



WOODSTOCK, N.Y.  
COLONY OF THE ARTS

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# Ulster County Climate Smart Committee Town of Woodstock Update June 26, 2017

## Summary of Current Activities

### Solar RFP for Woodstock Landfill

Woodstock will issue an RFP to understand the interest from solar developers for building a community solar project on Woodstock's closed landfill.

### Woodstock's 2016 Carbon Neutral Report Distributed

In March, 2007 the Woodstock Town Board adopted the Carbon Neutral/Zero Carbon resolution that committed the Town to implement policies resulting in no net emission of carbon dioxide and other greenhouse gases by the end of 2017. Based on a careful accounting of the Town's carbon dioxide emissions and the consequences of carbon sequestration by the town's forests, Woodstock has achieved "Net Carbon Neutrality."

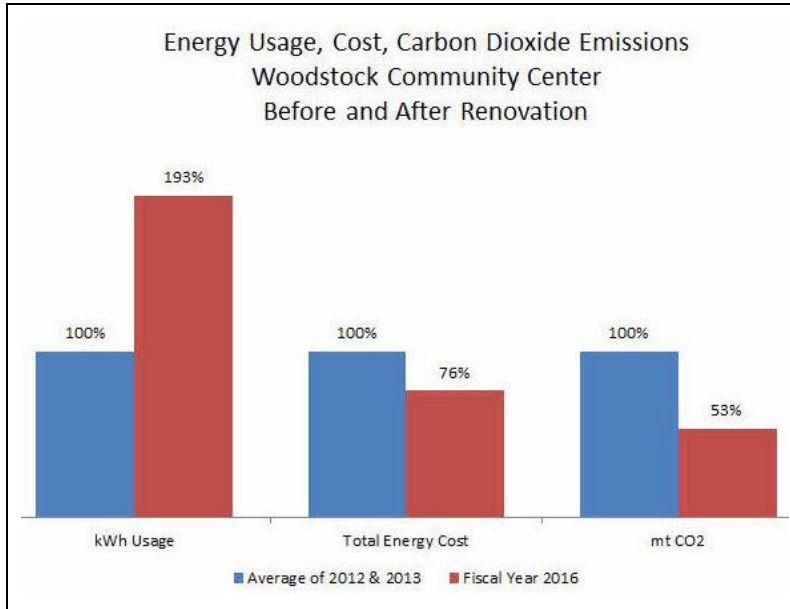
A written report on Woodstock's net carbon neutral carbon initiative for 2016 was submitted to the Town Board. A summary was previously presented to the Town Board in February.

### Community Center Carbon Footprint

During 2014 & 2015, Woodstock renovated the town's community center located at Andy Lee Field. One objective of the renovation was to improve the center's energy efficiency and reduce its carbon footprint. The community center's oil based heating system was replaced by air-sourced heat pumps for heating and cooling. Also, the individual electric services for the swimming pool, pavilion, and craft barn were combined into one service with the community center.

Analysis of before and after energy usage, costs, and carbon dioxide emissions shows the town met its objectives for improving efficiency and reducing cost and emissions. Although electrical usage doubled, the cost of energy was reduced by about 25% and emissions were reduced by about 50%.

It could be noted the emergency backup generator that supports the community center's use as an emergency shelter accounts for about a third, or 4 metric tons, of the attributed carbon dioxide emissions. The EPA estimates that a typical passenger vehicle emits about 4.7 metric tons of carbon dioxide per year; correspondingly the Community Center's backup generator emits less carbon dioxide than a typical passage car.



Andy Lee Field Energy Usage

	Average of 2012 & 2013				2016			
	Gals	kWh	Cost	mt CO2	Gals	kWh	Cost	mt CO2
Any Lee Field Pavillion								
Andy Lee Field Pool								
Andy Lee Field Craft Barn						112	\$219	0.0
Community Center Electric						51,480	\$6,489	8.5
Community Center Heating Oil								
Community Center Generator Diesel					394		\$601	4.0
Community Center Totals		26,675	\$9,594	23.6		51,592	\$7,309	12.6
Percent Change						93.4%	-23.8%	-46.6%

Andy Lee Field Energy Usage

	2012				2013			
	Gals	kWh	Cost	mt CO2	Gals	kWh	Cost	mt CO2
Any Lee Field Pavillion		32	\$417	0.0		299	\$447	0.1
Andy Lee Field Pool		7,951	\$1,146	1.8		6,057	\$1,014	1.5
Andy Lee Field Craft Barn		913	\$502	0.2		1,044	\$529	0.3
Community Center Electric		18,233	\$1,931	4.1		18,821	\$2,077	4.7
Community Center Heating Oil	1,528		\$5,336	15.6	1,850		\$5,790	18.9
Community Center Generator Diesel								
Community Center Totals		27,129	\$9,332	21.8		26,221	\$9,856	25.4
Percent Change								

mt CO2 – metric tons carbon dioxide

## Ryan Insurance/Heritage Energy Community Solar Project<sup>1, 2, 3</sup>

Ulster County's first community solar project was organized as a partnership between Bob Ryan, owner of Ryan Insurance Brokers, and Heritage Solar, an affiliate of Kingston-based fuel oil and propane distributor HeritagEnergy. Community solar allows residents and business without a proper site for solar panels to obtain solar energy from a community provider.



Ryan Insurance's building on Ulster Avenue showing the white reflective roof and bifacial solar panels.

Tom Kacandes of **Inside Track Solar**, the project manager, presented at the May 24, 2017 meeting of the Kingston Climate Smart Committee. Tom presented a well thought out and designed project.

Solar energy became a consideration because the roof on Ryan's building needed replacement and asked if it made sense to install solar panels with the new roof? Ryan Insurance teamed with Heritage Energy, which has an established customer management and billing process for selling energy, to manage the customer relationships and offer solar energy to its customers.

The solar panels, produced locally by Highland-based **Prism Solar Technologies**, are bifacial and use incident sunlight and reflected light from the white roof below. This design increases power output and provides more electrical energy from the same space. Bifacial modules are suitable for roofs with a white or reflective "cool roof" coating that reflects sunlight allowing the roof to stay cooler and improve solar panel performance. With the use of reflective backgrounds, bifacial modules can increase the energy produced in kilowatt-hours by up to 35% over a conventional solar module with an equivalent nameplate wattage rating.

## Cypress Creek Renewables<sup>4</sup>

Although Ryan Insurance/Heritage Energy partnership is the first community solar project in Ulster County, many more projects are proposed. The Central Hudson interconnection queue for April 2017, listed 110 distributed generation projects greater than 50kW, of which, Cypress Creek Renewables accounted for 40.

Cypress Creek Renewables CEO Matt McGovern recently spoke at a recent UCLA Anderson School of Management event in Los Angeles. New York is a great example of a market that makes sense, according to McGovern.

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<sup>1</sup> *First Mid-Hudson Community Solar Project Debuts in Kingston Area*, Central Hudson, March 7, 2017, <https://www.cenhud.com/news/news/first-mid-hudson-community-solar-project>

<sup>2</sup> *My only sunshine*, Sveikauskas, Geddy, March 16, 2017, <https://hudsonvalleyone.com/2017/03/16/my-only-sunshine/>

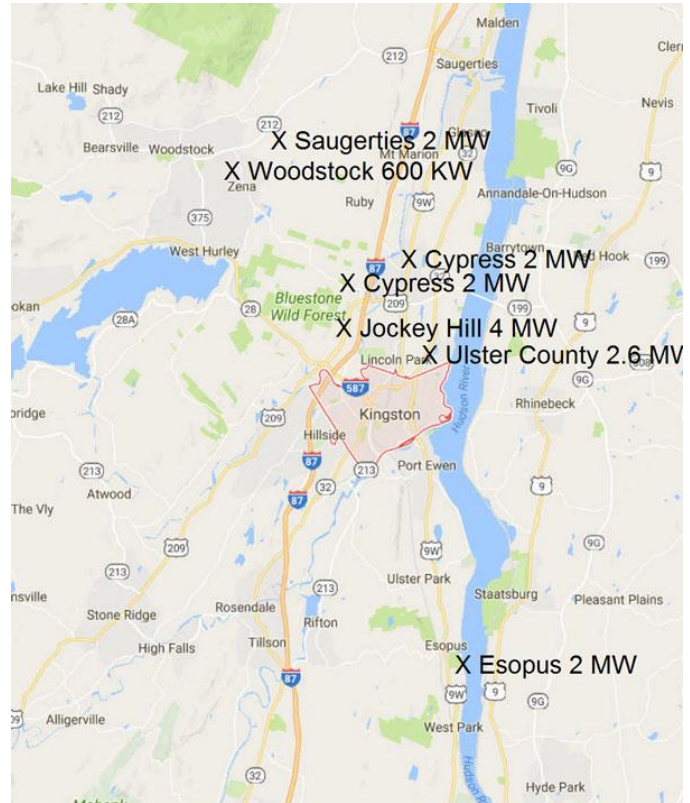
<sup>3</sup> *Community Solar Takes Off – With a Home Heating Oil Company Leading the Way*, Courtney Strong, April 21, 2017, <http://courtneystrong.com/2017/04/community-solar-takes-off-home-heating-oil-company-leading-way/>

<sup>4</sup> The Santa Monica-based company is the second-largest utility-scale solar developer in the U.S., behind only First Solar. <https://www.greentechmedia.com/articles/read/cypress-creek-ceo-well-be-sub-75-cents-per-watt-by-2020>

“We have 1,400 sites in New York and they're only 2-megawatt AC interconnects, but the fact that we could step in and aggregate that at scale means that I will systematize...my development process, my interconnect and my build to make that work,” he said.

Cypress Creek partners with local contractors on permitting and construction, while maintaining oversight. “It’s a local relationship that makes that stuff actually get over the finish line,” McGovern said. “I want to leverage that, not try and cannibalize that.”

Local to Woodstock, Cypress Creek Renewables has proposed two community solar projects: one in Saugerties along Route 32 and another in the Town of Kingston off of Hallihan’s Hill Road overlooking Sawkill Road.

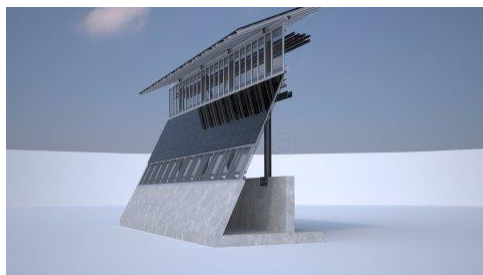


Map data ©2017 Google 2 mi

Solar projects >50kW near Woodstock

## Trump’s Solar Wall<sup>5</sup>

During a White House meeting with Republican Congressional leaders on June 6, President Trump discussed plans for his proposed US-Mexico border wall. As Axios reported, he pitched covering the wall in solar panels and using the generated electricity to pay for its construction.



"Pretty good imagination, right? My idea. So we have a good shot. That's one of the places that solar really does work, with the tremendous sun and heat -- it really does work there," said Trump. "So we'll see what happens with that. That would be great. And I think we could really make it look beautiful too...so that would be nice."

### How Much Solar?

Estimates of how much energy a solar border wall would produce vary, depending on the size of the array and the wall itself. But some companies are already imagining what it would look like. Oregon-based solar installation firm called Elemental Energy

<sup>5</sup> *How much electricity a hypothetical solar border wall could generate?*, Business Insider, June 9, 2017, [http://www.businessinsider.com/trump-solar-wall-energy-2017-6?nr\\_email\\_referer=1&utm\\_source=Sailthru&utm\\_medium=email&utm\\_content=TechSelect&pt=385758&ct=Sailthru\\_BI\\_Newsletters&mt=8&utm\\_campaign=BI%20Tech%20%28Wednesday%20Friday%29%202017-06-09&utm\\_term=Tech%20Select%20-%20Engaged%2C%20Active%2C%20Passive%2C%20Disengaged](http://www.businessinsider.com/trump-solar-wall-energy-2017-6?nr_email_referer=1&utm_source=Sailthru&utm_medium=email&utm_content=TechSelect&pt=385758&ct=Sailthru_BI_Newsletters&mt=8&utm_campaign=BI%20Tech%20%28Wednesday%20Friday%29%202017-06-09&utm_term=Tech%20Select%20-%20Engaged%2C%20Active%2C%20Passive%2C%20Disengaged)

calculated that a wall with 10-foot-high solar paneling would generate approximately 7.28 gigawatt-hours (GWh) of electricity each day (2,657.2 GWh per year).

Elemental's co-owner, John Grieser, broke down the math. In his hypothetical calculation, the solar panels would be mounted to the wall at a fixed tilt and orientation (meaning they wouldn't move to track the sun, which is a more expensive option), Grieser says. Each panel would feature 72 solar cells, and measure 78 inches high. The US southern border measures nearly 2,000 miles across four states, but only about half of that length is on unobstructed land. A 1,000 miles converts to 63.36 million inches. When you divide that by the size of each panel (78 inches), you get 812,308 columns of panels (oriented in landscape).

Multiplying 812,307 by five, you get 4,061,538 panels in total. Since 72-cell modules usually produce 350 watts (W), you end up with about 1.4 billion W (or 1.4 GW) of power.

### How Much Power?

Elemental's co-owner, John Grieser, estimated the wall would produce 2,657.2 GWh/year. This gives a solar capacity factor of about 22% on the sunny, southern border. In New York, the solar capacity factor is 15%. Two other solar developers gave much higher estimates, which may be more of a reflection on the integrity of some solar promoters rather than a proper analysis of the solar wall's generation potential.

Trump Solar Wall Estimates	GW	GWh/Year	Capacity Factor	Equivalent Hours of Sunshine/Day
John Grieser, Elemental Energy	1.4	2,657	22%	5.2
Jigar Shah, co-founder of Generate Capital	1.4	6,600	54%	12.9
Clean energy consultant Adam Siegel	1.4	8,431	69%	16.5

There's been little discussion about the requirement for all the solar panels to be oriented south facing Mexico.

### A Trump Wall to Replace Indian Point?

If, as a hypothetical question, how much of Indian Point's capacity could be replaced with a 1,000 mile long solar wall in New York? A big difference from the southern boarder is that the solar capacity factor in New York is only 15%. At a 15% capacity factor, a 1,000 mile Trump solar wall would generate 1,840 GWh/year, or about 11% of Indian Point's 16,666 GWh generation.