



WASHINGTON STATE UNIVERSITY
Energy Program



WSU TRI-CITIES
Institute for Northwest Energy Futures

Washington State Solar Energy: *History, Prices, Capacity, and Data Accuracy*

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Anas Mohamed

Mechanical Engineering Student Intern, Energy Program & WSU Tri-Cities Institute for Northwest Energy Futures

Mauro Martinez

Mechanical Engineering Student Intern, Energy Program & WSU Tri-Cities Institute for Northwest Energy Futures

Tejas Ghirnikar

Student Research Advisor, WSU Tri-Cities Institute for Northwest Energy Futures

Jillian Cadwell

Research Associate Faculty, WSU Tri-Cities Institute for Northwest Energy Futures

Executive Summary

In Washington State, the early solar market was mostly made up of residential customer-sited systems, meaning systems installed at or near the location where the electricity is used. To examine this early market in more detail, the dataset used in this paper includes 7,462 solar installations in Washington State that were placed into operation between 2011 and 2019. Of these installations, 6,875, or about 92.1%, are single-family residential systems⁸. The data were derived from Berkeley Lab's Distributed Solar 2020 Data Update, which provides project-level information on distributed solar systems installed through 2019⁸.

Here, we analyze how solar energy has affected Washington's energy system. Washington currently has approximately 955 megawatts of installed solar capacity and around 60,227 solar installations across the state¹. These systems represent about \$2.3 billion in total solar investment and produce enough electricity to power about 103,115 homes¹.

Solar prices and system sizes have also changed over time. As of July 2026, the average residential solar price in Washington is about \$2.53 per watt, and the average quoted residential system size is about 13.66 kilowatts². Larger system sizes and lower prices have helped solar energy grow in Washington. Government policies that support clean energy have also played a major role in this growth. However, in order to correctly understand the costs and benefits of using solar energy systems for electricity production, the data must be accurate, complete, and consistent.

Introduction

Hydroelectric power provides the largest share of electricity generation in Washington, accounting for more than half of the state's electricity generation in recent years³. Solar, however, can be installed on homes, schools, businesses, farms, tribal facilities, and community buildings throughout the state. Solar energy can also improve local energy resilience because solar systems can be combined with battery storage to provide backup power during outages.

We will examine more than just the total amount of solar capacity installed in Washington State. We will also explore the history and growth of the solar industry by using the Washington solar installation dataset⁸ and additional public sources. The paper will also examine several important factors, including the cost of installed solar systems, the size and capacity of the systems, changes in solar technology, and the policies and incentives that have supported clean-energy development in the state.

Because solar projects involve large amounts of money and energy production, the data must be checked carefully. Costs, system sizes, units, complete years of data, and expected energy production must all be accurate and realistic. Incorrect or incomplete data can make a solar project appear more expensive, less expensive, or more productive than it actually is. For this reason, data accuracy is an important part of understanding the true growth and value of solar energy in Washington State.

Problem Statement

The high cost of solar systems is one problem that this white paper will address. However, another problem is that it can be difficult to understand the true cost and performance of solar systems because the information is sometimes incomplete, inconsistent, or reported using different units.

For example, one project may have a high total cost but still have a lower cost per unit of capacity because it is a larger system. Another project may have a lower total cost but still be expensive

when its cost per watt is calculated. Looking only at the total price does not provide enough information to determine whether a solar project has a lower cost per unit of capacity.

Missing Observations

Periods of incomplete data can also create misleading results. A year with missing records may appear to show a decrease in solar growth, even though the decrease may only be caused by incomplete reporting. For this reason, cost, capacity, system size, and performance calculations must be checked carefully.

The process of checking the data must also be transparent. The calculations, units, and methods should be clearly explained so the results can be compared with other projects, other sources, and previous years. Without accurate and transparent data, it is difficult to make reliable decisions about solar development in Washington State.

Background Information

In the early years of solar growth in Washington State, most solar systems were installed on customers' properties instead of being built as large utility-scale solar plants. To better understand this early growth, the dataset can be used to examine the types of solar systems installed across Washington State. The dataset file includes 7,462 solar installation records from Washington State. The rest of the systems are listed under other categories, including general residential, multifamily residential, agricultural, commercial, government, school, tax-exempt, and other nonresidential systems. Because most of the records are residential, this dataset is most useful for understanding the growth of distributed residential solar in Washington State.

The dataset contains one Washington record from 2011, two from 2012, one from 2013, two from 2014, and nine from 2015. However, the lower number of records in 2019 should not automatically mean that the solar market in Washington decreased. The 2019 data may be incomplete, or it may have been reported differently from the data in the previous years.

State policies have also helped support the growth of solar systems on customers' properties. Washington's net-metering law allows utilities to measure how much electricity a customer's solar system produces. When the system produces more electricity than the customer is using, the extra electricity can be sent back to the grid, and the customer can receive a credit based on the utility's rules. This makes solar systems more useful because customers can still receive value from electricity they do not use right away.

In 2019, Washington passed the Clean Energy Transformation Act, also known as CETA. This law requires electric utilities in Washington to move toward carbon-neutral electricity by 2030 and electricity from renewable or nonemitting resources by 2045. The law also focuses on making sure the energy system stays reliable and affordable during the transition. CETA does not mean that all clean energy has to come from solar, but it can help support the growth of solar energy, battery storage, energy efficiency, and other clean-energy resources⁵.

Government grants have also helped support clean-energy projects in Washington. In 2025, the Washington State Department of Commerce awarded a total of \$41.1 million to 49 clean-energy community projects in 22 counties. These projects included rooftop solar, battery storage, building decarbonization, electric-vehicle charging, and studies for possible future clean-energy projects. Special attention was given to projects that serve tribes, low-income communities, communities of color, and other communities that face higher environmental and economic burdens⁶.

Overall, the data shows that Washington's earlier solar market was mainly made up of residential and other customer-sited systems. Policies such as net metering, CETA, and state grants helped create better conditions for solar and other clean-energy projects to grow. However, because the dataset mainly focuses on residential systems and includes only a small number of records for some years, it should not be treated as a complete history of every solar project built in Washington State.

Analysis

Cost per Watt and System Size

Solar systems come in many different sizes, which can make it difficult to compare the cost of one system to another. Residential systems are normally measured in kilowatts, while larger commercial and utility-scale systems may be measured in megawatts. One kilowatt is equal to 1,000 watts, and one megawatt is equal to 1,000 kilowatts, or one million watts.

Table 1. Summary of valid Washington records in the dataset.

Year	Records	Total capacity (kW)	Median size (kW)	Median price (\$/W)	Mean price (\$/W)
2015	9	54.5	5.50	\$4.21	\$4.43
2016	64	452.8	4.80	\$4.34	\$4.70
2017	1,246	10,723.6	8.12	\$3.56	\$3.76
2018	4,910	49,704.4	9.44	\$3.44	\$3.63
2019	1,227	12,952.7	9.00	\$3.34	\$3.47

The Excel spreadsheet includes a price-per-size value based on the total installed cost and the size of the system in kilowatts. For this paper, these values were converted into dollars per watt by dividing them by 1,000. This makes it easier to compare systems of different sizes using the same measurement.

Changes in Solar Prices and System Sizes

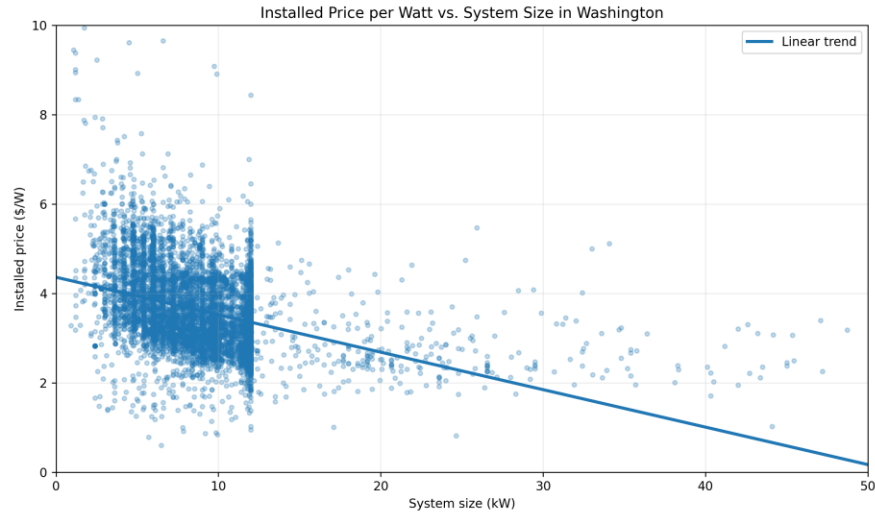


Figure 1. Installed price per watt compared with solar system size in the Washington dataset.

As shown in Figure 1, the data show that solar system sizes generally increased between 2016 and 2019. The median system size increased from 4.8 kilowatts in 2016 to 9 kilowatts in 2019, showing an overall increase in the size of systems installed during this period.

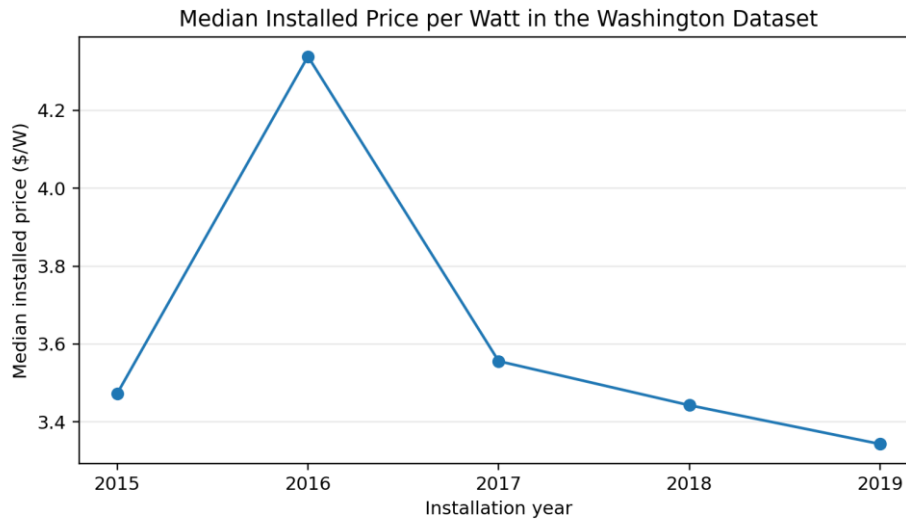


Figure 2. Median installed price per watt in the Washington dataset, 2015-2019.

As shown in Figure 2, the median installed price per watt decreased during the same period. The median price was about \$4.34 per watt in 2016, \$3.56 per watt in 2017, \$3.44 per watt in 2018, and \$3.34 per watt in 2019. This shows that customers were generally installing larger systems while paying less for each watt of solar capacity.

The lower cost per watt and the increase in system size likely played an important role in the growth of solar energy in Washington. When customers can install larger systems at a lower price per watt, the systems can produce more electricity while becoming more affordable compared with earlier years.

Current Solar Growth in Washington

More recent information shows that solar continued to grow after the historical dataset ended. According to the Solar Energy Industries Association, Washington has approximately 955 megawatts, or 955,000 kilowatts, of installed solar capacity across approximately 60,227 installations. Solar provides about 1.25% of the state's electricity, and the solar industry supports approximately 1,093 jobs in Washington. SEIA projects that Washington could add another 2,119 megawatts of solar capacity during the next five years¹.

Current residential solar prices are also lower than the historical prices found in the dataset. As of July 2026, EnergySage reports an average installed residential solar price in Washington of about \$2.53 per watt and a typical quoted system size of about 13.66 kilowatts, with an average total cost of approximately \$34,604 before incentives².

The EnergySage data cannot be compared directly with the historical dataset because the two sources cover different time periods and may use different methods of collecting information. However, they show the same general trend: residential solar systems have become larger over time while the price per watt has generally decreased.

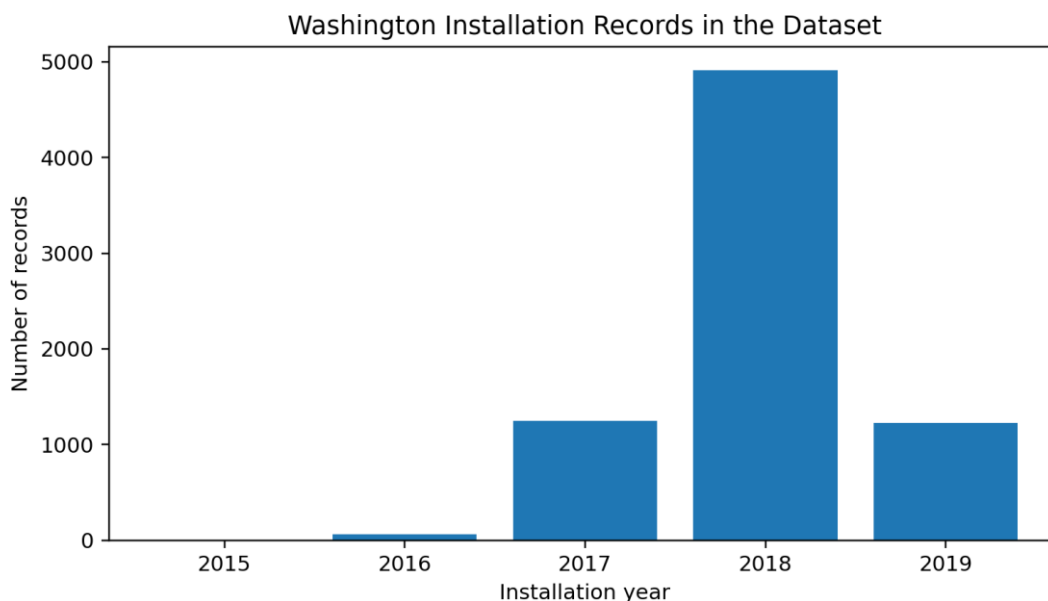


Figure 3. Number of Washington installation records by year in the supplied dataset.

As shown in Figure 3, Washington's solar market is still smaller than many other states. According to SEIA's 2026 state solar data, Washington ranks 39th nationally for installed solar capacity. For comparison, Oregon ranks 27th, New York ranks 7th, Arizona ranks 4th, Texas ranks 2nd, and California ranks 1st. These rankings show that solar has continued to grow in Washington, but the state still has much less installed solar capacity than several leading solar states¹⁰.

Taxes and Government Policies

Government policies can have a major effect on the overall cost and growth of solar energy. Net metering, clean-energy standards, government grants, and tax incentives can all make solar projects more financially possible. However, changes in these policies can also make solar projects less affordable or more difficult to develop.

Washington has specific policies that support solar development. One example is the state's net-metering law, which allows eligible customers with renewable-energy systems to receive credit for

electricity that is sent back to the grid⁴. Washington's Clean Energy Transformation Act also requires electric utilities to move toward carbon-neutral electricity by 2030 and electricity from renewable or nonemitting resources by 2045⁵.

Net metering affects the value of electricity produced by a customer's solar system. When a customer produces more electricity than they are using, the extra electricity can be sent back to the grid and counted as a credit under the utility's rules. This can help reduce the customer's electric bill and improve the financial value of the solar system.

Government grants can also reduce the upfront cost of community solar and other clean-energy projects. These grants can help schools, tribes, local governments, nonprofit organizations, and low-income communities develop projects that may otherwise be too expensive.

Washington has also provided direct funding for clean-energy projects. In 2025, the Washington State Department of Commerce awarded \$41.1 million to 49 clean-energy community projects across 22 counties⁶. These projects included rooftop solar, battery storage, building decarbonization, electric-vehicle charging, and other clean-energy projects.

Tax incentives have also helped reduce the cost of solar systems. The federal Residential Clean Energy Credit provided a credit equal to 30% of the cost of qualifying residential clean-energy property installed between 2022 and December 31, 2025. Federal legislation enacted in 2025 ended this credit for qualifying residential expenditures made after December 31, 2025⁷.

Because of this change, the former 30% residential credit should not automatically be deducted from the estimated cost of a Washington residential solar system in 2026.

Data Accuracy and Limitations

The data in the Washington solar installation dataset is useful, but it does not give a complete history of solar energy in Washington State⁸. The Washington installation records only go through 2019, which means installations from 2020 and later are not included. The early years also have only a small number of records, so it would be difficult to use those years to make strong conclusions about solar growth across the whole state.

Out of the 7,462 Washington records, 6,875 systems, or about 92.1%, are single-family residential systems⁸. There are some commercial, multifamily, government, agricultural, and other nonresidential systems included, but they make up a much smaller part of the data. Because of this, the spreadsheet is more useful for understanding residential solar growth than for explaining every part of Washington's solar industry.

The reported cost relative to system size also needed to be converted into dollars per watt so it could be compared with normal solar market prices.

A chart can be mathematically correct and still be misleading. For example, the lower number of installation records in 2019 could look like a decline in Washington solar growth even though the year may be incomplete. The reported cost relative to system size could also be misunderstood if the units are not correctly converted into dollars per watt. The number of records, the years included, the units being used, and the missing information all need to be considered. This is why the data has to be checked carefully before using it to make conclusions about solar cost, system performance, or solar growth in Washington State.

Conclusion

This paper explains the history of customer-sited solar power in Washington State and the growth of the broader clean-energy market. The data shows a large increase in solar installation records after

2016, an increase in the median size of installed systems, and a decrease in the median installed price from \$4.34 per watt in 2016 to \$3.34 per watt in 2019. More recent information also shows that Washington reached about 955 megawatts of installed solar capacity by June 2026. Even after changes to the federal residential tax credit, net metering, Washington's clean-energy requirements, and community grant programs continue to support solar growth in the state.

When comparing different solar projects, it is important to look at more than one number. Price, capacity, system size, customer type, and expected energy generation should all be considered. Using information from each of these categories makes it easier to compare project costs and understand how much electricity a system may produce.

Overall, solar energy is continuing to grow in Washington State, but accurate planning and good government policies are needed to support that growth. As more information becomes available through spreadsheets, public databases, and other computer programs, the data still needs to be checked carefully. Correct units, complete information, and updated sources are important because inaccurate numbers can make a project appear less expensive or more productive than it actually is.

References

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