SEDAC is to advise clients on energy cost reduction measures and estimate the savings potential of those measures. SEDAC recommendations occasionally include facility operations and maintenance (O&M) measures.


\[O&M \text{ measures cost approximately 20 times less and achieve roughly the same energy savings as retrofit measures.}\]

Focusing on operational efficiency can reap significant rewards, particularly when budgets for new equipment are limited. At times, purchases of newer equipment may prove to be unnecessary—for instance, when existing equipment can be adjusted to operate more efficiently.

**Areas of opportunity:** Major equipment and systems that hold great potential for O&M energy savings include boilers, steam traps, chillers, cooling towers, energy management and building automation systems, air handler systems, fan systems, pumps, motors, air compressors, and lighting.

SEDAC staff has observed a number of opportunities for operational energy savings during site visits. A sampling of O&M anomalies discovered by SEDAC:

- building automation controls in dire need of reprogramming
- reheat systems working overtime
- disconnected ducts
- leaking duct systems
- leaking steam traps
- excessive boiler blowdown
- disconnected actuators
- systems running unnecessarily
- leaking building envelopes

Most operational deficiencies do not require large capital expenditures to correct and can result in impressive energy cost savings. In addition, many corrective measures provide the further benefit of increasing occupant comfort.

**Proactive vs. reactive maintenance strategies:** The best approaches to O&M are preventative and predictive—rather than reactive. *Proactive measures* are taken to avoid problems and modify equipment operations to match needs. Contrast a proactive policy with the *reactive maintenance* strategy: waiting to act until equipment or systems fail. Proactive maintenance is accomplished by preventing failures and degradation, wherever possible, through regularly scheduled maintenance. Proactive maintenance employs predictive technologies to find and correct problems before they escalate to trigger equipment or system failure.

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The FEMP guide details a considerable number of diagnostic methods and technologies that perform as predictive maintenance. Below are a few of their recommendations:

- visual inspection
- infrared thermography
- lubricant and wear particle analysis
- ultrasonic analysis
- vibration analysis
- motor analysis
- metering and submetering
- performance trending

FEMP’s Best Practices guide offers several case studies of problems, analysis, and successful implementation of O&M remedies that resulted in improved building operations. These real-world examples may motivate you to realize similar successes for your own facility.

**Make a wide-ranging commitment:** Along with successful staff training, a truly effective O&M program requires an active commitment from operations, maintenance, engineering, and administration personnel. An integrated team approach is the primary key to success.

SEDAC strongly encourages building owners, engineers, operators, and maintenance personnel to institute a building operations team to address O&M issues. Fine-tuning currently building systems can result in energy savings and improved comfort, sometimes without large capital expenditures or equipment replacement.

**Financial benefits of maintenance:** Deferring maintenance costs more money than correcting problems as they arise and providing regularly-scheduled maintenance. (SEE CHART)

Consider an example: A roof top unit is installed for $10,000. The unit has a 15-year lifespan and will cost $300 a year to maintain, for a total cost of $14,500.

- Assume—that as a cost savings measure—annual maintenance is not performed and as a result, after five years, repairs equaling $3,000 are necessary.
- Annual maintenance continues to not be performed and the unit fails after five more years. Five years of service are lost and purchase of new $10,000 roof top unit is required.

**Net Result**

- Ten-year cost, because of lack of maintenance: $23,000 (10 years of service) versus $14,500 (for 15 years of service life—if the unit had been properly maintained)
- By not properly maintaining the unit, an additional cost of $8,500 was incurred and five years of service life were lost.

For good references about O&M practices, see:

- Sustainable O&M Practices by the Whole Building Design Guide, a program of the National Institute of Building Sciences, can be viewed at: [http://www.wbdg.org/resources/sustainableom.php](http://www.wbdg.org/resources/sustainableom.php)

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**T12 LIGHTING PHASE-OUT**

**DCEO** is offering increased incentives for retrofit T-8s and new T-8 and T-5 fixtures between June 1, 2011 and May 15, 2012.

**ComEd** is offering bonus incentives for T12-to-T8 retrofits between September 1, 2011 and March 31, 2012.

**Ameren Illinois** T12 phase-out bonus decreasing after October 31, 2011

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To participate in the *Smart Energy Design Assistance Program*, contact us at: (800) 214-7954 or info@SEDAC.org

Smart Energy Design Assistance Center, 1 Saint Mary’s Road, Champaign, IL 61820

[www.sedac.org](http://www.sedac.org)