

Update: Solar Electric Reductions of Polluting Emissions

Installing a solar electric system brings many rewards, from the independence of producing your own energy, to reducing our nation's reliance on fossil fuels. Arguably, the largest benefit to the environment comes from the reduction of polluting emissions by replacing dirty grid electricity with the clean and renewable electricity produced by your PV system. BPVS has recently updated our calculations of the emissions reduced by utilizing solar energy to reflect the 2010 mix of electricity production in Massachusetts. Despite the state's progressive attitude toward clean energy, the Massachusetts grid remains heavily reliant on fossil fuels. Oil, natural gas, and coal provide 78 percent of the state's electricity. As a producer of solar electricity, you are producing emissions-free electricity and taking the lead in reducing the environmental impact of our state.

Environmental Benefits per 1 kW of PV Capacity

Based on Massachusetts Generation Mix Year 2010

		Daily	Yearly	System Life 30 Yrs
kWh	high	3.710	1354.150	40624.500
	low	3.208	1170.920	35127.600
CO ₂ (lbs)	high	4.338	1583.462	47503.850
	low	3.751	1369.204	41076.110
SO ₂ (lbs)	high	0.018	6.714	201.416
	low	0.016	5.805	174.163
NO _x (lbs)	high	0.009	4.466	100.993
	low	0.008	2.911	87.327
Hg (g)	high	0.004	1.600	47.994
	low	0.004	1.383	41.500

CO₂- Carbon Dioxide, SO₂- Sulfur Dioxide, NO_x- Nitrogen Oxide, Hg- Mercury

High= Estimated Production based on Boston Weather Data 20 year average for irradiance and optimal array siting

Low= Actual Production average of 14 PV systems spread across Massachusetts and monitored by BPVS 2004-2009

Emissions calculated using data from ISO-NE, EPA, EIA, and McClatchy

Carbon Dioxide (CO₂)

The scientific consensus shows that climate change is a major threat to the environment and society in the near future. The main source of anthropogenic climate change is the greenhouse gas, carbon dioxide (CO₂). This pollutant is created in massive quantities from the burning of fossil fuels. A solar electric system produces power without the release of carbon, thus reducing emissions significantly by replacing traditional utility-provided electricity. In just one year, even with only a small 1 kW system, between 1300-1600 lbs of CO₂ is prevented from entering the atmosphere. Over the 30

year life of the system, this total climbs to well over 40,000 lbs. As a producer of solar electricity, you are making a difference in the fight against climate change.

Sulfur Dioxide (SO₂), Nitrogen Oxide (NO_x), and Mercury (Hg)

CO₂ is not the only hazardous pollutant that is reduced by your generation of clean electricity. Sulfur dioxide (SO₂) is credited with causing acid rain, which can greatly harm ecosystems. Nitrogen Oxide (NO_x) is the pollutant that forms the smog in our air, which carries with it numerous health impacts. Mercury (Hg), a byproduct of coal burning, is a potent toxin, notorious for its adverse effects on the neurological system. All of these are produced by fossil fuel-based energy suppliers in order to meet the electricity demands of the state. Your solar electric system produces none of them and your electricity production effectively replaces dirty energy with clean and renewable power.

Clearly, the benefits of solar electricity are greater than ever. Fossil fuel pollution damages our environment and communities, while climate change looms as an even greater threat to young and future generations. By installing a solar electric system, you are being part of a solution that is both practical and imperative. For PV system owners, a brighter future sits on their rooftops.



BPVS, Berkshire Photovoltaic Services
46 Howland Ave
Adams, MA 01220
Tel 413 743-0152
e:info@bpvs.com