



Understanding Solar Energy Issues in the Commonwealth of Massachusetts



February 2016

Prepared by Environmental Entrepreneurs



Good for the Economy
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EXECUTIVE SUMMARY



Solar energy is at a turning point in Massachusetts. While its benefits and popularity are undeniable, continued growth is in jeopardy. Solar development is completely stalled in half of Massachusetts and could grind to a halt throughout the state without supportive policies.

Solar energy is a long-term investment in a cleaner future. Every \$1 dollar invested in solar energy generates up to \$2.70 in benefits.

- Solar energy is a local source of clean, renewable energy that benefits all ratepayers, while reducing greenhouse gas pollution and fighting climate change.
- In Massachusetts, the solar sector is a large and growing industry that employs nearly 15,000 workers, an increase of 33% since 2013.
- Massachusetts, a leader in solar energy, has the potential to generate more solar power than we consume.

Benefits to ratepayers include:

- Avoided energy and transmission costs
- Reduced financial risk
- Greater grid resiliency and
- Lower energy prices

The benefits of solar energy are widespread. Businesses are turning to solar energy to provide predictable energy costs and meet their sustainability goals. Taxpayers in cities and towns are using solar energy to save money via reduced energy costs. Those who cannot put solar on their roof are participating in community shared solar programs or purchasing net metering credits from nearby solar projects.

Massachusetts provides fair compensation and reasonable incentives for solar developers.

- Solar system owners receive compensation for the energy they send back to the grid via a program called net metering. The utilities then resell this energy at the same price to neighboring customers.
- The state also offers an incentive program via Solar Renewable Energy Credits (SRECs). The cost of this program has dropped and will continue to drop as the cost of solar energy declines.
- The cost of solar energy has been overstated by the utilities, whose bottom line would be threatened by widespread adoption of solar energy.

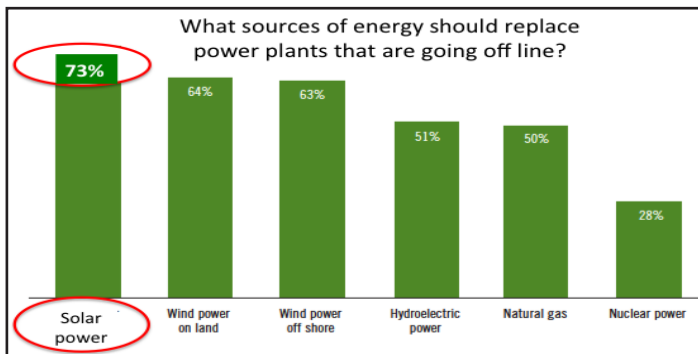
Massachusetts solar policy should take full account of both the costs and benefits of solar energy.

- State policy should eliminate the cap on solar net metering while maintaining retail compensation to solar developers by continuing to pay fair value for net metering credits.
- Proposals in H.3854 would have a chilling effect on the solar industry -- lost jobs and stalled solar projects that would disproportionately impact community projects and low-income residents.
- State policy should avoid arbitrary minimum bills for solar users that would stall solar development and send the wrong signal to the market.

SOLAR ENERGY ISSUES FOR MASSACHUSETTS

Q: What are the benefits of solar energy for Massachusetts?

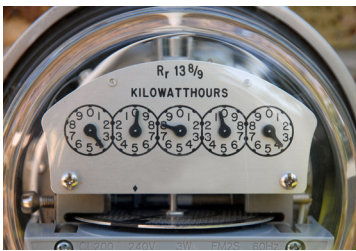
- A: Solar energy is a local source of clean, renewable energy that benefits all ratepayers – not just those with solar on their roofs.
- Solar energy supports nearly 15,000 well-paying jobs in Massachusetts¹ and contributes billions of dollars to our state's economy.
 - The state's Solar Task Force found that every \$1 invested in solar energy in Massachusetts generates \$2.20 to \$2.70 in benefits.²



• Solar energy is an important part of Massachusetts' efforts to fight climate change and reach state targets to reduce greenhouse gas emissions. Solar power is even more important because the Pilgrim Nuclear Power Plant is closing.

• Massachusetts residents overwhelmingly support solar energy. It was the number one choice – picked by 73% of respondents – to replace power plants going off line. In the same poll, 85% supported incentives for businesses and individuals to generate their own renewable energy.³

Q: How are solar developers compensated for delivering solar energy to the grid?



A. Net metering is a program used by Massachusetts and 43 other states to provide fair compensation to solar system owners for electricity they deliver to the grid. The payment is approximately equal to the retail value of this power, which the utilities then resell to nearby customers at the same rate. This policy has been instrumental in the growth of solar energy in the Commonwealth.

However, Massachusetts caps the amount of solar generating capacity eligible to use net metering. The cap has been met in two utilities' service territories, which has halted commercial, municipal and community solar projects in about half the state for nearly a year.

Q: What incentives does the state offer to develop more solar energy?

A: Massachusetts has a market-based incentive program to support new solar energy development. To encourage utilities to add more renewable power, they are required to buy SRECs (solar renewable energy credits) which represent the environmental benefits of solar power production.

As the cost of solar energy systems has declined, the state has reduced the SREC value, which reduces the overall cost of solar energy. The 2nd phase of this program, SREC II, will soon be totally committed. The DOER is expected to create a successor program to avoid a gap that would negatively impact solar development. DOER, the utilities, and the solar industry have agreed that in the successor program, SREC prices will continue to trend downwards to reflect the continuing cost declines.⁴

Q: How does solar energy benefit all ratepayers?

A: Solar energy reduces costs for all Massachusetts ratepayers in many ways:

- **Avoided energy costs:** Solar energy systems produce clean, renewable electricity on-site, reducing the amount of electricity utilities must purchase from fossil fuel-fired power plants. The New England grid operator, ISO-NE, recently announced that rooftop solar generation has gained so much traction in New England that it is changing the electric grid demand, dropping electricity consumption on sunny days.⁵

Massachusetts sends over \$20 billion out of state to buy imported fossil fuels. The more local energy we use, the more money stays right here in our local economy.
- **Avoided transmission costs:** Solar power reduces the need to buy power from a distant location and move it over long distance transmission lines. Solar power projects are located in Massachusetts, often right on the site where the power is used.
- **Avoided capital and capacity investment:** By creating local electricity supply, solar energy production helps ratepayers and utilities avoid the cost of investing in large power plants, transmission lines, pipelines and other fossil fuel electricity infrastructure.
- **Reduced financial risk:** Solar energy reduces ratepayers' exposure to volatile fossil fuel prices.
- **Increased grid resiliency:** More solar energy creates more diverse power sources, reducing our exposure to disruptions in power supplied by utilities.
- **Reduced line losses:** Large, centralized power plants transmit energy over long distances. As energy travels, some of it is lost as heat. Solar energy systems reduce this lost energy that costs ratepayers millions of dollars every year.
- **Lower energy prices:** Solar, like other renewable energy sources, operates without fuel costs. These low cost renewables displace resources with substantially higher operating costs, like coal or natural gas, which in turn lowers the price that ratepayers pay for electricity.

Q: How does solar energy benefit businesses?

A: Many businesses in Massachusetts are turning to solar energy to make energy expenses more predictable and to meet renewable energy targets. Traditional energy prices are volatile. By making these costs more predictable, solar energy makes it easier for businesses to manage expenses.



Wal-Mart, Staples, Bed Bath and Beyond, and IKEA are among the large retailers in Massachusetts that use solar energy. Verizon has installed one of the largest corporate photovoltaic systems in the state with 1 megawatt (MW) of solar capacity at its Billerica location.

Q: How does solar energy benefit taxpayers in cities and towns throughout the state?

A: Over 175 Massachusetts cities and towns have installed solar energy to reduce and stabilize energy costs and increase tax revenue. At least 181 Massachusetts schools generate 25,400 kilowatts (kW) of solar electricity, ranking the state's schools 4th in the nation in installed capacity.⁶

New Bedford's solar projects will save the city about \$22 million in electricity costs over the next 20 years. Dennis expects a solar project to save \$500,000 a year in electricity costs for the next 20 years. A former Billerica contaminated Superfund site has been turned into a solar energy farm that will provide millions of dollars in revenue for the town.



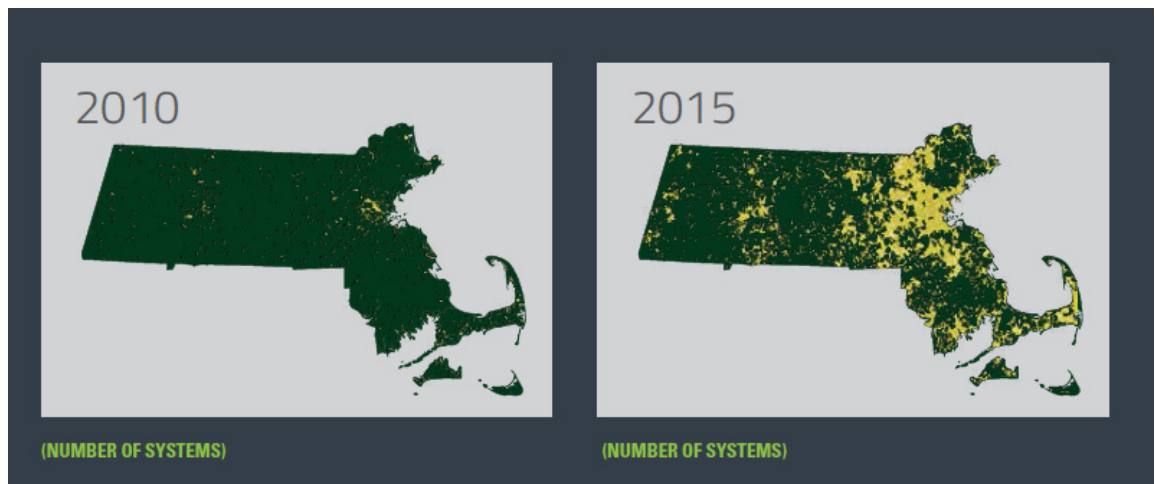
Billerica

Norton is one of more than 50 communities with projects currently stalled by the net metering cap. Norton plans to turn a 10-acre brown-field into a solar energy field. This project would generate more than \$6 million in financial benefits to Norton over 20 years through electricity savings, lease payments, and taxes. If the cap is not raised or if the amount of compensation is cut, projects like these would not be able to go forward.

Q: What is the potential for solar power in Massachusetts?

A: Massachusetts is a leader in solar energy, with nearly 1000 MW of installed solar capacity, enough to power approximately 160,000 homes⁷. After surpassing its initial goal of 400 MW four years ahead of schedule, the state set a new goal of 1600 MW by 2020.

Solar photovoltaic (PV) capacity in Massachusetts increased 19% in 2014 alone.⁸ Far more is possible. The federal National Renewable Energy Laboratory says Massachusetts has the potential to produce twice as much electricity from solar power as we consume each year.⁹



Q: Why do utilities claim that solar development is too costly in Massachusetts?



A: Utilities overstate the cost of solar development because solar energy has the potential to cut their profits. Until now, New England utilities have been extremely profitable — in 2014, for example, Ever-source shareholders received a total return of 30.5%.¹⁰

If solar energy were widely adopted, it could undermine utilities' bottom line by eroding their primary source of profit: large scale, long-distance transmission lines that move electricity from one place to another.

Utilities can earn 10-12% profit on these infrastructure investments.¹¹ These costs have triggered an investigation by the Federal Energy Regulatory Commission (FERC) because New England's transmission rates are the highest in the country – more than twice as much as nearby Mid-Atlantic states pay.

The utilities' solar cost estimates consider only the costs and not the benefits of solar energy. Solar energy is an investment in our future — like schools, roads or bridges — and like any other investment, we need to weigh both costs and benefits.

An independent report found the utilities' analysis: "Incomplete in scope and detail, and ... misleading on its own. Of greatest concern, the various simplifications, assumptions, and omissions in the companies' analysis tend to systematically ignore or understate net metering benefits, while overstating the utilities' presumed cost impacts on ratepayers." ... Expanded development of solar PV will reduce the costs to the region's consumers associated with new supply and transmission infrastructure needed to meet current and future demand for electricity."¹²

Q: Are Governor Baker and others correct that solar costs two to three times the price of any other option?

A: No, Governor Baker is comparing apples to oranges. His estimate does not consider distribution and transmission costs associated with other energy sources. A 4¢ per kilowatt hour (kWh) cost for natural gas doesn't include the transmission costs to get the energy to the customer or other costs embedded in our energy bills.

Also, the costs quoted are from old data, projects done years ago under the first phase of the solar incentive, SREC I, which offered more generous incentives to jumpstart the Massachusetts solar market when prices for solar development were higher. As these prices dropped over time, so have the incentives. Today, the average cost of an SREC over the life of a solar project is about 6¢-7¢ per kWh.

Solar is a zero risk to ratepayers — it only gets paid when it's used, unlike the transmission lines or gas pipelines.

Most importantly, many solar projects don't cost ratepayers any net metering compensation because they produce electricity used entirely on-site. Ratepayers pay only the average SREC cost of 6¢-7¢ per kWh for energy that is used on the site where it is generated. The cost of solar energy returned to the grid is about 25¢ per kWh -- a combination of the average net metering credit of 18¢ per kWh plus the average SREC cost of 6-7¢ per kWh. In addition, as noted earlier, the benefits of solar far exceed these costs.

Q: What would happen if net metering rates were cut by 75% as proposed by the House of Representatives in H.3854?

A: If H.3854 were to pass as written, jobs would be lost and many new solar projects would never be built because they would lose money.

Here are two examples of solar projects that currently save communities money but would not be profitable if net metering rates were slashed from retail to wholesale rates, as proposed in H.3845¹³



*Lexington Municipal Solar Project:
Current savings: \$73,000 per year
H.3845 loss: -\$116,000 per year*



*Pioneer Valley Community Shared Solar:
Current savings: \$30,000 per year
H.3845 loss: -\$25,680 per year*

New solar energy projects won't be built if net metering rates cease to provide compensation for delivering solar energy to the grid at a price that makes solar projects economically viable. We will lose revenue and jobs if the solar industry shrinks in Massachusetts. Also, it will be harder to reach our clean energy targets if solar energy fails to reach its potential in Massachusetts.

Nevada recently made drastic cuts to its net metering compensation and as a result has already lost nearly 1,000 jobs when the two largest solar developers promptly pulled out of the state. California recently made the opposite decision, opting to retain retail rate payments with only minor additional costs.

Q. What would happen if a minimum monthly charge were imposed on solar users as proposed by H. 3854?

A. Imposing a minimum monthly charge on solar in electric bills, especially a high minimum monthly charge, would increase the cost of solar and discourage solar development. H. 3854 would impose the highest possible minimum monthly charge, as it pegs the charge to utilities' "fixed costs," and would disproportionately affect municipal, community shared, and low income solar.

Footnotes

1. 2015 Massachusetts Clean Energy Industry Report, p.52; <http://www.masscec.com/content/2015-massachusetts-clean-energy-industry-report>
2 Massachusetts Net Metering and Solar Task Force Final Report to the Legislature, p. 132; <http://www.mass.gov/eea/docs/doer/renewables/final-net-metering-and-solar-task-force-report.pdf>
3 Looking for Leadership: Public Opinion in Massachusetts on the Response to Global Warming; MassINC, March 2015
<http://www.massincpolling.com/wp-content/uploads/2015/09/Looking-for-Leadership-MassINC-Global-Warming.pdf>
4 Solar Task Force report; <http://www.mass.gov/eea/docs/doer/renewables/final-net-metering-and-solar-task-force-report.pdf>
5 ISO- NE State of the Grid 2016, Slide 34, http://www.iso-ne.com/static_assets/documents/2016/01/20160126_remarks_2016stateofthegrid.pdf
6 <http://www.seia.org/news/massachusetts-schools-embracing-solar-energy>
7 <http://www.seia.org/state-solar-policy/massachusetts>

8 2015 Massachusetts Clean Energy Industry Report; MassCEC; <http://www.masscec.com/2015-massachusetts-clean-energy-industry-report>
9 U.S. Renewable Energy Technical Potentials: A GIS-Based Analysis; Technical Report NREL/TP-6A20-51946 July 2012; <http://www.nrel.gov/docs/fy12osti/51946.pdf>
10 Eversource 2014 Annual Report, <https://www.eversource.com/Content/docs/default-source/Investors/2014-annual-report.pdf?sfvrsn=2>
11 Utilities' Profit Recipe: Spend More; Wall Street Journal, April 20, 2015; <http://www.wsj.com/articles/utilities-profit-recipe-spend-more-1429567463>
12 Net Metering In The Commonwealth Of Massachusetts: A Framework For Evaluation; Analysis Group; May 2015; http://www.analysis-group.com/uploadedfiles/content/insights/publishing/hibbard_net_metering_5-2015.pdf
13 How Solar Energy Benefits Communities Across the Commonwealth; MassSolar Legislative Briefing; January 14, 2016
14 The Great Guessing Game: How Much Net Metering Capacity is Left?; EQ Research, September 2015; http://eq-research.com/wp-content/uploads/2015/08/NEM-Cap-Reporting-09_01_15.pdf

Q: What are the elements of the right solar policy for Massachusetts?

A: Massachusetts will benefit from a policy that takes full account of both the costs and benefits that solar energy provides to all citizens of the state. Such a policy would include the following:

1. Immediately and permanently remove the cap on net metering so that new solar development can go forward throughout the state. Eliminating the cap will provide the predictability that solar sector investors need to make long-term decisions to build solar projects in Massachusetts. Of the 44 states that use net metering, 17 have no cap.¹⁴
2. Avoid arbitrary cuts to solar net metering credits. Current net metering rates provide fair compensation for value delivered to all state residents, including solar customers. Reducing these rates significantly will make new projects unaffordable and drive solar business out of the state to more business-friendly locations, which will cost us revenue and job losses and impede our ability to reach our climate change goals.
3. Do not enact an arbitrary minimum bill for solar users. Annual charges of \$30 per month or more would undermine the value of installing solar systems for many users and dramatically reduce the amount of solar that is installed in the state. It would send the wrong signal to the market about the urgent need to increase renewable energy in Massachusetts.
4. All parties agree that the value of SRECs in the next solar incentive program should be reduced. This would save a significant amount of money over time, without jeopardizing the overall solar program. DOER should promptly create the SREC III program to ensure that there is no gap in solar incentives when SREC II expires within a few months. A gap will cause solar projects to be put on hold and create business uncertainty.

Solar power is an essential building block for Massachusetts' clean energy future. It is urgent that we provide a policy framework to encourage this clean, renewable source of energy that may well dominate the 21st century.



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