



Maximizing Savings

Industrial Energy Audits

Company Profile



Services



Code Compliance

Engineered guidance ensuring building owners a path to success while lowering capital expense. Optimizing projects while eliminating unknowns. Our experts are here to ensure every project checks all the boxes while meeting our clients' needs.



Facility Operations

Maintenance plans, shutdown procedures, future expansion planning, and more tailored to any building type. Reports written in formats that can easily be referenced for all qualified staff members to follow.



ASHRAE Energy Audits

Commercial and industrial energy audits that provide simple plans for building owners and operators to lower their utility expenses without sacrificing functionality. Procured from years of experience as engineers, project managers, and facility operators.

Additional Services

- Energy Engineering
- Building System Diagnostics
- Benchmarking
- Maintenance Plans
- Life Cycle Cost Analysis
- Production Efficiency Metrics

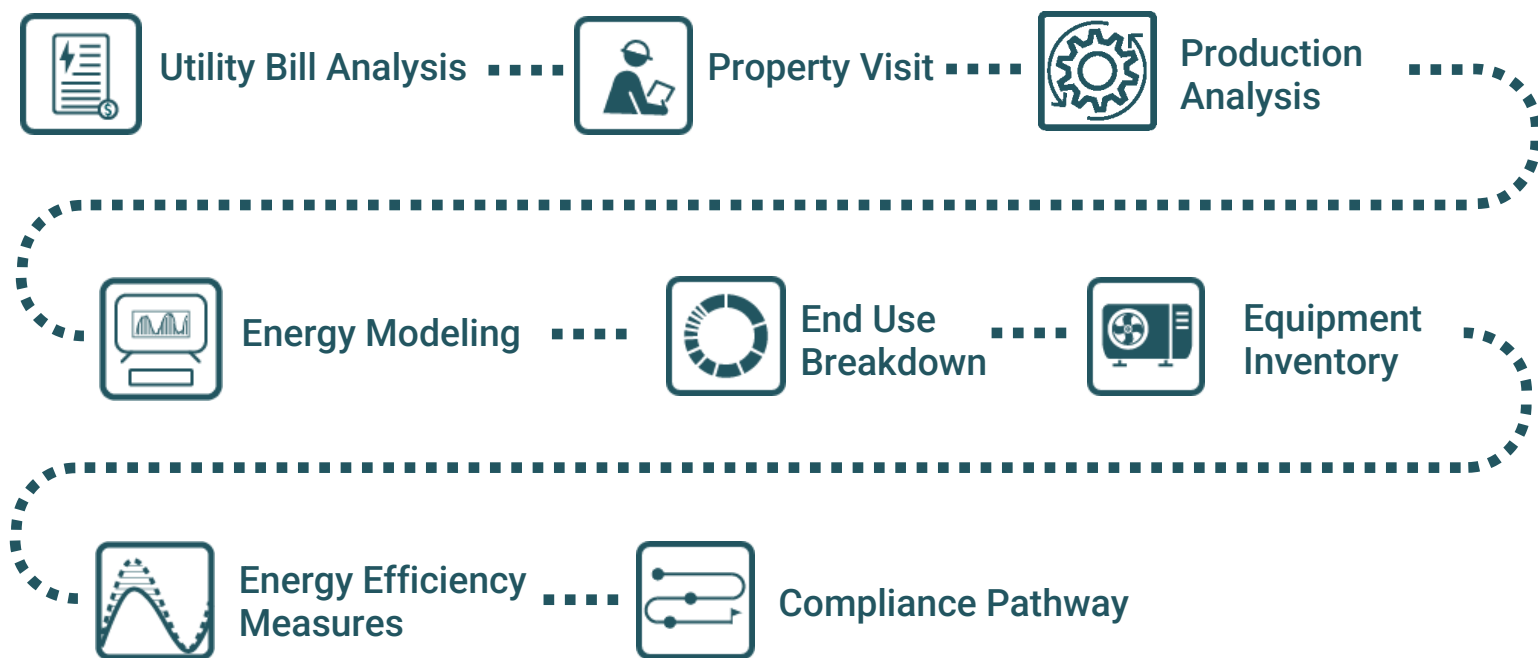
Cascade's Employees Have Helped
Clients Save Millions in Operating Costs



Commercial Energy Audit Path



ASHRAE Level 2 Audit



Utility Bill Analysis



The utility bill analysis allows the engineer to review the current energy use and find patterns that may lead key discoveries during the audit. Changes in seasonal fees are essential to understanding how building upgrades will effect operational expenses. Once the analysis is complete, the following information can be provided in the final report:

- A rate structure map and timeline of how prices fluctuate
- Opportunities for peak load adjustments
- Potential savings with lower energy rates from competitors

Property Visit



The property visit is the most essential component of an ASHRAE level 2 audit. It allows the auditor to compare on site conditions to construction drawings, assess the condition of equipment, and take essential measurements in order to understand the current operation of the building. Below is just a brief overview of what is included in the property visit:

- Review of operation and maintenance procedures
- Assessment of tenant thermal comfort
- Inspection of mechanical and electrical equipment condition
- Efficiency loss measurements of mechanical systems
- Review of building automation systems
- Building envelope inspection
- Lighting quantification and inspection
- Location of potential renewable energy locations



Production Analysis



Many building operators wonder, "what is the true cost of production?" This is a much more complicated question than many assume. Some products take more energy to produce than others. Also, how much heat is being introduced to the building from the different types of machines on site?

Cascade works with facilities staff to come up with a plan to solve this puzzle. With a combination of energy monitoring and precise heat flux measurements we can answer the question of cost per widget produced. This process can take weeks or even months but the knowledge can be worth millions. Owners can use this information to direct investments to producing widgets that truly have the best margin.

Simple Production Cost

Material	-	\$
Labor	-	\$
Maintenance	-	\$

 / WIDGET



Actual Production Cost

Material	-	\$
Labor	-	\$
Maintenance	-	\$
Power	-	\$
Process Cooling	-	\$
Space Cooling	-	\$

 / WIDGET



Energy Modeling



Energy modeling is Cascade Building Solution's method of choice when analyzing the performance of a building. Precisely calibrating the model creates a 'digital twin' that behaves the exact same way as the building in real life. This information helps reveal inefficiencies that cannot be seen in person. The model also allows precise, daily calculations to reveal all positive and negative energy trends from potential capital upgrades.

Cascade utilizes the latest version of IES's Virtual Environment software. This top-of-the-line technology is used by the leading engineering firms in America for Architectural and Mechanical design. Equipment upgrade scenarios are simulated down to the 6 minute interval for an entire year to achieve ultimate precision.

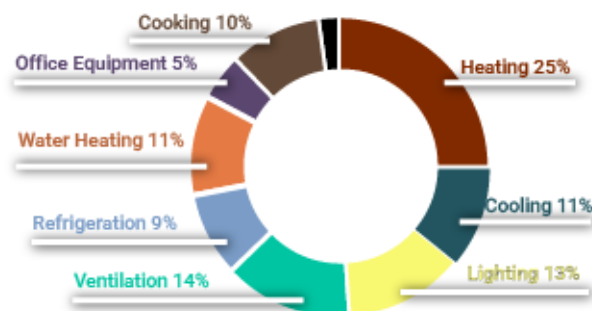
Virtual Environment takes into account weather, cloud cover, local shade, human heat load, air flow from open windows, part load inefficiencies, ground temperature, and so much more. The automation and sophistication of this technology ensures the most accurate results when estimating energy savings.



End Use Breakdown



What exactly is consuming all the energy in your building? Your energy provider typically delivers one electricity bill a month which makes troubleshooting energy increases very difficult. Are the HVAC units working harder due to the weather or are they in need of maintenance? Did tenants replace the new LEDs with outdated incandescents? The end use breakdown in the ASHRAE level 2 audit report is carefully calculated and validated with measurements. It provides important information to the building owner that can contain surprising insights. Is over half of your building's energy consumption due to only space heating? It may be time to upgrade.

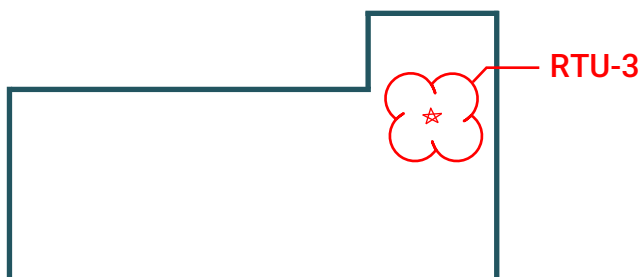


Equipment Inventory



The equipment inventory serves as an asset list for building owners. It contains a list of all equipment at a property with a map of all of their locations. The inventory contains all the important information below:

- Equipment locations, photos, and maps
- Current condition and performance of equipment
- Suggested maintenance upgrades
- Capacity of equipment and areas of service
- Estimated end of life



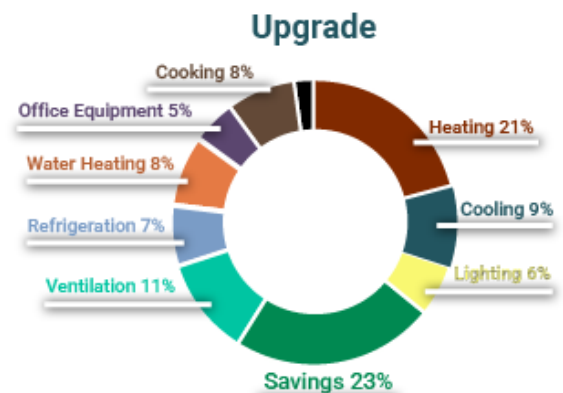
Make/Model:	Reznor GP5RD
Current Condition:	Fair
Current Efficiency:	76.8%
Capacity:	36,000 BTU
Area of Service:	Northern Corridor
Suggested Maintenance Upgrades:	
Annual combustion analysis with flue cleanings. Spray down of tube heat exchangers and replacement cog belt will restore unit to 83% AFUE.	

* Unit has an estimated life of 8 years remaining

Energy Efficiency Measures



The energy efficiency measures are the ultimate goal of the ASHRAE level 2 audit. These are the solutions that will eventually help the building owner reach their efficiency targets. With a combination of precise calculations from the energy model and the most up to date consumer data from RSMeans, building owners can rest easy knowing the measures proposed are realistic and accurate. Cascade Building Solutions has no ties to manufacturers and will only provide vendor neutral suggestions. The goal is to always provide solutions that result in the least capital expense possible and align with our client's budgetary constraints.



Compliance Pathway



A compliance pathway is the ultimate guide to adhering to a building's local performance ordinance. The Energize Denver and Colorado Regulation 28 ordinances have many different options to comply with their new standards. Making the wrong decision can unnecessarily cost an owner thousands. Cascade will analyze all pathways to find the one that best meets your needs. The solutions proposed in an ASHRAE level 2 audit will include suggested project timelines that will align to any ordinance deadlines. Our relationship does not end with report delivery. We are here to assist with communication with contractors to ensure your building upgrades stay on target. Compliance pathways contain all of the following essential information:



- Building maintenance, operations, and capital upgrades needed to meet the EUI reduction goals
- Project management timelines suggested to reach goals by ordinance deadlines
- Pathway comparisons with pros and cons of each option
- Estimated expense and annual savings resulting from building upgrades