THE RUCKS GROUP LLC

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UTILITIES AND ENERGY COORDINATION NETWORK
YEAR 3 EVALUATION REPORT

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EXECUTIVE SUMMARY

Northeast Wisconsin Technical College (NWTC) is addressing workforce shortages in the energy and utilities sector through the development of the Utilities and Energy Coordination Network. This project is designed to expand training opportunities, create new programs, and develop curricula for high-demand energy-related roles across the nation by creating a platform for industry, higher education institutions, and other stakeholders to share resources and generate partnerships in gas, electrical power, and utilities engineering to address workforce shortages.

Specific project objectives are to:

1. Leverage the knowledge base of the NWTC Program Advisory Committees to cultivate a core leadership group consisting of stakeholders representing national and regional employers from across the electrical power, gas, solar technology, energy management, and telecommunications industry, academia, and workforce development sectors to lead the formation of the Utilities and Energy Coordination Network (the Network);

2. Create a clear, shared vision that guides the evolution of the Network; and

3. Establish the structure and norms of the Network to build relationships and trust among members.

Findings

Evaluation Question #1: How effectively is the project team bringing together key individuals in the network?

As the Network slowly expands, the project team is identifying outreach opportunities to connect with potential and current partners. While they are challenged by the availability of potential industry and educational members to engage, they have leveraged multiple conferences and survey feedback information to continue their efforts to build the Network.

Evaluation Question #2: To what extent do the curricula offered by community colleges in the Network align with industry needs?

Community colleges in the Network are offering a few programs in the utilities and energy field and are considering expanding offerings in solar energy and energy management. Employer feedback on the curriculum offered in the Wisconsin technical college system has provided useful information for engaging advisory committees to modify and affirm program content.

Evaluation Question #3: What information, best practices, and/or resources are flowing through the Network? How does this information bring value to the Network?

Information and resources are being made available to the Network on a variety of topics, primarily generated by the project team through an ATE microsite and the Network newsletter. There is minimal engagement with these communication sources by Network members, the ATE community, and other interested individuals.

Evaluation Question #4: How and to what extent is the cross-sector Network ready to set and execute strategies, including implementing workforce issues solutions?

The project team has confirmed that there are connections among organizations in the Network, but there are still opportunities to develop meaningful and mutually beneficial collaborations, particularly in the Great Lakes and upper Midwest region. Examples of collaborations are developing among NWTC and other Network members.

Recommendations

Leverage opportunities to create connections. As funds allow, sponsor potential partners' attendance, invite Network members and interested organizations to participate in networking meetings at these events, and identify potential presentation opportunities to share information about the Network and to highlight collaborations. Additionally, consider how to highlight collaborations and include information about ways to find partners in the Network newsletter and on the website and microsite. Finally, while many survey respondents are not considering adding apprenticeships, these are a prime and common opportunity for partnerships between industry and education that meet the needs of both parties. Consider highlighting this type of partnership and exemplars in the Network's communication and resources.

Continue to develop the Network's communication mechanisms. The project team should consider how it can strengthen use of these tools to disseminate information and build partnerships. With limited connections between the microsite and the website, the project team should consider how and what information flows between the multiple communication tools to reduce confusion and ensure that Network members and interested parties can find the information they need. In addition, to increase opportunities to extend the Network, consider adding a "share this newsletter" feature to communications and highlight the benefits of investing time in the Network.

Consider using the BILT model[1] to sustain curriculum development and employer engagement. As the project team continues to prioritize its role in expanding training opportunities, creating new programs, and developing curricula for high-demand energy-related jobs across the nation, the BILT model – originally established for the Information Technology industry – would have many benefits for the Network. Using a BILT model would provide benefits to both employers and educators, focusing attention on the curriculum, workforce needs, and industry trends.

[1] https://connectedtech.org/business-industry-leadership-team/

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BACKGROUND

Northeast Wisconsin Technical College (NWTC) is a two-year technical college located in Green Bay, WI that offers one of the widest varieties of utility-related associate degrees, technical diplomas, and certificates in the Midwest and has partnered with local employers to meet regional economic needs for over 100 years. NWTC is also home to the Great Lakes Energy Education Center, a "living energy" laboratory featuring the latest technologies and serving as a model of sustainable building practices. NWTC's expertise and experience puts the College in an excellent position to form and facilitate a network of industry and educational partners.

Funded by the National Science Foundation's Advanced Technical Education program (NSF ATE) in 2020, the purpose of NWTC's Utilities and Energy Coordination Network (UECN) grant is to create a platform for industry, higher education institutions, and other stakeholders to share resources and collaborate to expand training opportunities, create new programs, and develop curricula for high-demand energy-related roles across the nation. The UECN, also referred to as "the Network" in this report, project will leverage relationships developed through prior grants, including UPDATE: Utilities Pipeline Development for Advanced Technological Education (DUE#1304726) and the Planning Grant for a Utilities and Energy Regional Center of Excellence (DUE#1700673) to create a formal utilities and energy coordination network.

Despite increased enrollments at NWTC over the past six years, the needs of industry outweigh the ability of a single entity to fill the workforce pipeline. The energy industry is experiencing workforce shortages and skills gaps in key engineering and technical areas due to an aging workforce approaching retirement, changing technologies, and fewer qualified, younger candidates. Furthermore, qualified workers are increasingly choosing to work closer to their hometowns, limiting the ability to fill positions across a wider geography.

Matching industry partners to community colleges with expertise to train future technicians will be critical to addressing pipeline shortages. Such partnerships will help industry gain access to students, training expertise, and graduates who want to work close to home. Higher education institutions will benefit from industry partners who can provide input and feedback into program competencies and access to resources such as equipment, tools, and field experiences. The Network will provide a platform to cultivate and generate partnerships that can expand training opportunities in gas, electrical power, solar energy, energy management, and apprenticeships to address workforce shortages across the nation.

Specific project objectives are to:

1. Leverage the knowledge base of the NWTC Program Advisory Committees to cultivate a core leadership group consisting of stakeholders representing national and regional employers from across the electrical power, gas, solar technology, energy management, and telecommunications industry, academia, and workforce development sectors to lead the formation of the Utilities and Energy Coordination Network (the Network);

2. Create a clear, shared vision that guides the evolution of the Network; and

3. Establish the structure and norms of the Network to build relationships and trust among members.

This document details the Network's progress in its third year of funding.

PURPOSE AND DESIGN OF THE EVALUATION

The Rucks Group, LLC (see Appendix A for author biographies) was contracted at project initiation to provide external evaluation services for the Network and has worked collaboratively with project leadership to determine the evaluation methods. The project's theory of change hypothesizes that bringing industry, academia, and other stakeholders together with a shared purpose will lead to resource sharing and collaborations focused on addressing current and anticipated industry workforce and training needs through new programs and curriculum development. Guided by the logic model (see Appendix B), the evaluation design includes formative evaluation for project improvement as well as summative evaluation to gather evidence of impact continually.

Evaluation Questions

Driving the evaluation are four evaluation questions:

1. How effectively is the project team bringing together key organizations in the Network?

2. To what extent do the curricula offered by community colleges in the Network align with industry needs?

3. What information, best practices, and/or resources are flowing through the Network? How does this information bring value to the Network?

4. How and to what extent is the cross-sector Network ready to set and execute strategies, including implementing workforce issues solutions?

All four evaluation questions are addressed in this report.

Data Gathering Approaches

The evaluation uses a mixed-methodological approach, collecting both qualitative and quantitative evidence of the completion of deliverables (e.g., outputs) and short-term project outcomes. Data collection in the third year relied on reviews of project-level documents (e.g., meeting notes, communication activity, outreach activity), regular meetings with the project team to understand project progress and planning, a listening session with project team members (see Appendix C for protocol), employer surveys (Appendices D and E) to gather feedback about the skills they need in their workforces, and a Network member survey (Appendix F) to understand expectations and communication preferences.

The UECN Network Survey was distributed in Fall 2022 to 434 individuals from industry organizations and educational institutions. Eighty-six responses were received (20%) over the course of a three-week collection

period. The data from this survey are used throughout this report to identify the extent of connections and the types of relationships between industry and education using descriptive statistics.

FINDINGS

Evaluation Question #1: How effectively is the project team bringing together key individuals in the network?

In Year 3, Network expansion continued with 80 organizations now identified as members[2]. New members were added across all three categories – industry, educational institutions, and other groups such as ATE centers and workforce development organizations (Figure 1). The project team had increased opportunities to develop the Network through its outreach efforts but was also challenged by the availability of potential partners to engage outside of their primary work.
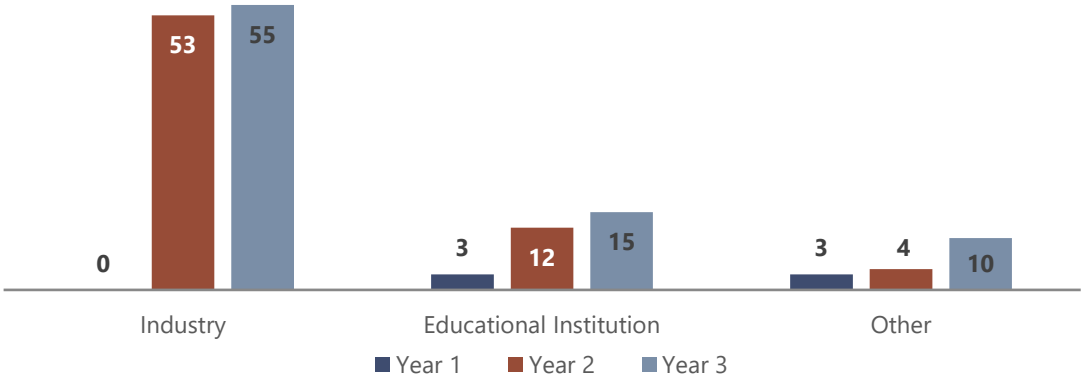
Figure 1. Network membership.

Outreach and Recruitment

The project team believes that being part of the ATE community and having opportunities to interact with other organizations has helped them to create connections through their participation in the ATE PI and HI-TEC conferences. These convenings have provided forums both for sharing information about the Network project and to connect with current and potential members. With more professional events returning to in-person formats and some no longer offering virtual options, the project team was able to participate in over a dozen regional and national conferences and events throughout the grant year (Table 1).

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[2] https://www.nwtc.edu/about-nwtc/nwtc-locations/green-bay/great-lakes-energy-education-center/utilities-and-energy-coordination-network/utilities-and-energy-coordination-network-resources

| Conferences and Events	Dates	Location
HI-TEC	July 2022	Salt Lake City, UT
SCTE Cable-Tec Expo	September 2022	Philadelphia, PA
Great Lakes Technology Showcase	September 2022	Fort Wayne, IN
NWTC Energy Programs Open House	September 2022	Green Bay, WI
Wisconsin State Telecommunications Association	October 2022	LaCrosse, WI
Wisconsin Energy Efficiency Exposition	October 2022	Milwaukee, WI
NWTC Utility Preview Day	October 2022	Green Bay, WI
ATE PI Conference	October 2022	Washington DC
RENEW WI Energy Summit	January 2023	Madison, WI
BEST Center Annual Institute	January 2023	Virtual
Nate Unite 2023	February 2023	Orlando, FL
Optical Fiber Communication Conference and Exhibition	March 2023	San Diego, CA
Fiber Connect 2023	June 2023	Kissimmee, FL
Illinois Broadband & Telecommunications Association Annual Convention	June 2023	St. Louis, MO
Midwest Renewable Energy Association Energy Fair	June 2023	Custer, WI

Table 1. Conferences and events attended by members of the Network project team.

While conferences and other meetings provide key opportunities to share information about the Network and engage current and potential members, the project team noted that it remains challenging to identify and recruit new members. As one team member shared, *"the worker shortages across all of these sectors has driven employers and educators into a place where they don't have time to look outside the work right in front of them. When we have been able to make connections and build partnerships it has been largely in instances where a problem exists that the employer or educational institution has identified, and they find us as a resource."*

The project team is continuing to identify ways to bring together current and potential Network members through existing conferences, planning free-standing events, and sharing information through their other professional activities. The Telecommunications team in particular is involved with state and federal conversations about the role of technical colleges in closing the workforce shortage in the information industry. The project team has also used data from the Network survey to develop connections. For example, several respondents indicated that they were interested in becoming more active with specific professional organizations, particularly those based in Wisconsin (Figure 2). The project team reached out to these survey respondents to facilitate these connections.
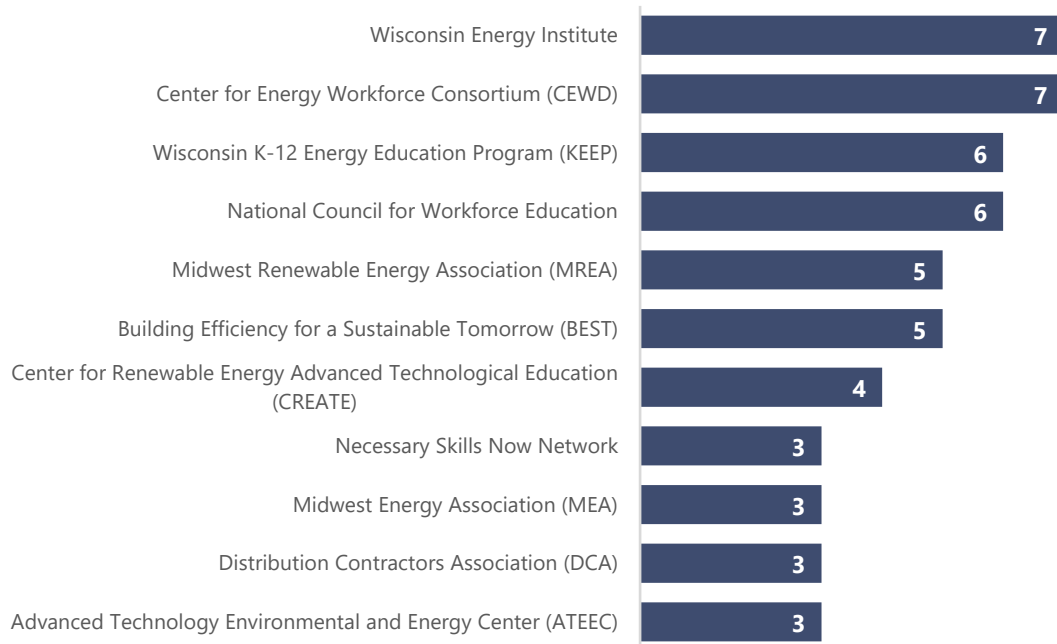
Figure 2. Survey respondents' requests for information.

Conclusions

As the Network slowly expands, the project team is identifying outreach opportunities to connect with potential and current partners. While they are challenged by the availability of potential industry and educational members to engage, they have leveraged multiple conferences and survey feedback information to continue their efforts to build the Network.

Evaluation Question #2: To what extent do the curricula offered by community colleges in the Network align with industry needs?

A key objective of the UECN project is to understand the extent to which the curricula offered by colleges in the Network align with industry needs. In Year 3, the project team monitored the existence of specific educational programs at member colleges and sought feedback from employers on the technical and professional skills they consider when hiring. This information is being used to review and modify college curricula to ensure that it reflects employer needs.

Academic Programs

The number of related programs offered by Network colleges varies. Among 27 institutions, most reported that they offer programs in Electrical Power Distribution/Lineman, Solar Energy, and Energy Management (Figure 3).
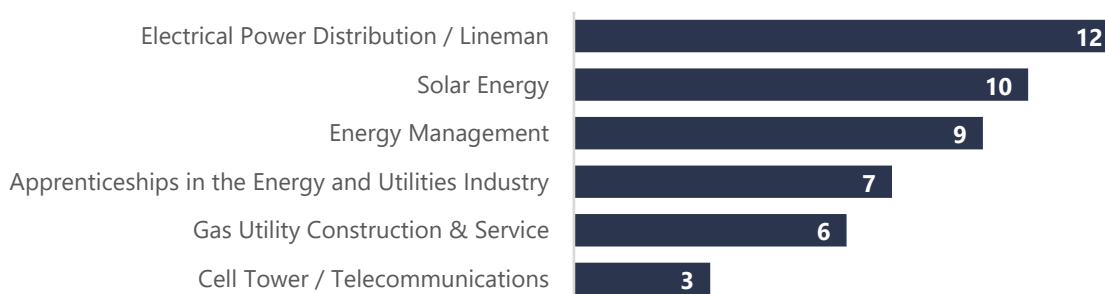
Figure 3. Programs currently offered by responding educational institutions.

Respondents were also asked to indicate which programs they may implement in the future, with most reporting that Solar Energy and Energy Management are the programs being considered (Figure 4).

■ Yes ■ No
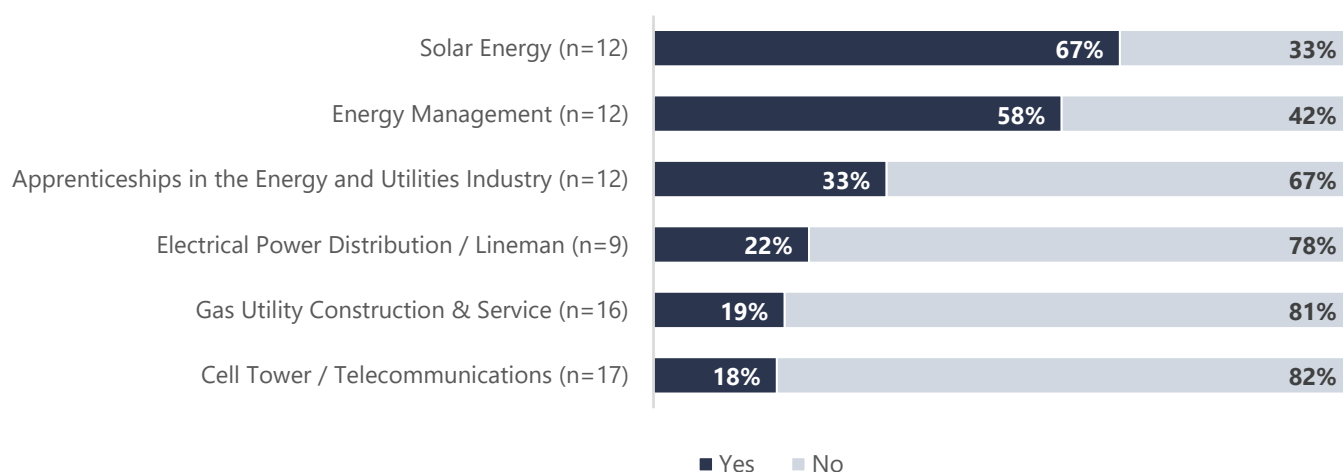
Figure 4. Programs being considered for implementation by educational institutions.

These responses suggest that Solar Energy and Energy Management are a focus of attention to most educational institutions, while Cell Tower/Telecommunications is less prominent.

Employer Feedback

The UECN project team continues to seek employer feedback through industry-focused surveys. In each survey, industry employers are asked to indicate the extent to which specific knowledge, skills, and abilities (KSAs) are important to their company when they are hiring, as well as the training opportunities they offer. To date, three groups have been surveyed – Gas Utility (Year 2), Energy Management (Year 3), and Electrical Power Distribution (Year 3).

Gas Industry

The NWTC Gas Utility Construction and Service team reviewed the results of Year 2 survey and discussed possible changes to the existing curriculum. In Year 3, proposed changes were shared with their Advisory Committee. The modifications were based on employer feedback including replacing some courses to provide more options for students, adding and removing competencies in specific courses, combining courses to meet needed competencies, and creating new courses focused on safety and communication. A notable change in

the curriculum is the discontinuation of *Communication Writing* and *Communicating Effectively*, to be replaced with a more industry-aligned course on *Utility Workplace Communication*. These changes will lower the number of credits required from 31 to 34, reducing the cost of the program while aligning competencies with industry needs. The Advisory Committee voted on and approved these changes.

Energy Management
A survey was sent to 46 Energy Management employers in Fall 2022 and 17 responses were received (37%). The NWTC Energy Management instructor noted that the results were well-aligned with the NWTC curriculum: *"We have been orienting the program towards building automation training, and those skills were emphasized [by employers]."* These survey data were shared with the Energy Management Advisory Committee, but no curricular changes were proposed.

Electrical Power Distribution
In Spring 2023, 165 employers in the Electrical Power Distribution industry were surveyed. Results from 27 respondents (16%) were presented to the Advisory Committee in March 2023. Similar to the Gas Industry curriculum, *Communicating Writing* and *Communicating Effectively* are being replaced with *Utility Workplace Communication*, which is tailored to utility industry communication. The Advisory Committee voted on and approved these proposed changes.

Telecommunications
Employers in the telecommunications industry have not yet been surveyed, but the NWTC Advisory Committee and instructional team are actively engaged in conversations about curriculum and employer needs.

Professional Skills
Across the three completed employer surveys – Gas Utility, Energy Management, and Electrical Power Distribution – the emphasis on certain professional skills varies slightly. For example, Gas Utility employers place less emphasis on computer skills and more emphasis on teamwork than those in the Energy Management field. In the aggregate, skills in problem-solving, customer service, communication, and teamwork are important to employers in all three industries (Table 2).

Ranking	Professional Skill
1	Problem-solving
2	Customer service
3	Verbal and written communication skills
4	Teamwork
5	Conflict resolution
6	Handling feedback
7	Computer skills
8	Diversity, equity, and inclusion

Table 2. Average employer ranking of importance of professional skills when hiring (n= 17).

Industry Needs

When asked about the needs they see in the Energy and Utilities industry, Network survey respondents ' comments centered on three themes: workforce development (n=19), education and training (n=9), and career awareness (n=6) (Table 3). A complete list of comments is available as Appendix G.

Themes	Example Comments
Workforce Development	• Ensuring enough craft labor in the pipeline to meet the industries long term needs • More young people interested in the trades • The electric power industry is facing changes the likes of which it has not seen since its inception. Qualified technical teams will be in great demand in the future. • Workers with the desire to become skilled and show real concern for what they are doing • Younger line workers, solar techs, wind techs, more modern control standards and tools • More workforce development and awareness training at earlier school levels to remove stigma of skilled trades and encourage more interest
Education and Training	• Educational programs for Engineering/Design of communication networks • Educational Studies in Technical areas such as Relay Technician, Equipment Specialist • More Natural Gas Training Programs • Better programs to get Gen Z into the industry • More specialized training on equipment many manufacturers do not provide training at a reasonable cost. • More Training • More training for field personnel • Technical computer based skill sets for relays and testing of equipment • Common knowledge of the equipment in the field and what it does
Career Awareness	• A better job must be done to improve the awareness of careers in these areas • Promoting career opportunities in the Energy industry

Table 3. Responses to "A need I see in the Energy and Utilities industry is:..".

These responses suggest the need to encourage younger individuals to consider trades occupations and the need for technical education and training.

Conclusions

Community colleges in the Network are offering several programs in the utilities and energy field and are considering expanding offerings in solar energy and energy management. Employer feedback on the curriculum offered in the Wisconsin technical college system has provided useful information for engaging advisory committees to modify and affirm program content.

Evaluation Question #3: What information, best practices, and/or resources are flowing through the Network? How does this information bring value to the Network?

In addition to the KSA information from employer surveys, information and resources are being made available to the Network through the communication tools that have evolved to emphasize the Network newsletter and the ATE microsite. While the campus-based website is still active, it is not used by many individuals, and the Teams platform is no longer used as it was not an effective tool for communication or information sharing.

UECN Newsletter

The project team published three newsletters during Year 3 – in September 2022, November 2022, and February 2023[3]. These newsletters contain updates on grant activities, information about partnerships and training opportunities, available funding, highlights from NWTC programs, a link to the Network microsite, and contact information for each project team member. While the number of recipients has increased from 286 to 392 over the course of the year and the delivery rate has improved, the open rate remains at an average of 23% and no one forwarded their copy of the newsletter, suggesting that this information was not shared more broadly (Figure 5).

February 2023: Open rate 25%, Delivery rate 83%
November 2022: Open rate 11%, Delivery rate 76%
September 2022: Open rate 32%, Delivery rate 77%

■ Open rate   ■ Delivery rate
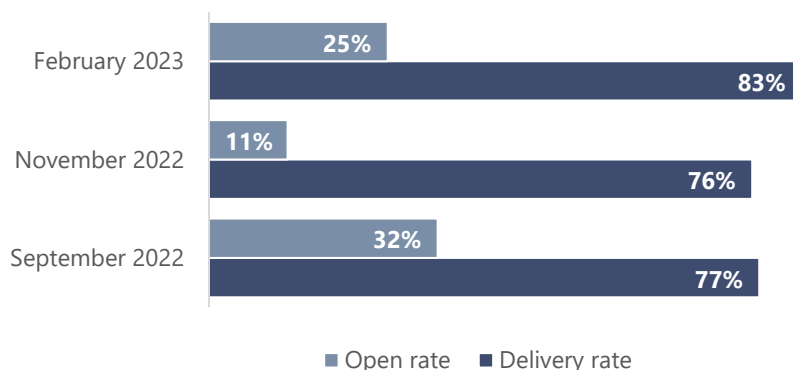
Figure 5. UECN Newsletter analytics.

UECN Microsite and Website

While the Network maintains a presence on the NWTC website, in Year 2 the project coordinator built a microsite hosted by ATE Central. The ATE Microsite Service helps projects to create a mini-website as a platform to share documents, publish curriculum materials, announce events and publications, and disseminate the products and progress of their grant project. Unlike many campus-hosted sites, the microsite allows project teams to update content themselves and removes limitations related to campus website traffic.

The project team has ensured that key information about the Network is available on the microsite, including access to curricular resources (e.g., course descriptions, sample student schedules, instructor job descriptions, and sample budgets), information on training and development opportunities from NWTC and other Network

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[3] Newsletters available at https://atecentral.net/msites/UECN/newsletters

partners, and access to the Network newsletter. The microsite received 242 unique page views during Year 3, but 76% of Network survey respondents reported that they were not aware of it (Figure 6).

Figure 6. Respondents' awareness of the Network microsite at https://atecentral.net/msites/UECN.

For those that have visited the microsite, most go no further than the home page (Figure 7).
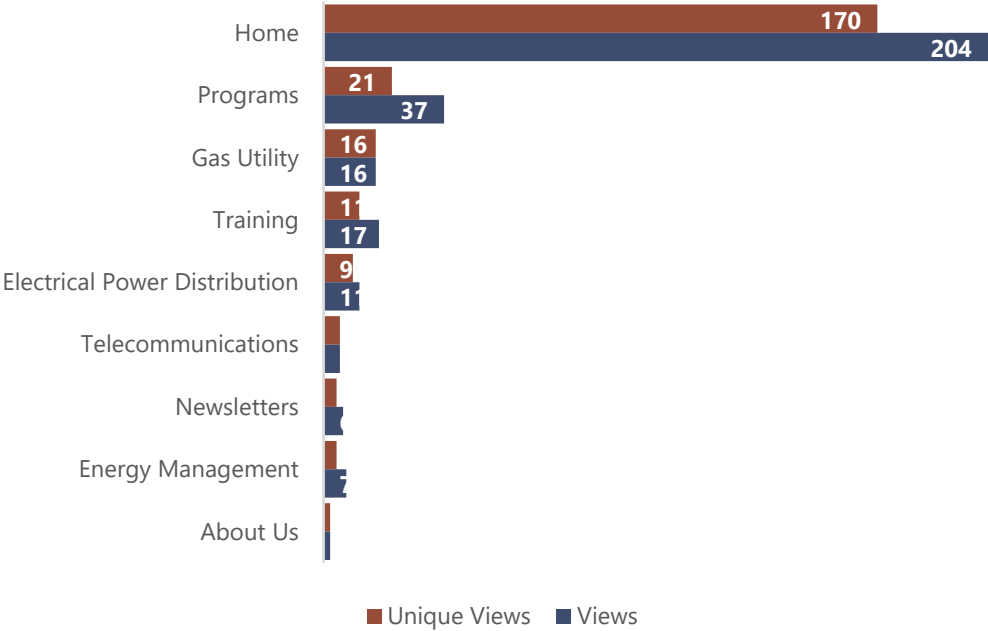
Figure 7. Views of microsite pages.

The college-based website received less traffic, capturing only 86 page views between July 2022 and February 2023.

Conclusions

Information and resources are being made available to the Network on a variety of topics, primarily generated by the project team through an ATE microsite and the Network newsletter. There is minimal engagement with these communication sources by Network members, the ATE community, and other interested individuals.

Evaluation Question #4: How and to what extent is the cross-sector Network ready to set and execute strategies, including implementing workforce issues solutions?

The UECN project aims to bring industry, academia, and workforce development entities together with a shared purpose that will lead to resource sharing and collaborations focused on addressing current and anticipated industry workforce and training needs through new programs and curriculum development. Network survey

results suggest that there are some connections among these organizations, but there are still opportunities to develop meaningful and mutually beneficial collaborations.

Network Characteristics

The Network survey provided some insight into the extent of connections between industry employers and educational institutions. One limitation of these data is that they do not include all current or potential Network member, only those that responded to the survey.

Among employers, the top five connected industry organizations named multiple educational institutions as connections (Table 4). Nine industry organizations indicated no known connections to educational institutions.

Industry Organization	# of connections	# of educational institutions that named employer as a connection	# of educational institutions that employer named as a connection
WPPI Energy	13	1	12
WEC Energy Group - We Energies & WPS	12	5	7
NATE: The Communications Infrastructure Contractors Association	9	0	9
Centuri Group, Inc	6	0	6
IBEW Local 2150	5	0	5

Table 4. Top five connected industry organizations.

Among educational institutions, NWTC continues to be the most highly connected among survey respondents (Table 5).

Educational Institution	# of connections	# employers that named institution as a connection	# employers that institution named as a connection
Northeast Wisconsin Technical College	20	20	0
Chippewa Valley Technical College	13	4	11
Heartland Community College	8	0	8
Danville Community College	7	0	7
Lakeshore Technical College	7	0	7
Walla Walla Community College	7	0	7

Table 5. Top six connected educational programs.

Organizations that are less-connected represent the potential of the Network and are opportunities for outreach, engagement, and recruiting. For organizations that were identified as partners by few respondents, these data will be useful for identifying where connections can be strengthened. Industry and educational respondents reported that they most frequently partner on employing graduates and through advisory boards (Figure 8).
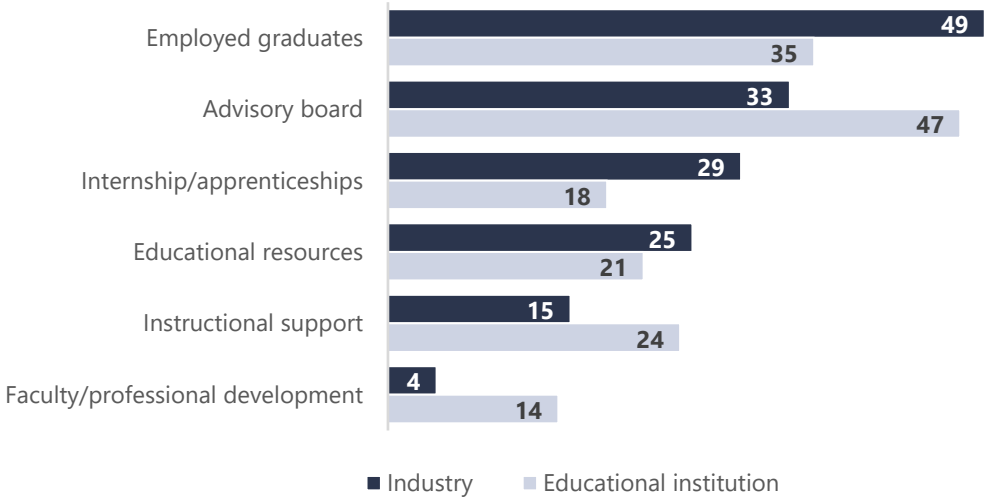
Figure 8. Frequency of education-industry partnership types.

The distribution of partnership activities differs by employer, suggesting the need to provide flexible options for engagement. Figure 9 provides an example of the varying emphases of those employers with the highest number of reported partnerships with educational institutions. While all these employers hired graduates, serve in advisory boards, and provide educational resources, there may be opportunities to develop additional areas of engagement that build on existing relationships.
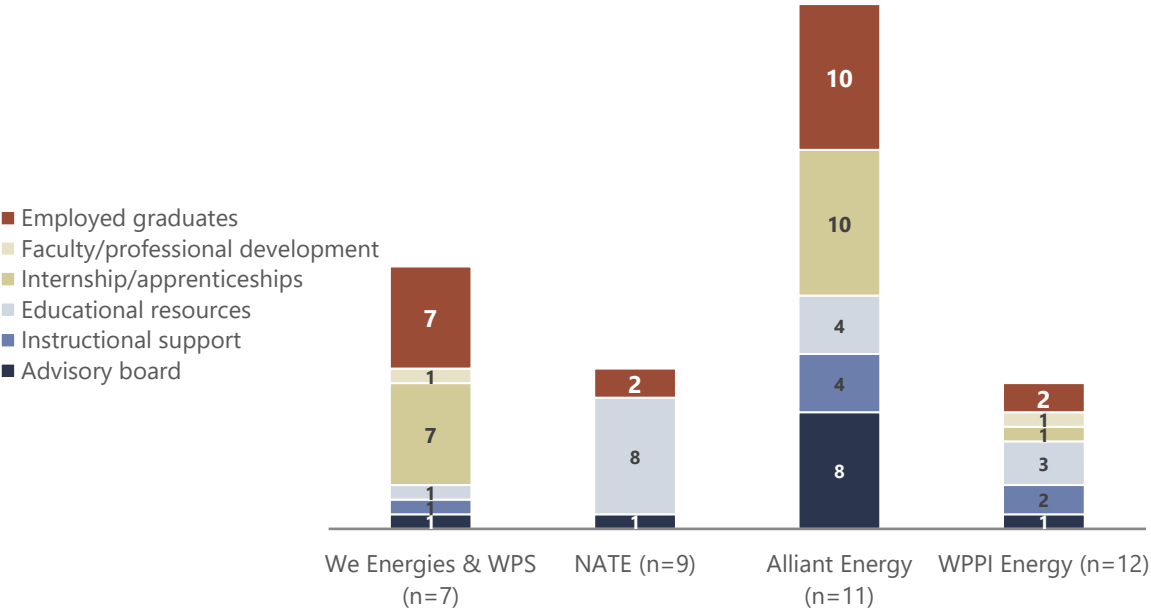
Figure 9. Example profiles of industry-reported partnership activities with educational institutions.

A key driver of this project is the understanding that qualified workers choose to work closer to their hometowns, which limits the ability to fill positions across a wider geography. Among Network survey respondents, Wisconsin and neighboring states had the greatest density of industry and educational institutions (Figure 10), which suggests that these are members who could be actively engaged as partners to address workforce development needs in the region.
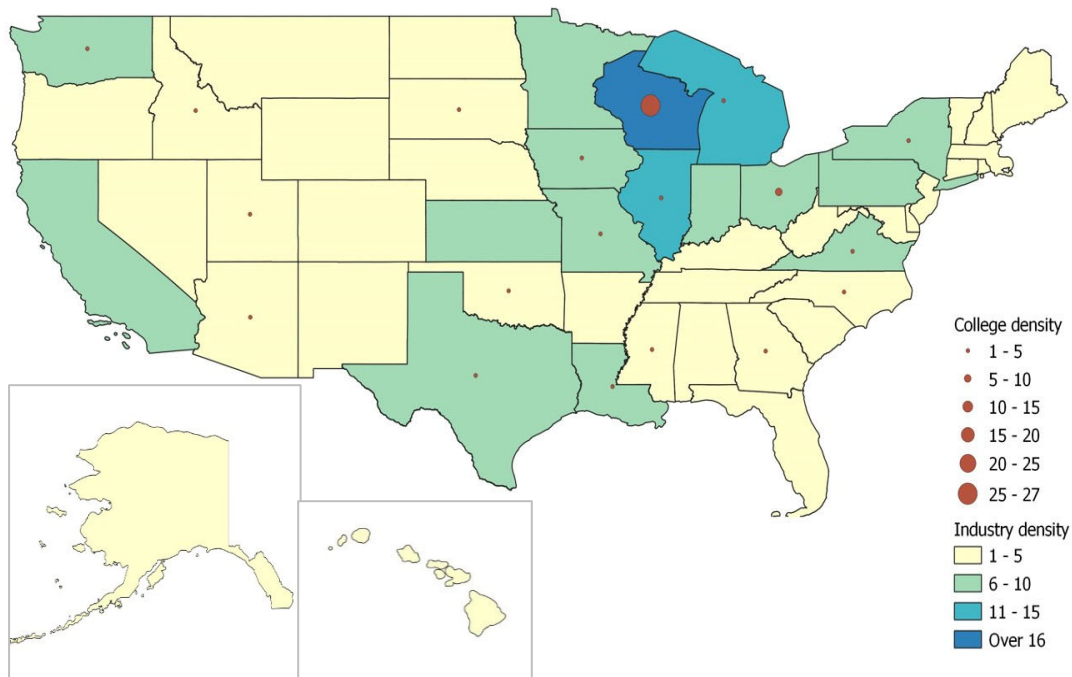
Figure 10. Location and density of industry and educational institutions.

Network Awareness

In addition to their connections to employers and community colleges, Network survey participants were asked to indicate their level of awareness of other Network resources, including energy-related centers and professional organizations. These organizations provide value to the Network through their information resources, research, and training opportunities. Most respondents were familiar with regional energy-related organizations, with awareness varying between industry organizations and educational institutions (Figure 11).
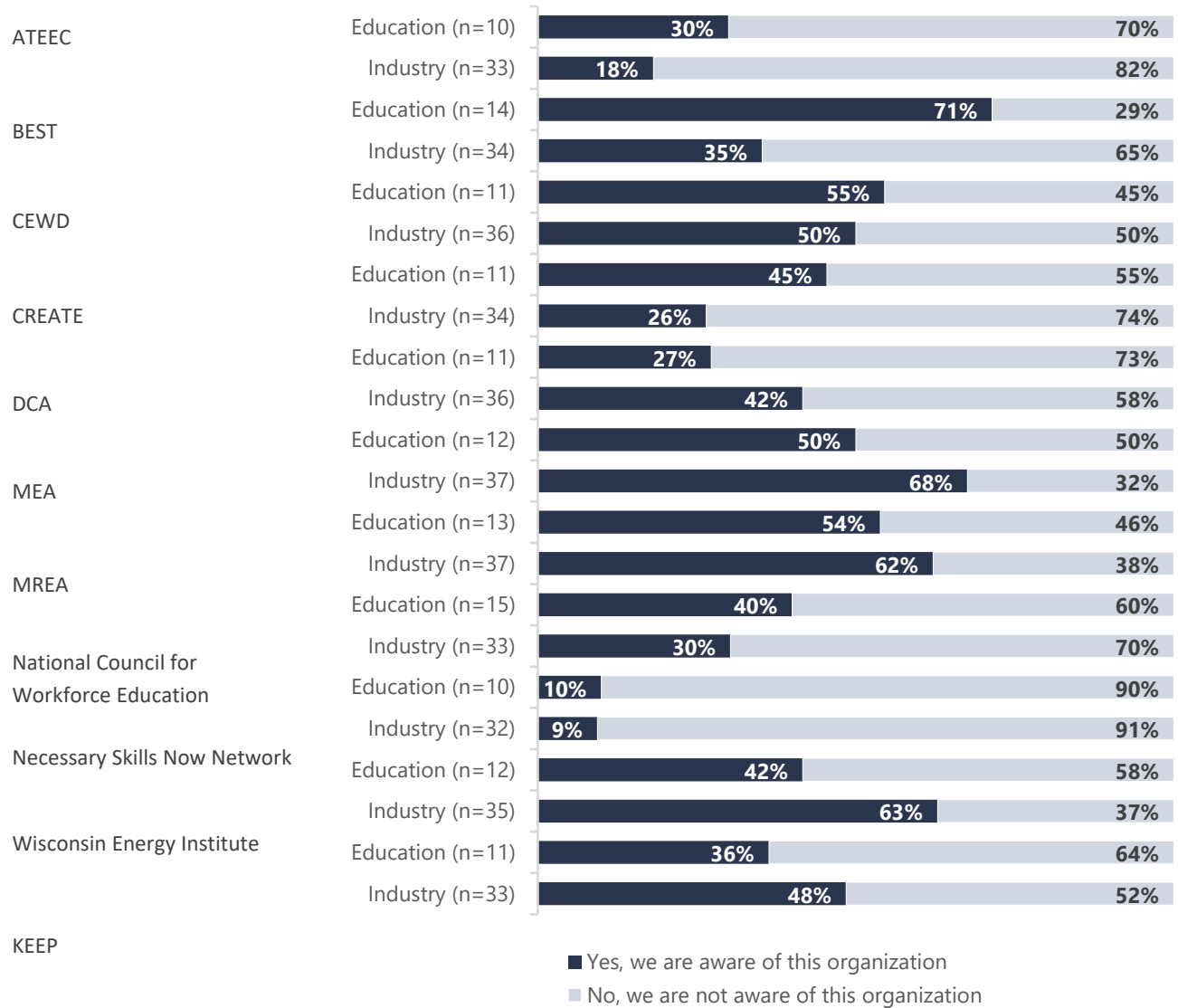
Figure 11. Respondents' awareness of energy-related centers and professional organizations.

Respondents reported that their organizations are most active with the Midwest Energy Association and the Midwest Renewable Energy Association (Figure 12), further emphasizing the regional nature of the current Network.
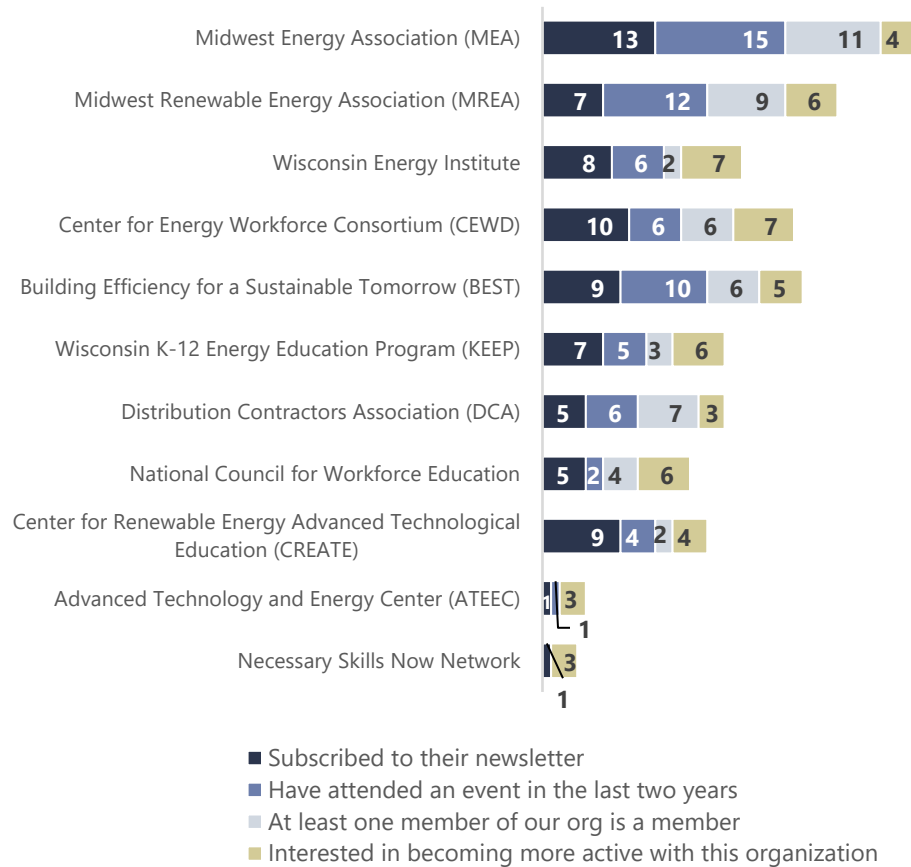
Figure 12. Respondent organizations' interactions with energy-related centers and professional organizations.

As noted in evaluation question #1, the project team used this information to connect respondents to the organizations in which they expressed an interest in becoming more active.

Collaborations

In addition to the multiple types of partnerships between industry organizations and higher education institutions identified above, collaborative opportunities emerged in Year 3 between NWTC and other organizations. One project team member is serving as an advisor on a Smart Building curriculum development grant and new academic programs have been started in two states because of Network activities. As an example of the important connection between industry and education, an employer contacted project team members to start a relevant educational program in their area and colleges have reached out to learn about starting Gas Utility and Power Distribution programs. NWTC is working with Frontier Community College as they build a Gas Utility program, and Interstate Renewable Energy (IRAC) has expressed interest in partnering on conference presentations or webinars. NWTC continues to work with material manufacturers, software vendors, hardware suppliers, installation contractors, broadband providers, and engineering companies to forge relationships and collaboration with the Telecommunications Program. A promising development is news that Southwest Technical College (Wisconsin) and College of the Canyons (California) are exchanging information about their energy management curriculum, reducing the centrality of NWTC in Network activity.

Conclusions

The project team has confirmed that there are connections among organizations in the Network, but there are still opportunities to develop meaningful and mutually beneficial collaborations, particularly in the Great Lakes and upper Midwest region. Examples of collaborations are developing among NWTC and other Network members.

SUMMARY AND RECOMMENDATIONS

The UECN is now a slowly expanding network of industry and educational partners as the project has leveraged multiple conferences and survey feedback information to continue their efforts to build the Network. The project team is still seeking increased involvement of entities from across the industry, academia, and workforce development sectors, but are challenged by the availability of potential industry and educational members to engage.

The Network's communication mechanisms have evolved but are not yet reaching a wide audience. Information and resources are being made available to the Network on a variety of topics, primarily generated by the project team through an ATE microsite and the Network newsletter. There is minimal engagement with these communication sources by Network members, the ATE community, and other interested individuals.

Community colleges in the Network are offering several programs in the utilities and energy field and are considering expanding offerings in solar energy and energy management. Employer feedback on the curriculum offered in the Wisconsin technical college system has provided useful information for engaging employer partners through advisory committees and modifying curricular content.

Some collaborative efforts are beginning to emerge between Network members around educational activities. There are still opportunities to develop meaningful and mutually beneficial collaborations, particularly in the Great Lakes and upper Midwest region.

The following recommendations are made as the project moves into its fourth year:

Leverage opportunities to create connections. The project team's expertise, experience, and leadership put them in an excellent position facilitate connections among industry and educational partners. As individuals and organizations return to in-person events, consider the opportunities that mutual conferences and convenings provide for gathering and connecting. As funds allow, sponsor potential partners' attendance, invite Network members and interested organizations to participate in networking meetings at these events, and identify potential presentation opportunities to share information about the Network and to highlight collaborations. Additionally, consider how to highlight collaborations and include information about ways to find partners in the Network newsletter and on the website and microsite. Finally, while many survey respondents are not considering adding apprenticeships, these are a prime and common opportunity for partnerships between industry and education that meet the needs of both parties. Consider highlighting this type of partnership and exemplars in the Network's communication and resources.

Continue to develop the Network's communication mechanisms. Communication and the ability to share resources is a vital part of the Network's role. With stable communication platforms in place, such as the newsletter, microsite, and campus website, the project should consider how it can strengthen use of these tools to disseminate information and build partnerships. With limited connections between the microsite and the website, the project team should consider how and what information flows between the multiple communication tools to reduce confusion and ensure that Network members and interested parties can find the information they need. In addition, to increase opportunities to extend the Network, consider adding a "share this newsletter" feature to communications and highlight the benefits of investing time in the Network.

Consider using the BILT model[4] to sustain curriculum development and employer engagement. The UECN project team is actively engaged with their multiple advisory committees, using these meetings of industry representatives, faculty, and students to review program updates; hear industry news; share Network information; and discuss curriculum modifications. As the project team continues to prioritize its role in expanding training opportunities, creating new programs, and developing curricula for high-demand energy-related jobs across the nation, the BILT model – originally established for the Information Technology industry – would have many benefits for the Network. Using a BILT model would provide benefits to both employers and educators, focusing attention on the curriculum, workforce needs, and industry trends.

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[4] https://connectedtech.org/business-industry-leadership-team/

APPENDIX A: Author Biographies

Kathleen Lis Dean, Ph.D., provides clients with insights from her extensive experience helping organizations connect strategy, evaluation, and learning for program improvement and impact. Prior to joining The Rucks Group, she spent 20 years in evaluation and strategic leadership roles at higher education, nonprofit, and philanthropic organizations. In these roles, she leveraged qualitative and quantitative data to support organizational effectiveness, outcomes assessment, accreditation, strategic planning, and continuous improvement. Dr. Dean utilizes a collaborative approach in her work. She also draws on her research about boundary-spanning teams, strategic thinking, and organizational learning to incorporate multiple perspectives and intentional practices to help clients achieve their goals. Dr. Dean earned a Ph.D. in higher education policy and leadership at the University of Maryland, and both a master's degree in education and a bachelor's degree in international relations at the University of Delaware.

Julia Siwierka, Ph.D., joined The Rucks Group in 2019. Dr. Siwierka's educational preparation focused on applied research methods within real-world broader systems and organizational settings. Her collaborative-focused approach to evaluation fits well with The Rucks Group's approach to evaluation. Dr. Siwierka has served as the evaluator for the Boys & Girls Clubs of South Central Kansas, assessing program impact for multiple sites and managing data collection efforts. She also worked on Kansas's System of Care evaluation funded by the U.S. Department of Health and Human Services 'Substance Abuse and Mental Health Services Administration. She is a member of the Society for Community Research in Action and OPEG. Dr. Siwierka earned a doctorate in community psychology at Wichita State University.

APPENDIX B: Logic Model

INPUTS	ACTIVITIES	OUTPUTS	SHORT-TERM OUTCOMES	MID-TERM OUTCOMES	LONG-TERM OUTCOMES
NWTC faculty subject-matter experts

Relationships from two previous NSF-funded projects

Past institutional history helping launch utility/energy programming around state and U.S.

Industry involvement via established NWTC Program Advisory Committees | Hire Project Coordinator to organize meetings, provide administrative support, for joint projects, create structure for information sharing, create Network web presence

Consult with NWTC Program Advisory Committees to develop plan for identifying and recruiting Network members
PI/Co-PIs travel to meet industry and academia connections and other stakeholder groups and/or to recruit members

Conduct contributions assessment of all members
Identify up to 10 individuals to serve as network facilitators and provide training to ensure meeting productivity. | Platform identified for group communication

Network webpage created

Member commitment of 20-30 core stakeholders representing national and regional employers, educators, and national organizations

List of peripheral stakeholders interested in participating in the Network once the strategic and action plans are established
Inventory of member expertise and list of skill gaps

Select network members complete facilitation training | Increased number of entities from industry, academic, and workforce development are part of the network

Increased involvement of entities from industry, academia, and workforce development | Network structures established

Increased connectivity and communication

Shared purpose | Network members are collaborating on research, training, and educational activities to address current and anticipated industry workforce and training needs through new programs and curriculum development. |
| | Conduct a SWOT Analysis

Facilitate Network visioning session(s)

Host strategic planning sessions

Develop an action plan | Completed SWOT analysis

Network vision statement documented

Three-year Strategic Plan

2023 Network Action Plan | | | |
| | Convene small workgroup to discuss framework/norms; draft structure and norms; Network members review/approve

Survey members on structure and member expectations; analyze results

PI/co-PIs implement established structure and reinforce norms/member roles and expectations | Group structure and norms documented

Plan for sustainability (e.g., member fee structure) | | | |

APPENDIX C: Project Team Listening Session

Implementation

1. What were your planned activities for Year 3?
2. What was most successful? Most challenging?
3. What opportunities emerged?

Curriculum

1. How have you used the results of the employer surveys?
2. What interactions did you have with Advisory Committees around curricular topics?
3. What, if any, curricular changes are planned? If so, what does that look like? How might this happen?

Network development and activity

1. What communication mechanisms are you using to share information and resources with the Network?
2. What collaborations and partnerships have emerged in the Network?

APPENDIX D: Electrical Power Distribution Employer Skills Survey

Q1 As part of the Utilities and Energy Coordination Network (Network) grant at Northeast Wisconsin Technical College, we are requesting your input regarding the skills needed by job candidates in the electrical power distribution industry. This survey will take approximately 10 minutes and will provide valuable information for the Network to understand the extent to which the existing curricula are meeting industry's needs. Your response will remain anonymous and confidential; responses will be aggregated for reporting. Thank you.

Q2 COMPUTER AND COMMUNICATION SKILLS

Please indicate how important each of the following computer and communication skills are to your company when hiring:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Manipulate files in a DOS environment					
Manipulate files in a Windows environment					
Create and edit documents in Microsoft Word					
Build and review spreadsheets in Microsoft Excel					
Design and write technical documents					

Q3 What, if any, computer and communication skills not listed previously is your organization looking for in an employee? _____

Q4 FIELD KNOWLEDGE AND SKILLS

Please indicate how important each of the following field concepts and skills is to your company when hiring:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important

Operate digger derrick trucks and bucket trucks

Operate underground distribution (UW) excavating equipment

Use hand and power tools

Tie knots and splice ropes

Set anchors

Pole climbing

Tree trimming

Perform pole top rescue

Perform bucket truck rescues

Perform self-rescue from bucket

Perform service hookup

Q5 FIELD KNOWLEDGE AND SKILLS (continued). Please indicate how important each of the following field concepts and skills is to your company when hiring:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Install and remove oil circuit reclosures (OCRs)					
Install and remove voltage regulators					
Install and remove capacitor bank					
Install and remove protective grounds					
Install and frame poles in single/three-phase system					
Install low pressure natural gas line					
Perform plastic pipe heat fusion procedures					
Wiring of three-phase bank configurations					
Design and construct single phase power distribution systems					
Design and construct three-phase power distribution systems					

Q6 FIELD KNOWLEDGE AND SKILLS (continued)

Please indicate how important each of the following field concepts and skills is to your company when hiring:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Install URD transformers/equipment					

Install single phase O.H. and URD transformer

Install three-phase O.H. and URD transformer/banks

Install a meter

Understand importance of traffic control

Understand importance of tailgate meetings

Commercial Driver's License (CDL)

Q7 For what field skills does your organization provide training opportunities? _____

Q8 CALCULATION AND MEASUREMENT SKILLS

Please indicate how important each of the following calculation and measurement skills is to your company when hiring:

	Not at all important	Slightly important	Moderately important	Very important	Extremely important
Use common meters to measure voltage, current, and resistance					
Calculate circuit values of voltage, current, resistance, and power for AC resistive circuits					
Solve values of voltage, current, impedance, power factor, and phase angles of AC reactive circuits					

Calculate voltage, current, impedance, power and power factor, and phase angle for resistive-inductive (R-L) and resistive-capacitive (R-C) series, resistive-inductive-capacitive (R-L-C) AC circuits, and parallel AC circuits.

Q9 For what calculation and measurement skills does your organization provide training opportunities? _____

Q10 PROFESSIONAL SKILLS
Please rank the following list of professional skills, in the order of importance for hiring in your organization.

_____ Computer skills: Microsoft Office word processing, spreadsheets, presentations
_____ Conflict resolution
_____ Customer service
_____ Diversity, equity, and inclusion; interaction with diverse populations
_____ Handling feedback
_____ Problem solving
_____ Team-building skills, teamwork
_____ Verbal and written communication skills

Q11 What, if any, other professional skills are important to your company when hiring? _____

Q12 For what professional skills does your organization provide training opportunities? _____

Q13 What other skills should colleges help students to develop to best prepare for roles in the electrical power distribution industry? _____

Q14 For what roles does your company hire job candidates that use the above competencies? _____

Q15 Is your company connected to any educational institutions from which you regularly hire employees and/or where current employees can pursue additional education or training?
o   Yes
o   No

Display Q16 if Q15 = Yes
Q16 With what educational institutions are you connected? _____

APPENDIX E: Energy Management Industry Employer Skills Survey

Introduction: As part of the Utilities and Energy Coordination Network (Network) grant at Northeast Wisconsin Technical College, we are requesting your input regarding the skills needed by job candidates in the energy management industry. This survey will take approximately 10 minutes and will provide valuable information for the Network to understand the extent to which the existing curricula are meeting industry's needs. Your response will remain anonymous and confidential; responses will be aggregated for reporting. Thank you.

Q1 TOOLS and SOFTWARE. Please indicate how important the ability to use each of the following tools and software is to your company when hiring:

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Architect's scale					
Digital multi-meter					
Cable continuity tester					
RJ45 continuity tester					
Wire cutter/stripper					
RETScreen					
eQuest					

Q2 Tools and software (continued)

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Temperature, relative humidity, and light data loggers					
Electric current transducer logger					
Infrared camera					
Blower door					
Building automation control software					
Energy Star's "Target Finder" software					

Energy Star's "Portfolio Manager" software

Building life cycle cost (BLCC) analysis software

Light modeling software

Microsoft Excel

Q3 What, if any, tools or software not listed previously is your organization looking for in an employee? _____

Q4 ANALYSIS SKILLS Please indicate how important the ability to conduct each of the following calculations and analyses is to your company when hiring:

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Energy performance of commercial buildings, including BIN methodology and degree-day					
Parametric studies of building energy use					
Utility bill analysis					
Identification of energy efficiency measures					
Energy savings and investment calculations					
Calculate life cycle cost analysis of energy projects					
Financial investment analysis of energy savings					
Calculate equipment efficiencies					
Building heating and cooling loads analysis					
Program building automation control strategies					
Analysis of energy savings based on energy control strategies					
Apply utility rates to utility consumption data					

Analyze Energy Use Intensity (EUI) data

Analyze commercial building energy end use profiles

Lighting design analysis (21)

Other: (please describe):

Q5 For what calculation and analysis skills does your organization provide training opportunities? _____

Q6 TECHNICAL SKILLS. Please indicate how important each of the following technical skills is to your company when hiring:

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Interpret construction drawings					
Interpret section, auxiliary views, and detail drawings					
Conduct a building audit					
Identify energy efficiency measures in new and existing buildings					
Develop strategies to operate HVACR systems efficiently					
Identify energy-saving automation control strategies					
Evaluate lighting systems, luminaries, and associated components					
Conduct a lighting audit					
Recommend energy-saving strategies for lighting systems					
Other: (please describe)					

Q7 For what technical skills does your organization provide training opportunities? _____

Q8 REPORTING. Please indicate how important each of the following reporting abilities is to your company when hiring:

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Generate reports from building simulation software					
Present energy simulation results to decision makers					
Audit report writing					
Present energy accounting information to decision makers					
Prepare written economic analysis reports					
Write a lighting energy audit report					

Q9 For what reporting skills does your organization provide training opportunities? _____

Q10 KNOWLEDGE. Please indicate how important each of the following knowledge areas is to your company when hiring:

	Not at all important (1)	Slightly important (2)	Moderately important (3)	Very important (4)	Extremely important (5)
Renewable energy technologies and sustainable design practices					
Building mechanical systems including ventilation and air handling, heating, cooling, and lighting component					
Network communication standards (i.e., OSI model, IP protocol, network signal transmission, media, physical and logical topologies, hardware, and typical building automation networks and sub-networks)					
Energy Star program					

Other (please describe):

Q11 PROFESSIONAL SKILLS. Please rank the following list of professional skills, in the order of importance for hiring in your organization.

_____ Computer skills: Microsoft Office word processing, spreadsheets, presentations

_____ Conflict resolution

_____ Customer service

_____ Diversity, equity, and inclusion; interaction with diverse populations

_____ Handling feedback

_____ Problem solving

_____ Team-building skills, teamwork

_____ Verbal and written communication skills

Q12 What, if any, other professional skills are important to your company when hiring? _____

Q13 For what professional skills does your organization provide training opportunities? _____

Q14 What other skills should colleges help students to develop to best prepare for roles in the energy management industry? _____

Q15 For what roles does your company hire job candidates that use the above competencies? _____

Q16 Is your company connected to any educational institutions from which you regularly hire employees and/or where current employees can pursue additional education or training?

o   Yes

o   No

Display Q17 if Q16 = Yes

Q17 With what educational institutions are you connected? _____

APPENDIX F: Utilities and Energy Coordination Network Survey

Start of Block: Intro

Q1.1 Thanks again for taking the time to complete this survey.

Start of Block: Group and organization

Q2.1 Which best describes the organization that you represent?
- o An employer or contractor in the Energy and Utilities Industry
- o A product supplier in the Energy and Utilities Industry
- o An educational institution

Q2.2 What is the name of the organization that you represent? _____

Q2.3 In what state(s) is your organization located? (select all that apply)

☐ Alabama		☐ Nevada
☐ Alaska		☐ New Hampshire
☐ Arizona		☐ New Jersey
☐ Arkansas		☐ New Mexico
☐ California		☐ New York
☐ Colorado		☐ North Carolina
☐ Connecticut		☐ North Dakota
☐ Delaware		☐ Ohio
☐ Florida		☐ Oklahoma
☐ Georgia		☐ Oregon
☐ Hawaii		☐ Pennsylvania
☐ Idaho		☐ Rhode Island
☐ Illinois		☐ South Carolina
☐ Indiana		☐ South Dakota
☐ Iowa		☐ Tennessee
☐ Kansas		☐ Texas
☐ Kentucky		☐ Utah
☐ Louisiana		☐ Vermont
☐ Maine		☐ Virginia
☐ Maryland		☐ Washington
☐ Massachusetts		☐ West Virginia
☐ Michigan		☐ Wisconsin
☐ Minnesota		☐ Wyoming
☐ Mississippi		
☐ Missouri		
☐ Montana		
☐ Nebraska		

Q2.4 For what entry-level positions do you hire? (please list below) _____

Q2.5 Could you also please provide your contact information to help ensure that we are connecting your responses to the right organization?

Name: _____

Email address: _____

Phone: _____

Start of Block: Employers

Q3.1 As an employer, does your organization have an Energy and Utilities-related connection with any post-secondary educational institutions in your region? This would include community colleges, technical career colleges, and four-year institutions. Connections might include serving on advisory boards, providing educational resources, offering internship/apprenticeship opportunities, and so on.

- o Yes
- o No

Skip To: End of Block if Q3.1 = No

Q3.2 Please list EVERY post-secondary educational institution with whom your organization has some type of Energy and Utilities-related connection.

1 _____

|

20 _____

Display Q3.3 if Q3.2 line 20 Is Not Empty

Q3.3 You listed 20 institutions. Could you have listed more?

- o Yes
- o No

Display Q3.4 if Q3.3 = Yes

Q3.4 Please list those institutions here. _____

Display Q3.5 if Q3.3 = Yes

Q3.5 Could we follow up with you at a later time to walk through this survey with the additional institutions? We would provide you with a list of the institutions you already mentioned.

- o Yes
- o No

Q3.6 During the past 12 months, what kinds of Energy and Utilities-related connection did your organization have with each of the educational institutions you listed? *(Select all that apply)*

	Advisory Board Service	Provided instruction or instructional support	Provided educational resources	Provided internship/ apprenticeship opportunities	Provided faculty/professional development	Employed their graduates	Other
1							
20							

Q3.7 Did you think of any additional institutions as you were completing the previous questions?
- o   Yes
- o   No

Q3.8 Please list those institutions here. _____

Q3.9 Could we follow up with you at a later time to walk through this survey with the additional institutions? We would provide you with a list of the institutions you already mentioned.
- o   Yes
- o   No

Start of Block: Educational institutions

Q4.1 Which of the following educational programs does your educational institution currently offer to students? (Select all that apply).
- ☐   Electrical Power Distribution / Lineman
- ☐   Gas Utility Construction & Service
- ☐   Energy Management
- ☐   Solar Energy
- ☐   Cell Tower / Telecommunications
- ☐   Apprenticeships in the Energy and Utilities Industry

Carry Forward Unselected Choices from Q4.1

Q4.2 Have you considered starting one or more of these educational programs?

	Yes	No
Electrical Power Distribution / Lineman		
Gas Utility Construction & Service		
Energy Management		
Solar Energy		
Cell Tower / Telecommunications		
Apprenticeships in the Energy and Utilities Industry		

Q4.3 As an educational institution, does your institution have any connections to any employers in the Energy and Utilities Industry? These connections might include members from these organizations on advisory boards connected with your institution, providing educational resources to your institution, offering internship/apprenticeship opportunities to your students, and so on.

- o Yes
- o No

Skip To: End of Block If Q4.3= No

Q4.4 Please list EVERY employer in the Energy and Utilities Industry with whom your educational institution has some type of connection.

1 _____

|

20 _____

Display Q4.5 if Q4.4 line 20 Is Not Empty

Q4.5 You listed 20 institutions. Could you have listed more?

- o Yes
- o No

Display Q4.6 if Q4.5 = Yes

Q4.6 Please list those institutions here. _____

Display Q4.7 if Q4.5 = Yes

Q4.7 Could we follow up with you at a later time to walk through this survey with the additional institutions? We would provide you with a list of the institutions you already mentioned.

- o Yes
- o No

Q4.8 During the past 12 months, what kinds of Energy and Utilities-related connections did your institution have with each of the employers you listed? *(Select all that apply)*

	Advisory Board Service	Provided instruction or instructional support	Provided educational resources	Provided internship/ apprenticeship opportunities	Provided faculty/professional development	Employed their graduates	Other
1							
20							

Display Q4.9 if Q4.4 line 20 Is Empty

Q4.9 Did you think of any additional institutions as you were completing the previous questions?
- o   Yes
- o   No

Display Q4.10 if Q4.9 = Yes

Q4.10 Please list those institutions here. _____

Display Q4.11 if Q4.9 = Yes

Q4.11 Could we follow up with you at a later time to walk through this survey with the additional institutions? We would provide you with a list of the institutions you already mentioned.
- o   Yes
- o   No

Start of Block: Employer and Educator awareness of ATE Centers or Professional Organizations

Q5.1 For each of the Energy and Utilities-related professional organizations below, please indicate if your organization is aware of it.

	Yes, we are aware of this organization	No, we are not aware of this organization
Advanced Technology Environmental and Energy Center (ATEEC)		
Building Efficiency for a Sustainable Tomorrow (BEST)		

Center for Energy Workforce Consortium (CEWD)

Center for Renewable Energy Advanced Technological Education
(CREATE)

Distribution Contractors Association (DCA)

Midwest Energy Association (MEA)

Midwest Renewable Energy Association (MREA)

National Council for Workforce Education

Necessary Skills Now Network

Wisconsin Energy Institute

Wisconsin K-12 Energy Education Program (KEEP)

Display Q5.2 if Q5.1 [Yes, we are aware of this organization] (Count) > 0

Carry Forward Selected Choices from Q5.1

Q5.2 Please select each statement that is true with regards to your organization's relationship with each of the following Energy and Utilities-related professional organizations.

	We are subscribed to this organization's newsletter	We have attended at least one of this organization's events in the last two years	At least one member of our entity is a member of this organization	We are interested in becoming more active with this organization	None are true
Advanced Technology Environmental and Energy Center (ATEEC)					
Building Efficiency for a Sustainable Tomorrow (BEST)					
Center for Energy Workforce Consortium (CEWD)					
Center for Renewable Energy Advanced Technological Education (CREATE)					
Distribution Contractors Association (DCA)					

Midwest Energy Association
(MEA)

Midwest Renewable Energy
Association (MREA)

National Council for Workforce
Education

Necessary Skills Now Network

Wisconsin Energy Institute

Wisconsin K-12 Energy
Education Program (KEEP)

Q33 Are there any additional Energy and Utilities-related professional organizations you are connected with that are not listed above?
- o   Yes
- o   No

Q5.3 Please list and describe the nature of the connection between your organization and any other Energy and Utilities-related professional organization.
1 _____
2 _____
3 _____
4 _____
5 _____

Q32 A need I see in the Energy and Utilities industry is:_____

Q5.4 Are you aware of the Utilities and Energy Coordination Network microsite at https://atecentral.net/msites/UECN? **(right click to open in a new tab)**
- o   Yes, I have visited the microsite
- o   Yes, but I have not visited the microsite
- o   No

Start of Block: Follow-up

Q6.1 We might like to follow up with you if we have any questions or want to learn more regarding your responses to this survey. Would you be willing to have a brief 10-15 minute follow-up conversation at some point?
- o   Yes
- o   No

APPENDIX G: Open-Ended Responses – Energy and Utility Industry Needs

Theme	Comments
Career awareness	• A better job must be done to improve the awareness of careers in these areas. • Awareness of career paths • Awareness, skilled talent • Increasing job awareness • Promoting career opportunities in the Energy industry
Education and training	• Educational programs for Engineering/Design of communication networks • Educational Studies in Technical areas such as Relay Technician, Equipment Specialist • More Natural Gas Training Programs, Better programs to get Gen Z into the industry • More specialized training on equipment many manufacturers do not provide training at a reasonable cost. • More training • More training for field personnel • Technical computer based skill sets for relays and testing of equipment • common knowledge of the equipment in the field and what it does.
Employee mindset	• Employees that want to travel. Also work weekends & Holidays. • Addressing the boy/man crisis in which men are relegated as expendable/disposable second-class citizens as compared to woman and having no options other than to work in one of the 'death professions' to earn a significant living. And us, who teach and train one of those professions, must retrain the brains of these young men to see their own value and worth and stop taking unnecessary risks as if they were being sent into combat to die anyway. • Gathering employees with a proper attitude for work and safety

Theme	Comments
Workforce development	- Developing new workforce - Ensuring enough craft labor in the pipeline to meet the industries long term needs. - Future workforce - Labor force; Experience and trust in digital platforms and electronic devices. - more employees - More staff - More trained personnel - more workers - More workforce development and awareness training at earlier school levels to remove stigma of skilled trades and encourage more interest. - More young people interested in the trades - People - Qualifies Energy Managers - The electric power industry is facing changes the likes of which it has not seen since its inception. Qualified technical teams will be in great demand in the future. As more and more systems switch to electricity as their energy source with the expectation that renewable energy source become the norm, reliability will become paramount. - Two year degree technical employees - Utilities to provide greater financial support to non-traditional utility careers - Workers with the desire to become skilled and show real concern for what they are doing. - Workforce development, training, infrastructure, navigating renewables and decarbonization, lots. - Younger line workers, solar techs, wind techs, more modern control standards and tools

Theme	Comments
Other	- A definitive plan to provide carbon free and reliable the sources of electricity - Qualified Instructors - Energy industry (legacy generation, renewable and storage) support for middle school and high school field trips to their locations. This goes beyond financial support & in WI can be modeled on what Manufacturing does for these groups of students - More meter and regulator schooling - Micro grid - Education about the use of battery storage - Stronger educational outreach and engagement for customers. The energy issues we face are complex, and we need better ways of engaging in meaningful conversation with people in and out of the industry. - Nothing comes to mind