

Building a Diverse Workforce within Energy Efficiency

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ABSTRACT

The ComEd Strategic Energy Management (SEM) program developed an internship opportunity with the goal of educating high school and college level students on career paths in energy efficiency and understanding the relevance and importance of energy management across industries and job functions. To accomplish this, the internship program has two primary elements: energy efficiency education, and independent work in energy analysis. Seminars are conducted by leaders in their respective fields, who share with students an array of experiences, aiming to provide context for their SEM work and highlight career opportunities in sustainability. Through this program, students become familiar with key components of SEM such as program structure, coaching, modeling, and engineering, as well as energy efficiency and broader clean energy goals. Additionally, they learn to create and analyze energy heat maps, and communicate them to utility customers, with the aim of enabling a focus on real-time energy consumption and the identification of significant inefficiencies.

In recruiting for the internship program, the SEM program implementation team partnered with ComEd's Workforce Development to reach students from the state's disadvantaged communities and local colleges and universities, including those participating in SEM. Since 2021, 28 students have participated in the internship program. The makeup of the 2023 cohort includes 38% women, 63% minorities, and 63% students from disadvantaged communities. The internship program will continue through the SEM offering, with the inclusion of more advanced tracks through the data and engineering teams in 2024. This panel discussion seeks to explore the intersection of energy efficiency, career development and diversity in the energy industry.

Introduction

The SEM Student Advisor Internship Program was established in 2021 to engage and make students aware of career paths in energy efficiency, understand the relevance of energy management across industries and job functions, and learn transferable work skills. ComEd and CLEAResult, the implementation contractor (IC) aim to reach diverse students from disadvantaged communities (DAC) to help close the gap between the energy efficiency workforce and DACs. With the understanding that student groups being underrepresented in STEM has societal costs beyond lower employment and earning power (Glennie et al. 2019), ComEd and CLEAResult developed an internship program designed to provide valuable learning experiences for students that supports the utility customers participating in SEM. The program is balanced between independent energy projects and a broader seminar curriculum that equips students with an understanding of the energy efficiency industry.

Program Conception & Development

ComEd and CLEAResult recognized the workforce trends that led to a gap in students entering the energy efficiency industry and the limited diversity within the industry. According to a study held by The National Association of State Energy Officials (2021), women account for only 25% of energy workers while representing almost half of the overall national labor force. Additionally, the same study found that Black or African American energy workers accounted for 8% of energy workers, compared to 12% in the national workforce. It was also found that Hispanic or Latinx workers accounted for 16% of the energy sector relative to the national workforce at 18%. Recognizing a need to showcase the industry and its professional opportunities, the CLEAResult SEM team looked to internal internship programs and was inspired by another SEM program within CLEAResult that trained students. This SEM program reported internally that the internship was determined a success by the utility company and after learning more, it was discussed that an adaptation of the program could not only help SEM customers achieve their savings goals, but also assist in introducing students, specifically from DACs, to career opportunities within energy efficiency.

Since its inception, the ComEd Student Advisor Internship program has focused on integrating students with organizations participating in SEM. The internship program supported a cohort of retail SEM customers, each customer enrolling multiple sites into the program. Each student was assigned two customers to monitor and analyze energy consumption and attend monthly participant calls with the SEM coach. The interns monitored customer electricity consumption data twice per week using ComEd's BEA (Business Energy Advisor) tool and reported any abnormal patterns and events to the SEM coach. This collaboration with SEM coaches helped the students develop and understanding of customers' energy usage.

The inaugural design left limited opportunity for students to learn about broader SEM topics and the energy efficiency industry overall. Iterating on the program for 2022, it was decided to integrate short, weekly seminars that presented learning opportunities about SEM, the energy efficiency industry, and decarbonization (see Table 1 for complete details). This structure was in place for interns in 2022 and 2023.

Evolving the program further for 2024, the ComEd and CLEAResult SEM teams decided to expand opportunities for students who have previously worked as an SEM intern or have more technical academic or professional experience. Planned for 2024 are two additional tracks of the Student Advisor Internship Program: an engineering focused track and a data analysis/modeling focused track. Students selected for these tracks will be paired with SEM professionals in these respective fields for a more technical experience. These tracks will run concurrently with the standard student internship offering.

Program Recruitment

CLEAResult managed the recruiting process for the student advisors. The primary phases of recruiting include: 1) establishing the role in coordination with the utility; 2) informing high schools participating in SEM about the opportunity for their seniors; 3) publishing the role and recruiting interns in coordination with CLEAResult's Talent Acquisition team; and 4) publicizing the internship role with support from the utility's Workforce Development. Partnering with Workforce Development allowed the posting to better reach target students in DACs.

ComEd and CLEAResult aim to make diversity, equity, and inclusion a central component of recruiting and participation in the student advisor internship program, with a preference for students from disadvantaged backgrounds. In recruiting for the internship program, the SEM program team partnered with ComEd’s Workforce Development to reach out to student groups across Illinois. This includes student groups from disadvantaged communities, students from our participating SEM customers, and local colleges and universities. This proved to be successful, as the first Student Advisor hired was a student attending a school participating in the SEM program. Furthermore, the program seeks to attract students with diverse educational focuses. The CLEAResult Talent Acquisition team received 78 applicants for the 2021 Student Advisor Program, 88 applicants for the 2022 program, and 160 applications for the 2023 program. As shown in Figure 1, of these applicants across all three years, 53 were selected to be interviewed, 41% of which represented DACs, 52% represented minorities and 53% represented women. Figure 2 shows the demographics of students that were selected and onboarded to the program. Of the 28 selected students, 57% represented minorities while 35% represented DACs and over half represented women.

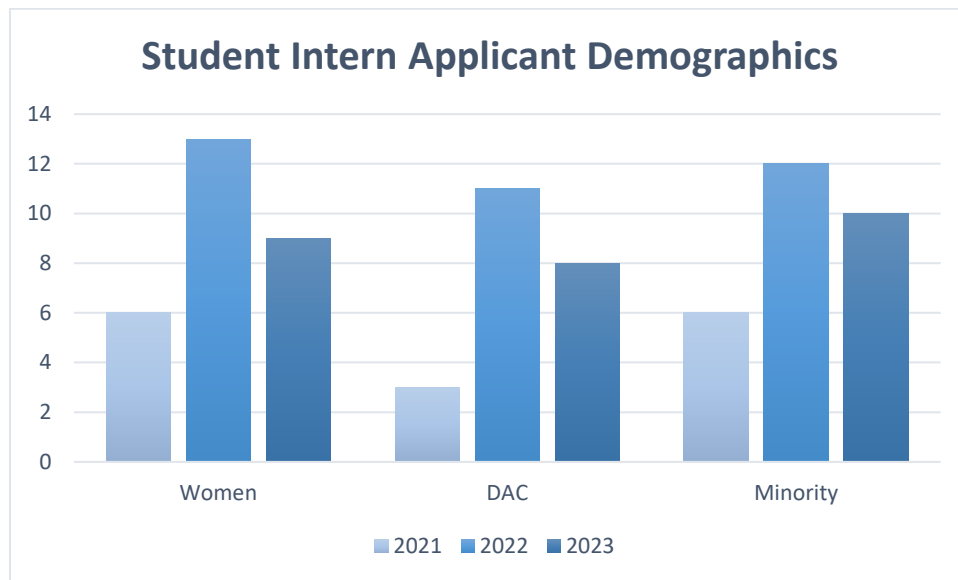


Figure 1. Demographics of the students interviewed for the internship programs in 2021, 2022 and 2023.

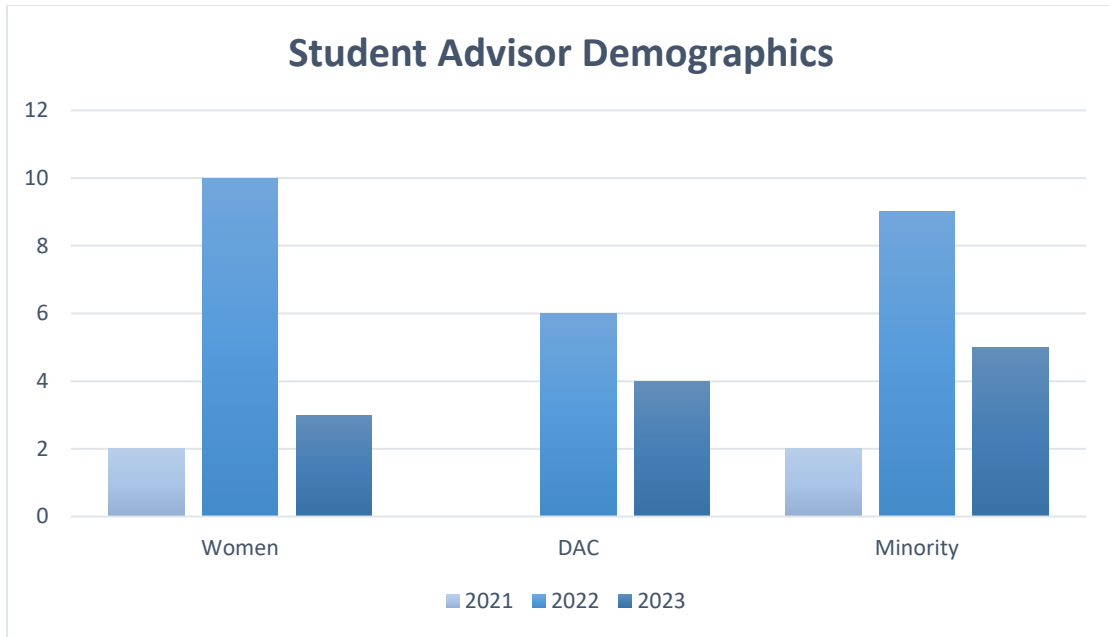


Figure 2. Demographics of the students selected and onboarded for the internship programs in 2021, 2022 and 2023.

In addition to students' diverse backgrounds, students represented diversity in their areas of study. This provided an excellent opportunity to highlight the relevance of energy efficiency and energy management across industries and roles. A full list of represented majors includes:

- Agricultural and Biological Engineering
- Business Administration and Marketing
- Business Management
- Chemical Engineering
- Computer Engineering
- Computer Science
- Criminal Justice
- Environmental Science and Economics
- High School Student
- Industrial Technology
- Mechanical Engineering
- Political Science
- Public Relations
- Science
- Social Sciences
- Statistics and Computer Science
- Integrated Biology
- Marketing/ Public Relations

Professional Development

The internship program is designed to provide valuable learning experiences for students that supports ComEd customers participating in SEM. The internship program was held during various seasons, including the summer months, to minimize disrupting the school year. The SEM program found that internships hosted over the summer worked best for students since it did not conflict or compete with student class schedules, as well as for the CLEAResult SEM to best manage the program for the students. The group of students met on a regular basis with program management and coaches. Large group meetings were held weekly which focused on broader SEM and energy efficiency learnings. Students were also assigned to groups of two or three students and assigned a coach who would meet with them weekly to review their projects. Finally, students were invited to observe customer check-in calls with coaches and SEM participants.

Participation in the SEM internship program is designed with professional development opportunities built into its structure. Key areas of professional development include corporate trainings, corporate tools and platforms, and communication in a professional setting.

The SEM internship program integrates several tools and platforms into regular student intern work. Most predominantly, students manage work emails and calendars through Microsoft Outlook. Additional Microsoft tools that are employed include OneNote, for note taking and managing information, and Excel, for project completion. Additionally, students gain access to the utility's platform to access and analyze energy usage data. For students with demonstrated proficiency in projects with a focus on Excel work and data analysis, the internship program offered access to Salesforce.

The internship provides an arena for students to exercise skills in a professional setting. Through regular meetings with the SEM program team, students were able to practice professional communication. Students were also encouraged to communicate with coaches and program management by email, strengthening their written business communications skills.

The SEM team developed a curriculum of seminars that provides context to SEM, as well as the energy efficiency industry and beyond. Topics were considered based on student interest, the core components of SEM, and new state and federal energy policy. Guests were invited to join weekly large group meetings to highlight different facets of the energy efficiency industry. While the primary goal was to broaden understanding of the industry, this also allowed students professional networking opportunities. See Table 1 for a complete list of offered seminars.

Table 1. Complete list of Seminars presented for students in 2022 and 2023

Seminars Completed:	Facilitator:	Topic Details:
SEM Overview	CLEAResult Program Manager	Technology overview and detail about the internship expectations and SEM Program.
Energy Heat Map	CLEAResult Program Specialist	Introduction to utility's energy analyzer tool to develop energy heat maps to identify anomalies.

Seminars Completed:	Facilitator:	Topic Details:
Electrification	SEM Roundtable	Workshop held by SEM Program where interns were able to hear conversation on benefits of electrification and how it can assist in optimizing energy goals for SEM participants.
Treasure Hunts/ Opportunity Registers	CLEAResult Energy Engineer	Overview of onsite energy scans to develop an Opportunity Register with detailed list of potential energy savings projects that are provided to every SEM participant company.
SEM Engineering	CLEAResult Energy Engineer	High level overview of engineering careers within energy efficiency and engineering for SEM 101, including opportunity registers
SEM Modeling	CLEAResult SEM Technical Director	High level of overview of data team careers and Energy Modeling 101.
Beyond Energy Efficiency	CLEAResult VP, SEM and Carbon Consulting	How energy efficiency works with energy transition (solar, wind, etc.), sustainability plans (business, municipalities).
Utility Energy Efficiency Presentation	ComEd Program Manager and Portfolio Manager	A Utility presentation about the different Energy Efficiency Programs. Opportunity for Student Interns to ask questions about potential careers within the multiple Energy Efficiency Programs.
Policy & Regulation	Utility Strategic Planning and Evaluation Manager	Deep dive into federal and state legislation and how it effects the Energy Efficiency industry.
Change Management	SEM Program Manager	Overview of ADKAR model and how to apply these methods to energy saving efforts.
SEM Coaching	SEM Coaches	Coaches provide detail on their role within the SEM Program to help Student Advisors better understand operations and strategies employed to help SEM Participants reach their energy reduction goals.
Careers in Energy Efficiency	IC Partner, Small Business Program Manager	An opportunity for Student Interns to hear a real-life example of how to successfully pursue a career in Energy Efficiency.

Projects

The primary project Student Interns completed was energy analysis for the participating SEM customers and their energy coaches. The result was for the students to focus on real time energy consumption in order to flag increases or inefficiencies. An energy heat map tool was created in Excel so that students could develop individual heat map report files for their assigned customers. Students were then responsible for updating utility data on a monthly basis and providing insights by identifying anomalies in energy consumption. This exercise led to an intern identifying a missing meter from a large participating company, which caused the energy model to be inaccurate. This discovery resulted in the SEM coach and participant recovering and including the missing meter data to ensure accuracy when reviewing the sites energy consumption.

Additionally, our program considers projects that match students' interests and skills that are valued professionally. For example, training a student majoring in business administration in Salesforce to support SEM customer relationship management. Salesforce work includes updating customer interactions (check-ins, workshops, etc.) for ComEd tracking purposes.

Results

The ComEd Student Advisor Internship program has seen three cohorts of students since its beginning in 2021. In this short time, the SEM team has seen direct results in entry to industry with students who have graduated from college. Following the Student Advisor Internship Program in 2021, one graduating student was placed in ComEd's New Grad Rotation Program for engineers and maintains employment with ComEd to date.

Following the Student Advisor Internship Program in 2022, it was determined that a second level internship would be valuable to ComEd, CLEARResult and the top performing Student Interns. Three interns were retained through Spring 2023; two Student Interns joined the CLEARResult SEM Data Team to support data analysis and the third Student Intern continued work with the CLEARResult SEM Program Management team. This led to the development of data analysis and engineering tracks to expand the SEM Student Advisor Internship Program.

Two of the three retained Student Interns graduated in May 2023 with their bachelor's degree and sought full time positions within the industry. A student retained with the Data Team is now a full-time Energy Engineer with a CLEARResult subcontractor. The other student that was retained with the SEM Program Management team was hired full-time to CLEARResult as a Program Specialist, furthering her knowledge and experience from the internship program.

The succession of Student Interns directly into the energy efficiency industry demonstrates the value of targeted internships to train in skills needed in the energy efficiency industry and to support awareness of career opportunities.

Key Student Learnings

Each program year that has hosted an internship cohort has provided ample opportunity to learn from and grow the program. Student Interns were asked to complete a survey at the end of their program.

When asked to describe the greatest learning or takeaway from the internship, one student stated the ability to enhance their skills in Excel, specifically when it comes to analyzing data, gave them an opportunity to feel proud of working with a company that is working to combat

climate change and felt inspired to be able to contribute. Another student described their greatest learning as becoming knowledgeable on how behavioral and operational changes could produce energy savings, as before the internship they believed most energy saving efforts would be produced by upgrading equipment and large machinery. A third student responded that their greatest takeaway from the internship was learning of all the possible career opportunities within the industry.

Of the 14 surveys received, responses to this question ranged from appreciation for hands-on work in Excel to understanding the professional landscape. This is indicative of successfully accomplishing the goal to increase awareness of the energy efficiency industry. Elements of the internship program that include project Excel work and highlighting different careers within the industry will be maintained and enhanced for future program years.

Greatest Challenges from Internship

The students were also asked to describe the most challenging aspect of this internship program. To this, one student responded that their greatest challenge was at the start of the internship when they were working to set their schedule to balance the work of the internship with their schoolwork. Another stated that they found troubleshooting errors within Excel to be their greatest challenge. The student stated, “I am still learning how to use more advanced Excel techniques, so it was definitely a learning experience.” A third student described their most challenging aspect of the internship to be understanding how to identify anomalies on their energy heat map project to provide insights to the SEM coaches and participant companies. However, through asking questions in team meetings and to coaches, the student stated that they became more confident in their understanding and ability to make important insights.

Responses to this question centered around managing workload and utilization of Excel. Learning how to manage workload is an element of the program goals. Students’ understanding and utilization of Excel proved to be a healthy challenge for students and an area for program improvement. The internship program may be able to better integrate instruction of Excel through courses accessible in Workday, CLEAResult’s employee management system. This would provide additional opportunity for students to learn and practice hands-on work on this platform.

Improvements for the Internship

As the program continues to evolve, the SEM team asked the Student Interns what they felt would improve the internship program. One student responded that they believed it would be beneficial to have video trainings for students to refer back to when they are working on their projects to help troubleshoot their error before reaching out to other interns or the SEM Coach for assistance. Another student mentioned the possibility of having more group activities to allow an opportunity for interns to connect with one another. While the interns did have an opportunity to speak with one another in the small group meetings, much of their work was independent and did not provide an opportunity to collaborate with other interns. A third student felt the internship could be improved by requiring more structure around the schedule students should be working. During the summer internship program, students are allowed a maximum number of hours a week to work, but they have the ability to complete this work as it fits their schedule. This flexibility is useful to students that have summer courses or are working a second job outside of the internship. However, given the feedback from this student, the SEM Program team

hopes to find a balance for future intern cohorts between allowing flexibility in their schedule while also providing some guidance on how their day can be structured to complete their tasks for the internship and otherwise.

Responses to this question centered around clarity in instruction for projects and work with other interns. The SEM program team will review how project information and instruction is presented and documented so that students have the resources needed to be successful in their role. It will be important to maintain aspects that require critical thinking on the part of the students. Guest speakers that attended group meetings tended to (and were asked to) present their area of expertise. In this area, program management can better work with guests in advance of their presentations to incorporate breakout groups and interactive activities so that there is more discussion among students. Finally, another avenue to explore is group-based projects as an element of the internship. More exploration is needed in this area to determine appropriate projects that can be worked on in groups and would add value to the SEM program team.

Understanding of Energy Efficiency

To help the SEM program team understand the impact of the internship program, students were asked to describe their understanding of the energy efficiency industry following their time as an intern. The first student stated that they felt they had a decent understanding of the energy efficiency industry prior to the program, but after being exposed to potential projects and energy efforts with the SEM program, they felt their understanding had significantly increased. Another student stated “I now appreciate all of this ‘behind the scenes’ work more. It was really cool to learn about all of this.” A third student responded by saying that they have a much larger understanding of the energy efficiency industry than they did at the start of the internship program. This student went on to say they found it interesting to learn about the different roles that play into making the process work, and how there are several key steps in providing energy efficient practices and suggestions to customers. They also stated they enjoyed learning about the different ways in which they could contribute to the fight on climate change, excited that there are other possibilities outside of costly projects. This student ended their response by saying before the internship, they had thought of energy efficiency as renewable energy such as solar and wind, but following the internship they were able to learn of the different opportunities that are possible for individuals to contribute on a smaller, but still impactful, scale.

Of the nine survey respondents, all students said their understanding of the energy efficiency industry increased because of the internship. This response overwhelmingly validates the program’s success in accomplishing the goal to broaden awareness of the energy efficiency industry. Both the project work completed by students and several guest presentations were intended to provide context to the energy efficiency industry.

Interest in Energy Efficiency

The last question the Student Interns were asked was to describe if they are more or less likely to pursue a career focused on energy efficiency or addressing climate change as a result of participation. One student stated, “I was already considering careers that would address climate change before this program but now I would be much more open to doing that by working with energy as well.” Another mentioned that they are more likely to pursue a career in energy efficiency as this program has helped them better understand their passion for environmental sustainability and how important energy efficiency is to achieving sustainability.

Of the nine survey respondents, eight students said they were more likely to pursue a career in the energy efficiency industry or addressing climate change following internship participation and the remaining students said their interest remained the same. This again indicates the internship programs' success in broadening awareness of the energy efficiency industry and demonstrating the variety of professional career paths within the industry.

Conclusion

The student internship program met the goal of exposing students from diverse communities to the energy efficiency industry while providing meaningful professional development experiences. Based on the feedback and learnings from the 2022 and 2023 student cohort, the SEM program team will iterate on and refine the internship program to enhance the skills learned and focus areas for students in the upcoming year.

References

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