

# Workforce



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Special thanks to external partners and stakeholders, whose expertise and insights informed this report.

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# Executive summary

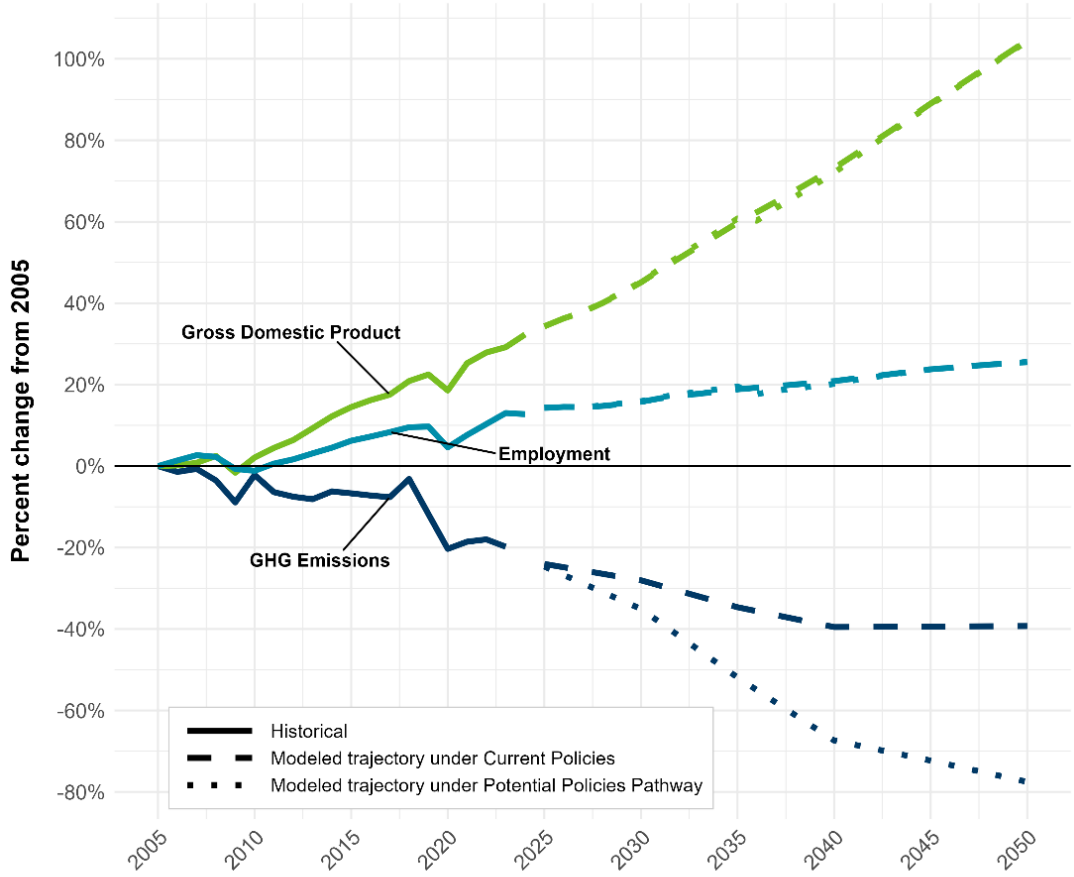
The 2026 Climate Action Framework outlines goals and actions to guide Minnesota toward a carbon-neutral, resilient, and equitable future. Achieving these goals will depend on a skilled labor force. To prepare for our clean-economy future, the state conducted a workforce analysis to understand the jobs and industries that support — or could support — Minnesota’s climate goals, and how workforce needs may change over time. Drawing on economic modeling that informed the 2026 Climate Action Framework, traditional labor market data, industry research, and input from state agency partners and stakeholders, this analysis provides a baseline view of the current workforce and highlights key trends, challenges, and opportunities.

## Key takeaways

### Key takeaway #1. Minnesota has maintained a strong economy while reducing emissions and can continue to do so.

Over the past two decades, **Minnesota has experienced economic and employment growth while lowering emissions.** This trajectory is expected to continue, supporting a strong economy while moving the state closer to its climate and resilience goals (Figure 1).

Figure 1. Historical and modeled economic and employment growth with current and more ambitious climate action.

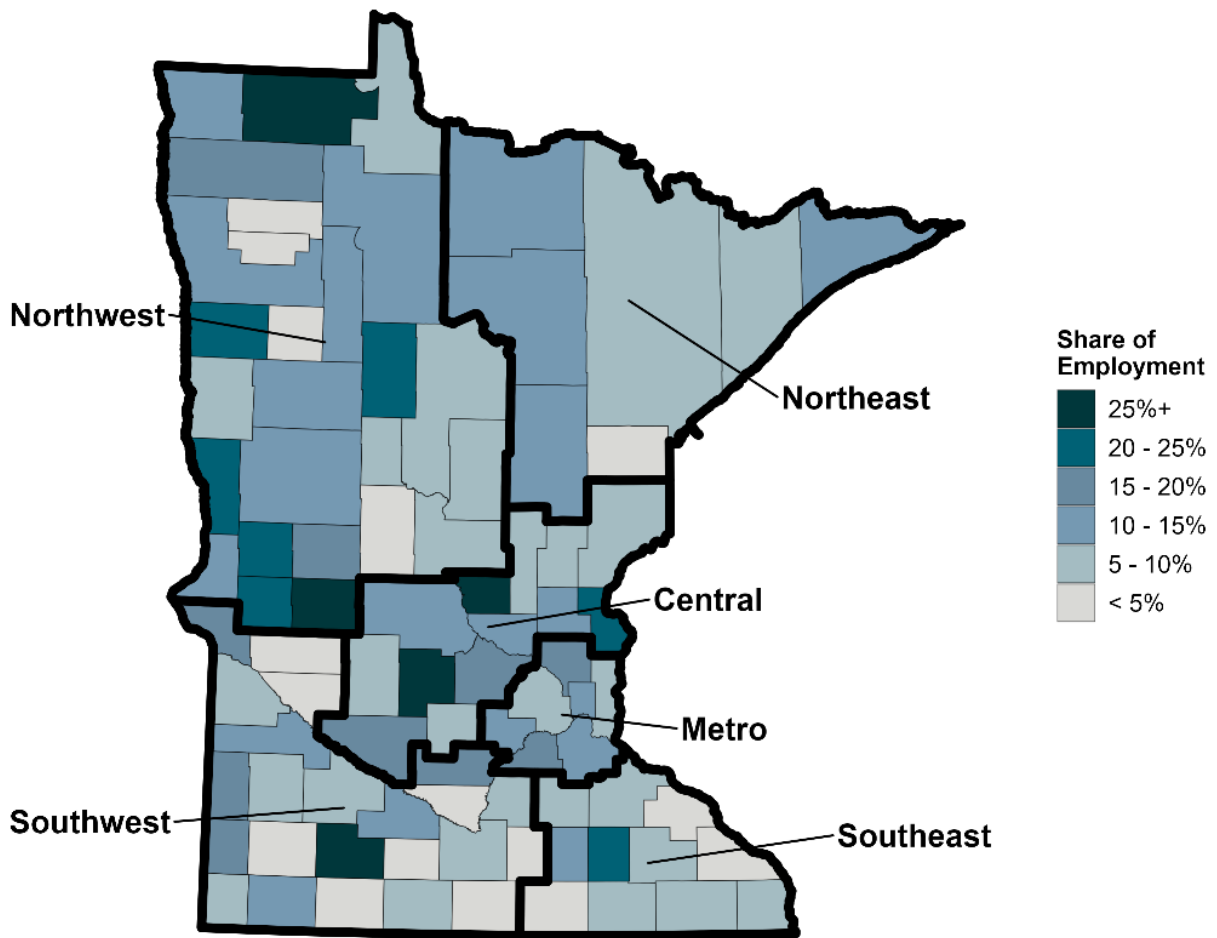


Source: MPCA, BEA, Modeling done for Climate Action Framework

**Key takeaway #2. Jobs that support a cleaner, more resilient economy are widespread across Minnesota and represent a significant share of employment, though their local importance varies.**

- **Many jobs contribute to emissions reduction and resilience efforts.** This work extends well beyond energy and transportation, spanning a wide range of industries, including construction, manufacturing, waste management, natural resource-based industries, and even roles in public health and education.
- Statewide, industries that directly contribute — *or could contribute* — to producing goods and services that help reduce emissions supported **more than 380,000 jobs in 2024, about one in eight jobs**. Taken together, these jobs would form the second-largest sector in Minnesota, behind only Health Care and Social Assistance.
- These **jobs are present in every county** and are concentrated in similar industries. **Construction and Manufacturing account for more than 75% of clean-economy employment statewide.** However, their share of local employment varies widely across counties, from less than 1% to more than 60% (Figure 2).

Figure 2. Share of clean-economy employment by county in 2024.

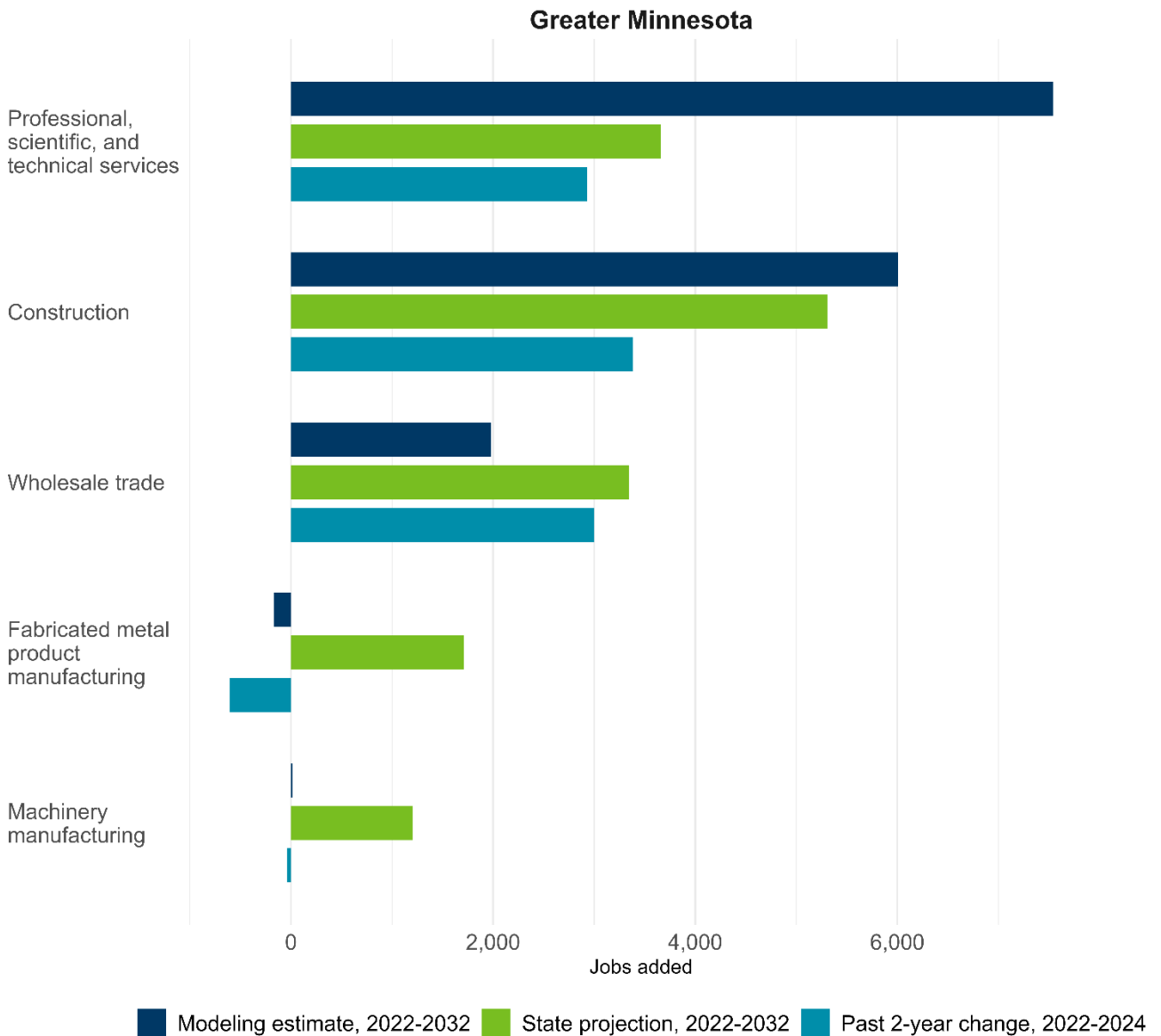


Source: QCEW

### Key takeaway #3. Demand for workers is growing, and some needs are already materializing now.

Economic modeling for the Climate Action Framework suggests **job growth could exceed prior employment projections by more than 30%**, particularly in Construction and Professional and Technical Services. In many industries — especially in Greater Minnesota — more than half of projected 10-year growth, from 2022 to 2032, has already occurred, and many fast-growing roles do not require a four-year degree (Figure 3).

Figure 3. Top clean-economy industries by projected job gains in Greater Minnesota.



Source: QCEW, Projections, Modeling for Climate Action Framework

## **Key takeaway #4. Meeting workforce demand in clean-economy industries will require stronger participation, retention, job quality, and skill-based mobility.**

- Since early 2021, Minnesota has consistently had **more job openings than unemployed workers**, and retirements from aging working will create even more openings. Meeting expanding employment needs will require intentional, coordinated workforce development and education and training pathways, particularly to engage younger workers who increasingly come from populations many clean-economy industries have historically struggled to attract or retain.
- While most clean-economy industries offer family-sustaining wages, **access barriers and working conditions remain challenges** to attracting and retaining workers. Barriers, such as access to transportation and childcare, can limit access to many jobs but they are especially notable in key clean-economy jobs, many of which require rigid schedules, nonstandard work hours, or travel between worksites.
- Although workforce demand is increasing, **many key skills needed in clean-economy industries already exist in Minnesota's workforce**. Strategies that recognize and leverage these transferable skills can expand hiring pools, support worker mobility, and help both workers and employers adapt to changing technologies, policies, and markets.

### **Minnesota's workforce is changing**

As Minnesota's workforce ages, young workers — who are more racially and ethnically diverse than older generations — are available to fill the growing number of clean-economy jobs. In fact, from 2020-2025, statewide employment growth was driven entirely by workers of color. To meet projected demand, clean-economy industries will need to **improve recruitment and retention from populations these industries have historically struggled to attract**.

## **Key takeaway #5. Minnesota has strong workforce, education, and industry foundations, but meeting future clean-economy workforce demand will also depend on how well systems, supports, and data are aligned.**

Several enabling conditions can help Minnesota build on existing strengths and meet evolving clean-economy workforce needs:

- **More responsive, skills-focused workforce data and systems.**  
Improving data on skills, job quality, and workforce transitions, particularly transferable skills, would support more nimble education, training, and workforce planning as technologies, policies, and market conditions change.
- **Stronger coordination across workforce partners.**  
Continued collaboration among employers, educators, workforce organizations, community partners, and state agencies will be critical to aligning training, credentials, and career pathways with evolving clean-economy needs.
- **Attention to job quality and worker supports.**  
Ensuring that clean-economy jobs offer family-sustaining wages, benefits, safe and stable working conditions, and pathways for advancement will be essential for attracting and retaining workers and for delivering broad economic benefits.
- **Sustained investment in workforce capacity.**  
Long-term coordination and investment can help workforce systems respond to growth, manage uncertainty, and support workers as skill needs evolve.

### **The work ahead**

Aligning and strengthening existing systems, rather than creating new ones, is critical to ensuring our clean-economy workforce remains durable, adaptable, and positioned to support long-term prosperity for workers, businesses, and communities across every region of the state.

In summary, Minnesota is well positioned to expand its already robust and ready clean-economy workforce. The state brings strong education and training systems, skilled workers, engaged employers, community partners, and a growing number of climate action projects. Meeting workforce demand in the clean economy will require adapting to a changing workforce by improving retention, reducing barriers such as childcare and transportation, and building clear pathways that help workers apply transferable skills to transition into in-demand jobs. With greater coordination, clear alignment between skills and emerging jobs, and attention to regional workforce needs, Minnesota can ensure its workforce is prepared to fill the growing range of clean-economy career opportunities.

# Introduction

The 2026 Climate Action Framework outlines hundreds of action steps across seven goal chapters to guide Minnesota toward a carbon-neutral, resilient, and equitable future. This report supplements the Framework by examining the workforce supporting those actions today and that will continue to support climate action in the years ahead.

The state of Minnesota developed this report, with the Department of Employment and Economic Development (DEED) leading the labor market and economic analysis, to better understand the jobs supporting its climate and resilience goals and how those workforce needs may evolve over time. This work draws on economic modeling conducted to inform the 2026 Climate Action Framework, traditional labor market data, industry research, and input from state agency partners and stakeholders.

Rather than defining “clean jobs” narrowly, this report recognizes the wide range of jobs that contribute to Minnesota’s climate goals. To evaluate these jobs using available data, the analysis focuses on employment in industries that directly contribute — or could contribute — to producing the goods and services that enable emissions reductions, along with related supply chains. These are referred to throughout the report as “clean-economy industries,” and their employment as “clean-economy employment” or the “clean-economy workforce.”

Designed for policymakers, agency staff, educators, employers, community partners, and others interested in understanding Minnesota’s clean-economy workforce needs, this analysis drew on input and feedback from agency staff and external stakeholders. Details on engagement and stakeholder input are provided in Appendix A: Engagement.

This report explores current trends, challenges, and opportunities shaping employment in these industries and, where possible, climate-related work more broadly, contributing to a shared understanding of the workforce supporting Minnesota’s climate goals.

Each section of the report answers a core question:

- 1. The workforce powering Minnesota’s climate goals:** *Why does this work matter, and what do we mean by a “green” or “clean” job?*
- 2. Jobs across the state — now and through 2032:** *Where are clean jobs today, and where are they headed?*
- 3. Creating an enduring and resilient workforce:** *How can Minnesota adapt to meet future workforce needs?*

The conclusion answers a final question: *Which actions can we take today to help prepare for the future?* It outlines how the state can sustain progress and offers guidance for partners to align efforts toward greater progress.

# Section 1. The workforce powering Minnesota’s climate goals

## Section highlights

Minnesota’s climate and energy goals are already generating economic growth and job opportunities. At the same time, identifying which jobs contribute to climate action is complex, as this work spans many industries and roles.

- **Climate action and economic growth can go hand in hand.** Minnesota has reduced emissions while growing its economy, and modeling suggests current policies will continue to drive job growth, income gains, and economic expansion.
- **Skilled workers are essential to climate progress.** Economic, health, and environmental benefits from climate action rely on workers — such as electricians, technicians, builders, engineers, planners, and others. The pace and scale of climate action depend in part on the availability of workers in critical roles across regions.
- **A wide range of jobs support climate and resilience goals.** “Clean” jobs are not confined to a single set of occupations. Workers’ contributions take many forms and are not always easy to observe. From construction and manufacturing to agriculture, public health, logistics and beyond, many roles help reduce emissions and strengthen resilience across Minnesota.

## Current policies create jobs and benefits statewide now and in the future

Minnesota’s transition to a cleaner, more resilient economy depends on people. Achieving current policy goals — and realizing the associated economic and health benefits — requires workers with the right skills and jobs that people can enter and build into careers over time.

Over the past two decades, Minnesota has reduced greenhouse gas emissions while the economy and employment have continued to grow. Since 2005, statewide greenhouse gas emissions have fallen by 15%,<sup>1</sup> while overall economic activity has increased by more than 25%, employment has grown by more than 10%, and personal income per capita has grown by more than 20%.<sup>2</sup> This progress is due in part to decisions made by businesses and households with the goals of reducing costs, improving efficiency, and increasing reliability, often independent of climate motivations.

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<sup>1</sup> [Minnesota Greenhouse Gas Inventory, Key state trends](#)

<sup>2</sup> U.S. Bureau of Economic Analysis. SASUMMARY State Annual Summary Statistics: Personal Income, GDP, Consumer Spending, Price Indexes, and Employment. Last updated September 26, 2025.

Economic forecasting supporting the Climate Action Framework estimated that under current policies, Minnesota will grow its economy by \$100 billion, add over 150,000 jobs, and increase disposable income by \$28,000 per capita over the next 10 years.<sup>3</sup> These gains rely on workers: electricians, technicians, builders, engineers, planners, and many others whose work turns state goals into real outcomes.

At the same time, Minnesota’s strong economy can bring workforce challenges. The state consistently has a higher labor force participation rate and lower unemployment rate than the national averages.<sup>4</sup> In a tight labor market, expanding and sustaining the workforce needed to support climate action will require intentional, coordinated education and training pathways, particularly for jobs that are already in high demand across regions and industries.

Multiple policy scenarios<sup>5</sup> informed the Climate Action Framework. Key findings of the forecasting include:

- Current policies could reduce greenhouse gas emissions by nearly 40% by 2050, relative to 2005 levels, while maintaining strong economic and employment growth.
- Achieving the statutory goal of net-zero emissions by 2050 will require an increased pace and scale of climate action across all sectors.
- Implementing a suite of ambitious policies (Potential Policies Pathway) could further reduce emissions while maintaining comparable economic and employment growth (Figure 4), underscoring the importance of a workforce that can scale alongside future action.

**“Success means Minnesota’s industries are growing while decarbonizing — not shrinking.”**

– Public comment

The state’s progress toward a cleaner, more resilient economy builds on trends already underway as businesses pursue cost savings, reliability, and efficiency.

## Spotlight

### Minnesota’s 2023 Carbon-Free Electricity Law

Minnesota’s electric sector has cut emissions more than any other sector since 2005, and the 2023 law requiring public utilities to deliver 100% carbon-free electricity by 2040 (Minn. Stat. § 216B.1691) will accelerate that progress. In 2025, Minnesota permitted 1,231 megawatts (MW) of solar energy and has over 1,200 MW of energy storage in the permitting process.

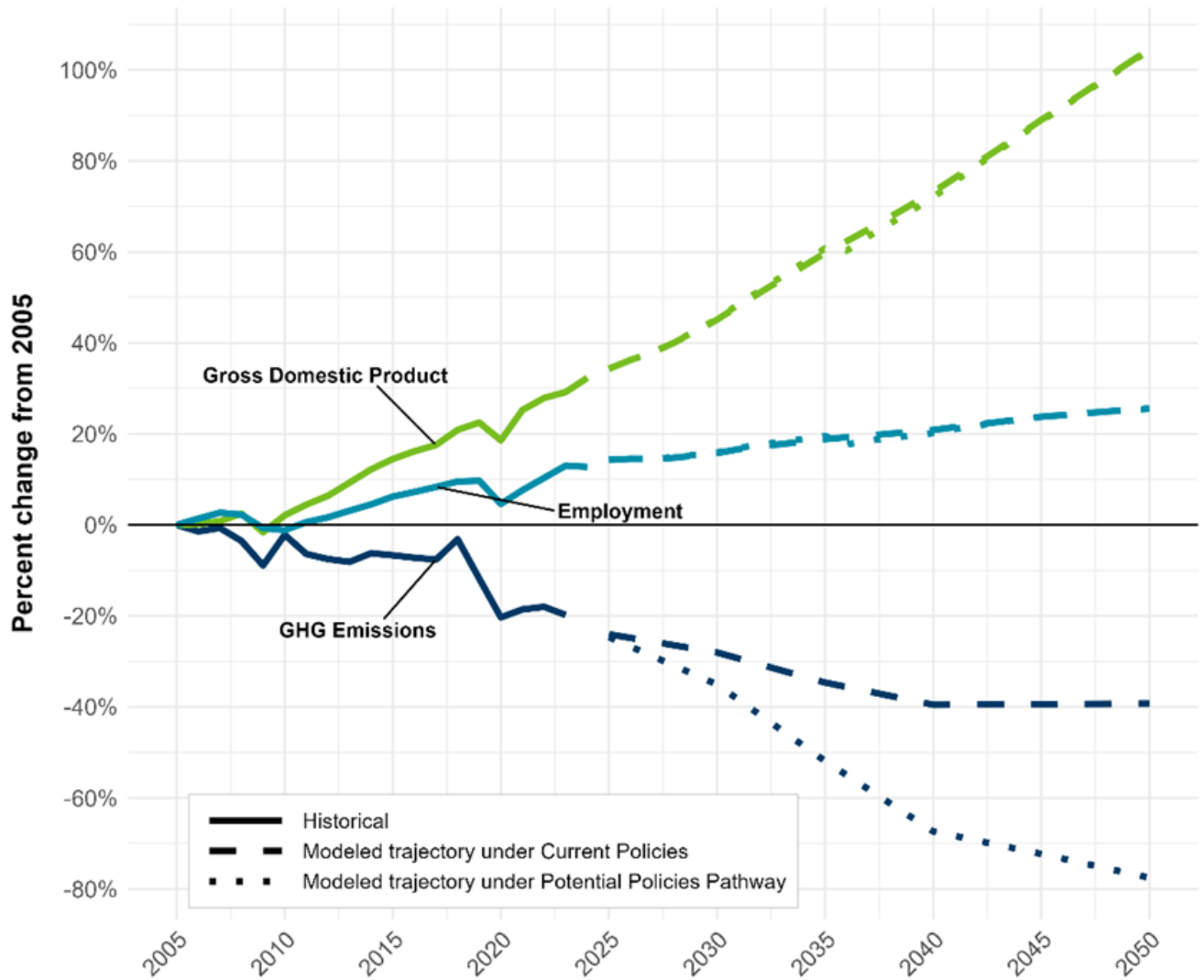
While it is too early to see the full impact of the 2023 law, clean-energy job growth already outpaces overall employment. U.S. Energy and Employment Report data show that from 2018 to 2024, clean-energy jobs in Minnesota grew 4.8% while overall employment grew 1.8% as reported in the Quarterly Census of Employment and Wages. Continued investments driven by the 2023 law will support new and existing jobs across Construction, Manufacturing, Utilities, and related industries over the coming decade.

<sup>3</sup> [Climate Action Framework 2026 Forecasting documentation](#)

<sup>4</sup> [BLS Local Area Unemployment Statistics \(LAUS\)](#)

<sup>5</sup> [Climate Action Framework 2026 Forecasting documentation](#)

**Figure 4. Historical and modeled economic and employment growth with climate action under current policies and more ambitious policies.**



Source: MPCA, BEA, Modeling done for Climate Action Framework

## What is a “green” or “clean” job?

Understanding who is contributing to work that moves Minnesota toward its climate and resilience goals, and how different jobs contribute, is essential for ensuring our workforce can help realize those goals. Although it is common for people to talk about green and clean jobs as a standard group of jobs, in practice, identifying which workers and businesses should be considered green or clean is not straightforward.<sup>6,7</sup> This work takes many forms and is not always easy to see or measure. Several factors shape this complexity:

<sup>6</sup> [Green and Clean Employment in Minnesota: A Starting Point / Minnesota Department of Employment and Economic Development](#)

<sup>7</sup> [Green and Clean Employment in Minnesota: An Occupational Approach / Minnesota Department of Employment and Economic Development](#)

- **Type of contribution:** Businesses and workers can contribute in different ways, such as producing clean goods and services *and* adopting cleaner technologies or practices. For example, a food manufacturer recovering waste heat or a fleet switching to electric vehicles contributes to emissions reduction even if it is not producing a good or service that specifically supports carbon-neutrality or resilience.
- **Mixed-work portfolios:** Many workers and firms that support clean production don't do so exclusively. An HVAC technician might install a heat pump one day and repair a 15-year-old furnace the next.
- **Perception of impact:** Some workers may not see themselves as part of a clean economy because the benefits of their work are indirect or long-term. A carpenter using locally sourced wood, for instance, might not think about the benefits of the carbon stored in that material — but this practice contributes to Minnesota's climate goals.
- **Beyond reducing emissions:** Climate action also includes helping communities prepare for, withstand, and recover from climate impacts. Many workers already contribute to resilience even if their roles are not what people typically picture when they think about "clean" or "climate" jobs. Emergency responders, public health staff, local government workers, loggers practicing sustainable forestry, and winter recreation businesses adjusting to warmer winters all play essential roles in keeping Minnesotans safe and communities resilient in the face of climate change impacts.

Thousands of Minnesotans already contribute to this work — from workers at wind farms to workers at wastewater plants. Yet many jobs enabling progress are less visible, such as equipment installers, truck drivers, welders, data analysts, and maintenance crews who keep systems running.

Table 1 below offers examples of both obvious and overlooked roles across different sectors. Recognizing how these workers and businesses already support Minnesota's goals can help the state strengthen what is already working and plan for what's next.

**Table 1: Examples of green and clean jobs across sectors.**

<b>In this sector</b>	<b>You might think of</b>	<b>But have you considered</b>
Transportation	Public transit operators, Electric vehicle technicians	Logistics planners, Transportation analysts, Highway construction & maintenance workers
Natural and working lands	Environmental scientists, Land conservation specialists, Ecologists	Forestry workers, Farmers, Ranchers, Wood products manufacturers, Agronomists
Energy production	Wind turbine techs, Solar PV installers, Electricians	Electric grid operators, Software developers, Data engineers, Electrical equipment manufacturers
Buildings	HVAC technicians, Energy auditors, Weatherization specialists	Construction laborers, Building inspectors, Materials manufacturers
Industry	Industrial engineers, Clean-tech production technicians	Welders, Millwrights, Maintenance mechanics, Heavy equipment technicians
Waste/circular economy	Recycling truck drivers, Materials sorters	Repair technicians, Deconstruction workers, Resale specialists, Reuse/recovery business staff
Health and resilience	Environmental health specialists, Emergency responders	Local government staff, Infrastructure maintenance crews, Environmental remediation techs

## Section 2. Jobs across the state — now and through 2032

### Section highlights

Climate-related work is already widespread across Minnesota today and is expanding under current policies. The scale of employment, geographic variation, and accelerating demand underscore the importance of regionally tailored workforce strategies.

- **Large share of current employment**  
More than 380,000 jobs, about one in eight statewide, are in industries that directly contribute, or could contribute, to emissions reduction. Construction and Manufacturing account for more than 75% of this employment.
- **High regional variation**  
Clean-economy employment ranges from less than 1% to more than 60% of jobs at the county level. While present statewide, its prevalence and composition reflect long-standing regional strengths, especially in Greater Minnesota.
- **Acceleration under current policies**  
Modeling suggests current climate and energy policies could increase projected job gains by more than 30% compared to earlier projections, especially in Construction and Professional and Technical Services.
- **Demand is already materializing**  
For many industries in Greater Minnesota, more than half of projected 10-year job growth from 2022 to 2032 has occurred in just the first two years, signaling near-term workforce pressure.
- **Workforce demand spans education levels**  
Many of the fastest-growing occupations do not require a four-year degree, highlighting the importance of trade, technical, and logistics training pathways.

### Climate-related work is already happening in every region and in all sectors

Minnesota's clean-economy workforce stretches far beyond wind and solar power. Across the state, workers in construction, manufacturing, transportation, waste management, natural resources, and other sectors already contribute to reducing greenhouse gas emissions and increasing resilience. While these jobs may look different from region to region, they are present statewide. Understanding where and how they show up helps target training, investment, and workforce support.

In 2024, more than **380,000 Minnesotan jobs** were in industries that directly contribute, *or could contribute*, to producing goods and services that help reduce emissions.<sup>8</sup> That is **about one in eight jobs statewide**. Taken together, these jobs would form the second-largest sector in Minnesota, behind Health Care and Social Services.

Over 75% of clean-economy employment today is concentrated in **Construction and Manufacturing**, reflecting the crucial role these industries play in reducing emissions across multiple sectors, including transportation, electricity generation, industrial, and residential and commercial buildings, which together accounted for more than 75% of statewide GHG emissions in 2022.<sup>9</sup>

In a climate action context, the term “sector” does not always align with how sectors are defined in economic or employment data. Climate sectors describe *where emissions occur (i.e., what energy is used for or the source of emissions)* while industry classifications describe *what businesses produce*.

Figure 5 shows employment in clean-economy industries by the climate sector where emissions could be reduced as a result of the goods and services those industries produce. **More than two-thirds of these jobs are in industries that could support reducing emissions from buildings (commercial and residential) or industrial decarbonization.**

### A note on data interpretation

The clean-economy industry scope is intended to support analysis of workforce trends and potential demand. It does not represent a precise count of jobs engaged exclusively in climate-related activities.

Instead, it identifies industries where climate-related work is likely to occur, allowing for consistent measurement of employment, wages, and workforce characteristics using available labor market data.

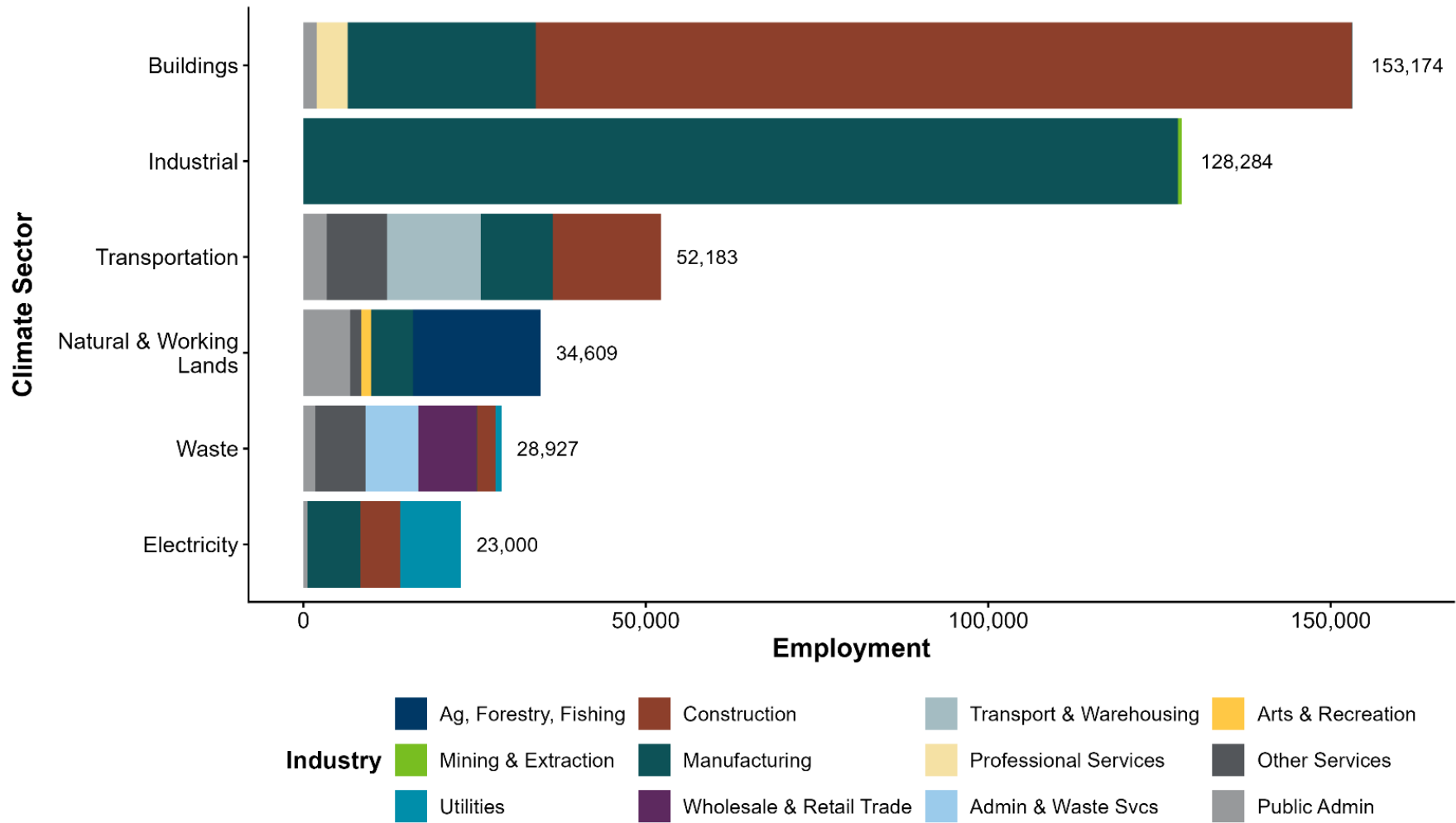
For full list of industries and how they were identified, see Appendix B: Methodology.

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<sup>8</sup> See Appendix B: Methodology for a full list of industries and how they were identified.

<sup>9</sup> [Greenhouse gas emissions in Minnesota 2005-2022 Legislative Report](#)

Figure 5. Statewide clean-economy industry employment by climate sector, 2024.



Source: QCEW

Note: The sum of jobs across sectors is larger than the total number of clean-economy jobs, because some industries can contribute to reducing emissions across multiple sectors. For example, some types of electrical and component manufacturing can support industrial decarbonization and decarbonizing the electricity sector.

## The workforce supporting resilience efforts

Recent analysis from the [Minnesota Climate Adaptation and Resilience Cost Study](#) underscores the scale of climate impacts and the value of acting early. Without additional adaptation actions, climate change could cost Minnesota \$17-\$22 billion per year by mid-century, with total impacts rising over time. In contrast, investing in adaptation is estimated to be eight to 15 times less expensive than the costs of inaction on adaptation.

These costs reflect real impacts on people, communities, and the workforce. Climate-related risks — including extreme heat, flooding, wildfire, and air quality — affect health outcomes, damage infrastructure, disrupt economic activity, and reduce earnings. For example, the study estimates significant costs associated with heat-related illness, premature mortality, flood damage to buildings, and lost wages.

Addressing these risks requires a broad workforce that extends beyond industries typically associated with emissions reduction. Many industries that can contribute to GHG emissions reduction efforts also contribute to adaptation activities. These industries include construction, agriculture, and forestry. At the same time, other essential roles support resilience more directly, including healthcare workers, emergency responders, public health professionals, and workers maintaining critical systems like transportation and electricity.

Together, these workers help communities prepare for, respond to, and recover from climate impacts. As climate risks increase, continued investment in resilience — and in the workforce that supports it — will be essential to protecting health, reducing economic losses, and supporting strong, adaptable communities across Minnesota.

## Regional variation in clean-economy employment

Clean-economy industries are present across Minnesota, but **their prevalence and composition vary by region**. While the relative size of clean-economy industries varies by region, **Construction and Manufacturing account for the largest share of clean employment in all regions of the state**, driven largely by the need to build, upgrade, and maintain buildings and their systems everywhere. At the same time, there are distinct key industries supporting climate-related work that reflect long-standing, unique regional economic strengths.

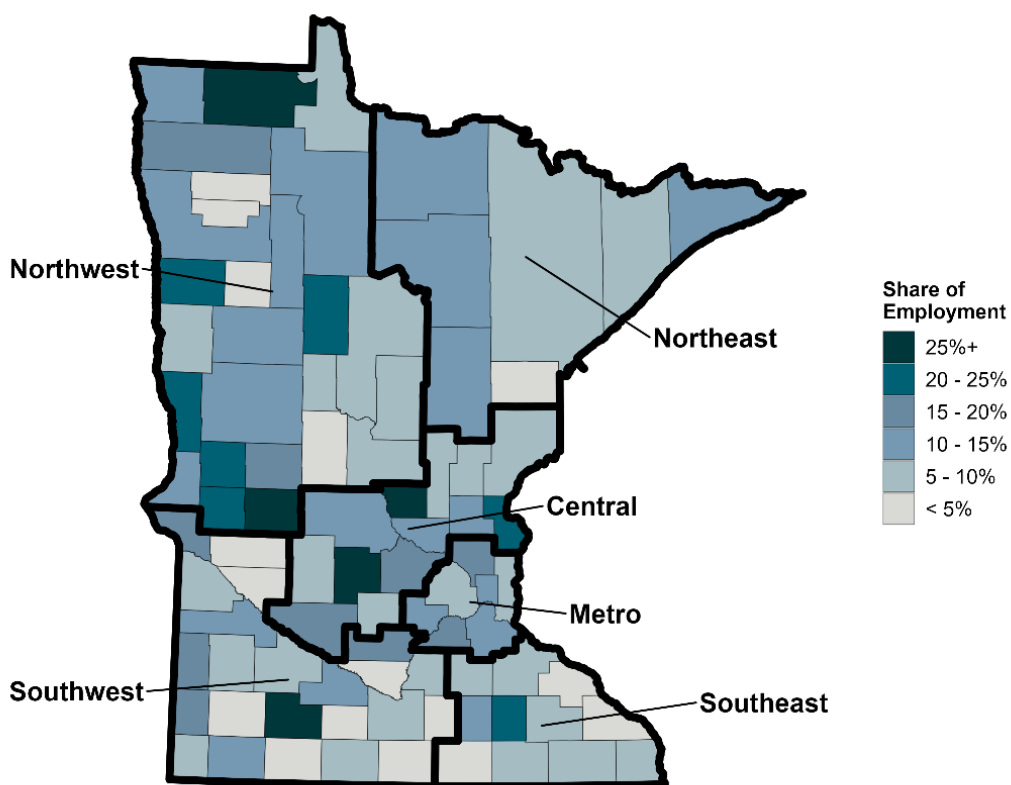
### Prevalence varies widely across regions

Statewide, clean-economy jobs account for 12.6% of all jobs, but at a county level this share ranges from over 60% to less than 1%. Even within regions, there are large differences in how prevalent clean-economy jobs are. For example, the Northwest region contains the counties with the highest and lowest shares of clean-economy employment. The Seven County Metro has the smallest differences between counties, around 11 percentage point difference, which is still a large difference considering the statewide prevalence is 12.6%. All but one of the counties with shares above the statewide level are in Greater Minnesota, highlighting that climate action can provide outsized economic opportunities for these areas.

The variation in share of clean-economy employment reflects differences in local industry mix, infrastructure, and populations, influenced by economic history rather than the absence of climate-related work in any part of the state. The types of industries supporting climate-related work often reflect long-standing regional economic strengths.

While clean-economy jobs are present statewide, their relative importance varies widely, even within the same region (Figure 6). This variation reflects differences in local industry mix, infrastructure, and population rather than the absence of climate-related work in any part of the state. Twenty-six out of the 27 counties with clean-economy employment shares higher than the statewide share are in Greater Minnesota.

**Figure 6. Share of clean-economy employment by county in 2024.**



Source: QCEW

### Industry mix differs by region, but key sectors lead employment

While the relative importance of clean-economy industries varies by region, **Construction accounts for the largest number of clean-economy jobs in every region of the state.** Clean-economy manufacturing industries account for the second largest number of jobs in every region except the Northeast. Construction and manufacturing jobs anchor climate-related work statewide, supporting a wide range of climate action efforts.

While most of the clean-economy construction and manufacturing industries contribute to increasing building efficiency and industrial decarbonization, there are also construction and manufacturing industries that support climate action efforts in transportation, natural and working lands, electricity generation, and community resilience. The following are examples of specific regional strengths in clean-economy industries:

- **Construction** is the single largest source of clean-economy jobs across Minnesota. Construction trades such as electricians, plumbers, and HVAC contractors are essential everywhere. In Greater Minnesota, a larger share of construction employment is tied to transportation and infrastructure projects, while the Twin Cities metro area has a higher concentration in commercial building. Residential construction plays a relatively larger role in Northeast and Northwest Minnesota.
- **Manufacturing** is the second largest clean-economy employer in most regions. Greater Minnesota tends to specialize in machinery, equipment, and materials production, while the Twin Cities metro area has higher concentrations in electrical, advanced, and technology-intensive manufacturing. These industries support emissions reductions across buildings, transportation, electricity, and industrial systems.
- **Natural and working lands climate action efforts** are supported by a variety of different industries, several of which play important roles across the state. Southwest and Northwest Minnesota have higher shares of employment in the Agriculture, Forestry, and Fishing industry, relative to the other regions. Northeast Minnesota has a comparatively high concentration of employment in environmental conservation and land-management activities, with many jobs supporting publicly administered conservation programs.

Together, these patterns reflect long-standing regional strengths and show where climate-related opportunities already exist. They also underscore why **regional workforce strategies must be tailored**: communities will grow clean-economy workforces from different starting points, building on the industries that already anchor their local economies.

### Counting clean jobs: What the data can and can't tell us

There is currently no statewide or nationally collected dataset that tells us exactly how many workers are employed in “clean” or “green” jobs — meaning jobs where we can confirm that a worker spends all or part of their time producing low-carbon or environmentally beneficial goods and services across all climate-relevant industries.

The closest existing source is the U.S. Department of Energy’s energy employment survey, which measures employment across *all* energy technologies — fossil, nuclear, and clean. Clean-energy employment estimates from this survey are published in the U.S. Energy and Employment Report (USEER) and Clean Jobs Midwest factsheets. In 2024, clean energy employment accounted for **2.3% of national employment** and **2.2% in Minnesota**.

Broader “green goods and services” estimates once published by the Bureau of Labor Statistics (last released in 2011) placed green jobs at **2.6% of national employment** and **2.9% of private employment in Minnesota**, but these figures are now too outdated for planning.

Because no current dataset captures all climate-relevant work, this report uses a practical approach: identifying **industries that directly contribute — or could contribute — to producing goods and services that enable emissions reductions**, along with their upstream supply chains. This “clean or potentially clean” scope includes industries that produce goods and services that directly support emissions reduction — from efficient and electric technologies to clean electricity and fuels, carbon sequestration solutions, and recycling and reuse — as well as the supply chains that enable them.

## Looking ahead: What current policies mean for Minnesota’s workforce

Under Minnesota’s current climate and energy policies, demand for workers is expected to grow more than earlier employment projections anticipated. Modeling done for the 2026 Climate Action Framework estimates that many of the industries with the largest previously projected increases in employment demand will see even larger increases as a result of the state’s recent climate and energy policies.

This section brings together three sources of information to help us understand where workforce demand is emerging:

1. Economic modeling that incorporates recently enacted state climate and energy policies.<sup>10</sup>
2. Minnesota’s 2022–2032 employment projections,<sup>11</sup> developed before major 2023 legislation.
3. Observed job growth over the past two years.<sup>12</sup>

Taken together, these data show not only where future growth is expected, but where it is already underway.

### Workforce demand is accelerating under current policies

Economic modeling completed for the 2026 Climate Action Framework indicates that current climate and energy policies increase demand for workers beyond what was projected prior to their adoption.<sup>13</sup> Modeling estimates suggest that current policies could increase the number of jobs added between 2022 and 2032 by more than 30% above previously projected employment gains. These model-based estimates are subject to change based on policy, market, and economic conditions. As discussed elsewhere in the report, a tight labor market could also constrain growth.

In several industries, particularly Construction and Professional and Technical Services, modeled employment gains exceed the state’s pre-policy projections, reflecting the scale and pace of work needed to modernize buildings, expand clean energy systems, upgrade infrastructure, and plan and implement climate solutions.

Estimates also suggest that some critical industries, such as utilities, forestry, and waste management, could see much faster increases in employment demand than previously thought, even though the total numbers of jobs added is modest. This acceleration helps explain why workforce demand is already becoming visible in some sectors, even though many of the underlying policies are still in early stages of implementation.

### Skilled trades and technical industries drive the largest employment gains

Across the state, Construction, Manufacturing, and Professional and Technical Services account for the largest potential clean-economy employment gains under current policies. These industries support much of the work required to retrofit buildings, build and maintain energy and transportation infrastructure, manufacture equipment and materials, and provide planning, engineering, and technical services.

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<sup>10</sup> [Forecasting, Climate Action Framework 2026](#)

<sup>11</sup> [Employment Outlook \(Employment Projections\) / Minnesota Department of Employment and Economic Development](#)

<sup>12</sup> [Quarterly Census of Employment and Wages \(QCEW\) / Minnesota Department of Employment and Economic Development](#)

<sup>13</sup> The Current Policies scenario includes both state and federal policies, including Minnesota’s clean electricity targets, building code efficiency standards, and federal tax credits, standards, and investment still in effect as of July 2025. For more details on how policies were modeled, see [Appendix B in Forecasting, Climate Action Framework 2026](#).

## Spotlight

### Buy Clean: Building future-ready supply chains

The Minnesota Buy Clean Buy Fair Act, enacted in 2023, is a procurement policy to reduce the environmental impacts of construction materials used in state buildings and transportation infrastructure projects. The Environmental Standards Procurement Task Force, with membership from state government and industry, is setting global warming potential limits for materials like concrete, steel, and rebar.

The Minnesota Buy Clean legislation can strengthen the local workforce by:

- Prioritizing demand for low-carbon materials, which encourages manufacturers to invest in modernized facilities and skilled labor.
- Supporting the creation of high-quality, future-ready jobs by fostering in-state economic activity and aligning with emerging market standards.

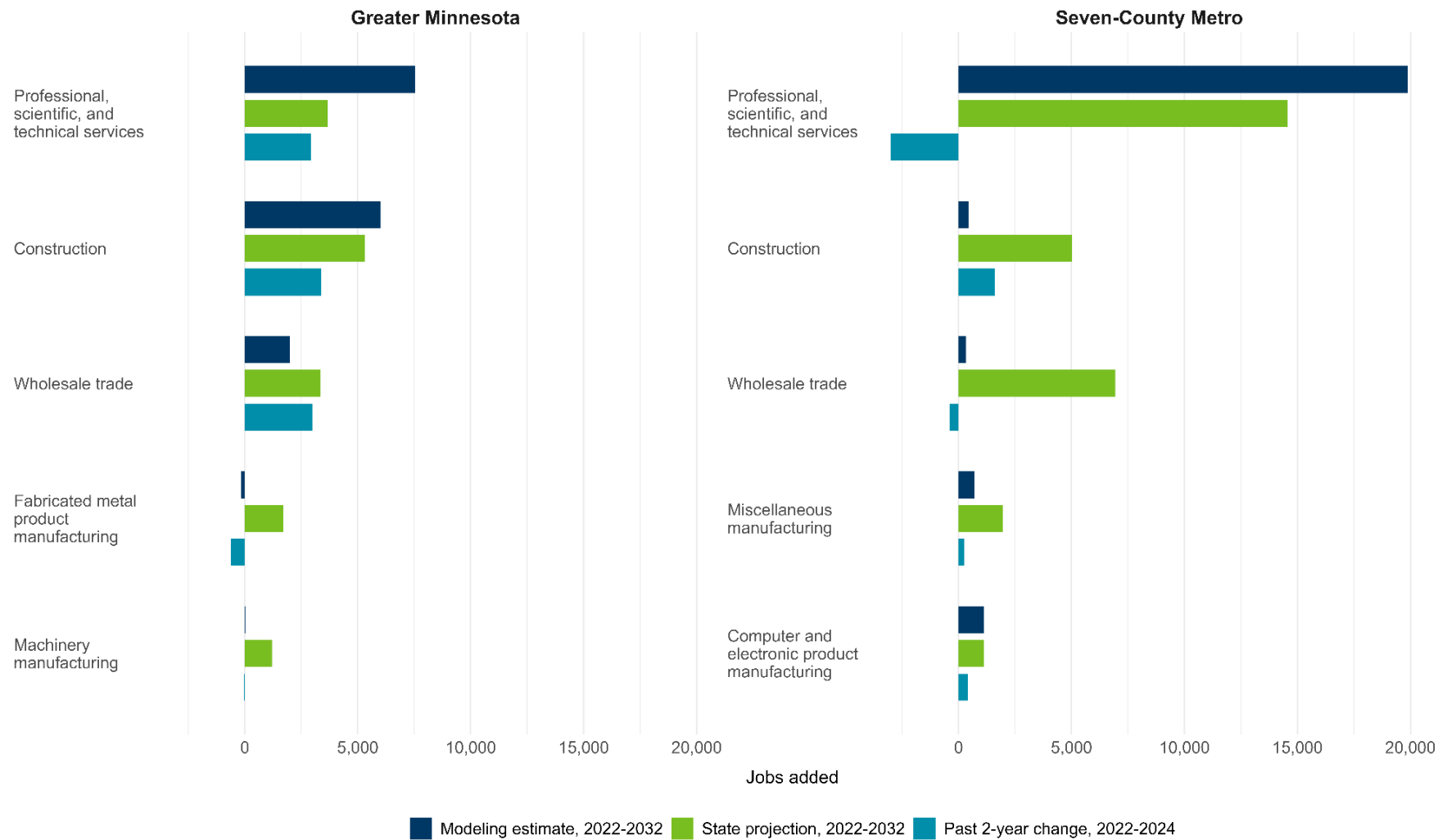
This policy positions Minnesota workers and businesses to stay competitive in a rapidly evolving, low-carbon economy, because:

- Construction materials manufacturers in Minnesota have received support and education to reduce the carbon emissions in their products.
- Many manufacturers have created Environmental Product Declarations for their products which will make them more competitive to supply environmentally preferable products not only in Minnesota, but across the Midwest and country.

The Twin Cities metro area accounts for roughly 60 percent of statewide employment today and is projected to add the largest number of jobs overall. At the same time, Greater Minnesota plays an outsized role in several clean-economy industries — including Construction, certain manufacturing subsectors, and natural-resource-related industries such as Agriculture, Forestry, and Mining — making workforce capacity in these regions especially important. While not all of these industries are among the largest sources of projected job growth in absolute terms, they remain critical to regional economies and to supporting climate-related activities.

Construction and Professional and Technical Services drive the largest employment gains under current policies in both the Twin Cities metro area and Greater Minnesota. While the Twin Cities metro area adds more jobs overall due to its size, many clean-economy industries represent a larger share of employment in Greater Minnesota, underscoring the need for regionally tailored workforce responses (Figure 7. Top clean-economy industries by projected job gains in Greater Minnesota and the ).

**Figure 7. Top clean-economy industries by projected job gains in Greater Minnesota and the Twin Cities metro.**



Source: QCEW, Projections, Modeling for Climate Action Framework

## Recent job growth shows demand is materializing now

Recent employment trends provide important context for understanding projected growth. In several industries — particularly in Greater Minnesota — a large share of projected 10-year employment growth from 2022 to 2032 has already occurred in just the past two years. In Greater Minnesota, over half of all industries have experienced more than 50% of all employment growth projected from 2022 to 2032 in just the first two years, from 2022 to 2024. This indicates that workforce demand is not only expected, but already materializing in some parts of the economy.

### Spotlight

#### How state-funded construction advances the clean-energy economy

State-funded construction of new buildings and major remodels are required to meet the B3 Sustainable Building 2030 (SB 2030) Energy Standard, resulting in buildings with lower long-term operating costs and emissions. Requiring SB 2030 on state-funded projects creates demand for energy modelers and building performance analysts, high-efficiency HVAC and electrification specialists, and renewable energy designers and installers. SB 2030 also builds skill sets within the design and construction industry for high performance projects that are energy efficient and incorporate renewable energy, making these companies competitive to export these skills to projects in other states.

SB 2030 is a performance-based design standard, driving innovation and advancement in engineering and construction methods, resulting in contracted firms developing a competitive advantage over firms doing traditional code-based design and construction. These aren't just jobs — state-funded construction requires that firms pay their workers prevailing wage.

Because of the scale of state-funded construction, these requirements drive industry-wide innovation and advancement in Minnesota.

## **Growing occupational demand spans education levels, with pressure in key skill areas**

As Minnesota's clean economy grows, demand is increasing not just for specific industries, but for a wide range of occupations and skills. Industries describe what is produced; occupations describe the work people do and the skills required to do it. Many clean-economy industries rely on a mix of trades, technicians, operators, engineers, and managers working together on the same projects.

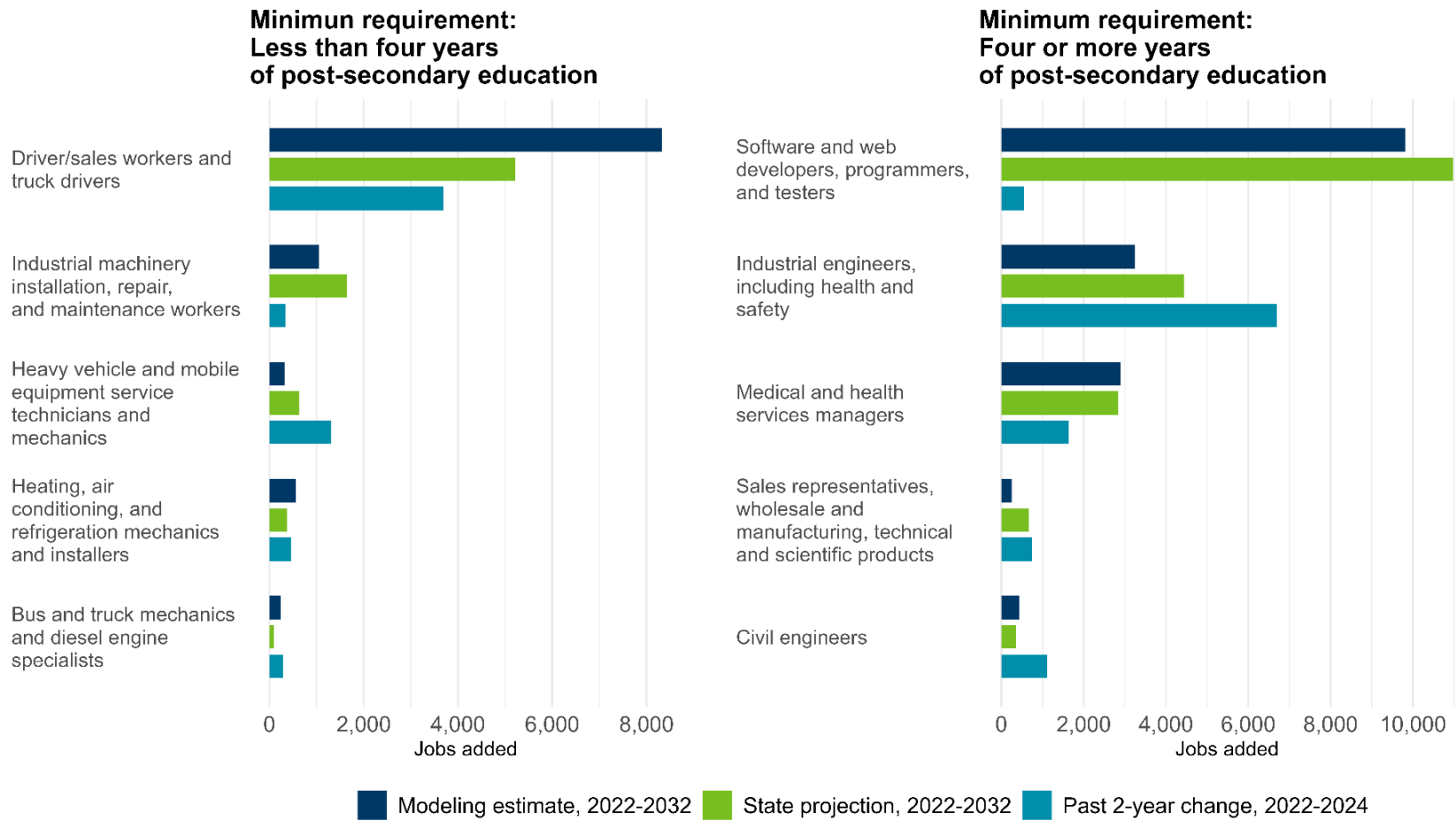
Many occupations critical to Minnesota's climate and energy transition do not require a four-year degree. Roles such as truck drivers, HVAC installers, industrial machinery mechanics, and heavy equipment technicians are essential to building, operating, and maintaining cleaner buildings, transportation systems, infrastructure, and industrial equipment. Several of these occupations have added more jobs in the past two years than projected over the entire decade, reflecting both strong current demand and the transferability of these skills across multiple industries.

Professional and technical occupations that typically require a bachelor's degree or higher are also expected to grow. Engineers, software developers, planners, sales and technical representatives, and health services managers support system design, modeling, project management, and the integration of new technologies. While short-term growth varies across these roles, long-term modeling indicates increasing demand as Minnesota modernizes infrastructure, expands clean energy, and strengthens climate resilience.

Across education levels, the overall pattern is clear: Minnesota will need more workers with construction, logistics, maintenance, engineering, and technical skills to meet its climate and resilience goals.

Employment growth under current policies spans occupations that both require and do not require a four-year degree. Many of the fastest-growing roles — particularly in construction, maintenance, logistics, and technical trades — do not require a bachelor's degree, highlighting the importance of near-term workforce capacity and training pathways. In Figure 8, occupations are grouped by whether they typically require less than four years of post-secondary education (e.g., associate's degree, non-degree credential, high school equivalent) or four years or more of post-secondary education (e.g., bachelor's, master's, doctorate, professional degree).

**Figure 8. Top occupations by projected job gains by typical minimum education requirements.**



Source: OEWS, Projections, Modeling for Climate Action Framework

## **A broad, adaptable workforce underpins the transition**

Workers contribute to emissions reduction and resilience in many ways — by producing cleaner technologies, helping organizations adopt new practices, supporting infrastructure and public services, or strengthening community resilience. This breadth reflects the reality of Minnesota’s transition. Progress depends on a large, adaptable workforce whose skills can shift as markets evolve, and regional needs change. The sections that follow examine where workforce pressures are likely to be most acute, the barriers that limit participation in critical jobs, and the strategies needed to support workers and employers across regions.

### **Guest workers in forestry and agriculture**

Some work essential to achieving Minnesota’s climate and resilience goals relies on guest workers employed through federal visa programs. These programs are designed to employ non-citizens where the domestic labor pool is not sufficient to meet workforce demand.

In sectors such as forestry and agriculture, these workers play important roles. In Minnesota’s forestry sector, many are employed through the H-2B program to support activities such as seed collection, forest maintenance, and planting, protecting, and tending trees. Similar programs, such as H-2A in agriculture, support work related to land management and food systems.

Demand for these programs underscores how meeting workforce needs in certain clean-economy industries depends on access to a broader labor pool.

## Section 3. Creating an enduring and resilient workforce

### Section highlights

Minnesota's clean-economy workforce must grow while facing a tight labor market, an aging workforce, and changing demographics. Meeting future demand will depend on participation, retention, mobility, and system alignment.

- **Tight labor market constraints.** Job openings have exceeded unemployed workers since 2021, limiting slack and raising the stakes for attraction and retention.
- **Aging workforce plus demographic shift.** Retirement-driven replacement needs are increasing, while younger cohorts are more diverse, reshaping who employers must attract and retain.
- **Working conditions and access matter as much as wages.** The majority of clean-economy jobs offer family-sustaining wages, but pay in combination with job stability, safety, scheduling, and wraparound supports influence whether workers can enter and remain in critical roles.
- **Transferable skills enable adaptation.** Many clean-economy skills already exist in Minnesota's workforce. Skill-based mobility can accelerate hiring, strengthen resilience, and support equity.
- **Aligned education and workforce systems are essential.** Stackable credentials, sector partnerships, and coordinated training systems help translate workforce demand into sustained workforce capacity.

### Strengthening training, access, and job quality across Minnesota's clean economy

Minnesota's clean-economy transition will only succeed if the state has a workforce that can enter, stay, and adapt in these jobs over time. Meeting future needs will depend not only on creating jobs, but on retaining workers, reducing barriers to participation, enhancing job-quality, and supporting skill development as technologies and markets evolve.

#### A tight labor market raises the stakes for workforce participation, attraction, and retention

Minnesota consistently maintains higher labor force participation rates and lower unemployment rates than the national average. Job openings in Minnesota also regularly exceed the number of unemployed workers. Since early 2021, monthly job openings have exceeded the number of unemployed workers by *at least* 1.4 openings for every unemployed worker.<sup>14</sup>

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<sup>14</sup> [JOLTS State Estimates: U.S. Bureau of Labor Statistics](#)

These are all signs of a strong economy. It also means there is relatively little slack in the labor market. As demand for workers grows, especially in construction, manufacturing, utilities, and technical occupations, workforce constraints are likely to emerge unless participation, attraction, and retention increase.

These labor market dynamics affect Minnesota’s economy broadly. Clean-economy industries operate within the same statewide labor market conditions, though in some cases workforce pressures may be more pronounced due to differences in work structure, geographic location, and the skill requirements of certain occupations.

## **An aging and changing workforce creates both opportunity and urgency in key industries**

Minnesota’s workforce is undergoing a long-term demographic shift. The share of workers aged 65 and older has increased in recent years, while growth among some groups of prime-age workers has slowed.<sup>15</sup> At the same time, the workforce is also becoming increasingly diverse. Each generation of workers is more racially and ethnically diverse than their elders. For example, nearly one in three Minnesotan workers ages 14–24 identify as Black, Indigenous, or people of color, compared to fewer than one in twelve workers ages 65 and older. This pattern holds across intermediate age groups as well, reflecting a steady demographic shift rather than a sudden change.

These shifts matter for employers. As experienced workers retire, businesses must recruit, train, and retain a new generation of workers to meet growing demand for workers, let alone sustain current capacity.

Efforts to expand recruitment channels, strengthen career pathways, and reduce barriers to entry in key clean-economy sectors will be crucial to maintaining a strong economy and accomplishing Minnesota’s climate goals. Several clean-economy industries, such as Manufacturing, Mining, and Utilities, rely on large shares of workers nearing retirement age and have relatively fewer younger workers entering these fields. Many clean-economy sectors are also among the least diverse across gender, race, ethnicity. For example, in the Construction industry, 16% of workers are women and 6% are workers of color.

This dynamic creates both opportunity and urgency. Upcoming retirements open pathways for younger and mid-career workers, while also increasing replacement needs in critical jobs, and the workers available to fill these jobs increasingly come from demographics these industries have historically struggled to attract or retain. To put the magnitude of this shift in context, statewide employment growth from 2020 to 2025 came entirely from increased employment among workers of color.<sup>16</sup>

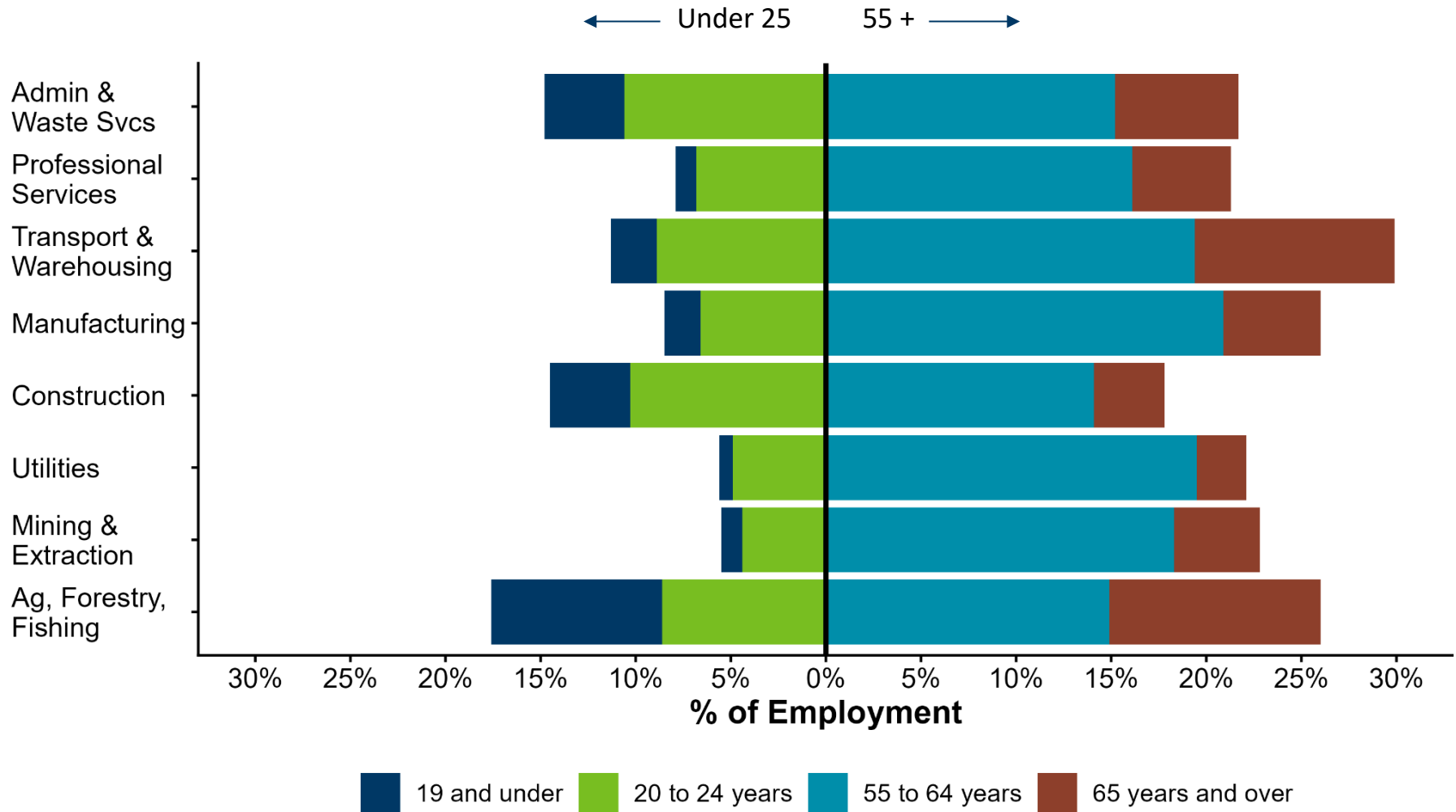
Some clean-economy industries have older workforces, with a higher share of workers nearing retirement age (Figure 9). In these industries, workforce needs are driven not only by job growth, but by the need to replace experienced workers as they retire. At the same time, each generation in or entering the workforce is more diverse than the previous generation. Together, these trends underscore the importance of expanding recruitment channels, strengthening training pathways, and supporting retention across regions and communities to ensure that industries can successfully attract and retain the next generation of workers.

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<sup>15</sup> [Minnesota’s Workforce Since the Pandemic: More Diverse, More Female, More Self-Employed / Minnesota Department of Employment and Economic Development](#)

<sup>16</sup> Ibid.

Figure 9. Share of employment by age group (select age ranges) for key clean-economy industries, statewide employment in 2024.



Source: QWD

## Many clean-economy jobs offer strong wages — but job quality beyond pay also matters

Wages and working conditions play a large role in whether workers are attracted to and remain in critical occupations. High-quality jobs — that offer family-sustaining wages, benefits, safe and stable working conditions, worker voice, and pathways for advancement — are central to workforce resilience.<sup>17</sup> When workers can access and remain in these jobs, employers benefit from lower turnover and more reliable staffing, and communities benefit from more stable economic opportunities across regions.

Statewide, average weekly wages exceed the family-sustaining benchmark in 90% of clean-economy industries, and most workers in green occupations earn hourly wages above regional family-sustaining thresholds, including many roles that require no more than a high school diploma or short-term training and offer strong long-term demand.

Still, the range of wages differs significantly by education level (Figure 10). Occupations requiring less than a four-year degree tend to cluster within a narrower wage band, which can limit opportunities for upward mobility within a single occupation. Many workers seeking advancement eventually transition into a different role or sector — a shift that can be supported through targeted training, career advising, and employer partnerships.

Additionally, while most green occupations provide hourly wages that exceed the hourly family-sustaining wage threshold, fewer occupations exceed the annual full-time family sustaining wage threshold.<sup>18</sup> The total annual earnings can vary depending on seasonality and scheduling challenges unique to different job contexts, which reinforces the importance of job stability alongside wage levels when considering job quality.

Wages alone, however, do not determine whether workers can enter or remain in these jobs. Job quality is also shaped by schedules, physical demands, safety conditions, benefits, and opportunities for advancement. Many critical clean-economy roles require frequent physical activity, outdoor work, travel, or project-based schedules that reflect the nature of the work itself. These characteristics do not make such jobs inherently low-quality; rather, they shape the workplace practices needed to support high-quality jobs across industries. Approaches such as predictable scheduling, strong safety standards, clear career progression pathways, and supportive workplace policies can strengthen both worker wellbeing and employer stability by improving attraction and long-term retention.

As workers' needs change over time — due to aging, caregiving responsibilities, or health considerations — flexible training options, adaptable career pathways, and supportive workplaces become increasingly important to long-term participation.

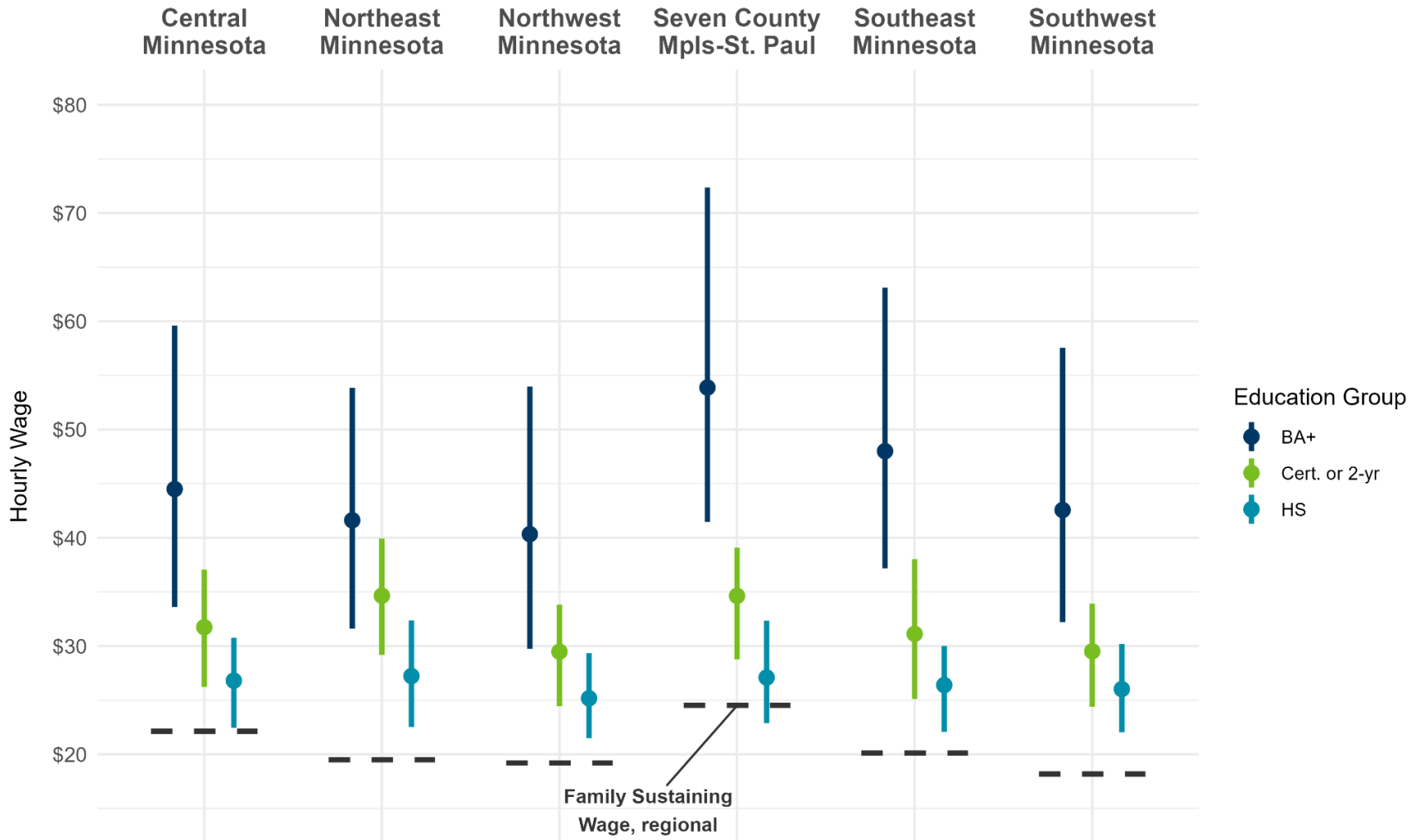
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<sup>17</sup> [The Measure of a High-Quality Job / Minnesota Department of Employment and Economic Development](#)

<sup>18</sup> [Greening of the World of Work: Implications for O\\*NET-SOC and New and Emerging Occupations at O\\*NET Resource Center](#)

**Figure 10. Regional wage ranges (25-75<sup>th</sup> percentiles) for clean-economy occupations by minimum education requirements.**

Many clean-economy occupations provide wages above regional family-sustaining thresholds across education levels. However, occupations that do not require a four-year degree often fall within a narrower wage range, which could indicate limited advancement opportunities within a single role. Clear career advancement pathways are essential to supporting upward mobility for workers in such roles.



Source: DEED Cost of Living, OWES, ONET

## **Practical barriers limit participation in critical clean-economy jobs**

Workforce participation is shaped not only by wages and job availability, but also by whether jobs are realistically accessible to workers across regions and life stages. Even when roles offer strong pay and long-term demand, practical barriers can limit who is able to enter or remain in these occupations.

Access to transportation, childcare for early or irregular hours, workforce housing near job sites, recruitment and hiring pathways, and licensing or credentialing requirements can all affect whether workers are able to enter or remain in clean-economy roles.

These barriers are not unique to climate-related work, but they can be especially acute in construction, manufacturing, and infrastructure-related jobs that require rigid schedules, nonstandard hours, or travel between worksites. For example, early start times at job sites may conflict with childcare availability, and project-based work may require travel beyond public transit routes. Addressing these practical constraints is critical to ensuring that clean-economy opportunities are accessible to workers across regions and life stages.

### **Tribal Nations and Minnesota's climate workforce**

Tribal Nations played an active role in shaping Minnesota's Climate Action Framework through ongoing Tribal-State coordination, consultation, and collaboration. Tribal climate priorities, including land and resource protection, infrastructure investment, and continued collaboration, are reflected throughout the framework and across all seven goals.

Indigenous employment has already grown rapidly in Minnesota. From 2019 to 2024, Indigenous employment grew more than ten times faster than statewide employment. Growth has been especially strong in industries that support climate action, such as Construction, Manufacturing, Agriculture and Forestry, and Professional and Technical Services. As demand increases in sectors tied to energy, infrastructure, and land stewardship, there will be continued opportunities for Indigenous workers to contribute to climate solutions in their communities and across the state.

Tribal communities are also well positioned to help meet rising labor demand. Minnesota's Indigenous population is significantly younger than the population overall, with a larger share of individuals entering working age and a smaller share nearing retirement. This demographic trend creates an opportunity for employers to access new local talent while expanding access to quality jobs and career pathways for Tribal community members.

At the same time, persistent barriers must be addressed to ensure equitable access to these opportunities. Transportation reliability, access to childcare and housing, and infrastructure needs, such as reliable power and internet, can limit access to employment and training, particularly in rural and Tribal communities.

Continued collaboration between Tribal Nations, state government, employers, and workforce partners will be critical to advancing shared climate and workforce goals. Early consultation, sustained coordination, and investments that reflect Tribal priorities can help ensure that climate action supports strong, resilient communities and creates meaningful, accessible opportunities for Indigenous workers across Minnesota.

## Transferable skills are foundational for a resilient workforce

Strengthening mobility within the existing workforce could help Minnesota meet increasing workforce demand in clean-economy industries even when labor market conditions are tight. Many of tomorrow's clean-economy workers are already employed in today's jobs. A large share of the skills needed for growing clean-economy roles already exists across Minnesota's workforce, particularly in manufacturing, logistics, maintenance, repair, construction, and utilities.

Identifying and strengthening transferable skills allows workers to move across roles or industries without starting from scratch. For example, many of the electrical, troubleshooting, and quality-control skills used in solar installation are also central to semiconductor manufacturing and other clean-technology component industries. Stackable and portable credentials can further support this mobility, helping workers build on prior experience as they advance.

Focusing on transferable skills strengthens workforce resilience in several ways:

- **Workers** can transition from slowing or high-turnover fields into growing occupations with stronger long-term demand.
- **Mid-career workers and those historically underrepresented in technical fields** gain new pathways into good jobs.
- **Employers** benefit from broader candidate pools and faster hiring for critical roles.
- **Communities** retain talent locally as workers adapt rather than exit the labor force.
- **The state and workforce development system** is better positioned to adapt as needs, policies, and market conditions change.

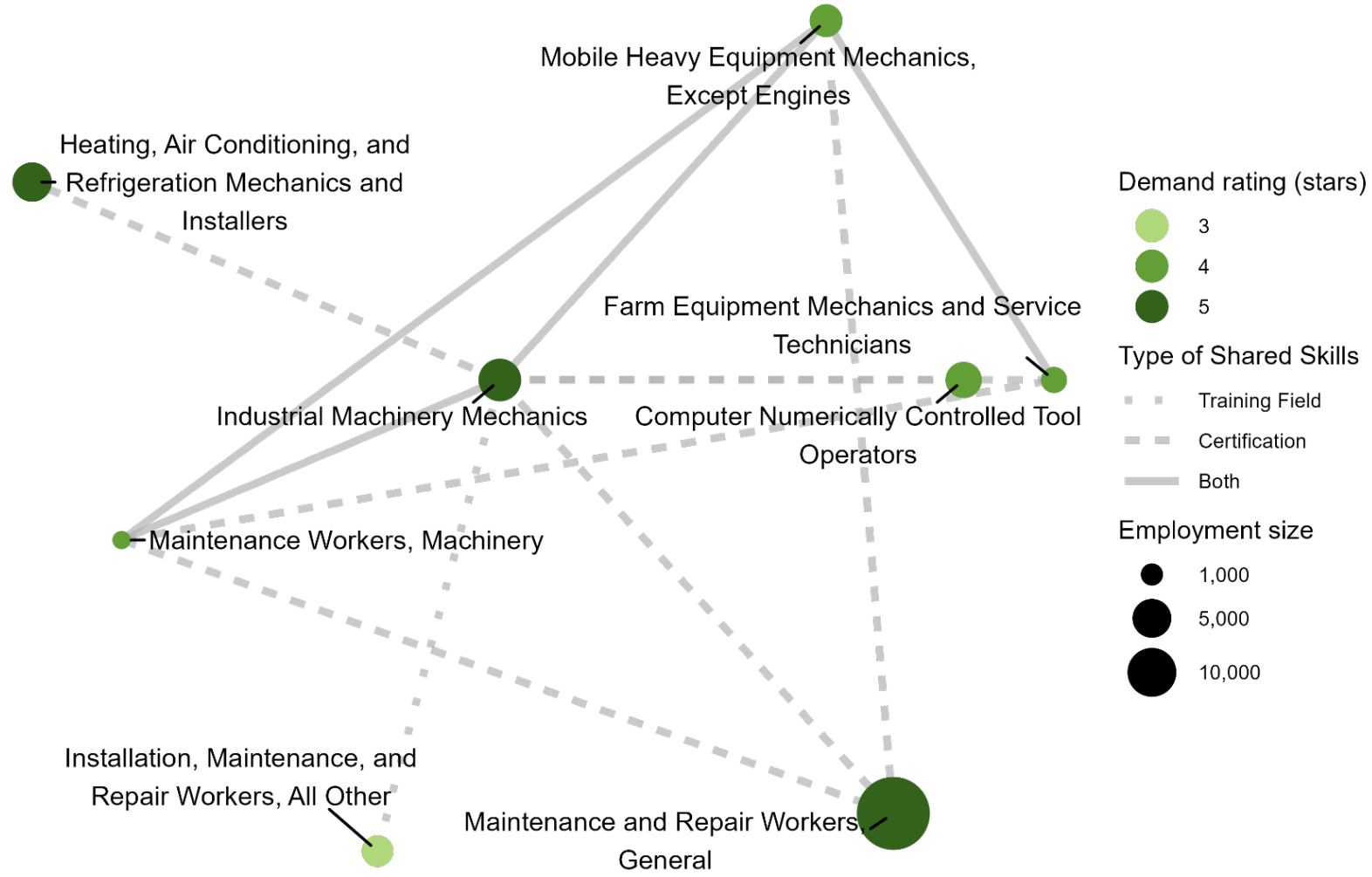
Building a shared understanding of transferable skills supports a more nimble, adaptable workforce as Minnesota's clean-economy needs shift over time. Fully realizing this potential, however, will require better workforce data and sustained coordination to align training systems, credential frameworks, and employer needs.

Figure 11 illustrates how one high-demand occupation — industrial machinery mechanics — connects to other in-demand occupations through shared skills, training program fields, and certifications. By mapping overlapping competencies rather than focusing solely on job titles, the figure demonstrates how workers can move between related roles without retraining from scratch. This skills-based perspective can help workforce partners design clearer mobility pathways and faster transitions across industries.

Figure 11. Transferable skills across selected in-demand occupations supporting the clean economy.

## How Skills Transfer Between Clean-Economy Occupations

Connections show shared training fields (CIP) and certifications. Node size reflects employment; color reflects job demand.



Sources: JobSTAT, NCES, CareerOneStop

## Education and training systems support adaptability over time

Education and training systems are central to turning workforce demand into workforce readiness. While this section focuses on clean-economy industries, the strategies discussed can benefit Minnesota’s workforce and employers more broadly.

Minnesota has a strong foundation of education and training systems that can support an adaptable clean-economy workforce. High school career and technical education, community and technical colleges, registered apprenticeships, workforce development organizations, and universities all play important roles in preparing workers for hands-on, technical, and professional clean-economy careers. Together, these systems provide multiple entry points for people at different stages of life and work.

To make skill-based mobility possible at scale, education and training systems must align curricula, credentials, and delivery models around shared competencies. Strengthening coordination across providers, including through stackable and portable credentials, can help ensure that training reflects employer demand and that workers can build on prior experience as they advance or transition between roles.

### Spotlight

#### Centers of Excellence

[Minnesota State Centers of Excellence](#) provide one example of how sector alignment can support workforce adaptability. Focused on sectors such as energy, engineering and applied manufacturing, information technology, agriculture, healthcare, and transportation, the Centers serve as hubs that connect employers, educators, and workforce partners around shared skill needs and emerging industry trends.

By convening partners across K–12 education, higher education, and industry, the Centers help translate employer demand into curricula, credentials, and training programs that reflect real-world needs. This convening role is especially valuable in industries where technologies and skill requirements are evolving and where many occupations draw on transferable technical foundations.

Other sector partnerships across the state — including emerging initiatives in advanced manufacturing and semiconductor production — demonstrate similar models of employer-led coordination and training alignment.

Together, these efforts provide a strong foundation for adapting Minnesota’s workforce systems as demand shifts across industries and regions.

# Conclusion

Minnesota’s clean-economy workforce is already substantial and spans a wide range of industries and occupations across every region of the state. The state has many of the building blocks needed to continue to grow a strong, resilient clean-economy workforce. Education and training institutions, employers, labor and community-based organizations, local governments, and state agencies are preparing people for careers that support emissions reduction, community resilience, and economic growth.

## Sustaining progress: What Minnesota can do next

Sustaining progress will require intentional alignment. Minnesota’s clean-economy workforce operates within a tight labor market, where job openings regularly exceed the number of available workers. At the same time, several key industries face significant replacement needs as experienced workers retire. Job quality and working conditions influence whether workers are attracted to and remain in critical roles, while practical barriers such as transportation, scheduling, and access to training shape who can participate. Strengthening transferable skills and aligning education and workforce systems will be central to adapting to these pressures over time and will shape how quickly the state can translate policy goals into on-the-ground capacity.

The transition also brings uncertainty. Evolving technologies, shifting market conditions, and changing policy environments may create workforce needs that today’s data cannot fully anticipate. Preparing for both known and emerging demands will require workforce systems that are flexible, coordinated, and responsive.

Minnesota has the pieces in place, among them skilled workers, engaged employers, strong education and workforce networks, and a growing number of climate action projects. The work ahead is less about inventing new systems and more about **aligning and strengthening** the ones that already exist so that our clean-economy workforce remains durable, adaptable, and positioned to support long-term prosperity for workers, businesses, and communities across every region of the state.

Several enabling conditions can support faster, more effective, and more equitable progress towards Minnesota’s climate, energy, and economic goals:

- **Sustained coordination across agencies and partners** to align climate, economic development, and workforce strategies.
- **Clear and timely signals of workforce demand** to help guide investments, training capacity, and equitable access to high-demand careers in line with employer needs.
- **Support for workforce participation and retention, including sustainable investments** that fund training and wraparound services like childcare and transportation.
- **Employer engagement** to strengthen job quality and advancement pathways into family-sustaining careers.
- **Transparent and accessible data systems** that allow agencies and partners to track workforce signals, respond to emerging workforce needs, and measure progress over time.

## Guidance for partners

Minnesota's clean-economy workforce spans many industries, regions, and institutions. The findings in this report suggest several areas where action and alignment across partners could help translate policy goals into durable workforce capacity. Many of the actions below rely on timely data, increased coordination, and sustained capacity across systems. In some cases, additional prioritization or resources may be needed to fully operationalize them.

### For legislators and policymakers

- Use available workforce data to inform funding, oversight, and implementation decisions. Consider how workforce capacity, replacement needs, and job quality affect the feasibility and pace of project delivery across regions.
- Support sustained investment in labor market data and analysis. Timely, reliable information on workforce demand, supply, and mobility is essential for effective planning and decision-making.
- Strengthen coordination across workforce, education, and industry partners to make systems easier to navigate and more responsive to changing needs. Provide sustained resources that enable alignment across programs, credentials, and wraparound supports so that systems can evolve along with industry needs.

### For employers, industry partners, and labor organizations

- Engage with education and workforce partners to communicate evolving skill needs and help translate those needs into training programs and credentials.
- Invest in job quality, retention, and advancement pathways to stabilize the workforce supply, where hiring alone may not meet demand.
- Participate in sector partnerships and collaborative efforts that support shared solutions to hiring, replacement, and skill-transition challenges.

### For education and workforce organizations

- Align programs around transferable skills, including stackable and portable credentials, to support mobility across occupations and industries, even as specific technologies and job titles continue to evolve.
- Use emerging demand signals to update curricula, credentials, and delivery models, while acknowledging where data limitations require judgment and employer input.
- Coordinate regionally to expand access to training and reduce barriers for workers at different life stages.

### For philanthropic organizations

- Invest in flexible workforce innovations and partnerships, including pilot programs, sector partnerships, and navigation tools that help workforce systems test new approaches and adapt under uncertainty, especially in high-demand occupations and in regions where public data or funding is limited or slow to adapt.
- Strengthen access and wraparound supports by complementing public funding, through investments in transportation, childcare, or scheduling flexibility, and other access solutions that enable participation and retention in training and employment.
- Build long-term analytic and system capacity, including efforts that improve data transparency, workforce analysis, and coordination across partners, helping systems respond more quickly and effectively to evolving clean-economy needs.

### For labor market information, data, and research partners

- Coordinate workforce data and analysis across agencies, institutions, and partners to improve consistency and clarity of reports, tools, and public data resources.
- Improve the timeliness and accessibility of workforce demand signals, including informative skills-based indicators and job quality information.
- Increase transparency around methods, assumptions, limitations, and appropriate use to help users interpret differences across estimates and projections and understand the limits of available data.

# Appendix A: Engagement

The 2026 Climate Action Framework reflects the input of over 1,000 Minnesotans from Tribal Nations, local governments, businesses, sector experts, and communities across the state. For more detailed on the engagement process and findings for the full Framework, see [Minnesota 2026 Climate Action Framework - Engagement summary](#).

The workforce analysis was informed by labor market data, industry research, partner insights, and stakeholder input from state agencies, regional partners, industry and labor organizations, academic experts, and community partners, including feedback shared through ongoing conversations and planning processes.

## General feedback themes

### Scope development, data methods, and definitional clarity

Stakeholders emphasized the importance of clearly defining the scope of “climate action work,” given the lack of national consensus and the limitations of existing occupational and industry classification systems. Feedback highlighted the need to:

- Distinguish between direct clean-economy work, enabling roles, and broader sectoral impacts.
- Improve alignment between industry classifications and climate sectors.
- Address challenges associated with mixed-activity industries.
- Use multiple data sources to improve transparency and consistency across analyses.

### Realistic assessments of future labor demand and supply

Stakeholders emphasized the importance of grounding workforce estimates in realistic assumptions about economic conditions, policy changes, and technology adoption. Feedback highlighted the need to:

- Clearly communicate how labor projections relate to policy and market shifts.
- Recognize that climate actions may change the nature of work, not just the number of jobs.
- Identify workforce bottlenecks, particularly in skilled trades and technical fields.
- Account for demographic trends such as retirements, aging, and geographic mobility.

### Equity, job quality, and regional workforce differences

Stakeholders emphasized the importance of ensuring that Minnesota’s clean economy provides equitable access to high-quality jobs across all regions. Feedback highlighted:

- Disparities in access to training, apprenticeships, and high-wage jobs.
- The importance of job quality, including wages, benefits, and safe working conditions.
- Barriers such as transportation, childcare, training costs, and limited local capacity.
- The value of culturally grounded, community-based workforce pathways.
- Regional differences in labor markets, industry mix, and training infrastructure.

## Appendix B: Methodology

There is no single dataset that directly measures employment in “clean” or “green” jobs across all industries. This reflects the complexity of climate-related work, which can take many forms and is not always directly observable in standard labor market data.

Workers and businesses contribute to emissions reduction and climate resilience in different ways. Some produce goods and services that directly support climate goals, while others adopt cleaner technologies or practices within broader operations. In addition, many roles involve a mix of activities, with only part of the work supporting emissions reduction or climate resilience outcomes.

For the purposes of this analysis, “clean-economy industries” are defined as industries that directly contribute — or could contribute — to producing goods and services that enable emissions reductions, along with related upstream supply chains. This approach identifies a pool of industries with the potential to support climate action, recognizing that not all workers within these industries are or will be engaged in climate-related work.

Key reference analyses include:

- Bureau of Labor Statics’ Green Goods and Services survey<sup>19</sup> (BLS GGS)
- Brookings Institution report: Advancing inclusion through clean energy jobs<sup>20</sup> (Brookings)
- From Economic Analysis Office, Minnesota Department of Employment and Economic Development: List of Clean Tech and Renewable Energy industries<sup>21</sup> (DEED EA)
- RMI Clean Growth Tool<sup>22</sup> (RMI)
- U.S. Energy and Employment Report (USEER)<sup>23</sup>

Because there is no single agreed-upon definition of “clean” industries, these reference analyses vary in scope. Some industries are consistently identified across multiple analyses, while others appear in only one. This variation reflects differences in methodology, sector focus, and definitions of climate-related activity.

All but four industries included in this analysis were identified in at least one of the reference analyses. The four added industries are repair services and were included because of their role in supporting circular economy activities and reducing material consumption.

Not all industries identified in other analyses were incorporated. For example, fossil fuel-related industries included in USEER were excluded from the clean-economy scope to maintain alignment with emissions reduction objectives.

Table 2 provides the full list of industries included in the clean-economy scope, identified using North American Industry Classification System (NAICS) codes. The table also indicates the climate sector(s) most closely aligned with each industry and whether the industry is included in selected reference analyses.

To preserve completeness, the full set of identified industries is included in the table, regardless of whether employment was reported in Minnesota in 2024.

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<sup>19</sup> [Green Goods and Service \(GGS\): U.S. Bureau of Labor Statistics](#)

<sup>20</sup> [Brookings 2019 Clean Energy Jobs Report](#)

<sup>21</sup> [Minnesota: Committed to Clean Tech Innovation](#)

<sup>22</sup> [Clean Growth Tool](#)

<sup>23</sup> [U.S. Energy & Employment Report | Department of Energy](#)

**Table 2: Clean-economy industries.**

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Agriculture, Forestry, Fishing	111110	Soybean Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111120	Oilseed (except Soybean) Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111130	Dry Pea and Bean Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111140	Wheat Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111150	Corn Farming	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	111160	Rice Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111191	Oilseed and Grain Combination Farming	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	111199	All Other Grain Farming	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	111211	Potato Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111219	Other Vegetable (except Potato) and Melon Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111310	Orange Groves	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111320	Citrus (except Orange) Groves	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111331	Apple Orchards	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111332	Grape Vineyards	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111333	Strawberry Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111334	Berry (except Strawberry) Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111335	Tree Nut Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111336	Fruit and Tree Nut Combination Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111339	Other Noncitrus Fruit Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111411	Mushroom Production	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111419	Other Food Crops Grown Under Cover	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111421	Nursery and Tree Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111422	Floriculture Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111910	Tobacco Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	111920	Cotton Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111930	Sugarcane Farming	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	111940	Hay Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	111991	Sugar Beet Farming	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	111992	Peanut Farming	Natural and Working Lands	BLS GGS, RMI

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Agriculture, Forestry, Fishing	111998	All Other Miscellaneous Crop Farming	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	112111	Beef Cattle Ranching and Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112112	Cattle Feedlots	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112210	Hog and Pig Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	112310	Chicken Egg Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112320	Broilers and Other Meat Type Chicken Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112330	Turkey Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112340	Poultry Hatcheries	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112390	Other Poultry Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112410	Sheep Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	112420	Goat Farming	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	112511	Finfish Farming and Fish Hatcheries	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112512	Shellfish Farming	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112519	Other Aquaculture	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	112910	Apiculture	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112930	Fur-Bearing Animal and Rabbit Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	112990	All Other Animal Production	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	113110	Timber Tract Operations	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	113210	Forest Nurseries and Gathering of Forest Products	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	113310	Logging	Natural and Working Lands	BLS GGS, USEER, RMI
Agriculture, Forestry, Fishing	115111	Cotton Ginning	Natural and Working Lands	RMI
Agriculture, Forestry, Fishing	115112	Soil Preparation, Planting, and Cultivating	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	115113	Crop Harvesting, Primarily by Machine	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	115114	Postharvest Crop Activities (except Cotton Ginning)	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	115115	Farm Labor Contractors and Crew Leaders	Natural and Working Lands	RMI
Agriculture, Forestry, Fishing	115116	Farm Management Services	Natural and Working Lands	BLS GGS, RMI
Agriculture, Forestry, Fishing	115210	Support Activities for Animal Production	Natural and Working Lands	BLS GGS
Agriculture, Forestry, Fishing	115310	Support Activities for Forestry	Natural and Working Lands	BLS GGS, RMI
Mining and Extraction	212220	Gold Ore and Silver Ore Mining	Industrial	RMI
Mining and Extraction	212230	Copper, Nickel, Lead, and Zinc Mining	Industrial	RMI
Mining and Extraction	212290	Other Metal Ore Mining	Industrial	USEER, RMI

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Mining and Extraction	212311	Dimension Stone Mining and Quarrying	Industrial	RMI
Mining and Extraction	212312	Crushed and Broken Limestone Mining and Quarrying	Industrial	RMI
Mining and Extraction	212319	Other Crushed and Broken Stone Mining and Quarrying	Industrial	RMI
Mining and Extraction	212322	Industrial Sand Mining	Industrial	RMI
Mining and Extraction	212390	Other Nonmetallic Mineral Mining and Quarrying	Industrial	RMI
Mining and Extraction	213114	Support Activities for Metal Mining	Industrial	RMI
Mining and Extraction	213115	Support Activities for Nonmetallic Minerals (except Fuels) Mining	Industrial	RMI
Utilities	221111	Hydroelectric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221113	Nuclear Electric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221114	Solar Electric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221115	Wind Electric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221116	Geothermal Electric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221117	Biomass Electric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221118	Other Electric Power Generation	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Utilities	221121	Electric Bulk Power Transmission and Control	Electricity	USEER, RMI, Brookings, DEED EA
Utilities	221122	Electric Power Distribution	Electricity	USEER, Brookings, DEED EA
Utilities	221310	Water Supply and Irrigation Systems	Waste	BLS GGS, RMI, DEED EA
Utilities	221320	Sewage Treatment Facilities	Waste	BLS GGS, RMI, DEED EA
Utilities	221330	Steam and Air-Conditioning Supply	Buildings, Electricity	BLS GGS, USEER, Brookings, DEED EA
Construction	236115	New Single-Family Housing Construction (except For-Sale Builders)	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	236116	New Multifamily Housing Construction (except For-Sale Builders)	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	236117	New Housing For-Sale Builders	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Construction	236118	Residential Remodelers	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	236210	Industrial Building Construction	Buildings	BLS GGS, USEER, Brookings, DEED EA
Construction	236220	Commercial and Institutional Building Construction	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	237110	Water and Sewer Line and Related Structures Construction	Waste	BLS GGS, USEER, RMI, DEED EA
Construction	237130	Power and Communication Line and Related Structures Construction	Electricity	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	237210	Land Subdivision	Buildings	BLS GGS, USEER, Brookings
Construction	237310	Highway, Street, and Bridge Construction	Transportation	USEER
Construction	237990	Other Heavy and Civil Engineering Construction	Electricity	BLS GGS, USEER, Brookings
Construction	238110	Poured Concrete Foundation and Structure Contractors	Buildings	BLS GGS, USEER
Construction	238120	Structural Steel and Precast Concrete Contractors	Buildings	BLS GGS, USEER, RMI
Construction	238130	Framing Contractors	Buildings	BLS GGS, USEER
Construction	238140	Masonry Contractors	Buildings	BLS GGS, USEER
Construction	238150	Glass and Glazing Contractors	Buildings	BLS GGS, USEER
Construction	238160	Roofing Contractors	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	238170	Siding Contractors	Buildings	BLS GGS, USEER
Construction	238190	Other Foundation, Structure, and Building Exterior Contractors	Buildings	BLS GGS, USEER
Construction	238210	Electrical Contractors and Other Wiring Installation Contractors	Buildings	BLS GGS, USEER, RMI, DEED EA
Construction	238220	Plumbing, Heating, and Air-Conditioning Contractors	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Construction	238290	Other Building Equipment Contractors	Buildings	BLS GGS, USEER, RMI, DEED EA
Construction	238310	Drywall and Insulation Contractors	Buildings	BLS GGS, USEER
Construction	238320	Painting and Wall Covering Contractors	Buildings	BLS GGS, USEER
Construction	238330	Flooring Contractors	Buildings	BLS GGS, USEER
Construction	238340	Tile and Terrazzo Contractors	Buildings	BLS GGS, USEER
Construction	238350	Finish Carpentry Contractors	Buildings	BLS GGS, USEER, Brookings
Construction	238390	Other Building Finishing Contractors	Buildings	BLS GGS, USEER

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Construction	238910	Site Preparation Contractors	Buildings	BLS GGS, USEER, RMI
Construction	238990	All Other Specialty Trade Contractors	Buildings	BLS GGS, USEER, Brookings
Manufacturing	312112	Bottled Water Manufacturing	Industrial	RMI
Manufacturing	312140	Distilleries	Industrial	RMI
Manufacturing	313230	Nonwoven Fabric Mills	Industrial	RMI
Manufacturing	313320	Fabric Coating Mills	Industrial	RMI
Manufacturing	314110	Carpet and Rug Mills	Industrial	BLS GGS
Manufacturing	314120	Curtain and Linen Mills	Industrial	BLS GGS, RMI
Manufacturing	316990	Other Leather and Allied Product Manufacturing	Industrial	RMI
Manufacturing	321114	Wood Preservation	NWL	BLS GGS
Manufacturing	321211	Hardwood Veneer and Plywood Manufacturing	Buildings, Natural and Working Lands	BLS GGS
Manufacturing	321212	Softwood Veneer and Plywood Manufacturing	Buildings, Natural and Working Lands	BLS GGS
Manufacturing	321215	Engineered Wood Member Manufacturing	Buildings, Natural and Working Lands	BLS GGS
Manufacturing	321219	Reconstituted Wood Product Manufacturing	Buildings, Industrial, Natural and Working Lands	BLS GGS
Manufacturing	321911	Wood Window and Door Manufacturing	Buildings	DEED EA
Manufacturing	321991	Manufactured Home (Mobile Home) Manufacturing	Buildings	BLS GGS, RMI
Manufacturing	321992	Prefabricated Wood Building Manufacturing	Buildings	BLS GGS
Manufacturing	322110	Pulp Mills	Industrial	BLS GGS
Manufacturing	322120	Paper Mills	Industrial	BLS GGS
Manufacturing	322130	Paperboard Mills	Industrial	BLS GGS
Manufacturing	323111	Commercial Printing (except Screen and Books)	Industrial	RMI
Manufacturing	324121	Asphalt Paving Mixture and Block Manufacturing	Industrial	BLS GGS
Manufacturing	324122	Asphalt Shingle and Coating Materials Manufacturing	Industrial	BLS GGS
Manufacturing	325110	Petrochemical Manufacturing	Industrial	USEER, RMI
Manufacturing	325120	Industrial Gas Manufacturing	Industrial	USEER, RMI
Manufacturing	325130	Synthetic Dye and Pigment Manufacturing	Industrial	RMI
Manufacturing	325180	Other Basic Inorganic Chemical Manufacturing	Industrial	RMI, DEED EA
Manufacturing	325193	Ethyl Alcohol Manufacturing	Industrial	BLS GGS, USEER, RMI, DEED EA

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	325194	Cyclic Crude, Intermediate, and Gum and Wood Chemical Manufacturing	Industrial	RMI
Manufacturing	325199	All Other Basic Organic Chemical Manufacturing	Industrial	BLS GGS, USEER, RMI, DEED EA
Manufacturing	325211	Plastics Material and Resin Manufacturing	Industrial	RMI
Manufacturing	325212	Synthetic Rubber Manufacturing	Industrial	RMI
Manufacturing	325220	Artificial and Synthetic Fibers and Filaments Manufacturing	Industrial	RMI
Manufacturing	325311	Nitrogenous Fertilizer Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	325312	Phosphatic Fertilizer Manufacturing	Industrial	RMI
Manufacturing	325314	Fertilizer (Mixing Only) Manufacturing	Industrial	RMI
Manufacturing	325414	Biological Product (except Diagnostic) Manufacturing	Industrial	RMI
Manufacturing	325510	Paint and Coating Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	325520	Adhesive Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	325612	Polish and Other Sanitation Good Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	325991	Custom Compounding of Purchased Resins	Industrial	BLS GGS
Manufacturing	325998	All Other Miscellaneous Chemical Product and Preparation Manufacturing	Industrial	BLS GGS
Manufacturing	326111	Plastics Bag and Pouch Manufacturing	Industrial	RMI
Manufacturing	326113	Unlaminated Plastics Film and Sheet (except Packaging) Manufacturing	Industrial	RMI
Manufacturing	326140	Polystyrene Foam Product Manufacturing	Buildings, Industrial	USEER
Manufacturing	326160	Plastics Bottle Manufacturing	Industrial	RMI
Manufacturing	326199	All Other Plastics Product Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	326220	Rubber and Plastics Hoses and Belting Manufacturing	Industrial	RMI
Manufacturing	326291	Rubber Product Manufacturing for Mechanical Use	Industrial	RMI
Manufacturing	326299	All Other Rubber Product Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327110	Pottery, Ceramics, and Plumbing Fixture Manufacturing	Buildings, Industrial	BLS GGS, RMI
Manufacturing	327120	Clay Building Material and Refractories Manufacturing	Buildings, Industrial	BLS GGS
Manufacturing	327211	Flat Glass Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327215	Glass Product Manufacturing Made of Purchased Glass	Industrial	RMI
Manufacturing	327310	Cement Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327320	Ready-Mix Concrete Manufacturing	Industrial	BLS GGS, RMI

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	327331	Concrete Block and Brick Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327332	Concrete Pipe Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327390	Other Concrete Product Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327410	Lime Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	327420	Gypsum Product Manufacturing	Buildings	BLS GGS
Manufacturing	327991	Cut Stone and Stone Product Manufacturing	Industrial	RMI
Manufacturing	327993	Mineral Wool Manufacturing	Industrial	BLS GGS, USEER, RMI
Manufacturing	327999	All Other Miscellaneous Nonmetallic Mineral Product Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	331110	Iron and Steel Mills and Ferroalloy Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	331210	Iron and Steel Pipe and Tube Manufacturing from Purchased Steel	Industrial	RMI
Manufacturing	331222	Steel Wire Drawing	Industrial	RMI
Manufacturing	331313	Alumina Refining and Primary Aluminum Production	Industrial	RMI
Manufacturing	331314	Secondary Smelting and Alloying of Aluminum	Industrial	BLS GGS, RMI
Manufacturing	331315	Aluminum Sheet, Plate, and Foil Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	331318	Other Aluminum Rolling, Drawing, and Extruding	Industrial	BLS GGS, RMI
Manufacturing	331410	Nonferrous Metal (except Aluminum) Smelting and Refining	Industrial	RMI
Manufacturing	331420	Copper Rolling, Drawing, Extruding, and Alloying	Industrial	BLS GGS, RMI
Manufacturing	331491	Nonferrous Metal (except Copper and Aluminum) Rolling, Drawing, and Extruding	Industrial	RMI
Manufacturing	331492	Secondary Smelting, Refining, and Alloying of Nonferrous Metal (except Copper and Aluminum)	Industrial	BLS GGS, RMI
Manufacturing	331511	Iron Foundries	Industrial	RMI
Manufacturing	331512	Steel Investment Foundries	Industrial	BLS GGS, RMI
Manufacturing	331513	Steel Foundries (except Investment)	Industrial	BLS GGS, RMI
Manufacturing	331523	Nonferrous Metal Die-Casting Foundries	Industrial	BLS GGS, RMI
Manufacturing	331524	Aluminum Foundries (except Die-Casting)	Industrial	BLS GGS, RMI
Manufacturing	331529	Other Nonferrous Metal Foundries (except Die-Casting)	Industrial	BLS GGS, RMI
Manufacturing	332111	Iron and Steel Forging	Industrial	BLS GGS, RMI
Manufacturing	332112	Nonferrous Forging	Industrial	BLS GGS, RMI

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	332114	Custom Roll Forming	Industrial	RMI
Manufacturing	332117	Powder Metallurgy Part Manufacturing	Industrial	RMI
Manufacturing	332216	Saw Blade and Handtool Manufacturing	Industrial	RMI
Manufacturing	332312	Fabricated Structural Metal Manufacturing	Buildings, Industrial	BLS GGS, USEER, RMI
Manufacturing	332313	Plate Work Manufacturing	Buildings, Industrial	RMI
Manufacturing	332321	Metal Window and Door Manufacturing	Buildings, Industrial	BLS GGS, USEER, Brookings, DEED EA
Manufacturing	332322	Sheet Metal Work Manufacturing	Buildings, Industrial	USEER, Brookings
Manufacturing	332323	Ornamental and Architectural Metal Work Manufacturing	Buildings, Industrial	RMI
Manufacturing	332410	Power Boiler and Heat Exchanger Manufacturing	Buildings, Electricity, Industrial	USEER, RMI, Brookings, DEED EA
Manufacturing	332420	Metal Tank (Heavy Gauge) Manufacturing	Industrial	USEER, RMI
Manufacturing	332431	Metal Can Manufacturing	Industrial	RMI
Manufacturing	332439	Other Metal Container Manufacturing	Industrial	RMI
Manufacturing	332510	Hardware Manufacturing	Industrial	RMI
Manufacturing	332722	Bolt, Nut, Screw, Rivet, and Washer Manufacturing	Industrial	RMI
Manufacturing	332911	Industrial Valve Manufacturing	Industrial	BLS GGS, RMI, DEED EA
Manufacturing	332912	Fluid Power Valve and Hose Fitting Manufacturing	Industrial	RMI
Manufacturing	332913	Plumbing Fixture Fitting and Trim Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	332919	Other Metal Valve and Pipe Fitting Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	332991	Ball and Roller Bearing Manufacturing	Industrial	USEER, RMI
Manufacturing	332996	Fabricated Pipe and Pipe Fitting Manufacturing	Industrial	BLS GGS
Manufacturing	332999	All Other Miscellaneous Fabricated Metal Product Manufacturing	Industrial	RMI
Manufacturing	333111	Farm Machinery and Equipment Manufacturing	Industrial, Natural and Working Lands	RMI
Manufacturing	333112	Lawn and Garden Tractor and Home Lawn and Garden Equipment Manufacturing	Industrial, Natural and Working Lands	BLS GGS, RMI
Manufacturing	333120	Construction Machinery Manufacturing	Buildings, Industrial	RMI
Manufacturing	333131	Mining Machinery and Equipment Manufacturing	Industrial	RMI
Manufacturing	333241	Food Product Machinery Manufacturing	Industrial	RMI
Manufacturing	333242	Semiconductor Machinery Manufacturing	Electricity, Industrial	DEED EA

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	333243	Sawmill, Woodworking, and Paper Machinery Manufacturing	Industrial	RMI
Manufacturing	333248	All Other Industrial Machinery Manufacturing	Industrial	RMI
Manufacturing	333310	Commercial and Service Industry Machinery Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	333413	Industrial and Commercial Fan and Blower and Air Purification Equipment Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	333414	Heating Equipment (except Warm Air Furnaces) Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	333415	Air-Conditioning and Warm Air Heating Equipment and Commercial and Industrial Refrigeration Equipment Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	333517	Machine Tool Manufacturing	Industrial	RMI
Manufacturing	333519	Rolling Mill and Other Metalworking Machinery Manufacturing	Industrial	RMI
Manufacturing	333611	Turbine and Turbine Generator Set Units Manufacturing	Electricity, Industrial	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	333612	Speed Changer, Industrial High-Speed Drive, and Gear Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	333613	Mechanical Power Transmission Equipment Manufacturing	Industrial	BLS GGS, USEER, RMI
Manufacturing	333618	Other Engine Equipment Manufacturing	Industrial, Waste	USEER, RMI
Manufacturing	333912	Air and Gas Compressor Manufacturing	Industrial	RMI
Manufacturing	333914	Measuring, Dispensing, and Other Pumping Equipment Manufacturing	Industrial	USEER, DEED EA
Manufacturing	333922	Conveyor and Conveying Equipment Manufacturing	Industrial	RMI
Manufacturing	333924	Industrial Truck, Tractor, Trailer, and Stacker Machinery Manufacturing	Industrial	RMI
Manufacturing	333991	Power-Driven Handtool Manufacturing	Industrial	RMI
Manufacturing	333993	Packaging Machinery Manufacturing	Industrial	RMI
Manufacturing	333994	Industrial Process Furnace and Oven Manufacturing	Industrial	RMI, DEED EA
Manufacturing	333995	Fluid Power Cylinder and Actuator Manufacturing	Industrial	RMI
Manufacturing	333996	Fluid Power Pump and Motor Manufacturing	Industrial	RMI, DEED EA
Manufacturing	334413	Semiconductor and Related Device Manufacturing	Industrial	BLS GGS, USEER, DEED EA

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	334416	Capacitor, Resistor, Coil, Transformer, and Other Inductor Manufacturing	Electricity, Industrial	RMI
Manufacturing	334417	Electronic Connector Manufacturing	Electricity, Industrial	RMI
Manufacturing	334418	Printed Circuit Assembly (Electronic Assembly) Manufacturing	Industrial	USEER, RMI
Manufacturing	334419	Other Electronic Component Manufacturing	Industrial	RMI
Manufacturing	334510	Electromedical and Electrotherapeutic Apparatus Manufacturing	Industrial	RMI
Manufacturing	334511	Search, Detection, Navigation, Guidance, Aeronautical, and Nautical System and Instrument Manufacturing	Industrial	RMI
Manufacturing	334512	Automatic Environmental Control Manufacturing for Residential, Commercial, and Appliance Use	Industrial	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	334513	Instruments and Related Products Manufacturing for Measuring, Displaying, and Controlling Industrial Process Variables	Industrial	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	334514	Totalizing Fluid Meter and Counting Device Manufacturing	Industrial	BLS GGS, USEER, RMI, DEED EA
Manufacturing	334515	Instrument Manufacturing for Measuring and Testing Electricity and Electrical Signals	Industrial	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	334516	Analytical Laboratory Instrument Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	334519	Other Measuring and Controlling Device Manufacturing	Industrial	BLS GGS, RMI
Manufacturing	334610	Manufacturing and Reproducing Magnetic and Optical Media	Industrial	RMI
Manufacturing	335131	Residential Electric Lighting Fixture Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	335132	Commercial, Industrial, and Institutional Electric Lighting Fixture Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	335139	Electric Lamp Bulb and Other Lighting Equipment Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	335210	Small Electrical Appliance Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings
Manufacturing	335220	Major Household Appliance Manufacturing	Buildings	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	335311	Power, Distribution, and Specialty Transformer Manufacturing	Electricity, Industrial	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	335312	Motor and Generator Manufacturing	Electricity, Industrial	BLS GGS, USEER, RMI, DEED EA

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	335313	Switchgear and Switchboard Apparatus Manufacturing	Electricity, Industrial	RMI, DEED EA
Manufacturing	335314	Relay and Industrial Control Manufacturing	Electricity, Industrial	RMI, DEED EA
Manufacturing	335910	Battery Manufacturing	Electricity, Industrial, Transportation	BLS GGS, USEER, RMI, Brookings, DEED EA
Manufacturing	335929	Other Communication and Energy Wire Manufacturing	Electricity, Industrial	RMI
Manufacturing	335931	Current-Carrying Wiring Device Manufacturing	Electricity, Industrial	USEER, RMI, Brookings
Manufacturing	335991	Carbon and Graphite Product Manufacturing	Electricity, Industrial	RMI
Manufacturing	335999	All Other Miscellaneous Electrical Equipment and Component Manufacturing	Electricity, Industrial	BLS GGS, USEER, RMI, Brookings
Manufacturing	336110	Automobile and Light Duty Motor Vehicle Manufacturing	Transportation	BLS GGS, USEER, RMI
Manufacturing	336120	Heavy Duty Truck Manufacturing	Transportation	USEER, RMI
Manufacturing	336211	Motor Vehicle Body Manufacturing	Transportation	USEER, RMI
Manufacturing	336212	Truck Trailer Manufacturing	Transportation	USEER, RMI
Manufacturing	336213	Motor Home Manufacturing	Transportation	USEER, RMI
Manufacturing	336310	Motor Vehicle Gasoline Engine and Engine Parts Manufacturing	Transportation	BLS GGS, USEER, RMI
Manufacturing	336320	Motor Vehicle Electrical and Electronic Equipment Manufacturing	Transportation	BLS GGS, USEER, RMI, DEED EA
Manufacturing	336330	Motor Vehicle Steering and Suspension Components (except Spring) Manufacturing	Transportation	USEER, RMI
Manufacturing	336340	Motor Vehicle Brake System Manufacturing	Transportation	BLS GGS, USEER, RMI
Manufacturing	336350	Motor Vehicle Transmission and Power Train Parts Manufacturing	Transportation	BLS GGS, USEER, RMI
Manufacturing	336360	Motor Vehicle Seating and Interior Trim Manufacturing	Transportation	USEER, RMI
Manufacturing	336370	Motor Vehicle Metal Stamping	Transportation	USEER, RMI
Manufacturing	336390	Other Motor Vehicle Parts Manufacturing	Transportation	BLS GGS, USEER, RMI
Manufacturing	336411	Aircraft Manufacturing	Transportation	RMI
Manufacturing	336412	Aircraft Engine and Engine Parts Manufacturing	Transportation	RMI
Manufacturing	336413	Other Aircraft Parts and Auxiliary Equipment Manufacturing	Transportation	RMI
Manufacturing	336415	Guided Missile and Space Vehicle Propulsion Unit and Propulsion Unit Parts Manufacturing	Transportation	RMI

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Manufacturing	336510	Railroad Rolling Stock Manufacturing	Transportation	BLS GGS, USEER, RMI
Manufacturing	336611	Ship Building and Repairing	Transportation	BLS GGS, RMI
Manufacturing	336612	Boat Building	Transportation	RMI
Manufacturing	336991	Motorcycle, Bicycle, and Parts Manufacturing	Transportation	RMI
Manufacturing	336999	All Other Transportation Equipment Manufacturing	Transportation	RMI
Manufacturing	339991	Gasket, Packing, and Sealing Device Manufacturing	Industrial	RMI
Manufacturing	339992	Musical Instrument Manufacturing	Industrial	RMI
Manufacturing	339994	Broom, Brush, and Mop Manufacturing	Industrial	RMI
Manufacturing	339995	Burial Casket Manufacturing	Industrial	RMI
Manufacturing	339999	All Other Miscellaneous Manufacturing	Industrial	RMI
Wholesale and Retail Trade	423930	Recyclable Material Merchant Wholesalers	Waste	BLS GGS, DEED EA
Wholesale and Retail Trade	459510	Used Merchandise Retailers	Waste	BLS GGS
Transport and Warehousing	483114	Coastal and Great Lakes Passenger Transportation	Transportation	BLS GGS
Transport and Warehousing	483212	Inland Water Passenger Transportation	Transportation	BLS GGS
Transport and Warehousing	485111	Mixed Mode Transit Systems	Transportation	BLS GGS
Transport and Warehousing	485112	Commuter Rail Systems	Transportation	BLS GGS
Transport and Warehousing	485113	Bus and Other Motor Vehicle Transit Systems	Transportation	BLS GGS
Transport and Warehousing	485119	Other Urban Transit Systems	Transportation	BLS GGS
Transport and Warehousing	485210	Interurban and Rural Bus Transportation	Transportation	BLS GGS
Transport and Warehousing	485410	School and Employee Bus Transportation	Transportation	BLS GGS
Transport and Warehousing	485510	Charter Bus Industry	Transportation	BLS GGS
Transport and Warehousing	485999	All Other Transit and Ground Passenger Transportation	Transportation	BLS GGS
Transport and Warehousing	486990	All Other Pipeline Transportation	Waste	RMI
Transport and Warehousing	487110	Scenic and Sightseeing Transportation, Land	Waste	RMI
Professional Services	541310	Architectural Services	Buildings	BLS GGS, USEER, Brookings, DEED EA
Professional Services	541320	Landscape Architectural Services	Buildings	BLS GGS, USEER, Brookings, DEED EA
Professional Services	541350	Building Inspection Services	Buildings	BLS GGS, USEER, Brookings
Admin and Waste Services	562111	Solid Waste Collection	Waste	BLS GGS, RMI, Brookings
Admin and Waste Services	562112	Hazardous Waste Collection	Waste	BLS GGS, RMI, Brookings
Admin and Waste Services	562119	Other Waste Collection	Waste	BLS GGS, RMI, Brookings
Admin and Waste Services	562211	Hazardous Waste Treatment and Disposal	Waste	BLS GGS, RMI, Brookings

Industry sector	NAICS	Title	Climate sectors	Identified in other analyses
Admin and Waste Services	562212	Solid Waste Landfill	Waste	BLS GGS, RMI, Brookings
Admin and Waste Services	562213	Solid Waste Combustors and Incinerators	Waste	BLS GGS, USEER, RMI, Brookings
Admin and Waste Services	562219	Other Nonhazardous Waste Treatment and Disposal	Waste	BLS GGS, RMI, Brookings
Admin and Waste Services	562910	Remediation Services	Waste	BLS GGS, RMI, Brookings, DEED EA
Admin and Waste Services	562920	Materials Recovery Facilities	Waste	BLS GGS, RMI, Brookings, DEED EA
Admin and Waste Services	562991	Septic Tank and Related Services	Waste	BLS GGS, RMI
Admin and Waste Services	562998	All Other Miscellaneous Waste Management Services	Waste	BLS GGS, RMI, Brookings
Arts and Recreation	712130	Zoos and Botanical Gardens	Natural and Working Lands	BLS GGS
Arts and Recreation	712190	Nature Parks and Other Similar Institutions	Natural and Working Lands	BLS GGS
Other Services	811111	General Automotive Repair	Transportation	USEER
Other Services	811114	Specialized Automotive Repair	Transportation	USEER
Other Services	811210	Electronic and Precision Equipment Repair and Maintenance	Waste	BLS GGS, USEER
Other Services	811310	Commercial and Industrial Machinery and Equipment (except Automotive and Electronic) Repair and Maintenance	Waste	BLS GGS
Other Services	811411	Home and Garden Equipment Repair and Maintenance	Waste	
Other Services	811412	Appliance Repair and Maintenance	Waste	BLS GGS
Other Services	811420	Reupholstery and Furniture Repair	Waste	
Other Services	811430	Footwear and Leather Goods Repair	Waste	
Other Services	811490	Other Personal and Household Goods Repair and Maintenance	Waste	
Other Services	813312	Environment, Conservation and Wildlife Organizations	Natural and Working Lands	BLS GGS, USEER, Brookings
Public Admin	924110	Administration of Air and Water Resource and Solid Waste Management Programs	Waste	BLS GGS, Brookings
Public Admin	924120	Administration of Conservation Programs	Natural and Working Lands	BLS GGS, Brookings
Public Admin	925120	Administration of Urban Planning and Community and Rural Development	Buildings	Brookings
Public Admin	926120	Regulation and Administration of Transportation Programs	Transportation	BLS GGS, Brookings
Public Admin	926130	Regulation and Administration of Communications, Electric, Gas, and Other Utilities	Electricity	BLS GGS, Brookings