SB 418 - Energy Generation - CBA and Labor Standar

Uploaded by: Donna Edwards

Position: FAV

MARYLAND STATE & D.C. AFL-CIO

AFFILIATED WITH NATIONAL AFL-CIO

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President
Donna S. Edwards

Secretary-Treasurer
Gerald W. Jackson

SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards
Senate Finance Committee
February 15, 2022

SUPPORT

Donna S. Edwards
President
Maryland State and DC AFL-CIO

Madam Chair and members of the Committee, thank you for the opportunity to submit testimony in support of SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards. My name is Donna S. Edwards, and I am the President of the Maryland State and District of Columbia AFL-CIO. On behalf of the 340,000 union members, I offer the following comments.

As we move from a traditional energy economy to a clean energy economy it is vital that we are creating a policy and regulatory framework that ensures we are bolstering family-sustaining careers and not just creating dead-end jobs. When labor unions talk about supporting legislation that simultaneously fights climate change and protects jobs, we are specifically talking about legislation like SB 418.

Renewable energy generation, transmission, and storage are the energy growth industries of the future. For these projects it is paramount that we apply labor standards like Project Labor Agreements (PLAs) and building them using Prevailing Wage. We must hold these new energy jobs to a high standard now, ensuring that we are setting up the next generation of workers to be as successful as the ones that precede them. SB 418 demands PLAs and Prevailing Wage and it also adds Community Benefit Agreements (CBAs) to the requirements of these projects, making sure that the local community is engaged and that at least 80% of the craft workers on the project are locally hired.

We need to fight climate change and we need to create family-sustaining careers in clean energy. With SB 418 we have the opportunity to protect workers and their families, as we grow clean energy production in Maryland.

We urge a favorable vote on SB 418.

Jason Ascher - Support - SB 418 - Energy Generati
Uploaded by: Jason Ascher
Position: FAV

MID-ATLANTIC PIPE TRADES ASSOCIATION

PLUMBERS - STEAMFITTERS - SPRINKLER FITTERS
PIPE FITTERS - PIPE WELDERS - HVAC SERVICE TECH

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Columbia, MD 21046

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Senate Finance Committee

To: Senator Delores Kelley, Chair; Senator Brian Feldman Vice-Chair; and Members of the Committee.
From: Jason Ascher, Political Director, Mid-Atlantic Pipe Trades Association.

On behalf of the Mid-Atlantic Pipe Trades Association and our 10,000+ United Association of Plumbers and Steamfitter members across Maryland, I ask you to **SUPPORT HB SB 418**.

The United Association of Plumbers and Steamfitters believes in an "all of the above" approach to energy production. Our members build and maintain infrastructure for fossil fuels, nuclear, and other less-used or developing renewable energy sources such as Geothermal, Hydrogen, and Concentrated Solar. We want to see renewable energy infrastructure constructed, including more nuclear, while keeping natural gas and carbon capture in use to protect the grid from failing. Unfortunately, with the rush to build new infrastructure for renewable energy, the workers tend to be the ones left behind. **SB 418** will ensure that the workers are looked out for on these projects and that the workers on these projects are the highest skilled and best trained available.

Fossil Fuel infrastructure is commonly (but not always) built and maintained by union workers. These workers earn family-sustaining wages, with benefits such as health insurance, pensions, and retirement saving. Under union contracts, workers also get other worksite protection such as a safer worksite, apprentice training, and a set schedule. The renewable sector, aside from Nuclear, which operates more like the fossil fuel sector when it comes to workers, tends to do things as cheap as possible, starting with labor. These renewable energy companies would rather use cheaper labor that they can exploit than highly skilled and highly trained local workers. **SB 418** will require all energy generation, transmission, and storage projects to have labor standards and a community benefits agreement. It will be a requirement for Prevailing Wages, licensed workers, and workers trained in registered apprenticeship programs. This bill is how we ensure that all energy projects protect both the community and workers. These workers will be able to take care of themselves and their families, be set up for a successful career, and allow them to retire with dignity.

For these reasons, I ask that you support **SB 418**.

Sincerely,

Jason Ascher
Political Director
Mid-Atlantic Pipe Trades Association

SB 418 Energy Generation Transmission and Storage

Uploaded by: Jeffry Guido

Position: FAV

Electrical Workers

Insulators

Boilermakers

United Association

Plumbers & Gas Fitters

Sprinkler Fitters

Steam Fitters

Roofers

Cement Masons

Teamsters

Laborers

Bricklayers

Ironworkers

Sheet Metal Workers

Elevator Constructors

Painters

Operating Engineers

Carpenters

Maryland Senate Finance Committee

Chair: Delores G. Kelley

Vice Chair: Brian J. Feldman

Senate Bill 418 Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Position: **SUPPORT**

The Baltimore DC Metro Building Trades Council supports Senate Bill 418. The solar and wind energy industry does not currently provide family sustaining wages and benefits comparable to employment in the nuclear, natural gas, fuel oil or coal industry. As Maryland is intent on moving away from the use of fossil fuels and increasing its reliance on renewable energy it is imperative to set the labor standards and conditions for the installation and expansion of these utilities. All of the Building Trades apprenticeship training centers teach green installation and construction. Our members provide readily trained certified and licensed skilled crafts persons that will install these systems safely and economically. These standards include paying the area prevailing wage standard for each trade, including the wages and fringe benefits per trade, and be subject to all state reporting and compliance requirements. Participation in an apprenticeship program registered with the State of Maryland for each trade employed on the project. Contractors that have been compliant with federal and state wage and hour laws in the previous three years. The establishment and execution of a plan for outreach, recruitment, and retention of Maryland residents to perform work on the project—including residents who are returning citizens, women, minority individuals, and veterans—with an aspirational goal of 25 percent of total work hours performed by Maryland residents, including individuals in one or more of the groups identified. The application and protection of these standards will protect Maryland's working men and women.

We ask the committee for a favorable vote. Thank you.

Respectfully,

Jeffry Guido - Baltimore-DC Metro Building Trades Council

Value on Display... Everyday.

Value on Display... Everyday.

BaltimoreCounty_FAV_SB0418.pdf
Uploaded by: Joel Beller
Position: FAV

JOHN A. OLSZEWSKI, JR.
County Executive

JOEL N. BELLER
Acting Director of Government Affairs

JOSHUA M. GREENBERG
Associate Director of Government Affairs

MIA R. GOGEL
Associate Director of Government Affairs

BILL NO.: **Senate Bill 418**

TITLE: Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

SPONSOR: Senator Feldman

COMMITTEE: Finance

POSITION: **SUPPORT**

DATE: February 15, 2022

Baltimore County **SUPPORTS** Senate Bill 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards. This legislation would require covered project developers to enter into a community benefit agreement with a local community organization, pay a prevailing wage for labor on these projects and ensure that all those working on covered projects will be treated in accordance with best practices.

The rapid growth in the sustainable energy industry has driven an urgent need for the production of a significant amount of new supporting infrastructure throughout the State. New demands for a workforce to construct and stand up these projects must be met for the State to rapidly meet industry needs. It a priority for the County that all those working on emerging energy projects housed locally and throughout the State are protected by strict labor standards.

This legislation will mandate fair and equitable labor standards by requiring that those working on covered projects from a renewable Tier 1 source, renewable Tier 2 source or nuclear energy are protected under community benefit agreements. SB 418 also requires the developers of these projects pay no less than a prevailing wage, a standard that Baltimore County sets for work within its jurisdiction. These provisions will ensure that all labor on covered projects in the State is appropriately compensated and valued.

Accordingly, Baltimore County requests a **FAVORABLE** report on SB 418. For more information, please contact Joel Beller, Acting Director of Government Affairs at jbeller@baltimorecountymd.gov.

Larry Stafford – SB 418 Favorable.pdf
Uploaded by: Lindsey Muniak
Position: FAV

PROGRESSIVE MARYLAND
P.O. Box 6988 Largo, MD 20792
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Testimony of Larry Stafford, Jr., Executive Director of Progressive Maryland

SB 418 – Energy Generation, Transmission, and Storage Projects –
Required Community Benefit Agreement and Labor Standards
February 15, 2022

Position: Favorable

Thank you, Chair Kelley and distinguished members of the Senate Finance Committee, for the opportunity to offer testimony in support of SB 418.

My name is Larry Stafford, and I am the Executive Director of Progressive Maryland. We are a statewide grassroots nonprofit with over 100,000 members, supporters, and affiliates who live in nearly every legislative district across Maryland. Our multi-racial, multi-issue organization is dedicated to building power for working people and ending all forms of structural oppression.

We at Progressive Maryland support SB 418, a measure that would establish strong labor standards for energy generation projects. Environmental justice is a key issue area for our organization, and we have been heavily involved with the push toward a green economy at both the state and federal levels. As Maryland shifts away from its reliance on fossil fuels, it is critical to ensure the roles created by this transition are quality jobs with strong benefits and meaningful worker protections.

SB 418 establishes some of the conditions for an economically just transition by requiring developers to pay workers prevailing wage rates on the construction of energy generation projects that require a Certificate of Public Convenience and Necessity (CPCN). This legislation also requires developers to demonstrate best efforts to enter into agreements with the communities affected by their projects that prioritize jobs for local residents and businesses, offer career training opportunities, and implement safety protocols.

Many states have already passed legislation to establish labor standards on energy projects — these include Illinois, Connecticut, New Jersey, Oregon, Washington, Minnesota, and New York. Now is the time for Maryland to join these other progressive states.

We **urge the Committee to vote favorably on SB 418** and move the legislation as soon as possible. Thank you for considering our support for this urgent and important bill.

Larry Stafford, Jr.
Executive Director
Progressive Maryland

Marshall Brown LECET SB 418 FAV.pdf
Uploaded by: Marshall Brown
Position: FAV

LECET
MID-ATLANTIC REGION

MID-ATLANTIC LABORERS – EMPLOYERS
COOPERATION AND EDUCATION TRUST
One Freedom Square • 11951 Freedom Drive • Suite 310 • Reston, VA 20190
Phone: 703-860-4194 • Fax: 703-860-1865 • Email: lecetmidatlantic@maliuna.org

Tuesday, February 15, 2022

The Honorable Delores Kelley
Chair, Senate Finance Committee
Miller Senate Office Building - 3 East
Annapolis, Maryland 21401

SUBJECT: **SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards**
Position – Favorable

Dear Chair Kelley and Members of the Senate Finance Committee,

It is an honor to submit written testimony in support of SB 418. My name is Marshall Brown, and I am the Director of the Mid-Atlantic Laborers-Employers Cooperation and Education Trust, or LECET for short.

LECET brings the Laborers Mid- Atlantic Region of LiUNA and its signatory contractors together to address issues of importance to both laborers and their employers. Currently, we represent more than 35,000 laborers in the Mid-Atlantic Region and more than 200 contractors. Through LECET, laborers and contractors work as a team to secure projects and jobs, increase union-sector market share, develop a workforce, and advance shared market-related interests.

LECET support SB 418 because it will benefit both our members and our contractors. The bill will help our members because it encourages local hiring, both for residents and for businesses, as well as training and safety protocols. SB 418 will help our contractors because it will establish prevailing wage on renewable energy projects. This will level the playing field and provide an opportunity for the high-road contractors LECET represents to bid and win work because wage requirements are set and it makes it harder for low road contractors to win work by lowering wages.

Attached to my testimony are a letters from LECET contractors who want you to know they support SB 418.

Please vote favorably on SB 418.
ATTACHMENTS

CARSON
CORPORATION
DIRECTIONAL DRILLING
CIVIL CONSTRUCTION

P 973.579.4100
F 973.579.4105

carsoncorporation.net

171 Route 94
Lafayette, NJ 07848

February 15, 2022

The Honorable Delores Kelley
Chair, Senate Finance Committee
Miller Senate Office Building - 3 East
Annapolis, Maryland 21401

Statement of Chris Simpson, Carson Corporation
on
SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards
Position - Support

Thank you for the opportunity to provide a written statement in support of SB 418.

My name is Chris Simpson. I am the Vice President of Civil Construction at Carson Corporation. Carson Corporation specializes in directional drilling and civil construction. We own and maintain over 75 pieces of earth moving equipment, and earthwork, utilities, paving, retaining walls, concrete and curbing are all performed with our own crews.

Carson Corporation has worked on numerous solar farm projects. We are a union company, and therefore, provide our construction workforce with family-sustaining wages and benefits that include family health insurance and a pension.

Carson Corporation supports SB 418. From a contractors' perspective, requiring prevailing wage on renewable energy projects is very helpful. That's because prevailing wage requirements level the playing field for reputable, high-road contractors like Carson Corporation. Prevailing wage prevents low-road contractors from undercutting high-road contractors committed to paying decent wages and benefits. Prevailing wage signals to high-road companies that they can compete for and win contracts.

Carson Corporation urges the committee to report favorably on SB 418.

Sincerely,

Chris Simpson
Vice President

KIRILA EARTHWORKS INC
WOMAN OWNED BUSINESS. BOWIE, MD

Tuesday, February 15, 2022

The Honorable Delores Kelley

Chair, Senate Finance Committee

Miller Senate Office Building - 3 East

Annapolis, Maryland 21401

RE: Support for SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Dear Chair Kelley and Members of the Finance Committee:

My Name is Jami Kirila. I am the owner of Kirila Earthworks, a WBE and MBE small business contractor based in Prince George's County. We specialize in sitework, stormwater, and utility projects throughout Maryland. We are proud to be a small company that helps create middle-class construction jobs for Maryland residents.

Kirila Earthworks supports SB 418, which would establish labor standards and community benefits agreements on Maryland energy generation projects 2 megawatts or greater.

As a small, Maryland-based construction contractor, I can tell you firsthand that requiring labor standards, especially prevailing wage, on energy generation projects will help my company compete and win work. That is because prevailing wage helps companies like Kirila Earthworks compete on a level playing field against companies that do not take care of their employees the way we do. On non-prevailing wage jobs, it is much harder for companies like mine to compete because low-road contractors will cut wages to the bone to try and win work.

My company is a great example of how prevailing wage builds value into infrastructure investment. Prevailing wage promotes the success of local contractors, employment growth for local construction workers, and helps build Maryland's economy.

We at Kirila Earthworks would love to grow our business in Maryland even more, and provide even more residents with quality, good-paying jobs. The passage of SB 418 will help us make that happen.

10201 Martin Luther King Jr. Highway, Suite 280
Bowie, MD, 20720
Phone: 301.453.6300 ● Fax: 301-453-6301

KIRILA EARTHWORKS INC
WOMAN OWNED BUSINESS. BOWIE, MD

Please report favorably on SB 418.

Sincerely,

Jami Kirila, President

Kirila Earthworks Inc.

10201 Martin Luther King Jr. Highway, Suite 280
Bowie, MD, 20720
Phone: 301.453.6300 ● Fax: 301-453-6301

Testimony in support of HB 418.pdf
Uploaded by: Tom Clark
Position: FAV

International Brotherhood of Electrical Workers
GEORGE C. HOGAN: Business Manager • THOMAS C. MYERS: President • RICHARD D. WILKINSON: Vice President
JOSEPH F. DABBS: Financial Secretary • RICHARD G. MURPHY: Recording Secretary • PAULO C. HENRIQUES: Treasurer

TESTIMONY IN SUPPORT OF SB 418
Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards
February 15, 2022

To: Hon. Delores G. Kelley, Chair, Brian J. Feldman, Vice Chair and Members of the Senate Finance Committee
From: Tom Clark, Political Director, International Brotherhood of Electrical Workers Local 26

Madam Chair and members of the Finance Committee, I respectfully ask that you vote **favorably on SB 418.** This "forward thinking" piece of legislation that addresses the needs of the renewable energy industry as well as the Maryland worker. It focuses on opportunities for local, minority, woman owned and veteran owned businesses.

Over the last three years, Annapolis has been flooded with bills containing in their titles, the words "just transition". A phrase more often used as a sales slogan or pitch to the working people of the state, yet does not address wages at the market rate or the local hiring of minority contractors that employ minority workers. **SB 418** is a "just transition" bill that sets certain labor standards at the dawn of this industry. There is no reason for the State or it's sons and daughters to start at rock bottom regarding workers' rights, safety issues or pay rates in this tremendously lucrative and environmentally responsible industry of the future. A favorably vote on this legislation will ensure that your constituents will receive the market rate for their services and the only ask for developers and contractors is to act responsible. History shows that without responsible bidder policy, contractors and developers will hire non-Maryland residents, misclassify workers and literally steal the wages from their employees. Under these unsavory business models, the men and women employed on these projects will be a financial burden to the state, unable to afford basic healthcare and need food assistance. With the passage and enforcement of **SB 418**, your very own constituents will thrive as citizens, while being trained in family sustaining careers, and spend their earned wages right here in the Freestate. This bill is in step with the General Assembly's goal to create quality infrastructure jobs. As a representative of some 11,700 IBEW members, I ask that you work towards that goal and support the Maryland workforce.

Please join with me and the Maryland workers of the future as we begin the just transition into renewable energy sources. I encourage you to vote **for SB 418.** Thank you

4371 Parliament Place, Lanham, MD 20706 • Office 301-459-2900 • Fax 301-459-2100
www.ibewlocal26.org

SB 418 Victoria Leonard LiUNA (FAV) .pdf
Uploaded by: Victoria Leonard
Position: FAV

LiUNA! BALTIMORE WASHINGTON LABORERS' DISTRICT COUNCIL
DC•MD•VA Feel the Power

Tuesday, February 15, 2022

The Honorable Delores Kelley
Chair, Senate Finance Committee
Miller Senate Office Building - 3 East
Annapolis, Maryland 21401

SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Position – Favorable

Thank you Chair Kelley and members of the Senate Finance Committee for the opportunity to submit written testimony in support of SB 418.

My name is Victoria Leonard, Political and Legislative Director for the Baltimore-Washington Laborers' District Council (BWLDC), an affiliate of the Laborers' International Union of North America, or LiUNA for short. The BWLDC represents more than 7,500 members across Maryland, Virginia, and the District of Columbia. Our members are proudly employed on many infrastructure construction projects across the region.

LiUNA supports SB 418 and its establishment of labor standards for energy generation projects. As the state of Maryland shifts to a green economy and away from fossil fuels, it is essential that the jobs created by the transition are quality jobs with benefits. Labor standards on energy generation projects help do just that.

For example, the labor standards included in SB 418 are applying prevailing wage to the construction of energy generation projects that need CPCNs and requiring best efforts to enter into agreements with affected communities regarding jobs for local residents and businesses, training, and safety protocols.

The prevailing wage standards are especially important because energy developers and construction contractors sometimes engage in business practices that do not promote quality jobs for local residents or opportunities for local businesses. These practices include: use of a traveling workforce, effectively boxing out opportunities for local employment; reliance on temporary staffing agencies like PeopleReady, whose workers in several states repaid wages so low they receive federal food assistance and Medicaid benefits; and misclassification of workers as 1099 independent contractors to avoid payroll taxes.

Moreover, extending the state's prevailing wage to energy generation aligns with the General Assembly's goal to create quality infrastructure jobs. Economic analysis of the legislation reveals that labor costs are only 5% of the total cost of energy development projects. Those costs are capitalized over the useful life of the project. Consequently, this legislation will have no impact on retail energy rates. Attached to my testimony is a cost analysis prepared by Pinnacle Economics supporting the de minimis impact of prevailing wage on the costs of renewable energy projects, as well as a brief summary of that study.

Finally, if SB 418 becomes law, Maryland would be joining other states like Illinois, Connecticut, New Jersey, Oregon, Washington, Minnesota, and New York that have already passed laws to establish labor standards for energy projects.

LiUNA urges the committee to vote favorably on SB 418.

The Impacts of Prevailing Wage on the Total Costs of Maryland Renewable Energy Projects

BACKGROUND

Other than offshore wind, Maryland's renewable energy projects are not subject to prevailing wages or other types of labor standards. In contrast, many other states, including New York, Illinois, New Jersey, and Connecticut, have enacted comprehensive labor standards for renewable energy projects. It is time for Maryland to do the same. Toward that goal, the Baltimore-DC Building Trades retained Pinnacle Economics, Inc. to evaluate how a prevailing wage requirement for renewable energy projects in Maryland would affect total project costs. Pinnacle's analysis focused on: 1) utility-scale and commercial solar, 2) land-based wind, 3) geothermal, and 4) energy storage (batteries).

PREVAILING WAGE IMPACT

- **Installation labor costs generally represent a small portion – typically 10 percent or less – of total renewable energy project costs** (see Figure 1, left column)**.** Equipment costs, including electrical and structural balance of system costs, primarily drive total project costs.
- **Consequently, the impact of extending prevailing wage to renewable energy projects is de minimis.** For example, a 30 percent increase in labor costs increases total project costs roughly between 2 and 3 percent, depending on the type and size of the system (see Figure 1, far right column and Figure 2).

FIGURE 1

Installation Labor Costs and Changes in Total Project Costs Attributed to Hypothetical Changes in Install Labor Costs, by Type of Renewable Energy (2019)

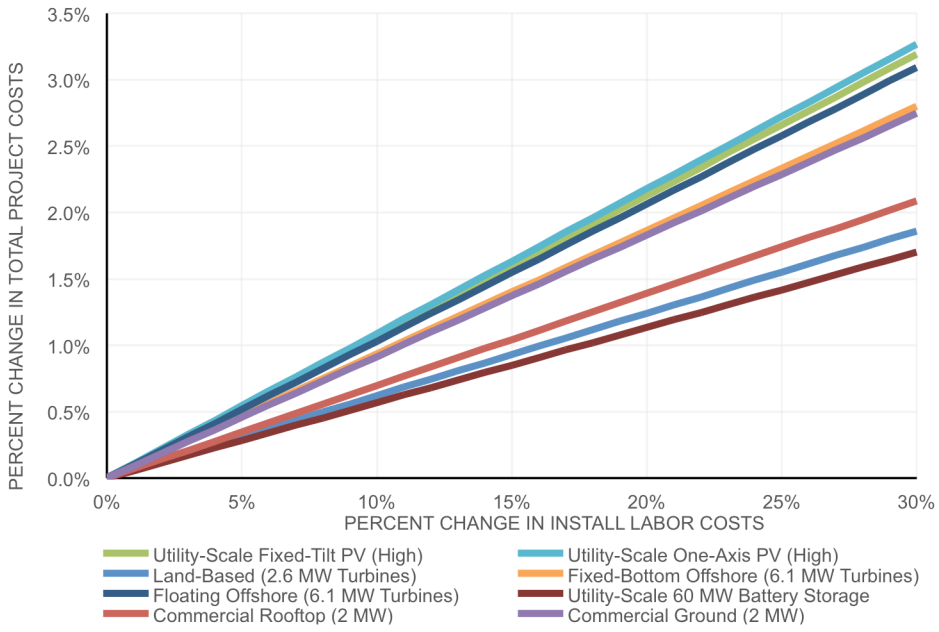
	Install Labor Costs	Percent % in Project Costs Associated with the Following % Changes in Labor Costs			
Resource / Technology	as % of Total Capital Costs	1%	10%	20%	30%
Solar: Utility-Scale Fixed-Tilt (Low - 5 MW)	9.68%	0.10%	0.97%	1.94%	2.90%
Solar: Utility-Scale Fixed-Tilt (High - 100 MW)	10.64%	0.11%	1.06%	2.13%	3.19%
Solar: Utility-Scale One-Axis (Low - 5 MW)	9.70%	0.10%	0.97%	1.94%	2.91%
Solar: Utility-Scale One-Axis Solar (High - 100 MW)	10.89%	0.11%	1.09%	2.18%	3.27%
Solar: Commercial Rooftop (2 MW)	6.96%	0.07%	0.70%	1.39%	2.09%
Solar: Commercial Ground (2MW)	9.15%	0.09%	0.92%	1.83%	2.75%
Wind: Land-Based (2.6 MW Turbines)	6.21%	0.06%	0.62%	1.24%	1.86%
Wind: Fixed-Bottom Offshore (6.1 MW Turbines)	9.34%	0.09%	0.93%	1.87%	2.80%
Wind: Floating Offshore (6.1 MW Turbines)	10.32%	0.10%	1.03%	2.06%	3.09%
Battery Storage: Utility-Scale 60 MW Lithium-ion	5.67%	0.06%	0.57%	1.13%	1.70%
Geothermal: 50 MW Flash Plant (bottom exhaust)	8.03%	NA	NA	NA	NA
Geothermal: 40 MW Flash Plant (top exhaust)	7.58%	NA	NA	NA	NA
Geothermal: 50 MW Binary Plant	3.02%	NA	NA	NA	NA

Note: Changes in total project costs for geothermal projects not estimated because install labor costs are based on union workers receiving prevailing wages and benefits. Offshore wind energy included for context.
Sources: Pinnacle Economics using detailed NREL and EPRI project cost data.

LiUNA! Feel the Power

- **A 30 percent prevailing wage premium is likely a conservative estimate because:**
  - The analysis does not include increases in worker productivity linked to a higher prevailing wage, such as lower worker turnover, greater access to apprenticeship training programs, and improved workplace safety.
  - Total installation costs have fallen dramatically over the last ten years, and are forecast to continue to decline over the next 30 years.
  - Installation labor costs can include equipment, as well as occupations not directly affected by prevailing wages.
  - Economies of scale for some technologies reduce average labor costs more than average total costs, thus reducing installation labor's percentage of total costs.
  - NREL's benchmark costs are based on national averages, where California is over-weighted and where that state's high cost of labor biases labor costs upward (labor costs in Maryland on commercial solar, for example, are 16 percent lower than the national average).

FIGURE 2
Sensitivity of Total Project Costs to Changes in Install Labor Costs, by Type of Renewable Energy Project



Sources: Pinnacle Economics using detailed NREL and EPRI project cost data.

The Impacts of Prevailing Wages on the Total Costs of Maryland Renewable Energy Projects

INTRODUCTION[1]

Maryland first enacted a prevailing wage law in 1945 for road construction projects in three counties, and over the years the General Assembly has expanded the law to include a broader range of infrastructure projects. Most recently, in 2019, Maryland extended its prevailing wage law to offshore wind projects and, in 2021, to investor-owned underground gas and electric utility construction.

As Maryland shifts away from traditional fossil fuels, it is essential that the transition to renewable energy is just and equitable. However, other than offshore wind, Maryland's renewable energy projects are not subject to prevailing wages or other types of labor standards. In contrast, many other states, including New York, Illinois, New Jersey, and Connecticut, have enacted comprehensive labor standards on renewable energy projects. It is time for Maryland to do the same.

Toward that goal, the Baltimore-DC Building Trades ("BDCBT") retained Pinnacle Economics, Inc., ("Pinnacle") to evaluate how a prevailing wage requirement for construction trades working on renewable energy projects in Maryland would affect total project costs. This report includes the following types of renewable energy projects: 1) utility-scale and commercial solar, 2) land-based wind, 3) geothermal, and 4) energy storage (batteries). In order to provide maximum context and to avoid any confirmation bias, this analysis includes a broad array of renewable energy technologies, regardless of whether they will be covered by labor standards or, in the case of offshore wind power, already are included or covered by labor standards.

EXECUTIVE SUMMARY

The additional costs to ratepayers of extending Maryland's prevailing wage law to non-residential solar, land-based wind, geothermal, and energy storage projects that are 2 MW or greater is negligible.

This is due, primarily, to the cost structure of renewable energy projects, where total project costs are most heavily influenced by equipment costs, including electrical and structural balance of system ("BOS") costs,[2] and less influenced by install labor costs which generally represent 10 percent or less of total project costs. As shown in the first section (shaded in dark gray) of Table ES1, for example, install labor costs represent 3.02 percent of total project costs for a 50 MW geothermal binary plant and 10.89 percent of total project costs for a utility-scale solar (photovoltaic or "PV") facility using one-axis solar technology. These cost estimates are derived

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[1] This analysis was conducted by Alec Josephson, of Pinnacle Economics. He would like to thank Steve Courtien of the Baltimore-DC Building Trades and Victoria Leonard of the Baltimore Washington Laborer's District Council, LiUNA, for their project oversight and review. This introduction was prepared by BDCBT and LiUNA staff.

[2] For example, for utility-based solar, modules, inverters, and BOS account for between 55-65 percent of total project costs, depending on the type of solar technology. For land-based wind, equipment costs (rotor, nacelle, and tower) account for 69 percent of total project costs.

using detailed, objective, industry-derived cost data from the National Renewable Energy Laboratory ("NREL") and other government or industry sources.

Table ES1: Install Labor Costs and Changes in Total Project Costs Attributed to Hypothetical Changes in Install Labor Costs, by Type of Renewable Energy (2019)

Resource / Technology	Install Labor Costs as % of Total Capital Costs	Percent % in Project Costs Associated with the Following % Changes in Labor Costs			
		1%	10%	20%	30%
Solar: Utility-Scale Fixed-Tilt (Low - 5 MW)	9.68%	0.10%	0.97%	1.94%	2.90%
Solar: Utility-Scale Fixed-Tilt (High - 100 MW)	10.64%	0.11%	1.06%	2.13%	3.19%
Solar: Utility-Scale One-Axis (Low - 5 MW)	9.70%	0.10%	0.97%	1.94%	2.91%
Solar: Utility-Scale One-Axis Solar (High - 100 MW)	10.89%	0.11%	1.09%	2.18%	3.27%
Solar: Commercial Rooftop (2 MW)	6.96%	0.07%	0.70%	1.39%	2.09%
Solar: Commercial Ground (2MW)	9.15%	0.09%	0.92%	1.83%	2.75%
Wind: Land-Based (2.6 MW Turbines)	6.21%	0.06%	0.62%	1.24%	1.86%
Wind: Fixed-Bottom Offshore (6.1 MW Turbines)	9.34%	0.09%	0.93%	1.87%	2.80%
Wind: Floating Offshore (6.1 MW Turbines)	10.32%	0.10%	1.03%	2.06%	3.09%
Battery Storage: Utility-Scale 60 MW Lithium-ion	5.67%	0.06%	0.57%	1.13%	1.70%
Geothermal: 50 MW Flash Plant (bottom exhaust)	8.03%	NA	NA	NA	NA
Geothermal: 40 MW Flash Plant (top exhaust)	7.58%	NA	NA	NA	NA
Geothermal: 50 MW Binary Plant	3.02%	NA	NA	NA	NA

Note: Changes in total project costs for geothermal projects not estimated because install labor costs are based on union workers receiving prevailing wages and benefits. Offshore wind energy included for context.
Sources: Pinnacle Economics using detailed NREL and EPRI project cost data.

The second section (shaded in light gray) of Table ES1 reports how changes in install labor costs affect total project costs. For example, install labor costs represent 6.21 percent of total project costs for utility-scale, land-based wind. Thus, every one percent increase in install labor costs translates into a 0.06 percent increase in total project costs. Based on a prevailing wage law that results in a hypothetical 30 percent increase[3] in construction wages, Pinnacle estimates that total project costs would increase, depending on the size of the system, between:

- 2.90 and 3.19 percent for utility-scale, fixed-tilt solar
- 2.91 and 3.27 percent for utility-scale, one-axis solar
- 2.09 percent for commercial rooftop solar
- 2.75 percent for commercial ground-mount solar
- 1.86 percent for land-based wind
- 1.70 percent for energy storage

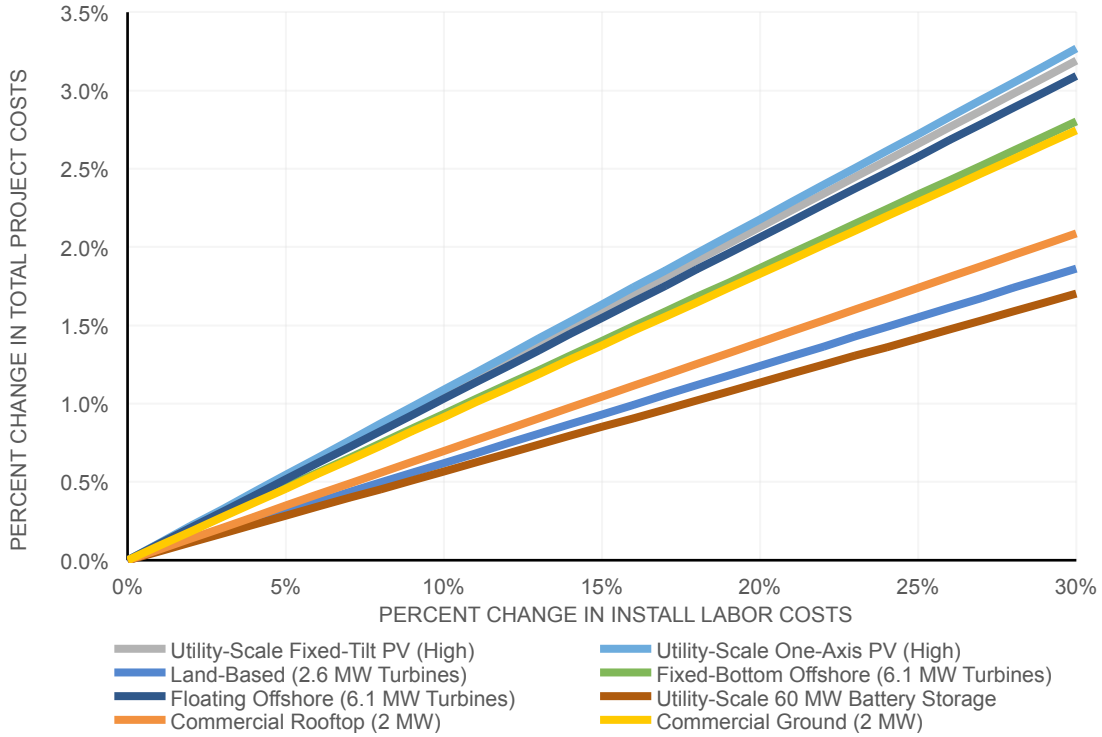
[3] A hypothetical 30 percent increase in construction wages due to prevailing wage likely is a conservative estimate: 1) a November 2020 study entitled *Potential Impacts of Prevailing Wage on Solar Costs in Illinois* found that prevailing wage could increase solar labor rates from an average of 23 to 41 percent when accounting for total compensation packages including healthcare, pension and worker training contributions (see https://drive.google.com/file/d/13ZWw7rOiIomG_mURNcmD0cw1p934FBSX/view); and 2) the Maryland General Assembly's Department of Legislative Services has found that prevailing wages tend to be higher than non-prevailing wages, but that it is reasonable to expect that the prevailing wage requirement adds at most between 2% and 5% to the cost of a public works project (see https://mgaleg.maryland.gov/2021RS/fnotes/bil_0005/sb0095.pdf).

These estimates are likely conservative given that:

1) Install labor costs can include equipment, as well as occupations that are not directly affected by prevailing wages,
2) Economies of scale for some technologies that reduce average labor costs more than average total costs, thus reducing install labor's percentage of total costs,
3) NREL's benchmark costs are based on national averages, where California is overweighted and where that state's high cost of labor biases labor costs upward (labor costs in Maryland on commercial solar, for example, are 16 percent lower than the national average), and
4) This analysis does not include increases in worker productivity that linked to a higher prevailing wage, such as: lower worker turnover, better and more prevalent apprenticeship training programs, improved workplace safety, and more.

Lastly, these *de minimus* changes in total project costs should be viewed within the context that total install costs of renewable energy have fallen dramatically over the last ten years, and that costs are forecast to continue to decline over the next 30 years. Figure ES1 shows the sensitivity of total project costs to changes in install labor costs for the renewable energy projects considered in this analysis.

Figure ES1: Sensitivity of Total Project Costs to Changes in Install Labor Costs, by Type of Renewable Energy Project



Sources: Pinnacle Economics using detailed NREL and EPRI project cost data.

DETAILED ANALYSIS AND FINDINGS

The BDCBT and its affiliates are seeking to establish labor standards, including prevailing wages, for construction trades employed on renewable energy projects in Maryland. Projects that would be subject to labor standards include renewable energy generation projects 2 MW or greater as outlined in Tier 1 and Tier 2 of Maryland's Renewable Energy Portfolio Standard ("RPS") Program,[4] as well as nuclear energy and energy storage devices.[5]

BDCBT retained Pinnacle Economics to evaluate the impacts on total project costs from prevailing wages for construction trades working on the following types of renewable energy projects: 1) commercial (2 MW) and utility-scale solar, 2) land-based wind, 3) geothermal, and 4) battery storage. The following sections use detailed cost data for these renewable energy projects to measure the sensitivity of total capital costs to higher install labor costs under prevailing wages.

1. Non-Residential Solar (Photovoltaics or "PV")

Due to improvements in solar module efficiencies, and declines across major cost components—particularly solar equipment (modules, inverters, BOS)—the installed costs of solar energy declined significantly between 2010 and 2020. As shown in Table 1, installed costs decreased 80-82 percent for utility-scale PV, 69 percent for commercial PV, and 64 percent for residential PV over this ten year period.

These trends are expected to continue, as NREL forecasts that the installed costs for utility-scale PV will decline by 65 percent between 2020 and 2050. Similarly, installed costs for commercial and residential PV are forecast to decline by 70 percent and 80 percent, respectively, over the same time period.

[4] Under Maryland's RPS Program, electricity suppliers must meet annual requirements for the installation of renewable energy generation. Tier 1 renewable energy technologies include solar (energy from photovoltaics and solar water heating systems), wind, qualifying biomass, methane from a landfill or wastewater treatment plant, geothermal, ocean, fuel cell (that produces electricity from a Tier 1 source), hydroelectric power plants less than 30 MW capacity, poultry litter-to energy, waste-to-energy, and refuse-derived fuel. Tier 2 includes hydroelectric power other than pump storage. Source: Maryland Public Service Commission, https://www.psc.state.md.us/electricity/maryland-renewable-energy-portfolio-standard-program-frequently-asked-questions/

[5] With the exception of energy storage projects subject to § 7-216 of the Code of Maryland.

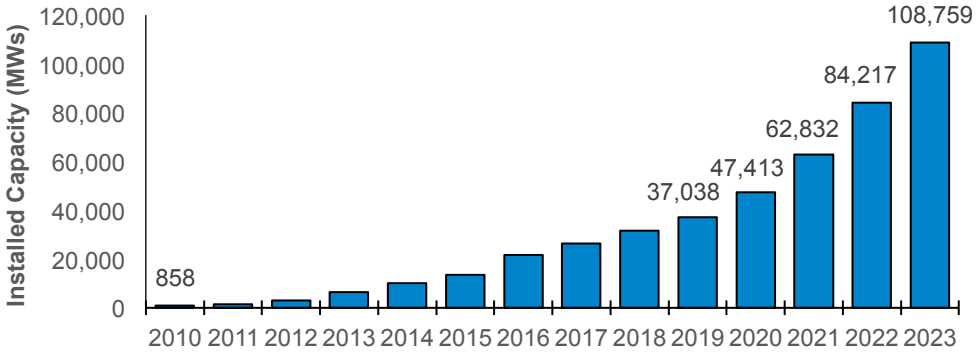
Table 1: Installed PV Costs, by Type of Project, 2010-2020 (2019 dollars per MW_{DC})

Year	Utility-Scale PV Fixed Tilt (100 MW)	Utility-Scale PV One-Axis Tracker (100 MW)	Commercial Rooftop PV (200 kW)	Residential PV (22 panel system)
2010	$4.75	$5.66	$5.57	$7.53
2011	$4.08	$4.79	$5.18	$6.62
2012	$2.77	$3.29	$3.57	$4.67
2013	$2.13	$2.50	$2.90	$4.09
2014	$1.97	$2.25	$2.89	$3.60
2015	$1.93	$2.08	$2.40	$3.36
2016	$1.53	$1.63	$2.29	$3.16
2017	$1.08	$1.16	$1.94	$2.94
2018	$1.08	$1.16	$1.88	$2.78
2019	$0.95	$1.02	$1.76	$2.77
2020	$0.94	$1.01	$1.72	$2.71

Sources: 1) Feldman, et. al., "U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020," National Renewable Energy Laboratory (NREL), Technical Report, NREL/TP-6A20-77324, January 2021. 2) NREL, https://www.nrel.gov/news/program/2021/documenting-a-decade-of-cost-declines-for-pv-systems.html, and 3) NREL Advanced Technology Baseline, https://atb.nrel.gov/electricity/2021/about.

As the installed costs of PV has decreased, the installed PV capacity has increased.[6] In the electric power sector—i.e., excluding small scale PV in residential, commercial, industrial, and other sectors— installed, large-scale PV capacity increased significantly between 2010 and 2020, and is expected to continue this growth over the next several years adding 21 GW of capacity in 2022 and 25 GW of capacity in 2023. (See Figure 1.)

Figure 1: Large-Scale PV Installed Capacity (MW), Electric Power Sector (2010-2023)



Source: U.S. Energy Information Administration ("EIA"), Short-term Energy Outlook, January 11, 2022, https://www.eia.gov/outlooks/steo/report/electricity.php.

[6] In economics, cost decreases will increase supply, i.e., more will be supplied at each and every price. Along a given demand curve, this increase in supply leads to an increase in quantity produced (sold, or consumed). However, renewable energy resources are also witnessing an increase in demand. All else the same, increases in supply and demand will unambiguously lead to an increase in quantity.

This analysis focuses on utility-scale and commercial PV.[7] All solar capital cost (or total project cost) assumptions are from the National Renewable Energy Laboratory's ("NREL") U.S. benchmark studies, including the most recent benchmark study for 1Q 2020.[8] NREL uses a bottom-up approach that accounts for all installation costs from the perspective of the developer/installer, i.e., costs include profits and represent the final retail price paid to the developer/installer. NREL reports detailed benchmark costs for various PV technologies and system sizes for 11 different cost categories.

1.A. Utility-Scale PV

NREL reports U.S. benchmark capital costs for utility-scale PV for fixed-tilt and one-axis tracking systems for various system sizes.

- **Fixed-tilt systems** do not change their orientation to the sun, are cheaper to install, and generally require less land. In addition, fixed-tilt systems are better at capturing diffuse radiation and are more common in the eastern U.S., where cloud cover reduces direct radiation from the sun. According to data collected by the U.S. Energy Information Administration ("EIA"), between 2010 and 2020, fixed-tilt PV systems accounted for 78 percent of the installed PV (as measured by nameplate capacity, MWs) in Maryland.[9] In addition, the average size of fix-tilt systems in Maryland is 4.0 MW, over the ten year reporting period. By comparison, fixed-tilt systems nationwide accounted for 34 percent of installed nameplate capacity, with an average system size of 5.5 MW.
- **One-axis (and dual-axis) tracking systems** are more expensive, but, because they track the movement of the sun, are better able to capture direct radiation from the sun. As a result, they are more common in the southwest region of the U.S., where cloudless days are more abundant. In Maryland, according to the EIA, between 2010 and 2020, one-axis tracking systems accounted for 22 percent of installed solar PV (as measured by nameplate capacity, MWs) with an average system size of 3.4 MWs. By comparison, one-axis tracking systems account for 65 percent of installed solar nationally and have an average system size of 19.6 MWs.

U.S. benchmark capital costs for utility-scale, fixed-tilt PV systems are shown by various system sizes in Table 2. U.S. benchmark capital costs for a 5MW utility-scale, fixed-tilt PV system are $\$1.24/W_{DC}$. Install labor costs (i.e., services provided by the construction trades) for this system are $\$0.12/W_{DC}$ and represent 9.7 percent of total capital costs. Similar to commercial PV technologies (discussed later), average capital costs decline as the system size increases due to economies of scale.

[7] Solar water heating systems are a renewable energy technology included in Tier 1 of Maryland's RPS, however, they are not included in this analysis.
[8] Feldman, David, Vignesh Ramasamy, Ran Fu, Ashwin Ramdas, Jal Desai, and Robert Margolis, "U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020," National Renewable Energy Laboratory, NREL/TP-6A20-77324, January 2021, https://www.nrel.gov/docs/fy21osti/77324.pdf.
[9] Through Form EIA-860, the U.S. EIA collects detailed generation data for electric power plants with 1 MW or greater of nameplate capacity. See https://www.eia.gov/electricity/data/eia860/

Table 2: NREL 1Q 2020 U.S. Benchmark Utility-Scale Fixed-Tilt Solar PV Capital Costs, by System Size

Cost Category	5 MW	10 MW	50 MW	100 MW
Costs (2019$ per Watt DC)				
EPC/Developer Profit	0.09	0.08	0.06	0.04
Contingency	0.03	0.03	0.03	0.03
Developer Overhead	0.11	0.07	0.03	0.02
Sales Tax	0.04	0.04	0.04	0.04
Permitting, Inspection, Interconnection,	0.08	0.06	0.05	0.05
EPC Overhead	0.08	0.07	0.06	0.05
Install Labor	0.12	0.12	0.11	0.10
Electrical BOS	0.13	0.11	0.09	0.07
Structural BOS	0.10	0.10	0.09	0.08
Inverter	0.05	0.05	0.05	0.05
Module	0.41	0.41	0.41	0.41
Total Capital Costs	**1.24**	**1.14**	**1.02**	**0.94**
Costs as a Percent of Total Capital Costs				
EPC/Developer Profit	7.3%	7.0%	5.9%	4.3%
Contingency	2.4%	2.6%	2.9%	3.2%
Developer Overhead	8.9%	6.1%	2.9%	2.1%
Transmission Line (if any)	3.2%	3.5%	3.9%	4.3%
Interconnection Fee	6.5%	5.3%	4.9%	5.3%
Permitting Fee (if any)	6.5%	6.1%	5.9%	5.3%
Install Labor	9.7%	10.5%	10.8%	10.6%
Electrical BOS	10.5%	9.6%	8.8%	7.4%
Structural BOS	8.1%	8.8%	8.8%	8.5%
Inverter	4.0%	4.4%	4.9%	5.3%
Module	33.1%	36.0%	40.2%	43.6%
Total Capital Costs	100.0%	100.0%	100.0%	100.0%

Note: Based on a 100 MW utility-scale fix-tilt system using monocrystalline (19.5% efficiency) modules on a ground-mount system on driven-pile foundations. Detailed costs for transmission line (if any), interconnection fee, permitting fees, and land acquisition have been combined to more closely resemble costs details provided for commercial PV.
Source: NREL, "U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020," 2021, pages 42-51.

Table 3 reports U.S. benchmark capital costs for utility-scale, one-axis tracker PV systems, by various sized systems. U.S. benchmark capital costs for a 5MW utility-scale, fixed-tilt PV system are $1.34/$W_{DC}$. Capital costs are modestly higher for this technology, compared to the fixed-tilt system. Install labor costs for this system are $0.13/$W_{DC}$ and represent 9.7 percent of total capital costs. As per utility-scale fixed-axis and commercial PV technologies, average capital costs decline as the system size increases due to economies of scale.

In addition, capital costs or total project costs are heavily influenced by equipment (modules and inverters) and structural (foundations, and racking/mounting systems) and electrical (wiring, switches, conductors, disconnects, monitoring devices, etc.) balance of system costs. Combined, these costs represent between 55-65 percent of total project costs for utility-scale solar projects.

Table 3: NREL 1Q 2020 U.S. Benchmark Utility-Scale One-Axis Tracker Solar PV Capital Costs, by System Size

Cost Category	5 MW	10 MW	50 MW	100 MW
Costs (2019$ per Watt DC)				
EPC/Developer Profit	0.10	0.09	0.07	0.05
Contingency	0.03	0.03	0.03	0.03
Developer Overhead	0.12	0.08	0.03	0.02
Transmission Line (if any)	0.05	0.05	0.05	0.04
Sales Tax	0.08	0.04	0.04	0.05
EPC Overhead	0.09	0.09	0.07	0.06
Install Labor and Equipment	0.13	0.13	0.12	0.11
Electrical BOS	0.13	0.12	0.09	0.07
Structural BOS	0.15	0.15	0.14	0.12
Inverter	0.05	0.05	0.05	0.05
Module	0.41	0.41	0.41	0.41
Total Capital Costs	1.34	1.24	1.10	1.01
Costs as a Percent of Total Capital Costs				
EPC/Developer Profit	7.5%	7.3%	6.4%	5.0%
Contingency	2.2%	2.4%	2.7%	3.0%
Developer Overhead	9.0%	6.5%	2.7%	2.0%
Land Acquisition	3.7%	4.0%	4.5%	4.0%
Sales Tax	6.0%	3.2%	3.6%	5.0%
EPC Overhead	6.7%	7.3%	6.4%	5.9%
Install Labor and Equipment	9.7%	10.5%	10.9%	10.9%
Electrical BOS	9.7%	9.7%	8.2%	6.9%
Structural BOS	11.2%	12.1%	12.7%	11.9%
Inverter	3.7%	4.0%	4.5%	5.0%
Module	30.6%	33.1%	37.3%	40.6%
Total Capital Costs	100.0%	100.0%	100.0%	100.0%

Note: Based on a 100 MW utility-scale one-axis tracker system using monocrystalline (19.5% efficiency) modules on a ground-mount system on driven-pile foundations. Detailed costs for transmission line (if any), interconnection fee, permitting fees, and land acquisition have been combined to more closely resemble cost details provided for commercial PV.
Source: NREL, "U.S. Solar Photovoltaic System and EneCost Benchmark: Q1 2020," 2021, pages 42-51.

Table 4 (dark grey sections) shows install labor as a percent of total capital costs for various system sizes. Under both utility-scale PV systems and all system sizes, install labor costs represent about 11 percent or less of total capital costs. As such, prevailing wage legislation that increases wages and benefits for the construction trades would have a small, negligible effect on total project costs.

The bottom sections (shaded in light gray) of Table 4 shows how total capital costs change in response to various changes in install labor costs. These metrics are calculated as: install labor costs x the percentage change in install labor costs = change in total capital costs.[10] (Install labor costs are based on national average nonunion wages for electricians and laborers.)

[10] For example, suppose a project with $1.0 million in capital costs consists of $500,000 in material costs and $500,000 in install labor costs. If install labor costs were to increase 10 percent (from $500,000 to $550,000), then, all else the same, capital costs would increase by 5 percent (from $1.0 million to $1.05 million).

As shown in Table 4:

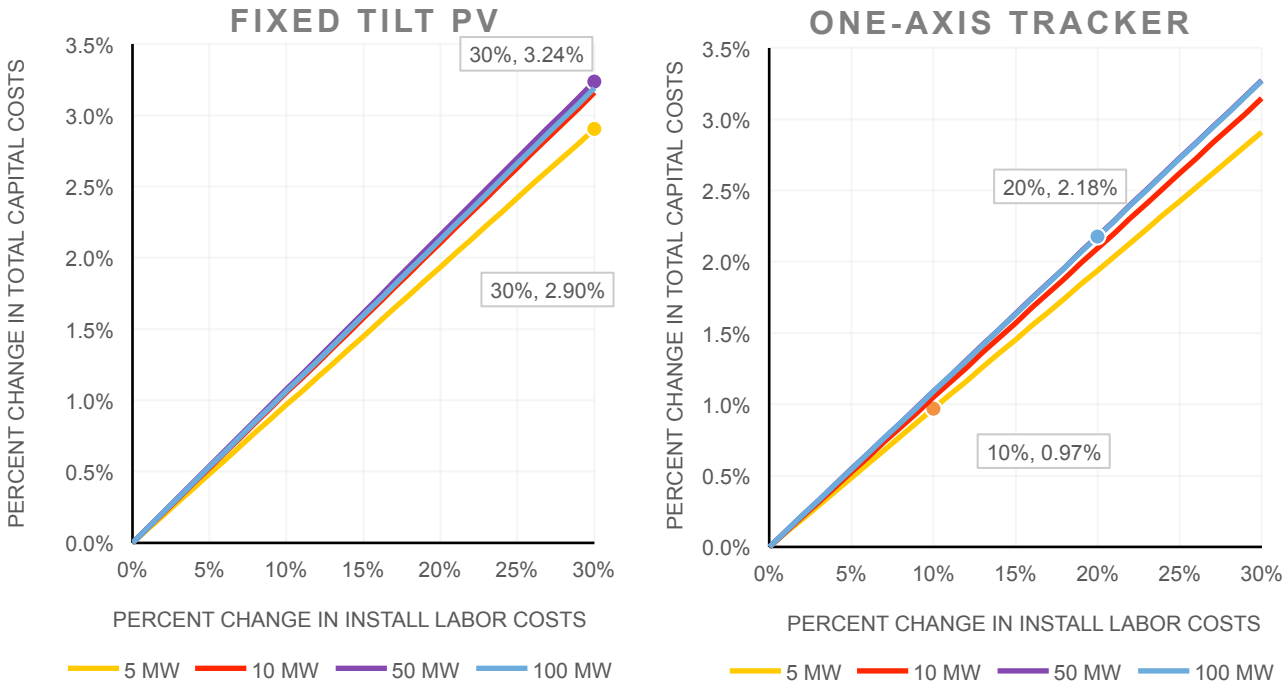
- For utility-scale, fixed-axis PV, every 1 percent increase in install labor costs results in a 0.10–0.11 percent increase in total capital costs, depending on the system size. In other words, a prevailing wage that results in a hypothetical 30 percent increase in install labor costs would increase capital costs by 2.90–3.24 percent, depending on the size of the system. (See Figure 2.)
- Similarly, for utility-scale, one-axis tracker PV, every 1 percent increase in install labor costs results in a 0.10–0.11 percent increase in total capital costs, depending on system size. In other words, a prevailing wage that results in a hypothetical 30 percent increase in install labor costs would increase capital costs by 2.91–3.27 percent, depending on the size of the system. (Also, see Figure 2.)

Table 4: Utility-Scale Fixed-Tilt PV and One-Axis Tracker PV – Sensitivity of Total Capital Costs to Changes in Install Labor Costs, by System Size

Type of System / % Change in Install Labor Costs	5 MW	10 MW	50 MW	100 MW
	Install Labor Costs as % of Total Capital			
Fixed-Tilt PV	**9.68%**	**10.53%**	**10.78%**	**10.64%**
	Percent Change in Total Capital Costs			
• 1% change in install labor costs	0.10%	0.11%	0.11%	0.11%
• 10% change in install labor costs	0.97%	1.05%	1.08%	1.06%
• 20% change in install labor costs	1.94%	2.11%	2.16%	2.13%
• 30% change in install labor costs	2.90%	3.16%	3.24%	3.19%
	Install Labor Costs as % of Total Capital			
One-Axis Tracking PV	**9.70%**	**10.48%**	**10.91%**	**10.89%**
	Percent Change in Total Capital Costs			
• 1% change in install labor costs	0.10%	0.10%	0.11%	0.11%
• 10% change in install labor costs	0.97%	1.05%	1.09%	1.09%
• 20% change in install labor costs	1.94%	2.10%	2.18%	2.18%
• 30% change in install labor costs	2.91%	3.15%	3.27%	3.27%

Source: Pinnacle Economics using U.S. Benchmarks, NREL, "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2020," 2021, pages 42-51.

Figure 2: Utility-Scale PV – Sensitivity of Total Project Costs to Changes in Install Labor Costs, by Type and Size of System (2019)



Source: Pinnacle Economics using U.S. Benchmarks, NREL, "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2020," 2021.

1.B. Commercial PV

Given the diverse customer base, building types and properties, NREL's 1Q 2020 U.S. cost benchmarks for the commercial sector include a range of system sizes for rooftop and ground-mount PV systems using the latest monocrystalline modules (premium efficiency).

Table 5 and Table 6 report installation costs for commercial rooftop and commercial ground-mount PV systems, respectively, as reported by NREL for 1Q 2020.[11] All costs are reported in 2019 dollars per watt of direct current (W_{DC}) installed.

[11]Commercial rooftop and ground-mount solar systems consist of solar panels, inverters to convert direct current ("DC") to alternating current ("AC"), mounting brackets, and cables. A 100kW solar system consists of approximately 280-400 panels and requires approximately 7,000 square feet of space. A 1MW solar system consists of about 4,000 panels and requires about 80,000 square feet of space (or almost 2.0 acres). Examples from Sunwatts at https://sunwatts.com.

Table 5: NREL 1Q 2020 U.S. Benchmark Commercial Rooftop PV Capital Costs, by System Size

Cost Category	100 kW	200 kW	500 kW	1 MW	2 MW
Costs (2019$ per Watt DC)					
EPC/Developer Profit	0.12	0.11	0.11	0.11	0.10
Contingency	0.05	0.04	0.04	0.04	0.04
Developer Overhead	0.36	0.33	0.31	0.31	0.30
Sales Tax	0.05	0.05	0.04	0.04	0.04
Permitting, Inspection, Interconnection	0.14	0.11	0.09	0.08	0.08
EPC Overhead	0.18	0.16	0.15	0.15	0.15
Install Labor and Equipment	0.19	0.15	0.13	0.12	0.11
Electrical BOS	0.15	0.13	0.13	0.12	0.12
Structural BOS	0.11	0.11	0.11	0.11	0.11
Inverter	0.12	0.12	0.12	0.12	0.12
Module	0.41	0.41	0.41	0.41	0.41
Total Capital Costs	1.87	1.72	1.64	1.61	1.59
Costs as a Percent of Total Capital Costs					
EPC/Developer Profit	6.4%	6.4%	6.7%	6.8%	6.3%
Contingency	2.7%	2.3%	2.4%	2.5%	2.5%
Developer Overhead	19.1%	19.2%	18.9%	19.3%	19.0%
Sales Tax	2.7%	2.9%	2.4%	2.5%	2.5%
Permitting, Inspection, Interconnection	7.4%	6.4%	5.5%	5.0%	5.1%
EPC Overhead	9.6%	9.3%	9.1%	9.3%	9.5%
Install Labor and Equipment	10.1%	8.7%	7.9%	7.5%	7.0%
Electrical BOS	8.0%	7.6%	7.9%	7.5%	7.6%
Structural BOS	5.9%	6.4%	6.7%	6.8%	7.0%
Inverter	6.4%	7.0%	7.3%	7.5%	7.6%
Module	21.8%	23.8%	25.0%	25.5%	25.9%
Total Capital Costs	100.0%	100.0%	100.0%	100.0%	100.0%

Notes: EPC stands for engineering, procurement, and construction. BOS stands for balance of system.
Source: NREL, "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2020," 2021, pages 30-41.

As shown in Table 5, U.S. benchmark capital costs for a 100kW commercial rooftop PV system are $1.87/$W_{DC}$. Install labor costs[12] for this system are $0.19/$W_{DC}$ and represent 10.1 percent of total capital costs. Table 5 also shows that total costs and install labor costs decrease as the size of the system increases due to economies of scale. For a 2MW system, total costs are $1.59/$W_{DC}$ and install labor costs are $0.11/$W_{DC}$, or 7.0 percent of total capital costs.

Table 6 reports U.S. benchmark capital costs for commercial ground-mount PV systems. For smaller sized systems, capital costs for ground-mount systems are modestly greater than those for rooftop systems due to higher material, equipment, and labor costs attributed to pile-driven mounting. However, ground-mount PV systems benefit more from economies of scale than rooftop PV, as their size increases the per-watt cost declines until it becomes less than rooftop PV at installations greater than 1.0 MW.

[12]NREL's direct installation labor are based on nonunion labor rates for electricians and laborers.

Table 6: NREL 1Q 2020 U.S. Benchmark Commercial Ground-Mount PV Capital Costs, by System Size

Cost Category	100 kW	200 kW	500 kW	1 MW	2 MW
Costs (2019$ per Watt DC)					
EPC/Developer Profit	0.17	0.15	0.13	0.12	0.11
Contingency	0.06	0.05	0.05	0.04	0.04
Developer Overhead	0.48	0.41	0.36	0.33	0.32
Sales Tax	0.07	0.06	0.05	0.05	0.05
Permitting, Inspection, Interconnection	0.10	0.07	0.04	0.04	0.03
EPC Overhead	0.17	0.13	0.11	0.10	0.09
Install Labor and Equipment	0.21	0.17	0.15	0.14	0.14
Electrical BOS	0.41	0.32	0.23	0.18	0.16
Structural BOS	0.17	0.14	0.12	0.11	0.11
Inverter	0.07	0.07	0.07	0.07	0.07
Module	0.41	0.41	0.41	0.41	0.41
Total Capital Costs	2.31	1.97	1.72	1.59	1.52
Costs as a Percent of Total Capital Costs					
EPC/Developer Profit	7.3%	7.6%	7.6%	7.5%	7.2%
Contingency	2.6%	2.5%	2.9%	2.5%	2.6%
Developer Overhead	20.7%	20.7%	20.9%	20.8%	20.9%
Sales Tax	3.0%	3.0%	2.9%	3.1%	3.3%
Permitting, Inspection, Interconnection	4.3%	3.5%	2.3%	2.5%	2.0%
EPC Overhead	7.3%	6.6%	6.4%	6.3%	5.9%
Install Labor and Equipment	9.1%	8.6%	8.7%	8.8%	9.2%
Electrical BOS	17.7%	16.2%	13.4%	11.3%	10.5%
Structural BOS	7.3%	7.1%	7.0%	6.9%	7.2%
Inverter	3.0%	3.5%	4.1%	4.4%	4.6%
Module	17.7%	20.7%	23.8%	25.8%	26.8%
Total Capital Costs	100.0%	100.0%	100.0%	100.0%	100.0%

Note: Based on a 500kW commercial-scale fix-tilt ground-mount system using driven-pile foundations.
Source: NREL, "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2020," 2021, pages 30-41.

Table 7 summarizes the sensitivity of total project costs to changes in install labor costs across both commercial technologies. The top sections (shaded in dark gray) of Table 7 summarize install labor costs as a percent of total capital costs for commercial rooftop and commercial ground-mount PV systems, by various system sizes.

As shown in Table 7, based on NREL's U.S. benchmark costs, install labor costs account for between 6.96 percent (2MW system) and 10.11 percent (100kW system) of total capital costs for commercial rooftop PV, depending on the size of the system. For commercial ground-mount PV, install labor costs range from 8.59 percent (200kW system) to 9.15 percent (2 MW system). As discussed previously, the costs per-watt direct current (per unit costs) of both commercial technologies are influenced by economies of scale.

Table 7: Commercial Rooftop PV and Ground-Mount PV – Sensitivity of Total Project Costs to Changes in Install Labor Costs, by System Size

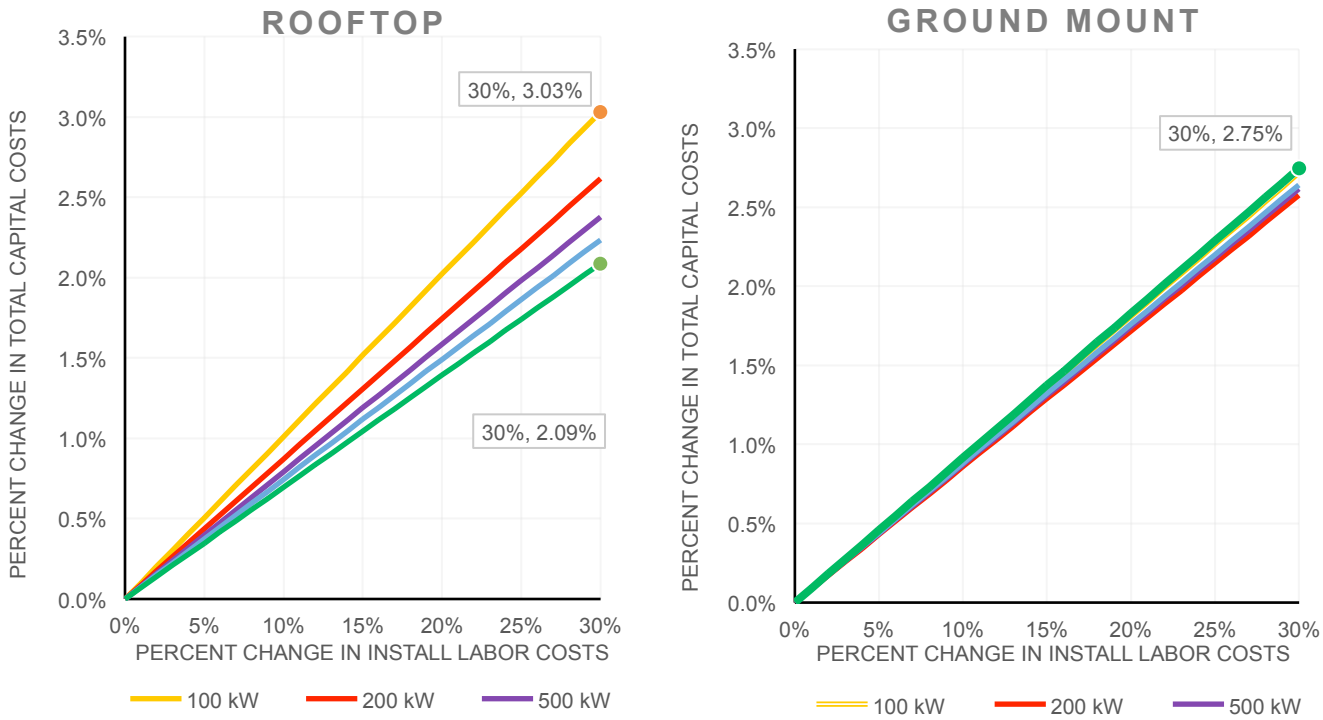
Type of System / % Change in Install Labor Costs	100 kW	200 kW	500 kW	1 MW	2 MW
	Install labor costs as % of total capital costs				
Commercial Rooftop PV	**10.11%**	**8.72%**	**7.93%**	**7.45%**	**6.96%**
	Percent Change in Total Capital Costs				
• 1% change in install labor costs	0.10%	0.09%	0.08%	0.07%	0.07%
• 10% change in install labor costs	1.01%	0.87%	0.79%	0.75%	0.70%
• 20% change in install labor costs	2.02%	1.74%	1.59%	1.49%	1.39%
• 30% change in install labor costs	3.03%	2.62%	2.38%	2.24%	2.09%
	Install labor costs as % of total capital costs				
Commercial Ground-Mount PV	**9.05%**	**8.59%**	**8.72%**	**8.81%**	**9.15%**
	Percent Change in Total Capital Costs				
• 1% change in install labor costs	0.09%	0.09%	0.09%	0.09%	0.09%
• 10% change in install labor costs	0.91%	0.86%	0.87%	0.88%	0.92%
• 20% change in install labor costs	1.81%	1.72%	1.74%	1.76%	1.83%
• 30% change in install labor costs	2.72%	2.58%	2.62%	2.64%	2.75%

Sources: Pinnacle Economics using U.S. Benchmarks, NREL, "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2020," 2021, pages 30-41.

For both commercial PV systems, across all system sizes, install labor costs represent about 10 percent or less of total capital costs. As such, prevailing wage legislation that increases wages and benefits for the construction trades would have a small, negligible effect on total capital costs. For example,

- For commercial rooftop PV, every 1 percent increase in install labor costs results in a 0.07–0.10 percent increase in total capital costs, depending on the system size. In other words, a prevailing wage that results in a hypothetical 30 percent increase in install labor costs would increase capital costs by 2.09–3.03 percent, depending on the size of the system. (See Figure 3.)
- Similarly, for commercial ground-mount PV, every 1 percent increase in install labor costs results in a 0.09 percent increase in capital costs (precision lost in rounding), across all system sizes. In other words, a prevailing wage that results in a hypothetical 30 percent increase in install labor costs would increase capital costs by 2.58–2.75 percent, depending on the size of the system. (Also see Figure 3.)

Figure 3: Commercial PV – Sensitivity of Total Project Costs to Changes in Install Labor



Costs, by Type and Size of System (2019)

Source: Pinnacle Economics using NREL 1Q 2020 benchmark capital costs.

In summary, this section shows that install labor costs represent about 10 percent or less of total capital costs for both utility-based PV and commercial PV systems, across all system sizes. These estimates are reasonable, likely lower-bound estimates applicable over the next 10-year period due to the following:

- The sensitivity of PV capital costs to changes in install labor costs are mathematically determined using objective, detailed, industry-derived benchmark capital cost estimates from NREL. Mathematically, even large percentage changes to a cost component that represents a small percent of overall capital costs do not translate into large increases in total capital costs.
- These findings are based national benchmark costs. According to NREL's earlier benchmark cost study for 1Q 2018, where capital costs are compared across ten

State	Install Labor Costs as % of Total Capital Costs	% of National
MD	7.34%	84%
MA	9.42%	108%
HI	9.33%	107%
NJ	8.95%	102%
CA	8.84%	101%
NY	9.55%	109%
AZ	6.47%	74%
FL	5.95%	68%
CO	7.06%	81%
TX	6.47%	74%
U.S.	8.74%	

Source: Fu, et. al., "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018," NREL.

states for a 200kW commercial PV system, install labor costs represent 8.74 percent of total capital costs nationally, and 7.34 percent of total capital costs in Maryland.[13] In other words, for commercial PV, labor costs in Maryland are about 16 percent lower than the national average. (This is due, in part, to the overweighting of California in the national data.)

- Although there are relatively minor differences in install labor costs and total capital costs across states, the NREL 1Q 2018 cost benchmark costs for ten states show that install labor costs represent a consistently small share of total capital costs. In fact, for larger commercial rooftop solar PV, install labor costs (6.96% of total capital costs) rank in the bottom third of the eleven cost categories, behind modules (#1, 26%); developer overhead (#2, 18.99%) engineering, procurement, and construction overhead (#3, 9.49%); inverters (#4, 7.59%); electrical BOS (#5, 7.59%); and structural BOS (#6, 6.96%).
- Historical and forecast decreases in total capital costs and install labor costs for utility-scale and commercial PV are approximately equal. Between 2010 and 2018, total capital costs and install labor costs for 200kW commercial solar PV decreased by 66 percent and 50 percent, respectively. NREL forecasts future benchmark cost changes across three scenarios (conservative, moderate, and advanced). Under the moderate scenario (which is based on U.S. manufacturers' assessments), NREL forecasts that total capital costs for a 200kw commercial solar PV will decrease 48.6 percent and install labor costs will decrease by 40.0 percent by 2030. (In 2020 dollars, the total capital costs will decline from $\$1.73/W_{DC}$ to $\$0.89/W_{DC}$.) This suggests that the sensitivity of total capital costs to install labor costs for future PV will not change significantly from those estimated in this study.
- This analysis does not include possible increases in worker productivity that are linked to a (higher) prevailing wage, such as lower worker turnover, better and more prevalent apprenticeship training opportunities, improved workplace safety, etc.

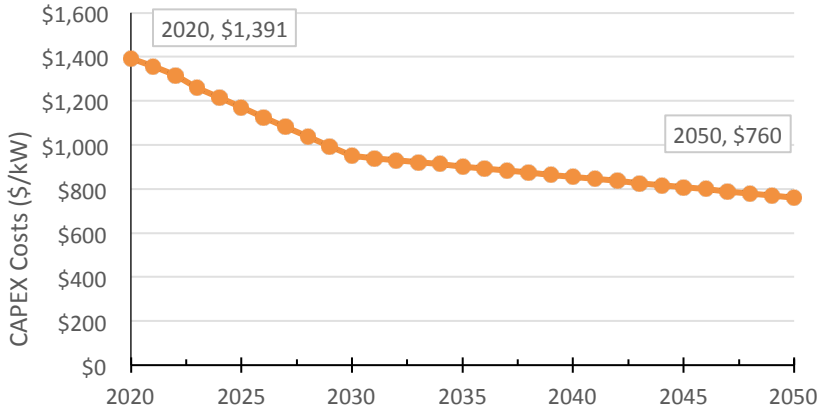
2. Utility-Scale Land-Based Wind

According to NREL, "*there is substantial focus throughout the global wind industry on driving down costs and increasing performance as a result of fierce competition from within as well as among several power generation technologies, including solar PV and natural gas-fired generation.*"[14]

Indeed, according to NREL's ATB, the costs of wind power have declined from $2,804 per kW in 2010 to $1,391 per kW in 2020, or by 50 percent. These historical cost decreases are expected to continue over the next three decades. NREL's moderate scenario forecast shows the costs of wind power decreasing to about $760 per kW in 2050, representing a decrease of 45 percent from 2020 costs. (See Figure 4.) NREL's conservative and advanced scenarios show the costs of wind power decreasing by 35 percent and 62 percent, respectively over the next three decades.

[13] Fu, et. al., "U.S. Solar Photovoltaic System Cost Benchmark: Q1 2018," NREL, pages 24-27.
[14] NREL, Annual Technology Baseline ("ATB"), https://atb.nrel.gov/electricity/2021/land-based_wind, 2021.

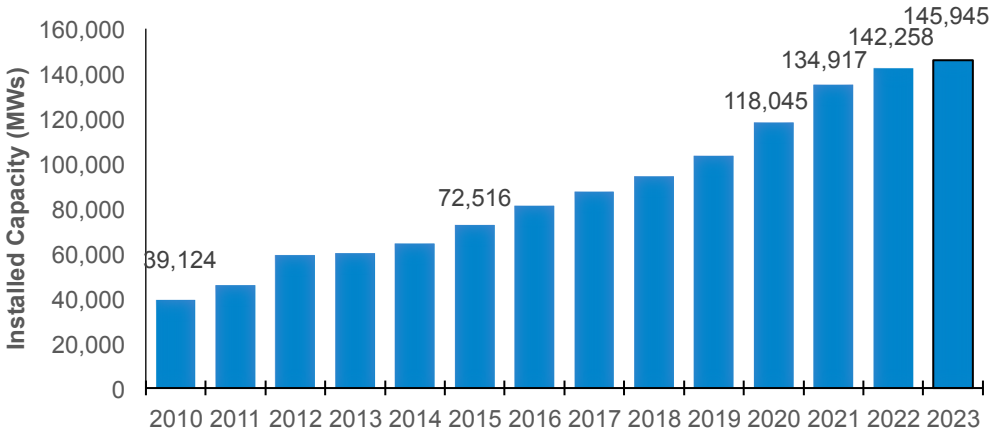
Figure 4: NREL Forecast Capital Costs for Wind Power, Moderate Scenario (2020-2050)



Source: NREL, Annual Technology Baseline, https://atb.nrel.gov/electricity/2021/land-based_wind, 2021.

As the installed costs of wind power have decreased, installed wind capacity has increased. In the electric power sector—i.e., excluding wind power capacity in other sectors— installed wind power capacity increased significantly between 2010 and 2020, and is expected to continue this growth over the next several years. (See Figure 5.) In fact, in 2019, wind power surpassed hydroelectric power as the most consumed source of renewable energy in the U.S.[15]

Figure 5: Wind Power Installed Capacity (MW), Electric Power Sector (2010-2023)



Source: U.S. Energy Information Administration ("EIA"), Short-term Energy Outlook, January 11, 2022, https://www.eia.gov/outlooks/steo/report/electricity.php.

Maryland's growing offshore wind power industry—where labor standards are in effect—provides a great example of the growth in wind power and the ability of the industry to make important economic contributions while simultaneously moving towards carbon reduction goals. According to a December 17, 2021 new release from the Maryland Public Service Commission,

[15] U.S. Energy Information Administration, "The United States consumed a record amount of renewable energy in 2020," June 16, 2021. See https://www.eia.gov/todayinenergy/detail.php?id=48396

"*Maryland's offshore wind portfolio is poised to grow substantially with a decision today by the Maryland Public Service Commission to award offshore wind renewable energy credits (ORECs) to two developers that have proposed more than 1600 megawatts of energy to be built off the coast of Maryland. Today's decision in the state's second round of offshore wind solicitations will support US Wind, Inc. and Skipjack Offshore Energy, LLC in their plans to build separate projects, together yielding nearly $1 billion in additional in-state spending and spurring the creation of more than 10,000 new direct jobs in Maryland. The new proposed projects are in addition to the 368 MW of offshore wind already being developed by both companies off Maryland's shore and whose ORECs were approved by the Commission in 2017."*

The proposals were evaluated on a number of criteria, including impacts to customer electric bills, Maryland's health, environmental and climate interests—including progress towards lowering the State's greenhouse gas emissions— and economic development benefits to the State. The Commission determined that the Round 2 projects can be built without exceeding the incremental residential and nonresidential ratepayer electric bill impact caps imposed by the Maryland General Assembly (88 cents per month for residential customers and no more than 0.9% a year for commercial and industrial customers).

In today's decision, the Commission attached numerous conditions[16] to the approval, including requirements that the developers create a minimum of 10,324 direct jobs during the development, construction and operating phases of the projects; commit to certain goals to engage small, local and minority businesses; pass 80% of any construction costs savings to ratepayers; and contribute $6 million each to the Maryland Offshore Wind Business Development Fund. Both companies will also be required to mitigate any potential adverse environmental, noise and lighting impacts during development, construction and operation."[17]

Utility-scale[18] wind energy includes land-based and offshore wind energy, and typically consists of large capacity turbines installed in multi-turbine wind farms connected to utility transmissions systems. This analysis focuses on the sensitivity of land-based wind energy project costs to changes in install labor costs resulting from prevailing wage laws. Similar to the broad scope of

[16] In 2013, Maryland's Offshore Wind Energy Act ("OWEA") established Offshore Wind Renewable Energy Credits ("ORECs") to incentivize the development of offshore wind energy. In 2017, the Maryland Public Service Commission ("PSC") approved two projects that would install 368 MW of offshore wind power. In 2019, Maryland's Clean Energy Jobs Act included provisions that offshore wind energy projects must include a Community Benefit Agreement that "ensures the timely, safe, and efficient completion of the project by facilitating a steady supply of highly skilled craft workers who shall be paid not less than the prevailing wage rate determined by the commissioner of Labor and Industry…". In addition to prevailing wages for skilled construction trades, Community Benefit Agreements under Maryland's Clean Energy Jobs Act also include the following provisions: "Promotes increased opportunities for local businesses and small, minority, women-owned, and veteran-owned businesses in the clean energy industry; Promotes safe completion of the project by ensuring that at least 80% of the craft workers on the project have completed an occupational safety and health administration 10-hour or 30-hour course; Promotes career training opportunities in the construction industry for local residents, veterans, women, and minorities; Provides for best efforts and effective outreach to obtain, as a goal, the use of a workforce including minorities, to the extent practicable; and Reflects a 21st-century labor-management approach based on cooperation, harmony, and partnership." See https://legiscan.com/MD/text/SB516/2019.

[17] See https://www.psc.state.md.us/wp-content/uploads/Maryland-PSC-Decision-Expands-Offshore-Wind-Development_12172021.pdf

[18] Utility-scale, land-based wind energy does not include distributed wind energy, such as small residential wind energy projects, larger wind energy projects for commercial or institutional facilities, and community wind power projects that deliver electricity to a local community rather than into the utility transmission grid.

technologies evaluated for solar energy, this section of the report includes offshore wind energy projects.

All wind capital cost (installation or project costs) assumptions are from the National Renewable Energy Laboratory's ("NREL") U.S. benchmark studies, including the most recent benchmark study for 1Q 2020.[19] NREL uses a bottom-up approach that accounts for all installation costs from the perspective of the developer/installer, i.e., costs include profits and represent the final retail price paid to the developer/installer. NREL reports detailed benchmark "average" costs for wind energy technologies based on the following project assumptions:

- **Land-Based Reference Project.** The reference land-based wind power project consists of 79 wind turbines, each rated at 2.6 MW (based on the average wind turbine size installed in the United States in 2019) for a total capacity of 200 MW.
- **Offshore-Based Reference Project.** The reference offshore wind power project consists of 100 wind turbines rated at 6.1 MWs (the turbine capacity estimated from NREL's global offshore wind project database for calendar year 2019) for a total capacity of 600 MW. This base reference project applies to fixed-bottom and floating technologies. According to NREL, "*Turbines at the fixed-bottom reference site are assumed to be supported by a monopile substructure 50 km from cable landfall at a water depth of 34 m, which is similar to the characteristics of the wind energy areas located in the North Atlantic region. At the floating reference site, the wind turbines are assumed to be held by a semisubmersible substructure 36 km from cable landfall at a water depth of 739 m, which is analogous to features of the Pacific Coast*."[20]

[19] Stehly, Beiter, and Duffy, "2019 Cost of Wind Energy Review," National Renewable Energy Laboratory ("NREL"), Technical Report NREL/TP-5000-78471, December 2020.
[20] Ibid.

Table 8: NREL 2019 U.S. Benchmark Land-Based Wind Capital Costs for a Representative Wind Project, (2019 dollars)

Component	$ / kilowatt (kW)	Percent of Total Capital Costs
Total turbine capital costs	**$991**	**69.0%**
Development and installation costs		
Development costs	$16	1.1%
Engineering and management	$18	1.3%
Foundation	$59	4.1%
Site access and staging	$44	3.1%
Assembly and installation	$44	3.1%
Electrical infrastructure	$145	10.1%
Construction financing costs	$34	2.4%
Contingency fund	$86	6.0%
Total development and installation costs	**$446**	**31.0%**
• Development and install labor costs	$89	6.2%
• Development and install non-labor	$357	24.8%
Total capital costs	$1,436	100.0%

Note: Numbers may not sum exactly due to rounding.
Sources: Capital costs from Stehly, Beiter, and Duffy, "2019 Cost of Wind Energy Review," National Renewable Energy Laboratory ("NREL"), Technical Report NREL/TP-5000-78471, December 2020. Development and install labor and non-labor costs from Mayfield and Jenkins, "Influence of High Road Labor Policies and Practices On Renewable Energy Costs, Decarbonization, Pathways, and Labor Outcomes," working paper, https://netzeroamerica.princeton.edu/img/Working_Paper-High_Road_Labor_and_Renewable_Energy-PUBLIC_RELEASE-4-13-21.pdf

As shown in Table 8, U.S. benchmark capital costs for a representative, land-based wind power project in 2019 are $1,436 per installed kW. Total turbine capital costs represent 69.0 percent of total project costs, while total development and installation costs account for 31.0 percent of total project costs. Install labor costs represent a subset of development and installation costs. Install labor costs amount to $89 per kW, and represent approximately 6.2 percent of total capital costs.

Table 9 reports the U.S. benchmark capital costs for a representative, offshore wind power project for fixed-bottom and floating wind power technologies. Compared to land-based wind power, total turbine capital costs account for a much smaller proportion of total project costs (31.9 percent for fixed-bottom and 24.4 percent for floating), while total development and installation costs account for a much larger proportion of total project costs (68.1 percent for fixed-bottom and 75.6 percent for floating). Nevertheless, install labor costs represent a modest proportion of total project costs at 9.3 percent for fixed-bottom and 10.3 percent for floating.

Table 9: NREL 2019 Offshore Wind Capital Costs for a Representative Wind Project, (2019 dollars)

Component	Fixed-Bottom		Floating	
	$ / kilowatt (kW)	Percent of Total Capital Costs	$ / kilowatt (kW)	Percent of Total Capital Costs
Total turbine capital costs	**$1,301**	**31.9%**	**$1,301**	**24.4%**
Development and installation costs				**0.0%**
Development costs	$138	3.4%	$165	3.1%
Engineering and management	$70	1.7%	$85	1.6%
Substructure and foundation	$817	20.0%	$1,438	27.0%
Port and staging, logistics, transportation	$58	1.4%	$44	0.8%
Electrical infrastructure	$761	18.7%	$979	18.4%
Assembly and installation	$198	4.9%	$439	8.2%
Lease price	$88	2.2%	$88	1.7%
Insurance during construction	$44	1.1%	$52	1.0%
Decommissioning bond	$58	1.4%	$76	1.4%
Construction financing	$183	4.5%	$221	4.1%
Contingency	$316	7.8%	$389	7.3%
Plant commissioning	$44	1.1%	$52	1.0%
Total development and installation costs	**$2,775**	**68.1%**	**$4,028**	**75.6%**
• Development and install labor costs	$381	9.3%	$550	10.3%
• Development and install non-labor costs	$2,394	58.7%	$3,478	65.3%
Total capital costs	**$4,076**	**100.0%**	**$5,329**	**100.0%**

Note: Numbers may not sum exactly due to rounding.
Sources: NREL, "2019 Cost of Wind Energy Review," December 2020. Mayfield and Jenkins, "Influence of High Road Labor Policies and Practices On Renewable Energy Costs, Decarbonization, Pathways, and Labor Outcomes," working paper, April 2021.

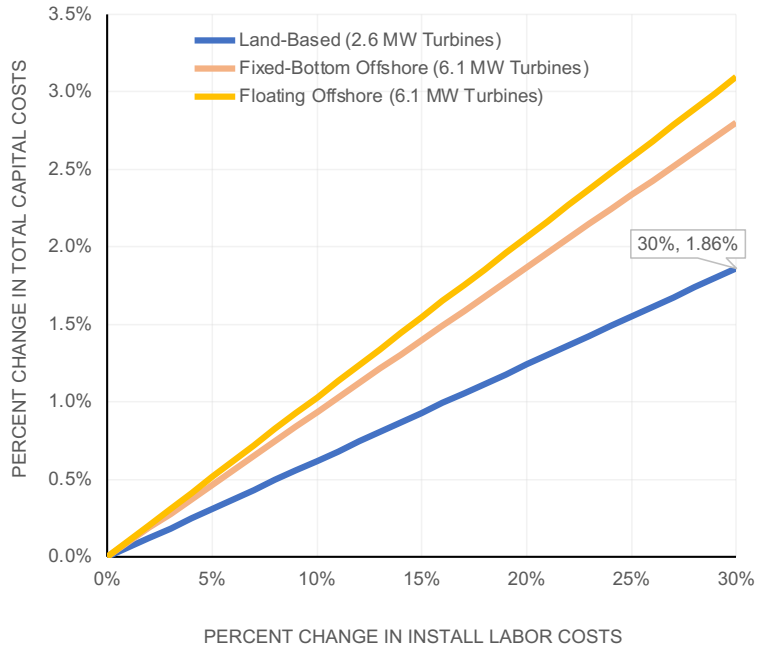
Install labor costs represent 6.2 percent for land-based wind (the subject of this study and potentially future prevailing wage laws). As such, prevailing wage legislation that increases wages and benefits for skilled trades working on utility-scale, land-based wind projects would have a small, negligible effect on total capital costs.

Table 10: Utility-Scale Land-Based and Offshore Wind – Sensitivity of Total Project Costs to Changes in Install Labor Costs for Representative Projects (2019)

% Change in Install Labor Costs	Land-Based 2.6 MW Turbine	Fixed-Bottom Offshore 6.1 MW Turbine	Floating Offshore 6.1 MW Turbine
	Install labor costs as % of total capital costs		
	6.21%	**9.34%**	**10.32%**
	Percent Change in Total Capital Costs		
• 1% change in install labor costs	0.06%	0.09%	0.10%
• 10% change in install labor costs	0.62%	0.93%	1.03%
• 20% change in install labor costs	1.24%	1.87%	2.06%
• 30% change in install labor costs	1.86%	2.80%	3.09%

Sources: NREL, "2019 Cost of Wind Energy Review," December 2020. Mayfield and Jenkins, "Influence of High Road Labor Policies and Practices On Renewable Energy Costs, Decarbonization, Pathways, and Labor Outcomes," working paper, April 2021.

Figure 6: Land-Based and Offshore Wind – Sensitivity of Total Project Costs to Changes in Install Labor Costs, by Type of Project (2019)



Sources: NREL, "2019 Cost of Wind Energy Review," December 2020. Mayfield and Jenkins, "Influence of High Road Labor Policies and Practices On Renewable Energy Costs, Decarbonization, Pathways, and Labor Outcomes," working paper, April 2021.

3. Geothermal

Geothermal energy is a renewable energy resource that uses the earth's heat to generate electricity and heat buildings. The advantages of geothermal as an energy resource include: it is abundant,[21] renewable and unvarying as the earth continuously produces heat, it is clean as most modern closed-loop geothermal plants emit no greenhouse gases and consume less water than other conventional energy sources,[22] it is domestic and can be found throughout the U.S., and it casts a relatively small footprint.

Going forward, geothermal energy represents an important emerging technology to accommodate a decarbonization future. Technological improvements that lower costs and improve geothermal economics could lead to greater, widespread adoption of geothermal energy. Indeed, an analysis conducted by the U.S. Department of Energy's Geothermal Technology Office (the "GeoVision" analysis) concludes that new technologies have the potential to lead to a 26-fold increase in geothermal electric generation capacity in 2050, when

[21] According to the International Renewable Energy Agency ("IRENA"), "The amount of heat within 10,000 meters of the earth's surface is estimated to have more 50,000 times more energy than all of the oil and natural gas resources worldwide." See IRENA, "Geothermal Power Technology Brief," page 2, September 2017.
[22] Argonne National Lab, "Life Cycle Analysis Results of Geothermal Systems in Comparison to Other Power Systems," Figure 16, page 43, August 2010.

geothermal capacity could reach 60 GWs of capacity or provide approximately 8.5 percent of U.S. electricity generation.[23]

The type of geothermal technology used depends, in large part, on the heat content of the geothermal field. This analysis covers two technologies that represent approximately 60 percent of installed geothermal capacity in the U.S. in 2020, and basically all of the new geothermal capacity added since 1985:

- Flash plants account for about 30 percent of installed geothermal capacity in the U.S. in 2020.[24] Flash plants extract steam through a process called "flashing". This steam is then fed into turbines to generate electricity. This technology works best with temperatures greater than 200 degrees Celsius. Flash plants vary in size (0.2 to 150 MW) depending on whether they are single, double, or triple flash. (Flash plants are similar to dry steam plants. Dry steam plants represent about 40 percent of installed geothermal capacity in the U.S. in 2020, but installed capacity has not increased since the mid-1980s so this technology is not included in this analysis.)
- Binary plants are used when the heat content of the geothermal field is lower, i.e., less than 180-200 degrees Celsius. At these lower temperatures, the resource fluid is used in combination with heat exchangers to heat the process fluid, which is then fed into turbines and generators to make electricity. Binary plants represent about 30 percent of installed geothermal capacity in the U.S. in 2020.

This analysis relies on detailed cost data for flash and binary geothermal plants developed by the Electric Power Research Institute ("EPRI") and reported in Table 11.[25] Importantly, install labor costs are based on union-workers receiving prevailing wages. As a result, this section reports install labor costs but does not measure the sensitivity of project costs to changes in install labor costs. Install labor costs represent 8.0 percent of total plant costs for a 50 MW, bottom exhaust flash plant; 7.6 percent of total plant costs for a 40 MW, top exhaust flash plant; and 3.0 percent of total plant costs for a 50 MW binary plant.

[23] U.S. Department of Energy's Geothermal Technology Office, "Geovision," see https://www.energy.gov/eere/geothermal/geovision

[24] Robins, et. al., "2021 U.S. Geothermal Power Production and District Heating Market Report, National Renewable Energy Laboratory ("NREL"), 2021.

[25] McGowin, "Engineering and Economic Evaluation of Geothermal Power Plants," Technical Update, Electric Power Research Institute ("EPRI"), December 2010.

Table 11: Geothermal Power Plant Installed Costs, by Plant Technology, 2010 (nominal dollars)

Phase/Item	50 MW Flash Plant (bottom exhaust) Cost	% of TPC	40 MW Flash Plant (top exhaust) Cost	% of TPC	50 MW Binary Plant Cost	% of TPC
Resource identification	$818,000	0.3%	$658,000	0.3%	$864,000	0.3%
Well field	$85,000,000	34.9%	$70,000,000	34.9%	$100,000,000	37.7%
Gathering system	$27,360,000	11.2%	$22,104,000	11.0%	$32,976,000	12.4%
Power plant	$87,212,000	35.9%	$71,457,000	35.7%	$95,012,000	35.9%
• Equipment	$45,670,000	18.8%	$37,125,000	18.5%	$73,924,000	27.9%
• Materials	$22,010,000	9.0%	$19,149,000	9.6%	$13,086,000	4.9%
• Labor	$19,532,000	8.0%	$15,183,000	7.6%	$8,002,000	3.0%
a) Equipment	$2,709,300	1.1%	$2,020,000	1.0%	$96,300	0.0%
b) Piping	$5,871,000	2.4%	$4,137,300	2.1%	$2,418,700	0.9%
c) Civil	$7,327,800	3.0%	$5,857,400	2.9%	$2,560,500	1.0%
d) Steel	$493,300	0.2%	$438,000	0.2%	$821,600	0.3%
e) Instruments	$974,300	0.4%	$847,900	0.4%	$569,800	0.2%
f) Electrical	$1,343,900	0.6%	$1,205,900	0.6%	$1,055,700	0.4%
g) Insulation	$396,100	0.2%	$341,300	0.2%	$454,700	0.2%
h) Paint	$416,300	0.2%	$335,400	0.2%	$24,700	0.0%
Indirect costs (EPC contract basis)	$42,860,000	17.6%	$36,088,000	18.0%	$36,088,000	13.6%
Total plant costs (TPC)	$243,250,000	100.0%	$200,307,000	100.0%	$264,940,000	100.0%

Notes: 1. Values may not sum exactly due to rounding. 2. EPC = Engineering, Procurement, and Construction
Source: McGowin, "Engineering and Economic Evaluation of Geothermal Power Plants," Technical Update, Electric Power Research Institute ("EPRI"), December 2010.

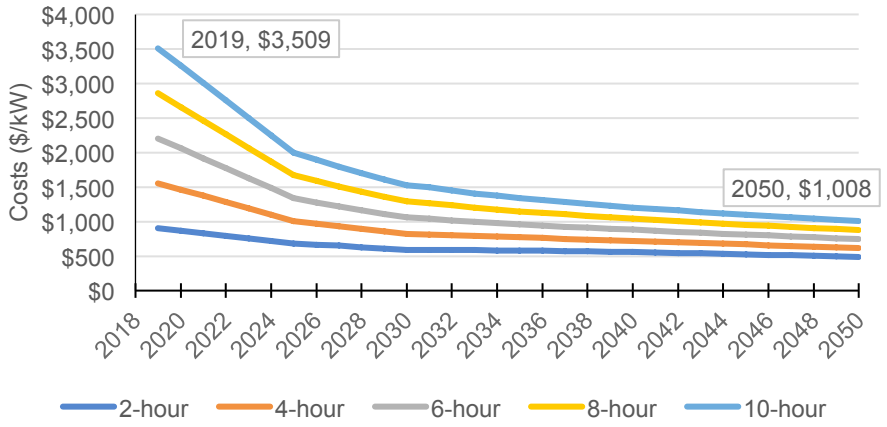
4. Energy (Battery) Storage Systems

Utility-scale energy (battery) storage systems represent a promising technology that will help bridge the imbalance between energy supply and energy demand attributed to the intermittency of renewable energy resources such as solar and wind. Driven by falling prices and technological improvements that allows batteries to store more energy, utility-scale energy storage systems are experiencing significant growth. This growth is expected to continue as battery energy storage system costs continue to fall.

- According to the U.S. Energy Information Administration ("EIA"), average installed utility-scale energy storage costs decreased by almost 70 percent between 2015 and 2018.[26]
- NREL's Moderate Technology Innovation Scenario (moderate scenario) forecasts cost decreases of between 46 percent and 71 percent, depending on battery storage duration, for 60MW utility-scale energy storage systems between 2018 and 2050. (See Figure 7.)[27]

[26] U.S. Energy Information Administration, "Annual Electric Generator Report," https://www.eia.gov/todayinenergy/detail.php?id=45596&src=email
[27] NREL, Annual Technology Baseline, 2018-2050, https://atb.nrel.gov/electricity/2021/utility-scale_battery_storage.

Figure 7: Cost Projections for a Utility-Scale 60 MW Lithium-Ion Battery Energy Storage System of Various Battery Durations (Hours), Moderate Scenario, (2018 dollars)



Source: NREL, Annual Technology Baseline, 2018-2050.

This analysis relies on detailed, cost data obtained from the NREL for a utility-scale, stand-alone energy storage system based on a lithium-ion, 60 MW_{DC} battery and inverters (2.5 MW per inverter), and four hour battery duration. (This cost breakdown is approximately the same across various battery durations, as well as for commercial projects.) Install labor costs are based on national average wages for non-union laborers and electricians.

Table 12: NREL Detailed Cost Breakdown for a 60 MW Utility-Scale, Lithium-ion Stand Alone Energy Storage System with Battery Duration of 4 hours (2019)

Model Component	Total Cost ($)	% of Total Cost
Lithium-ion Battery	$46,560,000	56.3%
Battery Central Inverter	$3,600,000	4.4%
Structural BOS	$3,173,302	3.8%
Electrical BOS	$8,599,517	10.4%
Install Labor & Equip	$4,694,348	5.7%
EPC Overhead	$2,354,557	2.8%
Sale Tax	$3,807,403	4.6%
Total EPC Costs	**$72,789,127**	**88.0%**
Land acquisition	$0	0.0%
Permitting fee	$295,289	0.4%
Interconnection fee	$1,849,475	2.2%
Contingency	$2,265,787	2.7%
Developer overhead	$1,603,157	1.9%
EPC/developer net profit	$3,940,146	4.8%
Total Developer Costs	**$9,953,854**	**12.0%**
Total System Costs	**$82,742,981**	**100.0%**

Source: Feldman, David, Vignesh Ramasamy, Ran Fu, Ashwin Ramdas, Jal Desai, and Robert Margolis, "U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020," National Renewable Energy Laboratory, NREL/TP-6A20-77324, https://www.nrel.gov/docs/fy21osti/77324.pdf.

As is shown in Table 12, install labor and equipment represents just 5.7 percent of the total cost of a 60 MW utility-scale, battery storage system. As such, prevailing wage legislation that increases wages and benefits for construction trades working on energy storage projects would have a small, negligible effect on total capital costs.

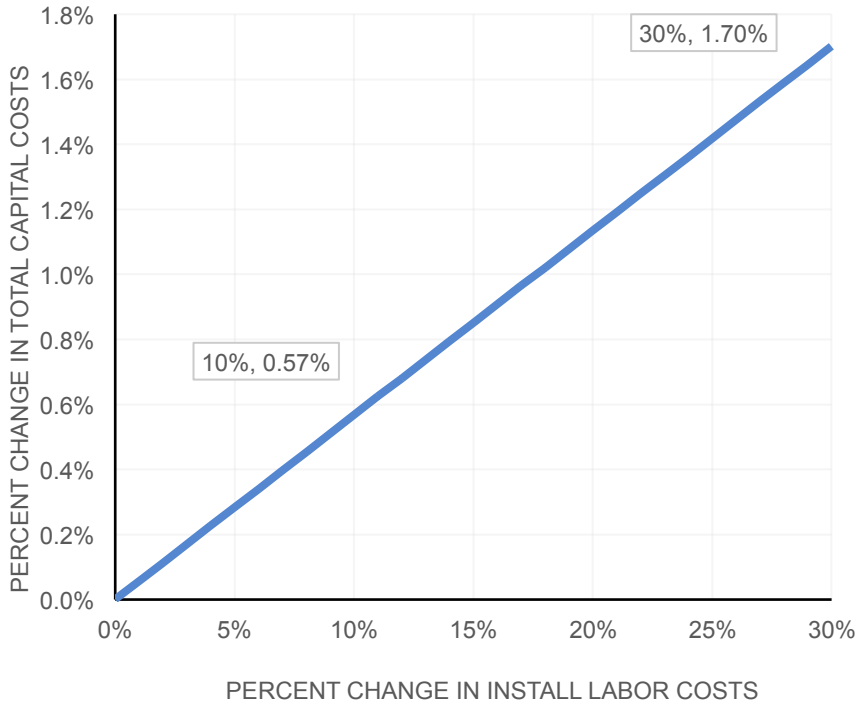
Table 13: Utility-Scale Energy Storage Systems – Sensitivity of Total Project Costs to Changes in Install Labor Costs (2019)

% Change in Install Labor Costs	Utility-Scale 60 MW Energy Storage
Install labor costs as % of total capital costs	**5.67%**
Percent Change in Total Capital Costs	
• 1% change in install labor costs	0.06%
• 10% change in install labor costs	0.57%
• 20% change in install labor costs	1.13%
• 30% change in install labor costs	1.70%

Source: NREL, "U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020," 2021.

For a 60 MW utility-scale energy storage system, every 1 percent increase in install labor costs results in a 0.06 percent increase in total project costs. A prevailing wage law that results in a hypothetical 30 percent increase in installed labor costs would increase total project costs by about 1.70 percent.

Figure 8: Utility-Scale Energy Storage Systems – Sensitivity of Total Project Costs to Changes in Install Labor Costs (2019)



Source: NREL, "U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020," 2021

Testimony_SB418_Energy Project Labor Standards_Fin
Uploaded by: Alfred Bartlett, MD
Position: FWA

Committee: **Finance**
Testimony on: **SB418 "Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards"**
Position: **Favorable with Amendment**
Hearing Date: **February 15, 2022**

The Chesapeake Chapter of Physicians for Social Responsibility (CPSR) submits this testimony in conditional support of SB418. CPSR absolutely agrees with the requirement that all energy projects (taking into account the sponsor amendment) of the sizes stated should be required to establish and observe the fair labor standards and practices that are included in this bill.

We also support the concept of "Community Benefits Agreements" for all such energy projects to define benefits and appropriate mitigation efforts, building on the efforts that most solar projects already make to inform and get input from local communities and authorities.

However, the bill as written has two significant structural problems, identified below, that require substantive amendment; we therefore can support the bill only if amended as suggested below.

It is inappropriate to negotiate important labor practices as "Community Benefits."
The bill presently places a number of important and appropriate fair labor practices –
- opportunities for local, small, minority, women- and veteran-owned businesses;
- occupational safety and health;
- career training opportunities for disadvantaged groups;
- minority inclusion in the workforce; and,
- "a 21st century labor-management approach"

into Section C (3)-(7), regarding the negotiation of a "Community Benefits Agreement" with the local community.

These appropriate labor practices should not be negotiated on a locality-by-locality basis – they should be included with the other fair labor practices in Section D, or as a separate section.

The criteria and determining authority for "reasonable efforts" need clear definition.
The problem with fair labor practices in negotiation of a "Community Benefits Agreement" also connects with the second problem – the bill offers no definition of what constitutes "*all reasonable efforts to enter into a Community Benefits Agreement,*" or who decides when that condition is satisfied.

Reasoned local deliberation is essential; the benefits of clean renewable energy projects to localities include substantial tax revenue for the local jurisdiction itself, affordable locally generated clean energy, and often personal income security for local citizens.

Unfortunately, experience in Maryland has shown that in some cases, small numbers of vocal opponents can use local processes to generate protracted obstruction of otherwise feasible projects,

leading to the ultimate loss of several projects. This has substantially contributed to the state's slow rate of clean renewable energy development, despite our ambitious goals and targets.

Creating an obstacle that results in fewer projects is not beneficial to workers in the clean renewable energy sector. It's also not supportive of Maryland's greenhouse gas reduction and clean energy goals.

So the "reasonable effort" requirement needs much greater specificity.

Considering these points, CPSR proposes the amendments below to address these two problems:

1. **Move items (3) through (7) from Section C to Section D, or to a new separate section:**

   (3) PROMOTES INCREASED OPPORTUNITIES FOR LOCAL BUSINESSES AND SMALL, MINORITY, WOMEN–OWNED, AND VETERAN–OWNED BUSINESSES IN THE ENERGY INDUSTRY;
   (4) PROMOTES SAFE COMPLETION OF THE PROJECT BY ENSURING THAT AT LEAST 80% OF THE CRAFT WORKERS ON THE PROJECT HAVE COMPLETED 24 AN OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION 10–HOUR OR 30–HOUR 25 COURSE;
   (5) PROMOTES CAREER TRAINING OPPORTUNITIES IN THE CONSTRUCTION INDUSTRY FOR LOCAL RESIDENTS, VETERANS, WOMEN, AND MINORITIES;
   (6) PROVIDES FOR BEST EFFORTS AND EFFECTIVE OUTREACH TO OBTAIN, AS A GOAL, THE USE OF A WORKFORCE INCLUDING MINORITIES, TO THE EXTENT PRACTICABLE, AS SUPPORTED BY A DISPARITY STUDY; AND
   (7) REFLECTS A 21ST–CENTURY LABOR–MANAGEMENT APPROACH 33 BASED ON COOPERATION, HARMONY, AND PARTNERSHIP.

2. **Provide clear definition of the criteria by which "*all reasonable efforts to enter into a Community Benefits Agreement*" on Items (1) and (2) of Section C will be determined.**

3. **Specify which state agency or authority shall determine whether an energy project's efforts to achieve a Community Benefits Agreement meet those criteria.**

CPSR supports SB418 with Amendment if these or equivalent amendments are made.

Respectfully,

Alfred Bartlett, M.D., F.A.A.P.
Board Member and Energy Policy Lead
Chesapeake Physicians for Social Responsibility
alfredbartlett@msn.com

SB418_MDSierraClub_fwa 15Feb2022.pdf
Uploaded by: Josh Tulkin
Position: FWA

Committee: **Finance Committee**

Testimony on: **SB 418 – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards**

Position: **Favorable with Sponsor Amendments**

Hearing Date: **February 15, 2022**

The organizations listed below respectfully urge a favorable report on SB 418 with Sponsor amendments, to require labor standards on energy generation projects greater than 2 MW that need a Certificate of Public Convenience and Necessity (CPCN) from the Maryland PSC.

Our organizations are committed to the principles of equity, justice, and inclusion, and are striving to put these principles at the center of environmental initiatives. These principles include respecting and supporting the rights of workers, which includes their ability to have good jobs, earn a decent living, and enjoy occupational health and safety protections.

We are proud to stand in solidarity with labor to advocate for stronger labor standards in all new energy generation for projects larger than 2 MWs.

As the future of Maryland's energy economy transforms, it is critical that the jobs created are good, family wage or prevailing wage supporting jobs with benefits, as well as career training for local residents, women, and minorities.

Maryland should join Illinois, Connecticut, New Jersey, Oregon, Washington, Minnesota, and New York which have already passed laws to establish labor standards for energy projects.

The policy should apply to all new electricity generation over 2 MW, not just renewable energy. It is our understanding that the bill sponsor will be introducing amendments to that effect.

We are unsure about the use of the "Community Benefits Agreement" (CBA) (page 5 line 10) to anchor some of the labor provisions. We support many of the provisions that would be included, but are uncertain whether CBAs are the right mechanism to codify those provisions. We urge the sponsor and advocates to connect with industry representatives and other stakeholders to explore the best mechanism.

We thank Senator Feldman for his leadership and the Committee for your consideration.

Sincerely,

Sierra Club, Maryland Chapter and

Cedar Lane Environmental Justice Ministry

Greenbelt Climate Action Network.
Interfaith Power and Light (DC.MD.NoVA)
Maryland Campaign for Environmental Human Rights
MLC Climate Justice Wing and Takoma Park Mobilization Environment Committee
Maryland Legislative Coalition
Strong Future Maryland
Unitarian Universalist Legislative Ministry of Maryland.

2022-SB418_PHI UNF Final.pdf
Uploaded by: Alexis Gallagher
Position: UNF

February 15, 2022

112 West Street
Annapolis, MD 21401
410-269-7115

UNFAVORABLE – Senate Bill 418
Senate Bill 418 Electricity – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Potomac Electric Power Company (Pepco) and Delmarva Power & Light Company (Delmarva Power) oppose **Senate Bill 418 Electricity – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards.** Senate Bill 418 would require the Public Service Commission (PSC) to condition the approval of a certificate of public convenience and necessity (CPCN) for the construction of a certain generating station or qualified generator lead line and an exemption from the requirement for a certificate of public convenience and necessity on the requirement that the developer of the project take all reasonable actions to enter into a community benefits agreement and adhere to certain labor standards and reporting requirements, among other things.

Senate Bill 418 requires the PSC to condition the approval of CPCN's for the construction of covered projects which include energy storage devices. These are defined as "a resource capable of absorbing electrical energy, storing it for a period of time, and delivering the energy for use at a later time as needed, regardless of where the resource is located on the electric distribution system." This "includes all types of electric storage technologies, regardless of their size, storage medium, or operational purpose."

The addition of "Energy Storage Device" in Senate Bill 418 is unnecessary. The current CPCN process already ensures that all environmental, historical, ratepayer impacts, and other considerations are addressed by the applicant. The process involves notifying specific stakeholders, holding public hearings, and consideration of recommendations by State and local government entities regarding the project's effect on various aspects of the State infrastructure, economy and environment. It is the PSC's statutory obligation to determine whether a CPCN is in the best interests of Maryland and the reliability of the electric system. Specifically, the PSC must consider, among other items the effect of the project on the stability and reliability of the electric system; economics; esthetics; historic sites; aviation safety; air and water pollution; and the need to meet existing and future demand for electric service. The very purpose of the CPCN permitting process is to determine whether the applicant has met the standards for receiving a permit.

The Department of Natural Resources (DNR) input to the CPCN process is particularly important. DNR reviews air and water impacts, and in reviewing both it considers the health impacts on persons affected by proposed infrastructure. Specifically, DNR's air pollution review assesses air emissions compliance with federal national ambient air quality standards, which are determined

based on human health risk assessments. The existing CPCN process sufficiently assesses the impact of a particular project and as such, the addition of "Energy Storage Device" is unnecessary.

For the above reasons, Pepco and Delmarva Power respectfully request an unfavorable vote on Senate Bill 418.

Contact:
Alexis Gallagher
State Affairs Manager
609-412-6345
Alexis.gallagher@exeloncorp.com

Katie Lanzarotto
Senior Legislative Specialist
202-428-1309
Kathryn.lanzarotto@exeloncorp.com

SB 418_CHESSA_Oppose.pdf
Uploaded by: Isaac Meyer
Position: UNF

OPPOSE
Senate Bill 418
Energy Generation, Transmission, and Storage Projects – Requirements Community Benefit Agreement and Labor Standards

Finance Committee
February 15, 2022

Honorable Delores Kelley
Chair, Finance Committee
3 East
Miller Senate Office Building
Annapolis, Maryland 21401

Chair Kelley, Vice-Chair Feldman, and members of the Committee,

On behalf of the Chesapeake Solar and Storage Association (CHESSA), thank you for the opportunity to issue our **OPPOSITION** of **Senate Bill 418**. This bill would require community benefit agreements (CBA) and either the payment of prevailing wage or entering into a project labor agreement for energy generating projects, including solar projects greater than 2 MW. In brief, this bill could have a severe impact on Maryland meeting its solar RPS obligation while opening many projects to new litigation, further slowing down solar project development.

Utility scale solar project development in Maryland has been historically hampered by an onerous permitting regime, and both the General Assembly and the Maryland Public Service Commission implemented new legislation and new regulations in 2021 to address this reality. With input from local governments, solar developers, and the environmental community, the Commission implemented new rules that ensure early engagement and collaboration with local governments on new solar or wind Certificate of Public Convenience and Necessity (CPCN) applications, increase transparency in the CPCN process, and ensure that such applications are processed and adjudicated in a reasonable timeframe without the opportunity for endless delays that marred the prior process and frustrated Maryland's in-state renewable and climate goals.

SB 418 would unbalance that carefully crafted multi-year effort by both the General Assembly and the Commission by providing a new and novel source for permitting delays: the requirement to pursue a Community Benefit Agreement (CBA) between projects seeking a CPCN and local governments/organizations. It is easy to envision that provision of SB 418 being the source of years of project delays and even litigation in pursuit of improved local engagement when that goal was already the subject of new legislation and a successful years-long rulemaking by the Commission.

Additionally, SB 418 would impose a new prevailing wage requirement on all CPCN projects without a commensurate financial offset to the alternate compliance payment (ACP) schedule. This requirement would harm Maryland's solar industry as solar projects compete on price against other non-renewable in-state generators (i.e. natural gas, nuclear, etc.). The cost of solar electricity is disproportionately driven by the cost of labor, and recent increases in labor costs, along with increases in solar equipment costs driven

by continued solar tariffs and supply chain disruptions, have in turn disproportionately hurt the ability for the Maryland solar industry to compete. SB 418 would exacerbate that dynamic at a time that the industry is already struggling with these broader challenges.

One of the earliest steps in the process to obtain a CPCN is entering a project into the PJM queue, essentially reserving a project's position in line to interconnect to the grid. Most projects in the queue have not obtained their CPCN and adding a prevailing wage requirement would result in many of these projects being forced to lose their queue positions as they wait for solar economics to improve to make up for the increases in cost. Cost increases of the magnitude represented by SB 418 when applied to the dozens of solar projects that have been under development in Maryland and under study in the PJM queue for years would make Maryland's 14.5% in-state solar goals unachievable.
However, the problem is even greater. Due to the increase in queue applications the last several years, PJM established an Interconnection Process Reform Task Force and has effectively frozen new queue applications until 2028. Simply put, if this bill moves forward, Maryland's ability to meet the in-state solar RPS obligation would be impossible without a commensurate increase in SREC price caps or other subsidies to make up for that increase in labor costs.

On behalf of CHESSA, thank you for your consideration of our testimony.

Submitted by:
Isaac Meyer, Compass Government Relations Partners, on behalf of CHESSA

BGE - Senate Bill 418 - Energy Generation Transmis

Uploaded by: John Quinn

Position: UNF

bge
AN EXELON COMPANY

Position Statement

OPPOSE
Finance
02/15/2022

Senate Bill 418 - Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Baltimore Gas and Electric Company (BGE) opposes *Senate Bill 418 - Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards*. Senate Bill 418 would place unnecessary additional barriers and costs on certain energy generation and storage projects. It would require the Maryland Public Service Commission (PSC) to condition the approval of a Certificate of Public Convenience and Necessity (CPCN), as well as the granting of an exemption from the requirement to obtain a CPCN, on wide-raging Community Benefits agreements between developers and organizations representing the communities in proximity to the projects.

The CPCN constitutes permission to construct certain facilities such as those covered in Senate Bill 418. The CPCN process requires a comprehensive review of proposed generation facilities to produce a consolidated state position before the PSC in licensing cases. It is a very inclusive and comprehensive adjudicatory process and is traditionally accompanied by an environmental review document that presents the applicant's environmental and socioeconomic studies. Parties to a case include the applicant, state agencies, the PSC Staff, and the Office of People's Counsel (acting on behalf of the Maryland residential ratepayers). Other groups, such as federal agencies and private environmental organizations, as well as individuals, have a right to participate in the PSC hearing process. Any such parties can file testimony, participate in cross-examination of other parties, and file briefs with the PSC summarizing their position and any objections they may have regarding the proposed project. Many state agencies have input to require recommended licensing conditions, including the Departments of Agriculture, Commerce, Environment, Natural Resources, Transportation, and Planning, as well as the Maryland Energy Administration.

The CPCN process is already very robust, but its comprehensiveness and adjudicatory structure ensure that licenses are only granted after a thorough and widely inclusive vetting process. The added process and complexity of requiring Community Benefits agreements that is the subject of this bill will disincentivize and discourage development of projects, and the additional associated costs may make many projects simply uneconomical.

The Community Benefits agreements must contain many elements that are wide reaching, including project labor agreements that may impact portions of BGE's current Collective Bargaining Agreement; would require a prevailing wage; requires us to make certain assurances with respect to contractors that could implicate joint employer

Sandy Grace | Charles Washington | Allyson Black | 410.269.5281

considerations; and attempts to regulate classification of independent contractors, among other issues. It is interesting that the bill specifically targets Tier 1 and Tier 2 renewable projects, nuclear and energy storage projects. Imposing additional requirements on these clean energy resources will most certainly serve to disincentivize further development of these projects, with implications to efforts to achieve the state's ambitious climate and environmental goals.

BGE has a particular issue with the inclusion of energy storage in the legislation. Even though this bill specifically excludes our current energy storage pilot projects overseen by the PSC, as written it would negatively impact potential future utility-scale energy storage projects. If the bill were to move forward, we would like to remove the applicability of the provisions to all energy storage devices, not just those projects currently within the PSC's pilot program.

For these reasons, BGE requests an unfavorable report on Senate Bill 418.

SB 418_LOO_Energy Generation, Transmission, and St
Uploaded by: Kevin O'Keeffe
Position: UNF

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February 15, 2022

To: Members of the Senate Finance Committee

From: Independent Electrical Contractors (IEC) Chesapeake

Re: Oppose Senate Bill 418 – Energy Generation, Transmission, and Storage Projects-Required Community Benefit Agreement and Labor Standards

Independent Electrical Contractors (IEC) Chesapeake opposes Senate Bill (SB) 418 and asks for an unfavorable report.

IEC Chesapeake believes that SB 418 as drafted creates an undue burden on small contractors as a result of numerous reporting requirements. Requiring 80% of the craft workers on a project to complete a 10 hour or 30 hour OSHA course can also disadvantage small contractors. IEC Chesapeake represents merit shop contractors who are concerned that they may be put at a competitive disadvantage for contracting opportunities in Senate Bill 418.
Thank you for your consideration. If you have any questions, please contact Grant Shmelzer, Executive Director of IEC Chesapeake, at 1-301-621-9545, extension 114 or at gshmelzer@iec-chesapeake.com or Kevin O'Keeffe at 410-382-7844 or at kevin@kokeeffelaw.com.

About Us

Independent Electrical Contractors (IEC) Chesapeake represents members throughout Delaware, Maryland, Virginia, Pennsylvania, and Washington, D.C. Our headquarters are located in Laurel, Maryland. IEC Chesapeake has an extensive apprenticeship program for training electricians. In addition, IEC Chesapeake promotes green economic growth by providing education and working with contractor members, industry partners, government policy makers and inspectors to increase the use of renewable energy.

IEC PRIDE

SB0418_DNR_LOI_FIN_2-15-22.pdf
Uploaded by: Bunky Luffman
Position: INFO

Larry Hogan, *Governor*
Boyd K. Rutherford, *Lt. Governor*
Jeannie Haddaway-Riccio, *Secretary*
Allan Fisher, *Deputy Secretary*

Bill Number: SB 418

Short Title: Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Department's Position: Letter of Information

Bill Summary:

SB 418 requires the Public Service Commission (PSC) to approve or exempt a Certificate of Public Convenience and Necessity (CPCN), conditioned that the developer of a "covered" project, defined as a 2 megawatt (MW) generation station, generation lead line, or energy storage facility take reasonable actions to enter into a Community Benefits Agreement (CBA) and adhere to certain labor standards, requirements and reporting.

Explanation of Department's Position

The Maryland Department of Natural Resources (DNR) provides the following information on SB 418.

DNR's Power Plant Research Program (PPRP) is responsible for coordinating the state's comprehensive review of proposed power generating and transmission facilities, and presents a consolidated state position before the PSC in licensing cases. PPRP's coordination with an applicant for a new or modified power or transmission facility usually begins before the formal CPCN process is initiated. PPRP lacks the expertise to define minimum standards for a CBA relative to energy projects. It also lacks the expertise to determine whether or not "reasonable actions" have been taken to enter into such an agreement and therefore, would need to hire additional staff and utilize consultants.

It is also uncertain that PPRP would be able to handle review of the CBA in a timely manner given that the legislature has established by statute a new, six-month review window for PPRP to complete its CPCN application review of all energy projects regardless of their size and complexity. The Maryland Department of Labor must also issue regulations implementing the law and until those are in place CPCN applications would remain frozen in place.

Contact: Bunky Luffman, Director, Legislative and Constituent Services
Bunky.luffman1@maryland.gov ♦ 410-689-9165

Lastly, statute does not require a CPCN for energy storage projects therefore new policies and procedures would need to be established to condition battery storage projects, which could potentially delay projects.

For any additional information, please contact our Legislative and Constituent Services Director, Bunky Luffman.

SB 418_JStanek_Info.pdf
Uploaded by: Jason Stanek
Position: INFO

STATE OF MARYLAND

PUBLIC SERVICE COMMISSION

February 15, 2022

Chair Delores G. Kelley
Senate Finance Committee
Miller Senate Office Building, Room 3 East
Annapolis, MD 21401

RE: SB 418 – INFORMATION – Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards

Dear Chair Kelley, Vice Chair Feldman, and Committee Members:

Senate Bill 418 requires a person seeking to construct a generating station with an electricity output (or capacity) of 2 MW or more to enter into a community benefits agreement and adhere to new labor standards and other requirements upon receiving a Certificate of Public Convenience and Necessity, or an exemption from the CPCN requirement, from the Maryland Public Service Commission.

SB 418 only applies to generating stations with a nameplate capacity of 2 MW or greater. The bill does not apply to offshore wind projects under § 7-704.1 of the Public Utilities Article. While the original language of the bill included energy storage devices among the scope of covered projects, the amended bill strikes that detail and, therefore, resolves an inconsistency with the Commission's CPCN requirement, which applies to generating stations, qualified generator lead lines, and overhead transmission lines designed to carry voltages over 69,000 volts. While the Commission does not support the legislation as originally drafted, I appreciate the sponsor's willingness to work on amendments and urge the Committee to adopt the sponsor's amendments, which will resolve my implementation concerns.

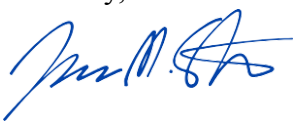
As originally drafted, SB 418 would have required the Commission to condition its approval of a CPCN or CPCN exemption on the requirement that the developer of a covered generating station comply with the new community benefits requirement and labor standards. It was unclear whether SB 418 would require the Commission to consider the new statutory requirements as part of its merits review for approving (or denying) a CPCN or CPCN exemption, or whether the Commission would simply require compliance with the new law as an express condition of an approved CPCN or CPCN exemption. Whereas the Commission lacks expertise in the field of labor standards, the Commission and its Technical Staff would have to

rely on the Maryland Department of Labor to determine whether and to what extent a project developer has complied with the new requirements. Absent the Department's expertise in this regard and participation in Commission proceedings, which the Commission cannot compel, and the statute does not require, it would be difficult for the Commission to make any conclusive findings for the purpose of conditioning its approval. Furthermore, the original language did not clearly identify which agency would be responsible for enforcing the new requirements.

The sponsor's amendments address this ambiguity. The new community benefits agreement requirement and labor standards will clearly fall within the ambit of the Department's jurisdiction, under the Labor Article. Moreover, it would not be necessary for the Commission to condition its CPCN approval on compliance with the new standards because the obligation to comply will be codified directly in PUA § 7-207, which—absent exemption—applies to the construction of generating stations with a nameplate capacity of 2 MW or greater.

For these reasons, the Maryland Public Service Commission supports the sponsor's amendments as solutions to identified implementation concerns. Thank you for the opportunity to provide informational testimony regarding Senate Bill 418. Please contact Lisa Smith, Director of Legislative Affairs, at 410-336-6288, if you have any questions.

Sincerely,



Jason M. Stanek
Chairman

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SB0418 (HB0569) - LOI - Energy Generation, Transmi

Uploaded by: Landon Fahrig

Position: INFO

Maryland Energy Administration

Larry Hogan, Governor
Boyd K. Rutherford, Lt. Governor
Mary Beth Tung, Director

TO: Members, Senate Finance Committee
FROM: Mary Beth Tung – Director, MEA
SUBJECT: SB 418 - Energy Generation, Transmission, and Storage Projects – Required Community Benefit Agreement and Labor Standards
DATE: February 15, 2022

MEA POSITION: Letter of Information

The Maryland Energy Administration (MEA) appreciates the intent of the sponsor. However, this bill may raise unnecessary barriers for the construction and interconnection of new electricity generation assets at a time when other state actors, including MEA, are attempting to spur new development; specifically clean and renewable energy development. This may have major impacts on our ability to implement resiliency measures to address climate change.

Senate Bill 418 requires developers of a Tier 1 renewable source, Tier 2 renewable source, or nuclear energy to seek a community benefits agreement (CBA) with a community-based organization(s). While CBAs are a good practice and are becoming more common, they are not necessary in every instance. The state has already taken measures to develop renewable energy on brownfields and parking lots. It seems unwise to further burden developers for these projects that typically carry a higher cost of construction. Additional burdens may make these projects in the best interests of the state less desirable. Furthermore, the bill excludes the possibility of simply reaching a CBA with individuals, rather than an organization which may not exist.

Additionally, the volumetric subsidy for in-state solar generation through the renewable portfolio standard is expected to decrease in CY22, perhaps significantly. This means that at the same time financial support for solar development is decreasing, the costs of solar development would likely be increased by the provisions of the bill. This scenario is likely to produce a chilling effect on utility scale solar generation.

As to the requirements of the CBA, it is unlikely that the requirements of 7-207.3(c) represent the contributions that the community immediately affected by the project would be most concerned with (e.g. a developer with a "21st-century labor-management approach"). In fact, the enumerated CBA requirements in the bill are less for the benefit of the community, and more so enhanced labor requirements. These requirements are misplaced in a CBA, and do not directly benefit the community.

MEA asks the committee to consider this information when rendering its report.