



Partnership for Nuclear Energy
Strengthening America's Global Leadership in Nuclear Energy



Nuclear Energy Academic Roadmap

Guiding Your Nuclear Educational Journey

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LETTER FROM MEGHAN MILLWOOD, ORAU President and CEO

It is a pleasure to introduce the Partnership for Nuclear Energy (PNE) Nuclear Energy Academic Roadmap (NEAR), a collaborative effort aimed at strengthening the future of nuclear education and workforce capacity building in the United States. Led by the ORAU STEM Accelerator, this roadmap represents the combined expertise and dedication of educators, industry leaders, government agencies and other stakeholders working together to address one of the most pressing challenges facing the nuclear energy sector – building a skilled and resilient workforce.

The nuclear energy sector is at a turning point, with incredible opportunities to grow and innovate. The demand for clean, reliable energy is on the rise. Building a strong pipeline of skilled professionals able to meet this demand is more important than ever. The NEAR outlines how we can support students, educators and professionals at every stage of their journey, ensuring they have the tools and resources needed to succeed. By fostering collaboration across schools, universities, industries, non-profit organizations and communities, this roadmap helps pave the way to meet current and future workforce challenges.

I want to express my gratitude to everyone who contributed to the development of the NEAR. Your commitment to collaboration and innovation has been instrumental in creating a roadmap that will guide the development of the next generation of nuclear professionals. ORAU is proud to support this initiative, and I'm excited to see how it will shape the future of nuclear energy, laying the foundation for a workforce capable of driving innovation and ensuring the long-term success of nuclear energy in the United States.

A handwritten signature in black ink that reads "Meghan Millwood".

MEGHAN MILLWOOD
President and CEO, ORAU



LETTER FROM MICHELLE GOODSON, OSA Director

On behalf of ORAU and the ORAU STEM Accelerator, I want to express my deepest gratitude to the exceptional team of collaborators who made the Nuclear Energy Academic Roadmap possible. Special thanks go to Lori Brady at the Nuclear Energy Institute and Olivia Blackmon, the former director of the ORAU STEM Accelerator, for the initial vision and support, and to lead authors Sue Magidson and Lyn Potter for their dedication and expertise in bringing this effort to life. Thank you to the many contributors and advisors who brought diverse perspectives and deep knowledge to the project. Coming from academic institutions, industry organizations and government agencies, this group's collective efforts enriched the roadmap and ensured it reflects the multifaceted needs of the nuclear energy sector.

This collaboration exemplifies the power of teamwork and shared purpose. By bringing together voices from across academia, industry and government, we've created a document that is not only comprehensive but also uniquely positioned to address challenges and opportunities in nuclear education and workforce development. To everyone who contributed their time, insights, and passion – thank you for helping to shape a resource that will guide the future of nuclear energy in the United States.

A handwritten signature in black ink that reads "Michelle Goodson". The script is fluid and cursive.

MICHELLE GOODSON, SHRM-SCP
Director, ORAU STEM Accelerator

INTRODUCTION

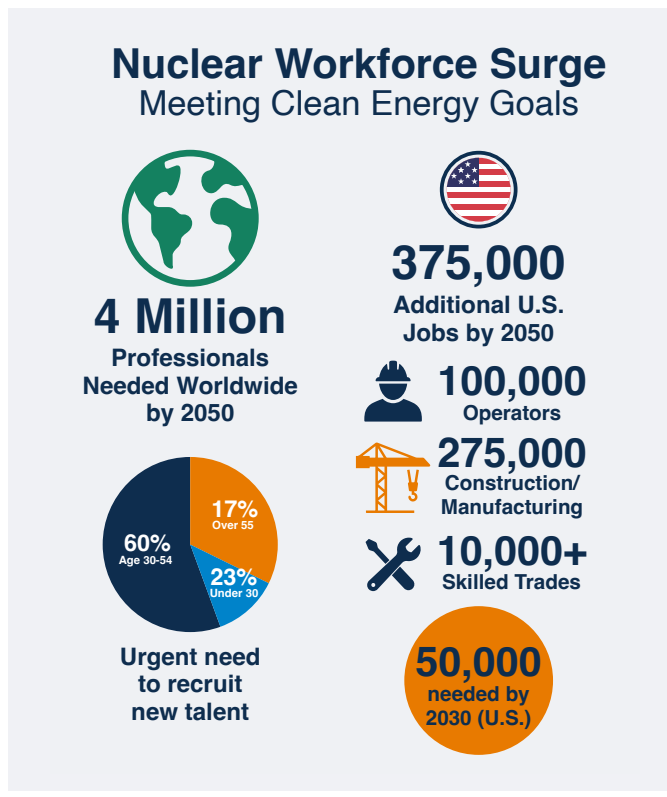
The U.S. nuclear energy sector is at a crucial juncture, presenting exciting opportunities to grow and strengthen its workforce. As the demand for carbon-free, reliable energy continues to grow, the need to attract and retain highly skilled workers becomes increasingly important. Addressing this challenge is essential to achieving a clean energy future and supporting the deployment of advanced reactors, modernization of regulatory frameworks, licensing improvements, and a resilient supply chain. To meet future energy needs, the U.S. Department of Energy (DOE) projects the sector will require over 375,000 skilled workers by 2050 to sustain ongoing nuclear power operations and continue next-generation reactor deployment.¹ Further critical needs for skilled nuclear workers are in the national security and environmental management sectors, which draw from the same workforce as nuclear energy. Additionally, the transition of an aging academic workforce underscores the importance of cultivating new talent and effectively transferring knowledge to the next generation.

Recognizing these needs, key industry organizations are coming together to develop proactive solutions. One such initiative is the Nuclear Energy Academic Roadmap (NEAR), which aims to strengthen pathways into nuclear careers, enhance educational infrastructure, and inspire a new generation of leaders in the field.

METHODOLOGY

To tackle the shortage of nuclear workers, workshops were held to brainstorm ideas on how to improve educational programs from early childhood education to higher education. These workshops aimed to find the best approaches to improve these programs. Goals included enhancing career awareness and pipeline development, assessing the financial support and other resources that academic institutions need, and optimizing academic resources including exploring new ideas to enrich education.

A total of 144 academic institutions participated, including 17 Kindergarten to 12th Grade (K-12) schools, 63 technical and community colleges, and 64 four-year institutions. Contributors were invited to participate based on their knowledge and interest in nuclear educational programs. They joined virtual sessions and used an online tool to provide feedback. Over 800 comments were collected and summarized by the ORAU Assessment and Evaluation team. The responses were categorized, themes identified, and subthemes elaborated through summaries, new ideas, and quotes from respondents. This information was documented in a qualitative analysis.



Graphic Credit: Lyn Potter and Nuclear News

The qualitative analysis helped create a framework that shaped the organization and structure of the roadmap. Four strategic priorities emerged: Enhancing Nuclear Career Awareness; Supporting Pipeline and Pathway Development; Identifying Financial Support, Resources and Programs; and Optimizing Academic Resources Through Collaboration. A description of each is below.

- **Enhancing Nuclear Career Awareness** informs people about various jobs, career paths, and earning potential. It aids students in choosing careers in the nuclear industry and helps employees find growth opportunities.
- **Supporting Pipeline and Pathway Development** aims to grow the nuclear workforce by linking individuals to education training and career opportunities that support advancement at every stage.
- **Identifying Financial Support, Resources, and Programs** ensures that financial barriers do not hinder students from pursuing careers in the nuclear field and guarantees the continuity and effectiveness of educational programs.
- **Optimizing Academic Resources Through Collaboration** involves sharing adaptable educational coursework and tools, equipment, and facilities among learning institutions to save time and money while helping to ensure consistent learning experiences across various educational settings.

Initially, these priorities were assigned to six groups: K-12, Vocational-Technical Schools, Community Colleges, Four-year Academic Institutions, Advanced Studies, and Professional Development. Based on this structure, a summary or synopsis was prepared to outline the main messages and recommendations for each group within each priority. Upon further review, it was observed that several of the recommendations for Vocational-Technical Schools and Community Colleges were nearly identical, as were the recommendations for Four-year Academic Institutions and Advanced Studies. Therefore, a decision was made to merge the Vocational-Technical Schools with Community Colleges and Four-year Academic Institutions with Advanced Studies, reducing the number of groups to four.



THE NUCLEAR ENERGY ACADEMIC ROADMAP: A CONTINUOUS JOURNEY



This roadmap represents a journey that begins with a child's first exposure to science concepts and continues through decades of professional growth. Each educational level builds upon the previous while preparing learners for the next phase, creating a seamless progression from curiosity to expertise. Understanding these connections is essential for stakeholders at every level, from elementary teachers introducing basic energy concepts, to senior executives mentoring working professionals throughout their careers.

The following sections trace this educational journey, beginning with the foundational years that shape initial interest and understanding. While each level has unique characteristics and challenges, the four strategic priorities remain consistent throughout, adapted to meet the specific needs and capabilities of learners at each stage. While there may be some overlap, readers are encouraged to explore recommendations beyond their immediate interests, as useful advice might be found elsewhere.

Two appendices are provided. The first appendix identifies all recommendations in the NEAR and specifies whether they require national action or can be addressed at the regional or local level. The second appendix presents a strategic approach for implementing selected recommendations, with further examples to be added in future updates of the NEAR.



Partnership for Nuclear Energy

Strengthening America's Global Leadership in Nuclear Energy



Building the Nuclear Workforce: **The Role of K-12**

K-12 education forms the bedrock of lifelong learning and career development. Introducing nuclear science and technology concepts early can ignite curiosity and lay the groundwork for future careers in the nuclear field. This early exposure helps students develop a foundational understanding that can evolve with their education. Early exposure to nuclear science cultivates a generation that is not only informed but also inspired to innovate. Sustained opportunities throughout K-12 are essential for maintaining student interest and participation. Family involvement is equally vital. Family and community support significantly influences students' academic interests and career aspirations. Hosting informative sessions and hands-on activities for students and families fosters a collaborative learning environment, provides sources of accurate factual information, and helps dispel misconceptions about nuclear energy and nuclear systems.



Empowering educators is essential to the success of K-12 nuclear education. Identifying knowledge gaps, offering targeted professional development, and building supportive educator networks will enable teachers to grow, share best practices, and confidently deliver accurate, engaging content. Involving industry partners in the design and implementation of nuclear-related programs ensures relevance and sustainability.

In summary, a comprehensive approach to nuclear education—targeting students, families, communities, and educators—strengthens the talent pipeline and supports a resilient, innovative future for nuclear energy.

SUMMARY OF FINDINGS: K-12 GROUP

1. **Early Engagement:** Introducing nuclear science concepts at the elementary level through age-appropriate lessons, storytelling, and interactive demonstrations can build curiosity and long-term interest in the subject.
2. **Integration into STEM Programs:** Integrating nuclear energy awareness into STEM education initiatives, such as science experiments, provides opportunities for students to learn about nuclear technology and its relevance to various scientific and engineering disciplines. Nuclear science content may be incorporated into broader STEM curricula, including physics, chemistry, biology, and environmental science.
3. **Tailored Educational Activities:** Grade-specific activities—such as nuclear-themed games, model reactor kits, radiation detection experiments, and virtual lab simulations—can be introduced to students at appropriate levels. Establishing a centralized platform for sharing resources and lesson

plans across schools and districts would support teachers delivering these activities.

4. **Family and Community Involvement:** Actively involving families empowers them to support and direct their children toward potential careers in the nuclear sector. Assigning educational projects that involve family members and organizing events such as science nights, open houses, and community workshops are effective methods to educate family members.
5. **Educator Support and Training:** Professional development workshops, online courses, and mentorship programs should be offered to enhance educator confidence and competence in nuclear topics. Peer networks and discussion forums can facilitate collaboration and resource sharing among educators. Efforts to maintain continuity and program sustainability may address staff turnover by building capacity among multiple educators.
6. **Sustainable Infrastructure and Resources:** Infrastructure and resources are necessary for promoting K-12 nuclear awareness and education. Funding is needed for curriculum development, lab equipment, network-based collaborations, and field trips. Partnering with industry to provide expertise, guest speakers, and internship opportunities can help address these needs. Sustainability efforts may include integrating programs within broader educational frameworks and involving stakeholders to ensure consistency despite personnel or leadership changes.



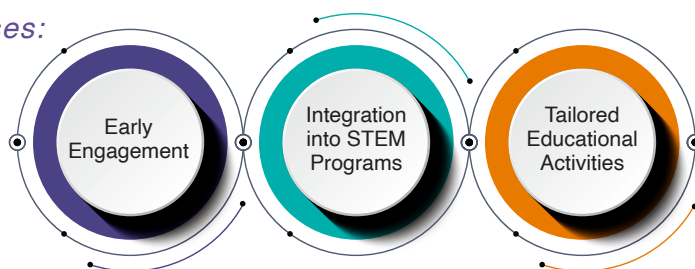
Graphic Credit: National Institute of Health Sciences Office of Science Education & Outreach

STRATEGIC RESPONSE: FROM ANALYSIS TO ACTION



Strategic Priority 1: Enhancing Nuclear Career Awareness

Addresses:



RECOMMENDATIONS:

- **Expose K-12 Students to Nuclear Energy Fundamentals:** Introduce students to nuclear energy concepts in ways suited to their academic level. Elementary students might explore atoms and energy sources through games and experiments. Middle school students may study radiation and

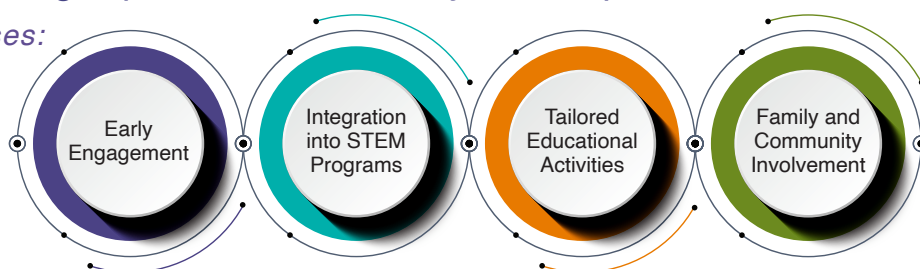
nuclear reactors with projects and simulations. High school students could tackle nuclear physics, reactor design, and environmental impacts through lab experiments, research projects, and industry collaborations.

- **Integrate Career Exploration into Curriculum:** Introducing students to nuclear careers broadens their understanding of the energy sector, encourages critical thinking, and prepares them for future roles. Including nuclear energy topics in wider energy education—through age-appropriate classroom activities, expert demonstrations, and use of XR tools—demonstrates the breadth of career opportunities.
- **Clearly Present the Benefits and Limitations of Nuclear Energy:** Educate students and families on nuclear energy’s contributions to clean power generation and climate change solutions, using fact-based, balanced resources—such as the ANS Navigating Nuclear Curriculum—to help them understand its benefits and limitations.
- **Unify Messaging and Address Misconceptions:** Develop a communication strategy to present consistent, accurate information about nuclear careers and dispel common myths.
- **Highlight a Range of Professional Journeys:** Showcase professionals with varied career paths and experiences to inspire the next generation of nuclear industry talent.



Strategic Priority 2: Supporting Pipeline and Pathway Development

Addresses:



RECOMMENDATIONS:

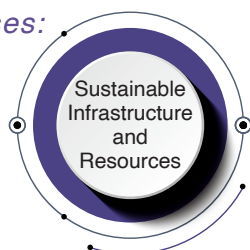
- **Develop Reproducible STEM Programs:** Create nuclear-focused STEM modules that are easy to implement across schools and adaptable to different regions and grade levels.
- **Partner Educators with Industry Experts:** Facilitate collaborations between teachers and nuclear professionals to co-develop curriculum and ensure scientific accuracy and educational relevance.
- **Introduce Nuclear Safety Culture:** Teach students the fundamentals of nuclear safety aligned with their academic level, using real-world case studies to instill a sense of responsibility and awareness.
- **Create Experiential Learning Opportunities:** Work with industry partners to offer internships, summer camps, and hands-on projects that introduce students to nuclear careers. While traditional internships may be restricted due to access, safety, and regulatory requirements, age-appropriate alternatives—such as job shadowing, project-based mentoring, university partnerships, or virtual lab simulations—can offer exposure to and maintain interest in nuclear careers.

- **Implement Multi-Channel Outreach:** Engage students through a variety of channels—online, in the community, and via STEM education partners—to increase understanding of nuclear energy and encourage career exploration.



Strategic Priority 3: Identifying Financial Support, Resources, and Programs

Addresses:



RECOMMENDATIONS:

- **Develop a Centralized Funding Portal:** Create a national website listing scholarships, grants, internships, and teaching resources to streamline access and increase utilization.
- **Engage Industry and Government Partners:** Secure financial and programmatic support from commercial and public sector stakeholders to fund externships, curriculum development, and outreach.
- **Expand Financial Support to Students, Educators, and Family Members:** Offer scholarships and stipends tailored to meet a wide range of student needs making nuclear education more affordable and appealing.
- **Plan for Long-Term Sustainability:** Establish a strategic plan for maintaining and expanding funding programs, including regular evaluation and stakeholder engagement.





Strategic Priority 4: Optimizing Academic Resources Through Collaboration

Addresses:



RECOMMENDATIONS:

- **Raise Awareness of Existing Programs:** Increase awareness and adoption of established resources like ANS Navigating Nuclear, Scouting America's Nuclear Science Merit Badge, and Girl Scouts' Get to Know Nuclear Patch.
- **Create an Open Educational Resource Repository:** Develop a centralized platform for sharing adaptable, high-quality nuclear education materials among educators nationwide.
- **Establish a Consortium for Online Learning:** Collaborate across institutions to create and share online courses and lab simulations that provide consistent, scalable learning experiences.
- **Develop National Teaching Guidelines:** Create standardized, scalable, and flexible frameworks to help educators effectively teach nuclear topics while adapting to varied educational formats and learner profiles.
- **Foster a Culture of Continuous Learning:** Encourage ongoing professional development for educators to stay current with advancements in nuclear science and pedagogy.



COMPLETING THE JOURNEY: A HOLISTIC APPROACH TO NUCLEAR WORKFORCE DEVELOPMENT



The professional development phase completes the nuclear workforce pipeline while also contributing to its renewal. Experienced professionals act as mentors, interactive presenters, and industry advisors for academic programs at every level, offering real-world insights that enrich classroom learning and inspire the next generation of nuclear professionals. This relationship—where industry professionals contribute to educational programs that, in turn, prepare their future colleagues—creates a sustainable ecosystem for nuclear workforce development.

The success of this system relies on strong, ongoing partnerships among all stakeholders: K-12 educators who plant the seeds of interest, vocational school/community college instructors who develop practical skills, university faculty who advance scientific knowledge, and industry professionals who apply this knowledge to address real-world challenges. Each level supports and depends on the others, creating a robust pipeline that can adapt to changing industry needs while maintaining the high standards of safety and excellence characteristic of the nuclear profession.

As the nuclear industry encounters new opportunities, from advanced reactor deployment to the growing recognition of nuclear energy's role in addressing global challenges, the strength of this educational pipeline will determine whether the U.S. can capitalize on these opportunities. The recommendations in this roadmap provide a framework for strengthening each stage in the pipeline, ensuring robust and effective connections between levels to support student achievement and highlight the success of workforce development initiatives.

ENDNOTES:

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Appendix A

Nuclear Energy Academic Roadmap Recommendations

The following four tables correspond to the Strategic Priorities outlined in the NEAR report. Each table presents a set of recommendations, categorized by group, and identifies whether it should be addressed at the national level, regional/local level, or both. To avoid redundancy, overlapping recommendations within the Strategic Priorities have been consolidated.

Strategic Priority 1: Enhance Career Awareness

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Expose K-12 Students to Nuclear Energy Fundamentals	●				●	
Integrate Nuclear Career Exploration into Curriculum	●				●	
Develop Unified Messaging Across Education Levels to Address Misconceptions and Promote the Benefits of Nuclear Energy	●	●	●		●	●
Highlight a Range of Professional Journeys	●	●	●		●	●
Develop a Digital Hub		●	●		●	●
Integrate Nuclear Career Pathways into Academic Programs		●	●		●	
Offer or Expand Experiential Learning Opportunities		●	●	●	●	
Provide or Enhance Career Counseling and Support Services		●	●	●	●	
Establish Nuclear Industry Ambassador Programs		●	●			●
Enhance Career Services and Mentorship Networks		●	●		●	
Create Interactive Career Pathway Tools		●			●	
Foster Community and Industry Engagement		●			●	
Develop Tiered Communication Strategies			●		●	●
Implement Targeted Communication Strategies				●	●	

Strategic Priority 1: Enhance Career Awareness, continued

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Develop Centralized Digital Platforms				●	●	●
Foster Tri-Sector Partnership Councils			●	●	●	●
Strengthen Recruitment and Support Programs for Veterans and Emerging Talent		●	●	●	●	●

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Develop Reproducible STEM Programs	●				●	●
Partner Educators with Industry Experts	●				●	
Introduce Nuclear Safety Culture	●				●	
Offer or Expand Experiential Learning Opportunities and Bootcamps	●	●	●	●	●	●
Implement Multi-Channel Outreach	●	●	●		●	●
Expand Dual Enrollment and Early College Programs		●			●	
Develop Stackable Credential Programs and Certificates		●	●	●	●	●
Support for Emerging Talent		●	●		●	●
Develop Internships and Mentorship Programs and Alumni Networks		●	●		●	●
Establish Pre-Apprenticeship and Apprenticeship Programs		●			●	●
Foster Academic Pathways and Transfers and Formalize Transfer Pathways		●		●	●	
Integrate Advanced Nuclear Technologies into Curricula		●	●	●	●	●
Implement Data Collection Program and Track Outcomes and Share Successes			●	●	●	●

Strategic Priority 2: Support Pipeline and Pathway Development, continued

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Integrate Sociotechnical Competencies in Curriculum			●	●	●	●
Provide Research Placement Opportunities			●		●	●
Develop Leadership-Focused Graduate Programs			●		●	
Promote Faculty Exchanges and Industry Externships			●		●	
Establish Industry Advisory Boards		●	●		●	
Broaden Access to Training				●	●	●
Establish Regional Training Hubs				●	●	●
Update Training Curriculum Regularly				●	●	
Create Career Mapping Tools				●		●
Formalize Mentorship and Peer Learning				●	●	
Offer Detail Assignments and Rotational Programs				●	●	
Leverage Professional Expertise				●	●	
Integrate Advanced Learning Technologies into Training				●	●	

Strategic Priority 3:

Identify Financial Support, Resources, and Programs

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Develop a Centralized Funding Portal	●	●	●	●		●
Engage Industry and Government Partners	●	●	●		●	●
Expand Student Financial Support, Financial Aid, and Subsidized Programs	●	●	●		●	●
Develop a Strategic Sustainability Plan to Secure Long-Term Funding	●	●	●	●	●	●
Coordinate Work-Study and Part-Time Opportunities		●			●	
Provide Wraparound Support Services		●			●	
Pursue Collaborative Grant Opportunities		●	●		●	
Identify and Secure Funding		●			●	
Secure Long-Term Funding Commitments			●		●	●
Support Educator Development		●	●		●	●
Advocate for Dedicated Funding Streams				●	●	
Offer Financially Supportive Programs				●	●	●
Leverage Career Centers and Online Resources				●	●	
Encourage Professional Association Memberships				●	●	

Strategic Priority 4: Optimize Academic Resources Through Collaboration

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Raise Awareness and Promote Existing Programs	●				●	
Create an Open Educational Resource Repository	●	●	●	●	●	●
Develop Standardized Introductory Courses		●	●	●	●	●
Establish a Consortium for Online Learning	●				●	
Develop National Teaching Guidelines	●					●
Foster/Promote a Culture of Continuous Learning	●	●	●	●	●	
Form Inter-Institutional Partnerships		●	●		●	
Expand Access to Shared Facilities and Leverage Federal Reactor and Training Programs		●	●		●	●
Establish and Institutionalize Faculty Mentorship Networks		●	●	●	●	
Invest in Faculty Development		●			●	
Host Curriculum Innovation Summits		●	●		●	●
Establish a National Advisory Board at the Federal Level		●	●			●
Establish Academic Consortia			●		●	●
Develop Train-the-Trainer and Pedagogical Programs			●		●	

Strategic Priority 4: Optimize Academic Resources Through Collaboration, continued

Recommendation	K-12	Vo-Tech / Community College	University	Professional Development	Local / Regional	National
Strengthen Academic-Industry Partnerships				●	●	
Establish a Consortium for Online Learning				●	●	●
Incorporate Experiential and Immersive Learning				●	●	



Appendix B

Nuclear Energy Academic Roadmap Example Implementation Methods, Tools and Resources

The following four tables align with the Strategic Priorities outlined in the NEAR Report. The tables include example recommendations, implementation strategies, and possible tools and resources. Future updates of the NEAR Report will provide more examples.

Strategic Priority 1:

Enhance Career Awareness

Recommendation: Develop Unified Messaging Across Education Levels to Address Misconceptions and Promote the Benefits of Nuclear Energy

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Collaborate with non-governmental organizations (e.g., NEI, ANS, EPRI, ORAU PNE) and academic partners to standardize messaging • Develop a national branding campaign to promote the benefits and career pathways of nuclear energy • Develop and distribute informational materials (e.g., brochures, videos, digital content) tailored for diverse audiences • Ensure all outreach materials highlight current and emerging career opportunities in the nuclear sector • Share resources with schools, community organizations, and workforce partners nationwide • Host career fairs, webinars, and information sessions for students, families, and community members	• Nuclear industry websites - American Nuclear Society (ANS): https://www.ans.org/ - Nuclear Energy Institute (NEI): https://nei.org/ - World Nuclear Association: https://world-nuclear.org/ - International Atomic Energy Agency (IAEA): https://www.iaea.org/ - Nuclear Regulatory Commission (NRC): https://www.nrc.gov/ - Nuclear Innovation Alliance: https://nuclearinnovationalliance.org/ • Educational curricula and learning resources - ANS Navigating Nuclear Curriculum • National Energy Education Development curriculum • Virtual nuclear reactor tours (video or 3D) • Digital media and communication platforms - Social media platforms (e.g., LinkedIn, X, Instagram, TikTok) - Video hosting platforms (e.g., YouTube, Vimeo) - Podcasts focused on science, technology, and energy - Online webinar platforms (e.g., Zoom, Microsoft Teams) • Public engagement opportunities - National Science Week and other STEM-focused public events - Virtual or in-person outreach sessions for schools and community groups

Strategic Priority 1: Enhance Career Awareness, continued

Recommendation: Highlight a Range of Professional Journeys

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Create video interviews and written profiles of professionals from varied backgrounds • Share stories through university, industry, and social media channels • Hold community events and school visits highlighting the benefits of a diverse workforce • Partner with professional societies for outreach events • Partner with institutions and schools serving a wide range of students	• Online platforms for hosting webinars (e.g., Zoom) • Social media platforms • Video hosting platforms (e.g., YouTube) • Industry conference • School-sponsored events • Nuclear Science Week • Boy and Girl Scouts merit badge workshops

Recommendation: Integrate Nuclear Energy Awareness into Broader STEM initiatives

Groups	Implementation Strategies	Tools & Resources
K-12	• Partner with STEM organizations to create and incorporate nuclear energy modules • Develop nuclear energy-focused workshops and activities at STEM fairs and events	• STEM organizations (e.g., Project Lead the Way, For Inspiration and Recognition of Science and Technology, Women in Science, ORAU K-12 STEM Education Programs) • STEM curricula providers • STEM fair organizers • Online learning platforms • National Science Week toolkits

Strategic Priority 1: Enhance Career Awareness, continued

Recommendation: Provide or Enhance Career Counseling and Support Services

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Establish formal career counseling and mentoring programs • Offer resume workshops and interview coaching • Host career fairs and information sessions • Maintain a job/internship board specific to nuclear careers • Assign dedicated career counselors • Establish mentorship programs tied to professional organizations	• Career offices and staff • American Nuclear Society: ans.org • Nuclear Energy Institute: NuclearWorks.org • Center for Energy Workforce Development: cewd.org/resources, getintoenergy.org • Nukeworker.com/job

Recommendation: Provide Research Placement Opportunities

Groups	Implementation Strategies	Tools & Resources
University	• Establish formal agreements for student research placements • Create joint research projects and internships • Establish summer research internships at national labs • Promote student participation in DOE/NEUP and NRC-funded projects	• Existing legal and partnership frameworks • Placement coordinators

Recommendation: Strengthen Recruitment and Support Programs for Veterans and Emerging Talent

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Partner with veterans' organizations and develop veteran-specific outreach and transition programs • Highlight transferable skills in recruitment activities • Offer scholarships and transition support (e.g., targeted transition workshops) • Offer credit for military experience	• Veterans Affairs offices – liaison staff • Transition program guides • Partnerships with Veteran groups • Industry mentors

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation: Create/Offer/Expand Experiential Learning Opportunities and Bootcamps

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Partner with organizations that have created internship, mentorship, and summer programs for students • Integrate AR/VR modules in education and training • Host virtual reality tours and simulations • Integrate industry site visits, hands-on labs, and facility tours into curriculum • Partner with industry to obtain case studies for use in the classroom	• Existing experiential learning frameworks (e.g., Kolb's Experiential Learning Cycle) • Immersive learning tools (e.g., GE Hitachi Virtual Reality Solution, AR Deni) • Online learning platforms (e.g., Riipen.com) • Educational websites and databases (e.g., IAEA's Nuclear Energy Education Resource Hub, ScienceEducation.gov) • Simulations and interactive tools (e.g., PhET Interactive Simulations) • Virtual nuclear reactor tours (video or 3D)

Recommendation: Develop or Enhance Internship and Mentorship Programs and Alumni Networks

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University	• Expand partnerships with companies for internship and co-op placements • Develop formal mentorship networks • Establish a phased internship program with pre-and post-internship activities to better prepare and retain students • Formalize and establish a communication plan for mentorship programs • Encourage graduate students to act as mentors • Organize peer learning forums and technical exchanges	• University career services and alumni associations • Professional organizations (e.g., ANS) • Government agencies and programs (e.g., NRC, DOE) • Online platforms and software (e.g., Engage2Serve, Pathways to Career Success, Zintellect.com)

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation: Develop Stackable Credential Programs and Certificates

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Partner with academic institutions, trade unions, and workforce boards • Develop curriculum and certification standards • Advertise availability of programs/ certificates	• “Stackable Credentials Tool Kit- Mapping Upward”, Center for Occupational Research and Development, April 2018 • Apprenticeship program templates • Certification bodies • Industry trainers

Recommendation: Provide Research Placement Opportunities

Groups	Implementation Strategies	Tools & Resources
University	• Establish formal agreements for student research placements • Create joint research projects and internships • Establish summer research internships at national labs • Promote student participation in DOE/NEUP and NRC-funded projects	• Existing legal and partnership frameworks • Placement coordinators • Utilize existing resources like the DOE ORISE Program and Zintellect.com

Recommendation: Integrate Advanced Nuclear Technologies into Curricula and Update Training Curriculum Regularly

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Contact nuclear organizations (e.g., NEI, ANS), to identify subject matter experts from industry and academia • Partner with subject matter experts and create modules to be used in established courses or summer programs	• NRC training materials • EPRI programs • Online DOE STEM Resources • Workshops (e.g., DOE/NNSA and Gateway for Accelerated Innovation in Nuclear (GAIN))

Strategic Priority 2: Support Pipeline and Pathway Development

Recommendation: Establish Industry Advisory Boards

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University	• Define purpose and scope of the board • Work with professional organizations to identify and recruit members • Establish clear expectations and structure • Create an onboarding process • Manage board activities and outcomes	• Existing advisory boards and committees (e.g., TN Nuclear Energy Advisory Council, Advisory Committee on Reactor Safeguards, PNE Advisory Council) • Federal Advisory Committee Act • NRC Best Practices and Guidelines Reports to Congress

Strategic Priority 3: Identify Financial Support, Resources, and Programs

Recommendation: Develop a Centralized Funding Portal

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Coordinate with industry and government agencies to collect information on funding opportunities • Contact nongovernmental agencies or not-for-profit organizations to determine who would manage and maintain the database and set up its functionality • Create and launch a database listing scholarships, grants, and internship opportunities • Regularly update and promote funding opportunities to students and educators • Offer application workshops to students	• Development frameworks • Management software • Funding discovery and tracking tools • Web analytics • Social media management • Generative AI • NSF – Advanced Technical Education - Mentoring services for grant writing: - Mentor Connect: http://mentor-connect.org - Mentor Links: http://www.aacc.nche.edu/programs/mentorlinks/ - Mentor Up: https://atementorup.org

Recommendation: Develop a Centralized Funding Portal Engage Industry and Government Partners

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Partner with industry to provide in-kind and financial support of nuclear education programs and resources • Partner with government agencies for financial support of nuclear education programs and resources	• Requests for Information • Industry days • One-on-one meetings • Industry and government association meetings • Trade groups • Conferences • NSF-ATE Business and Industry Leadership Team: https://connectedtech.org/business-industry-leadership-team/

Strategic Priority 3: Identify Financial Support, Resources, and Programs

Recommendation: Expand Student Financial Support, Financial Aid, and Subsidized Programs

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Increase university and industry-sponsored scholarships • Apply for federal and state grants	• Promote and expand federal and state financial aid programs • Institutional scholarships and grants • Tuition assistance programs • Employer and Union assistance programs • Online scholarship databases (e.g., scholarships.com, financialaidtoolkit.ed.gov)

Recommendation: Develop a Strategic Sustainability Plan to secure long-term funding

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Develop long-term funding strategies • Advocate for government and industry investment • Seek grant funding	• Building partnerships and collaborations • Online courses and workshops • Guidance from experts

Recommendation: Support Educator Development

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University	• Establish partnerships across academic institutions and identify educator needs • Create summer externships • Create research opportunities for educators	• Online learning platforms and courses • Professional development organizations, such as ORAU K-12 STEM Educator Programs • Conferences, workshops, bootcamps • Collaboration and mentorship

Strategic Priority 4: Optimize Academic Resources Through Collaboration

Recommendation: Create an Open Educational Resource Repository

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	- Determine which non-governmental or not-for-profit organization will create, manage, and maintain repository - Evaluate existing open educational platforms and perform a gap analysis to identify unmet needs - Collaborate with industry and government agencies to collect, curate, and develop high-quality curriculum materials - Develop a searchable online database - Promote and communicate availability of resource repository to educators, institutions, and stakeholders	- Existing open educational resource platforms such as: - IAEA's e-learning platform - IAEA NUCLEUS information resource portal - DOE Fundamentals Handbook - Open Educational Resource: oercommons.org - Open.edu/openlearncreate - MIT OpenCourseWare - DOE's website: energy.gov/doe-stem - NRC's website: https://www.nrc.gov/reading-rm/ - ANS's website: nuclearconnect.org - Nuclearscienceweek.org - Idaho National Laboratory (INL) Education Resources: inl.gov/education - NSF-ATE Regional Center for Nuclear Education & Training: https://gonuke.org/ - ORAU K-12 STEM Education Lesson Plans: https://orau.org/k12/educator/lesson-plans.html

Recommendation: Develop Standardized Introductory Courses

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	- Establish a partnership with representatives from academia, industry, and government - Perform foundational planning - Develop course content and learning activities - Establish a peer review process - Collect feedback and make improvements	- Existing open educational resource platforms - Existing introductory courses from selected universities and organizations

Strategic Priority 4: Optimize Academic Resources Through Collaboration

Recommendation: Foster/Promote a Culture of Continuous Learning

Groups	Implementation Strategies	Tools & Resources
K-12 VO-TECH / CC University Prof. Devel.	• Offer micro-credentials • Host regular professional development seminars • Encourage attendance at conferences and seminars • Encourage lifelong learning incentives	• Existing technology including online learning platforms, VR/AR, data analytics, mentorship programs • In-house workshops, seminars, and on-the-job training • Government and industry specialized training (e.g., Westinghouse Nuclear)

Recommendation: Establish and Institutionalize Faculty Mentorship Networks

Groups	Implementation Strategies	Tools & Resources
VO-TECH / CC University Prof. Devel.	• Evaluate and expand existing mentorship programs and networks to support new training initiatives • Facilitate knowledge transfer between institutions through formal or informal agreements • Pair emerging programs with experienced mentors to guide curriculum and workforce alignment • Provide guidance on program development based on best practices	• Mentorship guides and handbooks • Mentorship programs and models (e.g., National Research Mentoring Network)

