Building Good Jobs on Clean Energy Projects

A Primer on the Economics of Unions and Prevailing Wage Standards in Illinois

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Executive Summary

Illinois needs bold clean energy investments with comprehensive labor standards—including prevailing wage standards and project labor agreements—to reduce carbon emissions in Illinois while also creating pathways into the state's middle class, especially for communities disproportionately impacted by both climate change and the COVID-19 pandemic. The Climate Union Jobs Act introduced in March 2021 could achieve these goals.

Labor Unions Boost Wages, Expand Fringe Benefits, and Reduce Poverty

- Union workers earn 10 to 20 percent more than nonunion workers—including a 26 percent union wage premium for workers in Illinois' construction, extraction, and utilities industries.
- Fully 95 percent of union workers have access to health care coverage compared with just 68 percent of nonunion workers.
- In Illinois, workers in fossil fuel and nuclear power generation earn 21 percent more in annual compensation than their counterparts working for wind and solar power generation companies.

Prevailing Wage Standards Level the Playing Field for Local Contractors

- Prevailing wage standards are minimum wages for different types of skilled workers on publicly-supported construction projects.
- Prevailing wage standards increase hiring of local contractors and local workers by 10 percent.
- Prevailing wage standards promote bid competition, an important determinant of project costs.

Prevailing Wage Standards Increase Worker Productivity and Improve Worksite Safety

- Prevailing wage standards increase apprenticeship enrollments by up to 8 percent.
- In Illinois, 97 percent of all construction apprentices are enrolled in joint labor-management construction programs.
- Prevailing wage standards boost worker productivity by at least 14 percent and reduce on-the-job injuries by at least 13 percent.

Prevailing Wage Standards Promote Ladders into the Middle Class and Combat Racial Inequality

- Prevailing wage standards boost blue-collar construction worker earnings by 16 percent.
- Skilled construction workers earning prevailing wages contribute more in income, sales, and property tax revenues and are less likely to qualify for government assistance programs.
- Prevailing wage standards boost the homeownership rate of Black construction workers by 8 percent compared with a 3 percent increase in homeownership for White construction workers.

Labor Unions and Labor Standards Provide the Best Value for Taxpayers and Ratepayers

- The vast majority (83 percent) of peer-reviewed economic studies have concluded that prevailing wage standards have no impact on the overall cost of traditional public works projects.
- Installation labor accounts for just 7 to 10 percent of total costs on solar and wind energy systems.
- Including prevailing wage standards and project labor agreements on clean energy projects could only, at maximum, increase total costs by between 1 and 3 percent—*without* factoring in changes in productivity, training, safety, and other contractor efficiencies that offset higher labor costs.

All clean energy projects receiving either state tax dollars or ratepayer-funded subsidies created by the State of Illinois could reflect local compensation rates, quality standards, and diversity goals through the Climate Union Jobs Act. Illinois lawmakers can uphold local construction standards, promote apprenticeship training, and create thousands of middle-class careers through the Climate Union Jobs Act—all without meaningfully increasing the costs of clean energy infrastructure.

Introduction

A thriving and sustainable economy is dependent upon affordable energy. As public initiatives and private investments in Illinois have moved towards cleaner alternatives, solar power and wind power have become the primary sources of renewable energy. Additionally, a historic investment in clean energy infrastructure in Illinois can spur economic growth in the wake of the novel coronavirus disease (COVID-19) pandemic. However, the transition to clean energy sources has important implications not just for environmental health and public health, but also for working families. Ensuring that the clean energy sector creates good family-supporting careers, invests in registered apprenticeship programs, and upholds local construction standards is vital to a successful transition.

Bold clean energy investments with comprehensive labor standards—including prevailing wage standards and project labor agreements—can reduce carbon emissions in Illinois while also creating pathways into the state's middle class, especially for communities disproportionately impacted by both climate change and the COVID-19 pandemic. Prevailing wage standards establish local minimum wages for different types of skilled construction work on publicly-supported projects, based on what qualified craft workers are paid for comparable work in an area. Project labor agreements (PLAs) are comprehensive pre-hire agreements for construction projects that establish the terms and conditions of the labor-management relationship and typically include apprenticeship ratios, targeted hire requirements, no-strike clauses to eliminate work stoppages, and disadvantaged business procurement policies to help meet workforce diversification goals (Manzo & Bruno, 2015).

This white paper discusses the impact of labor unions, registered apprenticeship training programs, and prevailing wage standards on Illinois' construction industry, especially in light of the Climate Union Jobs Act that was introduced by a bipartisan group of lawmakers in the Illinois General Assembly in March 2021 (Miletich, 2021). Labor unions boost worker wages, expand fringe benefits, and reduce poverty while prevailing wage standards level the playing field for contractors, increase worker productivity, improve worksite safety, promote ladders in the middle class, combat racial inequality, and deliver excellent value for taxpayers. Including these standards in a comprehensive plan that invests in carbon-free infrastructure would promote a just transition for Illinois' workers.

Labor Unions Boost Wages, Expand Fringe Benefits, and Reduce Poverty

Numerous studies have found that labor unions boost wages for workers, specifically for low-income employees, for middle-class workers, and for people of color (Callaway & Collins, 2017; Long, 2013; Mishel & Walters, 2003). On average, union households earn between 10 and 20 percent more than nonunion households—an income premium that has been consistent since the 1930s (Farber et al., 2018). In Illinois, union members earn 11 percent more in hourly wages than their nonunion counterparts after accounting for education, demographics, occupation, industry, and other factors (Manzo et al., 2020a). For every $1 paid in union dues, more than $6 is returned to Illinois' union members in after-tax income each year, a return on investment that is unparalleled for working families (Manzo & Bruno, 2016).

Union workers have better fringe benefits. Fully 95 percent of union workers have access to health care coverage, 94 percent have access to retirement plans, and 91 percent have access to paid sick leave compared with just 68 percent health care access, 67 percent retirement plan access, and 73 percent paid sick leave access for nonunion workers (BLS, 2019). Unions also reduce poverty, lower worker turnover, and fight against inequality and discrimination in ways that reduce taxpayer costs for government assistance programs and increase tax revenues (Nunn et al., 2019; Manzo, 2015). According to recent economic research, union members contribute approximately $1,110 more in taxes and receive about $180 less in social safety net benefits, on average, than nonunion workers–positively impacting public budgets by $1,290 per member per year (Sojourner & Pacas, 2018).

Unions in the construction industry are no different (Figure 1). While unionization has declined over time for construction workers, the construction industry remains one of the most unionized private-sector industries in the

nation, and Illinois' construction workers are more unionized than their counterparts nationwide (CPWR, 2017; Manzo et al., 2020a). Union construction workers in Illinois earn about $13 more per hour than their nonunion counterparts, a difference of 62 percent. The union wage premium is slightly higher for construction workers of color (65 percent) than for White construction workers (58 percent). Similarly, while union construction workers who are White are 15 percent less likely to earn less than $15 per hour than their nonunion counterparts, union construction workers who are people of color are 31 percent less likely to earn less than $15 per hour than their nonunion counterparts (Figure 1). These outcomes are in addition to better health and retirement benefits, enhanced workplace safety procedures, and "gold standard" apprenticeship programs that ensure the next generation of workers is trained and highly productive (Manzo & Bruno, 2020).

FIGURE 1: INFLATION-ADJUSTED WAGES OF CONSTRUCTION AND EXTRACTION WORKERS IN ILLINOIS BY UNION STATUS, 2009-2018

Construction and Extraction Workers	Inflation-Adjusted Hourly Wages			Share Earning Less than $15 Per Hour		
	Union	Nonunion	Difference	Union	Nonunion	Difference
All Workers	$35.57	$21.92	+62.3%	8.9%	30.7%	-21.8%
White Workers	$36.02	$22.80	+58.0%	9.2%	24.6%	-15.4%
Workers of Color	$34.24	$20.75	+65.1%	7.8%	38.7%	-30.9%

Source(s): Authors' analysis of the 2009-2018 *Current Population Survey Outgoing Rotation Groups* (CPS-ORG) data from the U.S. Census Bureau and the Bureau of Labor Statistics (BLS) (CEPR, 2020).

The data presented in Figure 1 may overstate or understate the union wage effect because union members may be more or less likely to have characteristics associated with higher wages. Age, gender identification, racial or ethnic background, urban status, educational attainment, weekly hours worked, sector of employment, and occupation of employment all influence an individual's hourly earnings. To parse out the unique and independent effect of unionization on wages, an advanced statistical technique called a robust difference-in-differences regression is utilized. After accounting for these and other factors, unions are found to boost the hourly earnings of a worker in the construction, extraction, and utilities industries by 26 percent in Illinois, a result that is statistically significant.[1]

FIGURE 2: TOTAL COMPENSATION (INCLUDING WAGES, BENEFITS, AND TAXES) FOR ILLINOIS WORKERS IN ENERGY SECTORS, 2018

Combined Sector of Electric Power Generation in Illinois	Total Employee Compensation	Total Reported Employees	Compensation Per Employee
Fossil Fuel and Nuclear Electric Power	$1,304,301,303	6,772	$192,591
Solar and Wind Electric Power Generation	$120,516,329	755	$159,532
Compensation Difference: Fossil Fuel and Nuclear vs. Solar and Wind			**+20.7%**

Source(s): Authors' analysis of U.S. Census Bureau data using IMPLAN, an input-output economic impact software (IMPLAN, 2020).

In Illinois, workers in fossil fuel and nuclear power generation earn 21 percent more in annual compensation than their counterparts working for wind and solar electric power generation companies (Figure 2). While these estimates using economic data from the U.S. Census Bureau include both blue-collar workers, such as construction and maintenance workers, and white-collar employees, such as engineers, the pay penalty for working in the clean energy space is in large part due to a lack of unionization. The traditional energy sector is more highly unionized than the clean energy sector. Years of collective bargaining in the traditional energy sector have produced workplaces and worksites where hourly wages, health insurance coverage, retirement plans, and training contributions are generally better for workers. By contrast, the clean energy sector—and particularly subsegments like residential solar—have smaller firms with minimal or no union representation and less job security for workers (Jones et al., 2016). To attract, develop, and retain skilled workers, clean energy employers must compete with fossil fuel-based companies that tend to offer better pay and better job security for workers. One way to compete for skilled workers is to include project labor agreements and expand labor neutrality in the clean energy sector.

[1] For the regression analysis, please see Table A in the Appendix.

Prevailing Wage Standards Level the Playing Field for Local Contractors

Prevailing wage standards support skilled construction workers employed on construction projects funded in whole or in part by taxpayer dollars. Prevailing wage standards are minimum wages for different types of skilled construction workers on public works projects, ensuring that contractors pay no less than market-based wages and benefits in the local area where public projects are to be completed. By taking labor costs of out the equation for contractors bidding on projects, prevailing wage standards incentivize competition that is based on infrastructure quality, worker productivity, technological innovations, and materials and fuels usage.

Prevailing wage standards create a level playing field for contractors by ensuring that public expenditures reflect local market standards of compensation and craftmanship (Duncan et al., 2017). Competing on a level playing field, local contractors are awarded more taxpayer-funded projects in states with prevailing wage laws. Data from the *Economic Census of Construction* reveals that states with prevailing wage laws have 2 percent more of the total value of construction work completed by in-state contractors (Census, 2012). Impacts are even larger in certain areas. As examples, local contractors account for a 10 percent higher market share when prevailing wages are paid on public school projects in Minnesota and county-resident businesses account for 16 percent higher market share when prevailing wages are paid on library construction projects in Santa Clara County, California (Manzo & Duncan, 2018, Duncan, 2011). By keeping tax dollars in the local economy, more labor income and consumer spending tends to remain in communities with prevailing wage standards.

Furthermore, prevailing wage standards promote high levels of bid competition on traditional public works construction projects, contributing towards lower overall costs. Six academic studies conducted since 2000 that have cumulatively evaluated data on more than 9,400 bid proposals find that prevailing wage standards maintain—or even increase—the number of bidders on municipal, school, and highway construction projects (Figure 3). Researchers in a 2020 study found that "the cost-reducing effect of increased bid competition is stronger on projects covered by the prevailing wage policy" (Onsarigo et al., 2020). Prevailing wage standards can incentivize competition that is based on quality and value while also increasing the chances that Illinois-owned construction businesses will be building the clean energy infrastructure needed for a thriving 21st Century economy

FIGURE 3: ECONOMIC RESEARCH ON THE IMPACT OF PREVAILING WAGE LAWS ON CONTRACTOR BID COMPETITION SINCE 2000

Study	Authors	Year	Project Focus	Bids	Geography	Effect
1	Manzo, Duncan, Gigstad, & Goodell	2020	Highways	4,890	Wisconsin	+19%
2	Waddoups & Duncan	2020	School Construction	291	Nevada	+25%
3	Onsarigo, Duncan, & Atalah	2020	School Construction	669	Ohio	No Effect
4	Manzo & Duncan	2018	Public Projects	2,062	Indiana	No Effect
5	Duncan	2015	Highways	497	Colorado	No Effect
6	Kim, Kuo-Liang, & Philips	2012	Municipal	565	California	No Effect

Source(s): Individual studies listed in table.

Prevailing Wage Standards Increase Worker Productivity and Improve Worksite Safety

Construction is the most volatile major industry in the United States. The construction industry is seasonal, with major projects built and repaired during peak months. The construction industry is also cyclical, with more activity during the upswing in the business cycle when market conditions are favorable. Finally, when workers complete projects, there are often periods of unemployment while they look for new jobs. This inherent instability gives employers less incentive to invest in skills training. The result is a "market failure" in which long-term investments in worker training are not made at adequate levels.

Prevailing wage standards help to correct this market failure by reflecting privately-negotiated packages for wages, benefits, and training contributions in the communities where projects are being built, ensuring that the next

generation of workers is trained and the industry can access a stable supply of skilled workers. Economic research shows that prevailing wage standards increase apprenticeship training in the construction industry. Apprenticeship enrollments are 6 to 8 percent higher and apprentices complete their on-the-job and classroom training faster in states that have prevailing wage laws (Bilginsoy, 2005; Dickson Quesada et al., 2013).

Prevailing wage standards support the largest privately-financed system of higher education in Illinois. In 2019, registered apprenticeship programs trained more than 17,000 young adults in Illinois, a growth of 44 percent since 2011 (DOLETA, 2020). Fully 97 percent of all construction apprentices in Illinois are enrolled in joint labor-management construction programs, which are cooperatively administered by contractors and unions. These joint labor-management programs allow young people to "earn while they learn" without burdensome student loan debt while delivering training hours, graduation rates, diversity outcomes, and competitive earnings that rival the performance of Illinois' four-year universities (Manzo & Bruno, 2020).

Because prevailing wage standards improve training outcomes, they boost construction worker productivity and reduce injuries and fatalities on construction worksites. Productivity per construction worker has been found to be 14 to 33 percent higher in states that have prevailing wage standards (Philips, 2014). At the same time, on-the-job fatalities are 14 to 26 percent higher in states that do not have prevailing wage standards (Manzo, 2017). A recent peer-reviewed study reached similar conclusions—states that repealed their prevailing wage standards experienced a 13 percent increase in construction injury rates (Li et al., 2019).

Prevailing Wage Standards Promote Ladders into the Middle Class and Combat Racial Inequality

Prevailing wage standards foster good, middle-class careers for skilled construction workers. There is a significant disparity in the wages paid to blue-collar construction workers between states with prevailing wage standards and states without prevailing wage standards (Philips, 2014). Prevailing wage standards statistically increase blue-collar construction worker earnings by about 16 percent per year (Manzo et al., 2016). With family-sustaining incomes, prevailing wage laws reduce the number of construction workers living below poverty by 30 percent and reduce income inequality in the construction industry by as much as 45 percent (Manzo et al., 2016; Manzo & Bruno, 2014). Because they earn higher incomes, skilled construction workers in states with prevailing wage standards contribute more in tax revenues than their counterparts in states without the law. Skilled construction workers contribute 17 percent more in income taxes and property taxes and are less likely to rely on government assistance programs, like food stamps, in states with prevailing wage standards (Philips & Blatter, 2017; Manzo et al., 2016).

Prevailing wage standards are effective at combating inequality in construction. As long as workers have the same skillset operating the same equipment on the same project in the same county, they are paid the same prevailing wage rate as their coworkers next to them—regardless of background. However, prevailing wage standards have the largest positive effects on Black workers in the trades. Recent research has found that prevailing wage standards boost the homeownership rate of Black construction workers by 8 percent and increase their housing wealth by 18 percent compared with a 3 percent increase in homeownership and a 10 percent increase in housing wealth for White construction workers (Manzo et al., 2020b). There is also no evidence that prevailing wage standards deter people of color from participating in construction (Duncan & Ormiston, 2017; Belman & Philips, 2005). In fact, in states that have repealed prevailing wage, people of color accounted for 13 percent of all registered apprentices after repeal, a 6 percent drop from the pre-repeal share of 19 percent (Philips et al., 1995).

In Illinois, the building trades' joint labor-management apprenticeship programs are more diverse than employer-only programs in construction. The share of active apprentices who are Black or African American is 9 percent in joint labor-management programs and just 5 percent in employer-only programs, a 4 percent difference. The share who are Latinx is 18 percent in joint labor-management programs versus 11 percent in employer-only programs, a 7 percent difference. The completion rate for Black and African American apprentices is also 52 percent in joint labor-management programs and just 18 percent in employer-only programs (Manzo & Bruno, 2020).

As Illinois recovers from COVID-19, essential workers in the construction industry will be needed to repair roads and public transit systems for commuters to return to their offices, expand broadband for people working from home, rebuild hospitals to protect frontline health care workers for the next public health crisis, and install clean energy infrastructure to promote a thriving 21st Century economy. Prevailing wage standards attract, develop, and retain skilled construction workers and reduce the likelihood that those same workers will need to rely on public assistance to make ends meet.

Labor Unions and Labor Standards Provide the Best Value for Taxpayers and Ratepayers

Attaching labor standards to infrastructure projects can deliver value for taxpayers and ratepayers. Because prevailing wage standards promote investment in apprenticeship training programs, boost worker productivity, improve worksite safety, and reduce construction worker reliance on government assistance programs, the vast majority of peer-reviewed studies evaluating actual project data find that federal, state, and local prevailing wage standards have no effect on the total cost of public construction projects (Duncan & Ormiston, 2017). In fact, 83 percent of peer-reviewed studies since 2000 have concluded that prevailing wage standards have no impact on the overall cost of traditional public works projects (Figure 4).

FIGURE 4: PEER-REVIEWED RESEARCH ON THE IMPACT OF PREVAILING WAGE LAWS ON TOTAL CONSTRUCTION COSTS SINCE 2000

Study	Authors	Year	Project Focus	Projects	Geography	Effect
1	Onsarigo, Duncan, & Atalah	2020	School construction	113	Ohio	No effect
2	Duncan & Waddoups	2020	School construction	77	Nevada	No effect
3	Duncan	2015	Highways	132	Colorado	No effect
4	Duncan	2015	Highways	91	Colorado	No effect
5	Duncan, Philips, & Prus	2014	School construction	498	Canada	No effect
6	Kaboub & Kelsay	2014	Public buildings	3,120	12 states*	No effect
7	Atalah	2013	School construction	1,496	Ohio	No effect
8	Atalah	2013	School construction	1,496	Ohio	No effect
9	Duncan, Philips, & Prus	2012	School construction	723	Canada	No effect
10	Kim, Kuo-Liang, & Philips	2012	Municipal projects	141	California	No effect
11	Vincent & Monkkonen	2010	School construction	2,645	United States	13%
12	Duncan, Philips, & Prus	2009	School construction	438	Canada	No effect
13	Duncan, Philips, & Prus	2006	School construction	528	Canada	No effect
14	Azari-Rad, Philips, & Prus	2003	School construction	4,653	United States	No effect
15	Azari-Rad, Philips, & Prus	2002	School construction	4,974	United States	No effect
16	Vitaliano	2002	Highways	50**	United States	8%
17	Keller & Hartman	2001	School construction	25***	Pennsylvania	2%
18	Bilginsoy & Philips	2000	School construction	54	Canada	No effect

*Projects were analyzed from the following 12-state region: Nebraska, South Dakota, North Dakota, Kansas, Missouri, Iowa, Minnesota, Wisconsin, Illinois, Indiana, Michigan, and Ohio.
**The 50 observations are DOT expenditures for all 50 states, and do not account for the amount of new highway construction ordered, which is an important determinant of project costs.
***The analysis did not analyze *actual* projects, but rather conducted hypothetical "wage differentials" for 25 arbitrary projects. Wage differential studies are flawed compared to regression analyses (Duncan & Ormiston, 2017).

Source(s): Individual studies listed in table.

Prevailing wage standards result in stable construction costs because labor costs are a low and historically declining percentage of total costs in the construction industry—approximately 26 percent of total costs in Illinois (Census, 2017). By promoting the use of higher skilled workers, prevailing wage standards also reduce expenditures on materials, fuels, and rental equipment (Duncan & Lantsberg, 2015). Since labor costs are only a small portion of total costs, relatively minor changes are needed to offset the effect of the wage policy.

Expanding prevailing wage and other strong labor standards in the clean energy sector would not significantly alter the cost of wind and solar infrastructure projects. According to the National Renewable Energy Laboratory (NREL) at the U.S. Department of Energy, labor costs on a 6.2-kilowatt residential solar system are 27 cents per watt DC on average, which represents just 10 percent of the total installation cost of $2.70 per watt DC. Labor's share of a solar project declines as economies of scale are achieved. On a 500-kilowatt commercial solar system, labor install costs accounts for 21 cents per watt DC, which is just 7 percent of the total cost benchmark of $1.75 per watt DC. Likewise, on a utility-scale solar system, labor install costs average just 10 cents per watt DC, which equates to 9 percent of the total cost of the project of $1.25 per watt DC (Fu et al., 2018) (Figure 5).

FIGURE 5: BENCHMARK COST TO INSTALL SOLAR SYSTEMS OF DIFFERENT TYPES AND SIZES, NATIONAL, 2018 Q1

National Benchmark Per Watt DC	6.2-kW Residential Solar System	500-kW Commercial Solar System	10-MW Utility-Scale Solar Fixed-Tilt System
Total System Cost	$2.70	$1.75	$1.25
Install Labor Cost	$0.27	$0.13	$0.11
Labor Share of Total Cost	**10.0%**	**7.4%**	**8.8%**

Source(s): National Renewable Energy Laboratory at the U.S. Department of Energy (Fu et al., 2018).

Economic data from the U.S. Census Bureau corroborate these low labor costs. In 2018, an estimated $121 million in total compensation was paid to wage and salary employees in the wind and solar electric power generation sector. This accounted for 7 percent of the $1.7 billion in total economic output in the wind and solar energy sector. By contrast, the combined fossil fuel and nuclear power generation sector paid an estimated $1.3 billion in wages and salaries, which accounted for 16 percent of the sector's total economic output of $8.3 billion over the year.

FIGURE 6: EMPLOYEE COMPENSATION AS A SHARE OF TOTAL ECONOMIC OUTPUT FOR DIFFERENT ENERGY SECTORS IN ILLINOIS, 2018

Combined Sector of Electric Power Generation in Illinois	Total Employee Compensation	Total Economic Output	Employee Compensation as a Share of Output
Solar and Wind Electric Power	$120,516,329	$1,697,188,293	7.1%
Fossil Fuel and Nuclear Electric Power	$1,304,301,303	$8,272,204,668	15.8%

Source(s): Authors' analysis of U.S. Census Bureau data using IMPLAN, an input-output economic impact software (IMPLAN, 2020).

Attaching labor standards to clean energy infrastructure projects could only, at maximum, increase total costs by between 1 and 3 percent (Figure 7). With labor costs accounting for between 7 and 10 percent of total costs on wind and solar projects, a 16 percent average boost to blue-collar construction worker earnings due to prevailing wage standards could only mathematically increase total costs by between 1 and 2 percent. Similarly, a 26 percent average increase in blue-collar construction worker earnings from the union wage premium in Illinois' construction, extraction, and utilities industry multiplied by a typical labor cost share yields a potential cost increase of just 2 to 3 percent on solar and wind construction projects.

FIGURE 7: HYPOTHETICAL INCREASE IN TOTAL CLEAN ENERGY PROJECT COSTS DUE TO LABOR STANDARDS (NO PRODUCTIVITY CHANGES)

"Wage Differential" Approach: Labor Cost Multiplied by the Increase in Labor Rate Equals the Hypothetical Change in Total Costs		Impact of Labor Standards on Average Wage of Blue-Collar Construction Workers	
		Low End (Prevailing Wage): +16%	High End (Union Wage): +26%
Labor Cost Share of Total Costs	Low End (Commercial Solar): Labor Costs are 7% of Total Costs	1.12%	1.82%
	High End (Residential Solar): Labor Costs are 10% of Total Costs	1.60%	2.60%

Source(s): Authors' analysis using data from the National Renewable Energy Laboratory at the U.S. Department of Energy (Fu et al., 2018), from a national study on prevailing wage standards (Manzo et al., 2016), and from the 2012-2018 *Current Population Survey Outgoing Rotation Groups* (CPS-ORG) released by the U.S. Census Bureau and the Bureau of Labor Statistics (BLS) (CEPR, 2020).

It must be noted that this 1 to 3 percent range of hypothetical cost effects ignores changes in bid competition, labor productivity, apprenticeship training, workplace safety, and other contractor efficiencies that tend to occur when wages increase in construction (Duncan & Ormiston, 2017). Better wages and fringe benefits also result in workers contributing more in income taxes, sales taxes, and property taxes while relying less on government assistance programs—which saves additional dollars (Manzo et al., 2016). As a result, including prevailing wage standards on clean energy projects or expanding union-scale wages through project labor agreements (PLAs) would have little to no overall impact on the total cost of the average solar and wind project.

Conclusion

All construction projects receiving either state tax dollars or ratepayer-funded subsidies created by the State of Illinois could reflect the local compensation rates, quality standards, diversity goals, and economic development priorities of the people of Illinois through the proposed Climate Union Jobs Act. With new legislation that incentivizes a historic investment in wind and solar energy systems while also applying both prevailing wage standards and project labor agreements on the projects, Illinois lawmakers can uphold local standards of compensation and craftmanship, promote registered apprenticeship programs, and create thousands of stable middle-class careers in Illinois—all without meaningfully increasing the costs of clean energy infrastructure.

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Appendix

To ascertain the impact of union membership on workers in the construction, extraction, and utilities industries, add the interaction term effect (Union Member x Affected Industries) of 19.1 percent to the independent union member effect of 6.5 percent, which equals 25.6 percent.

TABLE A: ROBUST OLS REGRESSION, EFFECT OF UNIONIZATION ON THE NATURAL LOG OF REAL WAGES FOR AFFECTED WORKERS, 2012-2018

Natural Log of Inflation-Adjusted Hourly Wages	Effect	(Error)
Union Member x Affected Industries	**+0.191*** **	**(0.022)**
Union Member	**+0.065*** **	**(0.010)**
Affected Industries: Construction, Extraction, and Utilities	+0.019	(0.013)
Occupation: Construction and Extraction	+0.153***	(0.021)
Demographics: Age	+0.044***	(0.001)
Demographics: Age^2	-0.000***	(0.000)
Demographics: Female	-0.164***	(0.006)
Demographics: White	-0.013	(0.014)
Demographics: Black or African American	-0.158***	(0.016)
Demographics: Latinx or Hispanic	-0.078***	(0.014)
Demographics: Military Veteran	+0.045***	(0.015)
Demographics: U.S. Citizen	+0.051***	(0.014)
Demographics: Foreign Born	-0.057***	(0.012)
Geography: City Center	+0.094***	(0.009)
Geography: Suburb	+0.095***	(0.007)
Sector: Federal Government	+0.056**	(0.023)
Sector: State Government	-0.068***	(0.017)
Sector: Local Government	-0.048***	(0.012)
Employment: Hours Worked	+0.006***	(0.000)
Education: Less than High School	-0.122***	(0.011)
Education: Some College, No Degree	+0.050***	(0.008)
Education: Associate's Degree	+0.079***	(0.011)
Education: Bachelor's Degree	+0.327***	(0.009)
Education: Master's Degree	+0.441***	(0.012)
Education: Professional or Doctorate Degree	+0.607***	(0.020)
Occupation: Management, Business, and Financial	+0.349***	(0.013)
Occupation: Professional	+0.214***	(0.013)
Occupation: Services	-0.106***	(0.012)
Occupation: Sales and Related	+0.033**	(0.014)
Occupation: Office and Administrative	+0.023*	(0.012)
Occupation: Farming	-0.177***	(0.038)
Occupation: Installation, Maintenance, and Repair	+0.129***	(0.017)
Occupation: Transportation and Material Moving	-0.109***	(0.015)
Year: 2013	-0.004	(0.010)
Year: 2014	-0.020**	(0.010)
Year: 2015	-0.007	(0.010)
Year: 2016	+0.021**	(0.010)
Year: 2017	+0.028***	(0.010)
Year: 2018	+0.049***	(0.010)
Constant Term (Baseline)	1.489***	(0.033)
N= (Sample Size is Weighted to Population)	29,923	
R^2=	0.441	

Source(s): Authors' analysis of the 2012-2018 *Current Population Survey Outgoing Rotation Groups* (CPS-ORG) data from the U.S. Census Bureau and the Bureau of Labor Statistics (BLS) (CEPR, 2020). Three asterisks (***) indicate significance at the 99-percent confidence level. Two asterisks (**) indicate significance at the 95-percent confidence level. One asterisk (*) indicates significance at the 90-percent confidence level.