

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.3.0a-3hka

Specific project objectives are to:

- 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.

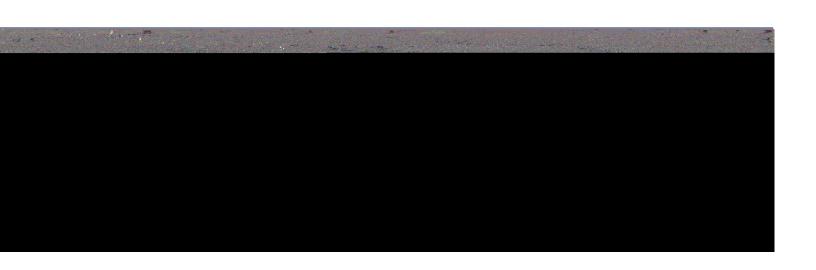
Evaluation Question #2: To what extent do the curricula offered by community colleges in the Network align with industry needs?

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.

Consider using the BILT model¹ 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

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

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 members². 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.

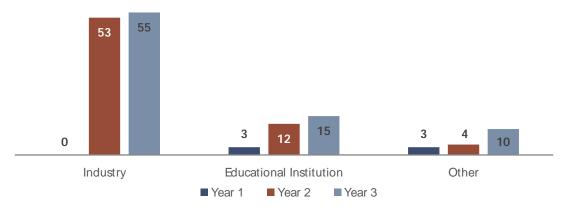


Figure 1. Network membership.

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).

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 |
| | | |





Conclusions

As the Network slowly expands, the project team is identifying outreach opportunities to connect with potential

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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 Effectivelyare 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).

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

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).

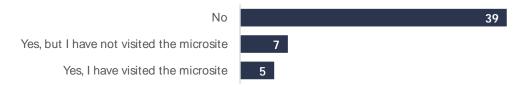


Figure 6. Respondents' awareness of the Network microsite at https://atecentral.net/msites/UECN.

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

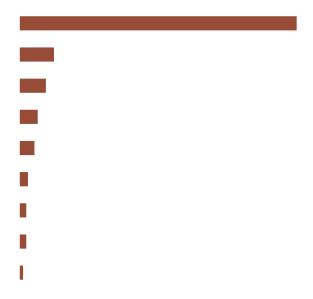


Figure 7. Views of microsite pages.

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

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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).

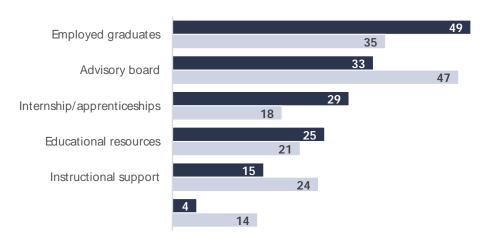


Figure 8. Frequency of education-industry partnership types.

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 oppo

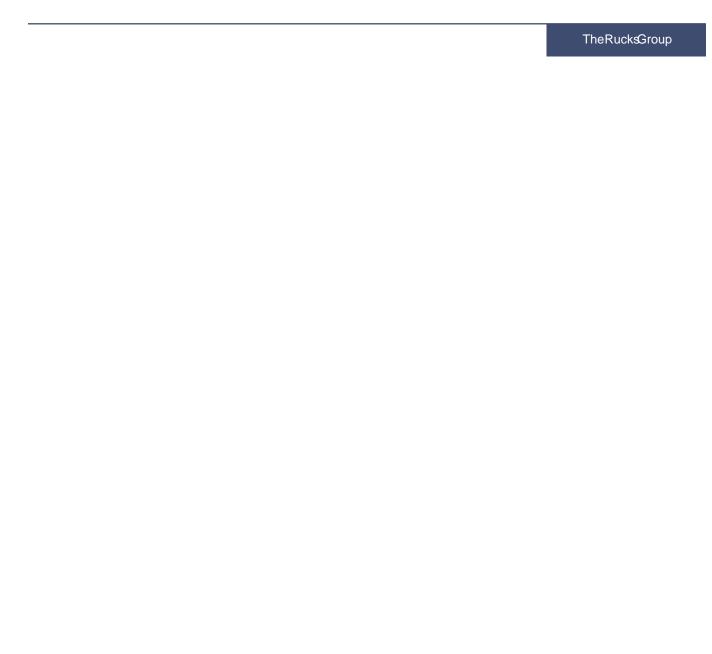


Figure 11. Respondents' awareness of energy-related centers and professional organizations.

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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 connemenLeveragTjmw[cT*cru-1.531Tw[T.1(de)-6.4(0l5 amon)Tj(xter)-6pe)-8se,tia)-4.r

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 model⁴shaities to exti(a)4.1duatry17p1 Te(a)4.1tTD.00ti(s,-2-1.53)41.0a00172(cua)4.1lty8(m(a)4.1duatry17p1 Te(a)4.1duatry17p1 Te(a)4.1duatry

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

APPENDIX C: Project Team Listening Session

Implementation

1.

APPENDIX D: Electrical Power Distribution Employer Skills Survey

Q1 As part of the Utilities and Energy Coordination Ne

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

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 an

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| | | |

Energy Star's "Portfolio Manager" software

Building life cycle cost (BLCC) analysis software

Light modeling software

Microsoft Excel

| Ω 3 | What | if any | tools or | software not | listed | previously | / is \ | our or | nanization | looking | for in | an em | nlov | ee? | |
|------------|---------|---------|------------|----------------|--------|------------|--------|---------|------------|----------|-----------|--------|------|-----|--|
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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 Slightly Moderately Very Extremely important (1) important (2) important (3) important (4) important (5)

Energy performance of commercial

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| | | |

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 | | | | | |

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

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

| Other (please describe): | |
|-------------------------------------|---|
| O11 DROFESSIONAL SKILLS Please rank | the following list of professional skills, in the order of importance for |
| QTTTTOTESSIONAL STILLS. Hease Talik | the following list of professional skills, in the order of importance for |
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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)



| Have you considered starting one of | or more of these ed | ducational program | s? | |
|-------------------------------------|---------------------|--------------------|----|--|
| | | Yes | | |
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Carry Forward All Choices - Entered Text from Q4.4

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 instructiona | Provided educational resources | Provided internship/ apprentices hip opportuniti es | Provided faculty/prof essional developme nt | 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 | Q4.9 Did you | u think of any | additional | institutions as | vou were com | pleting the | previous qu | uestions' |
|---|--------------|----------------|------------|-----------------|--------------|-------------|-------------|-----------|
|---|--------------|----------------|------------|-----------------|--------------|-------------|-------------|-----------|

- 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 (K⊞P) | |
| Q33 Are there any additional Energy that are not listed above? o Yes o No | gy and Utilities-related professional organizations you are connected with |
| Display Q5.3 if Q33 = Yes | |
| Q5.3 Please list and describe the na Utilities-related professional organ 1 | |
| Q32 A need I see in the Energy and | d Utilities industry is: |
| • | and Energy Coordination Network microsite CN? (right click to open in a new tab) |

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 |
| | x x | Awareness, skilled talent |

| Comments | |
|----------|---|
| х | Developing new workforce |
| х | Ensuring enough craft labor in the pipeline to meet the industries long |
| | term needs. |
| x | Future workforce |
| x | Labor force; Experience and trust in digital platforms and electronic |
| | devices. |
| x | more employees |
| х | More staff |
| х | More trained personnel |
| х | more workers |
| х | More workforce development and awareness training at earlier school |
| | levels to remove stigma of skilled trades and encourage more interest. |
| x | More young people interested in the trades |
| x | People |
| Х | Qualifies Energy Managers |
| Х | 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 |
| Х | 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. |
| Х | Workforce development, training, infrastructure, navigating renewables |
| | and decarbonization, lots. |
| x | Younger line workers, solar techs, wind techs, more modern control |
| | standards and tools |
| | x x x x x x x x x x x x x x |