IGEN Net Zero Collaborative Quarterly Performance Report

For the performance period of January 1 to March 31, 2023

Submitted to IGEN by:

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Summary

SEDAC, the Smart Energy Design Assistance Center, is working with the Illinois Green Economy Network (IGEN) to administer the IGEN Net Zero Collaborative program for the FY2023 program year. This report summarizes our work during the quarterly performance period from January 1 through March 31, 2023.

The Net Zero Collaborative program consists of education, resource development, and technical support for IGEN community colleges seeking to develop or enhance climate action plans. The goal of this collaborative is to help colleges develop a clear path towards achieving a net neutral carbon future.

SEDAC's work on the IGEN Net Zero Collaborative program includes the following core activities:

1. **Stakeholder outreach and education.** SEDAC will continue to reach out to IGEN community colleges through targeted monthly outreach pushes, to promote the Net zero Collaborative participation, to refer colleges for customized technical support, and to invite them to attend semi-annual online collaborative meetings. The 2 meetings will address topics of interest to collaborative members. Additionally, SEDAC will produce 2 new information resource documents, such as case studies or technical tip sheets, to support the education and outreach objectives.
2. **Individualized technical support.** As an ongoing service throughout the program year, we will provide Net Zero planning and GHG emissions reduction support to any IGEN member colleges that request assistance. Depending on the requests received, we will provide three levels of support:
    a. Quick advice via phone call or email
    b. Requests that involve some analysis or research
    c. In-depth analysis involving report development and potentially on-site review.
3. **Program reporting.** SEDAC will produce quarterly reports summarizing progress and outcomes of all project tasks and a final report at the end of the performance period.

Table 1 shows progress and targets met during the program year. SEDAC has met program targets for the third quarter.

Table 1. Performance summary

Tasks	Deliverable Targets	Q1	Q2	Q3	Total
Stakeholder outreach and education	2 collaborative meetings	-	1 complete; 26 people / 15 colleges attending	1 complete; 28 people / 16 colleges attending	2 complete; 54 people attending
Resource development	2 new resources	-	1 complete	1 complete	2 complete
Individualized technical support*	On-going support via e-mail, phone call, or other method	2 complete (1 Level 1, 1 Level 2)	2 in progress	2 complete (1 Level 2, 1 Level 3); 2 in progress	4 complete (1 Level 1, 2 Level 2, 1 Level 3)

*Technical support is provided in 3 levels of service. Level 1 includes quick advice via phone/email. Level 2 service is in response to requests involving research and analysis. Level 3 service includes in-depth analysis with report development and potentially on-site review.

1. Stakeholder Outreach & Education

Collaborative Meetings

SEDAC planned and delivered one collaborative meeting for IGEN colleges. The meeting featured presentations focusing on low-cost HVAC improvements, (retro-commissioning). Presenters included:

- Kim Hankins, McHenry County College
- Greg Swiss, Cyclone Energy Group
- Karl Helmink and Andy Robinson, University of Illinois

Kim Hankins from McHenry County College and Greg Swiss from Cyclone spoke about their experience with the ComEd retro-commissioning program. Their retro-commissioning project covered about 50% of the campus and produced savings of 3-5% of total campus utility costs. Much of the work focused on adding scheduling to the building HVAC systems that previously had operated 24 hours per day. They also discovered some plugged filters, which were causing inefficient operation of the system as well as comfort issues.

Karl Helmink and Andy Robinson from the University of Illinois presented on the campus retro-commissioning program. With over 10 years of retro-commissioning experience, they have developed some best practices for communicating with occupants and departments. These include developing labeled floor plans to provide to the unit and for mapping comfort issues. Some of their common implementation measures are equipment scheduling and conversion of constant volume systems to variable volume systems with demand-controlled ventilation. They also spoke about the importance of communicating with unit personnel, not only to learn about the issues, but also about tests they may be conducting to test and learn any issues that may not be known with performing such tests. Additionally, it provides an opportunity to communicate about the impact of equipment scheduling.

At the conclusion of the meeting, we asked attendees to select from a list of discussion topics for the spring collaborative. Grounds equipment electrification is the topic of interest to most.

Table 2 provides collaborative meeting details.

Table 2. Collaborative meetings

	Date	Topic	Attendees
Meeting 1	Oct 25, 2022	Solar Development Best Practices; Breakout sessions on Net Zero project tracking and LED lighting considerations	26 attendees across 15 colleges and 4 other organizations
Meeting 2	Feb 22, 2023	Low-Cost HVAC Improvements	28 attendees across 16 colleges and 4 other organizations

Information Resources

SEDAC developed a guide for managing power purchase agreements (PPA) and requests for proposals (RFP) for large solar projects. It introduces PPAs, project planning, and RFP design. A solar PPA is a financial arrangement in which a developer builds, owns, and maintains a solar system, and the customer purchases the produced electricity. In this arrangement, customers are not required to provide upfront capital. The intention is to provide some of the basics of solar PPA procurement and point readers to useful references for additional detail.

Figure 1 provides a sample image of the publication. Table 3 provides resource development details.

Table 3. Information resource development

	Date	Topic
Resource 1	February 2023	Solar RFP Development
Resource 2	In development	Low-cost HVAC Improvements

Figure 1. Image sample of the Solar PPA publication deliverable.

2. Individualized Technical Support

In this performance period, SEDAC provided technical support services shown in the table below.

Table 4. Summary of technical support services provided this quarter

College	Level of Service	Description
Joliet Junior College, City Center Campus	Level 3	Energy assessment report. Complete 3/31/23
Lewis & Clark Community College	Level 2	Electrification planning assistance, short report. Complete 1/12/23
Joliet Junior College, Romeoville Campus	Level 2	Utility bill analysis, for verification of post-implementation energy savings. In progress.
Prairie State College	Level 3	Energy assessments of Main Building and Adult Training and Occupation Center. In progress.

Joliet Junior College. SEDAC visited Joliet Junior College's City Center campus to conduct an energy assessment. This building's shell was constructed and then built out a few years later. The site includes several commercial kitchens for teaching. While all commercial kitchens use a significant amount of energy for ventilation, the HVAC systems in these kitchens are oversized leading to excess energy consumption. Additionally, the commercial kitchen equipment has hundreds of pilot lights, which not only cause the ventilation system to operate continuously, but also substantially impact indoor air quality. SEDAC identified 3 measures for implementation. This included retro-commissioning of the building, reducing the kitchen exhaust during idle periods, and optimizing the kitchen exhaust during all times. While the City Center has gone through some retro-commissioning, operations have changed over time and staff has more experience with the building leading to opportunities to conduct retro-commissioning again. These are estimated to reduce greenhouse gas emissions by 310 metric tons while having a payback of a little over 2 years. This is nearly a 20% reduction. The subject building is a cautionary tale of constructing a shell which can serve a multitude of uses leading to design choices that may limit a building's respond to the real loads following fit out if flexibility was not in the original design. This may include things such as a single air handler for a building, or oversized boilers, just in case it may be needed for the future use.

In a previous program year, SEDAC conducted an energy audit for Joliet Junior College's Romeoville campus. Facilities staff have completed implementation of most recommended from the assessment report. They requested an analysis of the electricity and natural gas bills to verify the energy savings from their implementation efforts.

Lewis & Clark College. In the previous program year, SEDAC developed a Net Zero plan for Lewis & Clark College. A large piece of this plan is to transition away from fossil fuels and toward renewable energy, specifically electricity which can be produced through renewable sources. The college is particularly interested in planning for electrification of HVAC, domestic hot water, and other systems to be converted to electricity (instead of natural gas or other fuels) across the campus. Therefore, SEDAC

provided preliminary electrification planning support and analysis to provide a roadmap for future implementation planning of electrification projects. The analysis focused on:

- Preliminary load calculations to support long-range central HVAC system planning for the campus.

Prairie State College. In a previous program year, SEDAC develop a Net Zero plan for Prairie State College. Through staffing transitions, the new sustainability coordinator has determined that the main building and Adult Training and Outreach Center are their two largest energy users and also likely have many opportunities for energy improvements. The new coordinator has requested SEDAC's assistance in performing an energy assessment of the two buildings along with training her how to conduct such assessments so that she can conduct such assessments on other buildings. These assessments and training may also touch on retro-commissioning, but the focus of the technical assistance will be on the energy assessments. Improvements resulting from the assessments will reduce the amount of renewable energy required for Prairie State College to achieve its net zero goals.