Tennessee Nuclear Energy Workforce Center (T-NEWC)

Aligning Tennessee Workforce Investments to Launch a Globally Competitive Nuclear Innovation Hub in Tennessee

Objective:
This document presents a plan to develop an integrated nuclear workforce enterprise in Tennessee. It addresses the need for inter-agency collaboration, resource sharing, and program mapping to bridge gaps in workforce development. The plan aims to establish a coordinated approach, optimizing workforce alignment and positioning Tennessee as a leader in the nuclear industry.

Summary:
The Tennessee Nuclear Energy Advisory Council, in collaboration with Oak Ridge Associated Universities (ORAU) and Global Action Platform (GAP), has initiated a strategic effort to assess and improve the state's nuclear energy workforce development landscape. The end goal is to create a comprehensive, integrated nuclear workforce enterprise that addresses current gaps and prepares for future industry needs. Major gaps identified include the absence of centralized leadership, fragmented efforts across agencies, and geographical disparities in workforce development. Key actions proposed include establishing a coordinating backbone organization and forming a collaborative network of educational institutions. The plan also emphasizes the need for enhanced data analytics, tailored adult education programs, and strengthened engagement with labor unions. Through these coordinated efforts, Tennessee aims to build a skilled workforce capable of supporting its nuclear energy goals and positioning the state as a leader in the industry. A comprehensive table with short to long-term goals is provided in the Appendix (Table 1: Summary of program components and development plan).

Key Findings: To advance competitiveness in nuclear energy, Tennessee must leverage current investments, state program integration, and industry coordination to ensure that the state has the most innovative and skilled nuclear workforce in the US and the world. A centralized backbone organization housed at ORAU is critically needed to achieve this goal.

Consensus Recommendation: The creation of the Tennessee Nuclear Workforce Center at ORAU is an essential infrastructure to support the ongoing integration and alignment of public-private workforce investments currently required by Tennessee's growing nuclear energy industry and to build a globally competitive nuclear innovation hub for the future. A globally competitive nuclear innovation hub will be a major driver of economic growth and shared prosperity for the citizens of Tennessee.

Building a Stronger Future: Comprehensive Recommendations for Tennessee's Nuclear Energy Sector

Tennessee's nuclear energy sector faces critical workforce development and communication challenges, including the lack of a central coordinating body, unclear labor demands, and ineffective marketing strategies. These issues, along with geographic disparities in training and insufficient data utilization, hinder the state's ability to attract and retain skilled workers. To address these challenges, strategic recommendations have been developed across key areas: governance, industry engagement, state and federal collaboration, academia, strategic communications, funding opportunities, and continuous improvement. Implementing these measures will strengthen Tennessee's nuclear workforce and position the state as a leader in the nuclear energy industry.

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SECTION 1: TIMELINE AND MAJOR IMPLEMENTATION AREAS

Short through Long-Term Summary of Program Components and Development Plan: This comprehensive table outlines a range of plans from short-term to long-term, categorized across several key areas of focus. It covers governance, strategic planning, infrastructure and programming, state agencies engagement, industry engagement, evaluation and improvement, and outcomes, providing a clear roadmap for organizational development and growth. The breakdown allows stakeholders to understand the progression of initiatives and goals over time, from immediate actions to long-range objectives. By presenting this information in a structured format, the table facilitates better decision-making, resource allocation, and alignment of efforts across various departments and timeframes.

Components for Success	Near-Term 0-6 Months	Short-Term 6 – 12 Months	Mid-Term 12 – 18 Months	Long-Term 18 – 24 +Months
Governance	**Establish advisory council** Identify champions Approve programmatic documents including program plan, stakeholder management plan and financial plan	Determine initial workgroups "WG" and plan backbone organization Approve stage-gates based on program evaluation	Build out the backbone organization, evolve WGs to meet emergent strategy Approve stage-gates based on program evaluation	Approve stage-gates based on program evaluation
Strategic Planning	**Labor Demands:** Create a high-capital industry roundtable to identify current and future labor demands (ETEC) Develop all programmatic documents, including program plan, stakeholder management, and financial plan	**Evaluate Other Models for Best-Practices** Examples include Blue Oval City model as a potential framework **Funding Strategy** Design interagency infrastructure funding agreements	Update programmatic documents based on first-year evaluation	**Strategic Communication and Marketing Initiative for Nuclear Energy Awareness**
Infrastructure and Programming	**Criticality Center of Excellence** – evaluate the development Identify and catalogue existing assets, and identify gaps based on overall regional nuclear industry stakeholder	**TN Nuclear Energy Academic Alliance** form a collaborative academic network **Create a Pre-Apprenticeship and Apprenticeship Program**	**Establish a Framework / Platform for Knowledge Sharing** **Establish Nuclear Specific Adult Education Programming** with current workforce programs like the Workforce Innovation and Opportunity Act (WIOA)	**TN Nuclear Energy Academic Alliance** implement educational pathways (e.g. dual enrollment) **Create Short-Term Credential Programming**
State Agencies Engagement	Establish a POC for mid- and west- Tennessee	**Pilot State-to-State** working group for 8-states (TVA/ETEC)	**Comprehensive Online Interactive Platform for State Resources and Programs**	**Establish a Federal-to-State** working group
Industry Engagement	**Labor Demands:** Create a high-capital industry roundtable to identify current and future labor demands	Convene industry stakeholders at annual TN nuclear seminar	**Industry Case-Studies** to facilitate replication and knowledge transfer	**Industry** Implement learning exchanges
Evaluation and Improvement	**Shared Measurement System** – develop a set of common metrics and indicators to measure the success of TN nuclear energy education, training and workforce	Analyze baseline data to ID key issues and gaps	Develop high level shared metrics and/or strategies at SC level	Establish shared measures (indicators and approach) at SC and WG levels
Outcomes	Approved program plan and other documents Stakeholder identification and alignment and infrastructure gaps identified	All strategic plans implemented including programmatic staff hiring, funding and stakeholder management	Plans implemented to close all infrastructure gaps	All initiatives implemented and functioning

SECTION 2: GOVERANCE

Recommendation #1: Establish a Central Coordinating Body for Nuclear Energy Education, Training, and Workforce Development

The nuclear energy sector in Tennessee faces significant challenges due to the absence of a central coordinating body to support cross-sector collaboration and align workforce efforts. This fragmentation extends across state agencies, federal agencies, and stakeholders within Tennessee, hindering efforts to meet industry demands effectively. There is a pressing need for stronger leadership and coordination across the public, private, and academic sectors to create a cohesive strategy for nuclear energy education, training, and workforce development. Establishing a centralized coordinating entity would streamline efforts, reduce redundancies, and ensure a more efficient use of resources in developing Tennessee's nuclear workforce.

Key actions to implement this recommendation include:

1. Form a governing consortium with representatives from key stakeholders such as the Tennessee Department of Education, TVA, UCOR, ETEC, local and state government officials, industry partners, and educational institutions to oversee strategic direction and ensure alignment with industry needs.
2. Designate or establish a dedicated organization, such as ORAU, to serve as the backbone for the initiative, providing staff and resources to coordinate activities across the public, private, and academic sectors.
3. Create a Steering Committee for continuous oversight and establish working groups focused on specific areas like education and industry to facilitate collaboration across sectors.
4. Develop a comprehensive 5-year strategy with implementation plans and actionable areas for FY25-28, focusing on creating a cohesive approach to nuclear energy education, training, and workforce development.

Recommendation #2: Nuclear Cluster Workforce Definition

A comprehensive cluster analysis is essential to clarify and identify the multiple components required by a competitive nuclear sector and its varied workforce needs. This analysis should encompass expertise in legal and finance, construction, management, and other related fields. By defining the scope of the nuclear cluster workforce, Tennessee can better tailor its educational and training programs to meet the diverse needs of the industry. This holistic approach will ensure that the state develops a well-rounded workforce capable of supporting all aspects of the nuclear energy sector, from regulatory compliance, to nuclear construction, to plant operations and beyond.

SECTION 3: INDUSTRY ENGAGMENT

Recommendation #1: Understanding Labor Demands in the Nuclear Energy Sector

Tennessee's nuclear energy sector faces a critical challenge in understanding industry labor demands, which impacts effective workforce alignment and development. To ensure that the state's nuclear workforce remains adaptable and competitive in the rapidly evolving energy landscape, a comprehensive approach is essential. This strategy should begin with the establishment of an industry partnership involving high-capital organizations to provide crucial insights into upcoming workforce demands, labor strategies, and predictive models. A key component of this effort is the implementation of a public-private mechanism for predictive workforce analytics, which will forecast requirements across the entire nuclear ecosystem, extending beyond craft labor workers.

To address these challenges, we recommend the following actions:

1. Organize Quarterly Round-Table Discussions: Host discussions with representatives from high-capital industry stakeholders, potentially facilitated by organizations such as ETEC or TVA, to identify current and future labor demands in the nuclear sector.
2. Develop a Future-Focused Competency Skills Framework: Create a dynamic skills matrix that anticipates both current and emerging industry needs, ensuring that training programs align with these competencies.
3. Implement Comprehensive Competency Planning: Develop an integrated labor strategy that bridges identified skill gaps while addressing geographic disparities in training and employment opportunities across the state.
4. Enhance Program Sequencing: Improve coordination and timing of training programs to effectively meet evolving industry demands.
5. Monitor Global Market Trends: Continuously assess global market trends that impact the competitiveness of Tennessee's nuclear sector to inform workforce development strategies.

Recommendation #2: Evaluate Collaborative Models for Nuclear Education and Workforce Development

To enhance Tennessee's nuclear energy education and workforce training initiatives, we recommend evaluating models similar to the Blue Oval City framework. This model exemplifies effective collaborative partnerships between government entities and industry stakeholders, demonstrating how such alliances can drive innovation and meet workforce demands. By exploring these successful frameworks, Tennessee can identify best practices that may be adapted to its unique context.

Recommendations to develop this include:

1. Benchmark Successful Models: Research and analyze existing collaborative education and workforce development models in other sectors that effectively integrate partnerships among government, industry, and educational institutions.
2. Identify Key Performance Indicators: Establish metrics to evaluate the effectiveness of different models in meeting workforce demands and fostering innovation within the nuclear sector.

Recommendation #3: Bridging the Knowledge Gap: Enhancing Information Sharing and Retention in Tennessee's Nuclear Industry

The nuclear industry in Tennessee faces significant challenges in effectively sharing plans and transferring critical knowledge, particularly in nuclear safety. Knowledge retention has emerged as a pressing concern, exacerbated by difficulties in recruiting and retaining skilled workers in public programs. This issue is further compounded by knowledge gaps resulting from the retirement of experienced staff and insufficient documentation of tacit knowledge, lessons learned, and best practices accumulated over decades of hands-on experience.

The industry suffers from insufficient sharing of plans across various sectors, hindering collaborative efforts and strategic alignment. Moreover, there is a critical need for improved nuclear safety knowledge transfer to ensure the maintenance of high safety standards and operational efficiency. These challenges underscore the importance of implementing structured knowledge transfer programs, mentorship initiatives, and comprehensive documentation efforts.

To address the challenges of knowledge retention and transfer in Tennessee's nuclear industry, we recommend implementing a comprehensive collaborative framework. This framework will facilitate the sharing of best practices, promote innovation, and ensure the preservation of critical industry knowledge. Key components of this framework include:

1. Case Study Development and Dissemination: Create and distribute detailed case studies of successful industry programs to promote replication and knowledge transfer across the sector.

2. Collaborative Industry Platform: Establish a dedicated platform where nuclear energy stakeholders can share best practices, discuss challenges, and collaboratively develop solutions.
3. Learning Exchanges and Knowledge-Sharing Mechanisms: Implement structured programs for learning exchanges and knowledge sharing to support ongoing industry development and foster innovation.

By adopting these measures, Tennessee's nuclear industry will be better equipped to retain critical knowledge, enhance safety practices, and maintain operational excellence amidst workforce transitions and evolving industry demands. This collaborative approach will strengthen the industry's resilience and competitiveness in the long term.

SECTION 4: STATE AND FEDERAL AGENCIES

Recommendation #1: Bridging the Geographic Divide - Expanding Nuclear Industry Opportunities Statewide

There is a critical need to diversify and increase nuclear industry and workforce capacities and opportunities across the state, particularly in West Tennessee. This geographical disparity in training and employment opportunities creates a misalignment between program locations and job market demands across regions. Addressing this issue will ensure more equitable access to nuclear energy careers and contribute to the overall growth of the sector in Tennessee. By strategically expanding nuclear industry presence and educational programs in underserved areas, the state can tap into a broader talent pool and foster economic development in regions that have been historically overlooked in this sector.

To address the geographical disparities in nuclear industry opportunities and workforce development across Tennessee, we recommend implementing a comprehensive strategy to expand the sector's presence beyond East Tennessee.

1. Establish a Mid- and West-Tennessee Nuclear Energy Development Council: Create a dedicated council, modeled after the East Tennessee Economic Council (ETEC), to spearhead nuclear industry growth and workforce development initiatives in underserved regions.
2. Develop and implement a comprehensive Statewide Nuclear Workforce Engagement Strategy that includes satellite training centers, virtual learning programs, internship and apprenticeship opportunities, and a statewide awareness campaign to expand nuclear industry education, training, and career opportunities across all regions of Tennessee, particularly in areas without existing nuclear facilities.

Recommendation #2: Enhancing Information Sharing Across State and Federal Agencies

The nuclear energy sector faces significant gaps in information sharing both at the state and federal levels. Currently, there is no established mechanism for states to exchange best practices and lessons learned regarding workforce development and operational efficiency in their nuclear sectors. Additionally, the lack of a structured communication model between state and federal agencies further complicates collaboration, leaving states without essential support and guidance from federal resources. This fragmentation is exacerbated by the absence of a dedicated federal agency focused on nuclear energy workforce issues, leading to missed opportunities for synergy and innovation.

To address these challenges, the following recommendations are proposed:

1. Create a State-to-State Collaborative Model: Establish a framework for information sharing between states with nuclear energy sectors to facilitate the exchange of best practices, resources, and strategies.

2. Create a State-to-Federal Model: Develop a structured communication model for sharing information between states and federal agencies, ensuring that states receive timely support and guidance on nuclear energy initiatives.
3. Federal Interagency Model: Establish a collaborative framework among federal agencies to streamline communication and resource sharing related to nuclear energy, enhancing coordination and support for state-level efforts.

By implementing these recommendations, Tennessee and other states can foster a more integrated approach to workforce development and operational excellence in the nuclear energy sector.

Recommendation #3: Comprehensive Online Interactive Platform for State Resources and Programs

The absence of a unified framework for knowledge sharing across different sectors and departments hinders effective collaboration and resource utilization in Tennessee's nuclear industry. Siloed organizational programs lack visibility with other programs, cross-mapping, and integration, preventing complementary efforts from leveraging each other's strengths. This fragmentation leads to inefficient resource allocation due to a lack of mechanisms for identifying shared opportunities and aligning investments across isolated programs. Implementing a comprehensive knowledge management system and fostering inter-organizational collaboration would significantly enhance the state's ability to develop and maintain a skilled nuclear workforce.

To address the fragmentation of knowledge and resources in Tennessee's nuclear industry, we recommend developing a comprehensive online platform with two key components:

1. Internal Government Resource Mobilization Tool:
    - Map all state programs related to nuclear workforce development
    - Track funding streams and resource allocation
    - Identify opportunities for cross-agency collaboration and efficiency
2. Public-Facing Information Hub:
    - Consolidate information on nuclear education, training, and career opportunities
    - Provide easy access to state resources and programs
    - Offer a user-friendly interface for stakeholders to navigate available support

This dual-purpose platform will streamline internal operations, optimize resource utilization, and improve public access to nuclear industry opportunities in Tennessee.

SECTION 5: ACADEMIA

Recommendation #1: Enhance Tennessee's Nuclear Energy Leadership through a Specialized Center of Excellence

During the workshop, the Department of Energy Office of Environmental Management (DOE-EM) representative highlighted the potential for establishing a specialized Nuclear Energy Center of Excellence in Tennessee. This proposed center would not only focus on critical aspects of the nuclear energy sector within the state but also serve as a national hub for collaboration and coordination across the United States.

This concept aligns with Tennessee's growing prominence in nuclear energy, as evidenced by recent developments such as ORANO, USA's selection of Oak Ridge as the preferred site for a major uranium

enrichment facility. The state's existing nuclear infrastructure, including assets like Oak Ridge National Laboratory, positions Tennessee favorably to lead this national initiative.

While the specific focus areas of this center require further deliberation, it could serve as a complementary resource to existing and planned nuclear energy projects both in Tennessee and across the country. By leveraging Tennessee's expertise and resources, this center has the potential to enhance the state's role as a leader in safe, clean, and reliable energy production while simultaneously becoming the nation's leading expert in nuclear energy innovation and policy.

This national hub would facilitate collaboration between states, federal agencies, and industry partners, positioning Tennessee at the forefront of nuclear energy advancement and solidifying its status as a key player in shaping the future of America's energy landscape. Preliminary recommendations included the following:

1. Consolidation of Expertise: Establish the center to bring together leading experts in nuclear safety and criticality, fostering collaboration and knowledge sharing across the industry.
2. Innovation in Risk Management: Foster innovative approaches to risk management at nuclear facilities, particularly focusing on the Department of Energy's Environmental Management (DOE-EM) complex.
3. Programmatic Guidance: Assist EM management with focused guidance on emerging safety basis issues and risk-informed decision-making.
4. Knowledge Management: Organize and maintain a comprehensive body of knowledge on nuclear safety, preserving lessons learned from the DOE-EM complex.
5. Benchmarking Successful Models: Research and benchmark successful Center of Excellence models from other sectors, particularly those that effectively integrate partnerships among state, local, and industry stakeholders.
6. Alignment with Strategic Objectives: Ensure that the center aligns with broader strategic objectives for nuclear safety and workforce development. Assemble a team of subject matter experts who can guide its initiatives while maintaining operational independence to maximize impact and effectiveness.

Recommendation # 2: Address Entry Barriers and Enhance Career Pathways in the Nuclear Energy Sector

Tennessee's nuclear energy sector faces significant challenges in workforce entry and career progression. There is a lack of clear information on prerequisites for nuclear careers, hindering potential candidates from understanding entry requirements. Insufficient coordination and ongoing communication among agencies working to create awareness and onboard prospective workforce participants exacerbate this issue. The sector suffers from a lack of feedback loops between agencies working on workforce awareness and industry, as well as between these agencies and education and training programs. This disconnect leads to misalignments in workforce development efforts. Career pathways and job requirements at various levels (e.g., entry-level, mid-career) lack clarity, impeding effective career planning. While there is a recognized need for personalized learning pathways and adult education programs tailored to the nuclear energy industry, budget constraints pose significant challenges in creating these essential programs. Addressing these interconnected issues is crucial for building a robust and sustainable nuclear workforce pipeline in Tennessee.

To address these critical gaps and build a robust, sustainable nuclear workforce pipeline, we recommend the following actions:

1. Establish a Comprehensive Apprenticeship Program:
    - Collaborate with the East Tennessee Apprenticeship Readiness Program and Labor Unions to develop a Department Pre-apprenticeship (K-12) and Apprenticeship Program.

- Implement K-12 outreach initiatives to raise career awareness in the nuclear field.
- Create opportunities for adults to explore nuclear energy as a viable career option.

2. Develop Tailored Adult Education Programs for Nuclear Workforce:
    - Design specialized adult education programs focused on nuclear workforce development, complementing existing general programs like the Workforce Innovation and Opportunity Act (WIOA).
    - Create curriculum and training modules that address specific skills and knowledge required in the nuclear sector, ensuring a more direct pathway to employment.
    - Collaborate with industry partners to align programs with current and future workforce needs in the nuclear energy sector.

Recommendation # 3: Educational and Curriculum Improvement

Tennessee's nuclear energy education system faces multifaceted challenges that significantly impede workforce development in this critical sector. A primary concern is the substantial misalignment between current educational offerings and the rapidly evolving needs of the expanding nuclear industry, creating a temporal disconnect that hampers the state's ability to meet emerging workforce demands. This issue is compounded by the insufficient focus on nuclear energy in the K-12 education system, where the absence of a comprehensive curriculum limits early exposure and interest in the field, potentially narrowing the future talent pipeline. Furthermore, there exist potential discrepancies between regulatory requirements and the content of existing educational programs, which may result in graduates being inadequately prepared to meet stringent industry standards. The absence of an adaptive curriculum mechanism exacerbates these issues, as it hinders the continuous updating of educational content to align with industry advancements and regulatory changes. This lack of agility in the educational framework poses a significant challenge to maintaining Tennessee's competitive edge in the nuclear sector. Addressing these interconnected gaps is not merely beneficial but essential for cultivating a well-prepared, adaptable, and innovative nuclear workforce capable of propelling Tennessee to the forefront of the national nuclear energy landscape.

Initial discussions with Tennessee state agencies revealed the feasibility of establishing the Tennessee Nuclear Energy Academic Alliance. This alliance aims to address preliminary challenges in the nuclear energy sector, including:

1. Create a Collaborative Network: Form a partnership among community colleges, universities, and technical schools to develop specialized nuclear energy education programs tailored to industry needs.
2. Coordinate Statewide Training Initiatives: Mobilize resources and efforts across institutions to address identified workforce requirements effectively.
3. Implement Diverse Educational Pathways Through Braided Models[1] (see Appendix B, Illustration 1) Introduce a variety of educational options, including high school dual enrollment programs, 2+2 pathways, and micro-credentialing initiatives, to better align with industry demands.
4. Develop Short-Term Credential Programs: Establish programs that facilitate quick entry into the nuclear industry, alongside certificate offerings designed to upskill professionals from related fields.

[1] The braided river model is a metaphor for STEM workforce development that emphasizes inclusivity and diversity, illustrating multiple entry points and varying career pathways. Unlike the traditional pipeline model, it recognizes that individuals can adapt their careers based on new interests and responsibilities, reflecting the natural flow of a braided river.fields.by natural braided rivers, this concept emphasizes the multitude of routes leading to the same ultimate destination in STEM careers, providing a more holistic view of professional development in these fields.

SECTION 6: STRATEGIC COMMUNICATIONS

Recommendation #1: Promoting Nuclear Careers: A Comprehensive Communication Strategy for Tennessee

Tennessee's nuclear energy sector currently faces significant gaps in its communication and marketing strategies. There is no cohesive communications strategy, branding initiative, or marketing campaign aimed at raising awareness of nuclear energy careers and educational opportunities. This absence limits the sector's ability to effectively engage potential students, parents, and communities, particularly in rural, low-income, and marginalized populations. Without a well-defined narrative around nuclear energy, misconceptions persist, hindering efforts to attract a diverse workforce that can support the industry's growth and innovation.

To address these challenges, the following actions are proposed:

1. Implement a Targeted Marketing Campaign: Develop a campaign to promote nuclear energy careers and educational opportunities specifically aimed at students and parents.
2. Base Marketing on Labor Demand Feedback: Create marketing strategies informed by feedback regarding current labor demand needs within the industry.
3. Focus on Underserved Populations: Target communications to reach rural, low-income, and marginalized communities to ensure inclusivity in workforce development efforts.
4. Reshape the Nuclear Narrative: Work on enhancing public perception of the nuclear industry by developing a positive and informative narrative that highlights its benefits and opportunities.

SECTION 7: FUNDING AND OPPORTUNITIES

Recommendation #1: Funding and Resource Mobilization

Tennessee's nuclear energy sector faces significant challenges in securing adequate funding streams to support nuclear marketing, education, training, and entry-level employment initiatives. The lack of a comprehensive funding strategy analysis hampers efforts to identify and leverage potential financial resources effectively. There is a pressing need for improved resource mobilization and better interconnections of resources between state entities, industry partners, and non-profit organizations. Developing a robust funding strategy and fostering stronger partnerships across sectors will be crucial for sustaining and expanding nuclear workforce development efforts in the state.

To effectively address the challenges facing Tennessee's nuclear energy sector, it is imperative to develop a comprehensive strategy for funding and resource mobilization that enhances collaboration among state entities, industry partners, and non-profit organizations.

1. Create an Education, Training, and Workforce working group to secure funding collectively through diversifying funding plans (e.g., investors, foundations, federal, etc.) so that we are not reliant on state government funding. This group can develop comprehensive strategies to attract diverse funding sources, create synergies between education and industry needs, and ensure long-term sustainability of workforce development initiatives.
2. Pursue interagency infrastructure funding agreements to leverage resources, reduce duplication, and maximize the impact of investments across multiple sectors. These agreements can help streamline project implementation, share costs, and ensure a more comprehensive approach to infrastructure development.
3. Industry + state resource connected and mobilized via sector-based strategies. Implement targeted approaches to align industry needs with state resources, fostering collaboration between public

and private sectors. This can lead to more efficient resource allocation, tailored workforce development programs, and increased economic competitiveness within key industries.
4. Explore public-private partnerships (PPPs) to attract private capital and expertise for large-scale projects, potentially reducing the financial burden on government budgets while accelerating project delivery and improving long-term maintenance.
5. Investigate grant opportunities from federal, state, and local sources, including specialized programs for sustainable infrastructure, urban development, and climate resilience initiatives.
6. Develop a comprehensive asset management strategy to optimize the use of existing resources and prioritize investments based on lifecycle costs and benefits.

SECTION 8: EVALUATION AND IMPROVEMENT

Recommendation # 1: Data Analytics for Decision Making

The underutilization of existing state models and data hampers effective decision-making in the nuclear energy sector. There is a pressing need to increase industry participation in the design of data collection and analysis processes. By leveraging data analytics more effectively, Tennessee can make informed decisions about resource allocation, program development, and workforce strategies to support the growth of the nuclear energy industry. Improved data utilization will enable policymakers and industry leaders to identify trends, anticipate challenges, and capitalize on opportunities in the nuclear sector, ultimately leading to more targeted and effective workforce development initiatives.

To effectively leverage data analytics for informed decision-making in Tennessee's nuclear energy sector, we recommend implementing a comprehensive data strategy focused on collaboration, improved collection, and advanced analytics. Key actions include:

1. Establish an Industry-Government Data Partnership: Create a framework for collaboration between state agencies and nuclear industry stakeholders to design data collection processes, develop shared standards, and identify key performance indicators aligned with workforce development goals.
2. Evaluate and Enhance Data Infrastructure**:** Conduct a comprehensive assessment of current data collection, management, and sharing practices across the nuclear energy sector. Based on this evaluation, develop a centralized data repository to consolidate and integrate information from diverse sources, ensuring data integrity through automated validation processes. This approach will optimize data utilization, improve accessibility, and facilitate more effective decision-making and collaboration among stakeholders.
3. Enhance Data Analytics Capabilities: Utilize advanced analytics tools to process large datasets, develop predictive models for workforce needs, and apply machine learning to uncover insights.
4. Foster a Data-Driven Culture: Provide training in data literacy for decision-makers and establish regular review sessions to discuss insights and implications for resource allocation.
5. Continuous Improvement: Implement a feedback system to monitor the effectiveness of data-driven initiatives and adjust processes based on evolving industry needs.

APPENDIX

Appendix A – Collective Impact Phase 1 Methodology:

The methodology to address the critical need for an inter-agency collaboration among state agencies and other stakeholders, as well as resource mobilization/sharing and program mapping is described herein.

ORAU and GAP collaborated with Tennessee state agencies and the TNEAC to implement Phase 1 of Collective Impact: Assess Readiness, and part of Phase 2: Initiate Actions. From September to October 2024, ORAU and GAP:

1. **Conducted an Inventory Survey of State Agencies and TNEAC members (September):**
    - Compiled a comprehensive inventory of all nuclear training, education, and workforce development programs and assets
    - Identified primary barriers to cross-agency collaboration in creating a shared agenda, system, and metrics for nuclear training, education, and workforce development
    - Gathered recommended solutions from organizations to overcome these barriers

2. **Hosted In-Depth Interviews with State Agencies and TNEAC Members (September – October):**
    - Assessed program impact and evaluation methods
    - Explored information sharing and inter-agency collaboration practices
    - Examined existing collaborative efforts and partnerships
    - Investigated resource allocation and support mechanisms

3. **Facilitated an In-Person Collective Impact Workshop for Phase 1 and Part of Phase 2 (October):**
    - Convened all stakeholders to expand on the inventory survey and in-depth interview findings
    - Identified potential champions to form a cross-sector steering committee
    - Mapped the resources and program landscape, analyzing baseline data to identify key issues and gaps
    - Initiated discussions on recommendations and next steps for the TN Nuclear Energy Workforce Center

Appendix B: Illustration 1 – Braided Model

The braided river model is a metaphor for STEM workforce development that offers a more inclusive, diverse, and equitable perspective on career paths. Unlike the traditional pipeline model, it illustrates multiple entry points, varying pathways, natural breaks, converging paths, and evolving careers. This model recognizes that individuals can enter the workforce from diverse educational backgrounds, progress at different speeds, experience career pauses, and adapt their paths in response to new interests, personal responsibilities, and further education. Inspired by natural braided rivers, this concept emphasizes the multitude of routes leading to the same ultimate destination in STEM careers, providing a more holistic view of professional development in these fields. Information on the model is found here: https://eos.org/opinions/reimagining-stem-workforce-development-as-a-braided-river