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National Roundtable on the Workforce for a Green and Inclusive Economy:

Recommendations to the White House and Federal Agency Staff



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Access this report at:
https://theseedcenter.org/resource_center/national-roundtable-on-the-workforce-for-a-green-inclusive-economy-report/

Introduction and Audience

This report is intended for federal and state agency program designers and policymakers. This Roundtable and its expert members recommend program designers reach out to this Roundtable for additional key information that should be incorporated into workforce programs. The Roundtable's expertise could be particularly useful to the White House offices, the National Science Foundation and the Departments of Labor, Energy, Commerce, Education and others before and during federal program design. This document will also be useful for community colleges and other workforce education organizations.

As the ongoing global climate crisis threatens the habitability of the planet, causes [massive human suffering](#), and brings about major civilization disruptions, our country is acting to create the clean energy and green economy transition we urgently need.

Through discussions at the **National Roundtable on the Workforce for an Inclusive Green Economy**, attendees pinpointed necessary actions to prevent redundant or fragmented green workforce efforts. The outcomes provide insights into what government agencies, industry, unions, higher education institutions, and workforce agencies must do, independently and together, to address gaps in the green workforce structure and programs, effectively scale them up, and ultimately drive forward an inclusive, green economy.

The Roundtable is organized by the [National Council for Workforce Education](#) and its longstanding [Sustainability Education and Economic Development Center](#), and the [Higher Education Associations Sustainability Consortium](#) with support from the [Illinois Green Economy Network](#). Dr. Debra Rowe facilitates the Roundtable and related expert meetings.



Key Takeaways

1. Improve Employer - Education Connections :

Improve the connection between employer needs and workforce education by the following methods:

1.1. Convene national consortia and support an information distribution plan in each workforce area (e.g. construction, HVAC, manufacturing, transportation, energy) to accomplish two goals:

1.1.1. Help large green employers efficiently share their workforce needs with workforce educators and state agencies for better curricular input and job placements¹;

1.1.2. Help promote sustainability knowledge among large employers that have not yet incorporated green technologies and processes into their businesses and supply chains.

1.2. Collect and share best practices to scale green workforce successes within existing higher education, workforce organizations and union networks, and build better collaborations across these networks².

1.3. Gather and present compelling data about how new policies in clean energy deployment will result in employment for green energy workers throughout the relevant supply chains. This will help workforce organizations create and expand programs based on anticipated workforce needs instead of using only current and prior demand data³.

1.4. Provide education and support for business owners and employers to transition their products, service offerings and practices to clean energy solutions and tap into all available federal, state, local and utility incentives to drive clean energy industry growth (e.g. provide HVAC contractor training in heat pumps sizing, installation, profit analysis and marketing as replacement of oil and gas units).

1.5. Support the further development and distribution of existing recommendations for green businesses about how to effectively connect with community colleges and other workforce education organizations for curricular input, internships, and job placements. Include in these materials a quality process for continuous feedback and improvement.



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¹ Presently, large employers are inefficiently asked to sit on multiple local employer advisory boards (e.g. for colleges).

² See Appendix B 4.4, 4.5; For community colleges, build from the [Sustainability Education and Economic Development Center](#) of the National Council for Workforce Education including its Green Genome self-assessment tools for green workforce development.

³ Use this data with employer-led models to assure energy workforce training is relevant and actually results in placing trainees in high growth, sustainable jobs related to the training. Provide real time evaluation of workforce development initiatives, including internships programs, to measure job placement and retention metrics and track outcomes to drive quality and continuous improvement.



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2. Improve Workforce Curricula:

2.1. Facilitate alignment processes between employers, educators and certifying bodies regarding marketable green skills and competencies. Help employers provide input to worker and education credentialing bodies to update their content standards⁴.

2.2. Improve the process to create well-compensated internships as a critical part of workforce training.⁵ Connect interns with career pathway training and subsidized pay to solidify the transition from internship to career.

2.3. Provide larger-scale federal funding to create nationally shared curricular modules on clean energy and green practices for workforce degree and certificate programs. Build on existing quality curricula. Nationally shared curricula will prevent redundant efforts.

2.4. Provide increased funding to support broader access to professional development opportunities for faculty. Leverage existing resources and platforms to widely publicize, distribute, and cross-market training materials and professional development opportunities supported by various federal agencies and programs (e.g. DOL Apprenticeship Centers of Excellence, NSF Advanced Technological Education Centers, DOE Workforce initiatives, etc.)

2.5. Connect government funding of labs and tuition to development of updated and new education programs in clean energy, energy efficiency and renewable energies (EERE).

2.6. Enhance workforce preparation by supporting university programs where students learn within community-based projects (e.g. [EPIC-N](#)).

3. Increase Workforce Enrollment and Participation

Provide the numbers of workers needed for the clean energy and decarbonization transition.

3.1. Support a national education campaign focused on the value of technical education and careers to counter the status disparity between Career Technical Education and four year university degrees. Campaigns should target high school students, parents and potential adult students to rebrand the image of technicians as heroes in the green economy. Integrate technicians' stories into STEM education, and educate students and parents about the value of a technical education and careers.

⁴ See Appendix B 8.1 and 8.2 for more details

⁵ Provide "microcredentials" for programs to facilitate and "on ramp" within a shorter time frame, with advancement opportunities for each "microcredential". See Appendix B 4.3 for more details

- 3.2.** Provide student grants, loan assistance, GI bill, and other aid for short term education and training programs of 1 year or less that lead quickly to gainful employment.
- 3.3.** Create a workforce that reflects the country's diversity by intentionally integrating diversity, equity and inclusion into the design of every educational effort. This includes the meaningful outreach to and engagement of people who self-identify as ethnic and racial minorities, women, LGBTQIA, disabled, veterans, formerly incarcerated and other groups underrepresented in the green energy economy.
- 3.4.** Support effective outreach to underrepresented and economically disadvantaged communities with the offering of scholarships, wrap-around services, mentoring programs and cohort internships.
- 3.5.** Support increasing the capacity of community based organizations to implement outreach to potential workers and community members for engagement in local and regional climate solutions.
- 3.6.** Redirect economic development funds to clean energy deployment with training for minority and underrepresented contractors and subcontractors, and with an emphasis on community wealth-building.
- 3.7.** Expand funding targeted to diverse communities to include empowerment and workforce education to help drive the transition to clean energy.
- 3.8.** Create an app or game that appeals to young people with career pathways, role models and educational pathways information including how skills can transfer to a variety of technical careers.

4. Fix Market Workforce Demand via Governmental Policy and Program Changes

Roundtable members expressed strong support for the efforts by the Biden administration to correct outdated policies and support science-based targets for urgently needed climate and clean energy solutions through legislative and executive actions. The following suggestions, gleaned from lessons learned in previous governmental initiatives, confirm and can enhance these efforts:

- 4.1.** Support incentives to hire BIPOC and other historically underrepresented and economically disadvantaged groups
- 4.2.** Integrate the deployment of clean energy into all economic development and infrastructure fund spending.
- 4.3.** Facilitate streamlined permitting as well as increasing and upskilling building inspectors to assure quality implementation of systems. Provide and support adoption of model building energy standards to reach emission reductions targets.

4.4. Support the use of new utility revenue models to increase energy efficiency and renewable energies (EERE) and facilitate community owned RE. Provide model utility regulations that support net zero implementation and tie it to city and state funding.

4.5. Support implementation of EERE on low income and moderate housing (e.g. NYSERDA model).

4.6. Provide on-bill financing, PACE and other financing incentives and tax credits to provide a net positive cash flow to consumers switching from fossil fuels to EERE to ensure market demand.

4.7. Work with clean energy industry associations to assess and provide necessary the policies and incentives (e.g. support the HOPE for HOMES Act for reduced emissions and improved health in buildings and work with HVAC contractor associations to provide transition subsidies for HVAC contractors).

4.8. Work with the National Association of Realtors and MLS listing industries to include the energy efficiency and renewable energy building characteristics (e.g. Energy Home Energy Score) on MLS listings.



Workforce Gaps, Additional Comments and Recommendations

Appendix A provides a list of Workforce System Gaps. Appendix B provides additional information on the Roundtable's comments and recommendations. Appendix C provides additional useful documents.

Next Steps

Now is a crucial time to drive the efforts for a green and inclusive economy. Roundtable participants recognized that their expertise could help improve federal and state policies and program designs. As noted by attendee Ken Walz, "The value of this report will result from the communication of these themes to policy and decision makers at the State and Federal level." Attendee Laure-Jeanne Davignon called the work of the Roundtable, "Not just worthwhile, but critical."

The National Roundtable will continue to make efforts to ensure that the depth of experience and knowledge of our Roundtable experts is embedded into upcoming green workforce policies and programs by responding to requests from governmental agencies.

Appendix A: Green Workforce System Gaps

The National Roundtable discussed gaps in the existing green workforce system and solutions that address these specific gaps in federal and state program design. Below, we have detailed the nine primary areas of the green workforce system that require improvement. Appendix B addresses recommendations for each of these gap areas. The US should take steps to develop the following areas:

1. **Equity and Diversity:** Increased focus on equity, access, inclusion and amplification for underserved community members as workers, business owners, and as workforce educators.
2. **Curricular Input:** More efficient and effective input on green workforce education needs from businesses and employers.
3. **Curricular Breadth:** Improve processes for curricular updates that integrate green and sustainability topics across multiple disciplines, programs, and levels of education, in grades 7-12 and throughout higher education.

4. **Workforce Education Structures:** More availability of effective workforce training structures such as hands-on training, apprenticeships, well-paid internships and boot camps.
5. **Job Placements:** Stronger processes to facilitate connections to green businesses for job placements.
6. **Career Advising:** Improve career advising that addresses the shortage of quality green workers in a variety of areas such as HVAC and construction, the “status gap for technicians”, and the gender disparity in technician training.
7. **Professional development:** Scale up professional development and diversity, equity and inclusion training for cultural competency for educators.
8. **Certifications:** Facilitate the update of industry certifications and educational certifications with green content for all sectors.
9. **Wages and Market Demand:** Improve policies to assure liveable wages for green jobs and robust markets for the green economy.

Appendix B: Further Recommendations and Reflections

In addition to the Key Takeaways above, the following can be utilized to address each gap.

1. Equity and Diversity:

- 1.1. Communities must be included in conversations about the design of programs in order for them to be effective and lasting beyond the initial funding. Trusted community partners are often critical to the community acceptance of energy and sustainability programs. (Sustainability programs are often presented poorly to underserved communities, in ways that do not center the community’s needs and abilities.)
- 1.2. Programs must have ease of access. Efforts to improve equity and reduce risk sometimes lead to longer applications and barriers to accessing capital. Address barriers to students pursuing a technical education, including provision of wrap-around services.
- 1.3. Provide beginning and mid-career mentoring programs for those in the BIPOC, historically underrepresented and economically disadvantaged communities.



Image provided by Green City Force

2. Curricular Input:

2.1. Identify and share best practices to coordinate higher education, industry training and on the job work experience. Utilize the lessons learned from the previous round of ARRA funding and the [Partnerships for Opportunity and Workforce and Economic Revitalization](#) initiative for negatively impacted communities (e.g. NYSEERDA learned to not give out training funds unless there is a defined forecasted skills gap from employers; include career pathway training within on the job training.)

2.2. Reduce the duplication of effort/overlap between higher education and industry training (e.g. one college opted to not create a stand-alone solar program because the local companies are hiring the electrical graduates and training them to be solar technicians).

3. Curricular Breadth:

3.1. Should support the development and wide scale distribution of curricular modules and build on high quality, existing curricula to reduce duplicative efforts.

3.2. Curricular modules should be used in all CTE programs (e.g. HVAC, construction, electrical, energy, clean manufacturing, automotive, pre-engineering) to expedite and standardize the curricular updating process. A similar sharing of curricular modules should be supported across universities (e.g. architecture, engineering, business, general education core courses).

3.3. Where possible, instructional materials should be aligned with Next Generation Science Standards and updated DOE Energy Literacy Standards to allow for easy adoption into the high school curriculum.

3.4. Coordinate with publishers for inclusion of modules in textbooks; build on other textbook initiatives to include sustainability and clean energy materials (e.g. [Disciplinary Associations Network for Sustainability](#), [UN and International Association of Publishers SDG pledge](#)).

3.5. Government-funded curricula (e.g. DOE, NSF, DOL) should be user friendly, accompanied by virtual professional development, and distributed to all workforce programs, community colleges and universities. The distribution of government supported curricular materials can be improved substantially. Whenever possible, instructional materials should be published in an editable, copyright-free, open source format so that teachers and training providers can adapt and modify it to fit their curriculum.

3.6. Build the capacity of cities, communities, nonprofits and businesses to implement their climate plans while teaching students skills. Promote programs that connect students and graduates to assist with community level projects (e.g. Civilian Climate Corp, EPIC-N, Projects That Matter).

3.7. Use introductory curricular modules in high school career advising. In addition, use these modules in developmental and ESL programs to educate underskilled adults about careers and opportunities.



Image provided by Green City Force

4. Workforce Education Structures:

- 4.1.** Invest in quality virtual reality training to address shortage of local lab training facilities taking lessons from what Clemson, MIT, Accenture, Facebook and Microsoft are doing.
- 4.2.** Focus on revitalizing and learning from hands-on programs that were cut off due to COVID-19 and before that, the 2008 crash. Support full utilization of existing training facilities, particularly in disadvantaged areas.
- 4.3.** Internships are a critical part of workforce training but can leave interns adrift after 12 weeks. Provide “microcredentials” for programs to facilitate an “on ramp” within a shorter time frame. Career pathway training and subsidized pay would solidify the transition from internship to career. Offer boot camps, designed as a short-term training, for people pursuing careers in clean energy.
- 4.4.** Identify and share good models of collaboration between unions and community colleges. Highlight examples where apprenticeships accept community college technical degrees and certificates toward journey level status, and the college grants credit for apprenticeship training towards related CTE degrees and certificates. Emphasize the potential for community colleges and unions to benefit from collaboration on hands-on training, and advanced cognitive skill development needed to apply clean energy and advanced energy efficiency technologies.
- 4.5.** Identify and share good models of quality hands-on, in-depth training so that errors are not made in the real world. For example, unions provide five years of training installers towards certification. If you don’t have a properly installed system, energy is wasted.

5. Job Placements:

- 5.1. Identify and share efficient and effective job placement processes with both educational organizations and employers.
- 5.2. Connect funds for workforce education to quality job placement processes and include a required process for continuous feedback and improvement.

6. Career Advising:

- 6.1. Update career advising materials. Integrate green careers into preexisting online models that help students perform self-evaluations for career choices and systematically encourage students explore all options with the support of career counselors.
- 6.2. Embed exposure to green careers into required courses. Incorporate green energy and real-world applications into mathematics instruction via initiatives with math disciplinary societies and textbook publishers. Create instructional exercises that use clean energy examples and real world data for student problem solving and analysis instead of generic, abstract data sets. This is also important for other disciplines such as computer science, finance, economics and CTE fields. Build upon existing work (e.g. calculus textbook on climate change, the [Sustainability Improves Student Learning](#) FIPSE project).

7. Professional Development:

- 7.1. Increase professional development opportunities for career counselors in green careers and pathways.
- 7.2. Fund professional development for faculty nationally to utilize updated curricula and hands-on skills training (in-person and virtual).
- 7.3. Fund diversity, equity and inclusion training to help professionals more successfully engage people from diverse communities.



8. Certifications:

8.1. Encourage and fund industry associations and certification organizations to include new skills for green and sustainability in a fast track process. Build upon completed work (e.g. [Green and Sustainability CTE Skills Statements](#) in career clusters) and support related professional development for educators.

8.2. Facilitate to update industry and educational certifications with green content for all sectors, including the following: transportation automotive (ASE NATEF), engineering (ABET), HVAC (ANSI 17024, HVAC Excellence), new construction and building retrofitting, energy production, manufacturing, agriculture, hospitality and tourism, business management. Integrate in new national certifications targeted for reducing greenhouse gas emissions (e.g. NSF BEST Center for High Performance Building Operations Technical-Professionals).



9. Wages and Market Demand:

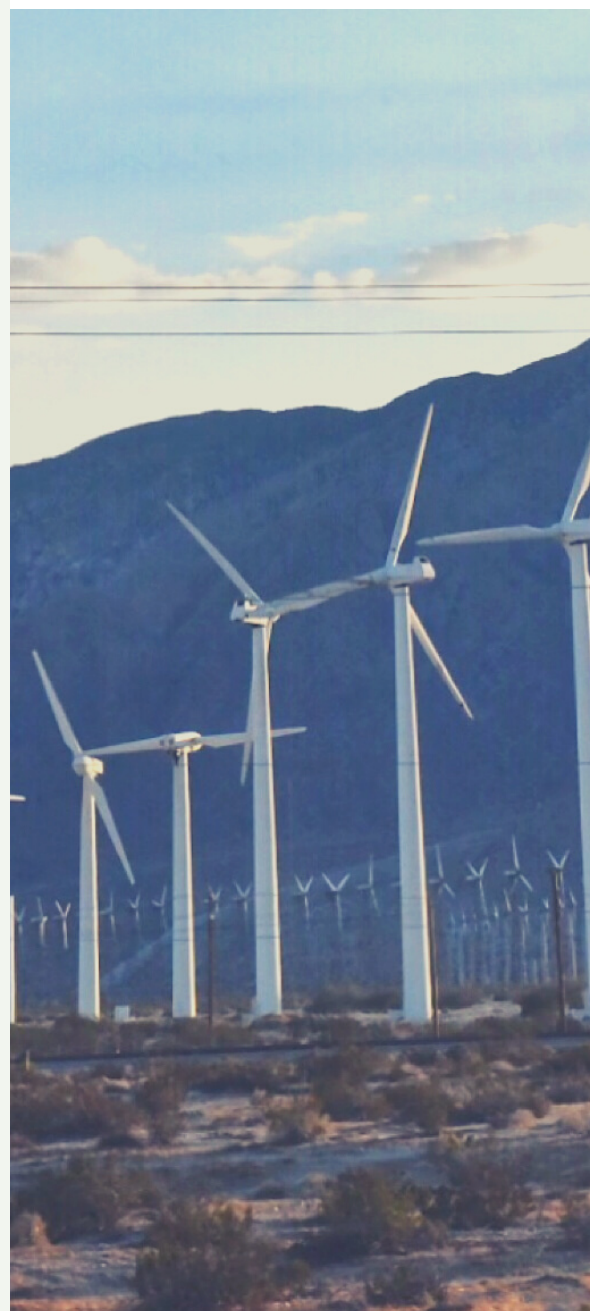
9.1. Structure the economy to ensure green workforce jobs provide a liveable wage and adhere to the Davis-Bacon Act's prevailing wage requirements (e.g. energy tax credits dependent on liveable wages).

9.2. Reduce the subsidies given to fossil fuels and facilitate permitting and financing of renewable energy systems, energy efficiency and other decarbonization technologies, products and processes.

9.3. Make the well-documented health and safety benefits of clean energy real and relevant to businesses, governments, and the average consumer to help drive the growth of the industry and attract funding from nontraditional sources, such as the healthcare industry, university researchers, the U.S. Department of Health and Human Services and others.

Appendix C: Additional Useful Resources

- [UNEP and USPESD's Global Guidance for Education on Green Jobs](#)
- [Advance CTE's Career Ready Practices](#)
- [Advance CTE's Green and Sustainability Skills Statements](#)
- [Advance CTE's Sector Fact Sheet](#) for use with career counselors.
- [Green and Sustainability Jobs: Career Resources](#)
- [Midwest Clean Energy Careers Resource Hub](#) for career advising.
- [Change the Chamber's Report on how the Green Energy Transition Can Create Thousands of Good-paying Jobs](#)
- [Academic Analysis - Changes Needed in Climate Finance](#)
- [Colorado Sheet Metal Industry's Choose Bigger Program](#), re: HVAC Union training.
- [Incorporating Green Economy Job Growth Areas into Curricula - Toolkit and Resources](#)
- [Diversity Best Practices Guide for the Solar Industry](#)
- [World Bank-UNEP Joint Webinar Report and Resources on Connecting Sustainable Energy Business with Education](#)



To cite this report:

National Roundtable on the Workforce for a Green and Inclusive Economy. 2021. National Roundtable on the Workforce for a Green and Inclusive Economy: Recommendation to the White House and Federal Agency Staff. Washington DC. https://theseedcenter.org/resource_center/national-roundtable-on-the-workforce-for-a-green-inclusive-economy-report/