



Executive Summary of PERI Report

Employment Impacts of New U.S. Clean Energy, Manufacturing, and Infrastructure Laws





EXECUTIVE SUMMARY

[The new report from the Political Economy Research Institute at the University of Massachusetts-Amherst](#) estimates that the combined investments in the Bipartisan Infrastructure Law (BIL), Inflation Reduction Act, and CHIPS and Science Act (CHIPS) will support nearly 3 million jobs per year and 19 million job-years over their lifetime. This represents a major expansion in overall job opportunities throughout the U.S. economy, equal to nearly 2% of the current U.S. workforce. Continuing with these employment gains through BIL, Inflation Reduction Act, and CHIPS investment programs can also contribute toward sustaining the current historically low unemployment rate in the United States.

The pace and scope of this job creation is already spurring urgent action by policymakers and businesses to ensure a sufficient supply of skilled workers. Without a qualified workforce, businesses won't be able to complete the clean energy and infrastructure projects catalyzed by these investments in a timely fashion. This would hurt local and state economies, workers, and climate mitigation.

Policymakers and other stakeholders shaping the implementation of these new investments now have a powerful opportunity to boost economic security and job quality, redress longstanding injustices in communities that have endured decades of disinvestment, and expand the universe of workers who are prepared for and actively pursuing employment in a range of sectors. **Well-designed, intentional job quality and workforce development strategies—supported by complementary investments—can ensure an ongoing supply of skilled workers, boost workers' economic security, and include communities and workers that have previously been shut out of economic advancement.**

This report's key findings are summarized here in the categories of job quantity, job access, and job quality:

- **Job Quantity:** The three federal investments analyzed are expected to create nearly 3 million jobs per year and 19 million job-years over their lifetime. **A renewed focus on workforce development will be essential to train millions of workers to occupy the new positions created by BIL, Inflation Reduction Act, and CHIPS investments.** In particular, the construction, transportation, manufacturing, and utilities sectors are expected to see high job growth and would be excellent areas to focus workforce development efforts. Notably, many of the sectors that are expected to grow currently employ a high percentage of workers without a bachelor's degree. Finally, while this study focuses on labor demand, a subsequent study will examine labor supply for the same sectors, offering a more precise understanding of workforce gaps that need to be filled.
- **Job Access:** **A significant share of jobs created by these investments are within reach for workers without a college degree.** This is an opportunity for low-income and blue-collar workers—who have been hurt by bad policies and economic downturn for decades—to access training opportunities and move into the middle class. However, women workers are acutely and consistently underrepresented in nearly all the sectors that are projected to grow with BIL, Inflation Reduction Act, and CHIPS investments. Black workers are also underrepresented, particularly among higher-paying sectors. Given the changing demographics of the U.S. workforce, it will be nearly impossible for clean energy and infrastructure employers to find the skilled workforce they need without establishing more inclusive pathways for workers who have traditionally been underrepresented in these industries.
- **Job Quality:** **The jobs created by BIL, Inflation Reduction Act, and CHIPS investments pay higher median wages on average than jobs in the U.S. workforce overall, making them a lever to help alleviate the United States' unacceptably high levels of income inequality.** However, workers in many of the specific sectors that are projected to grow via BIL, Inflation Reduction Act, and CHIPS investments are less likely to have union representation or offer health insurance and retirement benefits compared to national averages. Policymakers' efforts to attach labor standards to these investments and protect the rights of workers to organize—and complementary strategies to boost job quality, such as access to training and career advancement—will be critical to close these gaps.



JOB QUANTITY

Policymakers and other stakeholders directing investments in workforce development should be analyzing three factors: 1) areas of projected job growth; 2) supply of existing workers and prospects for future workforce growth; and 3) best practices for expanding the pipeline of qualified workers and avoiding potential shortages. This analysis focuses on the first factor, and briefly describes considerations for the third factor. Future publications will explore the second and third factors in more detail.

The economic sectors slated to see the largest relative growth in jobs created by BIL, Inflation Reduction Act, and CHIPS investments include:

- Construction (4% growth, relative to 2021 employment levels, and 467,000 jobs annually);
- Manufacturing (3% growth, 336,000 jobs annually);
- Transportation and warehousing (2% growth, 257,000 jobs annually); and
- Utilities (2% growth, 15,000 jobs annually).

These four sectors should be the primary focus of workforce development efforts.

The report shows job growth from BIL, Inflation Reduction Act, and CHIPS investments will be particularly strong in the following job categories, suggesting areas of particularly significant workforce development needs. (Figures are included if more than 10,000 direct jobs are created in a given job category by a given set of investments).

Job categories	Average annual direct jobs across all programs in BIL, Inflation Reduction Act, and CHIPS	Average annual direct jobs by a given set of investments
Construction	287,000	BIL: Roads, Bridges, Ports and Waterways – 120,000 BIL: Public Transit and Freight Rail – 20,000 BIL: Broadband – 13,000 BIL: Airports – 10,000 Inflation Reduction Act: Electricity – 70,000 CHIPS: Manufacturing – 18,000
Management	171,000	BIL: Roads, Bridges, Ports and Waterways – 51,000 BIL: Public Transit and Freight Rail – 15,000 Inflation Reduction Act: Electricity – 36,000 CHIPS: Manufacturing – 12,000
Transportation and Material Moving	122,000	BIL: Roads, Bridges, Ports and Waterways – 44,000 BIL: Public Transit and Freight Rail – 41,000 BIL: Electric Vehicles, Buses, and Ferries – 10,000
Production	94,000	Inflation Reduction Act: Electricity – 28,000 BIL: Public Transit and Freight Rail – 14,000
Office and Administrative Support	63,000	BIL: Roads, Bridges, Ports and Waterways – 17,000 Inflation Reduction Act: Electricity – 12,000
Architecture, Engineering, and Technicians	51,000	Inflation Reduction Act: Electricity – 12,000
Installation, Maintenance, and Repair	49,000	Inflation Reduction Act: Electricity – 12,000



JOB ACCESS

A disproportionately large share of jobs created by the investments of these three laws are available to workers without a bachelor's degree: 69.1% of direct jobs overall, compared to the 59.6% of jobs in the total U.S. workforce. This data highlights the opportunity created by these laws for America's economically hard-hit working class and for women and Black workers who have not had access to these opportunities in the past and underscores the importance of skills training programs—including those that are union-affiliated—as an on-ramp to these jobs and as a mechanism for boosting economic security and job quality.

In addition, as the U.S. workforce becomes more diverse, it is more urgent that policymakers and employers consider the full pool of potential workers, including under-represented groups that historically have not been employed in particular sectors. The new laws demand the proactive implementation of job access and workforce development strategies that are proven to be effective in preparing workers of all backgrounds for construction, manufacturing, and other energy and infrastructure-related careers. Examples include strategies that invest in earn-and-learn apprenticeship programs; supportive services that ensure that workers can get the childcare, transportation, mentoring, and other supports they need to participate in training programs and succeed on the job; and industry sector partnerships among trusted nonprofit organizations, unions, community colleges, businesses, and other relevant stakeholders.

Certain categories of BIL, Inflation Reduction Act, and CHIPS investments face a particularly acute need for targeted hiring practices, pre-apprenticeship programs, and other tools to expand access for underrepresented workers. This is particularly true for women and Black workers, who are consistently underrepresented across the jobs created by BIL, Inflation Reduction Act, and CHIPS investments.

Educational Credentials

- BIL: Most jobs created directly via BIL investment categories provide greater access to people without a bachelor's degree than jobs in the U.S. labor market more generally. The share of the total BIL workforce without a bachelor's degree is 71.1%, compared to the national workforce level of 59.5%. Energy Production is an exception; it is one BIL investment category with a relatively low rate of workers without a bachelor's degree (51.8%).
- Inflation Reduction Act: Three of seven Inflation Reduction Act investment categories create direct jobs that provide less access to people without a bachelor's degree than jobs in the U.S. workforce overall, though the share of the total Inflation Reduction Act workforce without a bachelor's degree exceeds the share in the total U.S. workforce (69.2% vs. 59.5%). Two Inflation Reduction Act investment categories with a relatively low rate of workers without a bachelor's degree (below 51%) are Lands and Environmental Justice and Community Resilience.
- CHIPS: Two of three CHIPS investment categories create direct jobs that provide less access to people without a bachelor's degree than jobs in the U.S. labor market overall: Research and Development and Defense. The share of the total CHIPS workforce without a bachelor's degree is 53.6%, compared to the national level of 59.5%.

Gender Composition

- BIL: Women are extremely underrepresented in the kind of jobs that will be created across all 11 BIL investment categories. The percentage of women in the BIL workforce is just 20.4%, far below the overall U.S. workforce level of 46.8%. The percentage of women is particularly low (below 20%) in these BIL investment categories: Roads and Bridges, Broadband, Airports, and Buildings.
- Inflation Reduction Act: Women are underrepresented in the direct jobs created across all seven Inflation Reduction Act investment categories. The percentage of women in the Inflation Reduction Act workforce is just 21%, far below the overall labor market level of 46.8%. The percentage of women is particularly low (below 20%) in these Inflation Reduction Act investment categories: Electricity and Manufacturing.
- CHIPS: Women are underrepresented in the direct jobs created in the CHIPS investment category of Manufacturing. Due to this, the percentage of women in the CHIPS workforce is just 28.7%, far below the overall labor market level of 46.8%.

Racial Composition

- **BIL:** Five of 11 BIL investment categories create direct jobs in which the current percentage of BIPOC workers falls below the overall U.S. workforce level, while nine of 11 BIL investment categories show underrepresentation of Black workers. While the percentage of BIPOC workers for the overall BIL workforce exceeds the overall workforce (41.8% vs. 39.5%), the percentage of Black workers falls below the overall level (10.9% vs. 12.7%). The percentage of BIPOC workers is particularly low (below 35%) in these BIL investment categories: Energy Production, Water, Lands and Resilience, and Economic Development—all of which pay relatively high average wages. The percentage of Black workers is particularly low (below 8%) in these BIL investment categories: Lands and Resilience, Airports, and Buildings.
- **Inflation Reduction Act:** Six of seven Inflation Reduction Act investment categories create direct jobs in which the percentage of BIPOC workers falls below the overall U.S. labor market level, while all seven investment categories show significant underrepresentation of Black workers. The percentage of BIPOC workers for the overall Inflation Reduction Act workforce falls below the national level (37.5% vs. 39.5%), as does the percentage of Black workers (7.7% vs. 12.7%). The percentage of BIPOC workers is particularly low (below 35%) in these Inflation Reduction Act investment categories: Buildings, Agriculture, Lands, and Environmental Justice and Community Resilience. The percentage of Black workers is particularly low (below 8%) in these Inflation Reduction Act investment categories: Electricity, Agriculture, and Lands.
- **CHIPS:** Two of three CHIPS investment categories create direct jobs in which the percentage of BIPOC workers falls below the overall U.S. workforce level, while all three investment categories show significant underrepresentation of Black workers. Notably, CHIPS investment categories generate among the highest wage jobs across the three laws. The percentage of BIPOC workers for the overall CHIPS workforce falls slightly below the overall level (38.8% vs. 39.5%) while the percentage of Black workers falls significantly below the overall level (7% vs. 12.7%). The percentage of BIPOC workers is particularly low (below 35%) in the Research and Development and Defense categories, while the percentage of Black workers is particularly low (below 8%) in the Manufacturing category.



JOB QUALITY

The average (median) hourly wages of direct jobs created by BIL, Inflation Reduction Act and CHIPS investments combined is \$26.20, higher than the average hourly wage of \$23.70 for the total U.S. workforce. As a consequence, these investments should be considered as a tool to boost wages and job quality and security in the U.S. workforce. However, the report shows other job quality indicators that are lower than average. Across a large number of BIL, Inflation Reduction Act, and CHIPS investment categories, union membership is lower than it is in the total U.S. workforce. Workers in these investment categories are also less likely to have health insurance or retirement plans through their jobs.

These indicators illustrate a strong need for policies and strategies that protect workers' rights to organize and that help workers advance to higher skill and high-paid occupations.

Average Wages

- BIL: The direct jobs created by most BIL investment categories have median wages that exceed the national level. The median wage of the total BIL workforce is 6% higher than the national level (\$25.20 vs. \$23.70).
- Inflation Reduction Act: The direct jobs created by most Inflation Reduction Act investment categories have median wages that exceed the national level. The median wage of the total Inflation Reduction Act workforce is 11% higher than the national level (\$26.20 vs. \$23.70). Two categories with median wages significantly below the national level (\$21.00) are Agriculture and Lands.
- CHIPS: The direct jobs created by all CHIPS investment categories have median wages that exceed the national level. The median wage of the total CHIPS workforce is 28% higher than the national level (\$30.25 vs. \$23.70).

Health Insurance

- BIL: Eight of the 11 BIL investment categories create direct jobs with health insurance coverage rates that fall below the national level. The coverage of the total BIL workforce is 46.2%, compared to the national level of 50%. Coverage rates are particularly low (below 45%) for jobs in these categories: Roads and Bridges, Lands and Resilience, Airports, Electric Vehicles and Buses, Buildings, and Economic Development.
- Inflation Reduction Act: Four of the seven Inflation Reduction Act investment categories create direct jobs with health insurance coverage rates that fall below the national level, though the total Inflation Reduction Act workforce has a coverage rate that exceeds the national level (53% vs. 50%). Two categories with particularly low coverage (below 40%) are Agriculture and Lands.
- CHIPS: The direct jobs created by all CHIPS investment categories have health insurance coverage rates that exceed the national level. The coverage of the total CHIPS workforce is 55.6%, compared to the national level of 50%.

Retirement Plans

- BIL: Nine of the 11 BIL investment categories create direct jobs with retirement plan rates that fall below the national level. The coverage of the total BIL workforce is 31.7%, compared to the national level of 40.8%. Coverage rates are particularly low (30% or below) for jobs in these categories: Roads and Bridges, Lands and Resilience, Airports, Buildings, and Economic Development.
- Inflation Reduction Act: Six of the seven Inflation Reduction Act investment categories create direct jobs with retirement plan rates that fall below the national level. The coverage of the total Inflation Reduction Act workforce is 36.6%, compared to the national level of 40.8%. Coverage rates are particularly low (below 30%) for the Agriculture and Lands categories.
- CHIPS: Manufacturing is the only CHIPS investment category that creates direct jobs with retirement plan rates (39.4%) that fall below the national level (40.8%).

Union Membership

- BIL: Five of the 11 BIL investment categories create direct jobs with union membership rates that fall below the national level, though the overall rate for the BIL workforce (12.5%) exceeds the national level (11.3%).
- Inflation Reduction Act: All seven Inflation Reduction Act investment categories create direct jobs with union membership rates that fall below the national level. The membership rate of the total Inflation Reduction Act workforce is 9.1%, compared to the national level of 11.3%.
- CHIPS: All three CHIPS investment categories create direct jobs with union membership rates that fall significantly below the national level. The membership rate of the total CHIPS workforce is 6.9%, compared to the national level of 11.3%.

View the full University of Massachusetts-Amherst Political Economy Research Institute report here: <https://peri.umass.edu/publication/item/1758-employment-impacts-of-new-u-s-clean-energy-manufacturing-and-infrastructure-laws>.



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