Reclaiming Our Future:

A Climate Jobs Agenda for the International Association of Machinists and Aerospace Workers

IAM UNION

CJI

Contents

About Us

The International Association of Machinists and Aerospace Workers (IAM) is one of North America's largest and most diverse industrial trade unions, representing approximately 600,000 active and retired members in the aerospace, defense, airlines, railroad, transit, healthcare, automotive, and other industries.

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The Climate Jobs Institute (CJI) at Cornell University's ILR School is guiding New York's and the nation's transition to a strong, equitable, and resilient clean energy economy by tackling the climate crisis; creating high-quality union jobs; confronting race and gender inequality; and building a diverse, inclusive workforce.

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Disclaimer:

The opinions, analysis, findings, and/or data interpretation contained herein are the authors' responsibility, and we take full responsibility for any errors or shortcomings.

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Executive Summary

IAM members are on the frontlines of the climate crisis. As global temperatures continue to rise due to human activity, workers must contend with deteriorating conditions on the jobsite and in their communities. In the last three years alone, dozens of IAM members have already seen their homes damaged or destroyed by climate related weather events. Extreme heat and other threats make it more and more difficult for IAM members to carry out their work safely.

We are also entering a time of major change in the economy at large. Many of the IAM's core industries–from aerospace and manufacturing, to healthcare and the federal government–are large energy consumers. As major employers look to implement new technologies and reduce emissions, IAM members are understandably wondering: What does this mean for me? How will my industry be affected?

Fortunately, the IAM has been proactive in addressing the climate crisis. IAM delegates passed climate resolutions at the union's 2016 and 2022 conventions, calling on the union to take leadership in making industry more sustainable, creating high-quality union jobs, and expanding opportunities for members to gain the skills needed to thrive in a climate-safe economy. This report is a result of those efforts.

Combating climate change is a massive undertaking, but the IAM is poised to push for solutions that protect our planet while building union power. In order to prepare for the clean energy economy of the future, the IAM must understand the threats climate change poses to members and prepare for how it will affect core industries and geographies. The IAM must also have a plan to advocate for climate action that creates good, union jobs while preserving a bright future for the next generation.

THREATS OF CLIMATE CHANGE

Climate change is the rapid warming of the Earth's atmosphere and oceans that is changing weather patterns. Climate change is primarily driven by our use of fossil fuels to power homes, businesses, and transportation systems. Fossil fuels emit gasses, like carbon dioxide (CO2), that trap heat in the atmosphere and warm the planet. Since the pre-industrial era, human activities have increased atmospheric CO2 levels to concentrations not seen in over 2 million years.

Climate change increases health risks for workers across industries, especially those working outdoors or in unairconditioned facilities. Record temperatures and more frequent heat waves can lead to heat stress, heat exhaustion, and heatstroke. Extreme weather events such as hurricanes, floods, or wildfires, damage infrastructure, lead to operational delays, increase maintenance costs, and can cause stress, injury, or even death. Deteriorating air quality exacerbates respiratory diseases, affecting workers' health and productivity. Climate change threatens entire industries, which could cause unemployment and migration, disrupt labor markets, and reduce economic output. Working-class communities, people of color, and older workers, are disproportionately vulnerable to the health impacts of climate change.

Climate threats also impact industry. For example, in the aviation sector, record heat affects aircraft performance, reducing plane carrying capacity and even grounding flights. Similarly, the rail industry faces risks from temperature-related delays that could cost the U.S. rail network up to $60 billion by 2100. Railroads could be a cleaner and more efficient method of transporting goods and people. However, deteriorating safety standards and working conditions in the industry, caused by practices such as "precision scheduled railroading" (PSR), are obstacles to building a 21st-century rail network.

CLIMATE ACTION: OPPORTUNITIES FOR THE IAM

To tackle the climate crisis, we need to cut CO2 emissions drastically by 2030. By 2050, we must achieve "net-zero" emissions, which means that any remaining CO2 emissions are balanced out by removing an equivalent amount from the atmosphere. If we can meet these targets, we could limit global temperature rise to a level that can prevent the worst effects of climate change. Meeting our targets will require changing our energy, transportation, buildings, infrastructure, and industrial systems on an unprecedented scale. Emissions reduction will come from adopting renewable energy, enhancing energy efficiency, promoting low-emission transportation,

developing resilient infrastructure, and introducing cleaner industrial processes. The adaptive measures listed below also have significant job creation potential.

- In the **energy sector**, shifting away from fossil fuels towards renewable energy, enhancing efficiency, and decarbonizing buildings and personal vehicles–is key. IAM members in manufacturing can make many of the machines needed to expand clean energy, while others in utilities can apply their skills to build, install, operate and maintain renewable energy systems.
- In **transportation**, developing sustainable aviation fuels, expanding electric and low carbon vehicles, massively expanding rail transportation, and decarbonizing rail and aerospace manufacturing are priorities. These new technologies create opportunities for IAM members in these industries to manufacture and maintain cleaner technologies.
- In the **industrial sector**, critical steps include improving energy efficiency through retrofits, introducing more sustainable business practices, increasing the use of renewable energy and low-carbon fuels, and deploying carbon capture, use, and storage technologies where appropriate.
- For the **buildings sector**, reducing emissions requires deep energy retrofits, decarbonization of heating/cooling, on-site renewable energy installations, and reducing carbon in construction materials. The healthcare sector, with its large, energy-intensive infrastructure, can lead by example on decarbonization.
- **Government facilities** like military bases must increase energy efficiency, deploy renewables and energy storage, decarbonize operations and vehicle fleets, and enhance resilience planning. The IAM's federal workers can support sustainable practices at military bases and other sites.

Our current moment provides new opportunities for climate action, with major investments and commitments at the federal, state, and local levels that include strong labor and equity standards. The Inflation Reduction Act (IRA) is set to boost key industries, including renewable energy, electric vehicles (EVs), clean hydrogen, and advanced manufacturing. These industries are expected to create millions of jobs with strong labor standards. Investments in clean energy infrastructure alone could create up to 1.5 million jobs by the end of the decade, with the most generous subsidies going to projects that pay prevailing wages and use registered apprentices on the jobsite. The IRA has already stimulated new investments, with 123 new manufacturing facilities announced, representing over $35 billion in capital investment and supporting nearly 42,000 new manufacturing jobs.

Complementing the IRA, the 2021 Bipartisan Infrastructure Law invests $550 billion into new projects to improve and modernize the nation's infrastructure. This includes $102 billion for rail upgrades, $65 billion for clean energy transmission and grid improvements, $7.5 billion for building a network of EV chargers, and significant funds for public transit. These investments

are expected to create many jobs in construction, engineering, and manufacturing, and they passed with strong union support.

THE IAM'S CLIMATE JOBS AGENDA

Climate change is real and one of the greatest crises of our time. It will present both great challenges and opportunities for the IAM. Through leadership on climate issues, the IAM can ensure members are protected and supported, and that climate actions and investments prioritize IAM industries and members. The IAM's Climate Jobs Agenda has four key pillars:

Climate change is real

Growing IAM Membership in Clean Energy Industries

Through workplace organizing, legislative advocacy, and other means, the IAM can protect and grow its membership by leading the expansion of climate safe clean energy sectors. Engaging stakeholders like businesses, trade groups, governments, consumer groups, and community organizations will position the IAM as a critical partner in securing public support and funding for new projects. Specifically, the IAM should aim to:

- Grow the Zero Carbon Energy Sector and Organize the Manufacturing Supply Chain
- Establish Large-Scale Sustainable Aviation Fuel (SAF) Production
- Build a 21st Century High-Speed Rail Network in the U.S. and Canada
- Grow and Organize the Offshore Wind Industry
- Grow and Organize the Clean Vehicle Market
- Use Department of Defense Climate Readiness Projects to Expand Service Contract Act and Civilian Military Organizing
- Advocate for Carbon Neutral Federal Buildings

Ensuring Climate Jobs are High-Quality, Union Careers

The IAM's advocacy for strong labor and equity standards attached to public and private investment into all climate and clean energy work can aid organizing efforts and help ensure new jobs are high-quality, union careers that expand pathways into the middle class. There are many ways the IAM can ensure climate jobs are high-quality union careers:

- Advocate for Labor Standards in the Clean Energy Economy
- Develop Community-Labor Partnerships in Support of Labor Standards
- Champion Labor Law Reform
- Pass the Tim Hart Wildland Firefighter Classification and Pay Parity Act
- Support and Engage with the American Climate Corps

- Pass Local and National Legislation to Create Climate Jobs

A Climate Resilient IAM

Strengthening IAM programs to be resilient to the impacts of climate change can prepare the union for new growth opportunities, protect members from job disruptions, and model labor leadership on decarbonization. The union can work to:

- Expand Manufacturing, and Operations and Maintenance (O&M) Training and Apprenticeship Programs
- Develop Climate Training Programs at the William W. Winpisinger Center
- Invest Further in the IAM Disaster Relief Fund
- Decarbonize the IAM's Physical Infrastructure
- Lead on Winning and Enforcing the OSHA Heat Standard Rule
- Deepen Relationships and Share Information with International Counterparts
- Prioritize Equity, Diversity and Climate Justice in the Energy Transition
- Protect IAM Members in Threatened Industries

Strengthening the IAM at the Bargaining Table and on the Shop Floor

The IAM's ultimate strength is on the shop floor. An effective climate jobs agenda must engage members in every shop, build power at the workplace, and secure stronger collective bargaining agreements. To do this, the union can:

- Outline Climate-Conscious Bargaining Agendas
- Establish Member-led Climate Committees
- Develop Labor-Management Partnerships To Prepare for the Clean Energy Economy
- Make Healthcare Safe Staffing a Pillar for Resilient Healthcare Systems and Resilient Communities

Introduction

Wildfires in Canada and the American West. Hurricanes in the Gulf. Torrential downpours in the Northeast and unprecedented heat waves in the Midwest. Climate change is no longer a distant threat to be dealt with at a later time. It is a crisis that has disrupted nearly every aspect of our lives, and it will only get worse in the years to come.

We also face a crisis of runaway inequality. **Over the past several decades, society's richest continued to amass great power and wealth as the vast majority of people struggled to get by.** This is due in no small part to the decline of organized labor, fueled by unfriendly politicians and an emboldened corporate class eager to bust union organizing drives. Like virtually all social issues in America, the negative impacts of climate change and increasing inequality fall disproportionately on working people and people of color.

We face a crisis of runaway inequality

The above realities are not inevitable, and they cannot be solved in isolation. Union workers can push back on these trends, organize, and create a more equal, sustainable economy. The International Association of Machinists and Aerospace Workers (IAM) has a critical role to play in this fight.

The IAM represents workers in a wide range of industries, from aerospace manufacturing and air transportation to healthcare and the federal government. Each of these industries has contributed to the climate crisis through carbon emissions, and climate policy will impact all of them. IAM members have also been negatively affected by climate change on jobsites and

in their communities. Heat waves, extreme weather events, and rising sea levels have affected workers in every corner of the United States and Canada. Addressing climate change is essential for protecting these workers and their livelihoods.

While climate action is a necessity, it will also be disruptive to IAM-represented industries. For example, aerospace manufacturing and air transportation are major contributors to climate change. They consume significant amounts of energy and natural resources, and aircraft emissions have a substantial warming effect on the climate.[1] To reduce these impacts, the aviation industry will need to embrace new, more environmentally friendly technologies and alternative fuels.[2]

Factories and manufacturing plants have been the economic backbone of working-class communities, but they are also big contributors to climate change. Many industrial processes, like making chemicals, metals, and other products, release large amounts of CO2 and other greenhouse gasses into the atmosphere. Industries such as steel, aluminum, chemicals, and paper are some of the biggest users of fossil fuels and emitters of harmful gasses that warm our planet.[3] The IAM represents members in many of these heavily-polluting manufacturing facilities. Union-led climate action can honor the legacy of North American manufacturing while transforming it to protect people from the climate crisis.

IAM members are also involved in industries such as health care, forest products and printing, food and beverage manufacturing, and government services. These sectors contribute to climate change through various direct and indirect means, including energy use, emissions from transportation, and resource consumption.[4]

The prospect of change across the economy can be scary, but unions can protect members by staying informed on emerging technologies, engaging with policymakers to create high-quality union jobs in new sectors, and ensuring impacted workers have equitable transition opportunities.

Over the last several years, the IAM has been proactive in addressing the climate crisis. In 2016, the union passed a resolution plainly stating that addressing the destructive nature of climate change is a top priority for the union going forward. It resolved that the IAM will fight to create and secure good union jobs in renewable energy and other industries across North America.[5] The union also committed to support training programs to prepare members for sustainable jobs, and to partner with environmental groups, communities, businesses, and others to battle climate change and build a renewable energy economy that benefits all workers.

A 2022 resolution went even further, calling on the IAM to examine how climate change will impact members' jobs and industries. It directed IAM leaders to work with experts, survey members, and develop a full report on plans and approaches for dealing with affected jobs and helping workers transition into new clean energy jobs.[6] This report is a result of the 2022 resolution.

This report is split into three parts, each of which is meant to carry out the charges outlined in the 2016 and 2022 IAM resolutions.

- **The Climate Crisis & Climate Action for Working People:** First, the report outlines the basic causes of climate change, with a focus on its impacts on IAM members and working-class communities. Next, it outlines how the transition toward a clean energy future will create new opportunities for workers and the labor movement.
- **The Climate Crisis & the IAM:** Next, the report details the many ways climate change affects the IAM's core industries and geographies. Here, we examine how IAM members and other workers have experienced climate change on the job and in their communities, and what is likely to happen if the crisis goes unchecked. This section also explains the challenges and opportunities that climate action will create for IAM members and their families.
- **A Climate Jobs Agenda for the IAM:** Finally, the report presents a robust "Climate Jobs Agenda" for the IAM. This section presents a vision for the IAM at every level of the union. The IAM will lead pro-worker, pro-union climate action by growing membership in climate and clean energy industries; it will ensure that new clean energy jobs are high-quality, union careers; it will help North America become resilient to climate impacts; and it will strengthen IAM power at the bargaining table and on the shop floor.

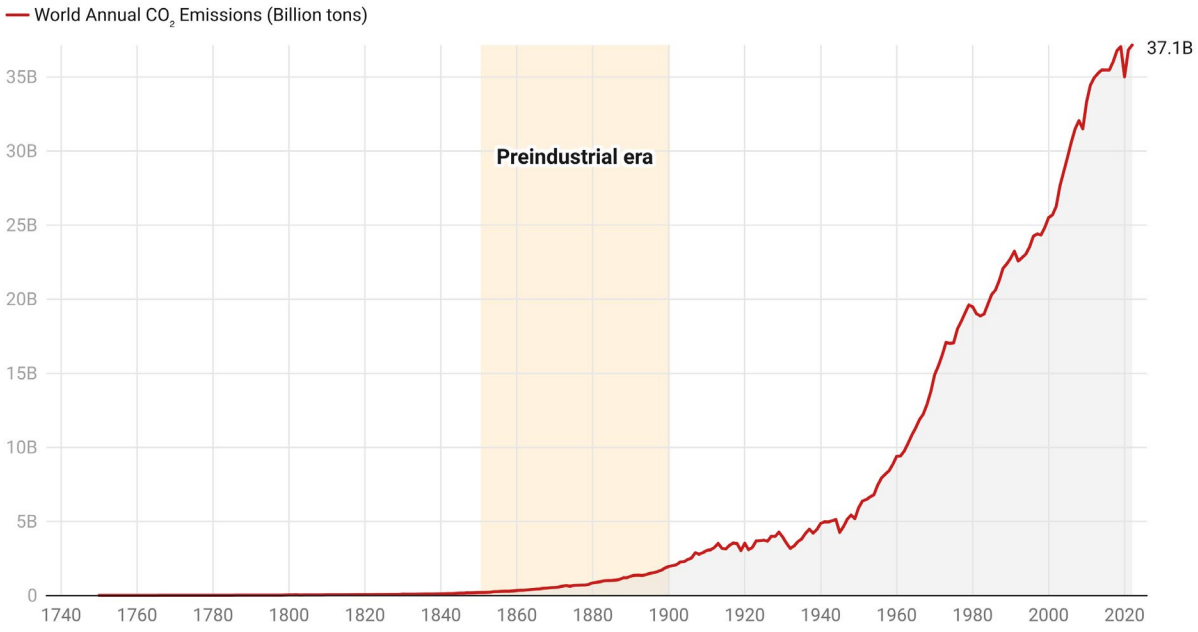
Like the 2016 and 2022 resolutions, this report is not an ending point. Rather, it lays out a vision for how the IAM can engage in climate work. A *truly* just transition to a clean energy economy will require more than just words. It demands proper recognition of the devastating effects climate change poses to working people, their families, and their communities. It also demands a big, bold, and powerful movement–anchored in organized labor and unions like the IAM–to tackle the climate crisis at the scale science demands, build power for working people and frontline communities, and create an economy that works for all, not just those at the top.

The Climate Crisis & Climate Action for Working People

Climate change refers to the rapid warming of the Earth's atmosphere and oceans, and the accompanying shifts in weather patterns, which are primarily driven by human activities–specifically our use of fossil fuels to power our homes, businesses, and transportation systems. Burning fossil fuels like natural gas, coal, and oil releases greenhouse gasses into the atmosphere. Due to its abundance, carbon dioxide (CO2) is the most dangerous greenhouse gas, but methane (CH4), nitrous oxide (N2O),[7] and other gasses also pose serious threats. When released, these gasses trap heat in the atmosphere and cause the planet to warm. Since the pre-industrial era, human activities have significantly increased atmospheric CO2 levels, reaching concentrations not seen in at least 2 million years.[8]

Annual CO_2 Emissions

Annual global CO_2 emissions from fossil fuels and industry, 1740-2020. X-axis shows years; y-axis displays emissions in a billion tons of CO_2. The graph highlights the preindustrial era, showing minimal emissions until 1850, followed by steady growth and rapid acceleration post-1950, reaching 37.1 billion tons annually by 2020.



Carbon dioxide (CO_2) emissions from fossil fuels and industry. Land-use change is not included.

Chart: Alejandra Rodriguez Climate Jobs Institute • Source: Our World in Data • Created with Datawrapper

The global average temperature has increased by approximately 1.0°C (1.8°F) above pre-industrial levels due to human activities.[9] To understand the impact of that temperature rise, think about a fever.[10] If your body temperature increases by even a single degree, you start to feel feverish and uncomfortable. A five degree rise could send you to the hospital. Without

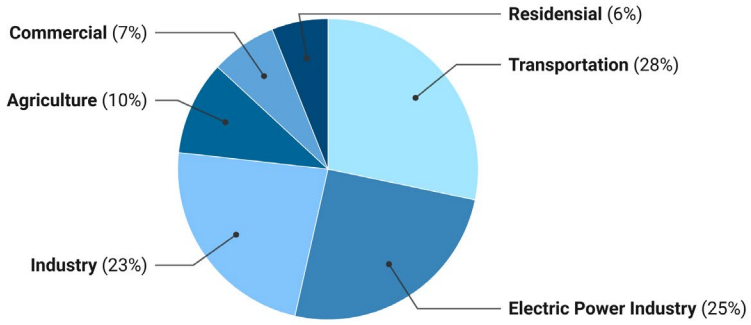
action, average temperatures on earth could increase by 3 to 10 degrees Fahrenheit over the next 70 years.[11]

EMISSIONS BY SECTOR

So where do all of these greenhouse gas emissions come from? In the United States, transportation activities are the largest source of emissions, accounting for 28% of total emissions in 2022. The electric power sector follows at 25% with industry standing at 23%. Key sources of industrial emissions include the production of cement, steel, and chemicals.[12]

Share of U.S. GHG Emissions by Economic Sector, 2022

Greenhouse gas emissions in the U.S. for 2022 were mainly from Transportation (28%), the Electric Power Industry (25%), and Industry (23%). Agriculture contributed 10%, while the Commercial and Residential sectors accounted for 7% and 6%, respectively. The units are in teragrams (Tg), where one teragram equals one million metric tons.



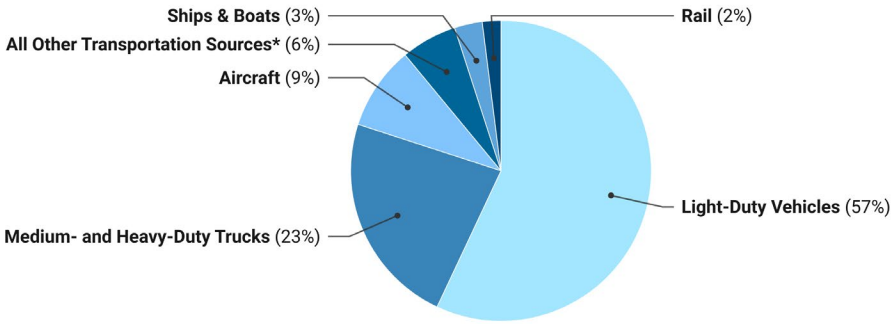
Note: Totals may not add to 100% due to rounding.

Chart: Alejandra Rodriguez Climate Jobs Institute • Source: Environmental Protection Agency • Created with Datawrapper

Within the transportation sector, light, medium, and heavy-duty vehicles are the largest contributors. Aviation and rail–two key IAM industries–are also major contributors to transportation emissions.

Share of U.S. Transportation Sector GHG Emissions by Source, 2022

In 2022, greenhouse gas emissions in the U.S. transportation sector were primarily from Light-Duty Vehicles, which accounted for 57% of the emissions. Medium- and Heavy-Duty Trucks contributed 23%, and Aircraft added 9%. Other significant sources included Ships & Boats (3%), Rail (2%), and All Other Transportation Sources (6%).



Note: Totals may not add to 100% due to rounding

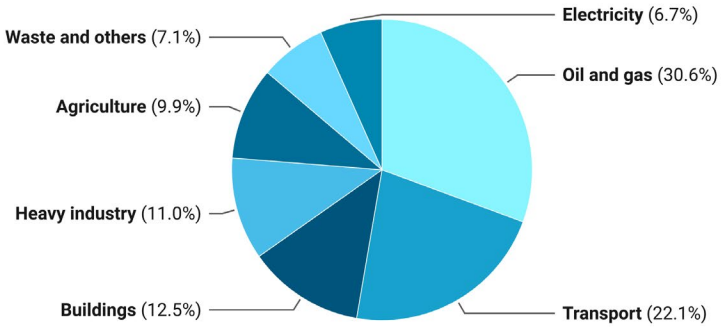
Chart: Alejandra Rodriguez Diaz Climate Jobs Institute • Source: Environmental Protection Agency • Created with Datawrapper

Other significant contributors to global greenhouse gas emissions include industrial processes, agriculture, deforestation, and land use changes.[13]

In Canada, the breakdown is slightly different. In 2022, the oil and gas sector was the largest source at 31% of total emissions, followed by the transport sector, buildings, heavy industry, agriculture, electricity, and waste.[14] Emissions from the oil and gas sector have risen 83% since 1990, largely driven by the massive 450% increase in emissions-intensive oil sands production over that period.[15]

Share of Canada GHG Emissions by Economic Sector, 2022

In 2022, Canada's greenhouse gas emissions mostly came from the Oil and Gas sector, making up 30.6% of the total emissions (measured in megatonnes of carbon dioxide equivalent). Transport was the next biggest contributor at 22.1%, followed by Buildings at 12.5%, Heavy Industry at 11.0%, and Agriculture at 9.9%. The Waste and Others category contributed 7.1%, and Electricity added 6.7%.



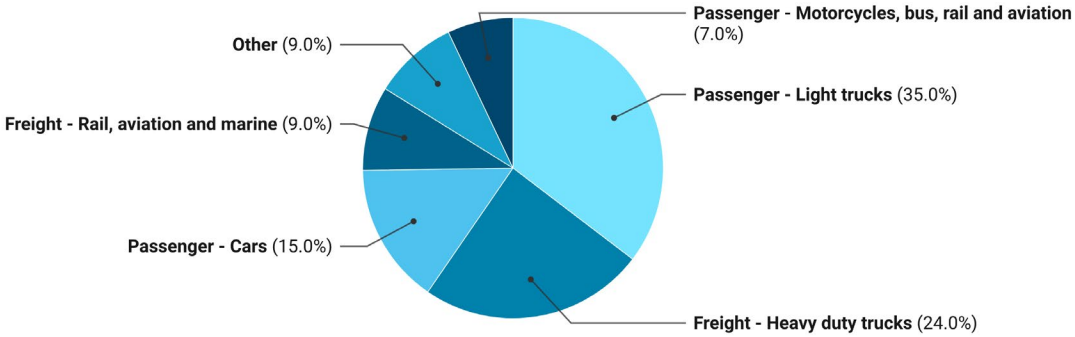
Note: Data are presented as rounded figures. "Others" in the Waste and others sector consists of emissions from light manufacturing, construction, forest resources and coal production. The Heavy industry sector consists of emissions from mining, smelting and refining, pulp and paper, iron and steel, cement, lime and gypsum, and chemicals and fertilizers. Available on the Environmental indicators website (www.canada.ca/environmental-indicators).

Chart: Alejandra Rodriguez Climate Jobs Institute • Source: Environment and Climate Change Canada (2024) Canadian Environmental Sustainability Indicators: Greenhouse gas emissions. • Created with Datawrapper

Looking at the breakdown within transportation in 2022, freight – including heavy trucks, rail, marine, and aviation – accounted for about 33% of emissions (51.8 megatonnes).[16] Passenger transport made up about 58% (90.2 megatonnes), with the remaining 9% (14.4 megatonnes) classified as “Other”. While emissions from passenger cars declined 46% since 1990 -from 44.9 to 24.1 megatonnes-, emissions from light trucks more than doubled (increasing by 114%) as they became a larger portion of the vehicle fleet, and freight emissions grew significantly, up 72% from 1990 levels.[17]

Share of Canada Transportation Sector GHG Emissions by Source, 2022

In 2022, Canada's transport sector produced approximately 156 megatonnes of greenhouse gas emissions (CO2 equivalent). Passenger vehicles were the largest contributors, with light trucks accounting for 35% (55 megatonnes) and cars for 15% (24 megatonnes). Freight transport was also significant, with heavy trucks emitting 24% (38 megatonnes). Other passenger transport contributed 7% (11 megatonnes), while other freight accounted for 9% (14 megatonnes). The remaining 9% (14 megatonnes) came from other transport sources.



Note: Data are presented as rounded figures. However, all calculations have been performed using unrounded data. The Other category includes other recreational, commercial and residential uses. Categories have been adapted from the classification used in Annex 10 of the National Inventory Report. For more details, consult the "Methods" section (www.canada.ca/en/environment-climate-change/services/environmental-indicators/greenhouse-gas-emissions.html#methods-transportation).

Chart: Alejandra Rodriguez Climate Jobs Institute • Source: Environment and Climate Change Canada (2024) Canadian Environmental Sustainability Indicators: Greenhouse gas emissions. • Created with Datawrapper

IMPACT OF CLIMATE CHANGE ON WORKERS

Climate change affects workers in many ways, impacting their health, productivity, and job availability.

Climate change increases health risks for workers, especially those working outdoors or in hot environments. Higher temperatures and more frequent heat waves can lead to heat stress, heat exhaustion, and heatstroke. These conditions can make workers sick and reduce their ability to stay on the job.

The 2021 Pacific Northwest Heat Wave: A Critical Event for Workers

From June 26 to July 2, 2021, the Pacific Northwest experienced an unprecedented heat wave. Temperatures reached 121.28°F (49.6°C) in some areas, shattering previous records.[18] In Seattle, temperatures hit 108°F, about 30°F above average for that time of year.[19]

The human cost was severe. Washington reported over 400 heat-related deaths,[20] while British Columbia estimated 740 extra deaths.[21] Heat-related illnesses and injuries surged, with a 69-fold increase in emergency room visits in the affected US region compared to 2019.[22] Outdoor workers in agriculture, construction, and forestry were particularly vulnerable–with older male laborers at highest risk.[23]

Work cancellations, insufficient safety measures, and heat-related illnesses led to lost work hours, lower output, and devastating economic losses for communities throughout the region.[24] In British Columbia, crop yields fell 20-30% below predictions, and farms reported over 651,000 animal deaths.[25] Wildfires destroyed infrastructure, burned towns, and worsened air quality across the region.[26]

Unions mobilized in response to this and previous heatwaves:[27]

- In Washington and Oregon, United Farm Workers (UFW), demanded emergency heat standards–highlighting that farmworkers' suffer an especially high death rate.[28]
- Familias Unidas por la Justicia (FUJ) advocated for new heat standards in Washington. [29]
- The International Union of Painters and Allied Trades secured heat and smoke safety protections for canvassers in their January 2021 contract.[30]

Today, Washington requires employers to provide water, shade, and breaks for all outdoor workers when temperatures exceed 80°F. [31] Additionally, Washington mandates that employers provide outdoor workers with N95 masks during wildfires.[32] Organized labor can use climate-conscious bargaining as a powerful tool to respond to the climate crisis.

By 2080, Washington could face up to 48 extreme heat days annually.[33] Ongoing enforcement, advocacy, and resilience planning for worker protection are key to addressing the climate crisis.

In the U.S., heat exposure is estimated to cause significant losses in work hours and productivity, leading to billions of dollars in additional costs annually. Between 1980 and 2016, the average annual economic loss due to heat stress was about $14 billion, affecting sectors such as manufacturing the most. Without action to mitigate climate change, these losses could rise to anywhere between $50 billion and $119 billion.[34]

Intense hurricanes and other extreme weather events linked to climate change also pose major threats to workplace safety and operations. In recent years, military bases have suffered catastrophic damage from these severe storms. For example, Hurricane Michael in 2018 devastated Tyndall Air Force Base in Florida, while that same year Hurricane Florence caused $3.6 billion in damage at Camp Lejeune in North Carolina.[35] Hurricanes frequently interrupt missions, knock out critical utilities like power and water, release hazardous materials, and can even lead to injuries and loss of life for personnel. [36]

Extreme weather events such as storms and floods pose direct physical threats and require clean-up activities, which can further expose workers to hazardous materials. These extreme weather events can spread around toxic pollution from contaminated areas. Floodwaters pick up and redistribute heavy metals, radioactive materials, and persistent chemical pollutants that had built up over time in riverbed sediments near old industrial sites and mines.[37] This

frequently happens when major floods hit regions that were impacted by past mining operations, releasing those toxic sediments laden with metals and other dangerous materials.[38]

Not only do workers have to deal with the dangers of the storms and floods themselves, but the aftermath can be risky too. All the contaminated mud and muck that gets spread around means clean-up crews working in the flooded areas face exposure to those hazardous materials from legacy pollution getting dredged up.[39] Handling the remediation and rebuilding in places with remobilized industrial contaminants from past manufacturing or mining poses an added health risk for those workers on the scene.

Poor air quality from climate change-related factors like increased levels of pollutants can lead to respiratory diseases, further impacting workers' health and productivity.[40] In the U.S., outdoor workers are more exposed to pollutants, which can lead to respiratory illnesses, including asthma.[41] Firefighters, including IAM members, exposed to wildfire smoke can experience health impacts such as reduced lung capacity and increased risk of cardiovascular disease, lung inflammation, and decreased lung function.[42] Similarly, indoor environments can worsen due to outdoor pollutants, affecting workers in various sectors.[43] COVID-19 exposed the widespread lack of air filtration and exposed the risk that poor indoor air quality poses to workers. Whether pollutants or disease, indoor workers are not immune to the negative effects of pollution outside their doors.[44]

Climate change also affects the labor market through job losses, changes in job availability, and shifting geographies of economic sectors. Sectors such as agriculture, construction, and outdoor services are highly susceptible to climate change impacts. Severe weather conditions, such as droughts, heavy rainfall, and intense storms, can negatively impact manufacturing and other industries. These disruptions may result in layoffs and reduced output. For instance, in the United States, factories and other vulnerable sectors are predicted to suffer significant financial losses due to a shrinking workforce caused by extremely hot temperatures.[45] Global warming can make some places too difficult to live or work in, leading to unemployment and migration. This can cause imbalances between the number of available workers and job openings in different areas.[46]

How Climate Change Impacts Workers

How Climate Change Impacts Workers

Climate change poses diverse risks to workers, from direct health impacts and safety hazards to economic disruptions and increased occupational demands. These effects span multiple sectors, highlighting the need for adaptive workplace strategies.

Climate-Related Risk	Impact on Workers
Heat Stress, Illness, and Death	Higher temperatures and frequent heat waves lead to heat stress, heat exhaustion, heatstroke, and increased incidences of heat-related illnesses and deaths. Outdoor workers and those in hot indoor environments are particularly affected.
Reduced Productivity	Extreme heat results in significant losses in work hours and productivity, especially in the manufacturing sector, impacting economic performance and individual livelihoods.
Safety Hazards and Infrastructure Damage	Hurricanes, floods, wildfires, and other extreme weather events pose threats to workplace safety, cause injuries, fatalities, and mental health issues, damage infrastructure, lead to operational delays, and increase maintenance costs.
Respiratory Diseases	Rising pollution from climate change exacerbates respiratory diseases, such as asthma and chronic bronchitis, affecting workers' health and productivity.
Economic Disruptions	Climate change threatens entire industries, causing unemployment and migration, disrupting labor markets, and reducing overall economic output.
Mental Health Issues	Exposure to climate-related disasters can lead to stress, anxiety, depression, and other mental health issues, particularly among vulnerable occupational groups.
Vector-Borne Diseases	Climate change affects the distribution of vectors such as mosquitoes and ticks, increasing the risk of diseases like Lyme disease and West Nile virus, particularly for outdoor workers.
Water-Related Illnesses	Changes in water quality due to runoff from extreme precipitation events increase the risk of waterborne illnesses for workers in agriculture and related sectors.
Chronic Diseases	Long-term exposure to higher temperatures and pollutants may contribute to chronic conditions such as kidney disease, cardiovascular diseases, and cancer among workers.
Allergies and Asthma	Increased levels of allergens due to climate change can worsen asthma and other allergic conditions, significantly impacting workers' health and productivity.
Food Safety, Nutrition, and Distribution	Climate change affects food production, safety, and nutrition, leading to potential foodborne illnesses and disruptions in food supply, impacting workers in agriculture and food industries.
Increased Demand for Medical Services and Short Staffing	The health impacts of climate change, such as heat-related illnesses and respiratory diseases, lead to higher demand for medical services, exacerbating existing staffing shortages in the healthcare sector.

Climate-Related Risk	Impact on Workers
Increased Demand for Emergency Response	Climate change-induced weather events such as wildfires, hurricanes, and floods increase the demand for firefighters and other emergency response personnel, straining resources and leading to staffing shortages.
Effects on Vulnerable Populations	Certain groups, including low-income workers, communities of color, immigrant groups, and older adults, are disproportionately vulnerable to the health impacts of climate change, due to socio-economic and health disparities.

Sources: Adapted from Burgess and Rattray (2021), which provide detailed analysis on occupational and environmental health risks; Ebi and Hess (2018), offering an overview of direct and indirect health effects; and the U.S. Global Change Research Program (2016), providing comprehensive data on health outcomes and vulnerable populations. These sources collectively inform the health risks and mechanisms through which climate change affects workers.

Table created by Alejandra Rodriguez Diaz, Cornell ILR-Climate Jobs Institute.

It is important to note that while the climate crisis affects everyone, it does not affect everyone equally. A 2021 analysis from the Environmental Protection Agency (EPA) found that "the most severe harms from climate change fall disproportionately upon underserved communities who are the least able to prepare for, and recover from, heat waves, poor air quality, flooding, and other impacts." "Racial and ethnic minority communities," they found, "are particularly vulnerable to the greatest impacts of climate change."[47]

By necessity, any attempts to combat climate change must also take on deep-seated inequalities–of race, gender, income, hope, and opportunity–that are pervasive in our society.

To minimize the harmful effects of climate change on workers and capitalize on potential opportunities, it is crucial to develop strategies for both reducing greenhouse gas emissions and adapting to the changes that are already happening. With smart policies and proactive measures to protect workers' interests, this shift can open up new employment possibilities in areas like renewable energy, green construction, and other sustainable industries.[48] Labor unions have an important role to play in this transition. Leaders and members can push for the creation of good, new jobs while also fighting to make sure there are training programs and other support systems in place for workers who might be negatively impacted by these economic changes. Through a combination of smart government policies and strong advocacy in the workplace, advocates can maintain high labor standards, create effective job training initiatives, and provide a safety net for affected workers as we shift to more sustainable ways of doing business.[49]

ACTION STEPS FOR THE IAM

To tackle the climate crisis, scientists agree that we need to drastically reduce the amount of carbon dioxide (CO2) we release into the atmosphere. We need to cut CO2 emissions significantly by 2030 and achieve "net-zero" emissions, which means that any remaining CO2 emissions are balanced out by removing an equivalent amount from the atmosphere, by 2050. If we can meet these targets, we have a chance of limiting global temperature rise to 1.5°C (2.7°F) above pre-industrial levels,[50] a target set by the 2015 Paris Agreement. Achieving this necessitates rapid, far-reaching transitions across energy, land, transportation, infrastructure, and industrial systems on an unprecedented scale, including adopting renewable energy, enhancing energy efficiency, implementing sustainable land use, promoting low-emission transportation, developing resilient infrastructure, and innovating industrial processes.[51]

Some key ways the IAM can aid this transition in major industries include:

- In the **energy sector**, shifting away from fossil fuels towards renewable energy, enhancing efficiency, and decarbonizing end-uses–like buildings and personal vehicles–is key.[52] IAM members in utilities can apply their skills to install, operate and maintain renewable energy systems, and those in mining can use their skills to extract critical minerals for clean technologies.
- In **transportation**, developing sustainable aviation fuels, expanding electric and low carbon vehicles, massively expanding rail transportation, and decarbonizing rail and aerospace manufacturing are priorities.[53] This creates opportunities for IAM members in these industries to manufacture and maintain cleaner technologies.
- In the **industrial sector**, critical steps include improving energy efficiency through retrofits and more sustainable business practices, increasing the use of renewable energy and low-carbon fuels, and deploying carbon capture, use, and storage technologies where appropriate.[54]
- For the **buildings sector**, which includes healthcare facilities that are responsible for 8.5% of U.S. emissions, reducing emissions requires deep energy retrofits, decarbonization of heating/cooling, on-site renewable energy installations, and reducing carbon in construction materials.[55] The healthcare sector, with its large, energy-intensive infrastructure of hospitals and clinics, can lead by example on decarbonization.
- **Government facilities** like military bases must increase energy efficiency, deploy renewables and energy storage, decarbonize operations and vehicle fleets, and enhance resilience planning.[56] The IAM's federal workers can support sustainable practices at military bases and other related sites.

The IAM can also play a leading role in tackling gender, racial, and other pervasive inequalities that deny economic opportunities to marginalized communities and leave them especially vulnerable to climate impacts. "When you have a diverse group of leaders, you get better

contracts" points out Julie Frietchen, the Director of the Women's and Young Workers Division. "You're better at bargaining. You're better at organizing. You get better contracts."[57] Through its organizing efforts and training opportunities, the IAM can diversify its ranks and ensure that all workers can access the life-changing benefits of union membership.

The transition to a low-carbon economy must be managed equitably, with the needs of workers and communities at the forefront. By taking a leadership role in shaping climate solutions, unions like the IAM can help ensure that the clean energy transition creates high-quality jobs, supports affected workers, builds resilient communities, and strengthens the labor movement.

MEETING THE MOMENT

While the climate crisis brings major challenges, it also offers a significant opportunity to transform our economy and society to better meet the needs of workers and communities. The current political landscape provides new opportunities for climate action, with major investments and commitments at the federal, state, and local levels that include strong labor and equity standards.[58]

A key piece of legislation in this effort is the Inflation Reduction Act (IRA) of 2022. The IRA is the largest investment in climate action in U.S. history, dedicating hundreds of billions of dollars to energy security and climate change efforts.[59] This funding aims to cut greenhouse gas emissions by about 40% by 2030, expand clean energy industries, and create high-quality jobs.

EMERGING INDUSTRIES AND JOB CREATION

The federal Inflation Reduction Act (IRA) is set to boost several key industries, including renewable energy, energy efficiency, electric vehicles (EVs), and advanced manufacturing. These industries are expected to create millions of jobs with strong labor standards. For example, the investment in clean energy infrastructure alone could create up to 1.5 million jobs by the end of the decade,[60] with the most generous subsidies going to projects that pay prevailing wages and use apprentices on the jobsite. The IRA has already stimulated new investments, with 123 new manufacturing facilities announced, representing over $35 billion in capital investment and supporting nearly 42,000 new manufacturing jobs.[61]

Additionally, the IRA's investment in clean hydrogen hubs could significantly boost job creation and industrial development. The Biden-Harris administration has allocated $7 billion to establish regional clean hydrogen hubs across the U.S. These hubs aim to prove what's possible with this clean technology and attract substantial private investment. For example, the Gulf Coast Hydrogen Hub in Texas will leverage renewable energy and natural gas with carbon capture, while the California Hydrogen Hub will use renewable energy and biomass. These initiatives will reduce emissions and create more than 200,000 jobs.[62]

Complementing the IRA, the 2021 Bipartisan Infrastructure Law invests $550 billion into new projects to improve and modernize the nation's infrastructure. This includes $65 billion for clean energy transmission and grid improvements, $7.5 billion for building a network of EV chargers, and significant funds for public transit and sustainable transportation projects. These investments are expected to create many jobs in construction, engineering, and manufacturing, and they passed with strong union support.[63]

State and local governments have also invested significantly in equitable climate action in recent years. For example, Illinois' Climate and Equitable Jobs Act (CEJA) sets a comprehensive framework for reducing emissions, promoting renewable energy, and creating jobs in green technologies.[64] Unions supported CEJA and were critical in its passage, ensuring that the transition to a clean energy economy also provides good-paying jobs with strong labor standards.[65] Further, New York City's Local Law 97, part of the city's Climate Mobilization Act, requires buildings over 25,000 square feet to meet new energy efficiency and emissions limits,[66] which could create a significant number of jobs in building retrofits.

In addition to strong labor standards, federal and state officials are also prioritizing equity as they disburse funds for climate action. At the federal level, Justice 40, a "whole-of-government" initiative, "has made it a goal that 40 percent of the overall benefits of certain Federal climate, clean energy, affordable and sustainable housing, and other investments flow to disadvantaged communities that are marginalized by underinvestment and overburdened by pollution."[67] With similar goals in mind, Illinois lawmakers invested millions of dollars in workforce development programs meant to create pathways for women and people of color into high-quality careers in clean energy and other climate-related fields. The IAM and other unions can play a productive role in advancing these initiatives, diversifying membership, and building power by reaching new communities.

Simply put, our current moment presents a unique opportunity to address the climate crisis while also creating good union jobs, expanding opportunities, and strengthening communities.

The Climate Crisis & IAM

WHAT IS THE IAM?

The International Association of Machinists and Aerospace Workers (IAM) is one of North America's largest and most diverse industrial unions, representing over 500,000 active and retired workers across a broad spectrum of the US and Canadian economies. [68]

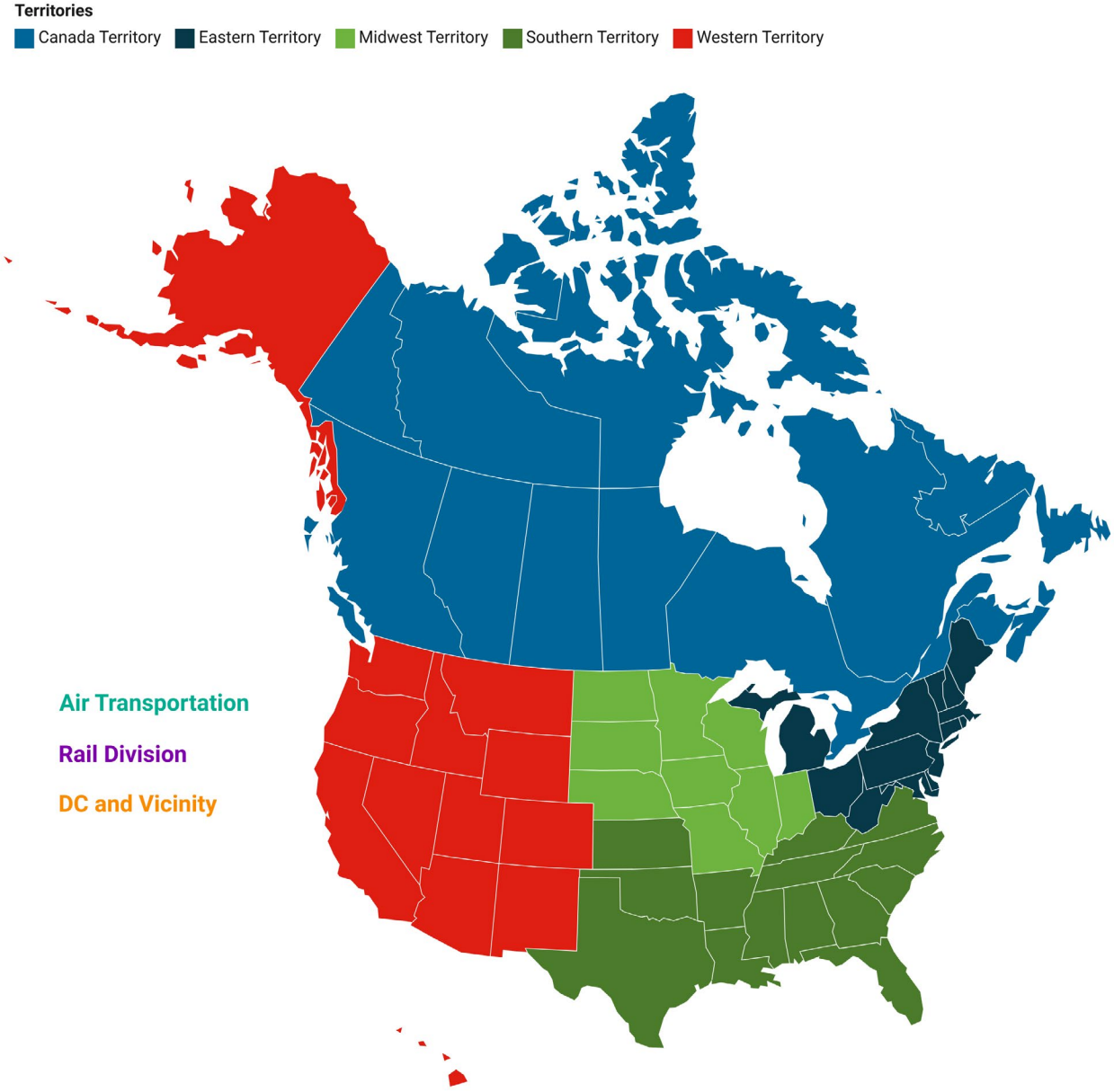
THE IAM'S STRUCTURE

Because of the IAM's extensive reach into different sectors and geographies, the climate crisis will touch every member's workplaces and communities, but often in very different ways. In order to understand both the threats and opportunities that come with the energy transition, it is important to outline how the IAM organizes its membership.

The IAM is divided into seven territories and one division. Five of the union's territories–Canada, Eastern, Midwest, Southern, and Western–cover members in most sectors within a specific geographic area. The other two territories, as well as one division, cover all workers from a specific sector across the entire United States. The Air Transport Territory has a national footprint and covers roughly 100,000 airport workers, while the Rail Division covers several rail-related areas of work in Washington, DC, and 31 states. The DC and Vicinity Territory, despite its name, covers mostly federal government workers in Washington, DC, and over two dozen states across the lower 48. A visual breakdown of the IAM's structure is found below.[69]

IAM Territories and Division

The IAM is structured with seven territories and one division. Five territories (Canada, Eastern, Midwest, Southern, and Western) cover most sectors within specific geographic areas. The Air Transport Territory operates nationwide, serving airport workers across the United States. The Rail Division, though not a territory, also has a national scope, managing rail-related work in Washington, DC, and numerous states. The DC and Vicinity Territory, despite its name, covers federal government workers in Washington, DC, and many states across the continental United States.



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

THE IAM'S SECTORS

The IAM also represents members in a wide variety of industries.[70] Aerospace manufacturing and related services is the largest industry where IAM members work.[71] This industry involves the production of aircraft, spacecraft, and related parts, encompassing manufacturing facilities that design, develop, and produce these vehicles, along with services related to maintenance, repair, and overhaul. Aerospace is a critical to national defense and commercial aviation.[72]

The air transportation sector is the second-largest group of members, further highlighting the union's significant influence in the aviation industry.[73] This sector includes businesses that provide air transportation for passengers and cargo, covering major airlines, regional carriers, and air freight companies essential for global connectivity, trade, and tourism.[74]

The IAM has a significant presence in vital infrastructure and government sectors.[75] A large number of members work in railroads and rail transit, operating trains and maintaining rail systems that keep people and products moving. The federal government also employs many IAM members in various capacities, from administrative roles to jobs that directly impact national security, like defense-related positions.

Manufacturing is another key area for the IAM.[76] In addition to the aerospace industry, thousands of members work in factories that make metal product and machinery.[77] These skilled workers take raw metals and turn them into everything from basic parts to complex equipment, supplying essential components for many other industries.[78]

IAM members work in fields like auto repair, personal care, and maintenance, providing services that people rely on in their daily lives.[79] Other IAM-represented industries are incredibly diverse, ranging from healthcare and forestry, to auto dealers and print shops, to mining, oil, and gas. The "Industries Represented by IAM Members" graph shows the different sectors where IAM members work.

Industries Represented by IAM Members

IAM membership spans 21 industries, with aerospace and transportation dominating. Aerospace Manufacturing leads at 24.7%, followed by Air Transportation (20.3%) and Railroad Transit (9.9%). These top three represent 54.9% of members. A Grouped Industries category (16.9%) combines sectors each under 2.5% of membership.

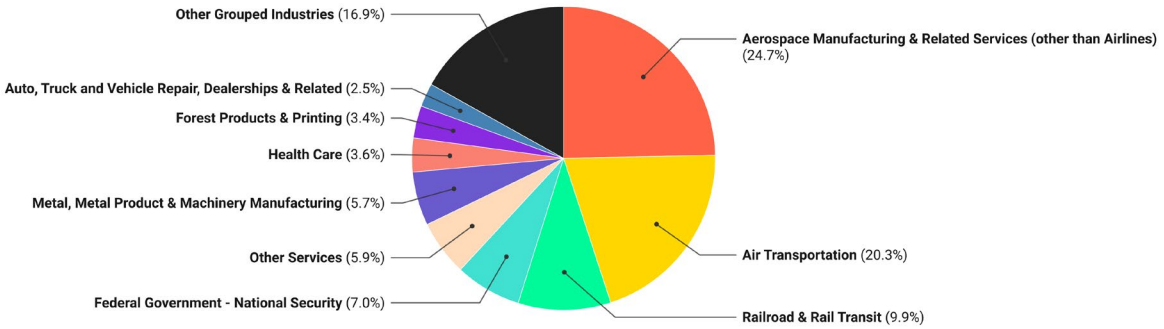


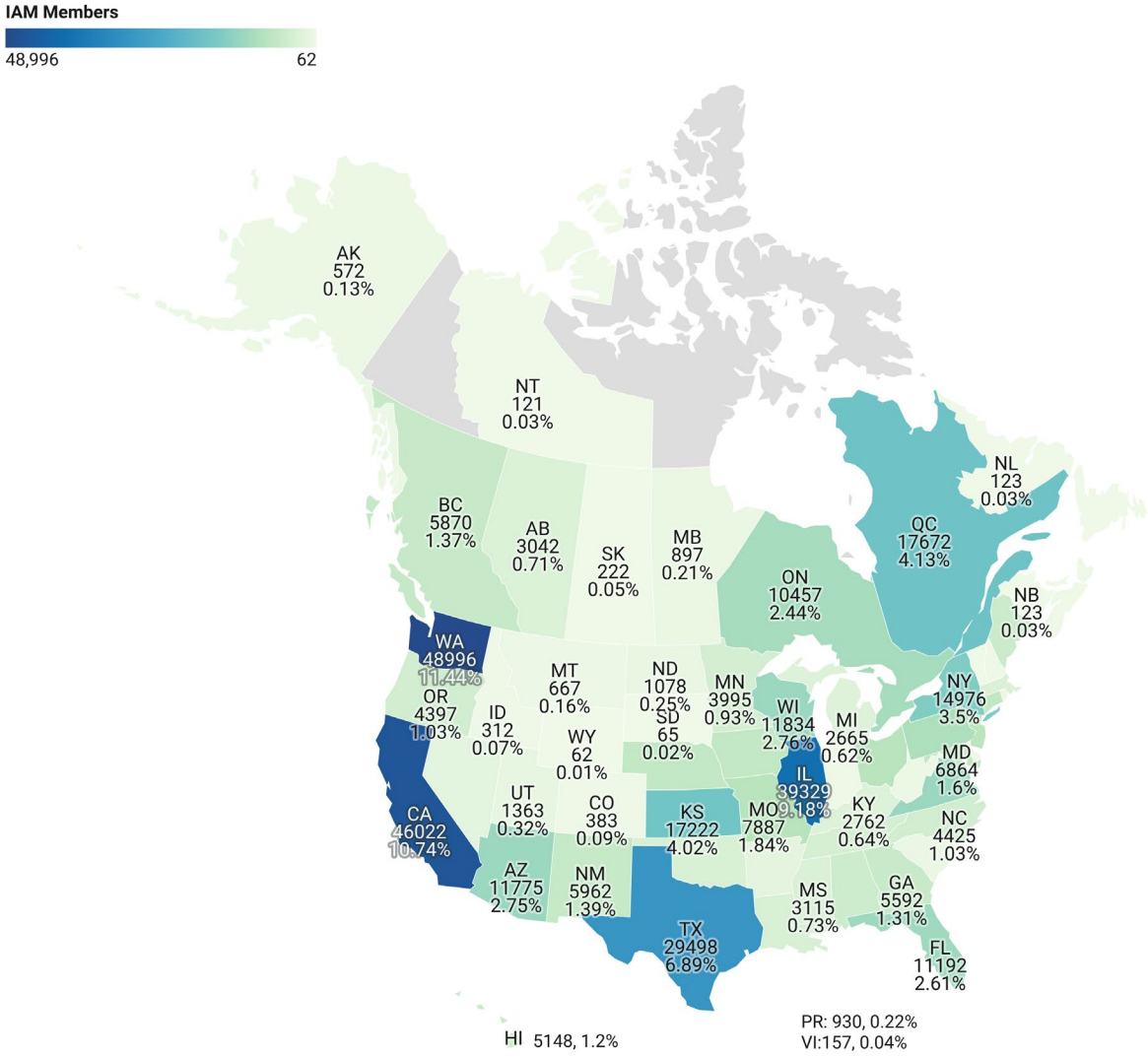
Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

GEOGRAPHIC DISTRIBUTION OF THE IAM'S MEMBERSHIP

As previously noted, the IAM's membership is spread across the United States and Canada, with each geography having its own industrial strengths.[80] State membership numbers range from nearly 50,000 in Washington to less than 100 in states like Wyoming and South Dakota.[81] The "Geographic Distribution and Density of IAM Members in North America" map shows the density of membership in each US state and Canadian province or territory.

Geographic Distribution and Density of IAM Members in North America

IAM membership concentrations across North America reflect key aerospace and manufacturing hubs. Washington state leads with 48,996 members (11.42%), followed closely by California at 46,022 (10.74%). States like Texas and provinces like Quebec show moderate densities, while areas such as Wyoming and New Hampshire have the lowest membership concentrations. This distribution mirrors the continent's diverse industrial landscape.



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

The IAM & the Climate Crisis

In the following pages, we examine the varying, intersecting ways climate change will affect the industries and places where IAM members live and work. First, we will look at the major industries and climate impacts–both current and expected–in each of the IAM's geographic territories. Then, we will take a deeper dive into threats and opportunities in key IAM-represented industries. Since air transportation, rail, and federal government (DC & Vicinity) workers are both sectors and territories or divisions within the union, our analysis of these three will bridge the two sections.

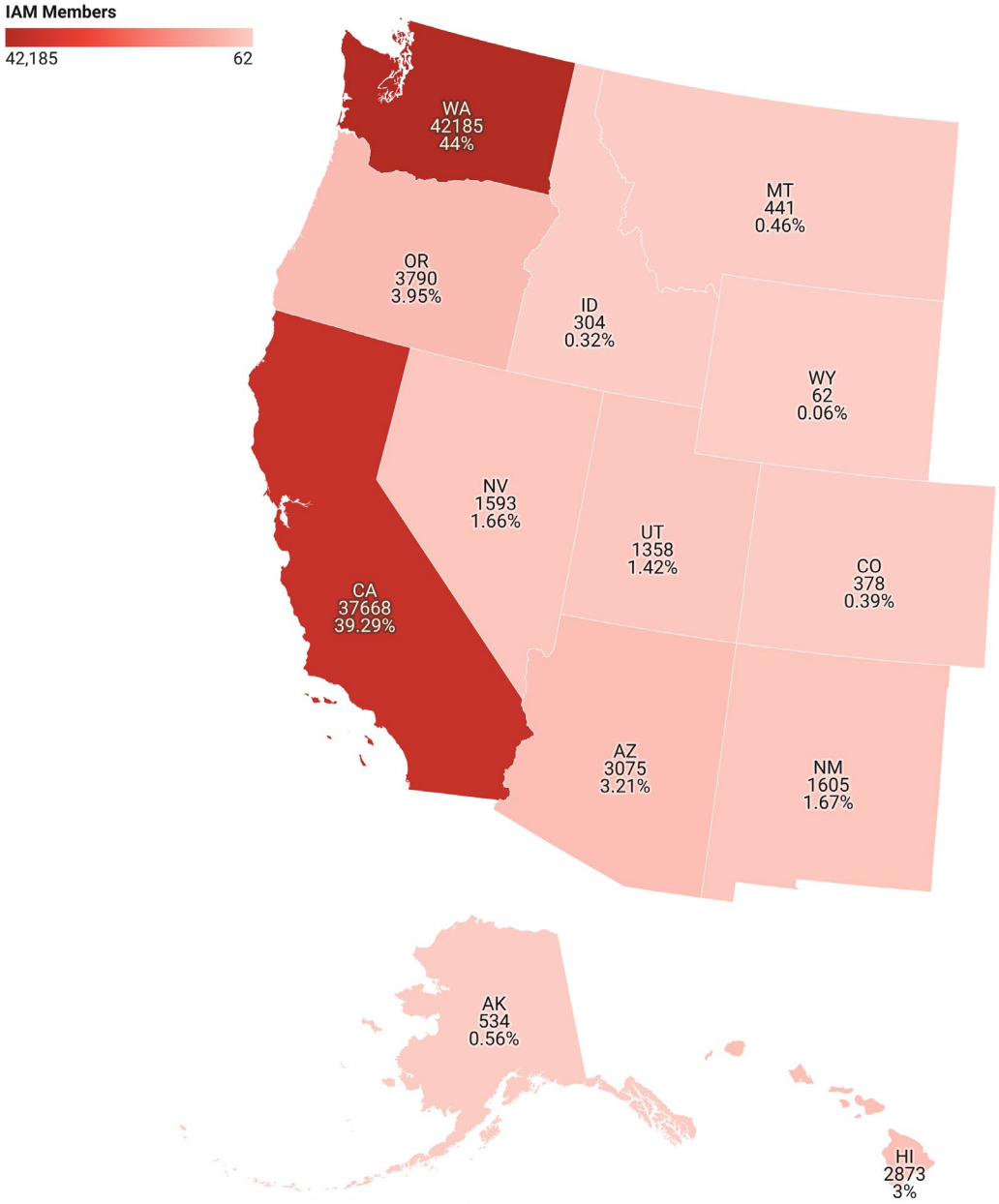
Climate Impacts In Geographic Territories

The IAM Western Territory

In the IAM Western Territory, Washington and California stand out due to their high number of members, with 42,185 and 37,668 members respectively. These two states are crucial hubs for IAM activities, reflecting their large industrial bases and workforce. Washington is home to Boeing, the largest single employer of IAM members.[82]

Geographic Distribution and Density of IAM Members in Western Territory

IAM membership in the Western Territory concentrates heavily in Washington and California, with 42,185 (44%) and 37,268 (39.29%) members respectively. These two states account for over 83% of the region's membership. Oregon and Arizona show notable but lower concentrations, while states like Wyoming and Montana have the fewest members. Darker shades on the map indicate higher membership densities, clearly illustrating the regional distribution.



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

A key feature of the IAM Western Territory is its heavy involvement in the aerospace and aviation industries. Aerospace Manufacturing & Related Services (excluding Airlines) is the dominant sector, accounting for approximately half of the territory's membership.[83]

IAM Western Territory Industries

IAM membership in the Western Territory is dominated by Aerospace Manufacturing, representing 50.3% of members. Other Services follows at 17.2%, while Federal Government - National Security accounts for 7.4%. The 'Other Grouped Industries' category (13.4%) combines several smaller sectors, each representing less than 2.4% of membership.

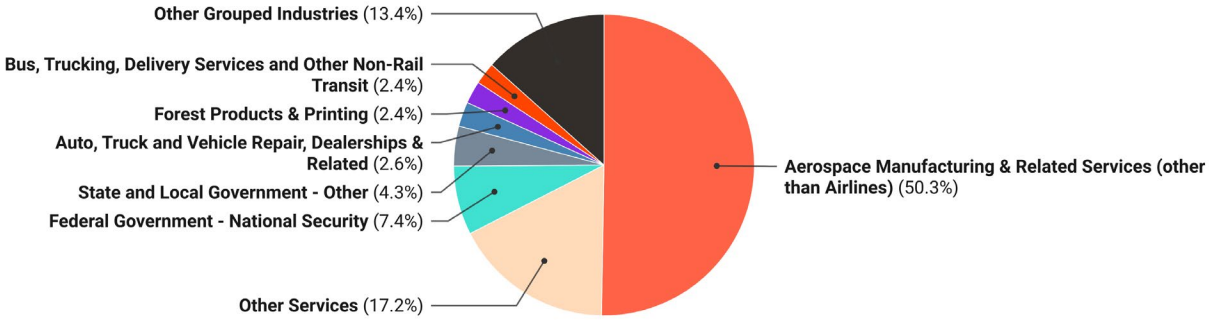


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

Apart from aerospace and aviation, the Federal Government's role in National Security is significant, accounting for 7.4% of the IAM's members in the territory. The Forest Products & Printing sector also plays a substantial role, particularly in states rich in natural resources like Washington, Idaho, and Oregon.[84]

Climate Change Impacts on the IAM Western Territory

Climate change profoundly affects workers in the IAM Western Territory, impacting health, safety, and job stability across various industries due to its diverse geography and climate zones.

Rising temperatures and more frequent severe weather events pose health risks, particularly for outdoor work and demanding jobs in aerospace, air transportation, and construction. States like Arizona and Nevada face extreme heat that could lead to heat-related illnesses, lower productivity, worsened health conditions, and heat-related deaths.[85] For example, in Maricopa County, Arizona, there were 645 heat-related deaths in 2023, representing a 52% increase over 2022.[86] In New Mexico and Montana, unpredictable weather may impact agricultural productivity and raw material supply, causing economic instability and potential job losses.[87] Extended droughts and wildfires threaten worker safety and disrupt operations.[88] In Washington, wildfire smoke might affect aerospace operations, pose respiratory risks, and necessitate advanced air filtration and modified work schedules.

Alaska is warming faster than the global average, leading to significant permafrost thaw that damages infrastructure crucial for aerospace and construction, increasing maintenance costs and operational disruptions. Melting glaciers contribute to sea level rise and altered marine ecosystems, affecting fisheries and tourism.[89] Hawaii also faces rising temperatures and health risks from diseases like dengue fever.[90]

Industry-Specific Climate Impacts and Implications for IAM Workers in the Western Territory

The IAM Western Territory encompasses a diverse range of industries, each uniquely impacted by climate change. These impacts pose significant challenges for workers, affecting their health, safety, and job security. The "Industry-Specific Climate Impacts for IAM Workers in the Western Territory"[91] chart provides an analysis of how different industries and states in the IAM Western Territory are affected.

Industry-Specific Climate Impacts for IAM Workers in the Western Territory

This table lists six key industries in the IAM Western Territory. States where over 10% of IAM members work in each industry are highlighted, along with the total percentage of members in that industry (e.g., 44% of IAM members in Alaska work in Aerospace Manufacturing). The table also highlights climate change risks in these states and the potential impacts on key industries in those areas.

Industry	States	Climate Change Risks	Climate Change Impacts
Aerospace Manufacturing	Alaska (44%), Arizona (92%), California (24%), Colorado (21%), Nevada (25%), New Mexico (33%), Hawaii (11%)	Increased frequency of wildfires; Intensification of extreme weather patterns; Rising temperatures; Permafrost thaw	Higher incidence of respiratory issues from wildfire smoke; More frequent operational disruptions due to extreme weather; Increased operational challenges from extreme heat; Infrastructure damage from permafrost thaw in AK
Federal Government and National Security	Hawaii (43%), Washington (10%)	Increased frequency of extreme weather events; Potential increase in vector-borne diseases	Increased emergency response operations; Disruptions to local economies; More frequent illnesses and contagion at workplaces
State and Local Government	Montana (49%)	More frequent climate-related emergencies; Long-term environmental changes	Increased expenditure on emergency response and wildfire management; Growing strain on public services; Disruptions to local economies; Shifts in local economic activities
Air Transportation	Alaska (27%), Nevada (32%)	Rising sea levels; Increased frequency of severe storms; Unpredictable weather patterns; More frequent extreme heat waves	Damage to coastal airports; Flight delays and cancellations; Operational challenges during heat waves
Healthcare	Hawaii (45%)	More frequent extreme weather events; Increased risk of vector-borne diseases; Rising temperatures	Increased patient load; Flooding of healthcare facilities; Health and safety risks for healthcare workers
Food and Beverage Manufacturing and Related	Alaska (25%), Montana (36%)	Changes in precipitation patterns; Rising temperatures; Increased frequency and severity of wildfires	Disruptions to harvesting and production schedules; Shifts in growing seasons affecting crop yields and work hours; Damage to forests leading to reduced timber supply and increased safety risks for workers

Data sources: Climate impacts and risks are summarized from the NOAA National Centers for Environmental Information State Climate Summaries 2022 and various chapters of the Fifth National Climate Assessment (2023). Industry representation percentages were provided by the International Association of Machinists and Aerospace Workers (IAM).

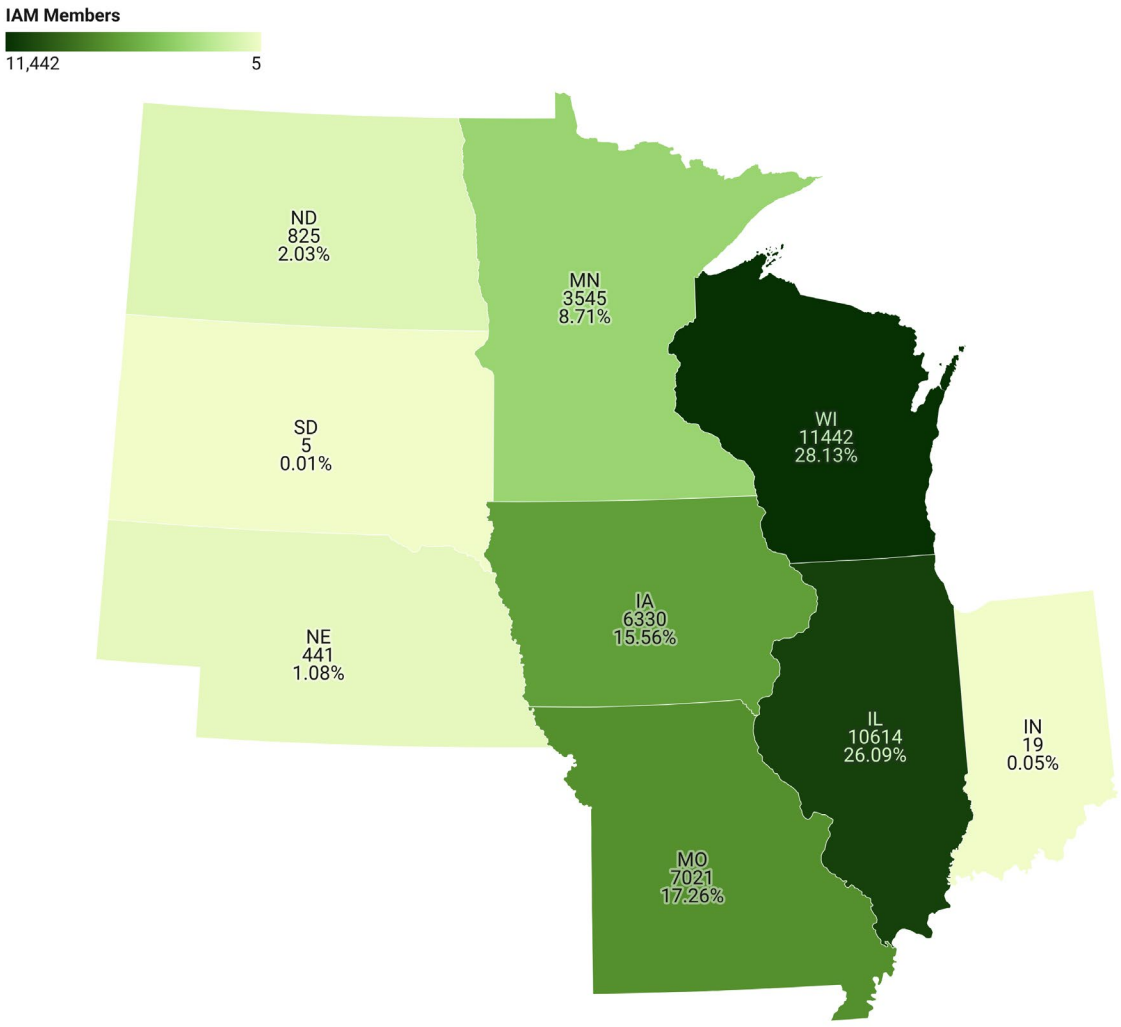
Table created by Alejandra Rodriguez Diaz, Climate Jobs Institute.

The IAM Midwest Territory

In the Midwest, with over 40,000 IAM members, Wisconsin and Illinois make up over half of the territory's total membership, with 11,442 and 10,614 members respectively. This high number highlights these two states' central roles in the region's industrial activities. Missouri and Iowa are also key players, with strong industrial bases and more than 5,000 members each.[92]

Geographic Distribution and Density of IAM Members in Midwest Territory

This map shows IAM membership density in the Midwest Territory. Darker shades indicate higher concentrations. Wisconsin (28.13%) and Illinois (26.09%) have the highest membership, followed by Iowa (17.05%) and Minnesota (8.71%). Other states have lower membership levels, with South Dakota and Indiana having the fewest members.



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

The dominant industry in the Midwest Territory is Metal, Metal Product & Machinery Manufacturing (35.50%). Other significant sectors include aerospace manufacturing (10.21%) and auto-related sectors (7.82%).[386] Each state in the territory has its own unique mix of industries and members.[387]

IAM Midwest Territory Industries

IAM members in the Midwest Territory are distributed across various industries, with Metal, Metal Product & Machinery Manufacturing leading at 36.5%. Following this, Other Manufacturing comprises 13.56% of the membership. Aerospace Manufacturing accounts for 10.21%, and Auto, Truck, and Vehicle Repair represents 7.82%. Other Grouped Industries, which account for10.79% of the membership and include sectors with less than 3.08% of members, are part of this distribution.

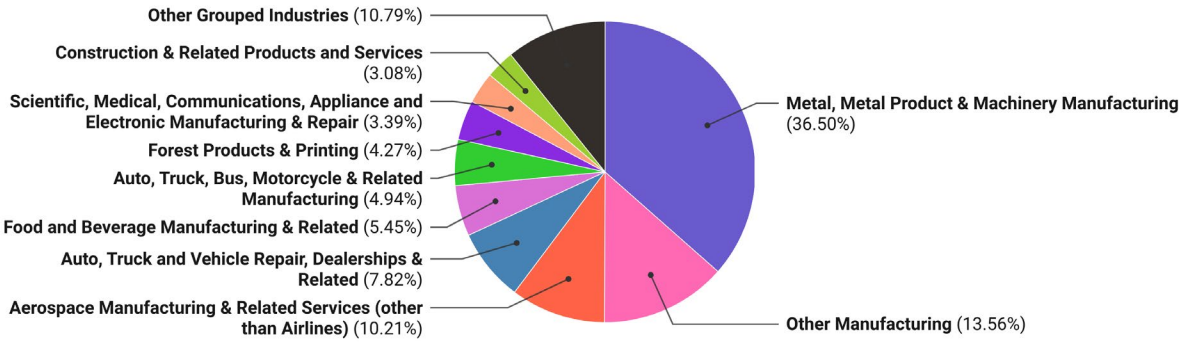


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

Climate Change Impacts on the IAM Midwest Territory

The IAM Midwest Territory spans nine states facing significant climate impacts. These include rising temperatures, frequent heat waves, variable precipitation, heightened flood risks, threats to agriculture, ecosystem disruptions, health risks, and stress on aging infrastructure.[93]

Illinois experiences heavy precipitation that strains stormwater infrastructure

and transportation systems.[94] In recent decades, annual precipitation increased significantly,[95] and the state now encounters more frequent wet and dry extremes, earlier snowmelt, and intense spring precipitation, all of which elevate the risks of floods, droughts, soil erosion, and nutrient runoff.[96] In fact, every state in the region has seen temperature increases that heighten the risk of extreme weather.[97]

Industry-Specific Climate Impacts and Implications for IAM Workers in the Midwest Territory

The Midwest Territory encompasses a diverse range of industries, each uniquely impacted by climate change. These impacts pose significant challenges for workers, affecting their health, safety, and job security. The "Industry-Specific Climate Impacts for IAM Workers in the Midwest Territory" chart offers a summary of how five key industries and various states in the IAM Midwest Territory are affected.[98]

Industry-Specific Climate Impacts for IAM Workers in the Midwest Territory

This table lists five key industries in the IAM Midwest Territory. States where over 10% of IAM members work in each industry are highlighted, along with the total percentage of members in that industry (e.g., 61% of IAM members in Iowa work in Metal, Metal Product & Machinery Manufacturing). The table also highlights climate change risks in these states and the potential impacts on key industries in those areas.

Industry	States	Climate Change Risks	Climate Change Impacts
Metal, Metal Product & Machinery Manufacturing	Iowa (61%), Illinois (31%), Minnesota (40%), Wisconsin (50%)	Increased frequency of extreme weather events; Rising temperatures; Increased flood risk	Disruptions in manufacturing and supply chains; Damage to manufacturing facilities and infrastructure
Other Manufacturing	Illinois (20%), Missouri (22%), North Dakota (61%), Wisconsin (13%)	Increased heat waves; Unpredictable precipitation patterns; Extreme weather events	Impacts on production processes; Increased costs for raw materials; Reduced infrastructure resilience
Aerospace Manufacturing & Related Services	Missouri (49%), Nebraska (33%), South Dakota (100%)	Increased frequency of severe storms; More frequent flooding	Disrupted production schedules; Supply chain interruptions; Damage to facilities
Auto, Truck and Vehicle Repair, Dealerships & Related	Indiana (100%), Minnesota (21%), Missouri (22%)	Extreme weather events; Increased temperature variability	Inventory risks; Demand shifts; Cost increases
Forest Products & Printing	Minnesota (10%), Nebraska (51%)	Rising temperatures; Increased risk of forest fires; Increased pest activity	Changes in forest health; Reduced availability of raw materials; Potential disruptions to production

Data sources: Climate impacts and risks are summarized from the NOAA National Centers for Environmental Information State Climate Summaries 2022 and various chapters of the Fifth National Climate Assessment (2023). Industry representation percentages were provided by the International Association of Machinists and Aerospace Workers (IAM).

Table created by Alejandra Rodriguez Diaz, Cornell ILR-Climate Jobs Institute.

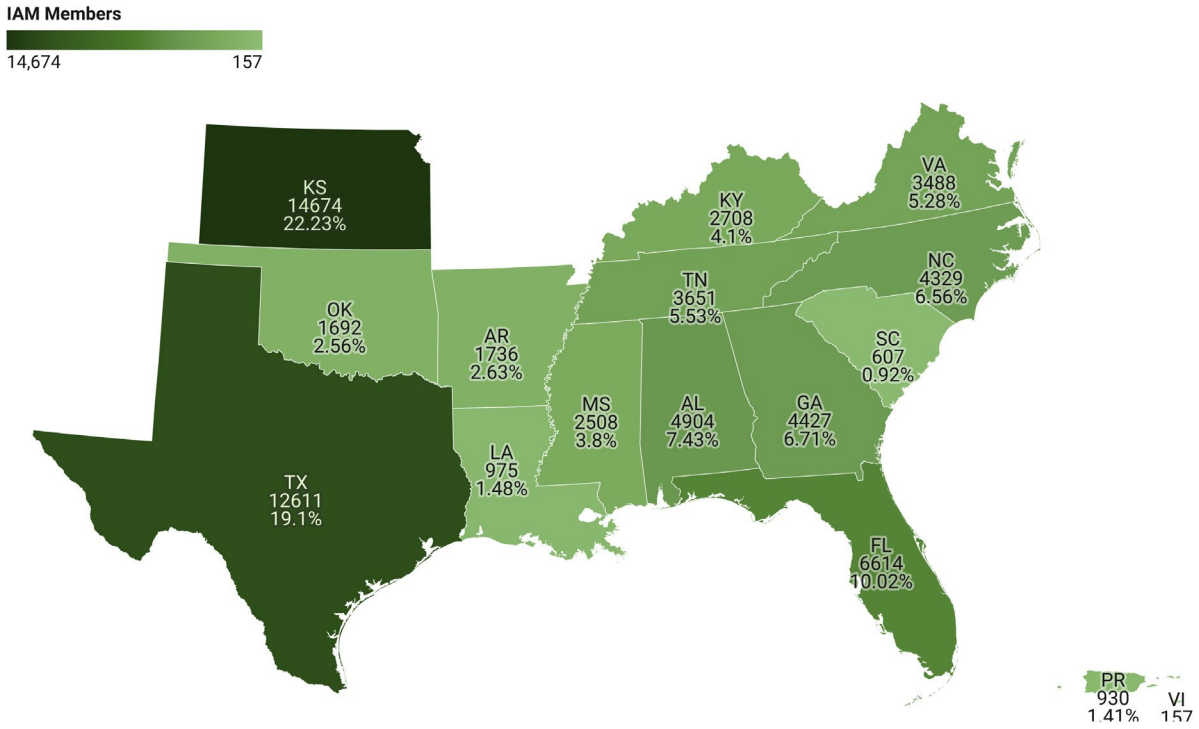
The IAM Southern Territory

Although IAM's Southern Territory is second to the IAM Western Territory in overall membership with 66,011 members in total, every state in the Territory (excepting Puerto Rico and the Virgin Islands) has passed so-called "right-to-work" laws.[99] These laws are meant to hinder labor's ability to collect dues vital to running their organizations.[100] Despite this challenge, the IAM maintains significant membership in the region.[101]

Kansas accounts for 22.23% of all IAM members in the Southern Territory, making it the largest state in terms of membership. The high membership in Kansas is primarily due to the significant aerospace industry presence in Wichita and other parts of the state[102] Texas follows with 19.1% of members. Florida and Georgia also have a significant IAM presence.

Geographic Distribution and Density of IAM Members in Southern Territory

This map shows the density of IAM membership across the Southern Territory. Darker shades indicate higher concentrations of members. Kansas (22.23%) and Texas (19.1%) have the highest numbers of IAM members. Other notable states include Florida (10.02%), Georgia (6.71%), and Alabama (7.43%).



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

The IAM Southern Territory is heavily influenced by the Aerospace Manufacturing & Related Services sector, which constitutes 59.2% of overall membership.[103] The Federal Government - National Security sector also plays a crucial role, making up 10% of membership, reflecting the presence of federal military and security installations. The Food and Beverage Manufacturing & Related sector is also significant, accounting for 5% of IAM members in the territory.

IAM Southern Territory Industries

IAM members in the Southern Territory are mainly concentrated in Aerospace Manufacturing & Related Services, which accounts for 59.2% of the membership. Other notable sectors include Federal Government - National Security (10.0%), Food and Beverage Manufacturing & Related (5.0%), Forest Products & Printing (4.9%), and Refineries, Chemical, Plastic, Rubber & Related Manufacturing (3.9%). Other Grouped Industries, representing sectors with less than 1.8% of the membership, make up 7.1% of the total.

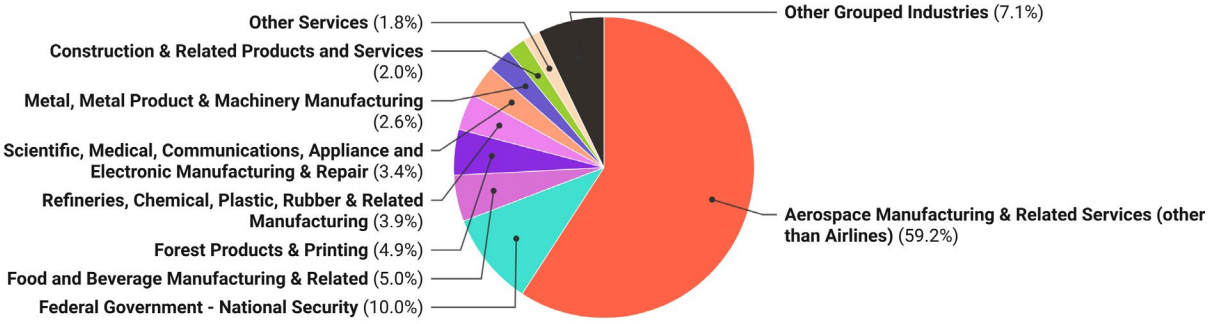
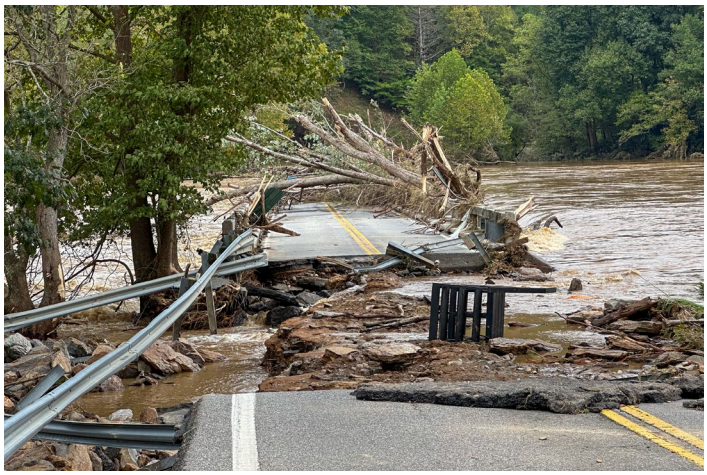


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

Climate Change Impacts on the IAM Southern Territory

The IAM Southern Territory, which includes 14 states and the U.S. Caribbean territories of Puerto Rico and the Virgin Islands, faces diverse challenges related to climate change. Climate change is causing a range of issues across the Southern Territory, including rising temperatures, shifting rainfall patterns, droughts, wildfires, stronger hurricanes, and flooding. Coastal areas are experiencing sea level rise and worsening storm surges. Western Gulf Coast sea levels are projected to rise 19–27 inches by 2050. **Also, by 2100, with an estimated 3.3 feet rise along the Texas Gulf Coast, a Category 2 hurricane could cause 3–10 times more damage to buildings and result in an additional $10.4 billion in damages (in 2022 dollars).** These changes are disrupting ecosystems, threatening water supplies and food production, and endangering communities' health and safety.[104] The Caribbean territories are particularly vulnerable to increased storm intensity and sea level rise.[105] Along with the Western Territory, IAM members in the Southern Territory may face some of the most diverse and intense climate impacts.



Industry-Specific Climate Impacts and Implications for IAM Workers in the Southern Territory

The IAM Southern Territory is home to a wide variety of industries spread across different states, and each of these industries is dealing with its own set of problems caused by climate change. The "Industry-Specific Climate Impacts for IAM Workers in the Southern Territory" table shows the main industries in the region, the states where they have a major presence, and the specific ways that climate change is affecting them.[106]

Industry-Specific Climate Impacts for IAM Workers in the Southern Territory

This table lists six key industries in the IAM Southern Territory. States where over 10% of IAM members work in the industry are highlighted along with the total percentage of members in that industry (e.g., 82.14% of IAM members in Alabama work in aerospace manufacturing and related services). The table further highlights the climate change risks in those states and the climate change impacts on key industries in those areas.

Industry	States	Climate Change Risks	Climate Change Impacts
Aerospace Manufacturing & Related Services	Alabama (82%), Arkansas (20%), Florida (59%), Kansas (92%), North Carolina (31%), Oklahoma (73%), South Carolina (75%), Texas (80%)	Increased heat; Sea level rise; Increased hurricane intensity; Heavy rainfall; Increased droughts; Severe storms	Reduced worker productivity; Increased cooling costs; Threats to coastal facilities and infrastructure; Supply chain disruptions; Water shortages; Extensive facility damage and downtime; Increased insurance costs
Federal Government National Security	Arkansas (23%), Georgia (30%), Puerto Rico (22%), South Carolina (19%)	Increased temperatures; Heavy rainfall events; Heatwaves	Declining equipment and infrastructure reliability; Challenges to base operations and logistics; Increased energy costs for cooling; Health risks for personnel
Food and Beverage Manufacturing & Related	Arkansas (33%), Florida (21%), Virginia (13%)	Increased temperatures; Increased precipitation; Heatwaves	Threats to food storage and processing conditions; Disrupted supply chains; Damaged facilities; Reduced productivity; Increased cooling costs
Forest Products & Printing	Georgia (18%), Mississippi (11%), Puerto Rico (20%)	Increased temperatures; More frequent heatwaves; Heavy rainfall events	Deteriorating forest health and productivity; Increased fire risk; Reduced worker productivity; Infrastructure damage; Disrupted production
Refineries, Chemical, Plastic, Rubber & Related Manufacturing	Arkansas (17%)	Increased temperatures; More frequent heatwaves; Heavy rainfall events	Threats to chemical processes; Increased cooling costs; Increased health risks; Reduced productivity; Damaged infrastructure; Disrupted production
Construction & Related Products and Services	Kentucky (22%), Mississippi (47%), North Carolina (63%), Virginia (41%)	Increased temperatures; Heavy rainfall events	Reduced worker productivity; Increased cooling costs; Delayed projects; Damaged materials

Data sources: Climate impacts and risks are summarized from the NOAA National Centers for Environmental Information State Climate Summaries 2022 and various chapters of the Fifth National Climate Assessment (2023). Industry representation percentages were provided by the International Association of Machinists and Aerospace Workers (IAM).

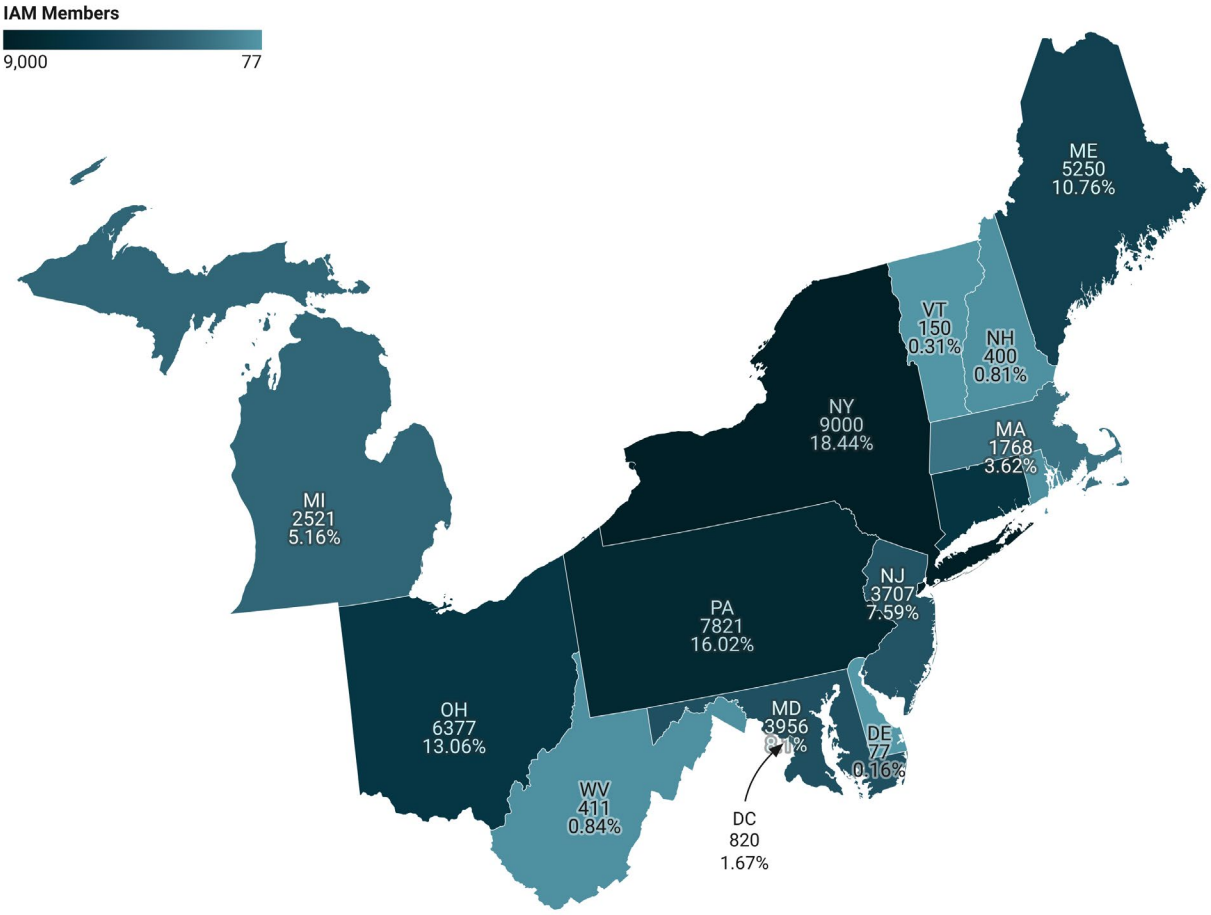
Table created by Alejandra Rodriguez Diaz, Cornell ILR-Climate Jobs Institute.

The IAM Eastern Territory

The IAM Eastern Territory, with nearly 50,000 members, includes some of the IAM's most union-dense states.[107] The territory includes arguably the most union-friendly state in New York, the nation's capital in Washington, DC, manufacturing hotbeds and politically-important states like Michigan, Ohio, and Pennsylvania, and West Virginia–perhaps the state most associated with fossil fuel extraction.

Geographic Distribution and Density of IAM Members in Eastern Territory

This map shows the density of IAM membership across the Eastern Territory. Darker shades indicate higher concentrations of members. New York (18.44%) and Pennsylvania (16.02%) have the highest numbers of IAM members. Other notable states include Ohio (13.06%), Connecticut (13.38%), and Maine (10.76%).



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

The leading industry in the Eastern Territory is Aerospace Manufacturing & Related Services, representing 20.6% of IAM members in the area.388 Shipbuilding, Repair and Maritime Services follows at 11%, reflecting significant contributions from maritime industries, especially in coastal states.

IAM Eastern Territory Industries

IAM members are distributed across a range of industries in the Eastern Territory. The largest sectors are Aerospace Manufacturing & Related Services at 20.6% and Shipbuilding, Repair, and Maritime Services at 11.0%. Other significant sectors include Metal, Metal Product & Machinery Manufacturing (10.7%) and Bus, Trucking, Delivery Services, and Other Non-Rail Transit (7.8%). Other Grouped Smaller Industries, which include sectors with less than 4.0% of the membership each, account for 23.3% of the total.

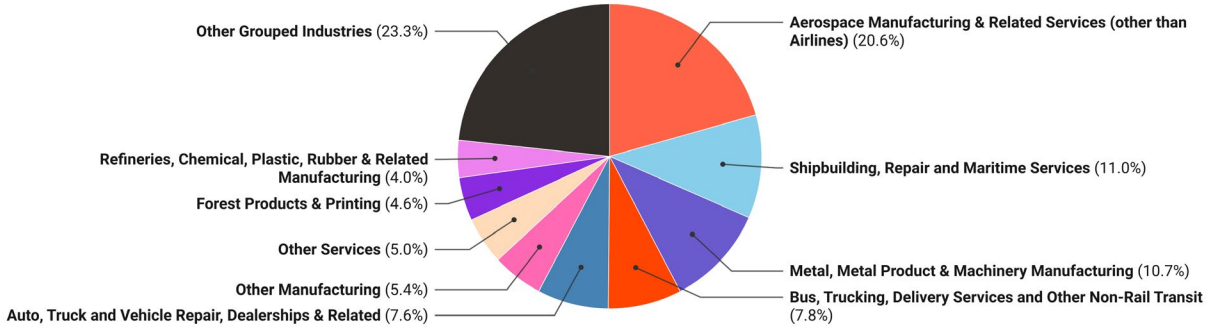


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

Climate Change Impacts on the IAM Eastern Territory

The Eastern Territory of the IAM covers 14 states plus Washington, DC, with a wide variety of climate risks.[108] These climate change impacts have significant implications for IAM members and industries across the territory.

In the Northeast region, aerospace workers in Connecticut and shipbuilders in Maine face challenges related to extreme weather events and rising temperatures.[109] Massachusetts and New Jersey are experiencing rising sea levels that threaten coastal areas with flooding and erosion.[110] Rhode Island faces significant risks from rising sea levels, with projections up to 4 feet by 2100.[111]

Inland communities are at risk, too. Pennsylvanians who live near gas extraction and industrial agriculture sites are experiencing greater air pollution.[112] Changing weather on the Great Lakes affects critical shipping and port operations in places like Michigan and Ohio.[113] Anywhere you go, there are serious climate risks to IAM members and their families.

Industry-Specific Climate Impacts and Implications for IAM Workers in the Eastern Territory

The “Industry-Specific Climate Impacts for IAM Workers in the Eastern Territory” table below outlines key industries within the area, detailing their presence in specific states and the potential climate change impacts. This region faces significant environmental changes, which are likely to affect operations, infrastructure, and worker safety across sectors like aerospace manufacturing, transportation, and metal products.

Industry-Specific Climate Impacts for IAM Workers in the Eastern Territory

This table lists nine key industries in the IAM Eastern Territory. States where over 10% of IAM members work in the industry are highlighted along with the total percentage of members in that industry (e.g., 91.2% of IAM members in the District of Columbia work in the Forest Products & Printing industry). The table further highlights the climate change risks in those states, and the climate change impacts on key industries in those areas.

Industry	States	Climate Change Risks	Climate Change Impacts
Aerospace Manufacturing & Related Services	Connecticut (68%), Maryland (54%), West Virginia (30%), Rhode Island (26%), Michigan (18%), Pennsylvania (13%), Ohio (13%), New York (10%)	Rising temperatures; Extreme weather events; Sea level rise	Increased cooling costs and heat stress; Production and supply chain disruptions; Flooding risks
Shipbuilding, Repair, and Maritime Services	Connecticut (11%), Maine (86%)	Rising sea levels; Increased storm intensity; Changes in sea temperature and currents	Flooding of coastal infrastructure; More frequent damage to vessels; Changes in ship design
Metal, Metal Product & Machinery Manufacturing	Ohio (29%), Michigan (15%), Pennsylvania (12%), Vermont (58%), New York (12%), Connecticut (12%)	Rising temperatures; Extreme weather events	Increased energy costs and quality control issues; Supply chain disruptions and equipment damage
Bus, Trucking, Delivery Services and Other Non-Rail Transit	Delaware (88%), Michigan (15%), New Jersey (12%), Massachusetts (12%), Michigan (15%), New Hampshire (18%), New York (14%)	Rising temperatures; Extreme weather events; Increased precipitation	Higher vehicle maintenance cost and quality control issues; Route disruptions and delays; Costs stemming from the transition to low-emission vehicles
Auto, Truck, Bus, Motorcycle & Related Manufacturing	Pennsylvania (18%)	Rising temperatures; Extreme weather events; Increased frequency of floods	Increased cooling costs in plants; Supply chain disruptions; Need for flood-resistant manufacturing facilities
Forest Products & Printing	District of Columbia (91%), Michigan (10%)	Increased frequency of wildfires; Increased pest activity; Changes in precipitation patterns	Reduced timber quality and quantity; Changes in wood fiber characteristics affecting paper quality; Variability in wood and pulp supply
Health Care	Rhode Island (42%), New York (11%)	Increased frequency of extreme heat events; Extreme weather events	Surge in heat-related illnesses and hospital admissions; Potential damage to facilities
Other Manufacturing	Vermont (38%), Massachusetts (15%), Michigan (12%), West Virginia (12%)	Increased frequency of extreme heat events; Changes in precipitation patterns	Increased cooling costs and productivity losses; Sudden changes in water availability for manufacturing
Federal Government - National Security	Maryland (12%), New Hampshire (66%)	Increased frequency of extreme heat events; Extreme weather events	Increased cooling costs and heat stress on personnel; Potential damage to military installations

Data sources: Climate impacts and risks are summarized from the NOAA National Centers for Environmental Information State Climate Summaries 2022 and various chapters of the Fifth National Climate Assessment (2023). Industry representation percentages were provided by the International Association of Machinists and Aerospace Workers (IAM).

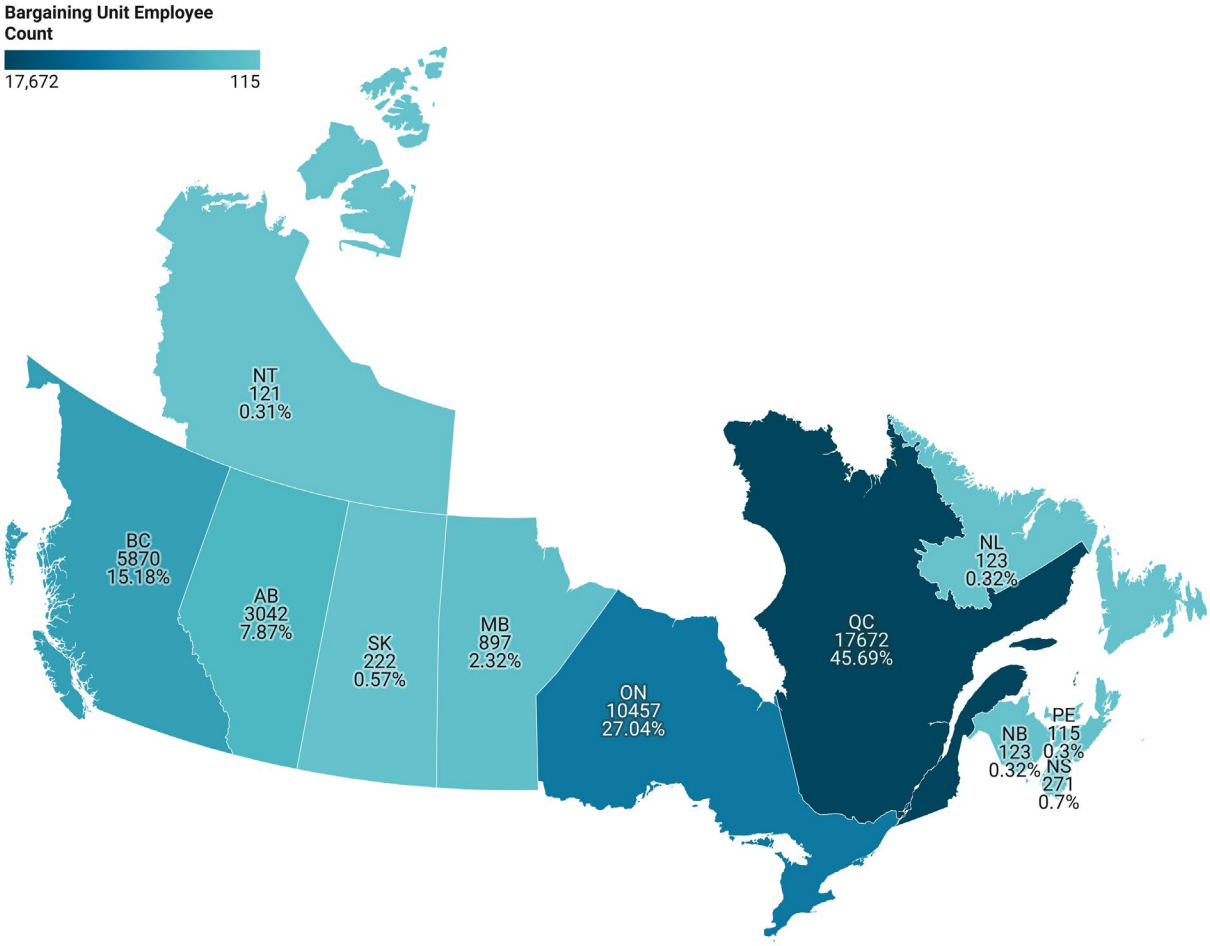
Table created by Alejandra Rodriguez Diaz, Cornell ILR-Climate Jobs Institute.

The IAM Canadian Territory

Quebec is home to nearly half of the Canadian Territory's total membership. Ontario–Canada's most populated province–also boasts a strong membership of over 12,000.[114] The IAM's Air Transportation Territory only covers the United States, so Canadian workers in this industry are included in the country's overall membership totals.

Geographic Distribution and Density of IAM Members in Canada Territory

IAM membership density across Canada is illustrated here, with darker shades indicating higher concentrations. Quebec (45.69%) and Ontario (27.04%) have the highest membership, followed by British Columbia (15.18%) and Alberta (7.87%). Other provinces and territories have lower membership levels, with Prince Edward Island and Newfoundland and Labrador having the fewest members.



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

Air transportation makes up over half of all members in Canada. Aerospace Manufacturing and Related Services is also a key industry in the country, especially in Quebec. Healthcare makes up a more significant portion of IAM membership in Canada than it does in the United States, with Ontario leading the way in organizing this sector. British Columbia, which boasts the third-highest membership totals amongst Canadian provinces–has a diverse industrial composition.[389]

IAM Canada Territory Industries

IAM members in the Canada Territory are mainly in Air Transportation, which comprises 51.2% of the membership. Other key sectors include Health Care (11.1%), and Aerospace Manufacturing & Related Services (10.7%). Additional industries include Mining, Quarries and Oil & Gas Extraction (4.6%), Construction & Related Products and Services (4.2%), and Auto, Truck, Bus, Motorcycle & Related Manufacturing (3.3%). Sectors with less than 3.1% membership are grouped into Other Grouped Industries, which account for 11.8% of the total.

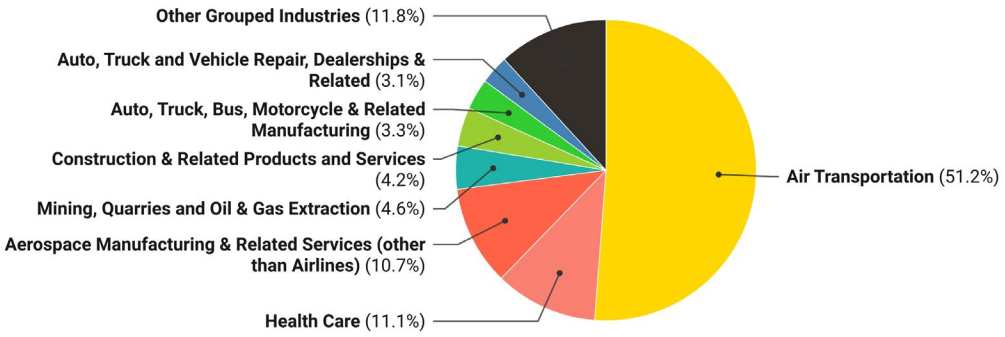


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

Climate Change Impacts on The IAM Canadian Territory

The IAM Canada region spans provinces and territories across five distinct climate zones, each facing significant impacts from climate change.[115] Temperatures in Canada are increasing at twice the global average rate, with northern regions experiencing even more rapid warming.[116] The primary consequences of climate change in Canada include increased frequency and severity of heat waves, reduced extreme cold events, extended growing seasons, rising sea levels, more frequent droughts and wildfires, and a shift from snow to rain.[117]

Industry-Specific Climate Impacts and Implications for IAM Workers in the Canadian Territory

The IAM Canada Territory encompasses various industries across several provinces and territories, each confronting distinct climate-related challenges. The “Industry-Specific Climate Impacts for IAM Workers in Canada Territory” table outlines the risks IAM workers face on the job and in their communities.

Industry-Specific Climate Impacts for IAM Workers in Canada Territory

This table lists six key industries in the IAM Canada Territory. Provinces where over 10% of IAM members work in the industry are highlighted along with the total percentage of members in that industry (e.g., 69% of IAM members in Quebec work in Air Transportation). The table further highlights the climate change risks in those provinces, and the climate change impacts on key industries in those areas.

Industry	States	Climate Change Risks	Climate Change Impacts
Air Transportation	Alberta (19%), British Columbia (43%), Newfoundland and Labrador (100%), Nova Scotia (76%), Ontario (39%), Quebec (69%), Saskatchewan (33%)	Increased frequency of extreme weather events; Rising temperatures; Increased wildfire activity	Disruptions; Damage to infrastructure; Higher cooling costs; Heat stress on workers; Reduced visibility affecting operations; Air quality issues
Auto, Truck, Bus, Motorcycle & Related Manufacturing	Manitoba (65%), New Brunswick (36%)	Temperature fluctuations; Extreme weather events; Rising temperatures	Changes in material performance; Adjustments needed in manufacturing processes; Supply chain disruptions; Potential damage to manufacturing facilities; Increased cooling costs in factories; Heat stress on workers
Health Care	Ontario (40%)	Increased frequency of heatwaves; Degraded air quality; Extreme weather events	Surge in heat-related illnesses; Increased strain on emergency services; Rise in respiratory ailments; Increased demand for air filtration; Potential damage to facilities; Disruptions in patient care and medical supply chains
Metal, Metal Product & Machinery Manufacturing	New Brunswick (41%)	Rising temperatures; Extreme weather events	Increased energy costs; Heat-related quality control issues; Disruptions in supply chains; Damage to large, immovable machinery
Mining, Quarries and Oil & Gas Extraction	Alberta (52%), Northwest Territories (100%)	Increased frequency of extreme weather events; Melting permafrost; Rising temperatures	Disruptions to extraction processes; Transportation challenges; Infrastructure damage; Challenges accessing remote sites; Increased energy costs for cooling; Changes in water availability for operations
Other Services	Nova Scotia (24%)	Increased frequency of extreme weather events; Sea level rise and storm surges	Disruptions to service delivery; Damage to service infrastructure; Flooding of coastal service facilities; Increased insurance costs for at-risk locations

Data sources: The data presented in this table is derived from multiple authoritative sources, including Government of Canada reports on climate change impacts across various regions of Canada (Luham et al., 2023; Hancock et al., 2022; Sauchyn et al., 2020; Douglas & Pearson, 2022; Dietz & Arnold, 2021) and peer-reviewed research on climate vulnerability in Arctic transportation (Debortoli et al., 2019). Industry representation percentages were provided by the International Association of Machinists and Aerospace Workers (IAM) in 2024.

Table created by Alejandra Rodriguez Diaz, Cornell ILR-Climate Jobs Institute.

Climate Impacts in Sectoral Territories & Divisions

The IAM Air Transport Territory

The IAM Air Transport Territory represents over 60,000 workers, including mechanics, customer service representatives, ramp workers, flight attendants, security agents and Network Operations Control agents for commercial and freight travel. These members are spread across 25 states, with Illinois making up over 40% of the Territory's workforce. Just five states–Illinois, Texas, Washington, Hawaii, and California–account for over 75% of the territory's membership.[118] Major employers in the industry include United Airlines, Southwest Airlines, American Airlines, Hawaiian Airlines, Spirit Airlines, Alaska Airlines, and Swissport.[119] A small percentage of the IAM Air Transport members work in wholesale distribution of petroleum and petroleum products, which are essential for fueling and maintaining aircraft.[120]

IAM Air Transport Territory Sub Industries

IAM members in the Air Transport Territory are mainly in Scheduled Passenger Air Transportation (80.08%). Other sub-industries include Scheduled Freight Air Transportation (14.12%), Other Airport Operations (3.07%), and Other Support Activities for Air Transportation (2.26%). Petroleum and Petroleum Products Merchant Wholesalers account for 0.47%.

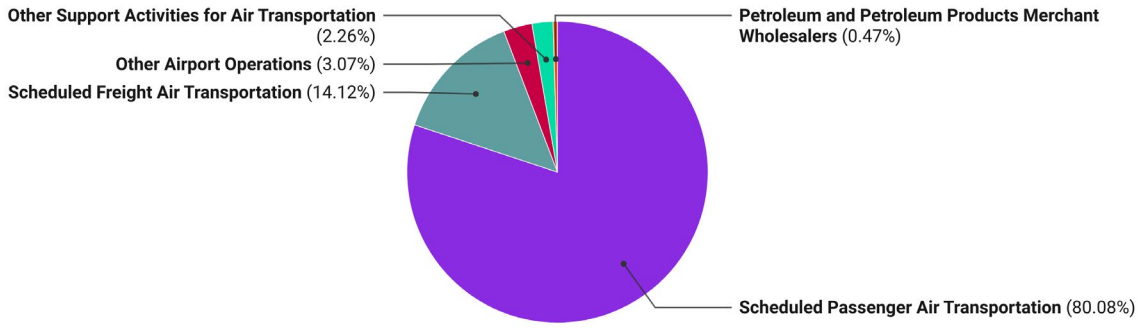


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

The aviation sector is a major carbon emitter, and it is also vulnerable to the effects of climate change. Record heat affects aircraft performance, reducing plane carrying capacity, and even grounding flights.[121] Frequent and severe extreme weather events, like floods, hurricanes, tornados, rising seas and more, damage essential infrastructure, ground flights, and increase hazards at airports.[122] "Climate change has impacted the industry on the whole," says Air Transport Territory Chief of Staff Edison Fraser, "whether it's the members or the passengers or the airlines".[123]

Left unaddressed, extreme weather will continue to upend working conditions and threaten the air transport industry itself.

IAM members in the industry face increasing on-the-job risks linked to climate change. A 2021 report from the European Transit Union Institute identified several heat-related risks to workers, including heat stroke, cramps, exhaustion, organ failure, and fever.[124] People laboring under heat stress are more likely to suffer accidents and injure themselves or others, and prolonged exposure to extreme heat and UV also increases the risk of chronic eye and organ illnesses.[125] This also raises equity concerns, as large percentages of airport service workers in the United States are immigrants and people of color.[126]

Working in primarily non-climate controlled facilities – such as on tarmacs or in trucks – poses its own health issues.[127] "Most of those workers are black and brown, and man, are they suffering," reports Human Rights Director Nicole Fears. "They are subjected to heat that we know is unhealthy. 100 degrees doesn't feel like 100 degrees anymore."[128] According to IAM Director of Safety and Health Michael Oathout, workers often interpret heat stress as common illnesses, and go to their doctor, who may not account for or fully understand workplace hazards.[129] The best way to ensure safe working conditions is to address new hazards before they arise.

As airlines scramble to deal with climate-caused disruptions, working conditions in the industry are deteriorating. The FAA reports that weather is responsible for more than 75% of flight delays–and weather patterns are becoming more difficult to predict.[130] Customer service workers shoulder the burden of delays, prolonged flights, reroutes, and last-minute cancellations by managing angry travelers and assisting those in difficult situations.[131] Extended travel times mean longer hours on the job, and employers often push mandatory overtime to cover for unexpected disruptions.[132] Leaders in the Air Transport Division have negotiated increased

compensation and limits to mandatory overtime, and such efforts are likely to continue as weather emergencies take a larger toll on the industry.

Rising heat has been an important issue in the campaign at Delta Airlines, where the IAM is organizing ramp, cargo, and tower workers. For example, many Delta workers are required to wear "bump caps" to reduce the risk of head injury. However, in many classifications, the caps serve no obvious safety purpose and create new hazards by trapping heat. According to Oathout, Delta workers have recorded temperatures under the caps to be 20–30 degrees above outdoor temperatures.[133]

The Delta Organizing Campaign & Bump Caps

Delta is the only U.S.-based mainline carrier where a union does not represent flight attendants, fleet service, and mechanics. As a result, tens of thousands of Delta workers lack a voice on the job. As part of a multi-union campaign, the IAM is currently organizing approximately 20,000 ramp, cargo, and tower workers.[134]

Gameli Appiah is a ramp worker and union organizer at Atlanta International Airport. Having previously worked at UPS, Appiah understands the union difference. "I was surprised when I came to Delta to see the shape the equipment was in. It's a lot of equipment that shouldn't be out there. It's dangerous."[135]

IAM member-led safety committees help implement informed safety procedures. At Delta, policies come down from executives with their eyes on the bottom line. Workers face disciplinary action if they don't wear a "bump cap," supposedly to reduce head injuries. The caps–which often serve no obvious safety purpose–can raise temperatures 20–30 degrees for the person wearing it. "Climate justice is affecting workers, and in most cases, it's always going to hit the folks on the bottom,"[136] says Human Rights Director Nicole Fears. "If you're outside, you're definitely suffering."[137] What's more, Delta only provides seven days off for sickness and personal leave, often forcing sick workers to choose between their health and their families' needs.

"Nobody should be getting ill or dying from heat related illnesses," argues Appiah, "We can prevent [tragedy] with basic safety measures, proper staffing, and education, instead of being so focused on profit that somebody doesn't make it home to their family."[138] The climate crisis heightens the need for workers to have a voice on the job. The Delta campaign demonstrates why climate adaptation must be a core part of new organizing campaigns.

At IAM-represented worksites, safety committee members walk the shop and collect data that informs safety procedures and bargaining priorities.[139] When hazards arise, union officers and representatives can draw from up-to-date information to craft recommendations or demands. "The union difference" says Fraser, "is that we have established safety procedures…If it's brought to our attention by the workers, we address those issues with the company."[140]

In addition to threatening workers, extreme weather threatens the future of air travel. In May 2024, extreme turbulence rocked a Singapore Airlines flight. High winds threw passengers and crew members throughout the cabin. Pilots steered the flight to an emergency landing, but dozens of passengers sustained injuries–and one lost his life.[141] Lightning storms and high winds all disrupt air travel by damaging planes, delaying flights, and endangering people on the ground.[142]

Sea level rise, a direct consequence of the warming climate, already threatens hundreds of coastal airports around the world.[143] In 2012, flooding from Hurricane Sandy shut down New York's LaGuardia Airport for three days.[144] Major worksites, such as Newark Airport, are at risk of inundation if global temperatures continue to rise.[145] Violent storms, wildfires, and floods have endangered IAM members at airports in Puerto Rico, Guam, and Hawaii.[146] Disruptive and dangerous weather events are making aviation jobs more hazardous and precarious.

Aircraft emissions, including CO2, nitrogen oxides, and particulates, have a substantial warming effect on the climate.[147] A shift toward more sustainable aviation practices that centers workers' perspectives will improve lives and the industry's long-term outlook. Workers on the frontlines can help lead the way. Fraser sees transparent long term planning as a win-win proposition: "The public would recognize an airline that comes out and says, 'we've met with our unions, we're going to [decarbonize] in a way that doesn't affect work.'"[148]

The IAM Rail Division

The Transportation Communications Union (TCU/IAM) and IAM District 19 together form the IAM Rail Division, representing tens of thousands of ticket agents and rail machinists who repair locomotives and heavy equipment.[149] The IAM's Rail Division membership is spread across 31 states and the District of Columbia, with DC and Virginia having particularly high membership numbers.[150]

The vast majority of rail division members work for line-haul railroads, which transport passengers or cargo over long distances on mainline rail networks.[151] When it comes to rail freight, the US Department of Transportation's Federal Railroad Administration shows a roughly even split in overall rail cargo between consumer goods and bulk commodities, like agricultural and energy products. Coal also makes up a significant portion of the goods shipped by rail in the United States.[152]

IAM Rail Division Sub Industries

IAM members in the Rail Division are primarily in Line-Haul Railroads, comprising 93.51% of the membership. Other sub-industries include Railroad Rolling Stock Manufacturing (4.52%) and Regulation and Administration of Transportation Programs (0.80%). Smaller sectors such as Support Activities for Rail Transportation (0.62%) and various merchant wholesalers each account for less than 0.2%. Commuter Rail Systems currently have only 1 member reported.

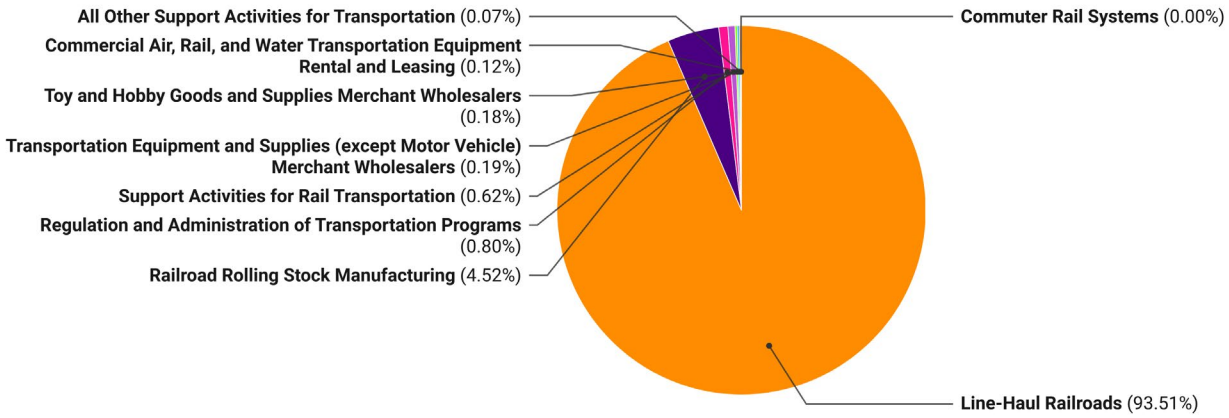


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

The entire rail industry faces increasing risks as a consequence of climate change. A 2020 study found that temperature-related delays could cost the U.S. rail network up to $60 billion by 2100.[153] The Federal Railroad Administration warns that weather events increasingly threaten the "safety, effectiveness, equity, and sustainability" of rail transportation.[154] An Amtrak assessment concluded that "Amtrak's assets have a wide range of vulnerability to various

climate stressors."[155] Economic and energy shifts also pose serious challenges to the industry and its workers. As the United States moves away from coal powered locomotives, freight lines will need to use other power sources.

Still, rail must play a central role in creating a climate-safe economy. Any viable path to decarbonization will require investments that increase the resilience and capacity of railroads. Rail is the most fuel-efficient way to transport freight in bulk. Furthermore, reducing emissions from transport has the immediate effect of improving air quality. Railroads create a cleaner and more efficient method of transporting goods and people.[156] Expanding existing networks is a climate-friendly job creator.

One obstacle to developing a 21st-century rail network is deteriorating conditions in the industry. So-called "precision scheduled railroading" (PSR) erodes safety standards and puts entire communities at risk. PSR entails consolidating freight loads into trains that stretch up to three miles long–while simultaneously reducing the number of workers assigned to run and maintain locomotives.[157] Rail Division Special Assistant to the President Josh Hartford describes the philosophy behind PSR as "run it harder, run it longer."[158] **In 2022, the IAM National VP Matt Hollis testified before Congress to report on the "complete and utter degradation" of the nation's railroads.** Private equity firms, Hollis warned, are deploying "business models that extract as much wealth as possible, to the detriment of workers, customers, and the public interest."[159] PSR has contributed to massive workforce reductions; companies laid off more than 20,000 rail workers in 2019 alone.[160] In 2020, *The Washington Post* reported that "the biggest cuts have been from the conductor and maintenance ranks."[161] In the IAM's shops across the country, "leaner" operations mean fewer skilled workers inspecting and maintaining tracks and locomotives.

The horrific derailment in East Palestine, Ohio, spotlighted the implications of companies' staffing decisions. In June 2024, the National Transportation Safety Board announced that a defective wheel bearing and faulty monitoring equipment caused the East Palestine disaster–as well as subsequent derailments in Delaware and Pennsylvania.[162] To avoid an even bigger catastrophe, rail workers were forced to trigger an explosion which spat toxic chemicals into the air, forcing thousands of residents to evacuate the surrounding areas. East Palestine and the broader region will now contend with the long term consequences of the catastrophe.[163] "If the right people had been doing the right inspections…[the derailment at] East Palestine could have been prevented," says Hartford.[164]

PSR and other low-road business models threaten the future of North American rail, and climate change is compounding existing problems. In the summer of 2024, heat waves swept the Eastern seaboard and forced Amtrak to shut down service along the Northeastern Corridor.[165] "That's becoming more and more common," reports Hartford, "We see these things [repeatedly]."[166] High winds, rockslides, heat waves, and snow storms damage essential infrastructure.[167] In coastal regions, hurricanes and floods wash out tracks.[168] In February

2024, storms pummeled California, causing landslides and coastal erosion that blocked lines on the Los Angeles-San Diego route.[169] Thick fog and torrential rain reduce visibility. Critical infrastructure such as electric wiring and railroad tracks cannot withstand extended bouts of extreme weather. Even worse, outdoor workers must contend with extreme temperatures, while manufacturing workers face rising temperatures and worsening air quality.[170]

Despite this turmoil, the current moment presents an opportunity to leverage federal and state investments in green infrastructure to build a better industry. The IRA created a $3 billion Department of Energy loan program for manufacturing low emissions heavy duty vehicles–including locomotives.[171] The Bipartisan Infrastructure Law includes an additional $102 billion earmarked for railroad upgrades.[172]

Despite unprecedented federal investment in climate infrastructure, some companies remain unwilling to invest in technologies and workforce development that can protect the industry's future.[173] Advocating for railroad expansion and decarbonization is the most direct way the IAM can help address the climate crisis and build a more powerful union in the rail industry. Several initiatives, such as forging new routes, expanding service on existing routes, increasing freight capacity, investing in passenger rail, growing Amtrak's fleet, and manufacturing green locomotives, have massive job creation potential. **Legislators, investors, unions, and high-road employers can partner to advance proven models, such as Metra's apprenticeship program in Chicago, to recruit and retain the next generation of railroaders.**[174]

Some IAM members are already seeing benefits from modernizing investments in the U.S. rail network. Forty-six unions and companies comprise the U.S. High Speed Rail Coalition.[175] The coalitions secured an MOU with Brightline Holdings to build a high-speed rail system connecting Las Vegas and Southern California. According to Brightline, trains on the new line will transport passengers at speeds of up to 200 miles per hour. As travelers make the long journey by train rather than automobile, California and Nevada could see carbon emissions reduced by over 400,000 tons annually.[176] The project is expected to create thousands of new jobs, and it provides a window into how a well-managed rail buildout could benefit IAM members.[177]

Brightline Train Project

Nearly three-quarters of Americans support creating a nation-wide high-speed rail network. An ambitious expansion and modernization of existing rail infrastructure would spur job creation and reduce emissions from the transportation sector.[178] The Biden administration mobilized billions to upgrade rail infrastructure,[179] and the American High Speed Rail Act, currently pending in Congress, would contribute an additional $205 billion to jumpstart construction.[180] Investment in our railroads is a popular and practical approach to combating the climate crisis.

IAM members have the skills necessary to build and maintain high-speed rail systems. As part of the High Speed Rail Coalition, the IAM secured a memorandum of understanding (MOU) ensuring that the "Brightline West" high-speed rail project will be built, operated, and maintained by union workers. The project will create 35,000 jobs during construction, 1,000 permanent jobs, and annually remove 400,000 tons of CO2 from the air. Additionally, the IAM has reached a Voluntary Recognition Agreement with Siemens Mobility to represent workers who will build state-of-the-art trains for Brightline West.[181]

The all-electric Brightline West system will service a 218-mile route connecting Las Vegas and Los Angeles. At speeds reaching over 186 miles per hour, the trains will transport passengers at half the average driving time.[182] The project broke ground in 2024 with the goal of being open in time for the 2028 Summer Olympics in Los Angeles.

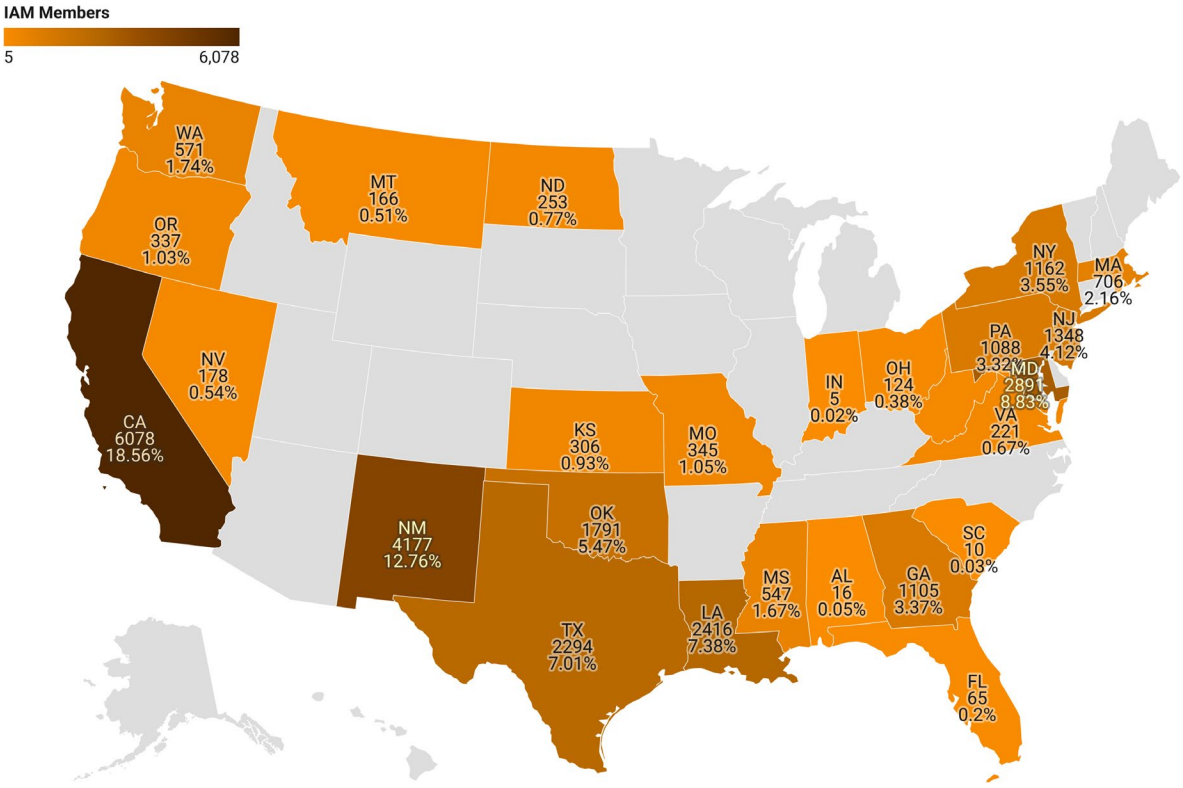
More than one-third of the world's track miles are electrified, with China, India, and Europe targeting fully electric and high-speed rail networks.[183] Meanwhile, less than 1% of North American rail lines are electrified.[184] Building a climate safe rail network, where renewable energy powers high-speed locomotives, is a chance for rail unions to help members, travelers, and communities across the country.

IAM DC and Vicinity Territory & Federal Government Workers

The IAM's DC and Vicinity Territory represents a diverse set of employees within the federal government. This territory has members in 28 states through the National Federation of Federal Employees (NFFE), an IAM-affiliated national union that represents 110,000 federal workers. NFFE members include 50,000 civilian military employees, all passport processing workers, 10,000 healthcare professionals in the Veterans Administration, 10,000 Forest Service workers caring for federal lands, and 10,000 Wildland Firefighters.[185] NFFE members can be found in 35 additional government agencies including the Government Service Administration. Outside the NFFE and the DC & Vicinity Territory, over 36,000 additional IAM members work for federal contractors under the Service Contract Act (SCA). SCA contractors perform a range of jobs like mechanics, maintenance, operations, and training.

Geographic Distribution and Density of IAM Members in DC and Vicinity Territory

IAM membership density across the DC and Vicinity Territory is illustrated here, with darker shades indicating higher concentrations. California (18.56%) and New Mexico (12.76%) have the highest membership, followed by Texas (7.01%) and Louisiana (7.38%). Other states have lower membership levels, with some Midwestern and Northeastern states showing the lowest percentages.



Map: Alejandra Rodriguez Climate Jobs Institute • Source: International Association of Machinists and Aerospace Workers Territories and Departments • Created with Datawrapper

IAM DC and Vicinity Territory Industries

IAM members in the DC and Vicinity Territory are primarily concentrated in Federal Government - National Security, which accounts for 46.4% of the membership. Other significant sectors include Health Care (21.1%), Forest Products & Printing (15.4%), and Other Services (10.5%). Additional industries include State and Local Government - Other (6.3%) and Utility (0.3%).

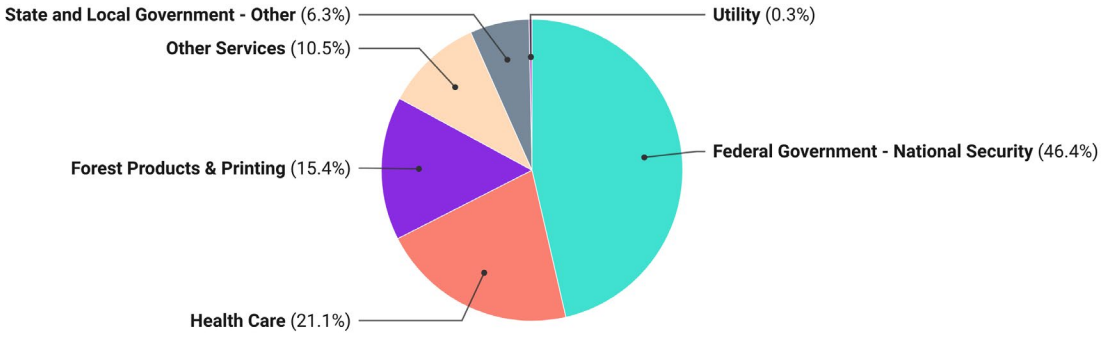


Chart: Alejandra Rodriguez Climate Jobs Institute • Source: The International Association of Machinists and Aerospace Workers (IAM) • Created with Datawrapper

IAM members in the federal government face a number of challenges due to climate change. One of the most dramatic examples are wildland firefighters, where the increased frequency and intensity of forest fires are added stressors to a dangerous job. **Climate change is causing hotter, drier conditions that have increased the frequency and severity of wildfires over the past 30 years.** In that time, fires have doubled, with 8 million acres of forest burning annually in the United States.[186] In Canada (where NFFE does not represent members), an average of over 6 million acres of forest have burned annually since 1990.[187]

But these averages do not truly capture the growth of wildfires in recent years. While the United States had a relatively tame wildfire season in 2023, Canada had "the most destructive ever recorded" according to government statistics, with over 40 million acres burned.[188] Firefighters not only face high risks of injury and death dealing with these fires, but they also are at high risk for mental health and respiratory problems.[189] Additionally, firefighting conditions are a known cause of cancer.[190]

On top of the health risks, low pay is leading to high turnover and low application rates to firefighting positions.[191] Over the last 3 years, the Forest Service has seen a 45% attrition rate for permanent employees in the fire service. An understaffed and inexperienced workforce has been left to contend with more intense and fast-moving blazes.[192] Early in his presidency, President Biden authorized wage increases of up to $20,000 a year for wildland firefighters. But these raises have not been made permanent and are at the whim of congressional action every year.[193]

Climate-conscious policy making is critical to the health of federal workers and the future of their jobs.

Additionally, many SCA workers are employed by Department of Defense (DoD) contractors and work on military bases alongside the NFFE-represented civilian military workers. Military bases face particularly high climate risks, as over one-third are near coastlines and are vulnerable to sea level rise and extreme weather events.[194] When climate disasters strike military installations, they extract a high cost. In 2018, hundreds of IAM members at Tyndall Air Force Base (AFB) witnessed Hurricane Michael destroy 500 buildings and cause $4.7 billion in damages.[195]

Despite these challenges, climate action also presents many opportunities for growth in the territory and in the federal sector more broadly. As the federal government decarbonizes its operations, IAM members stand to benefit from new work opportunities and safer workplaces. **The Department of Defense (DoD) climate action plan includes steps to move towards 100% carbon pollution-free electricity, 100% zero-emission vehicle fleet acquisitions, and net-zero emissions buildings, campuses, and installations.**[196] To meet these goals, the DoD is investing

in massive projects with serious price tags. In 2024, the military has requested $5.1 billion for "enhancing combat capability and mitigating climate risk." Of those funds, $3.7 billion is for installation, resilience and adaptation.[197]

As a pilot, the Army has constructed a net-zero base at Fort Hunter Liggett in CA, where the IAM represents members. At Fort Hunter Liggett, construction of a micro grid, a solar power plant, and battery storage will produce more energy than the base uses.[198] At Edwards AFB, the largest DoD public-private collaboration to date employed union labor to build 2 million solar panels that generate 1,300 MW of power.[199] Many of the projects linked to this investment in climate adaptation and mitigation for the military will be completed by IAM-represented military contractors. Additionally, NFFE-represented members are in civilian military positions that administer contracts.

NFFE members in the Government Services Administration (GSA) are responsible for federal buildings. The federal government owns and operates thousands of buildings in every corner of the country, and it has an ambitious goal "to retrofit 6% of the federal portfolio each year between 2022 and 2030… to reach 50% reduction by 2030."[200] Projects in federal buildings, including retrofits and decarbonization measures, are managed by union members in the GSA. Any legislation that would increase the pace of decarbonization in federal buildings would increase work opportunities for union members at the GSA, while also improving working conditions for IAM members who spend hours every day in government buildings.

Bargaining is another opportunity to ensure that IAM members are protected from the changing climate. In some contracts, the IAM has negotiated that SCA workers receive pay for days off in the event of a base closure due to extreme weather. Additionally, many SCA workers work outside and have bargained for the right to wear shorts as part of their uniforms.[201] Members have also benefited from the construction of shade structures for airplanes, reducing their exposure during heat waves and other extreme weather.

Climate Threats & Opportunities in Other Key IAM Sectors

In the previous section, we outlined some of the major climate impacts in the IAM's DC & Vicinity Territory, Air Transport Territory, and Rail Division. In this section, we dive more deeply into some of the other key sectors where IAM members work.

Aerospace: A New Frontier

From commercial travel to space exploration, the IAM represents workers across the North American aerospace industry. **Roughly 150,000 members build and service commercial and military airplanes, aircraft engines, missiles and rockets, and more.**[202] These workers are experiencing unexpected and serious climate-related problems.

Like IAM members in air transportation, aerospace workers are feeling the effects of high temperatures. Hotter summers trigger sudden changes to workplace conditions, and many

factories are not climate controlled. States like Texas and Arizona, home to thousands of IAM aerospace workers, are hit especially hard. Outdoor heat combines with machine-generated heat, building to potentially-dangerous levels throughout the day. Even workers in indoor facilities often find existing climate control systems overtaxed or ineffective.

Wildfires and pollutants also increasingly degrade air quality on worksites, highlighting the importance of quality ventilation.[203] IAM aerospace members are often in close proximity to hazardous materials. In 2020, an investigation at the Boeing Everett plant found that management negligence left hundreds of workers exposed to deadly carcinogens at levels far above OSHA's "permissible exposure limits."[204] The same conditions that threaten vital infrastructure also increase the risk of chemical leaks and other hazardous incidents. Industry safety standards must account for the immediate effects of climate change and the projected impact of introducing new fuels and production methods.

> ***"It's not even a debate when you start to talk about the jobs that will be created to solve the climate [crisis]"***
>
> IAM District 751 President Jon Holden

Climate change is also threatening existing production lines. Storms, wildfires and flooding increasingly damage critical infrastructure and halt production lines.[205] In December, 2023, the Pacific Northwest saw deadly flooding that forced school shutdowns, road closures, and work stoppages throughout the region.[206] A decarbonization strategy is critical to the sector's viability,

and change in the industry can create new work opportunities for IAM members. “It’s not even a debate when you start to talk about the jobs that will be created to solve the climate [crisis]” says IAM District 751 President Jon Holden.[207]

New sustainability practices will shape the future of the aerospace sector. Sustainable aviation fuels (SAFs) and engineering practices aimed at aerodynamic efficiency, aircraft mass reduction, and propulsion system improvements are on the way.[208] In Europe, for example, trade unions are pushing policymakers to attach labor protections to incentives for SAF production.[209] The Inflation Reduction Act authorizes a robust tax credit for producers of sustainable aviation fuels.[210] Furthermore, President Biden took executive action, including mobilizing billions in ongoing funding, to catalyze sustainable aviation fuel production. Companies such as Boeing, Airbus, and virtually all commercial airlines are now committing to electrification and using SAFs to decarbonize operations.[211] The IAM can use its membership power and industrial expertise to influence how companies introduce new innovations.

Aerospace workers also have skills that could be applied to manufacturing and other work in emerging industries in the clean energy economy. “Offshore wind is one we have high hopes for,” says Holden. Building out an offshore wind supply chain, for example in the Pacific Northwest, could create new roles for IAM machinists, who can build turbines, ship parts, and maintain machines on production lines.[212]

Sustainable Aviation Fuels (SAF)

Sustainable Aviation Fuel (SAF) is an alternative to traditional jet fuel, produced from renewable and waste-derived sources such as used cooking oil, animal fats, agricultural residues, and non-edible plants. SAF can reduce greenhouse gas emissions compared to conventional jet fuel. Over its lifecycle, SAF can lower these emissions by up to 80%, as the materials used absorb CO2 during their growth, offsetting the emissions produced when the fuel is burned.[213] Beyond reducing carbon emissions, SAF contains lower levels of sulfur and produces fewer particulate emissions. This leads to improved air quality around airports.[214]

SAF is a valuable “bridge” fuel because it can fuel existing aircraft; this allows for immediate emission reductions while researchers perfect hydrogen and electric propulsion technologies.[215] In 2023, SAF production grew to 26.3 million gallons–up from 2 million in 2016.[216] The International Air Transport Association (IATA) predicts SAF could provide about 65% of the emissions reduction needed for aviation to reach net-zero CO2 by 2050.[217]

SAF production could also spark job creation. According to the Climate Jobs Institute’s “Washington Climate Jobs Roadmap: A Worker-Centered Approach to a Clean Energy Future,” Washington could generate over 20,000 jobs by building two SAF plants. New plants would create permanent positions for workers to manage operations, maintain equipment, run

tests in labs, and handle paperwork. Preparing forest materials to be converted to fuel would create an additional stream of jobs. The SAF industry would also create forestry jobs. The process of supplying SAF plants includes trimming trees to help prevent fires. Washington's SAF industry is already poised to create high-quality jobs for IAM members.[218]

As key industry players implement more sustainable practices, the IAM can help ensure the next generation of aerospace workers have access to safe workplaces and quality union careers. By leading on sector-wide decarbonization, the IAM can protect existing jobs and create avenues to organize future workplaces. Holden emphasizes that the IAM must be proactive to "set the standard" for a changing economy. "We have to create the next generation of workers," he says.[219]

In 2024, IAM leaders bargaining the Boeing contract are demanding a say in airplane safety and quality control.[220] Boeing is under intense scrutiny for the safety of its airplanes, and **32,000 IAM members' livelihoods depend on how the company responds to ongoing crises**. Bargaining over these issues allows the IAM to simultaneously advocate for the public good, secure job security for members, and shape the future of a changing industry.

Manufacturing: The Clean Energy Supply Chain

Record temperatures are affecting members from virtually every IAM sector, and manufacturing is no exception. Rising heat is hitting each corner of North America, triggering deadly heat waves and wildfires that slow production and hurt workers.[221] "Some manufacturing plants have no air conditioning," says Western Territory General Vice President Gary R. Allen, "people are suffering because of it."[222] Four decades later, John Harrity still remembers working second shifts for Pratt & Whitney in Connecticut as heat piled up in the facility. "It was difficult then," he says, "and that's all compounded now."[223]

Even as extreme weather injures workers and slows down production lines, some employers have been slow to act. Maintaining safe workplaces will require capital investments that bring effective climate control to plants. "We've had fights about this time and time again," explains Allen.[224] Failing to address hazardous conditions puts workers in harm's way. Furthermore, ignoring changing economic and environmental realities can leave companies at a competitive disadvantage. High-road manufacturers, such as Pennsylvania's Voith Hydro, are providing workers with additional water breaks and protective equipment.[225] The future of work in the manufacturing sector depends on more companies getting serious about climate adaptation.

Decarbonization and climate adaptation is expensive, but the clean energy economy is also creating opportunities for employer-union partnerships to secure new work. **Some IAM-represented employers are already taking advantage of the unprecedented levels of climate funding from the Biden administration.** At the Cleveland-Cliffs steel plant in Middletown, Ohio, IAM Local 1943 worked with management to secure $500 million in federal funding to replace the facility's blast furnace with two electric furnaces.[226] According to local leaders, the upgraded plant could end up producing the cleanest steel in the world while generating savings for the company.

At Voith, IAM Local 1400 helped secure a $5.8 million investment from the Department of Energy (DOE) to install a 200-ton, 30-foot-tall horizontal boring mill.[227] The state of the art equipment will boost production at the only union hydroelectric turbine manufacturer in the United States. Throughout the process of turning flat steel into huge turbines, skilled IAM members weld, machine, and perform quality checks.[228] The union and company have "a very good rapport," says District 98 Assistant Directing Business Representative Kermit Forbes, Jr. "They've begun to reach out to us and treat us as a partner."[229]

Federal Clean Energy Investments Boost IAM Membership - Voith Hydro and Cleveland-Cliffs

York, a working-class city in Central Pennsylvania, is home to the Voith Hydro plant, where roughly 100 skilled IAM Local 1400 members build giant turbines for producing hydroelectric power. In May 2024, joint IAM-Voith advocacy efforts secured a $5.8 million tax credit from the Inflation Reduction Act (IRA). The tax credit is for investment in machinery to support the production of renewable energy equipment. "We're not talking little machines, we're talking about monsters," says **District 98 Assistant Directing Business Representative Kermit Forbes, Jr.** "Renewable energy…has the potential to double the membership at this facility."

The 2,000 IAM members at Cleveland-Cliffs Steel power the economy of Middletown, Ohio. A $500 million IRA grant will help the company retire a blast furnace and replace it with two electric furnaces. Neil Douglas, Eastern Territory Grand Lodge Representative, admits that members were initially concerned about tearing down the furnace. "My initial response would have been, we're going to lose work. But it's actually a net increase in union jobs."[230] The electric furnace will reduce carbon emissions by more than 50%, improving local air quality, and creating nearly 200 permanent, good-paying jobs. Next, the facility could switch to using clean hydrogen to power its operations and become one of the world's cleanest iron and steel plants. "As far as Middletown," reports Local 1943 President Shawn Coffey, "this mill is not going anywhere."[231]

The IAM's advocacy at Cleveland Cliffs and Voith Hydro shows how clean energy can help revitalize industrial communities across the country.

Coordination between the union and Voith helped bring the DOE funds to York, and it is also helping workers learn important new skills. Training for new machinery happens on company time, helping upskill existing IAM members and provide the employer with a steady supply of skilled labor. Federal incentives for domestic solar and wind energy production are projected to create thousands of new manufacturing jobs. Tax credits, such as the ones utilized by Voith Hydro, can ensure that plants can transition into long-term roles in the clean energy economy.

"Climate change is real, and for me the impact [on the IAM] is good," says Forbes, "As we grow Voith, our membership grows, which helps everybody. It helps the country."[232]

Apprenticeship infrastructure such as the Machinists Training Institute gives the IAM another leg up. Across the union, most of the IAM's apprenticeship programs are training programs run directly by employers, like at Voith. But in Washington, IAM District 751 created the Machinists Institute in 2018. This union-run training and apprenticeship program provides upskilling for members, creates a pipeline of trained apprentices, and recruits people from historically marginalized communities into good union manufacturing careers. Union-led manufacturing apprenticeship programs not only position the union to be a leader in building a more diverse workforce and addressing staff shortages, but also create the institutional capacity to replicate the successes of the building trades in requiring apprenticeship utilization in government-subsidized work.

Woodworking: A Sustainable Future

From forests to mills, thousands of IAM members work in all stages of wood and paper processing.[233] Union woodworkers–and the businesses they support–are critical to rural economies from Maine to Washington. Analysts project that demand for forest products will remain steady, and even inch up, in the coming years.[234] However, climate change could cause upheaval in the industry, with serious consequences for workers and their families.

Extreme swings in weather patterns affect wood and paper workers in several ways. "When you have extreme temperatures, and then you add steam, paper mills become saunas," says Woodworkers Director Bob Walls.[235] As a consequence of increased heat waves, hydration is a growing concern for woodworkers.[236] Warmer winters are limiting the days that loggers, who often rely on frozen forest ground to operate heavy machinery, can harvest trees.[237] Shorter harvest seasons mean fewer working hours throughout the industry's supply chain.

Forest fires pose another growing threat to woodworkers and the industry as a whole. The links between forest fires and climate change are well documented.[238] More frequent fires destroy forests and worsen air quality for workers and surrounding communities. Climate change is also increasing the frequency of deep freezes, heat waves, torrential rains, droughts, and extreme storms–all of which shorten harvesting seasons and destroy timber.[239] Unpredictable and extreme weather is putting downward pressure on working conditions for all woodworkers.

The consequences of the changing climate pose a serious threat to the working-class communities that produce wood and paper products. With destructive wildfires on the rise, rural homeowners are finding it increasingly difficult to find affordable insurance.[240] Walls also observes that worsening weather conditions are accelerating mechanization in some regions. "They make technology to replace the people so that equipment gets damaged and not people," says Walls.[241] Woodworkers are in a bind. On one hand, climate-fueled weather events are hurting workers and their communities. On the other hand, some regulations intended to reduce the causes of climate change could negatively affect the industry.

Despite these risks, a more sustainable industry could create new opportunities for woodworkers. The IRA mobilized $1.5 billion for forest restoration, which, in some states, will include logging in overgrown forests.[242] Forest thinning could prevent fires, provide timber for woodworking, and create good sustainable forestry jobs. Trees capture and store carbon, making forests an essential emissions-reduction resource. According to the US Forest Service, America's forests sequester over 800 million tons of carbon a year, which is roughly 12% of the country's annual emissions.[243] Reforestation could reduce emissions, help clean air and water, and sustainably provide materials for a variety of timber products.[244]

Tree care in populated areas is another space for job creation and union organizing. Poorly managed trees create safety hazards, especially as intense storms become more commonplace. In July of 2024 more than 30 arborists at Truetimber in Richmond, Virginia,

became the first unionized residential tree care workers in the United States.[245] Organizing campaigns in an increasingly important industry is another way for the IAM to grow membership while contributing to climate mitigation.

In addition, nascent technologies in construction are poised to create demand for sustainably harvested timber products. The construction industry accounts for roughly 38% of global total CO2 emissions. When manufactured sustainably, "mass timber" products, such as cross-laminated timbers (CLT), are a low-emissions alternative to traditional materials like cement. Mass timbers spur decarbonization by creating demand for carbon-sequestering trees and reducing the use of concrete, which emits significant amounts of carbon during production.[246] Buildings made with mass timbers are also less likely to release harmful chemical compounds over time, which leads to improved air quality for occupants.[247]

Already popular in Europe, North American developers have already built hundreds of new buildings with engineered mass timbers and have plans for more projects on a growing scale.[248] Local authorities are changing building codes to allow for mass timber construction.[249] $350 million in IRA funding for reducing the building sector's carbon footprint could also boost demand for mass timbers.[250]

Mass timber production is an emerging organizing opportunity for the IAM, but re-introducing timber products in construction will only meaningfully reduce emissions if raw materials come from sustainably managed forests.[251] Rapid deforestation in unregulated markets is destroying forests, contributing to climate change, and hurting the North American woodworking industry.

Through involvement in Programme for the Endorsement of Forest Certification (PEFC), IAM leaders have advocated for international sustainability standards.[390] The IAM is also a member of the Building and Woodworkers Congress (BWI) which is leading campaigns against deforestation in the Amazon to both protect the climate and the woodworking trade.[391]

Automotive: New Work in the Clean Vehicle Industry

IAM Automotive covers over 35,000 members in a wide range of industries, including power systems, buses, trucking, vehicle delivery services, auto, truck, vehicle repair, and dealerships.[252] Across the country, extreme weather poses escalating hazards to workers in

non-climate controlled workplaces, including automotive shops, trucking and other equipment repair facilities. "[Members are] working in unairconditioned shops, or in the yard in extreme heat, extreme cold, and in rainy and sloppy conditions," notes Midwest Territory General Vice President Sam Cicinelli.[253] "Normally, garages are not air conditioned," says Gary R. Allen, adding that "there's been a real uptick in people having problems with heat."[254]

Climate change is also changing the nature of work in the automotive sector. As consumer preferences and the regulatory environment change, employers are prioritizing the development of electric vehicles and sustainable fuels. These shifts may present a challenge for IAM members who work in automotive repair as electric vehicles have far fewer mechanical parts and a large-scale introduction to EVs may reduce work for mechanics.[255] Electric and alternative fuel cars, buses, and trucks will also require different maintenance skills and training. In trucking for example, unions will have to ensure that companies develop standardized certifications for working with hydrogen fuels.[256] Even as they demand new skills from workers, some companies do not want to pay for safety training or higher wage rates.[257] "Our folks have a real fear of the danger of working with pressurized hydrogen, and their concerns are minimized," Allen says.[258]

Despite the legitimate challenges facing automotive workers, surging demand for EVs could also create new jobs and organizing opportunities for the IAM. The U.S. Postal Service, for example, has secured funding to transition its fleet to zero emissions vehicles.[259] Change is coming at every step of the automobile supply chain. Emerging technologies and new employers present opportunities for the IAM to secure more work and better conditions for members.

In June 2024, nearly 300 workers who assemble electric buses and trucks at Lion Electric Company's facility in Saint-Jerome, Quebec, won their unionization drive.[260] In a preview of what it will take to organize the EV sector, workers defeated the company's vigorous anti-union campaign. The IAM is also engaged in an organizing campaign at another Lion Electric facility in Joliet, Illinois. Workers in Joliet complain of favoritism, unsafe conditions, low wages, and inadequate training.[261]

The newly unionized Canadian IAM members plan to assist other organizing workers however possible. "Our goal is to unionize all Lion Electric plants in North America," said David Chartrand, the IAM Canadian General Vice-President. "Why choose to remain divided when we can be stronger together?"[262] The multi-site, cross-border campaign at Lion Electric shows promise for IAM automotive workers.

Nuclear: Clean, Reliable Power

The IAM maintains several collective bargaining agreements with the Department of Energy's National Nuclear Security Administration covering nuclear technicians, engineers, and operators,

as well as a variety of plant maintenance and machining roles.[263] IAM members maintain additional nuclear power sites for the Tennessee Valley Authority.[264] As an efficient, emissions-free energy source, nuclear power is a vital component of our clean energy future.

Nuclear energy production is also threatened by climate change. Nuclear power plants often use water from nearby rivers as coolant. IAM District 1888 Business Representative Keith McFarland notes that "with climate change, we've seen the water temperature in rivers rise." Those temperature changes can "impact members' lives," he notes, by "shutting down plants" or by forcing longer hours to keep plants cool and safe.[265] Extreme weather events also pose a growing threat. The Government Accountability Office (GAO) found growing risks of "loss of offsite power, damage to systems and equipment, diminished cooling capacity…[and] reduced operations or plant shutdowns."[266] According to the International Atomic Energy Agency (IAEA), climate models show that nuclear sites along the United States' Eastern seaboard are "likely to be exposed to sea level rise and severe cyclones with maximum wind speeds and heavy precipitation."[267]

IAM leaders recognize the job creation potential of nuclear power. Federal initiatives to boost clean energy production are incentivizing investment into nuclear infrastructure. Tax credits in the Bipartisan Infrastructure Law and Inflation Reduction Act reward new construction and increased energy production in the nuclear sector.[268] There are additional opportunities in statehouses. Climate Jobs Washington, a labor coalition which includes IAM District 751, secured $25 million for nuclear power development in the state's 2024 budget.[269] "We made sure that the millions of dollars in new funding come with strong labor standards that will create family-supporting union jobs throughout our state," said District 751 President Jon Holden.[270]

Expanding nuclear capacity as part of a clean energy transition could create new jobs for IAM members. Many IAM leaders are excited about the potential of small modular reactors (SMRs), which can sit on sites not suited to large reactors.[271] [272] At the TVA, multiple IAM locals already train machinists for family-sustaining careers in area power plants. SMRs could be a reliable option for creating new jobs and generating clean power. McFarland, himself a 31-year IAM member hired at the Watts Bar Nuclear Plant, reports that nuclear expansion is helping IAM grow. "We were just over 300 [members] six years ago when we started with this. Now we're up to 614 and still growing."[273]

IAM member Thomas Bedford Jr., a third generation Machinist and TVA nuclear worker, summed up the union difference in nuclear power: "All this [work] is done with safety and the wellbeing of the community as a priority. I love my job and I'm grateful for it."[274]

The Tennessee Valley Authority & Clean Energy

When the Tennessee Valley Authority (TVA) shut down two coal fired power plants and announced plans to decommission the remaining four, IAM members, who have worked for the TVA for generations, might have feared for their jobs. But rather than spurring layoffs, the TVA's clean energy transition has doubled IAM membership at the authority. Keith McFarland, District 1888 Business Representative, credits this job creation to the positive relationship that the union has forged with the TVA through enacting a mutually agreed upon Code of Excellence. Many issues are now resolved on the shop floor, freeing up IAM and TVA leadership to focus on systemic staffing solutions as the Authority's energy portfolio changes.[275]

Through this partnership, the TVA has reduced outsourcing, created a regional maintenance program, and created a homeward bound initiative to help workers impacted by closures find work closer to home. The union is ensuring that members share in the benefits of the transition to clean energy, including nuclear, solar, and hydroelectric. Additionally, the union has partnered with local community colleges and created an employer-funded apprenticeship program. Accessible apprenticeships are creating a pipeline for the next generation of workers at the TVA. As the largest public power company in the United States, the TVA's transition to a clean energy future can help grow high-quality jobs and provide reliable power to residents.

Shipbuilding: Clean Energy Demand and Growth

The IAM represents workers building and maintaining ships in dozens of facilities across the United States and Canada. The U.S. Navy relies on skilled IAM members, including more than 4,200 workers at Maine's Bath Iron Works (BIW), to build its world-renowned fleet.[276] Once a massive North American industry, domestic shipbuilding has experienced a decades-long decline fueled by deindustrialization, offshoring, and trade policy.[277] President Biden's corrective action is creating new hope. In a recent op-ed, IAM International President and former BIW shipbuilder Brian Bryant applauded President Biden's efforts to even the playing field for domestic manufacturers and make "substantial investments in the shipbuilding industrial base."[278] The promise of a revitalized industry depends on the infrastructure and union labor that make shipbuilding possible. But climate change is threatening both.

Concentrated in coastal communities, shipbuilders and their families are especially vulnerable to rising sea levels. In 2015, torrential rains coinciding with high tide waters triggered sudden flooding in Bath, forcing the local utility to switch off power to the surrounding area. The power outage forced BIW to temporarily shut down production and send workers home.[279] Far from a one-off event, the BIW already faces flood risks that could intensify to the point of regularly inundating ⅔ of the facility by 2050.[280] In fact, towns across New England have reported increased flooding and hundreds of millions of dollars in associated property damage.[281] The

non-profit Climate Central calculates that, if seas continue to rise in the coming years, there is at least a 27% chance of a 5-foot flood in Bath itself.[282]

Bath is a case study for how climate could capsize the industry. Floods and dangerous storms lead to costly work stoppages. Ports and shipbuilding facilities, as well nearby towns, are often situated in low-lying coastal areas. Rising seas and lightning strikes threaten port infrastructure and accelerate the breakdown of ships. The burden of rebuilding falls on surrounding communities who must navigate deadly weather, lost work hours, and sinking property values.

IAM leaders have recognized that shielding members from rising seas and intensifying storms are reason enough to invest in climate action, but new economic trends also create opportunities to grow the shipbuilding industry. In its "Climate Action 2030" report, the U.S. Navy announced its intention to reduce its greenhouse gas emissions and achieve "the nation's commitment to net-zero emissions by 2050."[283] Recognizing that ships and aircraft generate most of the Navy's greenhouse emissions, Navy leadership further committed to investing in "hybrid and advanced propulsion options for all ships."[284] In Europe, unions, shipyards, and manufacturers are responding to the EU's Green Deal, which commits European governments to reaching net-zero emissions by 2050, by rethinking shipbuilder training. "The industry will design and build the green and digital vessels of the future: zero-emission ships, smart, connected and automated," reads one joint employer-union presentation aimed at young workers.[285] Transport and maritime unions are beginning to identify new hazards that may arise from propulsion technology and electronic components.[286]

Capturing work building "green" vessels could help the IAM build on recent policy wins and expand market share. The Jones Act, which requires that ships carrying goods between American ports be made, owned, and staffed in the U.S., means that offshore wind companies are in need of American-made service vessels. Dominion Energy commissioned a 472-foot, Jones Act-compliant offshore wind service vessel, which hit the water in 2024.[287]

Previous sections of this report noted the potential for IAM manufacturers to produce wind energy components. According to the National Renewable Energy Laboratory, domestic manufacturers will need to produce more than two dozen additional vessels to achieve U.S. wind energy targets.[288] As long as federal and state officials continue to support offshore wind projects, the industry could create tens of thousands of manufacturing and maintenance jobs in the next decade.[289] Shipyards could convert to serve the emerging offshore wind industry. The same holds true for shipbuilders, whose skills could help build the service vessels needed to maintain offshore wind turbines.

Between 2017 and 2021, the BIW supported roughly $8 billion in total activity throughout the state of Maine. "A revitalized shipbuilding industry means a more robust economy with high-quality jobs and long-term growth," wrote President Bryant.[290] The IAM can confront the climate crisis and protect members by promoting sustainable domestic shipbuilding.

Healthcare: A Growing, Strategic Sector

A growing department in the union, IAM Healthcare is organizing clinicians, technicians and caregivers in a variety of roles. Recently, pharmacy workers at providers such as CVS, Walgreens, and Rite Aid, have joined IAM Healthcare as the Pharmacy Guild.[291] Healthcare workers are uniquely impacted by climate change as they see the human health impacts of the crisis on a daily basis–especially when disaster strikes.

Charged with caring for the sick and vulnerable, healthcare workers are on the frontlines of the climate crisis every day. Climate change is driving an increase in heat related illnesses, including heart attacks. Air pollution increases the rate of asthma, and rising insect populations are increasing vector borne diseases, such as Lyme disease.[292] Healthcare workers themselves experience the health impacts of climate change. Workers suffering from asthma or anxiety caused by weather disasters then go into healthcare settings to treat individuals that are stressed by those same factors. Extreme heat and extreme weather can exacerbate mental health issues, overburden healthcare facilities, and put a strain on staff. Healthcare professionals already face high rates of workplace violence, a disturbing reality that could grow more hazardous as extreme weather taxes facilities.[293]

In campaigns, at the bargaining table, and in federal policy, IAM Healthcare is fighting for safe staffing levels. Healthcare workers need acuity based staffing standards that provide higher levels of staffing for more severely ill patients. “Increasing demand or need for staff is often not met by the corporations who run these hospitals and nursing homes,” reports IAM Healthcare Director Shane Brinton.[294] Healthcare facilities need to conduct 360 Degree Safety reviews to ensure that workers have a safe working environment. Climate change, and its associated ills, is deepening the need for safe staffing in care facilities and pharmacies.

But the healthcare industry also contributes emissions that worsen climate-related hazards. In the United States, the healthcare sector is responsible for around 10% of the nation’s emissions.[295] Healthcare systems are beginning to implement climate action plans that focus on improving energy efficiency, transitioning to renewable energy sources, and transitioning to lower carbon alternatives for anesthetic gas, pharmaceuticals and medical supplies.[296] While these changes are important, hospitals are a critical resource in communities, and climate resilient communities need functional health facilities. Safe staffing and protections for workers are essential to making sure that health settings are resilient and ready for extreme weather events.

A Climate Jobs Agenda for the IAM

Climate change is creating real challenges for IAM members. But through strategic action, the union can build its power, grow its membership, and play a leading role in addressing one of the most consequential issues of our time. By leading on climate, the IAM can ensure members are protected and supported through a monumental economic transition and that climate actions and investments prioritize the needs of working people and their communities.

The IAM's Climate Jobs Agenda has four key tenets:

- Growing IAM membership in climate and clean energy industries
- Ensuring that new clean energy jobs are high-quality, union careers
- Building a climate resilient IAM, and
- Strengthening IAM power at the bargaining table and on the shop floor

In each of these areas, we will outline a number of concrete action steps the IAM can take or support to make this vision a reality.

GROWING IAM MEMBERSHIP IN CLEAN ENERGY INDUSTRIES

The IAM can protect and grow its membership by leading the expansion of climate safe, clean energy sectors. Engaging stakeholders like businesses, trade groups, governments, consumer groups, and community organizations on the future of emerging industries will position the

IAM as a critical partner in securing public support and funding for projects that drive the clean energy transition.

Recommendations

- Grow the Zero Carbon Energy Sector and Organize the Manufacturing Supply Chain
- Establish Large-Scale Sustainable Aviation Fuel (SAF) Production
- Build a 21st Century High-Speed Rail Network in the U.S. and Canada
- Grow and Organize the Offshore Wind Industry
- Grow and Organize the Clean Vehicle Market
- Use Department of Defense Climate Readiness Projects to Expand Service Contract Act and Civilian Military Organizing
- Advocate for Carbon Free Federal Buildings

Grow the Zero Carbon Energy Sector and Organize the Manufacturing Supply Chain

The IAM can advocate for more clean energy investments with strong labor standards attached. The IAM's expertise in precision manufacturing and maintenance aligns well with the production and upkeep of clean energy technologies, and the union can play a crucial role in this transition.

Federal incentives are expected to help build 580 GW of new clean energy capacity and create 340,000 to 380,000 jobs by 2035.[297] The Bipartisan Infrastructure Law (BIL) allocates $9.5 billion for clean hydrogen initiatives, while some states offer additional tax credits, rebates, and incentives.[298] Similarly in Canada, the Accelerated Capital Cost Allowance (CCA) for Clean Energy allows businesses to deduct the costs of eligible clean energy equipment, providing immediate tax savings and encouraging investment in solar, wind, and geothermal systems.[299]

The Inflation Reduction Act (IRA) provides over $100 billion in clean energy tax breaks, offering strong financial incentives for the development of renewable energy, battery storage, electric vehicles, and more.[300] IRA provisions include credits of up to $7,500 for new electric vehicles and up to 30% off the cost of solar panels and heat pumps.[301] The emerging solar industry could create 29,000 new manufacturing and installation jobs.[302] Land-based wind power capacity increased by 8.5 GW in 2022, resulting in a total of 125,580 full-time jobs.[303] Geothermal energy development could create up to 262,000 additional jobs over the next 25 years.[304] Building 30 GW of offshore wind capacity by 2030 could create over 50,000 jobs in the next 5 years.[305] Similarly, clean hydrogen production is expected to rise significantly, potentially generating 100,000 new jobs by 2030 in related infrastructure and construction projects.[306]

As the clean energy supply chain grows, the IAM can add members while fighting for fair wages, job security, and good working conditions. The union should advocate for strong labor standards on incentives for clean energy manufacturing at all levels of government. Additionally,

to ensure local economic development and national security, the IAM should advocate that critical industries have access to affordable renewable energy sources. To build union density, the IAM should join multi-union climate jobs coalitions to secure a voice for labor at all levels of the clean energy transition.

Climate Jobs Washington

In 2021, Washington Governor Jay Inslee signed the Climate Commitment Act (CCA) into law. Among other things, this bill passed an historic "cap-and-invest" program meant to reduce carbon emissions over time and raise revenue for climate-friendly projects by forcing major companies to pay for the pollution they emit.[307]

Unfortunately, CCA did not require strong labor standards on projects using cap-and-invest funds. As a result, IAM District 751 and much of the broader labor movement in Washington State did not support the bill. "Most people I talk to understand… that climate change is an issue," said District 751 President Jon Holden. But "it doesn't give you solace when someone says… we are eliminating your job, but we're going to train you for a job that pays half with no rights."

This experience motivated many in the state's labor movement to set their own climate agenda. The Washington State Building & Construction Trades Council (WSBCTC), the Washington State Labor Council (WSLC), and many individual unions partnered with the Climate Jobs National Resource Center (CJNRC) and Cornell University's Climate Jobs Institute (CJI) to do just that. In 2023, CJI released the report, "Washington Climate Jobs Roadmap: A Worker-Centered Approach to a Clean-Energy Future." One of the report's recommendations spoke directly to IAM members in the state, calling for Washington to become "a national leader in sustainable aviation fuel production."[308]

Around the same time, the union-led coalition Climate Jobs Washington launched. With leadership from Holden, WSBCTC's Mark Riker, and WSLC's April Sims, Climate Jobs Washington is already seeing results. For example, District 751 helped lead the successful effort to pass legislation incentivizing in-state SAF production and expediting siting and permitting for clean energy projects.[309] Labor-led coalitions like Climate Jobs Washington are playing an important role across the country to grow climate-safe industries and expand high-quality job opportunities.

In addition to passing pro-worker legislation, organizing campaigns will sustain high standards in the clean energy sector. The IAM should dedicate resources to track federal funding grantees and identify strategic organizing targets; key programs to monitor include the Advanced Manufacturing Tax Credit, loans from the DOE Loans Program Office, and Green Bank finance

recipients. The IAM can also partner with the Cornell ILR Climate Jobs Institute, which has developed sophisticated methods for capturing this data. At Cleveland Cliffs and Voith Hydro, the IAM has already demonstrated that it can help employers secure advanced manufacturing tax credits to expand production at unionized plants.[310] Additionally, due to IRA tax credits tied to domestic manufacturing, some employers are seeking Buy American waivers as they develop capacity. The union can negotiate neutrality agreements for future manufacturing as a condition for such waivers. As clean energy production surges, the IAM can identify and execute ambitious new organizing campaigns.

Protecting IAM members' jobs is equally important. Training programs can build on existing skills while introducing new renewable energy concepts. The IAM should strategically transfer its members' existing skills in legacy industries to the renewable energy sector. Finally, expanded manufacturing apprenticeship programs can help diversify membership by recruiting women and people from underrepresented communities into high-quality manufacturing jobs.

Establish Large-Scale Sustainable Aviation Fuel (SAF) Production

SAF, which is derived from renewable or waste sources like municipal solid waste, biomass, and various oils, can reduce aircraft emissions by up to 94% and is compatible with existing engines and air transportation infrastructure.[311] The Biden administration has set a goal of reaching 3 billion gallons of SAF production annually by 2030 and 35 billion gallons by 2050.[312] Key industry players like United and American are changing their operations, and SAFs are the fastest way to reduce emissions and meet industry decarbonization targets.[313]

To maximize this opportunity, the IAM can begin by closely tracking the development of SAFs, hydrogen fuels, and plane electrification technologies. Massive corporations, like Honeywell, Neste, and Chevron, are producing SAFs and partnering with major airlines.[314] Understanding the industry landscape and likely developments of this emerging industry can help the IAM build coalitions across regional supply chains.

The IAM can also support tax credits aimed at jumpstarting SAF production, tied to strong labor standards. In 2023, IAM District 751 successfully lobbied for legislation that will bring SAF production and union jobs to Washington and make it easier for the state to approve clean energy projects.[315] SAF production could create over 20,000 direct jobs in the state over the next seven years. In Washington State, and across the US and Canada, the IAM will need to bargain around rigorous safety certifications, retraining programs for affected workers, and new wage scales to make sure SAF develops in a way that is good for workers and communities.

SAFs are not the final word in aviation decarbonization. Rather, they are a bridge to pollutant-free technologies. IAM District 751 is already engaged in research on the future of more sustainable fuels and fully electric planes. Promoting even cleaner technologies is crucial to preserve the sector's future and, by extension, thousands of IAM jobs.

Build a 21st Century High-Speed Rail Network in the U.S. and Canada

With a proper high speed rail network, transporting people and goods can be significantly greener and more convenient. Transportation accounts for nearly 30% of greenhouse gas emissions in both the United States and Canada,[316] and expanding rail service can significantly lower the sector's footprint. IAM members build and maintain locomotives for both Amtrak and several major rail carriers. The IAM is already a core member of the multi-union High Speed Rail Coalition, and with the right strategy, the IAM can become the United States' "High Speed Rail Union."

First, the IAM can help expand passenger rail. In the US, Amtrak has seen an infusion of $22 billion through the Bipartisan Infrastructure Law.[317] Other public and private investments can also fund construction to expand fleets, improve connectivity, and create good jobs. In 2023, the High Speed Rail Coalition secured a landmark agreement with Brightline to construct a high-speed rail system connecting Las Vegas and Southern California. A multi-union coalition secured a Memorandum of Understanding that commits the developer Brightline to employing union members under project labor agreements as a condition of receiving a $3 billion federal grant from the IIJA.[318] The IAM also forged a Voluntary Recognition Agreement with Siemens Mobility, the company that will manufacture locomotives for high-speed rail projects including Brightline West. Thousands of workers will build and maintain the new line.

While moving to expand our rail network, policymakers can maximize climate, community, and economic benefits by prioritizing rail decarbonization and various safety measures. Many trains currently run on diesel, which results in carbon emissions and other pollutants that can harm communities and rail workers. Decarbonizing both passenger and freight rail can significantly cut emissions.

Additionally, many industry employment practices have negative effects on rail workers. As previously mentioned, precision scheduled railroading, or PSR, **entails consolidating freight loads into trains that can stretch for miles, all while reducing the number of workers assigned to run and maintain locomotives**. Regulations to reverse PSR practices are overdue and essential as railroaders adapt to worsening climate-related hazards.

The climate crisis calls for an accelerated buildout of the U.S. rail network. Investment and incentives attached to labor standards can ensure that this work creates high-quality, union jobs. Railroad revitalization is also an exciting opportunity for the IAM to recruit young workers into family-sustaining careers.

Grow and Organize the Offshore Wind Industry

The U.S. Department of Energy has set targets to develop 30 GW of offshore wind capacity by 2030 and 110 GW by 2050. This reflects the industry's critical role in achieving the nation's decarbonization goals.[319] If the US built wind farms up and down its coastlines, we could meet

today's electricity demands more than three times over, enhance energy security, and power community-sustaining economic growth.[320]

OSW is a nascent industry in the US and Canada, and we are just scratching the surface when it comes to job creation potential. Four major US-based OSW projects–Vineyard Wind, South Fork Wind Farm, Momentum Wind, and Sunrise Wind–are set to power over 1.2 million American homes by 2026.[321] Vineyard Wind alone promises 3,600 job years,[322] while the industry as a whole is projected to create up to 45,000 full-time equivalent jobs over 6–9 years across manufacturing and supply chains.[323]

Furthermore, energy companies need U.S.-built vessels to comply with the Jones Act, a federal law which requires vessels transporting goods between U.S. ports be American-made, owned, flagged, and crewed.[324] Building OSW vessels is a massive undertaking. Virginia-based Dominion Energy has commissioned a $500 million ship named Charybdis that is nearly 500 feet long with a load capacity of over 2,000 tons.[325] Current projections suggest that the industry will demand more than a dozen domestically-manufactured service vessels in the coming years.[326] IAM shipbuilders could secure years of work if the industry takes off.

In recent years, the OSW industry has faced major obstacles. Inflation, high interest rates, supply chain bottlenecks, and other issues slowed the industry's growth in 2023 and 2024, with multiple projects being canceled or delayed.[327] After months of setbacks, many are now forecasting a "comeback" for the industry,[328] and continued support from labor and other allies can help in building a robust industry.

The IAM can use its expertise and influence to support the growth of the OSW industry. First, the union can leverage federal financing, such as the DOE's Advanced Technology Vehicles Manufacturing Loan Program, to partner with employers, drive investment, and support the development of critical infrastructure. Second, the IAM can prioritize skills transfer and training, developing specialized programs that align with industry needs.[329] Third, the union can advocate for more efficient permitting and siting processes as well as expanded lease areas to accelerate OSW development,[330] while working with existing maritime industries to mitigate any negative impacts. Finally, the IAM can advocate for labor standards in the procurement process and work with shipbuilders to ensure that skilled union workers build the OSW service fleet.[331]

Advocating for regional coordination across all states involved in offshore wind development could help play an important part in these efforts. Coastal states in the American Northeast and Pacific Northwest are poised to become hubs for OSW manufacturing and servicing.[332] The IAM should strive to promote smart growth in the industry and capture new work in these states.

Prioritizing equity should also be a key pillar of the IAM's strategy. Several states, including New York, New Jersey, and Massachusetts, have already included provisions in their OSW solicitations to increase workforce diversity and ensure environmental justice.[333] To build a more diverse and powerful union, the IAM can expand recruitment in marginalized communities.

This could include partnering with developers and state agencies to create training programs targeting underrepresented groups and developing strategies to recruit and retain workers from underserved communities.[334] By implementing these strategies, the IAM can play a pivotal role in shaping a skilled, diverse, and unionized workforce that meets the growing needs of the U.S. offshore wind industry.

Grow and Organize the Clean Vehicle Market

Consumer preferences and federal incentives are poised to spur domestic electric vehicle production in the decades to come. While the growth of the EV industry poses real challenges for the existing automotive workforce, the sheer volume of needed investments in domestic manufacturing also creates growth opportunities for the IAM and other unions.

To maximize opportunities in the automotive sector, the IAM can start by assessing its current workforce. Where are there locals that face the threat of membership decline, and how can we prioritize investments in these areas? Where are IAM members at risk of losing their jobs, and how can the union secure existing pensions and benefits as industries wind down? Preparation now can help ensure that auto mechanics and manufacturing workers retain high-quality jobs and benefits for years to come.

But the IAM's automotive strategy must also seek to expand upon its current membership. Currently, the majority of EV manufacturing investments are landing in the "right-to-work" South. Bringing new automotive workers into the union will require ambitious and well-resourced organizing campaigns, as well as sophisticated strategies to combat employer interference during union drives. IAM can draw on lessons learned from its recent victory for nearly 300 workers at Lion Electric, an electric bus manufacturer. Organizers can also study other unions' victories–such as the United Auto Workers Volkswagen campaign in Tennessee[335] and the United Steelworkers Blue Bird campaign in Georgia[336]–for additional lessons on successful organizing in the South.

To organize the rapidly-emerging clean vehicles industry, researchers should track the disbursal of IRA funds. The Climate Jobs Institute at Cornell's ILR School has developed IRA tracking practices and can assist the IAM in mapping out the terrain for new campaigns. The IAM can then work to leverage labor standards attached to federal dollars to help win campaigns. For example, advanced vehicle manufacturers can use the IRA's Advanced Energy Project Credit, which multiplies up 5x when employers meet prevailing wage and apprenticeship requirements.[337] The IRA contains similar tax credits and grants for manufacturing low emissions heavy duty vehicles and electric vehicles. When necessary, the union can call on political allies to speak up when companies take public funds, only to shirk their responsibilities to workers.

Finally, the IAM can play a positive role in training and reskilling workers for the growing low-carbon auto industry. By organizing new workplaces, the IAM can use collective bargaining to set industry standards, including expanded safety certifications, joint union-employer reskilling programs, and updated pay scales for new work on electric vehicle maintenance, hydrogen fuels, or other technologies. Tax credits incentivizing the use of apprentices in manufacturing can help companies, as well as unions like the IAM, attract a diverse, skilled workforce. The IAM can lead by continuing to introduce more new automotive skills into its training programs.

Use Department of Defense Climate Readiness Projects to Expand Service Contract Act and Civilian Military Organizing

In 2024 alone, the DoD will spend $5.1 billion on climate readiness projects on military bases. Spending at this scale is expected to continue well into the future.[338] Climate readiness projects, like the pilot net-zero base project at Fort Hunter Liggett and the construction of two million solar panels at Edwards AFB,[339] will create work opportunities for the civilian military workers who manage projects and for the military contractors who carry them out.

The IAM should track and analyze military spending on climate readiness to identify new organizing opportunities for federal civilian workers and with SCA contractors. Additionally, the IAM can advocate for increasing climate readiness funding in the military and across the federal government. The IAM can also support existing high-road union contractors as they bid for this critical work.

Advocate for Carbon Free Federal Buildings

Retrofits to improve the energy efficiency of buildings are an important part of reducing overall carbon emissions. The federal government has made great strides in this area. Energy used in buildings accounts for over 25% of federal emissions,[340] and under "The Federal Sustainability Plan" (Executive Order 14057) the government aims to reach net-zero building emissions by 2045.[341] This plan will require electrical and energy efficiency upgrades in thousands of federal buildings. In the short term, federal employees (including IAM members) will benefit from retrofits through cleaner air and more comfortable temperatures at their workplaces. In the long term, retrofits will save the government money and contribute to reducing harmful emissions.

The IAM represents tens of thousands of federal workers and is well-positioned to turn initiative into action. Elements of deep energy retrofits include applying reflective roof coatings, installing high-efficiency HVAC systems, insulating walls and ceilings, and replacing inefficient appliances.[342] Advocacy for follow through on building decarbonization can help the IAM build strategic relationships with building trades unions, who are likely to see new work in this initiative for their members. NFFE-IAM members in the GSA will be responsible for administering contracts for these upgrades, and the IAM can help members craft demands for adequate training and sufficient staffing ahead of project implementation. Advocating for the

federal government to meet its targets is one way to spur job creation and help members feel the benefits of decarbonization.

ENSURING CLIMATE JOBS ARE HIGH-QUALITY, UNION CAREERS

Union organizing is central to creating high-quality jobs in the climate and clean energy economy, and public policy plays an important role in making widespread organizing possible. With the right policies in place, the IAM and other unions can raise standards for all workers and give them a fair shot at organizing their workplaces. The IAM's advocacy for strong labor and equity standards attached to public and private climate investments can ensure that new jobs are high-quality, union careers that expand pathways into the middle class.

Recommendations

- Advocate for Labor Standards in the Clean Energy Economy
- Develop Community-Labor Partnerships in Support of Labor Standards
- Champion Labor Law Reform
- Pass the Tim Hart Wildland Firefighter Classification and Pay Parity Act
- Support and Engage with the American Climate Corps
- Pass Local and National Legislation to Create Climate Jobs

Advocate for Labor Standards in the Clean Energy Economy

The development of a clean energy economy is a generational opportunity to reduce inequality while making the world more secure for future generations. Billions of dollars in public funds are catalyzing historic growth in multiple industries. Incentivizing companies to create domestic jobs is a great start, but without proper safeguards emerging clean energy employers may not provide fair wages, benefits, or career pathways. Attaching strong labor standards to public funding can ensure that new industries create high-quality, family-sustaining careers.

The IRA shows that pro-labor policymaking can spur economic growth. Significant investment is happening across the country, much of it with prevailing wage and registered apprenticeship mandates attached to construction work. As states and federal agencies develop additional programs, there will be additional opportunities for labor to expand on these standards into other project phases. For example, the IAM can join multi-union coalitions to push policymakers to attach similar standards to operations and maintenance work. Further, policymakers can attach employer neutrality or "labor peace" incentives to full-time manufacturing work in facilities that benefit from government investment.

Unions can also advocate for the establishment and strengthening of coordinating bodies to oversee workforce development and labor standards in the clean energy sector. Such bodies could project job creation, set standards for working conditions, establish workforce diversity

goals, and direct recruitment programs. In some places, creating new bodies may be necessary. New York's Fast Food Wage Board[343] and Minnesota's Nursing Home Workforce Standards Board[344] are two examples of how new, industry-specific coordinating bodies can lift standards across the board. In some instances, strengthening existing bodies like Workforce Development Boards, while also broadening their mandates and representation, could make more sense.

Develop Community-Labor Partnerships in Support of Labor Standards

Community members have significant influence over approval of new clean energy projects, evidenced by local fights around the country.[345] Raising public awareness of how high road clean energy projects can benefit entire communities will be critical to successful legislative campaigns.

The organization Jobs to Move America (JMA) provides a useful example of how community-labor partnerships can drive successful campaigns. JMA has pioneered a strategy of leveraging federal investment in the green economy to negotiate community benefits agreements that provide pathways to employment for local residents. They have also pressured companies with a nationwide footprint to apply high-road manufacturing labor standards not only in labor-friendly states, but also in places like Alabama, where JMA's organizing helped lay the groundwork for a victory by IUE-CWA at an electric bus manufacturing plant.[346]

Environmental organizations often share the IAM's desire for a rapid and just buildout of quality, green infrastructure. Advocates for mass transit can also be allies in pushing for rail and bus decarbonization. The IAM can explore ways to use its current structures–like its robust disaster relief program–to grow its impact and deepen coordination with community groups.

Involvement in multi-union coalitions, such as District 751's key role in Climate Jobs Washington, are good models to build on. The International could provide the IAM's Human Rights Committees or other bodies with resources to build community labor partnerships and engage on climate issues in local communities. Alliances built to support attaching labor standards to clean energy investments can build power to help win future campaigns.

Champion Labor Law Reform

When companies are allowed to engage in aggressive union busting, it hurts workers in all industries. Labor law in the United States is tilted against working people, and the federal Protecting the Right to Organize (PRO) Act and the Public Service Freedom to Negotiate Act (PSFNA) are two strong steps toward leveling the playing field. Alongside other unions, the IAM can continue and escalate the push for immediate reform.

The PRO Act would safeguard free and fair union elections, create real penalties when employers violate workers' rights, and enhance protections for workers in the midst of unionizing campaigns.[347] The PSFNA would guarantee public sector workers the right to join a union, engage in collective bargaining, and sue in court to enforce their rights.[348] PSFNA will also help safeguard

workers against abrupt policy changes that come with new administrations, including efforts to strip roughly 50,000 federal workers–including IAM members–of their labor protections.[349]

The IAM can also push for pro-worker legislation at the state level. Several states have recently banned captive audience meetings that force employees to listen to anti-union rhetoric during work hours, with similar legislation pending in several others.[350] State, and even municipal, laws that protect workers' right to organize help grow union density and lay the foundation for national reform. Efforts such as these will help create a fairer environment for union organizers in clean energy industries and beyond.

Pass the Tim Hart Wildland Firefighter Classification and Pay Parity Act

Federal Wildland Firefighters are at the frontlines of the climate crisis, protecting communities from the increasingly-harsh reality of climate-fueled wildfires. These are dangerous jobs which have historically been underpaid given the need for Congressional approval of any compensation increases.[351] President Biden secured temporary increases of up to $20,000 per year for these critical workers through the Bipartisan Infrastructure Law. Since those increases have expired, Wildland Firefighters are now dependent on Congress to maintain their raises through continuing resolutions year after year.[352]

The Tim Hart Wildland Firefighter Classification and Pay Parity Act would permanently increase pay to firefighters, raising base pay and ensuring fair compensation for long hours and dangerous work. The bill also provides for health and wellness improvements, including better access to mental health services, wellness tracking, and preventive medicine. Additionally, the bill addresses longstanding issues with poor living conditions. Improved training, automatic conversion to permanent employment after 3 years of seasonal employment, and counting seasonal and temporary employment toward retirement will make these critical careers more attractive.[353]

The IAM can build on its current legislative advocacy for this crucial bill by organizing a wider campaign that unites allies on this issue. Youth climate activists, rural homeowners, and hunters, to name a few, are similarly alarmed by wildfires. A broader campaign could expand the IAM's profile as a climate leader, while uniting various interest groups for maximum impact.

Support and Engage with the American Climate Corps

The American Climate Corps, launching in 2024, presents a significant opportunity for the IAM to shape the future of the clean energy workforce. This program aims to train young people for careers in key climate-related sectors.[354] The IAM should work to ensure Climate Corps participants have organizing rights and clear paths to good union careers.

The IAM can track the Climate Corps' development by monitoring outcomes and maintaining communication with federal agencies.[355] This will help identify opportunities for involvement and advocacy. Collaboration with federal agencies should focus on securing organizing rights

for participants and advocating for strong career pathways, including transitions to union jobs in the clean energy economy. The IAM could even explore arrangements like direct entry–common in the building and construction trades–that provide Climate Corps members an accelerated pathway into IAM-sponsored training and job placement opportunities.

Given past challenges with low stipends in AmeriCorps programs,[356] the IAM should push for competitive compensation that reflects the demanding nature of Climate Corps work. For example, Emergency Response Team Members and SolarCorps Construction Fellows face challenging conditions requiring specialized skills, warranting better financial support and pathways into union careers.[357] The IAM can also explore integrating its training and apprenticeship programs with the Climate Corps curriculum. This could provide participants with valuable skills and union exposure while addressing the growing demand for climate-related workers.[358]

Equity should play a central role in the IAM's Climate Corps engagement. The union can advocate for stipends and benefits that enable inclusive recruitment, support culturally competent training, and encourage placement of Corps members in underserved communities.[359] To inform these efforts, the IAM can study models like the NYS Climate Justice Fellows and analyze outcomes from AmeriCorps programs. Research suggests program design elements like service duration maximize positive impacts on participants.[360]

Through these efforts, the IAM can help shape a new generation of climate and clean energy workers while ensuring strong labor standards and equitable access to these emerging careers.

Pass Local and National Legislation to Create Climate Jobs

The global climate crisis will not be solved without U.S. and Canadian leadership to dramatically decarbonize our economies. Legislation at the national, state, provincial, and local levels is critical, and the IAM is positioned to spearhead labor-led legislative campaigns. This report outlines a specific climate jobs policy agenda that can serve as a starting point.

The IAM should further integrate support for good clean energy jobs into its legislative priorities at every level of government. Legislation that incentivizes decarbonization, infrastructure adaptation, the development of clean energy industries, and workforce development should be prioritized. IAM members in traditional industries have a wealth of experience and skills that should be utilized as new industries develop. A climate analysis framework can extend to the IAM's positions on trade, where policy should account for global environmental impacts. A focus on climate forward legislation at all levels of government will open up new organizing and job creation opportunities for the IAM, as well as chances to build new legislative partnerships.

A CLIMATE RESILIENT IAM

Strengthening IAM programs to be resilient to the impacts of climate change can ensure the union is ready for new growth opportunities, that members are protected from job disruptions, and that the union is leading by example on decarbonization.

Recommendations

- Expand Manufacturing, and Operations and Maintenance (O&M) Training and Apprenticeship Programs
- Develop Climate Training Programs at the William W. Winpisinger Center
- Invest Further in the IAM Disaster Relief Fund
- Decarbonize the IAM's Physical Infrastructure
- Lead on Winning and Enforcing the OSHA Heat Standard Rule
- Partner with Unions Around the World to Build a Global Movement
- Prioritize Equity and Diversity in the Energy Transition
- Protect IAM Members in Threatened Industries

Expand Manufacturing, and Operations and Maintenance (O&M) Training and Apprenticeship Programs

The IRA requires that renewable energy developers meet construction apprenticeship utilization standards to receive the maximum tax credits allowable, thus encouraging the use of unionized construction labor.[361] Unfortunately, this requirement does not extend to manufacturing or O&M. Developing a robust system of apprenticeship programs for manufacturing and O&M will simultaneously create a pipeline of qualified workers and open avenues to advocate for apprenticeship utilization requirements in manufacturing and O&M in future rounds of government renewable energy subsidies.

Apprenticeship programs not only grow the union, but with the right recruitment and mentorship strategies they can also offer an essential pathway to union careers for communities that have been historically excluded from certain industries.

The IAM can expand on the example of the Washington State Machinists Institute and support locals in establishing manufacturing and O&M training centers in other territories. Where union training infrastructure is in place, the IAM can advocate for manufacturing and O&M apprenticeship requirements in policies incentivizing new manufacturing and renewable energy. A model for this is Washington State's SB6690 (2020), which includes apprenticeship utilization as a requirement for Aerospace companies to receive a reduced tax rate.[362]

Develop Climate Training Programs at the William W. Winpisinger Center

The IAM's robust education infrastructure can be utilized to help members develop a deeper understanding of climate change, its effects on their industries, and what actions they can take. Since 1981, more than 90,000 people have participated in educational programs at the IAM's William W. Winpisinger Center (W3) in Maryland.[363] By integrating climate jobs training into educational programs, the IAM can develop rank-and-file leaders ready to lead a worker-centered transition to the clean energy economy.

The W3 can jumpstart climate education efforts by building on its partnership with Cornell's Climate Jobs Institute (CJI). The IAM's educators can lean on CJI's expertise as they develop curricula related to climate, green jobs, and pathways to apprenticeship. The IAM can also incorporate climate modules into existing leadership programs and into power analysis in bargaining training. Organizing training can draw from abundant climate-related case studies, and labor history courses can study examples of joint labor-environmental justice organizing.

Climate training should also reach members unable to visit W3. Educators can develop field-ready modules and reach members in locals with limited resources. Climate jobs trainings can also be run as workshops at State Council meetings. Committees, such as the IAM's Human Rights committee, can participate in "train the trainer" programs, and then disseminate lessons learned in their workplaces and locals.

Climate education is also an opportunity to engage younger members. It is young workers and their families who face the most uncertainty if global temperatures continue to rise. By pioneering union-led climate training, the IAM can reaffirm its deep commitment to labor education and develop activists to carry the union into the future.

Invest Further in the IAM Disaster Relief Fund

In 2023, the U.S. experienced a record-breaking 28 climate and weather related disasters that caused nearly $100 billion in damages and killed nearly 500 people.[364] Nearly half of homes in the United States, valued at $22 trillion, are at risk of either flood, wind, wildfire, heat or air quality climate related hazards.[365] And according to CNBC, "some insurance companies are pulling back coverage from fire-and-flood prone areas, leaving homeowners with limited affordable options."[366] As working people become more at risk to the effects of climate change, they may also have fewer options to help them adapt and recover.

The IAM Disaster Relief Fund is a tremendous resource for the union. At its last convention, the IAM passed a 5 cent per capita fund contribution, adding $100,000 annually to the fund. Members who lose their homes to disaster can receive assistance from the fund: $100 for renters and up to $500 for homeowners. With the risk of disaster growing for members across the U.S. and Canada, it is imperative to expand this critical resource.

The IAM can continue to grow the Disaster Relief Fund to be prepared for future disasters and to increase the payment amount for claims. Increasing the payout to renters would also be an important measure to improve equity in the program. To fund this, the IAM can negotiate for employer contributions, either as direct contributions like those made to a training fund, or as a voluntary payroll deduction match like the union's Guide Dogs for America fundraising.

An expanded Disaster Relief Fund could also partner with the Employee Assistance Program, Critical Incident Response Program, the Women's and Civil Rights Committees and the Winpisinger Center to develop a comprehensive disaster response program that trains member volunteers in disaster support (distributing aid, assisting in cleanup and recovery, and supporting safety and health needs) who can be deployed to disaster areas as needed.

The Disaster Relief Fund is a strategic resource for the resiliency of the IAM and its members. The IAM can promote the Fund to current members and highlight this union benefit in organizing campaigns. Expanding this program will build member investment in the union and bolster the union's climate leadership through helping communities in times of need.

Decarbonize the IAM's Physical Infrastructure

With IAM lodges in communities across North America, and representatives driving thousands of miles each year to organize and enforce contracts, conducting the business of the union can be carbon intensive. The IAM can be a leader in decarbonization by supporting energy efficiency upgrades, installing renewable energy in lodge halls, and decarbonizing its vehicle fleet. This is an opportunity to reduce emissions and improve lodges for members. These efforts will reduce carbon emissions but will save money in the long run.

Headquarters can help local and district lodges apply for tax credits for energy efficiency upgrades and renewable energy installation. Under the IRA Direct Pay program, tax-exempt entities (e.g. non-profits, churches, municipalities and unions) are eligible for cash payments from the IRS for sustainable energy projects.[367] When these projects are built with strong labor standards and community benefits, the union can receive up to 70% of the total project cost in direct payments from the government. Direct pay will cover renewable energy installation, and the associated 179D commercial buildings energy-efficiency tax deduction can cover weatherization and energy efficiency retrofits.[368] The IAM could use these tax credits to upgrade lodges across the country.

IAM Lodges can also advocate for their communities to take advantage of federal programs to upgrade municipal infrastructure. By educating local governments and promoting direct pay projects, the IAM can help bring resources into communities that need them, all while reducing climate impacts and making IAM facilities more efficient.

The IAM can also incentivize the use of electric and low carbon vehicles for IAM business, be it through fleet purchases or an employee vehicle use reimbursement policy. New EVs are eligible

for up to $7,500 in tax credits.[369] The IAM could utilize the direct pay program to install EV charging stations at lodges to facilitate employee charging. If open to the public, EV charging stations could become an income source for Lodges and a way to build connections with local community members.

Lead on Winning and Enforcing the OSHA Heat Standard Rule

Extreme heat is a major concern across IAM industries. The IAM can build on its current advocacy to win implementation of the OSHA Heat Standard and educate members on heat safety in the workplace. In July 2024, OSHA released the new proposed Heat Standard Rule. If implemented, private employers will be required to supply water and break areas when the heat index reaches 80°F (26.6°C), provide 15-minute breaks every 2 hours, and monitor for symptoms of heat stress when the heat index rises above 90°F (32.2°C).[370] At the earliest, the rule will be finalized in 2026, but it faces significant opposition from industry. A change in federal administration could also threaten the rule's implementation.[371]

A campaign on this issue would simultaneously engage members in this federal fight and expand members' knowledge on protecting themselves and their coworkers in extreme heat. The union can develop materials and training to educate members on protecting themselves in extreme heat, and the Safety and Health Department can review current curricula to ensure that heat safety is adequately addressed. Additionally, the union can incorporate language from the OSHA heat standard in bargaining demands to ensure that members are protected before the rule is finalized and in the event it is not implemented.

While heat stress affects everyone, workers of color are more likely to be working in jobs in extreme heat.[372] IAM advocacy on this issue can advance workers' rights and equity. Winning the OSHA Heat Standard and promulgating extensive safety and health training will help the union to organize, both internally and externally, and save workers' lives.

Partner with Unions Around the World to Build a Global Movement

Unions around the world are mobilizing to reverse climate change. Given the worldwide scope of the climate crisis–and the international scope of capital–it is important for the IAM to have a strategy that goes beyond US and Canadian borders. The IAM has longstanding relationships with international labor organizations such as the Building and Wood Workers' International (BWI), IndustriALL Global Union, and the International Labor Organization (ILO). The global nature of the climate crisis reinforces the need for international unions to share information, strategies, and resources.

Forging new relationships with unions around the world can unearth innovative organizing strategies and lay the foundation for cross-border organizing of global supply chains. In its capacity as a member of BWI, the IAM has organized international solidarity to oppose the unsustainable deforestation of the Amazon rainforest.[373] In 2023, IndustriALL and the European

Transport Workers' Federation published a report on decarbonizing the continent's transit sector, including an outline joint employer-union dialogue on reaching net-zero emissions in aviation.[374] International cooperation will be critical to solving a global problem like climate change.

Prioritize Equity and Diversity in the Energy Transition

The global shift from fossil fuels to clean energy sources is not just an environmental imperative; it is also a social and economic necessity. In addressing the climate crisis, unions also have a chance to address historical inequities and build a more inclusive economy. The IAM has a critical role to play in ensuring that this transition benefits all workers, including those from low-income and marginalized communities.

The newly created Human Rights Department and the LEADS women's mentoring program show a commitment to leading on equity and diversity. The union can deepen that commitment through targeted hiring and recruitment strategies, expanded training programs, and mentorships within the IAM and on worksites.

The IAM can push for increased workforce diversity and inclusion in IAM industries. Expanding training and apprenticeship programs with a focus on diversity in recruitment is one way to build a pipeline of diverse and skilled workers. The union can also support employer diversity programs and encourage their implementation through bargaining. To track progress in this area, the IAM can expand the demographic data it collects on its membership.

The IAM can further prioritize equity and climate justice as it approaches policy advocacy in the clean energy economy. For example, the union could advocate for job training and economic development for communities adversely affected by the decline of fossil fuels, such as coal mining regions. The union could also support policies to expand subsidies and incentives for low-income households to access renewable energy technologies such as solar panels and energy-efficient appliances.

Diverse voices can be a source of strength for the IAM. By prioritizing equity, diversity and climate justice, the IAM can grow and increase diversity within its ranks. The IAM is positioned to advocate for fairness across industries and ensure that the benefits of the clean energy economy are shared widely. This strategic approach will benefit IAM members, while contributing to a fairer, more just society.

Protect IAM Members in Threatened Industries

The clean energy buildout is creating jobs across North America, but the shifting economy also threatens jobs in some industries. As a new economy emerges, the IAM must develop strategies to proactively protect members from job loss.

The IAM can begin by identifying locals with significant membership in industries that are at risk of contraction. The union should support members in these industries and encourage companies

to utilize existing skill sets to make emerging industries successful. IAM units can also conduct corporate campaign research on specific employers at risk of closing to preemptively bargain for protections in the event of layoffs or closures. Further, the union can support locals facing transition-related stress by mobilizing resources to expand new organizing, develop relevant upskilling programs, and, if necessary, explore mergers with other locals. Relatedly, the IAM can take measures to ensure that pension and retiree benefits are protected.

Furthermore, the IAM should aggressively advocate for the inclusion of at-risk IAM industries in state and federal just transition legislation, and support just transition legislation for all impacted workers. For example, Colorado's Office of Just Transition could be expanded from only supporting coal workers.[375] The IAM should build on experiences with the Trade Adjustment Program to advocate for more aggressive federal protections for workers facing transition.[376]

At times, proactive advocacy and relationship building can turn threats into opportunities. As detailed in this report, the decommissioning of coal plants at the Tennessee Valley Authority (TVA) has resulted in new work and more jobs for IAM members. Several factors have contributed to the TVA-IAM success story. First, the TVA is a large and diversified employer, which provides opportunities for members to transition to other areas of work. Second, the union has established a positive relationship with the employer to develop common ground solutions.

STRENGTHENING THE IAM AT THE BARGAINING TABLE AND ON THE SHOP FLOOR

The IAM's ultimate strength is on the shop floor. Any effective climate jobs agenda should not focus exclusively on policy and politics; it must also engage members in every shop, build power at the workplace, and result in stronger collective bargaining agreements for rank-and-file members around the US and Canada.

Recommendations

- Outline Climate-Conscious Bargaining Agendas
- Establish Member-Led Climate Committees
- Develop Labor-Management Partnerships To Prepare for the Clean
- Energy Economy
- Make Safe Staffing a Pillar of Resilient Healthcare Systems and Communities

Outline Climate-Conscious Bargaining Agendas

The risk of climate related workplace hazards is growing. Employers are launching climate and decarbonization plans that impact staffing and working conditions.[377] At the same time, IAM employers are actively pursuing new business opportunities in expanding climate industries

with no guarantee that future business will be union.[378] Given these realities, the IAM should make climate an issue at the bargaining table.

A climate conscious bargaining agenda for the IAM could include safety measures for climate related health hazards, protection in the event of shop closures due to extreme weather, and a process to engage employers on workplace decarbonization plans. The IAM can begin by first surveying IAM staff and leaders that work with contracts to identify relevant existing language. Then, leaders can develop climate-conscious questions for bargaining surveys. This will enable the union to develop model language and resources on climate related bargaining demands. Additionally, in bargaining preparation, the IAM can research employers' climate plans and commitments, emissions impacts on local communities, and funding for plans to expand in climate sectors. Information about how employers are responding to climate change should factor into strategic campaign planning and identifying organizing opportunities.

Potential climate resilience demands could include pay in the event of workplace closures due to extreme weather, safety and health protections for extreme weather, and weather appropriate uniforms and PPE. Negotiating new workplace attire is also an opportunity to ensure that women, especially those working in male-dominated industries with one-size-fits all equipment, have access to properly-fitting PPE.[379] The IAM's demands could also cover climate mitigation, including requiring Labor-Management Committees on technological changes and decarbonization plans, requiring employers to include workforce analysis in decarbonization plans, and bargaining to minimize negative impacts on surrounding communities.

Establish Member-Led Climate Committees

Across North America, IAM members–Wildland Firefighters, Airline Network Operations Control Officers, healthcare workers, and so many more–are at the frontline of the climate crisis.[380] IAM members have a wealth of knowledge and expertise from their everyday experiences that can inform how the IAM formulates climate solutions.

Member-led climate committees can track changing working conditions, coordinate member education, and formulate specific bargaining priorities. This could increase member engagement, improve climate literacy, and help gather better information about climate impacts on members and workplaces. Climate Committees are also an opportunity to engage young people who care deeply about climate change.

Climate Committees could be modeled on the constitutional requirement for the Women's and Human Rights Committees, and they could coordinate with both of those committees, as well as the Safety and Health Committees. They can also receive training from the Winpisinger Center and participate in the development and deployment of climate education modules across the union. Climate Committees could also conduct member surveys to better

understand climate impacts on members, attitudes and current levels of engagement on climate issues, and potential climate-conscious bargaining demands for future negotiations.

Develop Labor-Management Partnerships To Prepare for the Clean Energy Economy

Despite huge job creation potential in the transition to a clean energy economy, dramatic change also comes with risks for workers, communities, and employers. All parties can benefit if large employers collaborate with the IAM on long-range planning and help recruit and train a skilled workforce that is prepared to fill industry needs for years to come. Dialogue can help companies identify and take advantage of new opportunities in the clean energy economy.

The IAM's success stories at Voith Hydro and Cleveland-Cliffs point to "win-win" scenarios in emerging clean energy industries. In both cases, the IAM helped management secure valuable tax credits that enabled the companies to shift existing production lines toward in-demand green technologies, all while growing union jobs.

The IAM can work with companies to take advantage of tax credits, preserve jobs, and expand bargaining in the new economy. Joint labor-management plans to reskill workers could preserve jobs while making employers more adaptive. Worksite decarbonization can reduce emissions, improve working conditions, and save employers money. When employers resist necessary action, the IAM can use bargaining and worksite organizing to force their hands. Community and political allies can also add pressure on employers to initiate dialogue–a model that is becoming increasingly common in Europe.[381]

Make Safe Staffing a Pillar of Resilient Healthcare Systems and Communities

The IAM and other union partners are leading the fight for safe staffing in healthcare through organizing campaigns, bargaining, and policymaking. Fully-staffed and well-resourced healthcare facilities are essential for communities facing extreme weather and other climate related health impacts. From 2000 to 2017, 114 hospital evacuations occurred in the US from climate-related causes like hurricanes, wildfires, floods and storms. This accounted for nearly three-quarters of all hospital evacuations.[382] At the same time, governments and advocates are looking to healthcare facilities to protect communities in the face of climate change.[383] The US Framework for Resilient Healthcare Settings includes critical elements of healthcare resilience, including community vulnerability assessments, building design, and essential clinical care service delivery. Unfortunately, it does not include provisions for adequate staffing.[384]

The IAM can develop campaign and advocacy messaging for safe staffing as a climate resilience strategy, establish partnerships with community groups working on community resilience, and work with other healthcare unions to secure safe staffing on federal guidance for climate resilient healthcare settings. Additionally, the IAM could use research into climate plans,

carbon footprints, and environmental impacts to communities surrounding target healthcare employers as part of strategic campaigning.

Establishing safe staffing as a pillar of resilient healthcare systems is an essential environmental justice issue. Climate adaptation should not come at the expense of healthcare workers. Resilient healthcare systems with safe staffing ensure that vulnerable community members receive quality care, even in times of crisis.

CLIMATE JOBS AGENDA CHECKLIST

Growing IAM Membership in Clean Energy Industries

- ❏ Grow the Zero Carbon Energy Sector and Organize the Manufacturing Supply Chain
- ❏ Establish Large-Scale Sustainable Aviation Fuel (SAF) Production
- ❏ Build a 21st Century High-Speed Rail Network in the U.S. and Canada
- ❏ Grow and Organize the Offshore Wind Industry
- ❏ Grow and Organize the Clean Vehicle Market
- ❏ Use Department of Defense Climate Readiness Projects to Expand Service Contract Act and Civilian Military Organizing
- ❏ Advocate for Carbon Free Federal Buildings

Ensuring Climate Jobs are High-Quality, Union Careers

- ❏ Advocate for Labor Standards in the Clean Energy Economy
- ❏ Develop Community-Labor Partnerships in Support of Labor Standards
- ❏ Champion Labor Law Reform
- ❏ Pass the Tim Hart Wildland Firefighter Classification and Pay Parity Act
- ❏ Support and Engage with the American Climate Corps
- ❏ Pass Local and National Legislation to Create Climate Jobs

A Climate Resilient IAM

- ❏ Expand Manufacturing, and Operations and Maintenance (O&M) Training and Apprenticeship Programs
- ❏ Develop Climate Training Programs at the William W. Winpisinger Center
- ❏ Invest Further in the IAM Disaster Relief Fund
- ❏ Decarbonize the IAM's Physical Infrastructure
- ❏ Lead on Winning and Enforcing the OSHA Heat Standard Rule
- ❏ Partner with Unions Around the World to Build a Global Movement
- ❏ Prioritize Equity and Diversity in the Energy Transition
- ❏ Protect IAM Members in Threatened Industries

Strengthening the IAM at the Bargaining Table and on the Shop Floor

- ❏ Outline Climate-Conscious Bargaining Agendas
- ❏ Establish Member-Led Climate Committees
- ❏ Develop Labor-Management Partnerships To Prepare for the Clean
- ❏ Energy Economy
- ❏ Make Safe Staffing a Pillar of Resilient Healthcare Systems and Communities

Conclusion

"If we are going to get where we want to go, then we can ill afford playing the fates and the futures by ear. From here on we must make those decisions which propel us into a new dawn at the head of society, and we shall do it in our own self-determined way."[385]

Former IAM President William Winpisinger wrote these words in 1989. While he wasn't necessarily talking about climate change, his words ring true as the IAM, the labor movement, and society at large wrestle with how to deal with the existential crisis of our time.

The need for climate action is no longer up for debate. Wildfires, hurricanes, and many other calamities, both seen and unseen, make the need to act more apparent every day. The question is: What will this action look like, and in whose interests?

If left to the corporate class alone, climate action will lack the ambition needed to leave a habitable, sustainable world for future generations. Further, it will almost certainly be in service of profits and shareholder returns rather than the needs of working families and communities. If we want a truly just transition to the low-carbon, climate safe economy of the future, then organized labor must play a central role in making it happen.

In these pages, we conveyed the stakes of this fight and why it matters to IAM members in every sector of the economy and in every corner of the United States and Canada. We also proposed a "Climate Jobs Agenda" for the IAM, outlining several key steps the union's members, leaders, and staff can take to advance a bold, equitable, resilient, and unionized clean energy future.

As noted in the introduction, this report is not an ending point. Rather, it lays out a vision for how the IAM can grow its membership in climate and clean energy industries, ensure that new clean energy jobs are high-quality, union careers, become resilient to climate impacts, and strengthen its power at the bargaining table and on the shop floor. Through concerted action at every level of the union, the IAM can make this vision a reality, ushering in a more sustainable future not just for its members, but for communities around the world.

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617 MEDIA GROUP

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