



// DECEMBER 2022

Building Opportunity: New Jersey

The Jobs and Economic Benefits of
Decarbonizing Buildings Across the Garden State

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This report would not have been possible without the analysis and collaboration of BW Research Partnership. Special thanks to Philip Jordan and Ryan Young from BW and Jeff Benzak and Uchenna Bright from E2, for their efforts bringing this report's data and findings to light.

Methodology

The analysis is based on employment data collected and analyzed by the BW Research Partnership for the 2021 United States Energy and Employment Report (USEER). The USEER analyzes data from the U.S. Bureau of Labor Statistics (BLS) Quarterly Census of Employment and Wages (QCEW) to track employment across many energy production, transmission and distribution subsectors. In addition, the 2021 USEER relies on a unique supplemental survey of 35,000 business representatives across the United States.

Created and conducted by BW Research with methodology that has been approved by the Office of Management and Budget (OMB) and the U.S. Department of Energy (DOE), this survey is used to identify energy-related employment within key subsectors of the broader industries as classified by the BLS and to assign them into their component energy and energy efficiency sectors.

About This Report

This is the first Building Opportunity: New Jersey report produced by E2 based on analysis of the USEER, which was first released by the DOE in 2016. E2 was an original proponent of the DOE producing the USEER and was a partner on the reports produced by the Energy Futures Initiative (EFI) and National Association of State Energy Officials (NASEO) after it was abandoned in 2017.

For additional insight into E2's Building Opportunity: New Jersey report or our other clean energy economic reports, visit e2.org/reports.

An FAQ is available at e2.org/reports/clean-jobs-america-faq

Demographic Terms and Categories

For demographic racial groups, this report uses terminology used by the BLS Current Population Survey (CPS) to describe a person's race in accordance with Office of Management and Budget standards. Hispanic or Latino ethnicity is a wholly separate demographic category from race in the CPS statistics. People of Hispanic or Latino ethnicity may be of any race, but predominantly select white in BLS

and Census survey responses. In the survey process, the interviewer provides the five options shown below and the survey respondent indicates the race or races they consider themselves to be. Since 2003, people who identify as more than one race are tabulated separately in the category, Two or More Races.

- American Indian or Alaskan Native
- Asian
- Black or African American
- Native Hawaiian or Other Pacific Islander
- White

In CPS statistics published by the BLS, people who select Hispanic or Latino as their ethnicity are also able to select one or more racial groups (Asian, Black or African American, etc.) to identify with. Because of this, there is an overlap and demographic percentages may not add up to 100 percent.

For demographic gender groups, the CPS is designed to identify assigned biological sex.

While this report intends to include information on the overall diversity of the U.S. building decarbonization sector, there is limited data on the representation of people in clean energy who have disabilities; who are lesbian, gay, bisexual, transgender people, intersex and queer residents; and who are migrants and religious minorities. Based on the available data from the BLS and the supplemental employer survey used by the USEER, this analysis was unable to produce any findings regarding these various groups.

About E2



[E2 \(Environmental Entrepreneurs\)](https://e2.org) is a national, nonpartisan group of business leaders, investors, and professionals from every sector of the economy who advocate

for smart policies that are good for the economy and good for the environment. E2 members have founded or funded more than 2,500 companies, created more than 600,000 jobs, and manage more than \$100 billion in venture and private equity capital.

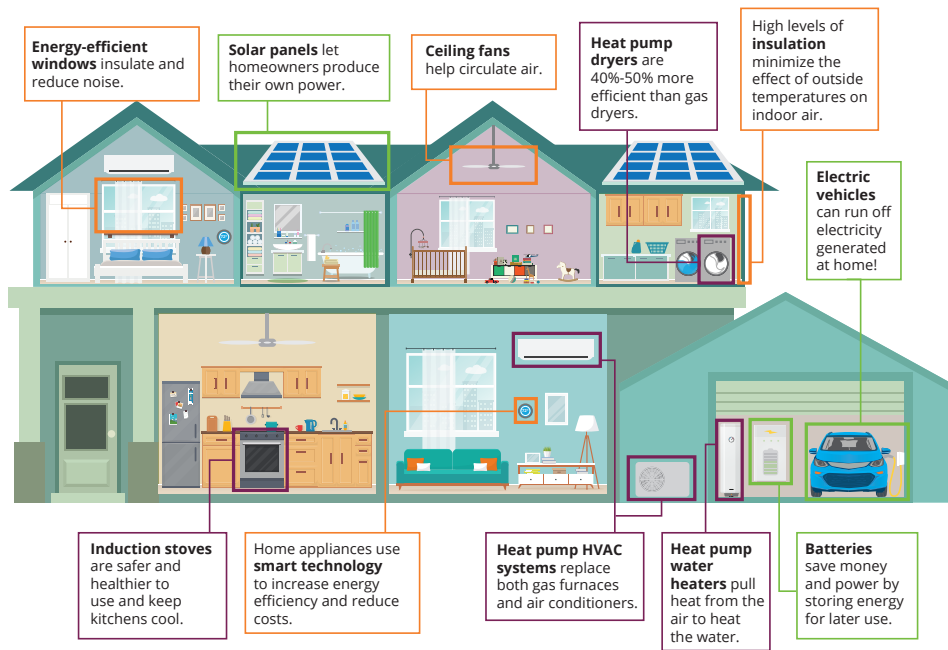
E2 releases more than a dozen clean energy employment reports annually — including Clean Jobs America — with state-specific reports covering more than 20 states every year.

What Is Building Decarbonization?

Anatomy of an Efficient, All-Electric Home

Credit: Edison International
edison.com/home/innovation/building-electrification.html

- Clean All-Electric Features
- Clean Energy Features
- Energy Efficiency Features



Examples of All-Electric Equipment



Air Source Heat Pump
 Credit: Shutterstock



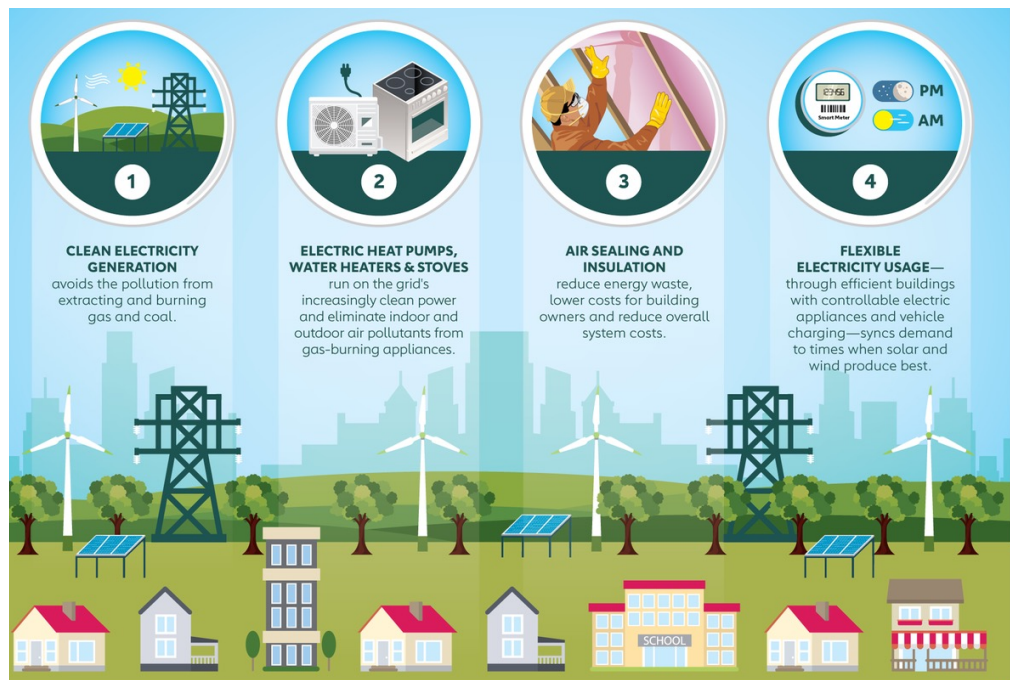
Electric Water Heater
 Credit: Jul Nichols/iStock



Induction Cooking Range
 Credit: Dennis Schroeder/NREL, 48437

How Renewables and Building Updates Work Together in the Clean Energy Era

Credit: Natural Resources Defense Council (NRDC)



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Policy Summary and Recommendations

Although the 33,000 workers who are currently employed in the building decarbonization sector in New Jersey would fill the Meadowlands Arena 1.5 times over, the state boasts far fewer jobs per capita in this sector than neighboring states¹ due to previous policy missteps. However, all New Jersey regions and counties stand to gain economically from stronger policies that support the accelerated decarbonization of buildings.

A major setback to investing in clean energy jobs occurred in 2012 when former Gov. Chris Christie withdrew the Garden State from participating in the Regional Greenhouse Gas Initiative (RGGI), a multi-state program that cuts carbon pollution from power plants and invests in energy efficiency and clean energy. Since RGGI launched in 2009, participating states have enjoyed a \$4.3 billion boost to their economies, and created more than 44,000 job-years of employment.² RGGI investments in energy efficiency and other clean energy measures in 2020 alone will save the region's energy consumers nearly \$2 billion on their bills.³

While New Jersey missed out on an estimated \$279 million in funding for clean energy investments by leaving RGGI⁴, Gov. Phil Murphy signaled interest in investing in these sectors upon taking office. In 2018, he signed Executive Order 7, allowing New Jersey to rejoin RGGI. Gov. Murphy also signed the Clean Energy Act, which expanded the state's renewable energy programs, called for utilities to implement cost-saving energy efficiency measures, and codified the state's energy storage goals. This was followed by Gov. Murphy enacting an Energy Master Plan in 2019 that mapped a path for achieving a 100-percent emission-free economy by 2050. Since then, New Jersey has announced local offshore wind projects that could be a boon to New Jersey businesses, employ local workers and build 7,500 megawatts of homegrown, renewable power generation by 2035.

Although New Jersey has made significant progress on power sector and transportation emissions, much work remains to make New Jersey buildings healthier and less expensive to operate. New Jersey's building sector is the state's second largest source of greenhouse gas emissions.⁵ New Jersey buildings are also a significant source of indoor air pollution⁶ and present a largely untapped opportunity for job creation.

As New Jersey's legislators and decisionmakers consider creating a healthier, more resilient, and equitable economy, they should enact the following policies:

1. **Building Decarbonization Legislation** that directs the Board of Public Utilities and the state's regulated electric utilities to create programs that help New Jerseyans rapidly reduce emissions from their homes and other buildings by adopting deep energy efficiency retrofits and high-efficiency electric heat pumps for space and water heating.
2. **New Construction Energy Efficiency Programs** that emphasize net-zero new construction standards and significant incentives for all-electric new construction.
3. **Take Advantage of Inflation Reduction Act and Federal Infrastructure Funding Opportunities** by continuing to implement a comprehensive plan that maximizes both formula and grant funding opportunities in the state aimed at further reducing GHG emissions.
4. **Update the State's RPS to achieve 100 Percent Clean Electricity by 2035** by leveraging the state's robust solar and new offshore wind resources, and continuing to utilize the state's zero-emitting nuclear fleet.

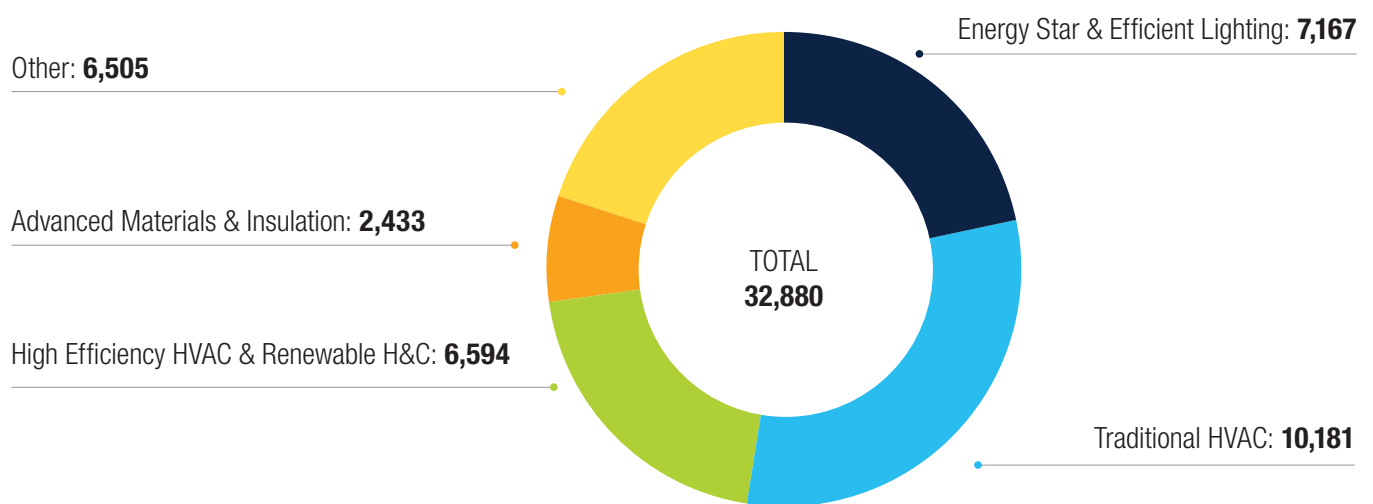
The Data⁷

Employment by Detailed Technology

In 2020, New Jersey had approximately 33,000 workers who were engaged in building decarbonization.

This includes work installing, manufacturing, engineering, and designing, as well as the repair, maintenance and wholesale trade of ENERGY STAR appliances, lighting materials, and heating and cooling equipment. It also encompasses work related to highly efficient building envelopes, advanced building materials and products such as windows, doors, insulation, and roofing — as well as professional services, like conducting energy audits.

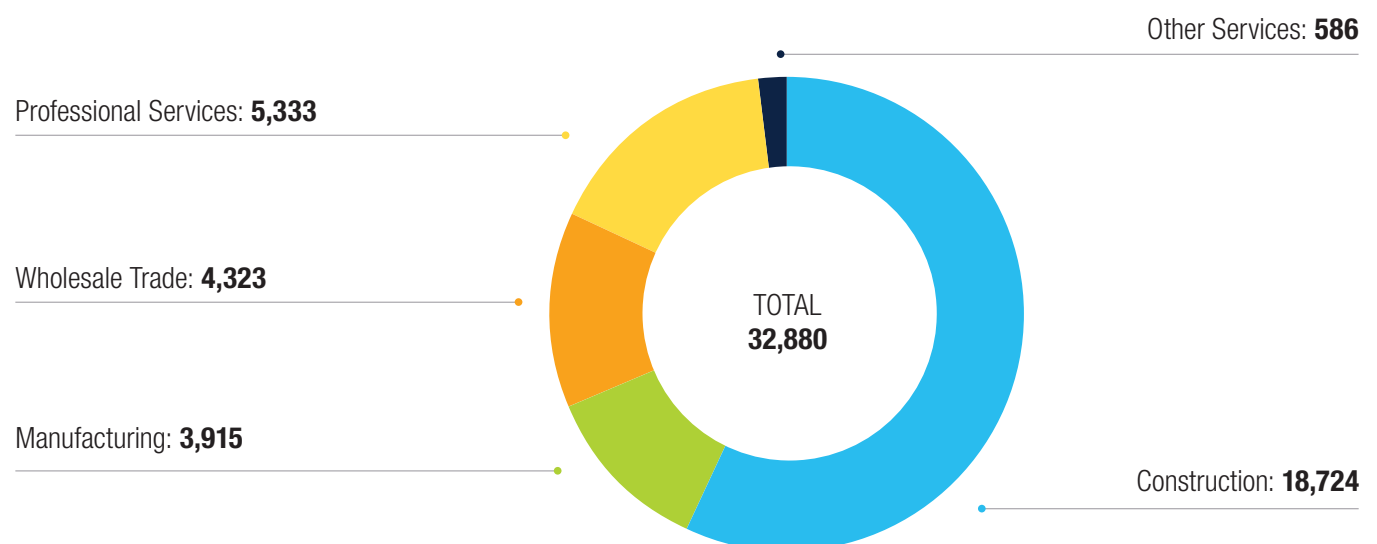
FIGURE 1 // Building Decarbonization Employment by Technology / 2020



Value Chain Employment

More than half of all building decarbonization jobs in 2020 were in construction, with almost 19,000 workers. A little over 16 percent, or more than 5,000 workers, were involved in professional services, including work in engineering, architectural services, software development, and other research and design occupations.

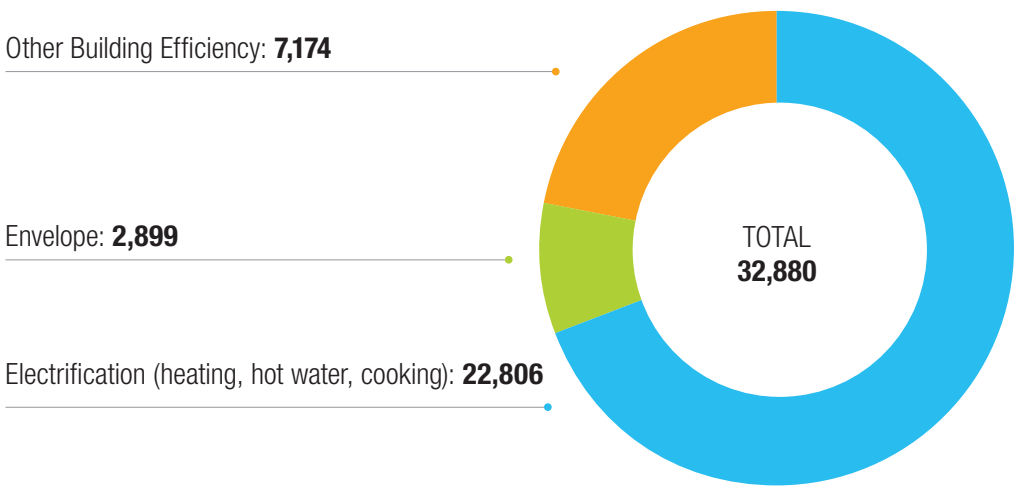
FIGURE 2 // Building Decarbonization Employment by Value Chain / 2020



Electrification, Envelope and Other Building Efficiency

The majority of building decarbonization employment in New Jersey is primarily involved with building electrification (almost 70 percent), followed by other building efficiency (more than 21 percent), and envelope work, which focuses on building performance and protecting the interior space from the exterior elements (nearly 9 percent).

FIGURE 3 // Building Decarbonization Employment by Sector / 2020



The following tables include the top 10 counties in New Jersey by employment within building electrification, building envelope and other energy efficiency categories.⁸

TABLE 1 // Top 10 Counties / Building Electrification Employment / 2020

County	Electrification Jobs
Bergen	2,916
Middlesex	2,368
Morris	2,324
Essex	1,799
Monmouth	1,763
Union	1,290
Camden	1,213
Mercer	1,194
Burlington	1,073
Somerset	1,000

TABLE 2 // Top 10 Counties / Building Envelope Employment / 2020

County	Envelope Jobs
Bergen	334
Middlesex	295
Morris	274
Essex	253
Monmouth	248
Camden	188
Union	162
Burlington	141
Ocean	134
Mercer	128

TABLE 3 // Top 10 Counties / Other Energy Efficiency Employment / 2020

County	Other Efficiency Jobs
Bergen	833
Morris	772
Middlesex	728
Essex	572
Monmouth	543
Union	459
Mercer	392
Camden	372
Burlington	342
Ocean	303

Residential and Commercial Building Decarbonization

Statewide, residential building decarbonization workers are the largest category with more than 21,000 employed, followed by almost 17,000 in commercial building decarbonization.⁹

The following tables include the top 10 counties in New Jersey in terms of residential and commercial building decarbonization employment.¹⁰

TABLE 4 // Top 10 Counties / Residential Building Decarbonization Employment / 2020

County	Other Efficiency Jobs
Bergen	2,695
Morris	2,221
Middlesex	1,958
Monmouth	1,742
Essex	1,658
Union	1,280
Ocean	1,207
Camden	1,088
Burlington	1,009
Mercer	1,004

TABLE 5 // Top 10 Counties / Commercial Building Decarbonization Employment / 2020

County	Other Efficiency Jobs
Bergen	2,020
Middlesex	1,959
Morris	1,671
Essex	1,371
Monmouth	1,209
Mercer	974
Camden	963
Union	929
Burlington	788
Somerset	721

Occupation Spotlight: Job Descriptions and Data on Wages, Education, Benefits and Demographics

While jobs in building decarbonization vary, this Occupational Spotlight provides descriptions on a selection of five of New Jersey's top building decarbonization occupations, as well as detailed information on job quality (wages and benefits), demographics (age, gender, race and ethnicity), and the qualifications and training these jobs generally require.

Job Descriptions



Heating, Air Conditioning and Refrigeration Mechanics and Installers

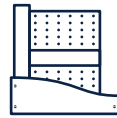
install, service or repair heating and air conditioning systems in buildings. These individuals work in homes and offices, calculating correct load requirements and installing and servicing complex systems using advanced materials, software, hardware, and design to ensure maximum energy efficiency and energy cost savings.



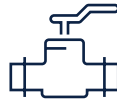
Electricians install, maintain and repair electrical wiring, control systems, equipment, and fixtures, while also ensuring electrical work is completed in accordance with all relevant codes and standards. Electricians are vital to the energy efficiency sector, as these individuals install LED and other efficient lighting technologies or ENERGY STAR appliances, ensure a building's grid-readiness and vehicle charging infrastructure capabilities.



Construction Laborers support nearly all activities at a construction site. Most tasks involve physical labor, such as preparation and cleaning of job sites, digging trenches, erecting scaffolding, and operating heavy machinery.



Insulation Workers line and cover floors, ceilings, and walls with insulating materials. These individuals are pivotal to increasing the energy efficiency of buildings, as proper insulation can reduce a building's overall energy use for heating and cooling and protect it from external damage such as excess moisture.



Plumbers, Pipefitters and Steamfitters

work with pipe systems that carry water, steam, air, or other liquids. These individuals install and test fixtures, appliances and equipment that are designed to reduce water and energy consumption, like toilets, water heaters, and gray water systems. Plumbers, pipefitters, and steam fitters will also help decarbonize high-pressure steam heating district systems and leverage geothermal heat and cooling as an additional electrification tool for homes, businesses, and entire communities.

Wages, Education and Benefits

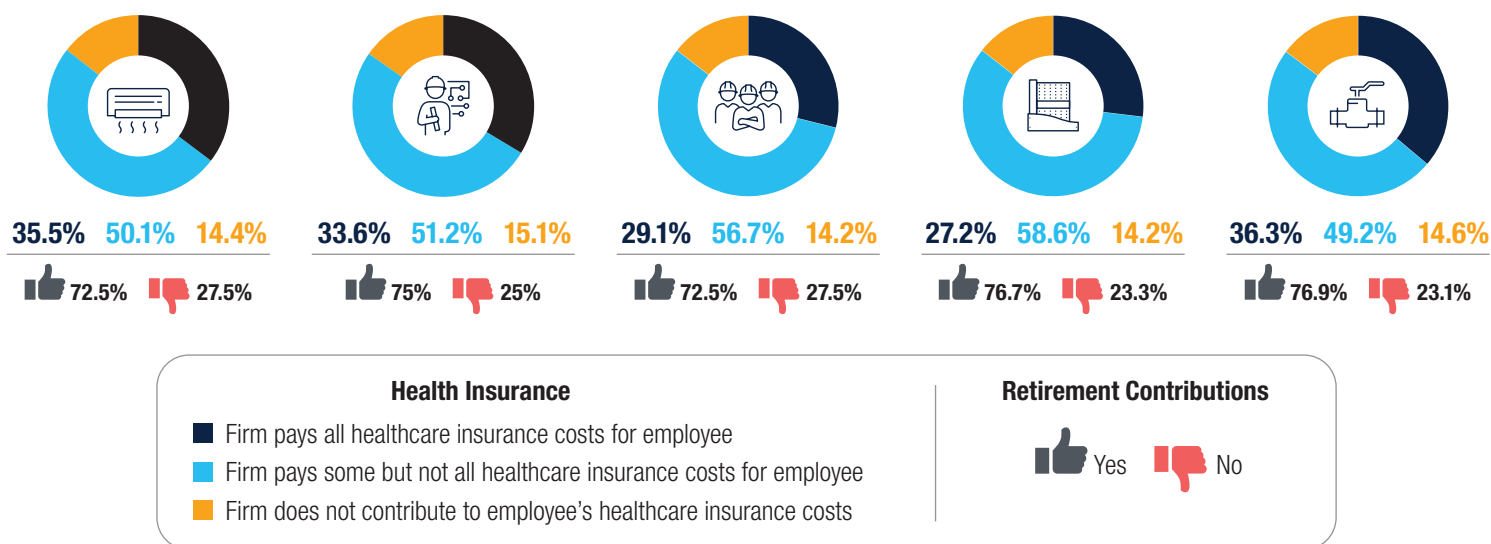
The wage data shows how significant of an opportunity building decarbonization represents to workers in New Jersey and to the overall economy. In five of the most common building decarbonization occupations, average annual wages in New Jersey range from \$56,700 to \$75,800.

TABLE 6 // Building Decarbonization Employment / Wages, Education and Training / 2020¹¹

Occupation	New Jersey Average Annual Wage	National Annual Wage ¹²	Education and Training ¹³	
			TYPICAL ENTRY-LEVEL EDUCATION	TYPICAL ON-THE-JOB TRAINING
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	\$63,500	\$54,690	High School diploma or equivalent	2-year degree or certificate; long-term on-the-job training
Electricians	\$75,100	\$63,310	High School diploma or equivalent	Apprenticeship; long-term training
Construction Laborers	\$58,700	\$44,130	High School diploma or equivalent	Short-term on-the-job-training
Insulation Workers, Floor, Ceiling, and Wall	\$56,700	\$44,810	High School diploma or equivalent	Short-term on-the-job-training
Plumbers, Pipefitters, and Steamfitters	\$75,800	\$62,250	Four-year degree	Apprenticeship; short-term on-the-job-training

The following table includes national survey data from a 2019 supplemental wage and benefit survey to the 2020 United States Energy and Employment Report (USEER).¹⁴ At least four in five employers indicated that they pay at least some of the health insurance costs for employees in each of the five occupations selected, while at least seven in 10 employers provide retirement contributions for those occupations at their firms.

FIGURE 4 // Employer-Offered Health Insurance and Retirement Contributions by Occupation / 2019¹⁵



Demographics

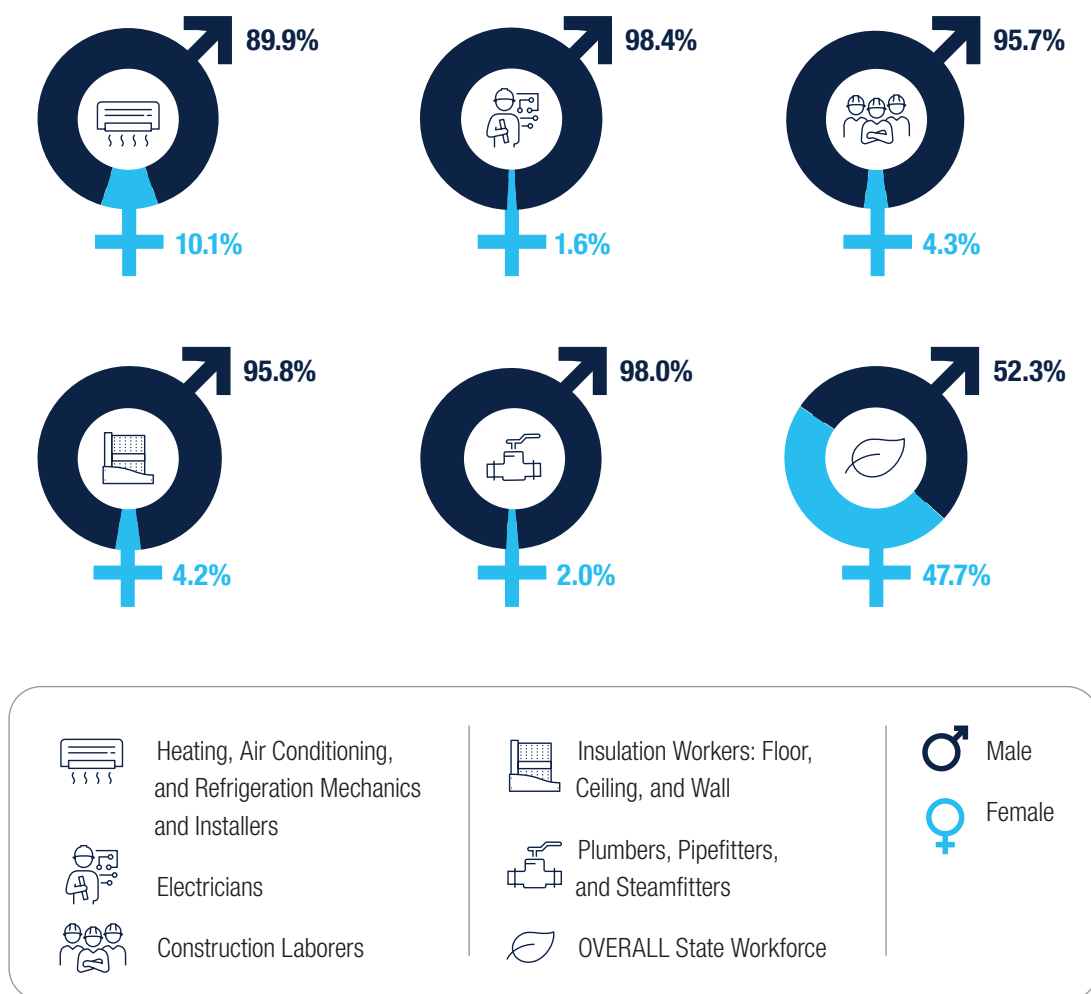
Accelerating the shift to carbon-neutral buildings will create job opportunities throughout New Jersey. For this shift to realize its maximum environmental, economic and health benefits, building decarbonization policies must focus on inclusion of underrepresented groups; provide new career pathways for fossil fuel workers affected by the transition, and enhance the skills of existing contractors, architects, engineers, tradespeople,

and building services and real estate professionals so all relevant workers are prepared to adapt to and help manage modern building technologies.

As New Jersey looks to adopt building decarbonization policies that can advance a just, equitable and sustainable transition, the following four tables illustrate where the state currently stands when it comes to the gender, age, ethnicity and race breakdown of five of the most common occupations in building decarbonization.

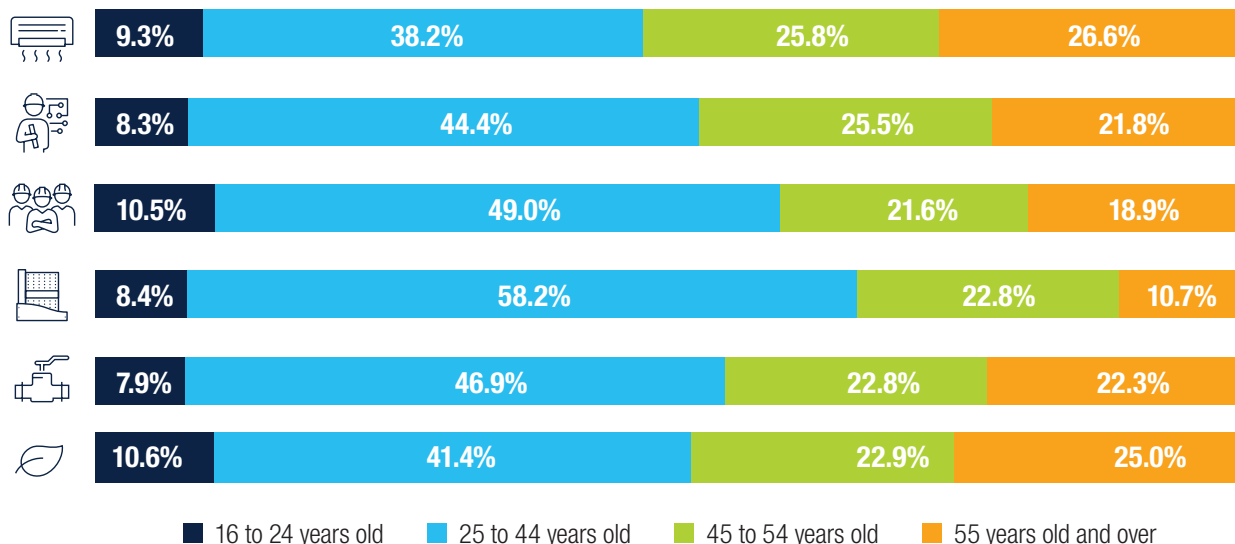
More than 95 percent of all workers in four of the five detailed occupations in New Jersey are male. This is compared to slightly more than half of all workers in the state who are male.

FIGURE 5 // Occupation by Gender / 2020¹⁶



The largest proportion of workers for each of the five occupations selected are between the ages of 25 and 44.

FIGURE 6 // Occupation by Age / 2020¹⁷



The majority of workers within each occupation in the state are white, followed by Black and Asian.

Hispanic or Latino workers make up the majority of insulation workers and construction laborers in New Jersey and are approximately one-fifth of the overall workforce in the state.

TABLE 7 // Occupation by Race and Ethnicity¹⁸

Occupation	Race and Ethnicity							
	AMERICAN INDIAN OR ALASKAN NATIVE	ASIAN	BLACK	NATIVE HAWAIIAN OR OTHER PACIFIC ISLANDER	WHITE*	TWO OR MORE RACES	HISPANIC OR LATINO**	NOT HISPANIC OR LATINO
Heating, Air Conditioning, and Refrigeration Mechanics and Installers	0.2%	1.8%	13.9%	0.1%	81.8%	2.4%	30.7%	69.3%
Electricians	0.1%	3.7%	11.8%	0.0%	82.4%	1.9%	26.2%	73.8%
Construction Laborers	0.6%	4.1%	13.0%	0.0%	80.0%	2.3%	51.3%	48.7%
Insulation Workers, Floor, Ceiling, and Wall	0.6%	2.2%	14.6%	0.0%	79.8%	2.8%	52.9%	47.1%
Plumbers, Pipefitters, and Steamfitters	0.4%	2.2%	12.0%	0.0%	82.5%	2.8%	31.1%	68.9%
NJ Clean Energy Statewide	0.2%	10.7%	14.5%	0.1%	72.2%	2.3%	20.3%	79.7%

* Includes non-Hispanic or Latino and Hispanic or Latino whites.

** Hispanic and Latino ethnicity is separate from race. Includes respondents who also answered as Asian, Black, two or more races, etc.

APPENDIX // Complete County Data

TABLE 8 // New Jersey Building Decarbonization Employment by County

County	Total Building Decarbonization Jobs	Detailed Technology					Buildings Sector			Buildings Type	
		Energy STAR & Efficient Lighting	Traditional HVAC	High Efficiency HVAC & Renewable H&C	Advanced Materials & Insulation	Other	Electrification (heating, hot water, cooking)	Envelope	Other Building Efficiency	Residential	Commercial
Atlantic	761	143	224	182	62	151	523	74	164	475	405
Bergen	4,083	1,148	1,195	707	280	753	2,916	334	833	2,695	2,020
Burlington	1,555	321	487	319	118	310	1,073	141	342	1,009	788
Camden	1,773	358	504	407	158	346	1,213	188	372	1,088	963
Cape May	263	51	76	62	22	52	180	27	56	248	55
Cumberland	337	74	91	78	29	64	233	35	69	171	218
Essex	2,624	554	777	555	214	524	1,799	253	572	1,658	1,371
Gloucester	736	158	206	159	60	153	500	72	165	402	448
Hudson	1,318	268	460	236	86	268	913	103	302	878	644
Hunterdon	511	109	139	111	41	109	344	49	117	357	233
Mercer	1,713	375	543	336	107	352	1,194	128	392	1,004	974
Middlesex	3,391	714	1,095	681	248	654	2,368	295	728	1,958	1,959
Monmouth	2,554	521	799	532	208	493	1,763	248	543	1,742	1,209
Morris	3,370	738	1,090	617	230	695	2,324	274	772	2,221	1,671
Ocean	1,410	283	386	347	113	281	972	134	303	1,207	423
Passaic	1,258	260	378	270	102	247	866	122	270	792	662
Salem	119	27	25	29	12	26	78	14	26	76	62
Somerset	1,412	303	480	271	91	268	1,000	108	303	908	721
Sussex	366	82	100	82	23	79	253	27	86	292	131
Union	1,912	412	581	362	136	420	1,290	162	459	1,280	929
Warren	193	39	52	46	17	39	131	20	42	158	65
N/A¹⁹	1,224	232	489	205	77	220	874	92	259	545	868

Endnotes

- ¹ U.S. Bureau of Labor Statistics, U.S. Department of Labor, Economy at a Glance December 2020 Overall Employment in NJ = 4.2M; Overall Employment in NY = 8.5M at <https://www.bls.gov/eag/home.htm>
- ² Analysis Group. The Economic Impacts of the Regional Greenhouse Gas Initiative on Nine Northeast and Mid-Atlantic States. 2018, https://www.analysisgroup.com/globalassets/uploadedfiles/content/insights/publishing/analysis_group_rggi_report_april_2018.pdf at pages 12-13
- ³ RGGI, Inc. The Investments of RGGI Proceeds in 2020. 2022 at page 6 https://www.rggi.org/sites/default/files/Uploads/Proceeds/RGGI_Proceeds_Report_2020.pdf
- ⁴ State of New Jersey, Executive Order No. 7, (January 29, 2018). <https://nj.gov/infobank/eo/056murphy/pdf/EO-7.pdf>
- ⁵ Boyd, Amy and Ben Butterworth. Acadia Center. The Future is Electric: Helping New Jersey Live in Cleaner Healthier and More Affordable Homes. 2022, <https://acadiacenter.org/resource/the-future-is-electric/>
- ⁶ Krasner, Andee and Brady Seals. Rocky Mountain Institute, et al. Gas Stoves: Health and Air Quality Impacts and Solutions. 2020, <https://rmi.org/insight/gas-stoves-pollution-health>
- ⁷ Unless otherwise stated, all data is from the 2021 U.S. Energy and Employment Report (USEER), April 2021, Department of Energy (DOE). All employment findings in USEER are based on survey and data analysis collected from Q4 2019 prior to any onset of the COVID-19 crisis. See Pages 201–206 for methodology questions
- ⁸ Employment statistics for all 21 Counties included in Appendix A
- ⁹ There is overlap, with some workers employed in both residential and commercial
- ¹⁰ Employment statistics for all 21 Counties included in Appendix A
- ¹¹ JobsEQ, BLS, QCEW
- ¹² Bureau of Labor Statistics, U.S. Department of Labor, Occupational Employment and Wage Statistics, at https://www.bls.gov/oes/current/oes_nat.htm (visited August 20, 2022)
- ¹³ Bureau of Labor Statistics, U.S. Department of Labor, Occupational Outlook Handbook, at <https://www.bls.gov/ooh/> (visited August 20, 2022)
- ¹⁴ NASEO and EFL. Wages, Benefits, and Change: A Supplemental Report to the Annual U.S. Energy and Employment Report. April 2021
- ¹⁵ Ibid.
- ¹⁶ JobsEQ, BLS, QCEW
- ¹⁷ Ibid.
- ¹⁸ Ibid.
- ¹⁹ An additional 1,224 building decarbonization jobs are in unknown or undefined counties



On Diversity & Equity

A good economy and good environment should be for all.

For that reason, E2 supports policies that advance diversity and equity and ensures that the benefits of a clean economy — jobs, savings, opportunities, health — are extended to all communities. Environmental justice is considered in every policy on which we work, and diversity and inclusivity are tantamount in everything we do. Internally, we will prioritize making our membership more representative of America as a whole and addressing internal biases that can keep us from fulfilling our goals.