

U.S. STATE-LEVEL STUDY

**Employment Impacts for *Colorado*
of Recent U.S. Clean Energy,
Manufacturing, and Infrastructure Laws**

**Job Creation, Job Quality, and Demographic
Distribution Measures for:**

- **BIL**—*Bipartisan Infrastructure Law*
- **IRA**—*Inflation Reduction Act*
- **CHIPS**—*Creating Helpful Incentives to Produce Semiconductors*

ROBERT POLLIN

Distinguished University Professor of Economics and
Co-Director, Political Economy Research Institute (PERI)
University of Massachusetts Amherst

JEANNETTE WICKS-LIM

Research Professor, PERI
University of Massachusetts Amherst

SHOUVIK CHAKRABORTY

Assistant Research Professor, PERI
University of Massachusetts Amherst

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Source Material and Methodology for Generating Results in Tables

In September 2023, we published the study *Employment Impacts of New U.S. Clean Energy, Manufacturing, and Infrastructure Laws*. This study reported estimates on job creation, job quality, and workforce demographics resulting from the BIL (Bipartisan Infrastructure Law), IRA (Inflation Reduction Act), and CHIPS (Creating Helpful Incentives to Produce Semiconductors). We now provide state-level companion studies to this September 2023 national-level study for four states, Colorado, Michigan, Ohio, and Oregon.

These four state-level studies follow the same basic methodology as our September 2023 national study. But there are three areas where we have needed to further specify and adjust our estimating methodology, to take account of state-level specific considerations with BIL, IRA, and CHIPS. These three areas are:

1. Estimating each state's share of the overall national level of BIL, IRA, and CHIPS expenditures;
2. Estimating the level of economic activity that will take place within each state's economy, as derived from each state's share of total expenditures resulting from BIL, IRA, and CHIPS. This is the measure of "state content," versus purchases of imported goods coming from outside the state resulting from BIL, IRA, and CHIPS expenditures; and
3. Estimating job characteristics at the state-specific level rather than a national level.

We begin this methodological discussion by addressing the first two state-specific considerations. Our expanded discussion on estimating job characteristics follows on pp. 5–6. The remaining sections of this methodological discussion are identical to that which we provided in the September 2023 national-level study.

State-level Budget Estimates for BIL, IRA, and CHIPS

Our September 2023 study provides estimates for the overall U.S. economy of expenditure levels for BIL, IRA, and CHIPS. In the Appendix to that study, we also estimate expenditure levels on a line-item basis for all BIL, IRA, and CHIPS programs.

For our four state-level studies, we use separate approaches for estimating expenditures at the state level for BIL, IRA, and CHIPS respectively. These differences in estimating methods reflect both differences in the ways the separate programs are designed to allocate their overall funding as well as the amount of information that has become available on actual investment activity generated by the three programs.

IRA Spending Estimate

We generated IRA-based funding at the level of individual states—and for Colorado, Michigan, Ohio, and Oregon in particular—based on a simple formula. That is, we derive each state’s share of overall IRA expenditure levels as an equally weighted average of the state’s share of the overall U.S. population and its share of overall U.S. GDP. Formally:

$$\text{State share of overall IRA investment spending} = \frac{(\text{state population}/\text{U.S. population}) + (\text{state GDP}/\text{U.S. GDP})}{2}.$$

This formula takes account of both the share of economic activity in each state as well as its share of overall population. It also reflects a broader assumption that IRA-supported investment spending is targeted to be distributed fairly evenly across all U.S. states.

Methodology Table 1 below reports on the results of these spending share estimates by state for the IRA.

BIL Spending Estimate

The White House provides a funding tracker for all BIL activity at the state level at Build.gov: <https://www.whitehouse.gov/build/resources/state-fact-sheets/>. This provides the most extensive reporting of ongoing announced and awarded BIL funding support. To estimate each state’s share of BIL funding through the 5-year life of the program, we first calculated the actual share of funding received by Colorado, Michigan, Ohio, and Oregon as of August 2023. This date corresponds with the date of U.S. economy-wide figures that we utilized in our September 2023 study.

In fact, the percentages of funding for our four states generated through this set of calculations closely mirrors the percentages generated by the formula we described above in calculating state-level shares of IRA funding—i.e. the weighted average of each state’s share of both U.S. GDP and U.S. population. We can see this in Methodology Table 1 below. Thus, as the table shows, the respective shares of BIL spending by state using the White

METHODOLOGY TABLE 1. Estimated Expenditure Shares for Colorado, Michigan, Ohio, and Oregon of Overall U.S. Economy-wide BIL, IRA, and CHIPS-based Spending

	BIL Spending	IRA Spending	CHIPS Spending
Colorado	1.8%	1.7%	0.25%
Michigan	2.7%	2.8%	0.0%
Ohio	3.4%	3.1%	8.0%
Oregon	1.2%	1.3%	10.5%

Sources: See text discussion above.

House figures are 1.7 percent for Colorado, 2.8 percent for Michigan, 3.1 percent for Ohio, and 1.3 percent for Oregon. With the GDP and population-weighted ratios that we applied in estimating IRA spending shares, the figures are nearly identical for Colorado, Michigan, and Oregon, at 1.8 percent, 2.7 percent, and 1.2 percent respectively. The difference in the ratios is slightly larger for Ohio, at 3.4 percent with our calculation using the White House spending figures versus 3.1 percent using the weighted average of Ohio's population and GDP shares. But this 0.3 percentage point difference—3.1 versus 3.4 percent—is still negligible for the purposes of our overall calculations of employment impacts. As such, the close correspondence between these two sets of ratios provides support as to the reliability of the spending shares by state that we generated based on the spending figures reported by the White House. We therefore applied the BIL spending shares by state derived from the White House figures to estimate each of our four state's share of overall BIL spending over the 5-year life of the program.

CHIPS Spending Estimate

A substantial share of the overall CHIPS public funding for semiconductor fabrication grants has been allocated as of 5/30/24. Specifically, according to figures from the Semiconductor Industry Association (SIA), as of 5/30/24, there have been 18 funding allocations announced, totaling to \$29.5 billion in public support.¹ Overall public funding support to be provided through CHIPS for semiconductor fabrication grants is \$39 billion. Thus, as of 5/30/24, roughly 76 percent of total public funding has been allocated. We can use the figures on public CHIPS funding to date received, respectively, within the Colorado, Michigan, Ohio, and Oregon state economies as one basis for estimating overall CHIPS investment spending in the four states, including private investments as well as public support.

As a further set of evidence for estimating the overall investment spending shares for each of our four states—including private as well as public spending—we can incorporate the SIA's reported figures on overall "project size." These SIA figures on "project size" are estimates of the level of private investments on individual semiconductor fabrication projects that will accompany the public funding for these projects allocated through CHIPS.

To estimate overall CHIPS spending shares for Colorado, Michigan, Ohio, and Oregon, our procedure was to calculate the weighted average of public allocations shares by states along with two separate estimates of the private "project size" spending figures. In fact, our estimates of the relative shares of overall spending by state derived from these three separate calculation methods were very close to one another. Methodology Table 1 reports the results of calculating the weighted average of the three approaches. Further details on our calculation method are available from the authors.

It is notable that, with the CHIPS program, unlike the spending share figures by state for the IRA and BIL programs, there are wide disparities in the shares of overall spending

¹ Semiconductor Industry Association, "CHIPS Incentive Announcements"; accessed 5/30/2024 from <https://www.semiconductors.org/chips-incentives-awards/>

received by the four states. Thus, as the table above reports, we estimate that Oregon will receive fully 10.5 percent of all CHIPS spending throughout the U.S. economy—including both private spending and public grants—and Ohio will receive 8.0 percent of total spending. By contrast, we estimate that Colorado will receive a negligible 0.25 percent of overall CHIPS spending, and that Michigan will not receive any support, public or private, through the CHIPS program. These ratios are incorporated into our full set of estimates on employment impacts of BIL, IRA, and CHIPS for Colorado, Michigan, Ohio, and Oregon.

Estimating State-level Employment Estimates and Import Content Shares of Overall BIL, IRA, and CHIPS Spending Levels

The state-level IMPLAN model that we use for generating employment estimates offers two options for estimating the relative shares of state-level specific content of any activity within any given U.S. state within the overall U.S. economy. This includes expenditures on the BIL, IRA, and CHIPS programs. One option within IMPLAN is to assume that the relative shares of state-level content resulting from these activities will be equal to the existing shares of state-level content for each activity. The second option provided within IMPLAN is to assume that all expenditures will take place within the given state—i.e. that state-level content will rise to 100 percent across-the-board and that import content will be zero.

The employment estimates that we report here are based on taking the midpoint estimates between existing state content shares and a 100 percent domestic content scenario. Because the BIL, IRA and CHIPS programs are explicitly designed to promote activity within various regions in the U.S. as well as within the domestic U.S. economy overall, it is reasonable to assume that state-level content for these programs will be higher than existing state content levels. At the same time, it is unrealistic to assume that the state content will rise across-the-board to 100 percent, especially within the initial years in which these programs are operating.

Sources for BIL Estimates

- Text of the Bipartisan Infrastructure Law (BIL)/Infrastructure Investment and Jobs Act (IIJA): <https://www.congress.gov/117/plaws/publ58/PLAW-117publ58.pdf>
- White House Guidebook to the Bipartisan Infrastructure Law: <https://www.whitehouse.gov/build/guidebook/>
- Spreadsheet tabulation of the individual BIL programs modeled in this analysis: <https://docs.google.com/spreadsheets/d/1IWPP6U9CAafNrKqnf2Y3-dZ2aw33LGCG/edit#gid=449713478>

Sources for IRA Estimates

- Text of the Inflation Reduction Act of 2022: https://www.democrats.senate.gov/imo/media/doc/inflation_reduction_act_of_2022.pdf

- Line-item summary of the IRA programs modeled in this analysis: https://docs.google.com/document/d/1PpmSTgaA7gQ_hX2Sjpf04tsrD1I8p5MRtFrYb7pzQ/edit
- Spreadsheet tabulation of the IRA programs modeled in this analysis: <https://docs.google.com/spreadsheets/d/1iHbr4Ph3cD7r30Z093pWUMV2P1kLhywAeW2UilVp09U/edit#gid=0>
- Tax credit scores from the Congressional Budget Office and the Joint Committee on Taxation: https://www.cbo.gov/system/files/2022-08/hr5376_IR_Act_8-3-22.pdf

Sources for CHIPS Estimates

- Text of the CHIPS and Science Act: <https://www.congress.gov/117/plaws/publ167/PLAW-117publ167.pdf>
- CHIPS Program Fact Sheet: https://www.nist.gov/system/files/documents/2023/02/28/CHIPS_NOFO-1_Fact_Sheet_0.pdf
- Spreadsheet tabulation of the CHIPS programs modeled in this analysis: <https://docs.google.com/spreadsheets/d/1IWPP6U9CAafNrqnF2Y3-dZ2aw33LGCG/edit#gid=449713478>

Data Sources

All figures have been estimated on the basis of calculations generated within the 2023 IMPLAN U.S. input/output tables. The IMPLAN U.S. input/output model features 546 industries within the U.S. economy. The data in the model are from 2021.

Time Dimension in Measuring Job Creation

Any type of spending activity creates employment over a given amount of time. To understand the impact on jobs of a given spending activity, one must therefore incorporate a time dimension into the measurement of employment creation. For example, a project that creates 100 jobs that last for one year only needs to be distinguished from another project that creates 100 jobs that continue for 10 years each. It is important to keep this time dimension in mind in any assessment of the impact of on job creation of any investment activity.

There are two straightforward ways in which one can express such distinctions. One is through measuring “job years.” This measures cumulative job creation over the total number of years that jobs have been created. Thus, an activity that generates 100 jobs for 1 year would create 100 job years. By contrast, the activity that produces 100 jobs for 10 years would generate 1,000 job years. The other way to report the same figures would be in terms of jobs-per-year. Through this measure, we show the year-to-year breakdown of the overall level of job creation. Thus, with the 10-year project we are using in our example, we could express its effects as creating 100 jobs per year for 10 years.

In the following tables, we report employment creation both in terms of jobs-per-year—i.e. annual job creation—as well as cumulative job years.

Details on Employment Estimates

For in-depth discussions of our methodological approach to estimating job creation through investments in clean energy and infrastructure, see:

- Pollin et al. (2009) *How Infrastructure Investments Support the U.S. Economy*, http://s3-us-west-2.amazonaws.com/aamweb/uploads/research-pdf/Infrastructure_2009.pdf;
- Pollin et al. (2014) *Green Growth*, <https://www.americanprogress.org/issues/green/reports/2014/09/18/96404/green-growth/>;
- Pollin et al. (2015) *Global Green Growth*, https://www.unido.org/sites/default/files/2015-05/GLOBAL_GREEN_GROWTH_REPORT_vol1_final_0.pdf.

ESTIMATING JOB CHARACTERISTICS AND REPRESENTATIVE JOBS IN VARIOUS INVESTMENT AREAS

Our strategy for identifying the types of jobs that would be generated through the various investment activities presented here involves two steps.

The first step is to calculate, for each specific investment program, the level of employment generated in each of 546 industries through our input-output model (IMPLAN) as explained above.

Next, we apply this information on the industry composition of the new employment created by an investment with data on workers currently employed in the same industrial mix of jobs. We use the characteristics of these workers to create a profile of the types of jobs and the types of workers that will likely hold the jobs created with each investment. These characteristics include types of occupations, gender, race/ethnicity, union status, credential requirements, wages and job-related benefits.

For details on the estimating methodology, see Pollin et al (2021), *Impact of the Reimagine Appalachia & Clean Energy Transition Program for Pennsylvania*, Appendix 2.² Most of the job characteristic estimates in this analysis are based on the most up-to-date micro-data files available from the U.S. Labor Department as of the writing of this report, i.e. the 2021–2023 data files from the Labor Department’s household survey, the Current Population Survey (CPS). Major exceptions include our estimates of job-related health insurance and retirement benefits. For these figures, we use data from the March supplemental survey of the CPS, the Annual Social and Economic survey (ASEC). Specifically, we pool ASEC data

2 <https://peri.umass.edu/?view=article&id=1383:impacts-of-the-reimagine-appalachia-clean-energy-transition-programs-for-pennsylvania&catid=143>

from the survey years of 2016–2019, and 2022–2023. We omit data collected during March 2020 and March 2021 to exclude data affected by the survey administration problems and employment shocks specific to the COVID-19 pandemic.

In addition, for some estimates, we include observations from nearby states or across Census regions to create sample sizes sufficient to analyze job characteristics for each law. Which geographic unit we used varies based on which type of CPS data file we used, as well as which law is being analyzed. This is because the CPS samples vary in size by data file. Additionally, each law draws observations from a different set of industries, each of which varies in the number of available observations.

Specifically, the demographic characteristics of the workforce are based on the full set of basic monthly files of the CPS. The average wage and union membership estimates are based on a subset of the basic monthly files referred to as the “outgoing rotation group” (ORG) data files of the CPS. These ORG data files have smaller sample sizes than the basic monthly files. The job benefits estimates—health insurance and retirement benefits—are based on the ASEC files of the CPS as noted above. These data files have smaller sample sizes than both the basic monthly files and the ORG data files.

We provide for reference the job quality and demographic characteristics for each state’s total workforce across all industries. For these estimates, we use data from within the state only. Note that the sample used to estimate each state’s total workforce characteristics may be somewhat different from those used to estimate job characteristics for the employment created by each law. This is, again, because we may pool across geographic units to get sufficient sample sizes for the industries for which each law generates employment. For example, the characteristics that appear in column 1 of Summary Table 3 will be based on data from within each state only. However, depending on the law, the characteristics that appear in columns 2 through 5 may be based on samples from the state only, or pooled across nearby states. We produce the job characteristics estimates for each law in this way in order to use the most industry-specific data available.

Additional Points of Clarification on Job Quality, Demographics, and Prevalent Job Types

1. Current vs. future workforce composition. The figures we report on, for example, wage levels and percentages of women and people of color employed in the various activities reflect the current composition of the workforce. Wage rates could rise over time through effective union organizing campaigns. Similarly, the share of women and people of color in the workforce could also rise through organizing and the establishment of effective affirmative action policies. See Pollin et al. (2020) for further discussion on these issues.³

³ <https://peri.umass.edu/?view=article&id=1355:employment-creation-and-just-transition-through-a-u-s-zero-carbon-program&catid=143>

2. All jobs within given industries vs. specific occupational categories. The figures we report on jobs by industry, such as the services, manufacturing, or construction industry, are distinct from the figures we cite on specific prevalent occupations. For example, the share of construction jobs, as an occupation, that are generated by BIL-related broadband investments is a distinct category from the overall job creation in the construction sector. Jobs generated in the construction sector will include secretaries, accountants, and truck drivers as well as those who perform construction work as their occupation.

ESTIMATES ON LEVERAGING PUBLIC FUNDS TO EXPAND OVERALL PUBLIC AND PRIVATE SPENDING

BIL and CHIPS Loan and Loan Guarantee Programs

These are the specific measures in the BIL and CHIPS programs that include loan or loan guarantee financing.

BIL

- *Broadband:*
 - Distance Learning, Telemedicine, and Broadband Program: Broadband Loans (corporations eligible for direct loans)
 - Distance Learning, Telemedicine, and Broadband Program: Reconnect Program (corporations eligible for combinations of direct loans and grants)
- *Energy:*
 - Transmission Facilitation Program (developers may access funding through loans, direct financing, and capacity purchases)

CHIPS

- *Manufacturing:*
 - Manufacturing Incentives
 - Advanced Manufacturing Tax Credit

To estimate total spending levels for these programs relative to their public funding allocation, we work from the relevant description in the CHIPS Program Fact Sheet. The Fact Sheet includes the following explanation on leveraging for the relevant CHIPS programs:

There is also no fixed limit on the loans or loan guarantees that a project may receive. Applicants can request loans or loan guarantees to provide debt financing that is not available on comparable terms on the private market, and the specific terms will be based on a project's financing requirements and risk profile. A single application can result in an award that contains more than one type of incentive. The CHIPS Program Office generally expects that the total amount of an award, inclusive of direct funding and the principal amount of a loan or loan guarantee, will not exceed 35% of project capital expenditures.

Based on this expectation within the CHIPS Program Office, we assume that with both the BIL and CHIPS programs listed above that the public funding that is allocated for these pro-

grams will constitute 35 percent of total public and private funding. That is, for all of these programs, we multiply the public funding allocation by 2.85 to estimate the total funding level.

IRA Tax Credit, Loan, and Loan Guarantee Programs

Tax credit and related incentive programs. For all tax credit and related programs in which public spending is designed to incentivize further private spending, we assume that the overall level of public spending will be matched equally by the same level of private spending—i.e. \$2 in total spending for every dollar of public funding. For example, we assume that the proposed \$7,500 tax credit per electric vehicle would incentivize another \$7,500 in private spending for electric vehicle purchases, for a total of \$15,000 in overall spending. The literature on leveraging public sector funds for incentivizing private spending considers a large number of variables and presents a range of estimates as to the likely private spending levels that result from such leveraging programs. We deliberately assume here a relatively low leveraging rate for the relevant IRA programs.⁴

Loan guarantee programs. The Department of Energy’s loan guarantee programs stipulate the loan authority associated with each level of appropriation. This includes a \$250 billion loan authority associated with a \$5 billion appropriation for the larger DOE program and a \$40 billion authority based on a \$3.6 billion appropriation. For the Tribal Loan Guarantee program, we assume the authority is \$3.8 billion based on an appropriation of \$75 million. The program thus assumes an approximate 50-to-1 leveraging ratio.⁵

TIME HORIZONS FOR BIL, IRA, AND CHIPS PROGRAMS

The time periods during which the various programs of these measures operate vary—both within each measure and between them. For the purposes of our estimates, we work with the simple summary assumption that the BIL and CHIPS programs will operate, on average, for 5 years, and the IRA programs will operate for 10 years. Our assumptions are based on the following:

BIL: There are a total nearly 300 individual programs under BIL. According to the White House’s *BIL Guidebook*, roughly 30 programs within BIL are mandated to operate for 5 years. Another roughly 50 programs are mandated for 4 years. Roughly 20 programs have fewer than 4 year time frames, and less than 20 are designated for 10 years or longer. The remaining more than 200 programs are designed to continue until ‘available funds are

4 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/438763/bis-15-340-relationship-between-public-and-private-investment-in-R-D.pdf; <https://www.cgdev.org/sites/default/files/assessing-leverage-climate-investment-funds.pdf>

5 Discussion of the larger DOE program is at <https://prospect.org/environment/inflation-reduction-bill-uses-public-finance-to-stoke-energy-investment/>. We note that this 50-to-1 leveraging ratio for the DOE loan guarantees is close to the 47-to-1 ratio resulting from the DOE’s 1705 loan guarantee program within the 2009 American Recovery and Reinvestment Act. See Pollin et al. (2014), pp. 260 – 263 for discussion on the this earlier loan guarantee program.

expended.’ For our purposes, assuming an average 5-year time span for all BIL programs is a reasonable rough and workable approximation.

IRA: According to the IRS, the stipulations of the IRA are meant to remain in place for 10 years: <https://www.irs.gov/inflation-reduction-act-of-2022#:~:text=Since%20the%20Inflation%20Reduction%20Act,as%20quickly%20as%20we%20can.>

CHIPS: According to the CBO, the budget authority for more than 90 percent of spending under CHIPS extends for 5 years: https://www.cbo.gov/system/files?file=2022-07/hr4346_chip.pdf. As a working approximation, we therefore assume that the full set of programs under CHIPS will operate for 5 years.

SUMMARY TABLES FOR COLORADO: Job Creation, Job Quality, and Workforce Demographics Estimates for BIL, IRA, and CHIPS

- **Average Annual Budgets and Job Creation p. 12**
- **Average Annual Job Creation p. 12**
- **Job Quality Indicators p. 13**
- **Educational Credentials and Race/Gender
Composition of Workers p. 14**

SUMMARY TABLE 1.**Average Annual Budgets and Job Creation in Colorado through BIL, IRA, and CHIPS**

	Average Annual Budgets <i>Public + Estimated Private Spending</i>	Average Annual Job Creation	Total Job Years
BIL	\$2,883 million	21,164	105,820
IRA	\$1,772 million	9,411	94,110
CHIPS	\$87 million	454	2,272
TOTALS	\$4,742 million As share of state GDP 2022: 1.0%	31,029 As share of state labor force 2022: 1.0%	202,202

SUMMARY TABLE 2.**Average Annual Job Creation in 6 Major Sectors in Colorado through BIL, IRA, and CHIPS**

	BIL	IRA	CHIPS	TOTALS
Total Job Creation	21,164	9,411	454	31,029
Services	9,231	3,856	254	13,341
Construction	4,899	2,269	69	7,237
Manufacturing	1,368	1,757	66	3,191
Transport/Warehousing	2,776	393	17	3,186
Wholesale/Retail	2,048	821	41	2,910
Utilities	166	34	1	201
Combined	20,488	9,130	449	30,067
Combined as share of total job creation	96.8%	97.0%	98.9%	96.9%

Notes: Figures in table are rounded. Remaining job creation is divided among agriculture/forestry/hunting; mining and mining-related activities.

SUMMARY TABLE 3.**Job Quality Indicators of Employment Created in Colorado through BIL, IRA, and CHIPS: Direct Jobs Only**

	1. Total Colorado Workforce	2. BIL, IRA, and CHIPS Combined (15,680 average annual direct jobs)	3. BIL (10,460 average annual direct jobs)	4. IRA (4,770 average annual direct jobs)	5. CHIPS (450 average annual direct jobs)
Average (median) hourly wage	\$27.00	\$28.10	\$27.55	\$29.40	\$31.25
Health Insurance coverage, percentage	51.4%	45.9%	44.4%	48.4%	55.2%
Retirement plans, percentage	43.8%	29.6%	29.0%	29.5%	42.2%
Union membership	7.9%	6.9%	7.3%	6.3%	4.9%

Notes: Wages are in 2023 dollars. Health insurance coverage indicates the share of jobs with employer-sponsored health insurance. Retirement plans indicate the share of jobs with employers that offer retirement plans. To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

SUMMARY TABLE 4.

Educational Credentials and Race/Gender Composition of Workers in Colorado in BIL, IRA, CHIPS-Related Employment: Direct Jobs Only

	1. Total Colorado Workforce	2. BIL, IRA, and CHIPS Combined (15,680 average annual direct jobs)	3. BIL (10,460 average annual direct jobs)	4. IRA (4,770 average annual direct jobs)	5. CHIPS (450 average annual direct jobs)
<i>Educational credentials</i>					
Share with less than high school degree	7.2%	9.8%	9.8%	9.9%	7.0%
Share with high school degree only	18.7%	25.1%	27.0%	21.8%	14.5%
Share with some college, no degree	14.4%	17.0%	18.9%	12.9%	14.3%
Share with Associate's degree (occupational/vocational or academic)	9.6%	10.5%	9.5%	12.4%	12.6%
Share with Bachelor's degree or higher	50.0%	37.7%	34.7%	43.0%	51.5%
<i>Racial and gender composition of workforce</i>					
Pct. White, non-Latinx	71.5%	69.7%	70.8%	67.4%	67.8%
Pct. BIPOC (incl. Latinx)	28.5%	30.3%	29.2%	32.6%	32.2%
Pct. Black, non-Latinx	4.6%	3.2%	3.6%	2.3%	3.6%
Pct. Asian, non-Latinx	4.3%	3.0%	3.2%	2.5%	5.8%
Pct. American Indian/Aleut/Eskimo, non-Latinx	0.7%	1.2%	1.4%	0.8%	0.5%
Pct. Other*, non-Latinx	1.5%	0.9%	1.0%	0.8%	0.9%
Pct. Latinx**	17.6%	22.4%	20.4%	26.9%	21.8%
Pct. Men***	53.7%	78.4%	79.3%	77.1%	71.8%
Pct. Women***	46.3%	21.6%	20.7%	22.9%	28.2%

Notes: **"Other" includes the following groups: Hawaiian/Pacific Islanders and multi-racial.

** The CPS survey, on which these data are based, asks respondents to identify whether they are "Spanish, Hispanic, or Latino." We use Latinx here because of the growing usage of this ethnic category to identify people with Latin American, as opposed to, Spanish heritage. We use Latinx to be more inclusive across gender categories.

***Labor Department data include only binary gender categories.

To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

EMPLOYMENT IMPACTS IN COLORADO OF BIL: *Bipartisan Infrastructure Law*

- **Job Creation** **p. 16**
Job creation across all industries

- **Indicators of Job Quality and
Workforce Demographics** **pp. 17 – 19**

- **Prevalent Job Types** **pp. 20 – 30**

Job Creation in Colorado Through Investment Categories: Across All Industries

BIL-1. COLORADO ESTIMATES

Jobs Created Across *All Industries* by BIL Major Investment Category with Budgetary Figures

BIL Investment Category	All Sectors Jobs/ \$1 Million				Annual Budget	Annual Job Creation				Job Years Created over 5 Years	
	Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs		Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs	Total Budget	Total Job Years
1. Roads, Bridges, Ports and Waterways, and Transportation Safety	3.8	1.9	2.0	7.7	\$1,289.4 million	4,885	2,486	2,616	9,987	\$6,447.2 million	49,935
2. Public Transit and Freight Rail	4.3	1.6	1.7	7.6	\$508.2 million	2,185	815	868	3,868	\$2,540.9 million	19,340
3. Energy Production, Safety, and Environmental Remediation	3.0	1.4	2.2	6.6	\$235.1 million	710	325	511	1,546	\$1,175.7 million	7,730
4. Broadband	2.3	1.8	1.5	5.6	\$231.6 million	533	416	348	1,297	\$1,157.9 million	6,485
5. Water	2.9	1.7	1.9	6.5	\$219.8 million	637	368	426	1,431	\$1,099.2 million	7,155
6. Lands and Resilience	5.9	1.8	2.8	10.5	\$127.4 million	750	232	353	1,335	\$637.0 million	6,675
7. Alternative Energy and Storage	2.4	1.6	2.0	5.9	\$97.6 million	233	153	191	577	\$487.9 million	2,885
8. Airports	3.7	1.9	2.2	7.8	\$85.0 million	317	164	185	666	\$425.0 million	3,330
9. Electric Vehicles, Buses, and Ferries	1.7	0.9	1.1	3.8	\$63.4 million	109	60	73	242	\$316.8 million	1,210
10. Buildings	3.8	2.4	2.1	8.4	\$19.8 million	76	48	42	166	\$99.0 million	830
11. Economic Development	5.1	1.8	2.7	9.5	\$5.2 million	26	9	14	49	\$26.0 million	245
Totals	--	--	--	--	\$2,882.5 million	10,461	5,076	5,627	21,164	\$14,412.6 million	105,820

Note: Due to rounding, direct, indirect, and induced job multipliers, within row, may not sum to "Total" job multiplier.

Indicators of Job Quality and Workforce Demographics in Colorado Within Investment Categories

BIL-2. COLORADO ESTIMATES

Indicators of Job Quality in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

	1. Total Colorado Workforce	BIL Investment Categories					
		2. Total BIL Workforce	3. Roads, Bridges, Ports and Waterways, and Transportation Safety	4. Public Transit and Freight Rail	5. Energy Production, Safety, and Environmental Remediation	6. Broadband	7. Water
Average (median) hourly wage	\$27.00	\$27.55	\$26.75	\$26.10	\$32.55	\$30.90	\$28.65
Health insurance coverage, percentage	51.4%	44.4%	42.0%	42.1%	56.3%	47.9%	54.3%
Retirement plans, percentage	43.8%	29.0%	26.1%	29.2%	38.6%	29.7%	40.3%
Union membership	7.9%	7.3%	7.6%	10.1%	4.9%	5.6%	4.9%

	BIL Investment Categories					
	8. Lands and Resilience	9. Alternative Energy and Storage	10. Airports	11. Electric Vehicles, Buses, and Ferries	12. Buildings	13. Economic Development
Average (median) hourly wage	\$30.35	\$32.45	\$27.00	\$32.00	\$26.00	\$28.50
Health insurance coverage, percentage	42.4%	55.7%	41.8%	51.8%	37.5%	45.3%
Retirement plans, percentage	26.9%	41.0%	25.7%	28.9%	21.7%	31.8%
Union membership	3.5%	4.7%	8.2%	6.1%	5.9%	3.6%

Notes: Wages are in 2023 dollars. Health insurance coverage indicates the share of jobs with employer-sponsored health insurance. Retirement plans indicate the share of jobs with employers that offer retirement plans. To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

BIL-3. COLORADO ESTIMATES

Educational Credentials and Race/Gender Composition of Workers in BIL-Related Employment by Major Investment Category: Direct Jobs Only

	BIL Investment Categories						
	1. Total Colorado Workforce	2. Total BIL Workforce	3. Roads, Bridges, Ports and Waterways, and Transportation Safety	4. Public Transit and Freight Rail	5. Energy Production, Safety, and Environmental Remediation	6. Broadband	7. Water
<i>Educational credentials</i>							
Share with less than high school degree	7.2%	9.8%	11.8%	7.6%	4.6%	11.7%	9.0%
Share with high school degree only	18.7%	27.0%	30.5%	24.7%	18.1%	30.9%	21.4%
Share with some college, no degree	14.4%	18.9%	18.7%	26.8%	14.1%	15.5%	14.4%
Share with Associate's degree (occupational/vocational or academic)	9.6%	9.5%	9.3%	8.5%	11.9%	9.9%	9.9%
Share with Bachelor's degree or higher	50.0%	34.7%	29.6%	32.3%	51.4%	32.0%	45.2%
<i>Racial and gender composition of workforce</i>							
Pct. White, non-Latinx	71.5%	70.8%	67.0%	74.0%	76.7%	64.8%	79.5%
Pct. BIPOC (incl. Latinx)	28.5%	29.2%	33.0%	26.0%	23.3%	35.2%	20.5%
Pct. Black, non-Latinx	4.6%	3.6%	3.8%	5.2%	3.2%	3.1%	1.4%
Pct. Asian, non-Latinx	4.3%	3.2%	3.0%	3.1%	4.2%	3.7%	3.8%
Pct. American Indian/Aleut/Eskimo, non-Latinx	0.7%	1.4%	1.4%	2.3%	0.6%	0.7%	1.1%
Pct. Other*, non-Latinx	1.5%	1.0%	1.0%	0.9%	1.2%	1.1%	1.5%
Pct. Latinx**	17.6%	20.4%	24.4%	14.6%	14.1%	27.1%	12.8%
Pct. Men***	53.7%	79.3%	82.4%	82.1%	69.1%	82.0%	69.6%
Pct. Women***	46.3%	20.7%	17.6%	17.9%	30.9%	18.0%	30.4%

Continued

BIL-3. COLORADO ESTIMATES *(cont.)*

Educational Credentials and Race/Gender Composition of Workers in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

	BIL Investment Categories					
	8. Lands and Resilience	9. Alternative Energy and Storage	10. Airports	11. Electric Vehicles, Buses, and Ferries	12. Buildings	13. Economic Development
<i>Educational credentials</i>						
Share with less than high school degree	6.1%	6.2%	15.0%	7.3%	16.8%	6.8%
Share with high school degree only	19.1%	23.2%	34.2%	25.6%	36.7%	16.3%
Share with some college, no degree	13.0%	11.9%	15.6%	14.6%	15.5%	17.7%
Share with Associate's degree (occupational/vocational or academic)	10.0%	10.1%	10.8%	10.6%	10.8%	15.8%
Share with Bachelor's degree or higher	51.8%	48.6%	24.4%	41.9%	20.2%	43.4%
<i>Racial and gender composition of workforce</i>						
Pct. White, non-Latinx	80.4%	75.0%	63.7%	72.7%	61.6%	76.9%
Pct. BIPOC (incl. Latinx)	19.6%	25.0%	36.3%	27.3%	38.4%	23.1%
Pct. Black, non-Latinx	1.8%	3.0%	1.9%	1.2%	1.9%	2.3%
Pct. Asian, non-Latinx	3.4%	2.3%	2.6%	3.0%	2.1%	2.8%
Pct. American Indian/Aleut/Eskimo, non-Latinx	0.4%	0.7%	1.0%	0.4%	1.1%	0.5%
Pct. Other*, non-Latinx	0.9%	0.4%	1.0%	0.6%	1.0%	1.2%
Pct. Latinx**	13.2%	18.8%	30.5%	22.1%	33.1%	16.5%
Pct. Men***	66.0%	72.1%	86.5%	74.4%	87.4%	64.9%
Pct. Women***	34.0%	27.9%	13.5%	25.6%	12.6%	35.1%

Notes: **"Other" includes the following groups: Hawaiian/Pacific Islanders and multi-racial.

** The CPS survey, on which these data are based, asks respondents to identify whether they are "Spanish, Hispanic, or Latino." We use Latinx here because of the growing usage of this ethnic category to identify people with Latin American, as opposed to, Spanish heritage. We use Latinx to be more inclusive across gender categories.

*** Labor Department data include only binary gender categories.

To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

Prevalent Job Types in Colorado Within Investment Categories

BIL-4. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Roads, Bridges, Ports and Waterways, and Transportation Safety**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Construction	1,689	34.6%	Plumbers, pipefitters, and steamfitters; first-line supervisors of construction trades and extraction workers; electricians
Management	976	20.0%	Human resources managers; general and operations managers; chief executives
Transportation and Material Moving	838	17.2%	Shuttle drivers and chauffeurs; driver/sales workers and truck drivers; transit and intercitybus drivers
Office and Administrative Support	279	5.7%	General office clerks; first-line supervisors of office and administrative support workers; customer service representatives
Installation, Maintenance, and Repair	248	5.1%	First-line supervisors of mechanics, installers, and repairers; automotive service technicians and mechanics; heavy vehicle and mobile equipment service technicians and mechanics

Note: Figures in table are rounded.

BIL-5. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Public Transit and Freight Rail**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Transportation and Material Moving	753	34.5%	Driver/sales workers and truck drivers; shuttle drivers and chauffeurs; transit and intercity bus drivers
Construction	277	12.7%	Plumbers, pipefitters, and steamfitters; first-line supervisors of construction trades and extraction workers; carpenters
Management	242	11.1%	Industrial production managers; chief executives; human resources managers
Farming, Fisheries, and Forestry	219	10.0%	Agricultural inspectors; forest and conservation workers; logging workers
Production	147	6.7%	Machinists; first-line supervisors of production and operating workers; welding, soldering, and brazing workers

Note: Figures in table are rounded.

BIL-6. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Energy Production, Safety, and Environmental Remediation**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	136	19.1%	Construction managers; marketing managers; general and operations managers
Business Operations Specialists	127	17.8%	Compliance officers; purchasing agents; market research analysts and marketing specialists
Production	58	8.1%	First-line supervisors of production and operating workers; inspectors, testers, sorters, samplers, and weighers; welding, soldering, and brazing workers
Office and Administrative Support	53	7.4%	General office clerks; weighers, measurers, checkers, and samplers, recordkeeping; first-line supervisors of office and administrative support workers
Architecture and Engineering, and Technicians	52	7.3%	Mechanical engineers; electrical and electronics engineers; architects
Transportation and Material Moving	51	7.3%	Industrial truck and tractor operators; hand packers and packagers; refuse and recyclable material collectors
Construction	49	6.9%	Carpenters; first-line supervisors of construction trades and extraction workers; construction laborers
Computer and Mathematical	41	5.7%	Computer systems analysts; computer support specialists; software developers
Installation, Maintenance, and Repair	39	5.5%	Heavy vehicle and mobile equipment service technicians and mechanics; electrical and electronics repairers, industrial and utility; electrical power-line installers and repairers

Note: Figures in table are rounded.

BIL-7. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Broadband**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Construction	190	35.6%	Plumbers, pipefitters, and steamfitters; first-line supervisors of construction trades and extraction workers; electricians
Management	122	22.8%	Sales managers; architectural and engineering managers; construction managers
Architecture and Engineering, and Technicians	45	8.4%	Civil engineers; industrial engineers; electrical and electronics engineers
Installation, Maintenance, and Repair	36	6.8%	Heavy vehicle and mobile equipment service technicians and mechanics; radio and telecommunications equipment installers and repairers; telecommunications line installers and repairers

Note: Figures in table are rounded.

BIL-8. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Water**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	133	20.9%	Computer and information systems managers; general and operations managers; construction managers
Construction	82	12.9%	Construction equipment operators; plumbers, pipefitters, and steamfitters; construction laborers
Architecture and Engineering, and Technicians	82	12.9%	Environmental engineers; mechanical engineers; civil engineers
Business Operations Specialists	76	11.9%	Purchasing agents; human resources workers; project management specialists
Production	71	11.1%	Water and wastewater treatment plant and system operators; welding, soldering, and brazing workers; first-line supervisors of production and operating workers
Office and Administrative Support	44	6.8%	Customer service representatives; bookkeeping, accounting, and auditing clerks; first-line supervisors of office and administrative support workers

Note: Figures in table are rounded.

BIL-9. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Lands and Resilience**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	161	21.4%	General and operations managers; farmers, ranchers, and other agricultural managers; chief executives
Construction	106	14.1%	First-line supervisors of construction trades and extraction workers; electricians; construction laborers
Business Operations Specialists	103	13.8%	Cost estimators; project management specialists; management analysts
Computer and Mathematical	64	8.5%	Database administrators and architects; computer systems analysts; software developers
Office and Administrative Support	42	5.5%	General office clerks; bookkeeping, accounting, and auditing clerks; customer service representatives
Architecture and Engineering, and Technicians	38	5.1%	Mechanical engineers; electrical and electronics engineers; architects

Note: Figures in table are rounded.

BIL-10. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Alternative Energy and Storage**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	50	21.7%	Architectural and engineering managers; sales managers; construction managers
Construction	39	16.5%	Electricians; carpenters; construction laborers
Architecture and Engineering, and Technicians	20	8.5%	Bioengineers and biomedical engineers; industrial engineers; mechanical engineers
Office and Administrative Support	18	7.9%	Bookkeeping, accounting, and auditing clerks; customer service representatives; secretaries and administrative assistants
Production	18	7.8%	First-line supervisors of production and operating workers; inspectors, testers, sorters, samplers, and weighers; welding, soldering, and brazing workers
Life, Physical, and Social Science	17	7.3%	Chemists and materials scientists; economists; life, physical, and social science technicians
Business Operations Specialists	13	5.4%	Human resources workers; cost estimators; project management specialists

Note: Figures in table are rounded.

BIL-11. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Airports**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Construction	149	47.0%	Plumbers, pipefitters, and steamfitters; first-line supervisors of construction trades and extraction workers; electricians
Management	71	22.5%	Sales managers; general and operations managers; chief executives
Office and Administrative Support	19	6.1%	First-Line supervisors of office and administrative support workers; customer service representatives; reservation and transportation ticket agents and travel clerks
Installation, Maintenance, and Repair	17	5.5%	Bus and truck mechanics and diesel engine specialists; aircraft mechanics and service technicians; heavy vehicle and mobile equipment service technicians and mechanics
Transportation and Material Moving	16	5.1%	Cleaners of vehicles and equipment; flight attendants; aircraft pilots and flight engineers

Note: Figures in table are rounded.

BIL-12. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Electric Vehicles, Buses, and Ferries**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	23	21.5%	Architectural and engineering managers; construction managers; chief executives
Production	20	18.0%	First-line supervisors of production and operating workers; welding, soldering, and brazing workers; inspectors, testers, sorters, samplers, and weighers
Architecture and Engineering, and Technicians	14	13.0%	Civil engineers; industrial engineers, electrical and electronics engineers
Construction	14	12.8%	Carpenters; electricians; construction laborers
Office and Administrative Support	7	6.2%	General office clerks; secretaries and administrative assistants; bookkeeping, accounting, and auditing clerks

Note: Figures in table are rounded.

BIL-13. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only *Job categories with 5 percent or more employment*

Job Creation Through: **Buildings**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Construction	40	52.9%	Plumbers, pipefitters, and steamfitters; first-line supervisors of construction trades and extraction workers; electricians
Management	18	23.9%	General and operations managers; sales managers; construction managers
Installation, Maintenance, and Repair	4	5.4%	Electrical power-line installers and repairers; heavy vehicle and mobile equipment service technicians and mechanics; heating, air conditioning, and refrigeration mechanics and installers
Office and Administrative Support	4	5.2%	Receptionists and information clerks; bookkeeping, accounting, and auditing clerks; secretaries and administrative assistants

Note: Figures in table are rounded.

BIL-14. COLORADO ESTIMATES

Prevalent Job Types in *BIL-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Economic Development**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	5	20.7%	Sales managers; education and childcare administrators; construction managers
Construction	4	16.1%	Plumbers, pipefitters, and steamfitters; carpenters; construction laborers
Education, Training, and Library	3	12.5%	Teaching assistants; postsecondary teachers; tutors
Installation, Maintenance, and Repair	3	10.7%	Electric motor, power tool, and related repairers; precision instrument and equipment repairers; computer, automated teller, and office machine repairers
Business Operations Specialists	2	8.7%	Training and development specialists; cost estimators; market research analysts and marketing specialists
Office and Administrative Support	2	7.5%	Customer service representatives; receptionists and information clerks; bookkeeping, accounting, and auditing clerks
Architecture and Engineering, and Technicians	1	5.4%	Electrical and electronics engineers; architects; civil engineers

Note: Figures in table are rounded.

EMPLOYMENT IMPACTS IN COLORADO OF IRA: *Inflation Reduction Act*

- **Job Creation** **p. 32**
Job creation across all industries

- **Indicators of Job Quality and
Workforce Demographics** **pp. 33 – 34**

- **Prevalent Job Types** **pp. 35 – 41**

Job Creation in Colorado Through Investment Categories: Across All Industries

IRA-1. COLORADO ESTIMATES

Jobs Created Across *All Industries* by IRA Major Investment Category with Budgetary Figures

IRA Investment Category	All Sectors Jobs/ \$1 Million				Annual Budget	Annual Job Creation				Job Years Created over 10 Years	
	Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs		Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs	Total Budget	Total Job Years
1. Electricity	2.7	1.1	1.5	5.3	\$1,193.6 million	3,172	1,292	1,807	6,271	\$11,936.1 million	62,710
2. Manufacturing	2.2	1.2	1.5	4.9	\$229.8 million	515	272	342	1,129	\$2,298.3 million	11,290
3. Buildings	1.8	0.9	1.0	3.7	\$168.9 million	296	157	170	623	\$1,688.5 million	6,230
4. Transportation	3.1	1.3	1.4	5.8	\$100.8 million	313	132	142	587	\$1,008.3 million	5,870
5. Agriculture	6.3	1.9	2.2	10.4	\$39.0 million	245	73	88	406	\$389.7 million	4,060
6. Environmental Justice and Community Resilience	4.0	1.7	2.3	8.0	\$19.9 million	80	34	45	159	\$198.8 million	1,590
7. Lands	7.5	1.9	2.6	12.0	\$19.7 million	147	38	51	236	\$196.7 million	2,360
Totals	--	--	--	--	\$1,771.6 million	4,768	1,998	2,645	9,411	\$17,716.3 million	94,110

Note: Due to rounding, direct, indirect, and induced job multipliers, within row, may not sum to "Total" job multiplier. This table includes the jobs created across all industries.

Indicators of Job Quality and Workforce Demographics in Colorado Within Investment Category

IRA-2. COLORADO ESTIMATES

Indicators of Job Quality in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

	1. Total Colorado Workforce	IRA Investment Categories							
		2. Total IRA Workforce	3. Electricity	4. Manufacturing	5. Buildings	6. Transportation	7. Agriculture	8. Lands	9. Environmental Justice and Community Resilience
Average (median) hourly wage	\$27.00	\$29.40	\$30.90	\$30.90	\$28.10	\$26.05	\$22.50	\$21.60	\$28.85
Health insurance coverage, percentage	51.4%	48.4%	48.6%	49.8%	55.9%	44.6%	42.8%	40.2%	49.5%
Retirement plans, percentage	43.8%	29.5%	29.3%	30.7%	39.1%	26.3%	24.2%	24.5%	31.8%
Union membership	7.9%	6.3%	6.8%	6.0%	8.7%	5.9%	1.2%	1.2%	2.4%

Notes: Wages are in 2023 dollars. Health insurance coverage indicates the share of jobs with employer-sponsored health insurance. Retirement plans indicate the share of jobs with employers that offer retirement plans. To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

IRA-3. COLORADO ESTIMATES

Educational Credentials and Race/Gender Composition of Workers in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

	1. Total Colorado Workforce	IRA Investment Categories							
		2. Total IRA Workforce	3. Electricity	4. Manufacturing	5. Buildings	6. Transportation	7. Agriculture	8. Lands	9. Environmental Justice and Community Resilience
<i>Educational credentials</i>									
Share with less than high school degree	7.2%	9.9%	11.0%	9.5%	0.1%	9.5%	9.0%	9.3%	5.9%
Share with high school degree only	18.7%	21.8%	23.5%	24.7%	8.2%	20.9%	15.6%	16.6%	16.3%
Share with some college, no degree	14.4%	12.9%	12.5%	13.8%	21.6%	15.0%	7.2%	8.0%	10.3%
Share with Associate's degree (<i>occupational/vocational or academic</i>)	9.6%	12.4%	12.5%	10.3%	23.4%	11.6%	7.9%	5.7%	10.3%
Share with Bachelor's degree or higher	50.0%	43.0%	40.4%	41.7%	46.7%	42.9%	60.3%	60.5%	57.1%
<i>Racial and gender composition of workforce</i>									
Pct. White, non-Latinx	71.5%	67.4%	65.3%	64.1%	68.5%	67.9%	87.9%	82.5%	72.8%
Pct. BIPOC (incl. Latinx)	28.5%	32.6%	34.7%	35.9%	31.5%	32.1%	12.1%	17.5%	27.2%
Pct. Black, non-Latinx	4.6%	2.3%	2.2%	3.4%	0.2%	3.7%	0.9%	2.4%	3.4%
Pct. Asian, non-Latinx	4.3%	2.5%	1.6%	2.2%	8.3%	5.1%	3.2%	1.6%	5.0%
Pct. American Indian/Aleut/Eskimo, non-Latinx	0.7%	0.8%	1.0%	0.8%	0.1%	1.2%	0.1%	0.0%	0.3%
Pct. Other*, non-Latinx	1.5%	0.8%	0.9%	0.8%	0.0%	0.5%	0.5%	0.5%	1.7%
Pct. Latinx**	17.6%	26.9%	29.8%	29.3%	22.9%	21.8%	7.5%	12.9%	16.8%
Pct. Men***	53.7%	77.1%	80.9%	80.5%	75.6%	77.6%	47.3%	45.2%	59.5%
Pct. Women***	46.3%	22.9%	19.1%	19.5%	24.4%	22.4%	52.7%	54.8%	40.5%

Notes: *"Other" includes the following groups: Hawaiian/Pacific Islanders and multi-racial.

** The CPS survey, on which these data are based, asks respondents to identify whether they are "Spanish, Hispanic, or Latino." We use Latinx here because of the growing usage of this ethnic category to identify people with Latin American, as opposed to, Spanish heritage. We use Latinx to be more inclusive across gender categories.

*** Labor Department data include only binary gender categories.

To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

Prevalent Job Types in Colorado Within Investment Categories

IRA-4. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Electricity**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Construction	1,031	32.5%	First-line supervisors of construction trades and extraction workers; painters and paperhangers; electricians
Management	679	21.4%	Sales managers; chief executives; architectural and engineering managers
Architecture and Engineering, and Technicians	379	12.0%	Bioengineers and biomedical engineers; industrial engineers; electrical and electronics engineers
Production	338	10.7%	First-line supervisors of production and operating workers; structural metal fabricators and fitters; inspectors, testers, sorters, samplers, and weighers

Note: Figures in table are rounded.

IRA-5. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Manufacturing**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Construction	142	27.5%	First-line supervisors of construction trades and extraction workers; painters and paperhangers; construction laborers
Management	100	19.5%	Chief executives; sales managers; architectural and engineering managers
Production	59	11.4%	Tool and die makers; inspectors, testers, sorters, samplers, and weighers; welding, soldering, and brazing workers
Architecture and Engineering, and Technicians	57	11.1%	Industrial engineers; mechanical engineers; electrical and electronics engineers

Note: Figures in table are rounded.

IRA-6. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only *Job categories with 5 percent or more employment*

Job Creation Through: **Buildings**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	100	33.7%	Administrative services managers; sales managers; human resources managers
Production	72	24.4%	Machinists; computer numerically controlled tool operators and programmers; welding, soldering, and brazing workers
Office and Administrative Support	33	11.1%	Dispatchers; executive secretaries and executive administrative assistants; customer service representatives
Computer and Mathematical	31	10.5%	Computer support specialists; computer systems analysts; computer programmers
Architecture and Engineering, and Technicians	25	8.6%	Electrical and electronics engineers; industrial engineers; mechanical engineers

Note: Figures in table are rounded.

IRA-7. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Transportation**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	73	23.3%	Social and community service managers; architectural and engineering managers; construction managers
Transportation and Material Moving	43	13.8%	Driver/sales workers and truck drivers; shuttle drivers and chauffeurs; transit and intercity bus drivers
Architecture and Engineering, and Technicians	36	11.5%	Industrial engineers; electrical and electronics engineers; mechanical engineers
Farming, Fisheries, and Forestry	33	10.5%	Forest and conservation workers; miscellaneous agricultural workers
Construction	31	10.0%	Electricians; carpenters; construction laborers
Production	20	6.5%	First-line supervisors of production and operating workers; welding, soldering, and brazing workers; inspectors, testers, sorters, samplers, and weighers
Office and Administrative Support	20	6.5%	First-line supervisors of office and administrative support workers; customer service representatives; secretaries and administrative assistants

Note: Figures in table are rounded.

IRA-8. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Agriculture**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	63	25.8%	Industrial production managers; chief executives; farmers, ranchers, and other agricultural managers
Computer and Mathematical	26	10.7%	Computer systems analysts; software developers; computer support specialists
Business Operations Specialists	25	10.1%	Compliance officers; project management specialists; market research analysts and marketing specialists
Education, Training, and Library	23	9.4%	Teaching assistants; tutors; postsecondary teachers
Farming, Fisheries, and Forestry	22	9.1%	Forest and conservation workers; miscellaneous agricultural workers
Personal Care and Service	15	6.2%	Childcare workers; recreation workers; animal caretakers

Note: Figures in table are rounded.

IRA-9. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only *Job categories with 5 percent or more employment*

Job Creation Through: **Lands**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	31	21.0%	Social and community service managers; marketing managers; education and childcare administrators
Education, Training, and Library	27	18.1%	Teaching assistants; postsecondary teachers; archivists, curators, and museum technicians
Building and Grounds Cleaning and Maintenance	24	16.6%	Janitors and building cleaners; tree trimmers and pruners; first-line supervisors of landscaping, lawn service, and groundskeeping workers
Business Operations Specialists	11	7.6%	Human resources workers; training and development specialists; management analysts
Personal Care and Service	11	7.3%	Entertainment attendants and related workers; childcare workers; animal caretakers
Computer and Mathematical	11	7.2%	Web and digital interface designers; network and computer systems administrators; software developers
Arts, Design, Entertainment, Sports, and Media	10	7.1%	News analysts, reporters, and journalists; interpreters and translators; writers and authors

Note: Figures in table are rounded.

IRA-10. COLORADO ESTIMATES

Prevalent Job Types in *IRA-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Environmental Justice and Community Resilience**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	17	20.8%	Marketing managers; general and operations managers; social and community service managers
Business Operations Specialists	16	19.4%	Compliance officers; project management specialists; management analysts
Building and Grounds Cleaning and Maintenance	9	11.2%	Tree trimmers and pruners; janitors and building cleaners; landscaping and groundskeeping workers
Office and Administrative Support	6	7.8%	Weighers, measurers, checkers, and samplers, recordkeeping; first-line supervisors of office and administrative support workers; customer service representatives
Transportation and Material Moving	5	6.6%	Industrial truck and tractor operators; refuse and recyclable material collectors; hand packers and packagers
Computer and Mathematical	5	6.4%	Computer systems analysts; database administrators and architects; computer support specialists

Note: Figures in table are rounded.

EMPLOYMENT IMPACTS IN COLORADO OF CHIPS: *Creating Helpful Incentives to Produce Semiconductors*

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Job creation across all industries

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Job Creation in Colorado Through Investment Categories: Across All Industries

CHIPS-1. COLORADO ESTIMATES

Jobs Created Across *All Industries* by CHIPS Major Investment Category with Budgetary Figures

CHIPS Investment Category	All Sectors Jobs/ \$1 Million				Annual Budget	Annual Job Creation				Job Years Created over 5 Years	
	Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs		Direct Jobs	Indirect Jobs	Induced Jobs	Total Jobs	Total Budget	Total Job Years
1. Manufacturing	1.9	1.4	1.5	4.7	\$79.8 million	148	113	118	379	\$399.1 million	1,895
2. Research and Development	5.2	2.1	2.7	10.0	\$6.5 million	34	14	17	65	\$32.5 million	325
3. Defense	5.2	1.8	2.4	9.4	\$1.1 million	6	2	3	10	\$5.5 million	52
Totals	--	--	--	--	\$87.4 million	188	129	138	454	\$437.1 million	2,272

Note: Due to rounding, direct, indirect, and induced job multipliers, within row, may not sum to "Total" job multiplier. This table includes the jobs created across all industries.

Indicators of Job Quality and Workforce Demographics in Colorado Within Investment Categories

CHIPS-2. COLORADO ESTIMATES

Indicators of Job Quality in *CHIPS-Related Employment* by Major Investment Category: Direct Jobs Only

	1. Total Colorado Workforce	CHIPS Investment Categories			
		2. Total CHIPS Workforce	3. Manufacturing	4. Research and Development	5. Defense
Average (median) hourly wage	\$27.00	\$31.25	\$32.05	\$28.85	\$33.35
Health insurance coverage, percentage	51.4%	55.2%	55.6%	53.5%	55.9%
Retirement plans, percentage	43.8%	42.2%	40.3%	48.0%	57.4%
Union membership	7.9%	4.9%	4.8%	4.6%	9.7%

Notes: Wages are in 2023 dollars. Health insurance coverage indicates the share of jobs with employer-sponsored health insurance. Retirement plans indicate the share of jobs with employers that offer retirement plans. To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

CHIPS-3. COLORADO ESTIMATES

Educational Credentials and Race/Gender Composition of Workers in CHIPS-Related Employment by Major Investment Category: Direct Jobs Only

	1. Total Colorado Workforce	CHIPS Investment Categories			
		2. Total CHIPS Workforce	3. Manufacturing	4. Research and Development	5. Defense
<i>Educational credentials</i>					
Share with less than high school degree	7.2%	7.0%	8.6%	1.4%	0.7%
Share with high school degree only	18.7%	14.5%	16.7%	6.1%	5.2%
Share with some college, no degree	14.4%	14.3%	14.6%	12.8%	16.7%
Share with Associate's degree (<i>occupational/vocational or academic</i>)	9.6%	12.6%	14.3%	6.5%	4.9%
Share with Bachelor's degree or higher	50.0%	51.5%	45.8%	73.2%	72.4%
<i>Racial and gender composition of workforce</i>					
Pct. White, non-Latinx	71.5%	67.8%	64.5%	80.1%	79.6%
Pct. BIPOC (<i>incl. Latinx</i>)	28.5%	32.2%	35.5%	19.9%	20.4%
Pct. Black, non-Latinx	4.6%	3.6%	2.5%	7.6%	7.8%
Pct. Asian, non-Latinx	4.3%	5.8%	6.7%	2.2%	3.1%
Pct. American Indian/Aleut/Eskimo, non-Latinx	0.7%	0.5%	0.6%	0.1%	0.3%
Pct. Other*, non-Latinx	1.5%	0.9%	1.1%	0.0%	0.0%
Pct. Latinx**	17.6%	21.8%	25.1%	9.9%	9.1%
Pct. Men***	53.7%	71.8%	78.6%	46.4%	46.5%
Pct. Women***	46.3%	28.2%	21.4%	53.6%	53.5%

Notes: **Other" includes the following groups: Hawaiian/Pacific Islanders and multi-racial.

** The CPS survey, on which these data are based, asks respondents to identify whether they are "Spanish, Hispanic, or Latino." We use Latinx here because of the growing usage of this ethnic category to identify people with Latin American, as opposed to, Spanish heritage. We use Latinx to be more inclusive across gender categories.

***Labor Department data include only binary gender categories.

To get sufficient sample sizes, samples across time and a select number of states have been pooled. See main text for details.

Prevalent Job Types in Colorado Within Investment Categories

CHIPS-4. COLORADO ESTIMATES

Prevalent Job Types in *CHIPS-Related Employment* by Major Investment Category: Direct Jobs Only
 Job categories with 5 percent or more employment

Job Creation Through: **Manufacturing**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	37	24.8%	Industrial production managers; administrative services managers; sales managers
Construction	35	23.6%	First-line supervisors of construction trades and extraction workers; painters and paperhangers; electricians
Production	17	11.5%	Inspectors, testers, sorters, samplers, and weighers; computer numerically controlled tool operators and programmers; welding, soldering, and brazing workers
Office and Administrative Support	14	9.4%	Executive secretaries and executive administrative assistants; bookkeeping, accounting, and auditing clerks; customer service representatives
Architecture and Engineering, and Technicians	11	7.7%	Electrical and electronics engineers; bioengineers and biomedical engineers; mechanical engineers
Business Operations Specialists	8	5.7%	Compensation, benefits, and job analysis specialists; purchasing agents; cost estimators

Note: Figures in table are rounded.

CHIPS-5. COLORADO ESTIMATES

Prevalent Job Types in *CHIPS-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Research and Development**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Management	8	23.3%	Chief executives; computer and information systems managers; natural sciences managers
Education, Training, and Library	8	22.8%	Teaching assistants; tutors; postsecondary teachers
Office and Administrative Support	3	8.7%	Receptionists and information clerks; data entry keyers; first-line supervisors of office and administrative support workers
Life, Physical, and Social Science	3	8.2%	Medical scientists; chemists and materials scientists; economists
Architecture and Engineering, and Technicians	2	7.1%	Chemical engineers; architects; bioengineers and biomedical engineers
Business Operations Specialists	2	6.0%	Market research analysts and marketing specialists; human resources workers; training and development specialists
Arts, Design, Entertainment, Sports, and Media	2	5.5%	Interpreters and translators; graphic designers

Note: Figures in table are rounded.

CHIPS-6. COLORADO ESTIMATES

Prevalent Job Types in *CHIPS-Related Employment* by Major Investment Category: Direct Jobs Only

Job categories with 5 percent or more employment

Job Creation Through: **Defense**

Job Category	Number of Direct Jobs	Percentage of Direct Jobs	Representative Occupations
Education, Training, and Library	1	23.6%	Teaching assistants; tutors; postsecondary teachers
Management	1	17.2%	Computer and information systems managers; natural sciences managers; education and childcare administrators
Office and Administrative Support	1	10.4%	Bookkeeping, accounting, and auditing clerks; first-line supervisors of office and administrative support workers; customer service representatives
Life, Physical, and Social Science	1	9.0%	Medical scientists; chemists and materials scientists; economists
Architecture and Engineering, and Technicians	1	7.0%	Chemical engineers; architects; bioengineers and biomedical engineers
Business Operations Specialists	1	6.3%	Training and development specialists; market research analysts and marketing specialists; project management specialists

Note: Figures in table are rounded.

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About the Authors

Robert Pollin is Distinguished University Professor of Economics and Co-Director of the Political Economy Research Institute (PERI) at the University of Massachusetts Amherst. He is also the founder and President of PEAR (Pollin Energy and Retrofits), an Amherst, MA-based green energy company operating throughout the United States. His books include *The Living Wage: Building a Fair Economy* (co-authored 1998); *Contours of Descent: U.S. Economic Fractures and the Landscape of Global Austerity* (2003); *An Employment-Targeted Economic Program for South Africa* (co-authored 2007); *A Measure of Fairness: The Economics of Living Wages and Minimum Wages in the United States* (co-authored 2008), *Back to Full Employment* (2012), *Greening the Global Economy* (2015), and *Climate Crisis and the Global Green New Deal: The Political Economy of Saving the Planet* (co-authored 2020). In 2018, he co-authored *Economic Analysis of Medicare for All*. He has worked as a consultant for the U.S. Department of Energy, the International Labour Organization, the United Nations Industrial Development Organization and numerous non-governmental organizations in several countries and in U.S. states and municipalities on various aspects of building high-employment green economies. He has also directed projects on employment creation and poverty reduction in sub-Saharan Africa for the United Nations Development Program. He has worked with many U.S. non-governmental organizations on creating living wage statutes at both the statewide and municipal levels, on financial regulatory policies, and on the economics of single-payer health care in the United States. Between 2011–2016, he was a member of the Scientific Advisory Committee of the European Commission project on Financialization, Economy, Society, and Sustainable Development (FESSUD). He was selected by *Foreign Policy* magazine as one of the “100 Leading Global Thinkers for 2013.”

Jeannette Wicks-Lim is a Research Professor at the Political Economy Research Institute at the University of Massachusetts Amherst, where she also earned her Ph.D. in economics. Wicks-Lim specializes in labor economics with an emphasis on the low-wage labor market, and the political economy of racism, the intersection of income, employment, health and health care. She is co-author of *A Measure of Fairness: The Economics of Living Wages and Minimum Wages in the United States* (2008). She also co-edited *Capitalism on Trial: Explorations in the Tradition*

of *Thomas E. Weisskopf* (2013). Her journal articles and research reports cover a wide range of topics, including the economics of minimum wage and living wage laws; overtime pay for agricultural workers; the effectiveness of affirmative action policies; trends in racial earnings inequality, the role of the Earned Income Tax Credit on improving population health outcomes; the economics of single payer programs; and the employment-related impacts of clean energy policies. Wicks-Lim has been a regular contributor to the magazine *Dollars & Sense*. She frequently serves as an economic policy consultant for non-governmental organizations as well as state and municipal legislative committees in her areas of research expertise. She currently serves on the board of the National Economics Association.

Shouvik Chakraborty is a Research Assistant Professor at the Political Economy Research Institute. His research focuses on the employment impacts of green energy investments. This work also examines issues at the intersection of inequality, climate change and environmental justice, especially with respect to developing countries. Separately, he researches subjects related to international trade between advanced countries and developing countries. He is the co-author of the 2015 study *Global Green Growth: Clean Energy Industrial Investments and Expanding Job Opportunities*. In 2019, he co-edited a broad-ranging book on the current political economic situation in India, *A Quantum Leap in the Wrong Direction?* He is a member of the UNESCO Inclusive Policy Lab, a global initiative dedicated to knowledge crowdsourcing and its translation into policy. He is also a contributor to the blog of the International Growth Centre, a research organization affiliated with the London School of Economics and the Institute for New Economic Thinking (INET). He is a member of the Indian Society of Ecological Economics (INSEE), the International Society for Ecological Economics (ISEE), and the Eastern Economic Association (EEA).

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