Energy Management Strategy

Prepared by Mr. Kelley Whalen, EEP
ADTRAN Facilities Department-Energy Management Supervisor

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Overview

ADTRAN, Inc.'s corporate headquarters is located in Huntsville, Alabama within the Cummings Research Park. The 80-acre campus includes three class-A buildings encompassing 1.01 million square feet, a parking deck and a 20-acre lake to support over 1,400 employees. ADTRAN has three General Service (GSA) Category-A electrical accounts with their Local Power Company, Huntsville Utilities including two GSA-3 accounts and one GSA -1 account.

Energy efficiency became a concentrated effort at ADTRAN during the first large-scale lighting retrofit in 2005. Prior to this, ADTRAN operated the building HVAC and lighting 24/7 to ensure the workplace was fully operational at any time for its employees.

The Facilities staff identified energy savings and a feasible Return On Investment (ROI) then accomplished the 2005 lighting retrofit project. Its success helped launch the energy management program.

The energy management program is designed to reduce power consumption along with operating and maintenance expenditures by implementation of Energy Conservation Measures (ECMs) such as, but not limited to:

- Light Emitting Diode (LED) lighting retrofits in manufacturing and office areas
- Retro-commissioning of HVAC systems and controls

- Energy Audits by an Energy Engineering Consultant
- Low cost and/or no cost ECMs

ADTRAN's Energy Management Strategy:

1. Reduce operating expenses and promote sustainability**.** The Tennessee Valley Authority (TVA) and Huntsville Utilities (HU) have implemented rate structure changes and increases over recent years. This inspired the Facilities Staff to find additional ways to reduce energy consumption. ADTRAN recognizes that an effective energy management program can reduce expenses and promote sustainability through more efficient operation of its energy-consuming equipment.
2. Continuously improve energy efficiency**.** ADTRAN developed an Energy Conservation Measure (ECM) plan with prioritized projects over multiple years. ADTRAN engaged SAIN Engineering to perform a level 1 hybrid energy audit to identify additional ECMs along with some HVAC retro-commissioning projects.
3. Leverage end-of-useful-life-cycle and technology obsolescence**.** ADTRAN's Facilities Team utilizes a 5-year capital expenditure (CAPEX) plan to communicate, prioritize and implement approved CAPEX projects within corporate budget parameters. ADTRAN has found that a sound energy management program can help justify CAPEX projects, including those with equipment end-of-useful-life-cycle and technology obsolescence issues. Feasible energy projects will provide both qualitative benefits (e.g., new air conditioning units and lighting retrofits will make workspace more comfortable for employees) along with quantitative operating cost, heat load and maintenance reduction benefits.

Key components of the Energy Management Strategy:

The overall goal is to reduce energy consumption when operationally, financially and sustainably feasible. To accomplish this objective ADTRAN Facilities utilizes the following processes:

A. Benchmark Energy Performance**.** An energy performance baseline was established to quantify the energy use intensity (EUI) for the campus. EUI is defined as energy consumption (KBTU's) per square feet of building floor space. EUI is used to: (1) measure and monitor campus energy performance over time, (2) compare building performance to other similar buildings, and (3) prioritize energy related CAPEX projects.

   ADTRAN implemented a metering program and benchmarked energy performance using EUI. The data collected from the metering program provided a more comprehensive understanding of the energy performance of our campus.

B. Planning and Prioritization. Energy conservation projects are researched, quantified and prioritized based on several factors including:

   i. *End of Useful Life cycle*- Capital improvement projects that require replacement lighting, heating/ventilation/air conditioning, control systems, and other building related projects typically have opportunity

to reduce building energy consumption and improve workspace comfort and functionality.

ii. *High Priority*- Includes “low hanging fruit” projects with a 1 year or less simple payback/return on investment.

iii. *Medium Priority*- Projects with a simple payback period of 1-3 years and are typically justifiable if funds are available.

iv. *Low Priority*- These projects typically have 3-10 years simple paybacks. Rebates and incentives often help justify investment.

v. *High visibility*- Includes projects that may not have a favorable payback period but significantly increase energy awareness such as lighting dimmers and solar photovoltaic panels.

C. Energy Awareness**.** The purpose is to implant an energy conservation emphasis in the employees through education and participation. This can be done by communicating plans and accomplishments via company Green Team events, newsletters, dashboards and professional associations.

D. Standards

1. *Lighting:* To reduce energy and improve illumination:
   - ADTRAN will consider energy reduction lighting projects when the ROI is feasible, the technology is proven, and aesthetics are improved and /or end of life cycle.
   - ADTRAN also uses motion and occupancy sensors and other smart lighting controls when technology and return on investments are favorable.

2. *Interior workspace temperature:* Normal office occupied hours are 7:00 am to 5:00 pm M-F. In general HVAC thermostats are operational but will have the following set point limits:

   - Cooling low limit 73 degrees F
   - Cooling high limit 80 degrees F
   - Heating high limit 73 degrees F
   - Heating low limit 60 degrees F
   - After-hours unoccupied set points are cooling 82 & heating 60 degrees F
   - Conference rooms and VIP areas may have lower cooling limits for special requirements.

3. *Space heaters:* ADTRAN has allowed employees to have workstation space heaters. In recent years this has been curtailed due to power issues, energy management and HVAC conflicts. Space heaters are now only issued for specific medical reasons or system gaps as approved by management.

Energy Management Program Resources

A comprehensive energy management program requires resources including competent personnel to run the program, specialized energy consultants to provide support, and engineering firms to provide design and construction services for energy conservation projects.

ADTRAN's energy program resources are:

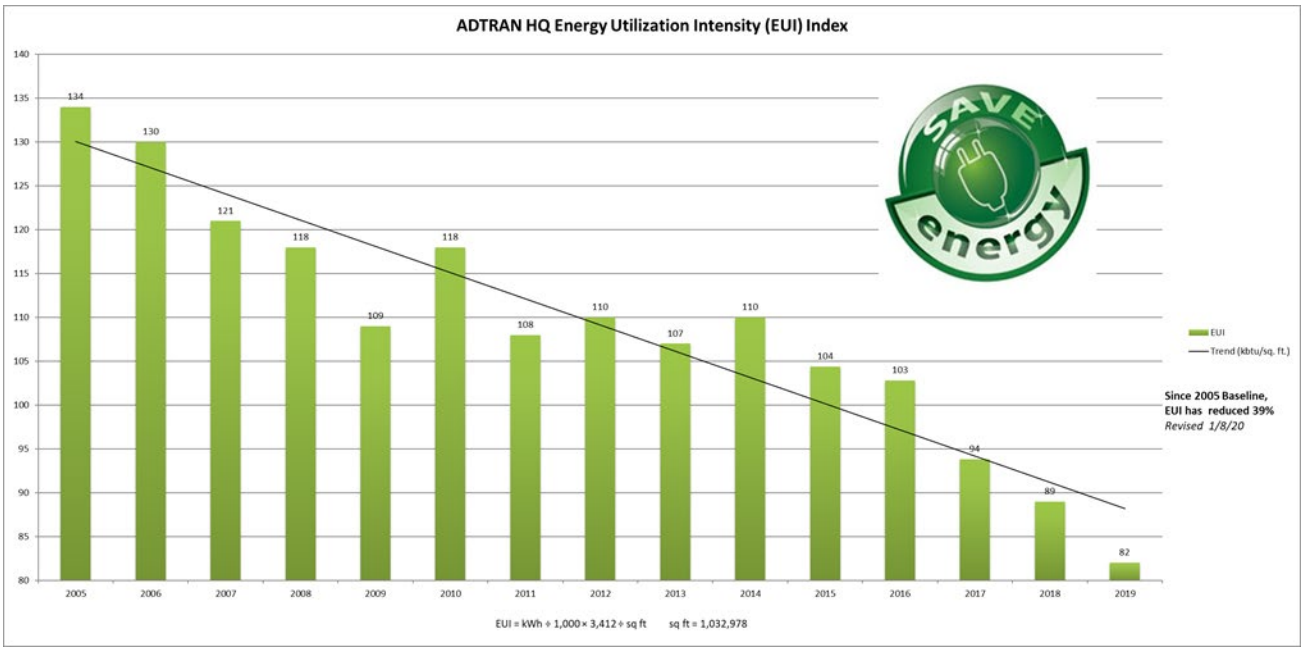
- Energy Manager - The Facilities Department manages the corporate energy program via one full time employee who also handles Building Automation Systems (BAS), Energy Metering and HVAC systems.
- Energy Consulting Firms - As needed and approved, ADTRAN utilizes energy consulting engineers for special projects like retro – commissioning and large-scale audits
- Professional Associations – Staff participate in professional associations including AEE, AVI, IFMA and ASHRAE for training and certifications.

Goals and Accomplishments

In 2005, ADTRAN had a EUI of 134, and set an initial goal of reaching 82, with this strategy implementation ADTRAN has achieved this goal and reduced the EUI 39% to an 82.2, as of December 31, 2019. Some of this was accomplished during significant corporate infrastructure growth including R&D lab load increases, estimated at 2-3% annually during the growth period. ADTRAN plans to continue its energy management program via sustainability awareness, planning and funded conservation measures to reach a new revised goal of a 65 EUI in the next decade.

Conclusion

ADTRAN is committed to developing and executing a cost effective and sustainable energy management strategy that will reduce energy consumption, minimize operating cost, extend equipment life, and provide a comfortable workplace. ADTRAN will continue to achieve energy reductions through its commitment to energy awareness, fiscal responsibility, and environmental stewardship.


ADTRAN HQ Energy Utilization Intensity (EUI) Index
140
135
130
125
120
115
110
105
100
95
90
85
80
134
130
121
118
109
118
108
110
107
110
104
103
94
89
82
2005
2006
2007
2008
2009
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
SAVE
energy
EUI
Trend (kbtu/sq. ft.)
Since 2005 Baseline,
EUI has reduced 39%
Revised 1/8/20
EUI = kWh ÷ 1,000 × 3,412 ÷ sq ft
sq ft = 1,032,978