

How to calculate the value of solar

Many CHELCO members are interested in installing solar arrays at their homes as a way of reducing their energy bills and as a way to produce electricity with less environmental impact.

CHELCO has used actual data from its demonstration array at our Operations Center, along with real-time usage data from the average home, to produce a tool to estimate annual savings.

Payback calculation using CHELCO rates

Assumes 61.5% percent of electricity will be consumed on site, while 38.5% will be sold to CHELCO. This is based on an hour-by-hour study of when power is used compared with hour-by-hour solar production for a year.

| | |
|-----------------------------|----------|
| Solar array size | 5KW |
| Investment after tax credit | \$8,050 |
| kWh produced annually | 7,235 |
| Value of power produced | \$599.12 |

Power used: 4450 kWh x \$.094615 = \$420.99

Power sold: 2785 kWh x \$.06395 = \$178.13

Simple payback period in years **13.44**

The model does not reflect increased electricity prices over time. It also does not account for the loss of use of the capital, which could be invested, to make the purchase.



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Assumptions

CHELCO has a special rate for those who install solar, wind or other self-generation. This rate allows them to reduce their electric bill in two ways.

1. Kilowatt-hours used in the home, which means they pay for fewer kWh purchased from CHELCO.
2. If there is more energy produced by a solar array than used on site, CHELCO will meter the energy and credit the member by purchasing those kWh at a rate similar to our wholesale power rate.

Our model is based on purchasing a solar array without a loan and interest expense. Using a loan increases the payback period.

The kWh output is based on calendar year 2017 production by an actual 5 KW array on CHELCO property.

The rates used to figure the value of the energy produced are the average monthly rates for CHELCO in 2017.

CHELCO can customize the calculation with a member's individual installation costs, array size and current rates.

Details of solar value calculation and other scenarios

Solar Array Payback -- Estimate from Actual Usage Study

| | | | | | |
|-------------------------------------|-----------|-------|----|-------------------------|--------------|
| Array Size | | | | | 5KW |
| \$ Invested after tax credit | | | | | \$8,050 |
| Annual kWh produced | | | | | 7,235 |
| Value of electricity produced | Used/Sold | kWh | | Rate/kWh | Saving |
| Retail avoided cost | 61.50% | 4,450 | \$ | 0.094615 | \$ 420.99 |
| Sold to CHELCO | 38.50% | 2,785 | \$ | 0.063950 | \$ 178.13 |
| Total | | | | | \$ 599.12 |
| Investment divided by total savings | | | | Years to payback | 13.44 |

Solar Array Payback -- 100% Consumed/0% Sold

| | | | | | |
|-------------------------------------|-----------|-------|----|-------------------------|--------------|
| Array Size | | | | | 5KW |
| \$ Invested after tax credit | | | | | \$8,050 |
| Annual kWh produced | | | | | 7,235 |
| Value of electricity produced | Used/Sold | kWh | | Rate/kWh | Saving |
| Retail avoided cost | 100.00% | 7,235 | \$ | 0.094615 | \$ 684.54 |
| Sold to CHELCO | 0.00% | - | \$ | 0.063950 | \$ - |
| Total | | | | | \$ 684.54 |
| Investment divided by total savings | | | | Years to payback | 11.76 |

Solar Array Payback -- 50% Consumed/50% Sold

| | | | | | |
|-------------------------------------|-----------|-------|----|-------------------------|--------------|
| Array Size | | | | | 5KW |
| \$ Invested after tax credit | | | | | \$8,050 |
| Annual kWh produced | | | | | 7,235 |
| Value of electricity produced | Used/Sold | kWh | | Rate/kWh | Saving |
| Retail avoided cost | 50.00% | 3,618 | \$ | 0.094615 | \$ 342.27 |
| Sold to CHELCO | 50.00% | 3,618 | \$ | 0.063950 | \$ 231.34 |
| Total | | | | | \$ 573.61 |
| Investment divided by total savings | | | | Years to payback | 14.03 |



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