

NEELGIRI INVESTMENTS

How the UCEP Custom Energy
Technology Solution Reduced Energy
Costs by 40% in Just One Month

A Comprehensive Case Study



UNITED COMMERCIAL
ENERGY PARTNERS

Table of Contents

The Overview	3
<i>About UCEP</i>	3
<i>Situation</i>	3
<i>Activities</i>	3
<i>Results</i>	4
The Challenge	5
The Insights	6
The Solution	8
The Results	9



NEELGIRI INVESTMENTS, INC

IMPLEMENTATION TIME:

4 days

CLIENT NAME:

Neelgiri Investments, Inc.

SECTOR:

Commercial

LOCATION:

9221 LBJ Freeway, Ste 204,
Dallas, TX 75243

NUMBER OF BUILDINGS:

1; Number of Stories - 2

TOTAL AREA:

34,916 SF

RETURN ON INVESTMENT:

5 years

GUARANTEED SAVINGS:

33%

The Overview

About UCEP

United Commercial Energy Partners (UCEP) is an industry leading energy management and optimization firm. Our team is led by some of the most reputable and sought-after executives, engineers, advisors, and analysts in the country. UCEP's proprietary technology makes us industry leaders in building decarbonization, reducing energy consumption, facility optimization, wholesale contract procurement, and energy efficiency measures. Our primary mission is to assist businesses with becoming better stewards of their existing energy resources. By utilizing our sole-sourced and patented technology, we create virtual endowments for our clients through energy dollars saved. Unlike others, our savings are guaranteed and average 34% across 1,000+ projects.

Situation

Neelgiri Investments, Inc. is an engineering and consulting firm located in Dallas, TX. The company faced **two main issues** in relation to their HVAC equipment: an ongoing struggle to keep their **occupants comfortable** and a lack of **centralized control** for their HVAC systems. In order to keep their tenants content and comfortable, a solution was needed to not only cool the space appropriately but also address the latent heat load (humidity). Neelgiri's needs are not uncommon in office spaces, but UCEP's solution resolves not only these problems but provides immediate energy savings and additional perks.

Activities

- ❖ Technical Changes/Programming Applied to 50 Pieces of Equipment:
 - ▬ Wireless mesh-network communicating thermostats
 - ▬ Variable Air Volume (VAV) controllers
 - ▬ Fan Power Boxes (FPB) controllers
 - ▬ Economizers
 - ▬ New and existing Roof Top Unit (RTU) controllers
- ❖ Integrated VAV and FPB operations
- ❖ Layered patented optimization software onto existing equipment



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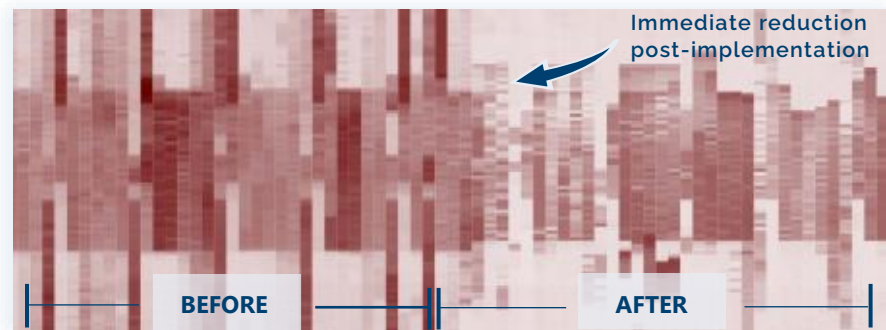
5 years

GUARANTEED SAVINGS:

33%

Results

- ⚡ First month post project achieved over 40% energy savings
- ⚡ Guaranteed 33% annual reduction in overall energy consumption
- ⚡ Resolved Indoor Air Quality (IAQ) and occupancy comfort issues
- ⚡ Reduced Latent Heat Load w/ Proactive Relative Humidity Management
- ⚡ Transparent and automated control of HVAC systems and scheduling
- ⚡ Drastically reduced carbon footprint
- ⚡ Extended equipment lifespan +3-5 years
- ⚡ 5 year return on investment (ROI)
- ⚡ Improved facilities operations
- ⚡ Access to proactive energy consultant




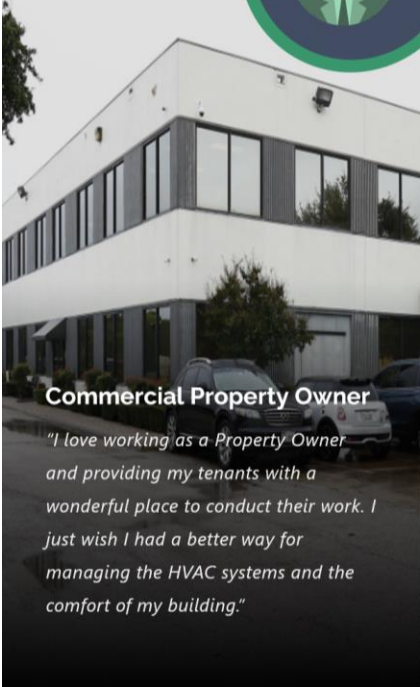
The Challenge

Neelgiri Investments, Inc. communicates an ongoing struggle to keep occupants comfortable and has difficulty managing HVAC controls.

UCEP's process for all projects begins with a preliminary analysis to qualify their clients and ensure that they can guarantee savings and recommend their services. From the findings gathered during UCEP's analysis to the personal testimonies derived from meetings with the individuals at Neelgiri Investments, UCEP created a persona to better understand and identify with the **obstacles, experiences, needs, behaviors, and goals** of the client. Some of the key traits and pain points include:

- The process for managing space temperature is burdensome
- They aspire to ensure occupants are happy and content with their workspace
- The building tenants are continuously experiencing comfort issues

Persona Archetype

Commercial Property Owner

"I love working as a Property Owner and providing my tenants with a wonderful place to conduct their work. I just wish I had a better way for managing the HVAC systems and the comfort of my building."

BACKGROUND

For the past couple of years, the owner of Neelgiri Investments, Inc. has been managing complaints from his tenants about issues surrounding the comfort of his building. The owner wants to be able to find a way to easily control the building thermostats and improve the comfort of his occupants so they can remain happy and productive in their workspace, as well as draw in new tenants.

(for privacy reasons the owner's name remains anonymous)

THINK & FEEL aspirations – needs - wants

The owner's favorite part of his role as a property owner is hearing from his tenants that they are happy and content with the space that they are in. He aspires to maintain all HVAC systems through a single pane of glass so he can better provide his tenants with an improved workspace where people feel motivated, productive and can further grow their business. He needs to be a key contributor to the success of his company and is constantly on the lookout for new ways to ensure his current and future tenants are comfortable and satisfied with their workplace.

PAIN POINTS fears – frustrations - obstacles

Neelgiri Investments' building was developed in the early 1980's and has had several HVAC equipment replacements since the owner purchased the property. However, the owner has continued to face many challenges pertaining to the thermal comfort of his occupants. He often gets frustrated with having a decentralized HVAC control system because it is difficult to manage the units if he is not on site. He receives constant 'hot' and 'cold' calls that are seemingly impossible to manage if he isn't at the physical location and fears that this could lead to unsatisfied customers if not handled properly.

RESPONSIBILITIES goals - motivations

Tenant retention	Keeping up with employee requests	Lease negotiations
Asset management	Managing tenant issues	Improve building operations
Development and execution of preventative maintenance plan	Handling financials	

SAY & DO comments - behaviors

"We had the old dialog controllers for our building. It is harder to separate out turning the building on and off and schedule."

"The scheduling was a nightmare because I had to physically go through the small, ancient programmer in order to program things."

"I wonder what other measures I could take to automate my HVAC equipment and improve the comfort of my building."

"Hearing that my tenants are comfortable and able to maximize productivity in the workplace is what is most important to me."

Talks with current building occupants to see how they feel about their current agreement and experiences.

Searches for new ways to add value to the property through strategic improvements and renovations.

After developing a persona to better empathize and understand the pain points associated with the owner and building occupants at Neelgiri Investments, UCEP was confident that they could provide a solution that will successfully satisfy the users' needs. However, they first needed to perform an in-depth analysis of the facility to verify or uncover the obstacles presented.

The Insights

Neelgiri Investments, Inc. lacked centralized controls for thermostats and faced many challenges leading to occupant discomfort.

To provide concrete savings numbers to the client, UCEP needed to first conduct a comprehensive, in-depth energy audit to **gather data** and **discover gaps in the current facility operations** that are leading to the issues presented above. UCEP has a team of highly skilled and experienced facilities engineers and technicians with thousands of completed energy audits under their belt. Their team has the experience and expertise to collect data to provide an **exhaustive analysis** and generate **custom solutions** for any facility.

This evaluation consisted of an analysis on overall energy use, identifying physical air intrusions in the building envelope, HVAC system capabilities, mechanical equipment integrity, systems used, energy management system settings, interior and exterior square footage, occupancy schedules, and mechanical plans for validation and updates (if necessary). **The post-audit insights and analysis for Neelgiri Investments, Inc. include:**



Lack of Centralized Control System Leads to Occupant Discomfort

When conducting the audit for Neelgiri Investments, UCEP discovered that the building consisted of a decentralized air conditioning system. Decentralized systems are beneficial if the building is anticipating varied conditions as tenants have the ability to adjust the temperature of their space depending on their preferences. The space cooling was managed by a variable air volume (VAV) terminal box and was controlled by individual space thermostats. Space heating was managed by a building perimeter electric heat fan powered air terminal box (FPB) and, in addition to the VAV thermostat, was also controlled by individual space thermostats. The audit findings revealed that the HVAC zoning was not in alignment with the decentralized systems, resulting in tenants claiming that their thermostats “don’t work” as their space was not reaching the desired temperature set for the space. Implementing a centralized control system will offer one base location for distributing air across the facility, improve overall energy efficiency, and requires less maintenance over time.

Irregular Facilities Management Results in Excess Energy Use

One of the most critical preliminary metrics calculated at the initial stage of UCEP's in-depth energy analysis is the Energy Usage Index (EUI) calculation which helps to briefly summarize the current operational efficiency of the building. The EUI acts as the "miles per gallon" of the facility as it measures the building's annual energy consumption relative to the gross square footage. Neelgiri Investments' EUI was 58.95 which signals that the facility is not efficiently maximizing HVAC system capabilities due to a variety of challenges (improper zoning, loose building envelope, construction defects, etc.). Utilizing UCEP's expertise to improve the HVAC management process at Neelgiri Investments would reduce overall energy costs, stabilize room temperatures, improve indoor air quality, and extend equipment lifespan.

Proper HVAC Zoning is Critical for Effective Temperature Regulation

The vast majority of the projects UCEP completes have improper HVAC zoning due to a variety of different reasons (prior facility remodeling, non-updated HVAC zoning maps, equipment replacements, etc.). After receiving several testimonies from the tenants at Neelgiri Investments regarding thermal temperature issues, the next step in UCEP's process was to record all HVAC equipment information and map out the current zoning layout to verify the root cause of these complaints. The audit findings concluded that Neelgiri Investments' current HVAC zones did not mirror the original zoning maps due to the remodeling of office space. This explains the reasoning behind tenants claiming their thermostats simply "don't work" as their controls were manipulating the temperature in neighboring spaces. Developing an updated zoning map would assist in the redesign of HVAC zones and improve overall occupancy comfort.

Increased Latent Load Creates Uncomfortable Work Environments

When initializing communication with the owner of Neelgiri Investments, one of the primary issues presented was the poor occupant comfort throughout the building. The facility was being conditioned by two roof top units (RTU's), each distributing air to either the first or second floor respectively. The RTU's are variable air volume air flow with multiple stage, multiple compressor conventional refrigerant based cooling. The building was designed in such a way that only the exterior spaces had heating but needed proper circulation to ensure that all areas were properly heated. In addition, the audit revealed that RTU 1 for the first floor had a broken compressor, which led to an increase in the latent load due to heat not being properly expelled from the interior space. More issues were found within the economizers in both RTU's as they were drawing in outside air that was not being properly dehumidified. In most cases, multiple stage systems are more effective at preventing an increase in humidity levels due to longer, lower speed cooling cycles. However, a variety of Neelgiri Investment's HVAC components required revisions to allow the system to maximize performance and better manage humidity.

After conducting the in-depth energy audit on Neelgiri Investment's facility and performing a detailed analysis of all of the discoveries and notable insights, UCEP was confident that they could be the solution to all the issues presented and more.

The Solution

Neelgiri Investments, Inc. partnered with UCEP in April of 2022 with the goal to reduce overall annual energy costs by 33% guaranteed.

Many businesses that are experiencing issues relating to poor HVAC performance, high humidity in the building, occupant discomfort, or frequent, high-cost maintenance look towards performance contractors as a potential solution. Performance contracting is a mechanism for replacing current facilities HVAC equipment with more “energy efficient” improvements. The average cost of performance contracts for commercial facilities ranges between \$8.00 - \$10.00/square foot. With such a large project cost and a Return on Investment (ROI) that varies between 15-20 years on average, Neelgiri Investments was not comfortable pursuing a performance contracting solution. After hearing about how UCEP’s low cost solution can resolve all of these problems while also providing immediate energy savings and additional perks, the decision was clear that UCEP is the right company to pursue.

UCEP’s **primary mission** is to assist businesses with becoming **better stewards** of their existing energy resources. By utilizing their **sole-sourced** and **patented technology**, UCEP created a **virtual endowment** for Neelgiri Investments through energy dollars saved. Unlike others, UCEP’s achieved savings are guaranteed and average **34% across 1,000+ projects**. As a result of having a team led by some of the most reputable and sought-after executives, engineers, advisors, and analysts in the country, UCEP had a **clear vision** for what needs to be done to resolve the issues found within the audit analysis and those presented by the client.

Being **agnostic to manufacturers** and **products** empowers UCEP to **partner with existing equipment / systems** providers to drastically improve operating efficiency and client satisfaction. In lieu of unwarranted or unjustified investments in new assets, UCEP made technical changes and enhanced the operating energy-consumed assets and systems.

UCEP’S UNIQUE STRATEGY PROVIDES:

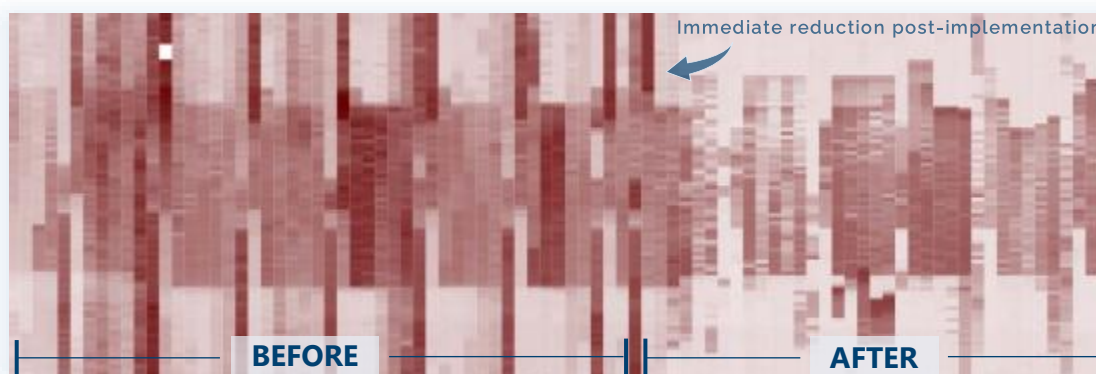
- | **Guaranteed savings** → **Zero** financial risk
- | Highly **accelerated payback** period
- | **Long-term** stream of surplus operating **funds**
- | Improved **occupancy comfort**
- | Improved **Indoor Air Quality (IAQ)**
- | Improved **facilities operations**
- | Low **carbon footprint**
- | **Average** annual utility cost reduction of **34%**
- | **4-6 year** ROI

The team began by going through Neelgiri Investments' entire facility to make any necessary technical changes, reprogram, and optimize all 50 pieces of equipment (wireless mesh-network communicating thermostats, VAV controllers, economizers, new and existing RTU controllers, etc.) so they can operate how they are intended, based on the specific space they are in. The VAV and FPB operations were integrated to eliminate simultaneous heating and cooling. Lastly, UCEP's patented optimization software was layered onto the existing equipment and building automation controls to maintain and maximize energy and operations efficiency.

The Results

Neelgiri Investments, Inc. achieved 40% energy savings in the first month and is projected to save an average of 33% in Year One.

The building owner and tenants at Neelgiri Investments were, and continue to be, delighted with the project results. After just one month post-project implementation, Neelgiri Investments **surpassed** the **guaranteed savings amount** (33%) and later achieved an outstanding **33% reduction** in annual utility costs for year one.



The image above is an Energy Intensity Chart (EIC) that displays Neelgiri Investments' overall energy consumption throughout the 2 months prior to pursuing the project with UCEP (BEFORE), as well as the consumption for 1 month immediately after the project was completed (AFTER). Each red block represents a 15-minute interval of energy usage. The darker shades denote more intense energy usage. As shown, Neelgiri Investments saw a reduction in total energy use immediately after the project was implemented and will continue to realize these savings in perpetuity.

Improved Indoor Air Quality (IAQ) and Occupancy Comfort

After UCEP utilized their custom energy technology solution to reprogram and optimize the facility's existing equipment, Neelgiri Investments, Inc. is not only seeing a dramatic reduction in their overall monthly energy

consumption, but the owner also noted that the simple and automated technology system has helped to **ensure proper temperature management** and the **elimination of issues** surrounding **comfort** and **Indoor Air Quality (IAQ)**.

“

Usually, we get tenant calls when things are not turning on or they are not programmed correctly. The scheduling was a nightmare because I had to physically go through the small, ancient programmer in order to program things. It was a grueling process to get all of that going and UCEP helped us with that... It definitely made it easier! ”

The owner of Neelgiri Investments, Inc. would receive occupant comfort complaints as a result of the difficulties surrounding the management and programming of the HVAC systems. Several months after the project was completed one of the buildings RTU compressors failed. This piece of equipment is a critical for an effective refrigeration cycle. UCEP’s custom energy technology solutions easily solved this issue by optimizing the equipment. Neelgiri Investment’s building is now consistently **eliminating humidity**, effectively and efficiently **cooling air temperatures**, and the owner is now able to **easily manage and schedule** all HVAC systems to **eliminate occupant comfort issues**.

Transparent and Custom Technology Solution for HVAC Systems and Scheduling

Prior to initiating the project, one of the primary deliverables desired by the owner of Neelgiri Investments, Inc. was to be able to maintain all HVAC systems through a single pane of glass so that he can better provide the tenants with an improved workspace that promotes uninterrupted productivity. Several months after the project was completed, the owner was ecstatic at the fact that he is now able to **easily manage all of the facilities thermostats** and **abolish all thermal comfort complaints** from the tenants.

“

Being able to see everything and having the option to have different scheduling times being entered makes a big difference. ”

The building owner was extremely pleased with UCEP’s custom and centralized energy technology solution because they truly addressed his needs. Now he can **effortlessly manage and schedule** space temperatures with a **30 second process** and **three simple clicks** once a week.

5 Year Return on Investment (ROI)

In addition to a guaranteed 33% reduction in overall energy consumption, the cost of UCEP's project was drastically lower when compared to any other company within the industry. As a result, the owner of Neelgiri Investments, Inc. was very pleased to hear that the **project ROI will be less than 5 years.**

“

The ROI was a big factor in the decision. We wanted the system to be paid for through the savings we'd get, or else it didn't make sense. ”

UCEP's primary mission is to assist businesses with becoming better stewards of their existing energy resources. By utilizing their sole-sourced and patented technology, UCEP created a **virtual endowment** for Neelgiri Investments, Inc. through energy dollars saved. This allowed the building owner **to take the dollars** that were being sent to the utility company and put them **back into the bottom line.**

Drastically Reduced Carbon Footprint

For the owner of Neelgiri Investments, Inc., being conscious about lowering carbon emissions is extremely important as it shows that the company is making a clear commitment towards becoming more energy efficient. The client noted that he is appreciative for UCEP helping his business become more energy efficient and, in turn, more environmentally sustainable. UCEP was able to help Neelgiri Investments **avoid the consumption of:**

199,011 KWh | 141 Metric Tons of CO₂ | 156,095 lbs. of coal burned |
15,875 gallons of gasoline consumed

Every commercial facility has a carbon footprint that plays a role in the larger scale issue of global emissions. UCEP's custom energy technology solution provides owners and managers with a **pathway to operational carbon neutrality**, and/or **net-zero operations carbon.**