Knoxville CCAP Stakeholder Engagement Summary for Participants

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Working Groups Round 1

(10/24/24)

These summary notes capture key points from the sector-specific working group discussions held in October 2024 as part of the stakeholder engagement process for the Knoxville MSA's Comprehensive Climate Action Plan (CCAP). The discussions were organized into the following sectors: Agriculture, Natural & Working Lands, and Waste; Buildings & Energy; and Land Use and Transportation.

All Sectors

The following climate risks and impacts were identified in discussions across all sectors:

- Increased frequency and intensity of severe weather events, such as droughts, floods, and extreme temperatures are disrupting economic activity and threatening regional stability. They are also posing significant public health risks.
- Climate change is exacerbating existing economic pressures, leading to increased costs, resource strains, and reduced profit margins across sectors.
- Urban development and land use changes are contributing to the rapid loss of greenspace and agricultural land, impacting biodiversity and increasing urban heat effects, and affecting the mental health and wellbeing of residents.

The following ideas for future climate action were raised in discussions across all sectors:

- Encouraging community-based solutions, such as local food systems, urban gardening, and decentralized energy production, can empower residents and enhance resilience.
- Investing in resilient infrastructure.
- Providing education and facilitating community conversations through workshops, town halls, and accessible formats that are tailored to diverse communities. Look for ways to build off the CPRG planning process for more sustained education and engagement; focus less on surveys and more on education and capacity building.
- Provide financial support and incentives (farmers, companies, households, etc.) to promote the adoption of sustainable tech and practices.
- Finding ways to break down silos and collaborate across groups to go for larger dollars and creating greater impact (it is hard to get a lot of small grants).
- Promoting integrated land use planning that considers needs across sectors (transportation, agriculture, buildings, and energy).

The following points were highlighted as barriers and challenges across sectors.

- Rising energy and living costs.
- Lack of robust metrics to track Justice 40 initiatives and dedicated resources.
- Lack of financial resources and investment in sustainable practices, infrastructure, and education initiatives, and high cost or level of understanding needed to access resources.

- Many community members lack awareness or understanding of climate programs, policies, and resources. Open discussions about climate change can be difficult in conservative areas.
- Many assume that a community cannot lead their own change, but they are often the best to do so because they understand their history and their programs.
- Silos between organizations prevent effective partnerships and broad-scale impact, limiting resource-sharing and the collective approach necessary for significant climate action. Sometimes this can be seen as a lack of willingness to collaborate.
- Critical infrastructure (e.g., dams, buildings, and utility grids) is aging and unprepared for climate-related disasters, threatening both safety and resilience.
- Public trust and accountability are highlighted as essential for advancing climate planning and, more importantly, action. Many community members and others are looking for ways of holding government accountable for enforcing and maintaining accessibility, safety and sustainability in city planning and following through on action.

Agriculture & Natural Working Lands

Working group participants identified the following climate risks and impacts:

- Increased occurrences of drought and flooding put stress on the agricultural community, raising crop prices and exacerbating economic burdens on farmers.
- Rapid development of farmland and the invasion of non-native species threaten local ecosystems, pushing farmers out of business.
- Warmer temperatures contribute to the spread of diseases affecting crops, requiring farmers to import produce from other regions.
- Climate change facilitates the spread of invasive species, which poses a risk to native plants and threatens biodiversity.

Working group participants discussed the following ideas for future climate action:

- Provide financial support and incentives to promote and test climate-smart agricultural practices and innovations – alongside communities.
- Support urban gardening and small-scale farming, enabling more community-driven food sources. Shared interest with the Transportation & Land Use Sector.
- Establish large-scale composting initiatives to reduce waste and support local agriculture.
- Support carbon credit programs and educate farmers on the potential benefits, while addressing the barriers to participation.
- Leverage wood products and waste management to create economic opportunities and reduce reliance on landfills.
- Establish closed-loop food systems with infrastructure such as cold storage facilities to support sustainable agriculture and enhance market access.
- Increase public awareness and involvement in discussions about agricultural practices, food security, and environmental sustainability.

Working group participants identified the following barriers and challenges to climate action:

- A lack of financial resources hampers investment in sustainable practices and infrastructure development.
- Competition and historical distrust among farmers hinder collaboration and the adoption of new practices.
- Effective communication and education must consider the diverse cultural backgrounds of the farming community.
- Insufficient local data on carbon sequestration and agricultural practices makes it challenging to advocate for climate-smart initiatives.
- Existing zoning laws often prohibit sustainable agricultural practices in urban areas.
- Open discussions about climate change can be difficult in conservative areas. Gaps in education about sustainable practices.
- Younger generations show less interest in farming, often leading to the sale of family farms.

Waste

Working group participants identified the following climate risks and impacts:

- Natural disasters (flooding, tornadoes and storms) generate large amounts of debris and cause landfills to fill faster than anticipated.
- Methane emissions and toxic pollutants from landfills pose health risks to neighboring communities.

Working group participants discussed the following ideas for future climate action:

- Establish large-scale composting programs.
- Develop better recycling infrastructure and practices.
- Implement policies to encourage a circular economy.

Working group participants identified the following barriers and challenges to climate action:

- Poor infrastructure and limited funding hamper recycling and composting capabilities.
- Privately owned landfills have little incentive to invest in methane capture.

Buildings & Energy

Working group participants identified the following climate risks and impacts:

- Critical infrastructure (e.g., dams, buildings, and utility grids) is aging and unprepared for climate-related disasters, threatening both safety and resilience.
- Climate-related challenges, such as heat islands, floods, droughts, and wildfire risks, threaten regional stability. Communities lack adequate shelter options, particularly those experiencing homelessness.
- Urban sprawl and insufficient green space create urban heat islands, exacerbated by widespread deforestation.

Working group participants discussed the following ideas for future climate action:

- Educating the community about climate risks and available resources through workshops and other communication strategies.
- Updating building codes to promote energy efficiency and resilience. Participants suggested incorporating resilience standards into new developments and adapting policies to support these priorities, including incentivizing electric vehicle (EV) charging infrastructure in housing developments. Shared interest with the Transportation & Land Use sector.
- Create citywide shelters for extreme weather events, especially to aid people experiencing homelessness. Retrofitting and design updates for resilience in multi-family housing and public buildings were highlighted as top priorities.
- Expanding clean energy options, like distributed energy systems and community solar. Advocates call for these systems to be community-owned, unlike current models managed by utilities. Lowering the cost of electrification and providing income-based payment programs would make clean energy more accessible to low-income residents.
- Expanding financial incentives and accessible loan programs. Additionally, implementing programs like PACE (Property Assessed Clean Energy) loans for residential properties could make them more affordable over time.
- Invest in workforce training programs for solar panel and battery production to support economic resilience and create job opportunities.

Working group participants identified the following barriers and challenges to climate action:

- Increased energy and housing prices strain affordability, especially for low-income households.
- Lack of coordination among stakeholders and difficulty navigating existing programs and resources.
- Small businesses and individuals struggle to access grants or financing for green infrastructure due to complex application processes and restricted eligibility.
- Inequitable access to resources, information, and new technologies, particularly for renters and low-income communities.
- Energy providers, especially TVA, create obstacles for local energy resilience, distributed energy solutions, and clean energy transitions.
- Outdated building codes and restrictive state laws prevent cities from enforcing higher efficiency standards, with additional resistance from construction lobbyists. Efforts to adopt stricter codes (e.g., energy efficiency) face opposition at state levels, slowing climate action.

Transportation & Land Use

Working group participants identified the following climate risks and impacts:

- Limited accessibility and unsafe conditions for non-drivers; poor pedestrian/bike infrastructure increases climate vulnerability.
- Heat and lack of shade affect bus stop safety and sidewalk usability.
- Flooding risks due to poor infrastructure, impacting roads and evacuation capabilities.

- Urban sprawl increases interstate congestion, air pollution, and exacerbates emergency risks.
- Low-income neighborhoods and people without cars face disproportionate climate impacts, as they often have limited access to safe, walkable streets, reliable public transit, and nearby grocery stores.

Working group participants discussed the following ideas for future climate action:

- Integrate mixed-use zoning, with community-driven, sustainable development for better accessibility.
- Prioritize public transit expansion and safety enhancements, such as improved bus stops and pedestrian-friendly designs.
- Incentivize compact city planning to reduce dependency on cars and promote active transportation.
- Invest in renewable energy for public infrastructure (e.g., EV charging, solar at airports).
- Build regional transportation hubs.
- Implement strategies for safe school routes that encourage walkability and bikeability for school-aged children.

Working group participants identified the following barriers and challenges to climate action:

- Insufficient collaboration across city departments and neighboring regions.
- Restrictive planning and zoning policies hinder the development of mixed-use, walkable neighborhoods. NIMBYism prevents the development of higher-density housing.
- Limited funding sources for climate-resilient infrastructure, especially for active transportation.
- Public reluctance toward increased density and unfamiliar transit options.
- Regulatory constraints and planning inconsistencies hinder progress on equitable infrastructure projects.
- High cost of electric vehicles (EVs) and bikes present a financial barrier, particularly for marginalized communities, while limited EV infrastructure (charging stations) and lack of heavy-duty vehicle electrification amplify pollution in these areas.
- EV adoption shows promise, but limitations in charging infrastructure present challenges. Education and resilience-centered strategies (e.g., hybrid vehicles, renewable energy use) are crucial, especially in rural areas where infrastructure is sparse.
- Car dependency remains high, driven by factors like job access, food deserts, and suburban sprawl.
- Challenges and inefficiencies in public school transportation result in personal car use and idling in school drop off and pick up lines.
- Trust in government is low, and this translates to lack of trust in public transit.
- Gentrification is a persistent threat.

Working Groups Round 2

(11/13/24)

These summary notes capture key points from the sector-specific working group discussions held in November 2024 as part of the stakeholder engagement process for the Knoxville MSA's Comprehensive Climate Action Plan (CCAP). The discussions were organized into the following sectors: Agriculture, Natural & Working Lands, and Waste; Transportation & Land Use; and Buildings & Energy.

Draft Measure List

This list reflects the changes encouraged during the working group sessions including breaking up existing measures, adding new measures, and other modifications.

Draft Measures Prior to Round 2	Revised Measures After Round 2 (Revisions in Red)
Accelerate use of electric vehicles throughout the community.	Accelerate use of passenger electric cars across the region through education, incentives, and partnerships.
Transition to electric and alternative fuel vehicles in public fleets (including school buses) and provide access to supporting charging or fueling infrastructure.	Transition to electric and alternative fuel vehicles in public fleets, including government fleets, **transit agencies,** and school buses
Expand electric vehicle infrastructure.	Expand publicly accessible and private electric vehicles and alternative fueling infrastructure through education, regional siting analyses, incentives, partnerships, and other opportunities.
Optimize and improve efficiency of freight routes.	Optimize and improve efficiency of freight routes.
Improve transportation systems through sustainable construction practices.	Improve transportation systems through sustainable construction practices.
Expand and improve public transit.	Improve transportation systems' management and operations through new policies and practices (e.g., optimization to improve traffic flow, reduce idling, reduce VMT, etc.).
Boost active transportation and the use of alternative transportation systems.	Expand and improve public transit infrastructure to create safe, reliable and affordable options for the region. Base these changes on studies, new and expanded programs, and community engagement to provide more mobility options for residents to access work and life and community amenities.
N/A	Boost active transportation and the use of alternative transportation systems through expanding safe, reliable and affordable options, and marketing those options.
Implement energy efficiency upgrades in residential, commercial, and public buildings.	Increase uptake of energy efficiency and weatherization of residential, commercial, and industrial buildings through: increased marketing, education and outreach around

	technologies, funding opportunities, and maintenance and behavior changes; provide new or expanded incentives to support implementation; and consider and implement solutions to incentivize landlords to make upgrades with managing resident costs.
Implement energy efficiency upgrades in residential, commercial, and public buildings.	Plan for and implement energy efficiency upgrades in and take other actions to decarbonize (e.g., through electrification) public buildings.
Electrify residential, commercial, and public buildings.	Study, plan for and implement targeted electrification of residential, commercial, **and industrial** buildings.
Develop and invest in clean and renewable energy.	
Reduce waste generation and increase waste diversion through recycling, community engagement, and education.	Reduce or divert waste going to landfills through engagement and education and programs for recycling.
Study, design, and implement organics waste reduction and collection programs.	Study, design, and implement composting programs and other organic waste management.
Enhance urban tree canopy through strategic planning, implementation, and community engagement.	Enhance tree canopy through strategic planning, implementation, and community engagement, particularly focused on areas of high risk for urban heat island effects.
Promote land conservation and the creation of green spaces.	Promote land conservation and the creation of green spaces through education and more shared green community spaces, while balancing different needs for land use (e.g., renewable energy)
Create more dedicated space for urban and micro farming and improve other agricultural practices (*note, could split into two measures)*.	Create opportunities for, reduce barriers to, and increase education about urban and micro farming and benefits.
Create more dedicated space for urban and micro farming and improve other agricultural practices (*note, could split into two measures)*.	Promote and support new and improved agricultural farming practices and educate and support farmers around available incentives.
Create more urban density/less sprawl	Evaluate policies and opportunities for reduced sprawl.

Agriculture & Natural Working Lands & Waste

Opportunities:

- Convert vacant lands into community gardens/urban farms to improve food access and promote community ownership of shared spaces.

- Improve pathways for locally grown products to reach local markets.
- Leverage partnerships with schools and nonprofits to educate and involve the public. For example, hold community workshops on invasive species management, urban farming, and composting through organizations like UTIA.
- Provide financial incentives and support research to encourage the adoption of sustainable agricultural practices.
- Promote urban native plant corridors, invasive species removal, and eco-tourism to preserve natural lands.
- Provide incentives for local businesses to move away from disposables.
- Establish a City Waste Board to build out infrastructure for waste diversion.

Current or Future Actions, Policies, or Programs:

- Develop land trusts to preserve agricultural land and promote sustainable farming practices. Look to the Farmers Land Trust as a potential model.
- Investigate the sourcing of local wood for wood pellet production facilities and look to the Dogwood Alliance as a potential collaborator/model.
- Develop incentives to reduce single-use plastics and establish a City Waste Board for sustained action.
- Support research to test innovative farming practices.
- Partner with organizations like Resilient Ecosystems Knoxville (RESET) to promote land conservation efforts.
- Expand tree canopy in underserved communities and build off the Urban Forest Master Plan.
- Build on existing composting programs, like the Knoxville Compost Project and UT's composting facility

Barriers and Risks:

- Farmers face financial pressures, leading to the sale of farmland and consolidation in the farming industry.
- Younger generations show less interest in farming, and traditional practices struggle to adapt to climate change.
- Zoning laws restrict urban farming.
- Lack of waste infrastructure
- Culture of convenience reduces participation in waste diversion efforts.
- Need to balance competing land-use needs (e.g., solar development, stormwater management, and land conservation).
- Lack of recycling and compost infrastructure
- Issues with waste contamination hinder composting efforts
- Waste-to-energy facilities could reduce incentive to divert waste

Transportation & Land Use

Opportunities:

- Improve public transit service and bus infrastructure (shelters, lighting). Expand routes to underserved areas, increase service frequency, connect stops to bike/pedestrian infrastructure, and improve parking access for transit users. Consider adding express bus routes and offering free bus fares to increase ridership.
- Promote public buy-in through education and marketing campaigns.
- Improve infrastructure for active transportation and micro-mobility options. Expand bike share and e-scooter programs, build protected bike lanes, and create mobility hubs to improve multi-modal access.
- Develop new metrics to measure the impact of gentrification and displacement.
- Expand access to EV charging networks by integrating charging infrastructure into new multifamily homes, adding solar charging canopies, and creating charging stations in central locations like grocery stores.
- Connect neighborhoods to cultural and community amenities.
- Expand bidirectional charging (V2G/V2B).
- Reduce vehicle idling and enforce vehicle emissions inspections to mitigate the negative health impacts associated with tailpipe emissions.

Current or Future Actions, Policies, or Programs:

- Programs like the GUMBO EVSE workforce development initiative are training technicians to build out EV infrastructure.
- Federal EV incentives and programs like the EPA's Clean School Bus and Clean Heavy-Duty Vehicle Programs support the electrification of public and private fleets.
- Existing initiatives and organizations like Vision Zero and Bike Walk Knoxville aim to increase bike and pedestrian accessibility. Expanding public education campaigns and offering incentives for cycling or e-bike use are part of broader efforts to reduce vehicle dependency.
- Technologies like Advanced Traffic Management System (ATMS) can be used to optimize traffic flow, reduce congestion, and improve real-time travel information.

Barriers and Risks:

- Costs associated with EV infrastructure, EVs, and retrofitting public fleets are too high, even with existing incentives.
- Many fear the incoming presidential administration may eliminate federal incentives, further slowing progress on EV adoption.
- In rural areas, adoption of EVs may be slower due to concerns about charging infrastructure and vehicle range.
- Efforts to electrify school buses are complicated by the private ownership of school buses. Furthermore, mechanics and bus drivers lack experience with EVs, so programs will need to work with unions to ensure a just transition.
- Securing political buy-in, particularly outside of major urban centers like Knoxville, remains a significant challenge.
- Safety concerns, such as the lack of sidewalks or pedestrian-friendly streets, particularly in underserved areas, limit the effectiveness of active transportation initiatives. Poor connectivity and inadequate shelter or safety at bus stops can deter use.

- Need to overcome cultural perceptions about public transit and alternative transportation (e.g., stigmas around riding the bus). Normalize using micromobility for formal transportation.

Buildings & Energy

Opportunities:

- Explore solutions like community solar and Virtual Power Plants (VPP) to increase deployment of distributed energy resources.
- Workshops and marketing campaigns targeting both homeowners and contractors can drive greater awareness and participation, especially in underserved communities.
- Expanding the use of solar energy, particularly through community solar programs, to provide affordable, renewable energy options for low-income households. Other opportunities include offering property tax discounts for solar installations, incentivizing local solar manufacturing, and coupling solar installations with battery storage or vehicle to building (V2B) charging to improve energy resilience.
- Reusing abandoned buildings for affordable housing or mixed-use development provides an opportunity to revitalize communities while addressing energy-efficiency and environmental justice goals.
- Innovative water conservation practices like rainwater harvesting and greywater reuse can reduce water use and wastewater discharge.

Current or Future Actions, Policies, or Programs:

- Existing programs like TVA's EnergyRight, Home Energy Audits, and rebates are in place to support energy efficiency upgrades. Efforts to expand weatherization programs, such as TVA's Home Uplift and KUB's Round It Up program, are currently underway. The Knoxville MSA region was also awarded a $2 million grant through Power Forward Communities to decarbonize 10,000 homes, focusing specifically on LIDACs.
- Solar energy initiatives like the CAC's Solar Photovoltaic Energy Reduction Initiative (SPERI) and TVA's Flex Generation program aim to increase local renewable energy generation.
- Programs like the Living Building Challenge showcase the benefits of rainwater harvesting and greywater reuse.

Barriers and Risks:

- High upfront costs for energy efficiency upgrades, electrification, and solar installation can deter participation, especially for low-income households. Additionally, limited access to financing and high interest rates make it challenging for contractors, homeowners and renters to invest in new technologies.
- Cost savings from energy efficiency retrofits may not be passed on to tenants.
- The lack of qualified contractors and the slow pace of workforce development have contributed to long wait times for weatherization programs and inefficiencies in program implementation. For example, TVA's EnergyRight PPN aims to streamline the process of applying for incentives, but the current program is burdensome for contractors.

- State laws, such as preemptive restrictions on local building code adoption, can slow progress on updating building codes and implementing energy-efficient standards.
- Some are concerned about power outages and the resilience of electric systems, especially during extreme weather events.
- Lack of net metering means solar installation must be coupled with expensive battery storage.
- Solar still feels out of reach for low-income residents.
- Aging infrastructure, such as outdated transmission lines, limits the ability to integrate renewable energy sources like solar effectively.
- Efforts to redevelop abandoned buildings often lead to gentrification.

Call outs for Collaboration and Capacity Building

The following organizations, programs, policies or reference ideas from other regions were called out in conversation

- UTIA composting programs
- Farmers Land Trust: example land trust
- Knoxville Compost Project
- Urban Forest Master Plan: reference for urban forestry efforts
- Resilient Ecosystems Knoxville (RESET): reference for urban forestry and land conservation efforts
- Dogwood Alliance: guidance on wood pellet facilities and industry practices
- GUMBO EVSE: workforce development
- EPA's Clean School Bus and Clean Heavy-Duty Vehicle Programs: example of federal rebate programs to leverage
- Vision Zero: potential transportation partner to reduce car dependency
- Bike Walk Knoxville: potential alternative/active transportation partner
- Advanced Traffic Management System (ATMS): VMT reduction technology
- Virtual Power Plants (VPP): expanding solar access
- TVA's EnergyRight, Home Energy Audits, and rebates
- CAC's Solar Photovoltaic Energy Reduction Initiative (SPERI)
- TVA's Flex Generation
- TVA's Home Uplift: weatherization assistance
- KUB's Round It Up: weatherization assistance
- Living Building Challenge: use of runoff and greywater
- Power Forward Communities: grant to Knoxville to decarbonize 10,000 homes, focusing specifically on LIDACs.

To Tackle Next…

- Collaboration and communication across the MSA about the CCAP development process
- Public education and awareness of solutions and the CCAP development process
- Desire to continue peer-to-peer learning beyond the working group sessions
- Creating a measure list with sector wide coverage that has the right specificity

- Consider cross collaboration of sectors for future working groups

Workforce/Business Development

Special Topic Highlights from Rounds 1 and 2

These summary notes capture key points from both rounds of the sector-specific working group discussions held in October 2024 and November 2024 as part of the stakeholder engagement process for the Knoxville MSA's Comprehensive Climate Action Plan (CCAP). These notes specifically speak to the special CPRG topics on Workforce/Business Development.

Workforce/ Business Development Throughlines

Throughout rounds 1 and 2, the following key themes were brought forward when discussing the status quo of workforce/business development:

- Understanding and meeting training needs
    - Installation and maintenance of EVs, EVSE, and electrification/efficiency technologies require training specific to those technologies that may be different for contractors used to working with gas or other fossil fuel-powered technologies.
    - Lack of awareness around sustainable farming practices and technologies.
    - Time, monetary, and other capacity restraints on meeting training needs.
- Contractor/product verification and consumer protections
    - Current lack of verified contractors is slowing down weatherization programs and leading to other inefficient program role outs.
    - Contractors need clearer certification/verification processes to increase consumer trust and protection as people and businesses invest in climate solutions for their properties.
    - Need for efficient incentive program to promote contractor training in new technologies (e.g., TVA's EnergyRight PPN).
    - "Sustainable" technology and other "eco-friendly" products have a verification issue in many industries. Not only are verifications often decentralized, but the public lacks widespread awareness about the verifications.
- Incentives for sustainable practices in industry
    - Currently, businesses and industry have few incentives to take action to reduce waste generated, reduce electricity used, and transition to lower-carbon fuel alternatives.
        - Farmers lack a substantial market for sustainable, local goods.
        - Contractors are trying to reduce deadstock materials that are deemed outdated.
        - Businesses have no clear infrastructure or incentives for recycling, composting, or reducing waste of single-use materials.
- Collaboration and capacity building

- Existing workforce training (e.g., GUMBO EVSE workforce development initiative) lack the capacity to meet demand.
- Increase collaboration and conversation with training providers, industry leaders, business owners, and educators to determine better comprehensive planning for workforce development rather than working in silos.

Workforce/Business Development December Session

(12/4/24)

These summary notes capture key points from the workforce working group discussions held in December 2024 as part of the stakeholder engagement process for the Knoxville MSA's Comprehensive Climate Action Plan (CCAP).

Participants identified the following elements and approaches for developing and implementing a successful workforce and business development plan:

- Local Empowerment
  - Prioritize hiring local businesses and contractors to support development work rather than outsourcing large corporations that may prioritize cost over community investment.
  - Leverage existing workforce development programs in schools, reentry, retirement, and transition programs to integrate climate and energy-focused career pathways.
  - Expand training and job opportunities for rural communities, ensuring virtual or accessible resources are available for those with limited access to continuing education or professional advancement.

- Ensure Stability, Equity, and Accessibility
  - Provide career pathways with upward mobility, focusing on high-paying jobs instead of only entry-level positions.
  - Integrate tech-focused roles, such as data and AI careers, alongside hands-on climate and energy trades.
  - Retrain workers in trades vulnerable to displacement, offering them stable, future-ready skills to mitigate economic risks from new technologies.
  - Link training programs directly to job availability to ensure participants can transition smoothly into the workforce.
  - Ensure wrap-around support like childcare, internet, and transportation to remove barriers to participation in workforce programs.

- Training, Partnerships and Integration
  - Partner with unions and apprenticeship programs to draw on their expertise in training underserved populations and connecting trainees with employment.

    - Include union leadership in developing training programs, leveraging their expertise in building trades and electricians' skills.
    - Develop specialized training programs in collaboration with local community colleges for careers like clean energy infrastructure installation.
    - Offer mentorships, internships, and fellowships to create a pipeline from high school to the workforce, emphasizing climate-ready careers.
    - Establish paid training opportunities to make programs accessible and inclusive for all economic backgrounds.
    - Partner with community organizations and established EJ/climate leaders to amplify their impact through complementary professional development opportunities.
    - Include community input and leadership in workforce planning to ensure efforts align with local needs and priorities.
    - Leverage existing models and adapt them to local contexts to ensure programs meet Knoxville's unique needs.
- Marketing and Strategic Communication
    - Use strategic language to reframe climate issues as opportunities for economic development, disaster resilience, or environmental stewardship to build support across different demographics.
    - Build narratives that resonate locally, using topics like natural disasters, impacts on agriculture, and economic benefits to bridge divides.
        - E.g., Agriculture is a big concern for rural folks in Knoxville MSA. Putting solar on farms to generate income for farmers could be a compelling narrative.
    - Avoid confrontational rhetoric, instead validating diverse perspectives and making climate action relatable.
    - Emphasize job security and long-term growth potential in climate jobs to overcome skepticism about their viability.
    - Highlight a diverse range of job opportunities, such as careers in nuclear energy development.

- Policy and Advocacy
    - Advocate for integrating climate education into school curriculums and securing supportive public policies at the local and state levels.

Participants identified the following **challenges** to developing a climate-ready workforce and business environment:

- Need to accommodate and provide training for various skill levels and competencies. Gaps in workplace readiness, including basic math and language skills, hinder workforce integration.

- Historically marginalized populations continue to face structural inequities. Consider expanding pathways to employment for individuals with substance abuse or criminal records.
- High costs of training programs and infrastructure development pose significant barriers. Financial constraints faced by small businesses and community organizations make it challenging to expand teams or take on larger projects.
- There is limited understanding or value placed on climate-related work, especially in rural areas, due to skepticism about climate change or the longevity of climate jobs.
- The politicization of climate change leads to resistance in schools, workplaces, and policymaking, creating uncertainty for workforce and business development.
- Poor alignment between training and job availability in green sectors risks leaving participants without employment opportunities.
- High political uncertainty – potential rollback of federal incentives for clean energy projects and initiatives.
- Implementing models from other regions without fully understanding their context and reasons for success can lead to failed adoption.

Existing Programs and Models

- Local workforce development programs and activities already in place:
    - *SEEED's Green Construction Bootcamp*
    - *TVA's EnergyRight – Quality Contractor Network & Preferred Partners Network*
    - *East Tennessee Apprenticeship Readiness Program*
    - *Knoxville Chamber of Commerce* Apprenticeship program
    - *ORNL* offers internships in decarbonization and clean energy that are targeted toward underrepresented communities
    - *Two Bikes, a* high school apprenticeship program for bicycle mechanics
    - *Clearloop*, a clean energy company based out of Jackson, TN, developed a curriculum around solar installation and partnered with Rivian to build EV charging stations across Tennessee.
- Programs in other cities and areas of the country:
    - *Guaranteeing Access to Underserved and Marginalized Populations by Building Employment Opportunities (GUMBO)* in Louisiana: program aiming to educate and train a qualified workforce for electric vehicle supply equipment (EVSE) technicians.
    - *LADWP's Utility Pre-Craft Training* (UPCT) program in Los Angeles: an earn-and-learn, pre-apprenticeship training program in which entry-level trainees work full time weatherizing homes and small businesses
    - *Green Raiteros* program in Central California: a free electric