ENERGIZING THE FUTURE MOBILITY WORKFORCE IN MICHIGAN

C2ES CLIMATE INNOVATION 2050

by

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Recent momentum in the electric vehicle and battery sectors—driven largely by federal investments through the Inflation Reduction Act of 2022 and the Infrastructure Investment and Jobs Act of 2021—has led to significant investments in new production and assembly facilities in Michigan. As the birthplace of the automotive industry, Michigan now faces an opportunity to lead the development of the "future mobility" industry, a term inclusive of all elements of the electric and hydrogen fuel cell vehicle supply chain and associated infrastructure. To power the transition, companies, economic development organizations, educational institutions, and state and local government must be prepared to support the current and future workforce to develop the skills necessary to lead the industry and to provide support for workers to access new opportunities. This brief provides insights and recommendations from a roundtable hosted in Detroit, Michigan, in February 2024 that explored the shifting needs of the future mobility industry in the state and generated collaborative solutions to support a developing workforce.

INTRODUCTION

ABOUT REGIONAL ROUNDTABLES

Efforts to accelerate the transition to the low-carbon economy of the future are accelerating across all sectors of the economy. To chart a pathway to sustainable, long-term prosperity, communities must be able to leverage their particular strengths and capitalize on emerging economic opportunities, while addressing barriers that are often unique to their communities. To that end, the Center for Climate and Energy Solutions (C2ES) is hosting a series of regional roundtables to bring together local, state, and federal policymakers; businesses of all sizes; community organizations and nonprofits; academics and issue experts; trade associations; investors; philanthropy; economic development organizations; and individuals working across sectors. These conversations are meant to elevate the perspectives of a diverse set of local stakeholders who are deeply embedded in their communities and uniquely positioned to speak to the needs of their states and regions. They are also meant to

create opportunities to integrate local perspectives into state and federal policy decisions and identify concrete steps to better align the long-term prosperity of these communities with the urgent task of reaching economy-wide net-zero emissions.

Our February 2024 roundtable, held in Detroit, Michigan, brought together approximately 45 participants representing companies and industry groups across the automotive sector, state and federal government, workforce development, higher education, and nonprofit sectors to explore workforce opportunities in the electric vehicle (EV) industry and adjacent sectors. This brief summarizes key takeaways from the discussion, a shared vision among participants for what success looks like in Michigan in the next decade to become a leader in the future mobility industry, and a series of actionable, near-term, collaborative solutions developed through the event.

PAST CONVERSATIONS IN MICHIGAN

Our convening in 2024 builds upon a previous regional roundtable which C2ES hosted virtually "in" Detroit in February 2022, focused on Accelerating Vehicle Electrification in Michigan.[1] In this conversation, participants across the vehicle manufacturing and EV charging industries—many of whom engaged in the subsequent 2024 roundtable—met to consider challenges and opportunities for building out EV charging infrastructure in the state and promoting transportation emissions reductions among drivers across the state. The discussion produced a series of recommendations to expand access to charging infrastructure, future-proof charging infrastructure, provide low-carbon alternative mobility solutions, and support the zero-emission vehicle manufacturing workforce.

Among these topics, participants in the 2022 roundtable expressed strong interest in the workforce development segment of the conversation. Recommendations stemming from this discussion session included:

- **Develop curricula to integrate problem-solving and project management skills training into K-12 education**: The Michigan Department of Education should work with prospective employers and educators to develop learning objectives for every level consistent with career readiness skills and should integrate these objectives into academic standards and curricula throughout the state's K-12 school systems.
- **Promote collaboration between future employers and training programs to prepare new workers for success in the ZEV industry**: Companies should provide funding for vocational training programs for high school and early career students to augment public education offerings. Additionally, the Michigan Department of Education should actively seek input from companies in industries directly or indirectly relating to the ZEV industry to forecast skills and training needs and proactively address them in new curriculum development.
- **Promote working conditions that enhance productivity and quality of life while offering opportunities for growth and professional development**: To compete for top talent, companies will need to offer a living wage, competitive benefits, and professional development opportunities to attract new workers and offer existing workers a path to advancement.
- **Sponsor talented workers from the global economy to grow the American industry**: Michigan-headquartered companies should work with the state and federal government to attract global workers and provide a path to citizenship.[2]

Since the convening, Michigan has made significant progress in supporting and growing the electric vehicle workforce, including through the establishment of the Community & Worker Economic Transition Office, the creation of the EV Jobs Academy, a resource for workers of all experience and skill levels interested in working in the field, and work implementing experiential learning in PK-12 education programs across the state through the MiSTEM Network.[3] Building on this success, participants in the 2024 roundtable identified additional opportunities to encourage further coordination among government and private sector actors; to transparently communicate to workers the skills and qualifications necessary to succeed in the industry; to promote careers in the EV industry to current and future workers; and to better support the "whole worker" to succeed in the industry.

BOX 1: A Note on Process

This roundtable followed a format distinct from others C2ES conducted. In previous roundtables, participants worked in small groups to develop specific, actionable next steps to promote collaborative solutions. For this roundtable, using a methodology called the Innovator's Compass, developed by Ela Ben-Ur, participants collaboratively developed a shared basis for developing solutions before generating "big ideas" and "experiments" to begin implementing their ideas.*

Participants shared observations about current challenges and opportunities the future mobility industry faces in Michigan, and briefly mapped a landscape of key stakeholders who needed to be engaged in developing and implementing solutions. Next, they developed a shared set of principles that must be met in the development of those solutions. Finally, they generated "big ideas," or big-picture goals that could be achieved over the next 10 years, and a set of "experiments," or near-term actions that could be taken over the next six months to begin implementing the "big ideas."

Ultimately, a total of five "experiments" emerged from the discussion, with actionable next steps for each. These are listed below in the recommendations section, with further detail provided in the subsequent sections pertaining directly to each issue area. They range from federal policy recommendations to private sector actions, and include specific reference to actors at the local, state, and/or federal level who should be responsible for their implementation. They are not meant to be a comprehensive list of policy solutions, and should be viewed as a starting point rather than an end goal. They were developed collaboratively by diverse groups of stakeholders engaging in future mobility workforce development and are intended to help put the state and the industry on a path to success by 2035.

** Ela Ben-Ur, "Innovators' Compass," accessed May 16, 2024, https://innovatorscompass.org/.*

THE STATE OF EV WORKFORCE DEVELOPMENT IN MICHIGAN

Growing Investments in the EV Industry

The electric vehicle industry is entering a new phase of growth and adoption, driven in large part by several incentives and tax credits provided by the Infrastructure Investment and Jobs Act of 2021 (otherwise known as IIJA or the Bipartisan Infrastructure Law) and the Inflation Reduction Act of 2022 (IRA). The Bipartisan Infrastructure Law includes $50.3 billion in EV-related provisions, including $7.5 billion in grants to states to establish a national electric vehicle charging network (the National Electric Vehicle Infrastructure program, or "NEVI", and the Charging and Fueling Infrastructure Discretionary Grant Program).[4] The IRA provides a consumer tax credit through 2032 of up to $7,500 for the purchase of new or used EVs with the important caveat that the vehicle, its battery, and the critical materials within must be manufactured, processed, or recycled in the United States.[5] These investments in America's EV infrastructure, paired with tax credits to incentivize domestic manufacturing, have turbocharged private investment in the U.S. electric vehicle industry.

Globally, car companies have announced commitments totaling an estimated $515 billion for EV and battery investments by 2030.[6] In the United States, manufacturers have announced $188 billion in investments in domestic EV and EV battery manufacturing since 2013.[7] Over half of those investments—$114 billion—have occurred since the passage of the IRA. Of that, more than $20 billion of investments are planned to take place in Michigan, the second highest of any state after Georgia's $31.2 billion.[8] These investments are projected to create and retain 18,200 in Michigan—9.3 percent of the 194,500 jobs created and retained across the country. For comparison, in 2021, Michigan had 175,745 motor vehicle and parts manufacturing jobs, making these new announcements equal 10.3 percent of the total employment in the sector prior to the passage of the IRA.[9] This raises the important question of how and where communities hosting projects will find the talent needed to build out the future mobility industry.

Economic and Demographic Transition in Michigan

As one participant reminded the room, Michigan has been in a long-term economic transition over the last 40 years. The state has gone from 16th to 39th in per capita income in the United States from 1999–2024, driven in large part by the loss of manufacturing jobs in Michigan.[10] Michigan has lost well over 100,000 jobs in transportation equipment manufacturing over the last 34 years, decreasing from 328,000 jobs at its peak in January of 1999 to around 183,000 jobs in January 2024.[11] This decrease represents a drop in automotive manufacturing's total share of jobs in Michigan from 7.4 percent in early 1990 to around 3.7 percent by the end of 2023.[12] Analysts attribute the decline to a number of factors including increased automation, outsourcing operations to Mexico as a result of trade agreements such as NAFTA, and manufacturing shifts to non-union plants in the southern United States.

While the total number of mobility manufacturing jobs have declined, so too has the interest of younger workers to take on roles in manufacturing generally. Younger workers associate the auto industry with layoffs, long hours, and physically demanding work, ranking it below other careers for work-life balance, according to a survey released by MICHauto that polled 860 adults age 17–24.[13] At the same time, younger residents are leaving the state, with the population aged 24 and younger expected to decline by 5 percent between 2021 and 2050.[14] According to the state's workforce analysis, workers aged 45 to 64 make up 46.3 percent of manufacturing employment, 9.3 percentage points higher than the statewide average.[15] With the high proportion of current auto workers approaching retirement age, and a declining population of younger Michiganders, the state must consider how to compete for the job growth that is expected to come from increased investment in advanced mobility manufacturing.

Investments in Workforce Development

Both the federal and state governments have made significant investments in workforce development. The Workforce Innovation and Opportunity Act (WIOA), passed in 2014, lays the groundwork for a public workforce development system.[16] WIOA provides services to dislocated workers, youth aged 16 to 24 who face barriers to employment, and all adults with a priority for low-income individuals and veterans to access employment, training, education, and support services.

However, funding for WIOA programs has declined by 12 percent in real terms between its passage and fiscal year 2023.[17] The underfunding of this program means that not everyone who wants to train for a new job can. In 2021, most funding went to job searching, career counseling, and referrals, while only 31 percent of people who completed WIOA adult and dislocated worker programs received actual training for new or better jobs. Insufficient funding also means fewer workers participating in the program received needed support services such as childcare and transportation, with only 15 percent of program participants receiving these services as part of their participation in 2021.[18]

More recent legislation has created new programs and provided funding for workforce development both nationally and in region-specific programs. The Bipartisan Infrastructure Law includes $800 million in dedicated investments for workforce development, including on-the-job training implemented by the Department of Transportation.[19] The American Rescue Plan of 2021 includes $1 billion in investments through the Economic Development Administration in regional industry clusters across the country to drive equitable economic growth, create good paying jobs, and enhance U.S. competitiveness in key industries.[20] In Michigan, the Global Epicenter of Mobility Coalition (GEM), led by the Detroit Regional Partnership, received $52.2 million in September 2022 to transform Detroit's legacy automotive industry into an advanced mobility cluster.[21]

In April 2024, the Biden administration announced a new Electric Vehicle Workforce Hub in Michigan to support the auto industry during its evolution to the next generation of clean vehicles.[22] Michigan's new Workforce Hub is among four additional hubs added to the initial five Investing in America Workforce Hubs announced in May 2023. The hub will facilitate coordination and collaboration among partners across companies, educational institutions, unions, and nongovernment organizations to support retooling existing factories and rehiring local workers with comparable wages as companies transition to EV manufacturing. Importantly, of the four hubs announced, the Michigan hub is the only one that includes an entire state, indicating the importance and necessity of a state-wide workforce development coordination effort.

The Michigan state government has also been engaged in meeting the workforce needs of the advanced mobility industry. This expanded programming includes the state's EV Jobs Academy, an employer-led collaborative of more than 100 stakeholder partners to identify the occupational and skill needs for EV and other mobility-related jobs. The EV Jobs academy is supported by the state's Office of Labor and Economic Opportunity and is working closely with GEM to maximize resources among common partners to create interconnected skill-building opportunities across the region's network of talent service providers.[23]

In early 2024, Michigan launched the statewide Office of Worker and Community Economic Transition as part of the Clean Energy Future Package passed in November 2023 to develop a statewide plan to help workers access high quality jobs in high-tech EV manufacturing and clean energy and help employers retool their equipment and train their employees.[24] The office will collaborate with community leaders, workforce partners, and businesses to provide programs that fill gaps in labor needs, connect communities with resources, and centralize best practices.[25]

BOX 2: Vision 2034: Envisioning Headlines a Decade into the Future

At the beginning of the day, participants were placed into groups and asked to develop a shared vision of what success looks like in Michigan in the next decade to become a leader in the future mobility industry to help identify what challenges or complications need to be considered and overcome as the future mobility industry evolves.

Across all groups, a few major themes emerged. Participants agreed that high wages, a focus on population growth and retention, and collaboration and alignment among public and private organizations are key to unlocking success for the development of Michigan's future mobility workforce over the next decade. Participants also underscored the importance of emphasizing inclusivity and diversity to maximize competitiveness as the state implemented programs to grow the future mobility workforce.

The conversation culminated in several newspaper-style headlines that would reflect success in Michigan's future mobility industry in ten years:

- *Michigan capitalizes on mobility leadership to create the world's best clean energy ecosystem.*
- *Michigan leads the country in inclusive income growth, driven by the advanced mobility sector.*
- *Workforce training, sector alignment, and high paying jobs make Michigan the number 1 state to live in.*
- *Michigan population booming as diverse clean energy mobility workforce grows.*

These hypothetical headlines underscore the consensus in the room that the growth of a future mobility industry in Michigan offers a major opportunity for the state to become a pillar of future clean technologies and the economic benefits that follow. Successful regrowth of this industry in Michigan would bring good-paying career pathways and revitalized communities that serve as an attraction to people of all ages to move to Michigan and stay in the state. Alongside the industry's talent attraction efforts, a focus on diversity and inclusion in workforce training offerings would help ensure income growth for all Michiganders and help the state secure its place as a leader in the electric vehicle and future mobility industry.

RECOMMENDATIONS FROM THE DISCUSSION

Following the day's discussion, participants developed recommendations to address the biggest challenges facing workforce development for the future mobility industry. These ranged from large-scale federal programs to local support that help communities maximize the effectiveness of existing resources. The following recommendations can serve as inspiration for how policymakers can energize the future mobility workforce.

- **The Department of Transportation's Center for Transportation Workforce Development should create a national EV workforce moonshot with clear roles for each level of government.** This includes fewer restrictions on federal investments, as well as technical support, state convening, and supporting programs, with an eye toward leveraging local knowledge to drive more effective implementation. As an intermediate step, the federal government should invest in capacity building for states to support local governments applying for federal funding related to workforce development programs.
- **Michigan should help support applications for federal funding applications,** similar to the EPA's Technical Assistance Hubs.[26] These programs provide capacity for frontline communities to navigate and access the historic level of resources provided by the Inflation Reduction Act. Michigan should have a program that also provides technical assistance to communities looking to access resources for workforce development programs.
- **The state should create an "anchor" organization that coordinates and is supported by employers to create an inclusive workforce.** This "anchor" organization should serve as a central and neutral convenor to bring all stakeholders together, create a forum for sharing and understanding all stakeholders' unique needs, and create an organized path forward for the EV workforce. It should engage companies throughout the supply chain, education providers, workforce development agencies, economic development organizations, labor, and state government.
- **The state should lead a marketing campaign for jobs and careers in the future mobility industry to make these careers attractive to prospective workers.** This marketing campaign should target Michiganders broadly, with specific focus on secondary educators including: guidance counselors, career advisors in vocational/technical schools, and teachers—particularly of science, technology, engineering, arts, and mathematics (STEAM) classes. Outreach and marketing materials should demonstrate the possibilities of a career in the future mobility industry, as well as highlighting the kinds of skills that are needed to thrive.
- **The state should invest in placemaking to build a community of support for a person's full day,** including wrap-around services like housing, public transit or alternative modes of transportation, and childcare. Building on the baseline data in the 2023 Growing Michigan Together Council Report, state agencies should identify neighborhoods with lower labor force participation and their barriers to working.[27] Once these are identified, the state should create and fund employment hubs to provide the necessary support to pursue employment opportunities.
- **The state should provide funding and technical assistance to communities,** whether municipal governments or local economic/workforce development organizations, to identify barriers to enter the workforce, make a plan to address these barriers, and seek resources for these solutions.
- **The city of Detroit, with funding and policy support from the state, should invest in its transportation infrastructure to attract and retain residents**. In addition to investing in public transportation infrastructure to better connect the city, and to connect neighborhoods where people live and work, the city should invest in electric mobility solutions like public EV charging infrastructure. The city government should work collaboratively with the automotive industry to highlight future mobility industry opportunities in the city and attract investment.

ANALYZE AND PREPARE TO MEET THE SHIFTING NEEDS OF THE AUTOMOTIVE INDUSTRY

MANUFACTURING GROWTH IN MICHIGAN

Michigan has long been synonymous with the American automotive industry. Michiganders are proud of this legacy, even as the automotive industry's impact on the state's economy has waned over the past decades. As the auto industry shifts its investment focus to future-oriented mobility options such as electric vehicles, companies are beginning to plan, site, and build new facilities around the United States.

Building on Michigan's long history of leading the nation in automotive manufacturing, the state has the experience and reputation to lead this new industry as it continues to grow. Facing increased competition from other regions of the country, Michigan had made it a priority to attract forthcoming investments from automotive companies looking to expand their battery, electric vehicle, and EV charging manufacturing capacity. Working toward this goal has proven to be highly successful over the past few years: Michigan welcomed transformative EV and battery investments totaling over $14 billion in 2022 alone.[28]

These investments include:

- $7 billion from GM to build Ultium Cells's third U.S. battery cell plant in Lansing
- $2 billion from Ford to support electric vehicle manufacturing growth across Michigan
- $3 billion from charging network operator FLO for a new electric vehicle charger manufacturing facility in Auburn Hills.[29]

In 2023, Ford announced an additional $3.5 billion investment for a new EV battery manufacturing facility in Marshall.[30]

In the leadup to the roundtable event, participants pointed to Michigan's success in attracting EV-related manufacturing investments, including EVs themselves, batteries, and charging. However, other states—including Georgia, North Carolina, Tennessee, and Nevada—have seen $167.6 billion in new EV-related facilities.[31] Losing out on these projects to other states is a major concern, and the state of Michigan has worked to provide supportive incentives to assuage anxiety about Michigan's ability to remain a key player in the automotive industry. The state is focused on attracting manufacturing investment to the state. For instance, the state is providing an additional $125 million in matching grants for companies seeking federal funding for clean energy and infrastructure projects.[32]

CHANGING SKILLS NEEDED FOR MANUFACTURING

New manufacturing jobs will require a different set of skills than traditional manufacturing roles. For example, advanced manufacturing includes the use of more sophisticated technologies such as advanced software, artificial intelligence, and robotics that will require different skillsets and specialized training for workers. Rather than completing repetitive tasks using a mill or a lathe, future factory workers will need to be able to operate preprogramed computer control machines that influence entire systems of robotic production.[33] As production lines incorporate more digital aspects, employers will look for employees who are flexible and adaptable to learn new skills as technology progresses, and who can solve problems throughout a complex production line.[34] To develop the necessary workforce that can support the new manufacturing investment the state has attracted, Michigan is now in the process of building out an ecosystem of workforce development programs to expand the talent pipeline for future mobility projects.

Just as the skills needed by advanced manufacturing workers to succeed have become more complex and dynamic, so too will the processes needed to train them. The technology used in production facilities, and the products the facilities are producing, will continue to evolve rapidly. Roundtable participants repeatedly noted that training programs need to be flexible, fast, and customizable to ensure that the skills provided to workers evolve at the same pace as the technology they are producing and the manufacturing processes they use. These programs must train for the needs of today while also anticipating future needs in the mobility industry. This makes partnership between industry and training programs crucial to integrate the needs of employers as they make planning decisions years into the future.

Participants identified increased data availability and a shared repository for that information as a key to addressing major challenges in developing a talent pipeline for the future mobility industry. Partnerships and communications between training programs and industry is crucial for key stakeholders to collect data on the needs

of the industry. The consolidation of data across multiple areas could support a more robust workforce development ecosystem. For example:

- Data about existing training efforts and skill gaps will help increase transparency for both employees and employers, while helping to connect existing internal tracking infrastructure across companies, agencies, and educational institutions.
- Data around needed workforce skills for future mobility jobs and careers can help address the uncertainty around market direction and workforce needs that many suppliers are facing in the transition.
- Data about changing social and economic conditions in local communities will help drive strategic investments and implement targeted programs, which are crucial to the overall success of a workforce development ecosystem.

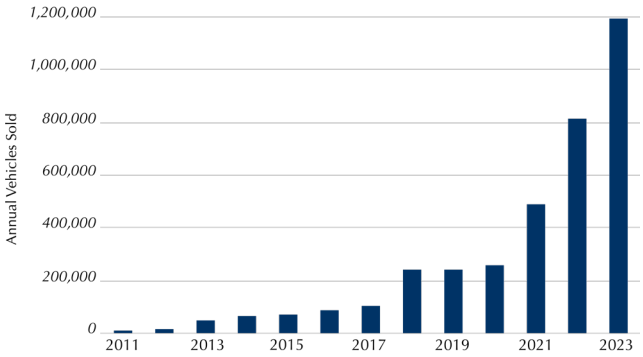
CHALLENGES FOR INDUSTRY SEGMENTS

Each segment of the future mobility supply chain faces its own challenges that need to be addressed to support the success of the entire system. Participants emphasized that two segments of the automotive industry face acute challenges as the share of EVs produced grows: charging station installation and servicing, and tier 2 and 3 internal combustion engine (ICE) component suppliers.

With U.S. EV sales rising rapidly from just over 100,000 in 2017 to nearly 1.2 million in 2023, the availability and reliability of charging stations for these vehicles is critically important to the long-term success of the industry (**Figure 1**).[35] Lack of available charging and issues with existing chargers have contributed to some negative perceptions of EVs among consumers. Over 70 percent of EV owners and 80 percent among prospective buyers indicate they are dissatisfied with the current charging infrastructure.[36] One of the issues with building out charging infrastructure is the lack of workers with the skills to install them.

Electricians are needed to install charging stations and are often expected to maintain and repair them. Demand for electricians is growing nationwide: around 79,900 openings for electricians are expected each year over the next decade.[37] At the same time the electrical workforce could shrink by 14 percent by 2030, due in part to increased retirements by older trade workers and lack of interest from younger workers.[38] Furthermore, many electricians do not have the specialized, platform-specific training required to install myriad brands and

FIGURE 1: U.S. Battery Electric Vehicle Sales



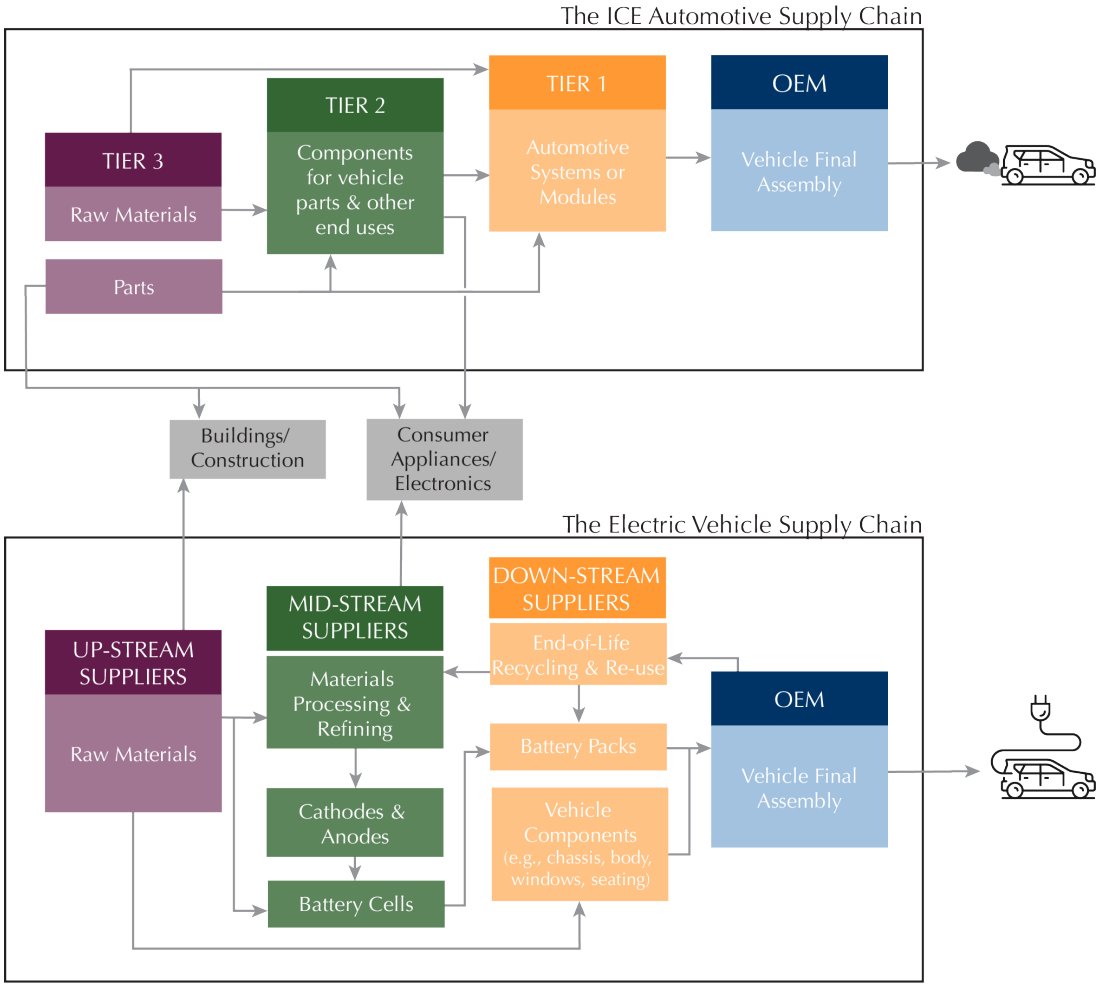
Sources: Alternative Fuels Data Center, 2020; Cox Automotive, 2022–24.[1]

models of charging stations. As a solution, participants suggested expanding training programs for technicians to help service charging stations for issues that a worker can address without the full certification of an electrician. Additionally, creating stackable, universally-recognized servicing certifications that include a range of different models of charging stations would help create a network of technicians able to serve a broad range of needs.

Another challenge of the transition from ICEs to EVs is the impact on small- to medium-sized tier 2 and tier 3 component suppliers for auto manufacturers (**Figure 2**). Tier 3 suppliers produce raw and semi-raw materials, such as metal and plastic, that are crucial throughout the automotive supply chain. Tier 2 suppliers manufacture specific components that are ultimately used in cars but can also be used for end products in other industries. Tier 1 suppliers take the components produced by tier 2 manufacturers and produce the automotive-grade products that the original equipment manufacturers (e.g., Ford and GM) use to assemble vehicles.[39]

Roundtable participants expressed concern that tier 2 and 3 suppliers with fewer than 200 employees are at risk of getting left behind in the transition to EVs. Certain producers of components that are needed for ICEs, such as those that compose the powertrain, will need to reposition their manufacturing in the transition to an electrified future.[40] Many of the smaller suppliers of these components lack the capacity to begin planning and training their workforce for future manufacturing needs. With the need to focus on fulfilling current orders and a lack of clarity on what the market will need from suppliers over the next decade, these small suppliers are unlikely to have the resources to compete in the future

FIGURE 2: Internal Combustion Engine and Electric Vehicle Automotive Supply Chains



mobility space. Roundtable participants emphasized that these smaller suppliers would need extra support to build out this capacity, including workforce development resources.

RECOMMENDATIONS

To address the growing workforce development needs of the automotive industry, participants suggested three near-term recommendations: creating an EV workforce moonshot, providing technical assistance for federal workforce development funding applications, and expanding on existing workforce development and educational program offerings.

Create an EV Workforce Moonshot

The U.S. Department of Transportation's Center for Transportation Workforce Development should create a national EV workforce "moonshot" with clear roles for each level of government. This should include less restricted federal investment and technical support, state convening and supporting programs, and locally-driven implementation. As an intermediate step, the federal government should invest in capacity building for states to support local governments applying for federal funding related to workforce development programs.

Provide Technical Assistance for Federal Workforce Development Funding Applications

Michigan should support communities' ability to apply for federal EV workforce related funding, similar to the EPA's Technical Assistance Hubs.[41] Technical Assistance Hubs help provide capacity for frontline communities to navigate and have access to all of the resources provided by the IRA. Following this model, Michigan should also have a program that provides technical assistance to communities looking to access federal funding opportunities and grant resources for supporting workforce development programs.

Expand on Existing Workforce Development and Educational Program Offerings

The State should build on the existing Career Quest by broadening it to include PK-12, rather than its current focus on high school, and including a range of new, relevant occupations.[42] West Michigan Works! created MI Career Quest to introduce students to opportunities in high demand industries and address employer's need for future talent in construction, health care, information technology, and manufacturing. Companies are involved, but the program currently focuses on potential occupations rather than including the broad vision of available career pathways and partnerships with specific companies who can offer employment.

The state should create a shared center for EV and battery education. Like an academic center, this center should be hosted by a university but accessible to all for EV and battery education. This center should help lead the development of a standardized workforce compact/continuum. Standardized, replicable, and validated templates for programs would be extremely valuable in coordinating training programs across the state to ensure that the skills being developed are comparable and match employer needs.

The state should significantly increase funding for the Michigan Works! system, and more broadly for the public investment systems, to improve data sharing among employers, training programs, and educational institutions to help improve the training of incumbent workers.

BOX 3: Data Sharing & Workforce Development Spotlight: StriveTogether (Baltimore)

The state could look to Baltimore, Maryland, for an example of data sharing to improve workforce development programming. One project in Baltimore, led by the nonprofit StriveTogether, provides resources to community groups using data forward approaches to identify barriers, create community partnerships, and advance equitable results in the educational system.* One of their members used performance, programmatic, and big-picture evaluation data to improve Baltimore's Grads2Careers program (G2C), a joint effort between Baltimore's Promise, the Baltimore Mayor's Office of Employment Development and Baltimore City Public Schools.† Data sharing across collaborators allowed for constant improvement to the program offerings. This resulted in positive outcomes from the program, with the notable achievement that "compared to Baltimore City high school graduates in 2009 who received a college degree six years after graduation, the median annual income of G2C completers is 22 percent higher for African American male G2C alumni and 33 percent higher for African American female alumni."†

** See https://www.strivetogether.org/.*

† StriveTogether, Transforming systems in pursuit of equitable outcomes (Baltimore, MD: StriveTogether, 2023), https://wwww.strivetogether.org/wp-content/uploads/2023/01/ST_PostsecondaryOutcomes_Story-BaltimoresPromise_Final.pdf

COORDINATE AND EXPAND OUTREACH AND EDUCATION INITIATIVES FOR ALL LEVELS

INSIGHTS FROM THE DISCUSSION

Throughout the discussion, participants highlighted that workforce development, particularly in the future mobility industry, must be viewed as a career pathway, rather than a set of individual jobs. To build a ready workforce with the skills, interests, experience levels, and capabilities necessary to support a thriving future mobility industry, there must be a talent pipeline beginning in pre-Kindergarten and extending through mid-career. Participants emphasized that workers should be able to develop transferrable skills and competencies that build upon one another so they can grow through a well-rounded career, rather than focusing directly on an individual job at a singular company. This necessitates the enhanced coordination among employers, training providers, educational institutions, and governments.

Experiential Learning

One area of opportunity participants highlighted in the session was to integrate experiential learning, a framework developed by David A. Kolb to focus on learning through experience.[43] Often, experiential learning programs integrate project-based units through which students learn about a given topic by experimenting in real-world scenarios (see **Figure 3**). In Michigan, the MiSTEM network, an office within the Department of Labor and Economic Opportunity (LEO), works to support science, technology, engineering, and mathematics (STEM) education across the state to connect PK-12 learners with "high-demand, high-wage careers of the future."[44]

One example of a project-based experiential learning curriculum is the Ten80 Unmanned Aerial Vehicles (UAVs, or drones) Challenge, which the Wayne County MiSTEM network piloted.[45] In this challenge, students learn engineering and coding concepts through a project to reverse engineer and design a drone. This model helps students develop academic skills while concurrently applying them to a real-world design challenge.

Voluntary programs can offer experiential learning approaches to students from different geographies and backgrounds. For example, the evGrandPrix at Purdue University encourages high school and college students across the country to experience EV design first hand by building an electric go-kart, which they can then race at an annual event, competing on several project deliverables including a STEM report, an outreach video, and their vehicle's energy efficiency.[46] Through this experience, students develop a variety of STEM skills that are directly transferrable to a career in the EV industry. Additionally, in learning through trial, error, and experimentation, they are exposed to a new teaching format that may be more effective for their own learning styles.

Workforce Development and Training for Early- and Mid-career Workers

Participants highlighted the varied needs of young entrants to the workforce alongside mid-career workers making a career transition, re-entering the workforce, or otherwise demonstrating unique needs not always met by the traditional education and workforce system. Examples of "nontraditional" workers raised in the roundtable included formerly incarcerated people; immigrants; people living at or below the ALICE (asset limited, income constrained, employed) threshold (i.e., households earning above the federal poverty level but

FIGURE 3: Experiential Learning Theory

Source: Institue for Experiential Learning.[2]

less than what it costs to make ends meet); workers with a GED; and single parents.[47] For workers without a bachelor's degree, careers in the future mobility industry may seem out of reach, particularly those careers that call for STEM competencies; however, a variety of programs can help them to develop necessary skills to succeed on the job while preparing them for a career in the industry.

To support workers already employed in the industry, "upskilling" programs can help workers with ICE manufacturing or maintenance experience develop the additional skills necessary to support electric vehicles. For example, some EV jobs require workers to be able to diagnose and solve both hardware and software issues, requiring many workers to complete additional training in software and coding skills.[48] Employer-sponsored mid-career programs can fill these training gaps and help fill EV jobs relatively quickly, while ensuring workers gain the competencies directly necessary to succeed in their job.

Separately, for workers interested in developing specific EV-related skills and competencies, certificate programs, bootcamps, registered apprenticeship programs, and other short-term, skills-based programs may be more effective. Participants emphasized the need for these kinds of programs, and for providers to develop them in collaboration with employers and community partners.

Community colleges are often in the best position to offer this kind of programming. In Lansing, where Ultium Cells is building a new EV battery factory, one such program is already in motion at Lansing Community College. In collaboration with the Lansing Economic Area Partnership (LEAP) and Ultium Cells, Lansing Community College offers accessible trainings for early- and mid-career workers informed by the battery plant's employment needs.

Lansing Community College offers a three-tiered model to support workers at all levels:

- **Pre-Employment**: Pre-employment includes talent pipeline development, including through identifying a talent pool among underemployed, underserved, unemployed, and at-risk populations. Specifically, the college engages employers to review and approve curricula designed for short-term programs (i.e., 5–8 weeks) that can be connected to industry-recognized credentials, and to provide opportunities for employers to recruit directly from the training program pool.
- **Post-Employment**: Post-employment includes upskilling for an existing workforce, including through customized corporate trainings offered either on-site at the company's facility or at one of the college's locations, developed in collaboration with both employers and state government resources.
- **Credit for Prior Learning**: To create a culture of continuous learning, the college's Office of Experiential Learning works with individuals to provide career development services, identifying their skills, past experiences, and opportunities to translate those into college credit that can build toward a certificate or degree.[49]

Standardizing and Validating Certification Programs

Roundtable participants agreed that greater standardization of required certifications and skills across the future mobility industry would improve the ability of employees, workforce development organizations, and employers to align around priority skills. Because the EV industry is still relatively nascent, participants indicated an interest in greater transparency from employers to provide clear direction on what specific skills are necessary for employment at different levels of EV and battery manufacturing, service, testing, and dismantling/disposing. Additionally, participants representing employers and workforce development organizations indicated that EV skills certifications would be more useful if standardized across the industry and validated by a third party.

A few programs currently exist that can offer solutions to some of these challenges. For example, the Institute of the Motor Industry (IMI), a UK-based independent organization, offers several levels of internationally accepted EV battery safety certifications, which it recommends for all workers who may come into contact with a high-voltage battery, whether in manufacturing, service, or dismantling.[50]

One-stop data platforms are crucial to filling the information gap by providing transparent, accessible, centralized information for both employers and workers. For example, software startup Skillfusion aims to help fill the information gap related to the workforce for EV charging installation and maintenance. The software platform hosts information for job seekers in the industry about skills, qualifications, certifications, trainings, and job opportunities, while also hosting profiles of individual workers for employers including the necessary information to pair workers with where they are needed

in the industry to help increase charger reliability.[51] Roundtable participants expressed interest in this kind of platform because the accessible, centralized information makes it easy for both employers and employees to see relatively standardized levels of certification for work in the EV charging installation, operations, and maintenance sectors.

Roundtable participants expressed interest in a platform similar to this for workers and employers in the EV and battery manufacturing and maintenance industries, informed by the real needs of companies with U.S. operations seeking to fill open positions.

Building a Pathway to Employment

In the roundtable, community representatives shared concerns with the real-world materialization of the forecast jobs in the future mobility industry, and indicated that many prospective job seekers were hesitant to invest the time and resources to complete weeks- to months-long training programs without the guarantee of employment upon completion. Participants indicated that employers, workforce development providers, and training programs should coordinate to provide a more direct path to employment, including job placement programs workers can consider alongside their choice to enter education programs.

Some participants highlighted direct partnerships between community colleges and employers, such as Lansing Community College's mid-career program in partnership with Ultium Cells, as the most effective tool to create a talent pipeline for workers upskilling, retraining, or entering the industry.

RECOMMENDATIONS

To coordinate and expand educational opportunities and outreach for all education and job levels, participants identified two near-term recommendations: create an anchor organization and lead a marketing campaign for EV careers.

Create an Anchor Organization

The state should create an anchor organization that coordinates and is supported by employers to create an inclusive future mobility workforce. This organization should serve as a neutral convenor to bring all stakeholders together, create a forum for sharing and understanding all stakeholders' unique needs, and create an organized path forward for the EV workforce. It should engage companies throughout the supply chain, education providers, workforce development agencies, economic development organizations, labor, and state government.

To begin development of this anchor organization, participants recommended the following near-term steps:

1. Key stakeholders should identify who would act as the leader of the anchor organization, then define the anchor organization's mission and goal.
2. Convenors should host a convening among prospective participants to test the idea of establishing the organization, while collecting feedback from among the group.
3. Building on key stakeholders' knowledge of the current EV workforce landscape, the anchor organization should identify research and data needs and initiate efforts to address them in order to create a better understanding of the current landscape for the EV workforce.
4. Convenors should create a network of employer resources detailing information employers need to hire for jobs in the future mobility industry, including which kinds of certifications are available, which training programs exist, and which partnerships with training providers are already operating.
5. The anchor organization should identify and secure "champions," or key proponents from companies, communities, and government, to lead the anchor organization and propel its work forward.

In the mid- to long-term, participants suggested this anchor organization should develop an industry "playbook" with best practices for companies and Michigan state government to support profitable and high-wage employment. Additionally, it should support the development of a common language across the industry, such as standardizing job titles to be more transparent of the associated duties and skills needs that can be consistent across companies.

Lead a Marketing Campaign for EV Careers

The state should lead a marketing campaign for jobs and careers in the future mobility industry to make these careers attractive to prospective workers. This marketing campaign should target Michiganders broadly, with specific focus on secondary educators including guidance counselors, career advisors in vocational/tech schools, and teachers—particularly of STEAM classes. Outreach

and marketing materials should demonstrate the possibilities of a career in the future mobility industry, and highlight the kinds of skills that are needed to thrive. Participants envisioned the campaign being modeled on the highly successful "got milk" campaign, which encouraged students to drink more milk by leaning on positive role models for students and targeting marketing pathways with the greatest accessibility to students.[52]

Participants recommended utilizing the state's existing communications assets and programs, such as the Pure Michigan campaign, which the state launched in 2008 to market the state as an attractive tourism destination.[53] MEDC, the sponsoring agency of the campaign, published its most recent tourism strategic plan in 2023, detailing goals and tactics that could be emulated and modified to support the future mobility industry.[54]

SUPPORT THE "WHOLE WORKER"

INSIGHTS FROM THE DISCUSSION

Throughout the roundtable, participants demonstrated a shared interest in making Michigan a place people want to live and work. They highlighted that having a job is one piece of the puzzle, but that the ability to get to that job and devote one's full attention to the tasks at hand is crucial to success on the job, for both workers and employers.

Attracting and Retaining Workers

Michigan is ranked 49th nationally for population growth since 1990—with only West Virginia experiencing slower growth—and with its low birth rate, immigration from other states and countries accounts for most of its rate of change.[55] The state's population has declined since 2020, with a drop in population of 0.04 percent from 2021 to 2023, according to census estimates.[56] Participants shared concerns over this population decline, and envisioned a positive future in which leadership in the future mobility industry, as well as a supportive environment for people of all backgrounds and ability levels, could attract more people to want to live and work in the state.

In addition to attracting more people from other locations to come to Michigan, they also shared an interest in encouraging young people to stay in the state. Moving rental company U-Haul shared data in January 2024 showing that Michigan was in the top three states nationally for the highest percentage of one-way trips out of the state in 2022.[57] Participants citing these statistics and other anecdotal experiences highlighted the need for the state to invest in making its communities attractive to young people born in and outside of the state.

There are many different elements that make a place attractive to live and work. State and local governments can invest in "placemaking" to make communities more accessible and appealing. According to the Project for Public Spaces, placemaking is "a collaborative process by which we can shape our public realm in order to maximize shared value…placemaking facilitates creative patterns of use, paying particular attention to the physical, cultural, and social identities that define a place and support its ongoing evolution."[58] It includes urban planning focused on accessible downtown spaces, neighborhoods, campuses, public buildings, and other physical elements of a community that encourage people to interact with their surroundings and neighbors in a constructive way. See **Figure 4** for more examples of elements that make up placemaking.

The state of Michigan has funding available to support placemaking initiatives, largely through the 2023 Revitalization and Placemaking Program (RAP 2.0), which is a $100 million grant funding program administered through MEDC.[59] This program will provide grants of up to $5 million for real estate rehabilitation and development, up to $1 million for public space place-based infrastructure, and up to $20 million to partners for sub-grant programs.[60] The program aims to "help create the environment necessary to attract and retain talent, add new housing options, enable business creation and attraction, and provide resources for Michigan citizens and communities."[61] These investments are intended to support local governments' financial health and retention of residents, while revitalizing downtown areas. A previous iteration of the program from 2022 (RAP 1.0) funded 22 community development across the state and supported a new multifamily housing project in the city of Portage.[62]

FIGURE 4: What Makes a Great Place?

Source: Project for Public Spaces.[3]

Improving Access to the Workplace

Roundtable participants were particularly interested in placemaking through investments in public transportation to make it easier for people to access jobs and public spaces as a beginning step to encourage people to want to live in a given area. In addition to public transportation, affordable housing was a key priority to attract new residents and retain existing ones. Participants also highlighted that good jobs—those with high wages and pathways to career advancement—are central to making young people want to work in Michigan and that the future mobility industry could offer those good jobs.

In addition to accessibility to transportation and affordable housing, participants noted access to childcare as essential for making work accessible to parents and caregivers. A 2022 study identified 20 Michigan counties as "childcare deserts"—defined as counties in which "three children compete for every available slot at an in-home or group center."[63] A combination of federal, state, and local government resources, as well as coordinated efforts by economic development agencies, nonprofits, and businesses, will be needed to address the gaps in offerings of childcare as well as its geographic accessibility to parents across the state. For example, in 2023, the Early Childhood Investment Corporation's Child Care Innovation Fund provided $150,000 in Regional Child Care Planning Grants to 16 regions across the state.[64] In some cases, employers offer childcare onsite for the children of employees. A 2014 study found improved performance and reduced absenteeism among employees in workplaces offering employer-sponsored childcare assistance.[65]

With low unemployment levels and a declining population, employers in the state must look to expand the talent pools from which they recruit prospective workers. Some roundtable participants pointed to examples of partnerships between companies, local economic development organizations, and educational institutions to recruit "nontraditional" workers, or workers who may face higher structural barriers to participation in the workforce, such as formerly incarcerated people, immigrants, single parents or caregivers, people with disabilities, and people from marginalized or under-resourced communities. Many of these workers may not follow a "traditional" career path through high school and college, and may

not be reached by mainstream career development resources. They may also have greater accessibility needs like access to transportation and childcare, as mentioned above. Roundtable participants emphasized the need for the industry to work to address these accessibility needs to succeed.

RECOMMENDATIONS

To support the whole worker, participants developed three near-term recommendations for placemaking initiatives in Michigan: invest in placemaking, provide funding and technical assistance to communities, and make Detroit an "American example of the future of transportation".

Invest in Placemaking

The state should invest in placemaking to build a community of support for a person's full day, including wraparound services like housing, public transit or alternative modes of transportation, and childcare. Building on the baseline data in the 2023 Growing Michigan Together Council Report, state agencies should identify neighborhoods with lower labor force participation and their barriers to working.[66] Once these are identified, the state should create and fund employment hubs to provide the necessary support to pursue employment opportunities.

Provide Funding & Technical Assistance to Communities

The state should provide funding and technical assistance to communities, whether municipal governments or local economic or workforce development organizations, to identify barriers to entry to the workforce, make a plan to address these barriers, and seek resources for these solutions.

This kind of assistance could take direction from similar kinds of programs, such as the technical assistance program administered by the Michigan Infrastructure Office to help local communities secure federal funding.[67] This program provided a total of $25 million in "technical assistance, planning, and matching grants to connect local or Tribal governments, road commissions, and transit agencies with consulting services to help identify, apply for, manage and administer federal grant funding."[68]

Make Detroit an "American Example of the Future of Transportation"

The city of Detroit, with funding and policy support from the state, should invest in its transportation infrastructure to attract and retain residents. In addition to investing in public transportation infrastructure to better connect the city, and to connect neighborhoods where people live and work, the city should invest in electric mobility solutions like public EV charging infrastructure. City government should work collaboratively with the automotive industry to highlight future mobility industry opportunities in the city and attract investment.

BOX 4: Growing Capacity Through Community Partnerships Spotlight: Lansing, MI

One positive example of placemaking around the future mobility industry is underway in Lansing. The Lansing Economic Area Partnership (LEAP) has partnered with Lansing Community College and Ultium Cells to create an ecosystem around Ultium Cells' new battery manufacturing facility that will support workers and create a talent pipeline to staff the facility. Through the partnership, LEAP and Ultium Cells identified barriers to access, such as lack of access to public transit and childcare. The partnership worked with the local transit authority, a regional childcare coalition, and community partners providing translation services to create an ecosystem that could break down barriers to access for all workers.* Additionally, Lansing Community College (as highlighted in the previous section) worked with Ultium Cells to create a training and certification pathway for workers of all skill and experience levels.† By coordinating across the company, economic development organization, and a community college, the partnership is able to produce more comprehensive programming to address the needs of the local community than each would individually, working alone.

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CONCLUSION

Throughout the February 2024 convening, participants representing key companies, economic development organizations, NGOs, and communities demonstrated that Michigan has the potential to lead the development of the future mobility industry, and showed excitement around developing the next steps necessary to succeed. Building on the state's existing investments in EV workforce development, additional policy and programmatic initiatives can augment federal and private sector resources to support the recruitment, training, retention, and prosperity of workers across the future mobility industry in Michigan.

Additional C2ES Resources

C2ES Regional Roundtables
https://www.c2es.org/accelerating-the-us-net-zero-transition/regional-roundtables/

Accelerating Vehicle Electrification in Michigan
https://www.c2es.org/document/accelerating-vehicle-electrification-in-michigan/

Creating a Circular Economy for Critical Materials in Ohio
https://www.c2es.org/document/creating-a-circular-economy-for-critical-materials-in-ohio/

Fueling a Low-Carbon Biofuel Future in Minnesota
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FIGURE ENDNOTES

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