Volume 1

SUSTAINABLE HANOVER
Energy | Environment | Community

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*Dennis Robison (robisode@gmail.com) editor*

## Solarize Hanover 2.0 brings more renewable energy to residents

On June 26, ***Solarize Hanover*** attracted 60 interested residents to its *Strawberries and Solar* Open House held at the R.W. Black Center. Solar energy experts from our partner installers – Catamount Solar, Norwich Solar, ReVision Energy and Solaflect – greeted them with information about roof-mounted and ground mounted panels, batteries and heat pumps. Several residents, who already enjoy the benefits of owning a solar system were on hand to share advice and experience.

Over the summer four open houses were hosted at Hanover homes with solar systems that are located both in-town and in outlying neighborhoods. These were up-close and personal opportunities to talk with owners and installers of photovoltaics (pv) panels, inverters, heat pumps and other related equipment. Many thanks to Dodd Stacy, Barb & Alan Callaway,


*Solarize Hanover banner on the fire station*

Rich Greger & Patricia Min, as well as Julia Griffin & John Steidl for generously welcoming Open House visitors into their homes.

By September 8 when sign ups closed for 2019, 100 residents had requested site visits from one or more Solarize installers. We cannot yet determine how many of these will identify solar-feasible properties and how many will subsequently go on to install solar. A recent town report lists 21 permits issued over the past five months for residential solar installations, with 3 of these being expansions of existing systems and 18 being first time solar households.

*Solarize Hanover* will be back in the Spring with a new campaign for 2020. Watch for announcements! The Federal Tax Credit will be available at 26 percent of the cost of the system including in many cases associated costs incurred with site preparation (consult your tax expert to confirm your specifics).

*Strawberries and Solar Open House*

## Making a Residence Energy Efficient A Case Study

Michael & Kay Hillinger

Our yearly electric usage was relatively small (4362 kWh). Our primary heat source was propane. And while we installed a high efficiency systems for both heat and domestic hot water in 2014, we were were still spending approximately $3000 a year on fuel. We also had to upgrade 5 windows to triple glaze units and replaced the front door with a more efficient unit.

**Solar.** We decided to install a system in 2017. Part of our timing was to take advantage of the net metering system in place which allowed a kWh of electricity pack for every kWh put on the grid. Our house was poorly situated for rooftop solar so we decided to go with a ground-mounted 4.3 Kw tracking system from Solaflect. The cost of the system was $23,115. This was higher than we expected because the system was mounted over 200' from the house and during the trenching they encountered ledge that increased the cost. This was balanced by a $2,160 cash rebate from the State of NH and about $7,000 federal tax credit. The net cost was $13,995.

The solar generation varies from 850 kWh in July (2018) to 188 kWh in November (2018). Total lifetime generation since September 2018 is 8.44 Mwh. At 17.5 per kWh we have saved $1477.00 Our electric bill declined to the minimum charge of $14 per month. We were also generating KwH credits every month.

**Heat Pump.** Because of our surplus electrical generation in mid 2018 we added a cold weather heat pump. This was done by ARC Mechanical at a cost of $11,590. The system had an external compressor and three interior units, called "splits" in the dining room, master bedroom, and sun room. There were no units on our second floor or basement. The heat pump provides all of our heat on all but the coldest days—we will switch to propane if the outside temperature dips below 5 degrees. The system will provide heat to 5 below but efficiency is lower. The system was started in early October so it is too early to judge the cost, it will vary tremendously by month with January likely being the worst and increasing sunlight and temperatures going forward.

**Reflections**. The ground-mounted tracker system optimizes collection, especially in the summer months. This must be balanced against the increased cost and complexity of the technology. The heat pump has increased our electric use above what we generate during the winter months, using all of our surplus credits. We expect the use/generation lines to cross in late spring and hope to generate credits again for the 2019-2020 heating season. *Feel free to contact me via email for any further information. ml.hillinger@gmail.com*

**See NREL Dashboard for the most cost-effective improvements for New Hampshire single family homes: https://resstock.nrel.gov/factsheets/NH**

**10th Annual Yard Sale**

The Annual Community Yard Sale sponsored by Sustainable Hanover and the Dartmouth Sustainability Office was a great success. All 129 spaces were filled, volunteers were cheerful and efficient, the weather was ideal, and the attendance was excellent. Thanks go to everyone who helped with the running of the sale, Dartmouth's parking office which helps us clear the lot for the big day, Dartmouth College's Facilities, Operation and Management for removing most of their machinery so we have more consumer parking, Hanover's Youth-In-Action for providing willing volunteers, police for helping with traffic control and most of all to Betsy McClain for taking care of our finances. She reports that we made a profit of $1,662.50. We have not increased prices for several years but the profit seems reasonable.

So many people play important roles in the success of the sale, heartfelt thanks to you all. Susan Edwards, Chair Recycling Committee.


Hanover High school students are concerned about climate change, and they have backed up their concern with action. Assisted by Hannah Kornfeld AICP, HHS alumna and Air Quality and Climate Change Specialist, students from Jeannie Kornfeld's Earth Systems and Ecological Design classes of 2017/18 and 2018/19 researched and created a Climate Action Plan (CAP) to significantly reduce the greenhouse gas emissions associated with their school's operation. Jeannie reports the HHS CAP is the country's first Climate Action Plan written for a high school.

CAP aims to lower greenhouse emissions from HHS operations by focusing on seven emissions sectors: (1) building energy; (2) employee commute; (3) student commute; (4) school buses; (5) solid waste generation; (6) waste water generation and (7) water consumption.

**School Board Response.** Earth systems students presented the plan to the Dresden School Board on May 28. Board Chair Neil Odell applauded the students' effort, asked about follow up plans, and said the Board plans to adopt a strategic plan on climate for all schools through its planning cycle.

**Implementation**. On October 10 an implementation team (aptly named CAP-IT) met to review progress and strategize implementation. CAP-IT consists of students from the HHS Environmental Club, teacher Jeannie Kornfeld, members of the school board, administration, faculty and community.

**Energy Audit.** One of CAP's highest priority recommendations is an energy audit for the school building. At the October meeting Tony Daigle, SAU Facility Director, reported that an energy audit (ASHRAE Level 1) is scheduled to be conducted by building efficiency consultant Andrew Hatch. The audit will be funded by Liberty Utilities. It will identify specific energy efficiency improvements to save energy and costs. Some measures will likely qualify for incentive funding from NHSaves. Andrew is working on audits and efficiency improvements with over 100 commercial and municipal organizations in Hanover and Lebanon. His work is co-sponsored by Sustainable Hanover.

**Waste-Free Cafeteria**. Food Service Director Melissa Candon reported that HHS is close to achieving a CAP recommendation on solid waste reduction. HHS has ordered a dishwasher to support the use of washable cutlery, replacing plasticware which cannot be recycled or composted. She also discussed ways to increase composting of kitchen waste.

Sustainable Hanover salutes Jeannie Kornfeld and the students working to transition HHS to a sustainable, clean energy future. But they can't do it without community support. Contact sustainablehanovernh@gmail.com if you would like to help.

***Links to Energy Saving***

**Top Ten Ways to Reduce Your Carbon Emissions (and Save Money at the Same Time)**

**Expert Advice from the Union of Concerned Scientists**

**https://www.ucsusa.org/resources/cooler-smarter-practical-steps-low-carbon-living**

***Click on download for a copy***

**—-**

**For Energy Efficient products for the home see www.energystar.gov/products/energystarday**

**LED Lighting Display**

Stop by Howe Library to see Sustainable Hanover's LED Lighting Display during the month of November.

Today's LEDs come in an amazing assortment of styles, sizes and colors. LED prices have come down. They provide excellent lighting quality while using much less power. Consider replacing your incandescents, halogens and tube fluorescents with LEDs to lower both your electric bill and your carbon footprint.

Not sure if you'll like LED lighting? Borrow the LED light kit from Howe Library to see how they will look in your home.

**New Hampshire Environmental Concerns Links of interest:**

https://environmentnewhampshire.org/issues

https://ballotpedia.org/Environmental_policy_in_New_Hampshire

https://www.momscleanairforce.org/volunteer-states/new-hampshire/

**Weatherize Hanover Is Coming!**

**Weatherize Hanover** is a new initiative from Sustainable Hanover to help residents **save money, stay warm, and reduce their energy usage** by weatherizing their homes.

**Weatherize Hanover** is also a key component in the Town's campaign to reach 100% renewable energy by 2030, followed by 100% renewable transportation, heating and cooling by 2050. Improved energy efficiency, achievable through weatherization, is crucial to achieving these goals.

Weatherizing your home involves making physical home improvements—such as **insulation** and **air sealing**—to **reduce energy costs, improve comfort, and resolve issues** such as ice dams, moisture, mold, cold spots and drafts.

Two upcoming events will provide information about this program:

**Rebate Info Night**

Thurs., Dec. 5th, 6:30 to 8 pm Howe Library (Mayer Room) Drop by anytime between 6:30 and 8; Meet NHSaves staff and learn about NHSaves weatherization rebates.

**Contractor Night**

Wed., Jan. 15th, 6:30-8 pm Black Community Center; Meet and chat with Weatherize Hanover contractors; Hear presentation on weatherization by Vital Communities.

**Visit: hanovernh.org/weatherize**


*posters-for-good.tumblr.com/post/28620592958/how-long-does-it-take-to-decompose*

*For more information see:*

www.thebalancesmb.com/how-long-does-it-take-garbage-to-decompose-2878033

www.sciencelearn.org.nz/resources/1543-measuring-biodegradability

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