Building EQ

Be an Energy Genius

UCF Campus Buildings Case Study

✳ The Challenge

Founded in 1963, the University of Central Florida (UCF) has grown into one of the nation's largest public universities. Having such a large footprint of buildings, the university seized the opportunity to perform Level 1 energy audits as part of their sustainability initiative and to reduce energy consumption and cost. It was also important to the owner that students be involved in the process.

✳ The Strategy

In 2018, UCF engineering students and Hanson Professional Services, Inc. conducted an ASHRAE Standard 211-2018 Level 1 Energy Audit on nine buildings located on the UCF Campus. The buildings chosen included a wide range of functions. The goal was to capture a snapshot of each building's performance. In addition to the energy audit, Hanson created a standard operating procedure (SOP) specific to UCF for students to perform future energy audits, utilizing the BEQ Portal platform, which will provide hands-on experience and insight to the auditing process.

✳ The Outcomes

The Level 1 Audit identified 204 Energy Efficiency Measures (EEMs) across all nine buildings. Of the 204 EEMs, 88 (43% of the total number) had an expected payback of one year and 82 had no capital cost (i.e., maintenance items). The implemented EEMs for Building 1, the building with the best BEQ score, are shown in the table below. As a result of this work, the UCF/Hanson Professional Services team was awarded the 2022-2023 ASHRAE Energy Genius Award. The award recognizes excellence in the assessment of building energy performance.

✳ For More Information:

- *ASHRAE's 2023 Energy Genius Award Winner*, ASHRAE Journal Article, February 2024 Issue (Volume 66, No. 2)

Check out the Building EQ Portal at **ashrae.org/BuildingEQ.**

Building EQ Scores and EEMs by Building and Payback							
Bldg #	**Building Type**	**BEQ Score**	**<1 year**	**1-4 years**	**5-10 years**	**>10 years**	**# EEMs**
1	Main Administration Building	82	14	10	11	0	35
20	Biological Sciences Building	87	5	2	5	1	13
51	Visual Arts Building	90	2	0	2	4	8
53	Laser Research Building	105	17	7	6	1	31
5	Chemistry Building	112	13	10	11	1	35
121	Physical Sciences Building	119	16	8	4	0	28
90	Classroom Building	120	8	4	3	1	16
54	Computer Center	288	6	8	8	0	22
117	Wild Animal Facility	251	7	7	1	1	16
Total # EEMs per payback period			**88**	**56**	**51**	**9**	**204**

Energy Efficiency Measures (EEMs) – Building 1 (Score: 82)
Perform a building envelope inspection at least once every three years.
Replace or clean filters in accordance with the manufacturer's recommended schedule or design pressure drop.
Maintain the steam water heating, hot-water heating, and chilled water-cooling control valves against leakage.
Check that dampers move freely through their entire operating range. Clean, lubricate, adjust, and repair as necessary.
Eliminate outside air ventilation during unoccupied building morning warm up.
Control VAV system VFD speed based on the static pressure needs in the system.
Reset the static pressure set point dynamically, as low as is practical to meet the zone set- points.
Reset supply air temperatures in response to load.
Rebalance ducting and piping systems.
Identify and correct rogue zones (dictate cooling or heating demand on entire system) in multi-zone systems
Use night setback or turn off HVAC equipment when building is unoccupied.
Reduce overpumping on chilled-water systems.
Balance water flow in the chilled-water system.
Reduce demand charges through load shedding, operational changes, and procedural changes.