

## Solar Performance and Price Considerations

### Many details impact costs and benefits

Jeff Dickinson

Solar Photovoltaic (PV) panels produce DC electricity when sunlight strikes a chemically-coated silicone cell. The amount of power produced fluctuates with the intensity of the sun. The DC current moves through wires to an inverter, where it is converted into AC current, the type of electricity that runs our households and businesses.

A solar PV panel needs to operate for about four years to generate enough electricity to theoretically make up for the energy used to manufacture and install the panel. Once in place and generating electricity, the panel does not produce carbon or other greenhouse gases. The fuel source is free, and the panels create a positive environmental impact with every watt of electricity produced.

Almost all Solar PV systems being installed these days fall under the New Hampshire Net-Metering Program. Under this State-sponsored program, a household-level electricity generator is given privilege to sell small amounts of renewable electricity into the grid.

These systems run independently of a house's electrical panel. All the electricity goes directly into the grid; should the grid lose power, the house will also be without electricity.

With a net-metering PV system in place, additional equipment will be required to keep the power on during a daytime outage. Adding batteries so the electricity can be stored and used at night is possible, but this kind of system comes with increased cost and complexity.

#### Pricing of Power

New Hampshire Electric Cooperative (NHEC), Andover's electric supplier, is required by state law to purchase a pre-set amount of electricity from renewable sources. The amount the utilities pay electricity producers for household solar PV electricity is set by the legislature and thus is subject to politics and change in the future.

Currently under the net metering program, NHEC pays a household generator the same rate as all residential users pay for electricity – this is where the “net metering” name comes from. The rates NHEC pays to commercial renewable electricity providers are market-based and about half that paid to household generators under the net-metering program.

The general trend around the world is for legislatively-set rates to decline downward to market rates over time. If this were to happen in New Hampshire, it would have a direct and adverse effect on the break-even point, sometimes called pay-back, of a net metering Solar PV installation.

#### Financing Solar PV

The time it takes to break-even on

the purchase of a Solar PV system varies depending on the upfront cost incurred; the amount of electricity produced over its life; the rate at which the electricity is purchased over that lifetime; and the on-going maintenance and repair cost. Some think Solar PV systems are a way to immediately save money on electricity, but in reality there will not be a financial saving for quite a while (the so-called “break-even” point).

While the owner of a net metering system will see their electric bill drop, what is happening, if financing was used for the purchase, is a transfer of payments from the electric company to a finance company until such time as a true break-even is achieved.

#### Life Expectancy

Most manufacturers warranty their panels for 25 years. While there are no moving parts in a Solar PV system, they are exposed to UV rays and temperature extremes that will wear out the components over time – not unlike how a TV picture will degrade over the years.

An important PV system component life expectancy issue is with the inverter (both “string” and “micro” types). Inverters are the weak link in Solar PV systems and have a documented history of failing before the panels do.

The inverters may have a shorter warranty than the panels, as they typically come from a different manufacturer. While the inverter may be covered by a manufacturer's warranty, the replacement may not be in the later years of a systems life.

When the panels do finally wear out, they will need to be disposed of as electronic waste. Firm estimates on the price for decommissioning are hard to find at this time, but disposal will be an additional cost (currently not included in break-even calculations) when the panel wears out.

## Mario Ratzki Reports from Concord: December 2014

Mario Ratzki, NH Representative

It may seem a lifetime ago, but the 2014 election was just over a month ago. I want to thank all who participated, and especially those who voted to re-elect me to represent our three beautiful towns of Andover, Salisbury, and Danbury. My buddy, David Karrick, also got the nod, as did Senator Andrew Hosmer after a vote recount.

The results in New Hampshire saw Maggie Hassan re-elected as governor, Jeanne Shaheen as US senator, Annie Kuster as Congresswoman, and Frank Guinta elected as Congressman, having defeated Carol Shea-Porter. The New Hampshire Senate is now 14 to 10 in favor of Republicans, while the House has a 239 to 160 (plus one independent/Democrat) Republican majority. The Executive Council switched to Republican control as well, 3 to 2.

The Democratic caucus unanimously elected Steve Shurtleff of Penacook as speaker, while the Republican caucus elected Bill O'Brien in a 116 to 112 vote against Gene Chandler. The entire House elected the 2015-2016 speaker on December 3. In a stunning turn of events, former speaker Bill O'Brien failed in his attempt to regain the top post, and Shawn Jasper (R) was elected Speaker of the House of Representatives instead.

While the Republicans will control the House and the Senate, they will not have the two-thirds majority necessary to overturn the Governor's vetoes. This simple fact would argue for compromise and bipartisan legislation. We will

have to wait and see.

Given the future composition of the legislature, I gave up on a bill to establish a four-year term for governor, the bill having zero chance of being approved. I did introduce a new privacy bill which would forbid Internet and other providers from sharing one's content history with third parties.

I was told by Ms Asplund-Walsh, county commissioner, that the county budget will see a zero-percent increase for 2015, \$500,000 below last year's budget.

I also want to congratulate the New Hampshire Department of Transportation for a job well done on the Green Crow bridge, as well as the partial repaving of Highway 127 in Salisbury. The final repaving will occur in the spring of 2015.

Signing up for health insurance through the Affordable Care Act has already started at HealthCare.gov amid reports that premiums have fallen by about 15% since last year due to increased competition from multiple providers. It may pay to re-examine one's policy rather than simply continue with a previous insurance policy.

On a personal note, I was happy to be the lucky winner of a 12-gauge Browning shotgun at the Andover Fish and Game raffle in East Andover. Watch out, squirrels and woodchucks! Stay away from my barn!

I am always available at 735-5440 or at MarioRatzki@gmail.com. I guarantee full discretion for my help. Please do not hesitate to get in touch.

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