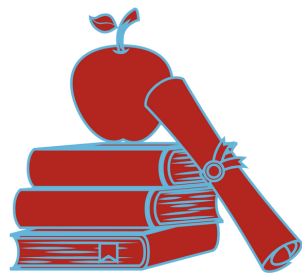


JANUARY 2020

POWER PURCHASE AGREEMENTS

A no-nonsense way
to energize economic growth
in West Virginia

REPORT: States that legalize Power Purchase Agreements control energy costs, create jobs, and save millions, without tax increases or government funding





EXECUTIVE SUMMARY

Most of West Virginia's neighbors have authorized third-party power purchase agreements (PPAs) in some form.[1] To enable this popular method of distributed energy financing in West Virginia, bills were introduced in both the House and Senate in 2019. Despite bipartisan support, these bills never made it onto a committee agenda. This legislation is expected to be reintroduced during the 2020 session.

When considering the legislation, it is essential to understand the benefits that PPAs will have on an individual, institution, or business's ability to finance renewable energy projects — and on West Virginia's economy.

This report concludes that even a very limited pilot program will lead to significant projected economic benefits in the form of nearly 400 new jobs and 13 MW of clean energy project deployment. West Virginia's renewable energy market and workforce could grow exponentially in the coming years with enactment of PPA legislation.

SPECIAL REPORT BY





What are power purchase agreements?

PPAs allow property owners to reduce their electricity bills without making large up-front investments. A PPA is a long-term contract with an energy developer, who installs, owns, and maintains an energy generation facility — such as a solar array or landfill biodigester — on a customer's home or business. The electricity generated by the facility is sold to the property owner using a long-term, fixed-rate contract, usually at a price below that charged by the customer's electric utility provider.

PPAs help nonprofit and government organizations

Federal tax credits — and in some places, state and local tax credits — help make solar energy more affordable; however, nonprofit and government organizations cannot use these tax credits because they do not pay income taxes. PPAs allow a solar developer to take advantage of the tax credits and pass those savings along to the end user, making solar energy more affordable and reducing energy costs.

As discussed below, after Virginia legalized PPAs, universities, public and private schools, and places of worship began using these contracts

to save on energy costs, Federal tax credits for solar begin to decline in 2020, from 30% to 26% of total project cost. In 2021, the tax credits decline to 22%, and in 2022, they are set to expire entirely for residential projects and decline to a permanent 10% for commercial projects.



IN WEST VIRGINIA: Spencer Presbyterian Church in Roane County added an 89-panel, 28.48-kW solar array in 2018. The church, built in 1975, houses a preschool, after-school program, and worship space. The system will offset 100% of the church's annual electricity consumption. Spencer Presbyterian used loan and grant financing, as well as church funds. The investment will pay for itself within a decade. PPAs remain the preferred financing mechanism for most schools, churches, governments, and businesses to access affordable on-site renewable energy.

TIME SENSITIVE

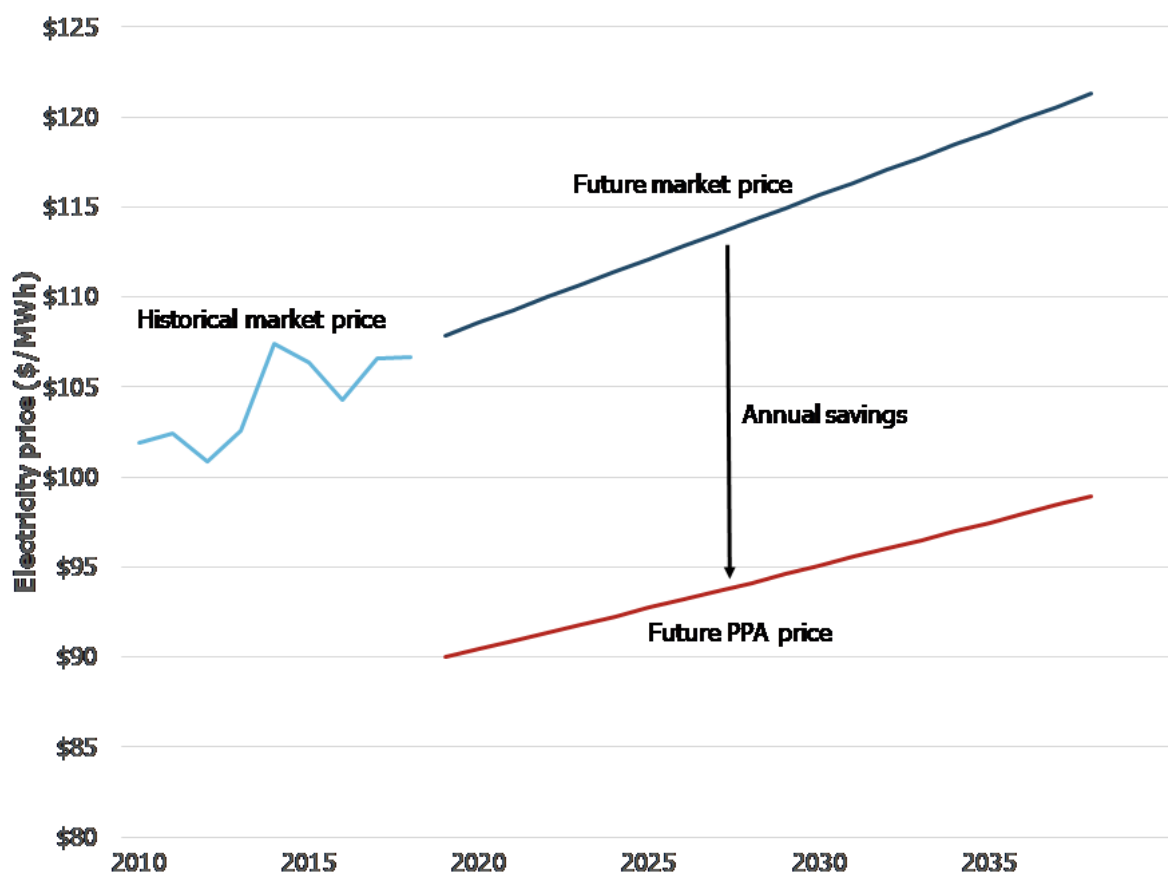
The window is closing quickly for tax-exempt institutions to use PPAs to capture the full benefits of these tax credits at their current levels.

PPAs save money over the long term

Electricity purchased from the grid has been increasing in cost.[2] With a PPA, property owners can lock in their electricity rates for decades, saving money each month. These savings will increase as grid-based electricity continues to rise in price.

As illustrated in Figure 1, electricity prices over the past decade have been erratic, but have generally risen. If that trend continues, the future market price will increase from \$107 to \$121 per MWh by 2038. If a PPA were to set the electricity price at \$90 per MWh, even with a small annual increase, it would still be considerably less expensive than the future market price. For a 100-kW solar system, this would produce \$64,000 in electricity savings over 20 years, even without considering any incentives.

Figure 1: Future savings from a PPA

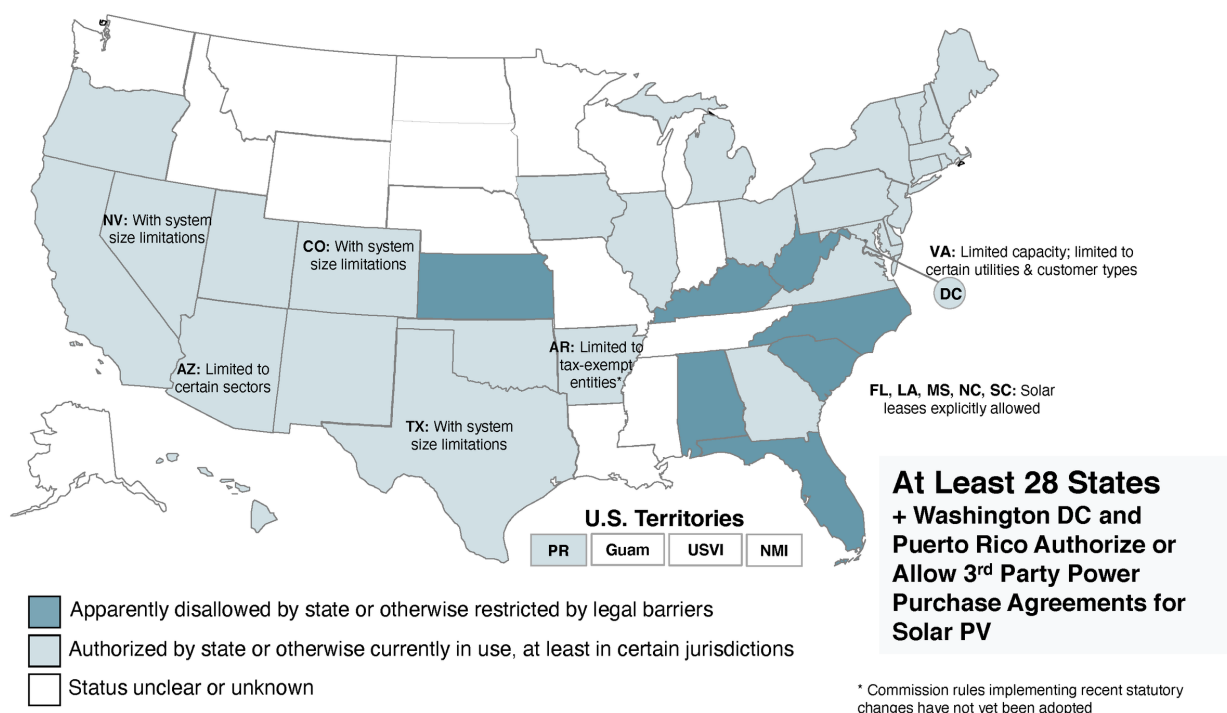


SOURCE: Historical market price from U.S. Energy Information Administration (EIA): https://www.eia.gov/totalenergy/data/monthly/pdf/sec9_11.pdf. Future market price is a continuation of the historical trend.

PPAs are common across the country

As of June 2019, third-party solar PPAs are permitted in at least 28 states, including Virginia, Maryland, Pennsylvania, and Ohio. In some states, such as Virginia and Arkansas, certain limitations are placed on PPAs. Other states have authorized PPAs more broadly. In some states, the legal status of PPAs is unclear.

3rd Party Solar PV Power Purchase Agreements in the U.S.



SOURCE: NC Clean Energy Technology Center/June 2019, https://s3.amazonaws.com/ncsolarcen-prod/wp-content/uploads/2019/07/DSIRE_3rd-Party-PPA_June_2019.pdf.

KEY FACTOR TO SUCCESS

An act of the legislature to clarify that third-party PPAs are legal, with or without additional limitations, will provide certainty for project developers and customers to move forward.

Other states have taken recent steps to allow PPAs

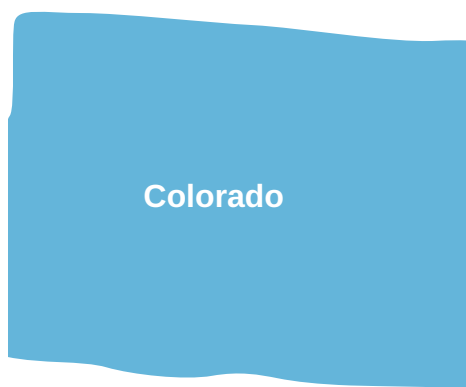
In some states, PPAs have played a major role in the development of the distributed solar market.[3] Consider these examples:



83% of residential solar systems installed in New Jersey over the past four years are owned by third parties.



Leading the nation in solar capacity, third-party ownership of residential solar systems in California reached 72% in 2013.



95% of non-residential solar systems installed in Colorado in the fourth quarter of 2017 were third-party owned.

ACROSS THE COUNTRY IN 2017

More than half of non-residential solar capacity was third-party owned.

Other states have taken recent steps to allow PPAs



The Virginia legislature enacted a pilot program for third-party PPAs in 2013. This pilot program applied only to Dominion Energy's Virginia service territory, and it placed a cap of 50 MW on the total capacity of eligible solar or wind projects. This pilot program has been highly successful, as described below.[4]

The Georgia legislature in 2015 approved the Solar Power Free-Market Financing Act. This law allows electric customers to use “solar energy

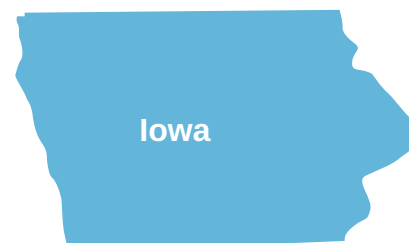


procurement agreements” to finance the installation or operation of solar projects. Projects are limited in size to 10 kW for residential sites and 125% of the maximum annual peak demand for commercial sites.[5]

In 2019, the Arkansas legislature passed SB 145 to allow PPAs. Walmart, with its corporate headquarters in Arkansas, helped develop this bill so that the company could more easily access solar electricity.[6]



A state Supreme Court ruling in 2014 clarified that solar PPAs are legal in Iowa.[7]



VIRGINIA: Even limited programs produce big results

One way to predict the outcome of successful PPA legislation in West Virginia is to look at what is happening next door in Virginia, where a pilot program allowing for third-party PPAs was enacted in 2013.

This pilot program applied only to Dominion Energy’s Virginia service territory, and it placed a total cap of 50 MW on eligible projects. This is a small percentage (0.002%) of Virginia’s rooftop solar technical potential.

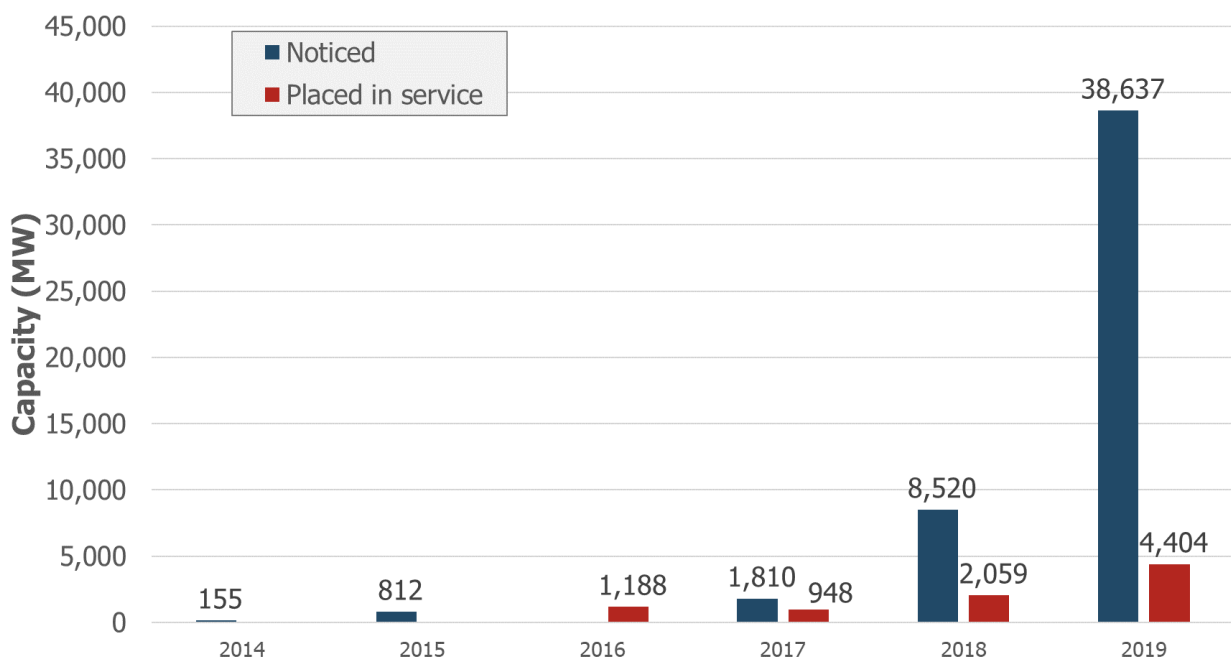
Solar developers began “noticing” new projects in 2014, meaning they were reported to the Virginia State Corporation



IN VIRGINIA: Working closely with Sun Tribe, Middlesex County Public Schools installed the first ground-mounted solar system at a Va. school and will be the first school district in the Commonwealth to have its schools 100% powered by on-site renewable energy – all while saving \$4.74 million for taxpayers.

Commission, the agency that tracks the projects. The pilot program has been nearly fully subscribed in just six years. As illustrated in Figure 2, 49.9 of the total 50 MW allowed under the pilot program was noticed by December 2019.[8]

Figure 2: Solar under the Dominion Energy Virginia Pilot Program



SOURCE: Values for 2014-2019 from Virginia State Corporation Commission, https://www.scc.virginia.gov/pur/ppa/dev_ppanotc.pdf. Values for 2020-2021 are projections.

NOTE: Once a PPA is noticed, it can take a year or more until the system is placed in service due to a number of factors, like system design and permitting.



This pilot program can generally only be used for projects with capacities between 50 kW and 1 MW, although the minimum size requirement does not apply to certain nonprofit entities. The average size of the 161 noticed projects is 310 kW. Nine projects are sized at the maximum 1 MW capacity, and 21 projects are sized at 50 kW or smaller, with the smallest being 7.6 kW at a prep school.

As illustrated in Table 1, many different types of entities are making use of PPAs under Virginia's pilot program, and it has clearly made it easier for educational institutions to access solar: 86% of the total noticed capacity is for K-12 education, and an additional 7% is for higher education.

Table 1: Types and sizes of solar installations under the Dominion Energy Virginia Pilot Program

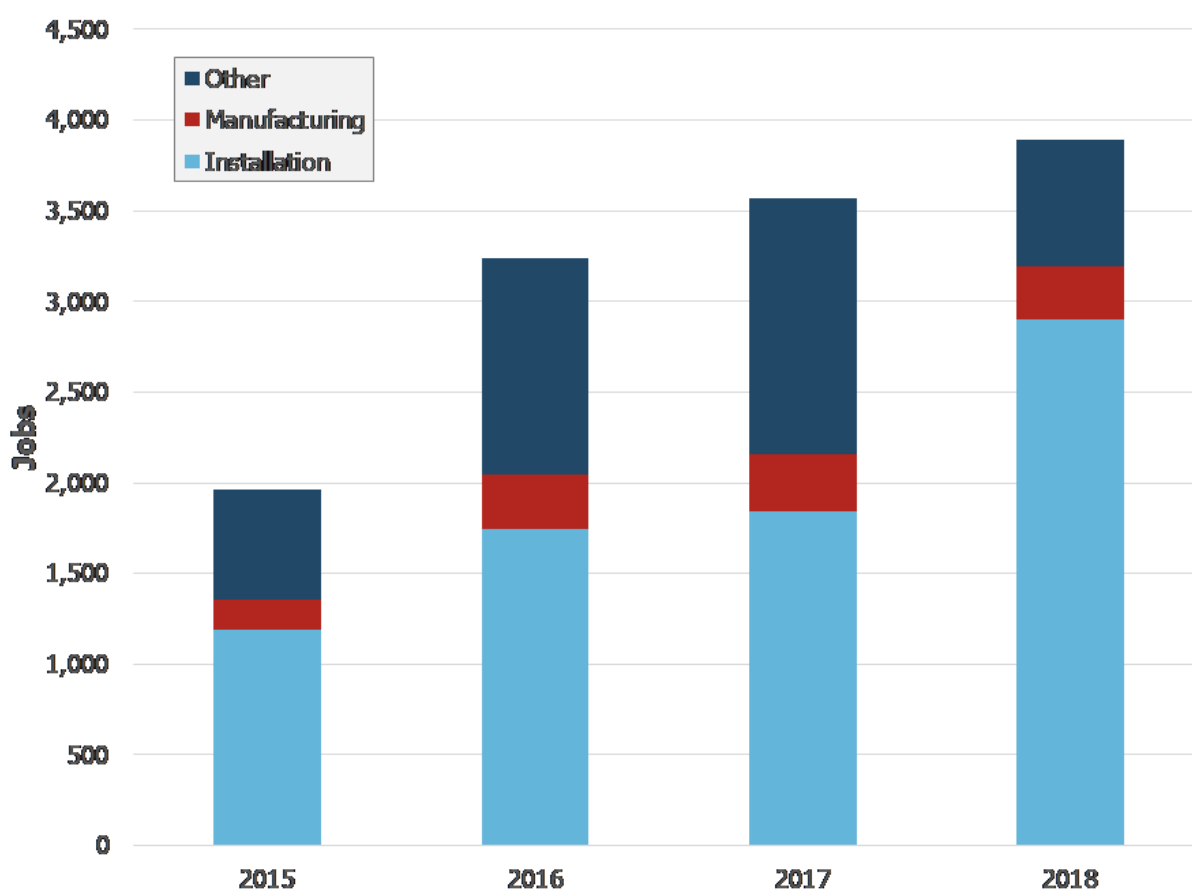
CATEGORY	# of installations	Capacity (kW)	% of total capacity	Average capacity (kW)
K-12 education	110	42,979	86%	391
Higher education	19	3,589	7%	189
Private business	15	1,681	3%	112
Place of worship	12	733	1%	61
Other	5	952	2%	190
TOTAL	161	49,934	99%*	310

SOURCE: Virginia State Corporation Commission, https://www.scc.virginia.gov/pur/ppa/dev_ppanotc.pdf
*Percentage does not total 100 due to rounding.

At the same time that this growth in PPA-financed solar projects has taken place, solar jobs in Virginia have grown substantially (see Figure 3). In 2015, fewer than 2,000 solar jobs existed in Virginia, with most related to installation. Three years later, solar installation jobs alone had reached nearly 3,000, and a total of almost 3,900 solar jobs were found in Virginia in 2018.

These jobs include, for example, sales and distribution, project development, and operations and maintenance.

Figure 3: Solar job growth in Virginia



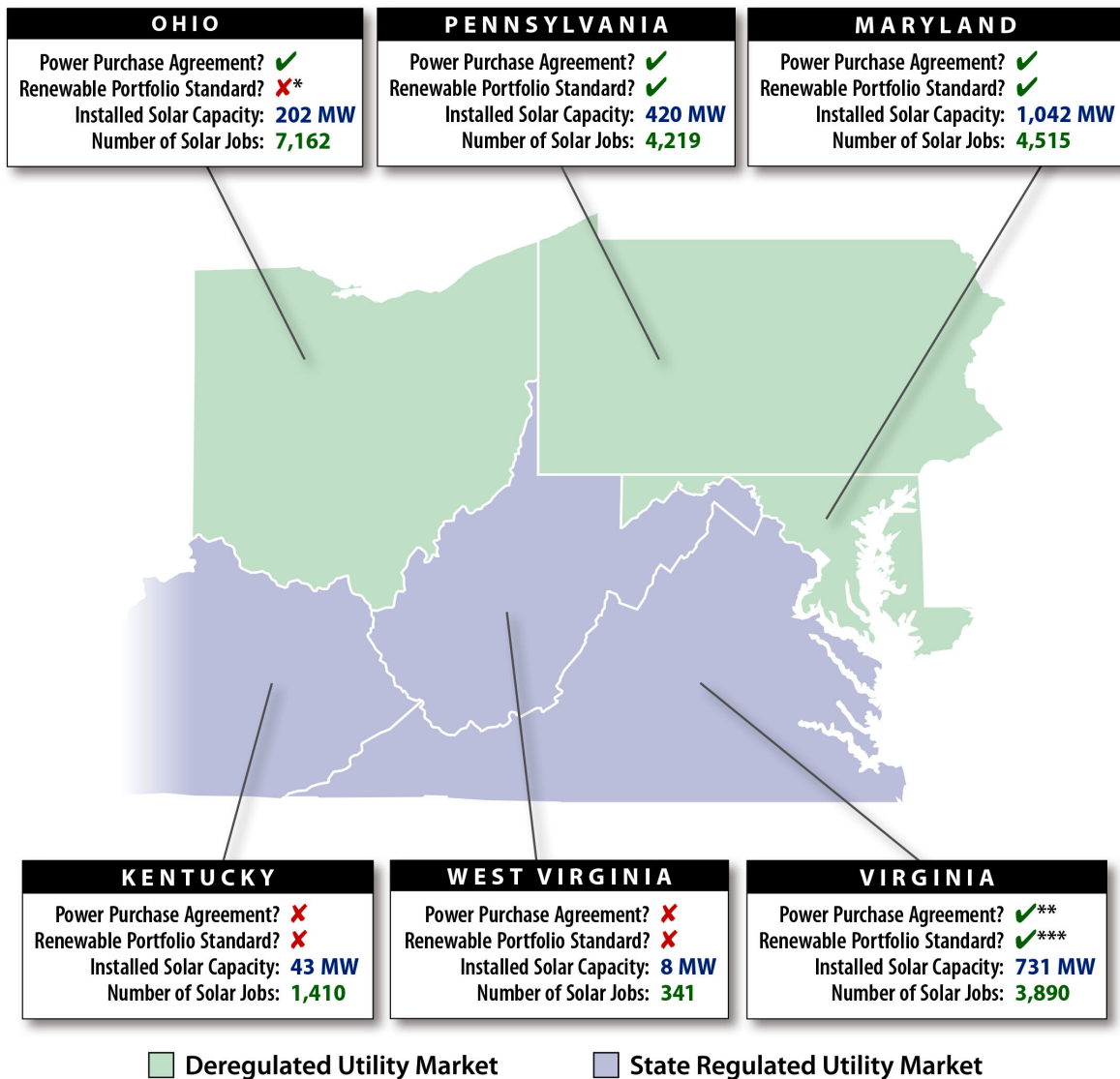
SOURCE: Solar Jobs Census, <https://www.solarstates.org/>

For states considering taking action on PPAs, Virginia's story should serve as encouragement. Even under the limitations of its pilot program, a significant amount of solar has been noticed and will be installed, with positive impacts for the state's economy.

PROJECTION FOR WEST VIRGINIA

If West Virginia enacts PPA legislation that results in outcomes of similar magnitude as those of Virginia, the state could reasonably expect to install 13 MW of distributed solar.[9]

If half of this capacity is installed on commercial buildings and half on residential buildings, nearly 400 solar project development and installation jobs could be supported. This is more jobs than the total number of solar jobs in West Virginia today.[10]



NOTE: MW = Megawatts

* In 2019, Ohio effectively repealed their renewable portfolio standard.

** Pilot Project Only

*** Voluntary Only



ACKNOWLEDGEMENTS



A coalition of residents, business owners, community leaders, and officials who believe West Virginians should have the right to choose where their energy comes from. [EnergyFreedomWV.org](https://www.energyfreedomwv.org)



A national organization dedicated to helping people go solar, join together, and fight for their energy rights. [SolarUnitedNeighbors.org](https://www.solaruniteneighbors.org)



A West Virginia-based consulting firm offering services that combine sound interdisciplinary skills with a core belief in the importance of protecting the environment and linking economic development with natural resource stewardship. [DownstreamStrategies.org](https://www.downstreamstrategies.org)

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Report design: Crystal Dempsey of From The Hip Communications.

ENDNOTES

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[1] See Ohio: PUC Order 06-653-EL-ORD (11/05/2008), Pennsylvania: PUC Order, Docket M-2011-2249441, Virginia: H.B. 2390 (2017); S.B. 1769 (2019), and Maryland: H.B. 1057 (2009).

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[2] See average commercial retail prices at EIA: https://www.eia.gov/totalenergy/data/monthly/pdf/sec9_11.pdf.

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[3] See Solar Energy Industries Association: <https://www.seia.org/initiatives/third-party-solar-financing>.

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[4] See Virginia State Corporation Commission: <https://www.scc.virginia.gov/pur/pilot.aspx>. No wind projects have been proposed under the pilot program.

[5] See Smith, Gambrell, & Russell, LLP: https://www.sgrlaw.com/site/assets/files/3595/hb_57.pdf.

[6] See Utility Dive: <https://www.utilitydive.com/news/how-arkansas-eliminated-third-party-solar-barriers-in-a-red-state/550588/>.

[7] See Energy News Network: <https://energynews.us/2014/07/11/midwest/iowa-supreme-court-rules-in-favor-of-third-party-solar/>.

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[8] See Virginia State Corporation Commission: https://www.scc.virginia.gov/pur/ppa/dev_ppanotc.pdf, downloaded November 20, 2019. Since then, additional solar projects have been noticed.

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[9] Virginia will have 50 MW of installed capacity built under Dominion's PPA pilot program. This is 0.27% of Virginia's rooftop technical potential of 18.5 GW. The same percentage of West Virginia's rooftop technical potential of 4.8 GW would be 13 MW of installed capacity.

[10] Assumes 38.7 jobs created per MW of residential systems installed and 21.9 jobs created per MW of commercial systems installed (Solar Jobs Census, 2018).