

## **ReVision Energy – presentation to SMMC Energy Team – 3-13-2014**

Sam LaValle of ReVision Energy gave an oral and power point presentation with pictures projected onto the wall.

ReVision Energy is the largest installer of solar energy panels in northern New England, having done 3500 installations in the last 10 years. ReVision Energy also installs recharging stations for electric vehicles.

The usual solar panel installation for a home is about 350 square feet. Solar panels create direct current (DC) electricity. For use in our homes this needs to be converted to alternating current (AC), so an “inverter” must also be installed to do this.

Panels placed on a roof usually last about 30 years. They shed snow very well - better than asphalt shingles do. ReVision Energy does not advise people to climb onto the roof to scrape snow from the panels because this could do some damage to the glass panels. Solar panels can be installed on metal roofs by attaching the panels to the ridges that stick up where the steel panels are joined together. This causes no leaks in the roofs. If asphalt shingles are on the roof, the panels are attached to large screws that are put through the shingles and plywood into the rafters that support the roof. This works very well also, with no leakage.

Solar panels can also be mounted on the ground. The best angle at this latitude is 40 to 45 degrees from horizontal, but thirty degrees works very well. Some ground-mounted panels can be constructed so as to change the angle from time to time depending on the angle of the sun's rays. It is best for all types when the sun's rays are at a 90-degree angle to the flat of the panels. These are called tracker panels. Tracker panels follow the sun and adjust to intercept the sun's rays in an efficient way. It costs about 40% more to install tracker panels than stationary ground panels.

The cost of a normal roof installation is about \$3 per watt. The cost of a non-moving ground mount is \$3.50 per watt. A 4.0 kilowatts installation is typical. This is about 5600 kilowatts per year. Sizing of a system needs to be calculated so that is approximately equal to the electrical use of the building it is related to. At some times of each day (such as mid day) the solar panels will produce more electricity than is being used by the building. The extra energy will be moved into the utility company's wire distribution system and sent to other utility customers that need electricity. At other times of day (when the sun is not shining or is obscured by clouds) the building may be drawing power through the utility customer's wires from other generators, such as hydroelectric, wind, or a generator that burns a fuel of some kind. The electric meters attached to the building with solar panels measure the amount of energy brought into the building and sent from the building into the distribution system. The electricity that is produced in excess of the building's need during the course of the month will be credited to the customer as a net energy credit. The customer will pay the energy and distribution charge for the difference between total usage less the energy credits. If, at the end of the year the building has exported more electricity than it imported the owner will not be

paid for this electricity. This is according to current state law. This is because there is a cost to the electricity distribution company for transferring electricity to and from the building. This is called “net metering”.

Total installation cost on a roof of a 4kw system is about \$13260. Federal tax credits will reduce capital cost by about \$3978, leaving a net cost of \$9282. The money for the installation cost borrowed at 5% on a twenty-year loan can produce money from day one, and can result in an annual savings of \$0.16 per kilowatt-hour due to the avoided energy and distribution charges which will total about \$848 per year. The twenty-year cost will be \$0.097 per kilowatt-hour.

There can be a shared ownership on a single installation. This works well for buildings owned by non-profit organizations. An investor (possibly a philanthropist) owns the solar array and can deduct Federal tax credits and accelerated depreciation in the first six years. The building owner pays the investor for the electricity used by the building owner – normally through a purchased power contract. After the six years, the investor sells (or may donate) the installation to the owner of the building at a cost significantly less than the initial installation cost.

A non-profit owner cannot take the income tax rebate because it pays no income taxes. Neither can it deduct annual depreciation costs.

The largest such project of this type in Maine is at Thomas College. The Natural Resources Council of Maine and Kennebec Valley Technical College are also doing this. The Town of Vassalboro and City of Waterville are considering projects of this kind.

Another similar kind of net metering project, called a Solar Farm, can be done by a group of property owners. Sometimes all the solar panels are on one well-situated roof. Electricity may be distributed to 9 other partners (not necessarily nearby partners). Efficiency Maine and ReVision Energy are now doing a pilot project of this type on a barn in South Paris to show how well it can work. An investor or (or investor group) puts up the money for the installation. In some cases the individual investors may make the payment for their share of the cost at the beginning of the project (usually about \$14,500). In other cases the individual investors may make a monthly payment (usually about \$250 per month) until they have paid their share. In either case the solar installation is jointly owned. This is currently a demonstration project. The State of Maine currently limits the number of different entities sharing like this to 10. The current statutes would need to be changed to allow more than 10 meters to be included in the net metering project.

The federal tax credit for solar panels will expire at the end of 2016. If not extended, this kind of project will be less feasible and might not be used.

ReVision Energy has a staff tax lawyer, Steve Hinchman, who can advise people who want to install solar panels and make the best use of any available tax incentives.

The cost of insurance on the building may go up a little when solar panels are installed. Property taxes might go up a little also because the sales value of the house should be a little greater.

The viability of roof mounted solar collectors may depend on the orientation of the roof to the rays of the sun and the amount of shade from nearby trees or other objects. ReVision Energy can take a look at a building to assess whether or not such problems are significant enough to make it feasible to use roof mounted solar panels on a building.

Installation of ductless air source heat pumps using electricity from solar panels would have a cost equivalent to heating a building with fuel oil that costs only \$0.89 per gallon.

From notes taken by Elery Keene, Peter Garrett, and Ken Fletcher.