Henniker, New Hampshire: Solar Energy Program 2018

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Henniker Energy Committee

A report from the Henniker Energy Committee: Solar Energy 2018

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Abstract

Eighteen years into the “New Millennium” the world has clearly turned its attention to carbon emissions. How private companies and municipalities manage their carbon footprint and approach to energy supply and consumption in general is becoming a top-tier operational issue — and a big deal to regulators, customers, employees, investors and home buyers. One needs to look no further than the tech world, where energy is now the largest component of variable cost for running a datacenter. It is not hard to see why tech giants have developed renewable energy strategies.

For the Town of Henniker, understanding our energy consumption and developing a renewable energy strategy will play a large role in determining our property tax rates in the future. A well-managed property tax rate will certainly be a key factor in attracting future business startups.

In the summer of 2017, Henniker’s Board of Selectmen received a proposal regarding the construction of a solar energy system. At that time, Selectmen Peter Flynn encouraged the Board of Selectmen to reconstitute the Energy Committee. Once re-established, the Energy Committee set out to review a prior Energy Audit (Jordan Institute Energy Audit of 2011) on all Town owned buildings. The committee also reviewed the amount of electrical energy consumed by the Town of Henniker.

Once the review was completed, the Energy Committee developed this report and recommendation, to help guide the Board of Selectmen in developing Henniker’s future Solar Energy Program.

Keywords: *solar energy, solar panels, net-metering, power purchasing agreements*

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Creating a solar energy program is not easy. It is far more than just placing some sort of sunlight collection panel on a roof that attracts the sun and magically electricity is created, or heat is captured. A well-designed Solar energy program has two vital components that need to be thoroughly examined as the program's operating conditions are being developed;

1.) Types of Solar Energy systems: Solar Panels and Solar Collectors. For this review and report only, Solar Panels were considered.

2.) Financial agreements: The committee reviewed two financial agreement options that currently dominate the solar market place; Net-Metering Credit Purchasing Agreements and Power Purchasing Agreements.

Solar Panels `

Today, Solar Panels are, "Photovoltaic (PV) devices that generate electricity directly from sunlight via an electronic process that occurs naturally in certain types of material, called semiconductors. Electrons in these materials are freed by solar energy and can be induced to travel through an electrical circuit, powering electrical devices or sending electricity to the National Power Grid."

The industry has two types of PV devices, Flat panel and Curved or Parabolic. Both types can be roof mounted and or ground mounted. To increase capture efficiency both Flat panel and Curved Panel arrays can be constructed with a motorized Sun Tracking mechanism.

Financing Agreements

Below are the two types of financing/power agreements that the committee researched and discussed.

Net Metering Credit Purchasing Agreement NMA.

A NMA is a billing mechanism that credits solar energy system owners for the electricity they add to the grid. Understanding the process of net metering is key to understanding a NMA. When a building consumes electricity from the grid the building's electricity meter spins forward to account for the consumption. When solar is installed on site, the meter will still spin forward if consumption is greater than the solar production. However, when the solar array is producing more electricity than what is being consumed, the meter will spin backwards. The utility accounts for this, and if more solar electricity is produced than consumed during a billing period the utility will credit your next month's bill with the excess production.

Typically, in a NMA the customer owns the solar equipment and is responsible for maintenance costs of the solar array.

Pricing of credits: Pricing in a NMA, typically fluctuates depending on the value of the Net Metering Credit. Contracts do have a price floor and a guaranteed percent savings. "For example, a NMA may be priced with a $0.105/kWh price floor or a 5% savings to the value of the Net Metering Credit. Since the value of the Net Metering Credit fluctuates with rising utility prices, the NMA payment for the Net Metering Credit will also increase." (Eliza Porter)

Power Purchasing Agreements; PPA.

A PPA is a financial agreement where a developer arranges for the design, permitting, financing and installation of a solar energy system on a customer's property at little to no cost. The developer sells the power generated to the host customer at a fixed rate that is typically lower than the local utility's retail rate. This lower electricity price serves to offset the customer's purchase of electricity from the grid. The solar company owns and operates the solar

array and undertakes the costs associated with installing and maintaining it. The host client leases the roof or ground space to the solar company.

***Pricing*:** The power purchase agreement specifies how much the host client will pay the solar company for every kilowatt-hour (kWh) produced by the solar array. This figure is also translated into monthly and yearly costs. The price can be calculated in one of two ways:

• Flat price (same every month for the PPA term)

• Escalating price (increases at a certain interval agreed upon by both parties)

The power purchase agreement also specifies the estimated amount of electricity produced annually by the solar array for the entire term of the agreement.

Summary:

Simply put, Power Purchasing Agreement (PPA) is a contract to sell power and a Net Metering Agreement is a contract to trade energy credits.

Energy Committee Recommendation:

After thorough review the Energy Committee on January 17, 2008, voted unanimously to adopt the following recommendation to the Henniker Board of Selectmen:

The Town of Henniker solicit proposals from qualified solar energy design and installation companies to engineer, provide equipment, and install one of the 2 following photovoltaic electric systems (which one is to be determined by the Town after reviewing the proposals and following a Town vote):

1. Provide an analysis of electrical energy consumption of municipal buildings
2. Generate designs and reports of estimated electricity production for 2 systems over a projected system lifespan of 25 years:

   a. One that covers the electricity usage of the Highway Garage and Police Station
   b. One that covers the electricity usage of all municipal buildings
3. Present Cost Quotes for the two systems that include all costs including design, permitting, equipment, installation, interconnection, financing, internet-based production monitoring, and periodic maintenance (if any) costs
4. Create a Financial Benefit Analysis for:
   a. Ownership through outright purchase
   b. Ownership through bonding
   c. Power Purchase Agreement
5. Supply a schedule of equipment warranties and of periodic maintenance, if any.

In choosing equipment for the project, long-term durability is very important. The use of American-made components will be given favorable consideration.

Recommended companies for receipt of RFP:

Granite State Solar	Bow, NH (603) 369-4318
Harmony Energy Works	Hampton, NH (603) 926-3366
Norwich Solar Technologies	White River Junction, VT (802) 281-3213
ReVision Energy	Brentwood, NH (603) 679-1777
Do Energy	Weare, NH (603) 529-0801