

Electricity from solar reduces the need to run other power plants, which cuts the amount of electricity utilities need to buy and saves customers money. By avoiding the need to run the most expensive power plants (which are often powered by fossil fuels), when solar lowers the amount of electricity purchased, it also reduces the wholesale price of electricity.

Analyzing hourly data from ISO New England, we estimated what demand and prices for electricity would have been if not for local solar. These include benefits shared by all New Englanders, not just those with solar. **Vermonters saved more than \$79 million due to local solar.**

On average, over the six years analyzed, local solar provided 11.9 cents per kWh of energy market benefits. This calculation only includes weeks where there is a strong relationship between loads and prices; other likely energy savings are not estimated here.

New England Solar Energy Savings

Year	VT	New England
2014	\$7 million	\$96 million
2015	\$9 million	\$118 million
2016	\$11 million	\$171 million
2017	\$15 million	\$206 million
2018	\$20 million	\$258 million
2019	\$17 million	\$211 million
Total	\$79 million	\$1,060 million

Numerous heat waves and especially high summertime energy prices in 2018 contributed to higher savings that year. Benefits in this figure only include impacts related to the wholesale energy market. Other benefits (e.g., public health, climate, capacity, transmission and distribution, reliability, or retail margins) are not included.

From 2014 to 2019...

- ☀️ Solar created **\$1.1 billion** in energy savings in New England, including **\$79 million** in Vermont
- ☀️ New England solar cut **4.6 million metric tons** of CO₂ pollution, equal to taking **one million cars** off the road
- ☀️ Solar created **\$87 million** in public health benefits in New England and **\$13 million** in Vermont

In Vermont in 2019...

- ☀️ Local solar produced **382 million kWh** of electricity, equal to **7 percent** of the state's needs
- ☀️ Local solar powered the equivalent of **58,000** homes
- ☀️ Local solar created **\$22 million** in CO₂ benefits, and removed the equivalent of **42,000** cars from the road

Pollution Reduction Benefits

Energy market savings are just one benefit solar provides. Using peer-reviewed tools from U.S. EPA, we find that local solar avoided 4.6 million metric tons of climate-damaging carbon dioxide emissions in 2014 to 2019. Local solar also avoided the release of hundreds of thousands of pounds of criteria pollutants proven to have negative impacts on human health. **Public health and avoided CO₂ benefits of local solar exceed \$600 million dollars from 2014 to 2019 in New England, and \$93 million dollars in Vermont.**

Benefits of More Solar

If solar produced in Vermont in 2019 were doubled to 763,000 MWh, it would have provided \$29 million in energy benefits to Vermont, an increase of 1.7X. If Vermont's local solar were tripled, energy benefits would be increased by 2.4X to \$42 million. While the incremental energy benefit of each solar MWh does decrease, some of this difference could be mitigated by pairing solar with energy storage and smart load management.

Synapse Energy Economics, Inc. is a research and consulting firm specializing in energy, economic, and environmental topics. Since its inception in 1996, Synapse has grown to become a leader in providing rigorous analysis of the electric power sector for public interest and governmental clients. Contact: Pat Knight pknight@synapse-energy.com

Historical Local Solar Benefits

Benefit category	2019 c /kWh
Energy	11.9 ¢
Capacity	1.6 ¢
Criteria pollutants	1.0 ¢
CO ₂ @ \$112/MT	6.0 ¢
Energy, capacity, and pollution reduction benefits of solar	20.5 ¢

Additional benefits not calculated:

- Capacity price impacts
- Local economic benefits
- Transmission and distribution capacity
- Reliability benefits
- Participant savings
- Local tax support
- Retail margin

As a point of comparison, the typical Vermont household pays 16.4 cents per kWh for electricity. "Local solar" includes all solar less than 5 MW that is not enrolled in New England's electricity markets.

Renewable Energy Vermont's members are creating resilient, local economies powered by renewable energy and employ a 21st century workforce committed to improving the lives of their neighbors and communities. Together, we will achieve 100% total renewable energy (electric, thermal, transportation). Join us at www.revermont.org. Contact: Olivia Campbell Andersen olivia@revermont.org

See Synapse Energy Economics' 2020 report "Solar Savings in New England" for additional information on our methodology, findings, and sources: www.synapse-energy.com/new-england-solar-savings