

*26th Annual Metropolitan Washington, DC*

# SOLAR & GREEN

## HOME TOUR

*October 1 - 2, 2016*



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## ON THE COVER

*This Harwood, Maryland home features an off-grid 10 kW photovoltaic system.*



### 26th ANNUAL TOUR OF SOLAR AND GREEN HOMES

The tour is organized by a staff of dedicated volunteers to educate the public on the positive aspects of Solar Energy.

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### The 27th ANNUAL TOUR OF SOLAR HOMES IS OCTOBER 2017

#### Show your home on the 2017 Tour

To put your home in the tour send an email request to [homes@solartour.org](mailto:homes@solartour.org). We'll be accepting home requests from October 4, 2016 to March 31, 2017 on a first come, first served basis.

#### Advertising Information

To advertise in the 2017 tour send an email request to [advertising@solartour.org](mailto:advertising@solartour.org)

Deadline for ad submission is June 30, 2017. See [www.solartour.org/sponsors.html](http://www.solartour.org/sponsors.html) for ad specs.



**Welcome to the  
26th Annual  
Metro Washington, D.C.  
Tour of Solar and  
Green Homes.  
Part of the American  
Solar Energy Society's  
National Tour of  
Solar Homes.**



REI is the official distributor of the 2016 solar tour guide.

**T**hank you for taking part in what we hope will be an exciting and informative tour of solar and environmentally friendly homes. This guide book is your ticket to see the homes and will provide you with information and directions to the homes that are showcased throughout the Washington DC Metropolitan area.

Because the homes are spread throughout a wide area, we suggest you plan your tour in advance to maximize the number of sites you will be able to see. We have included a handy map in the center of the guide. Our advertisers are the best in the solar industry and will be more than happy to help you with information on going solar.

We hope you will come away with an appreciation of how and why each of these buildings was developed and an understanding of their features. Consider incorporating these energy saving features in your present or future solar home.

***2016 Tour Info***

Over 40 solar and green homes on tour.

Homes are open from 11:00 am to 5:00 pm, October 1 and 2.

Plan your trip in advance with the centerfold map on page 16.

Consider ideas for your current home or future solar home.

Visit our website for the latest news on the tour and changes and last minute cancellations.

[www.solartour.org/updates.html](http://www.solartour.org/updates.html)

# Forward

*by Jamie Raskin*

**G**reetings and welcome to the 2016 Solar and Green Home Tour! I want to commend the Solar Energy Industry Association ([www.seia.org](http://www.seia.org)) for curating this wonderful tour of green homes in Maryland. I know you will see splendid residential solar homes featuring energy efficiency improvements as well as renewable energy-improved buildings and properties.

The Tour recognizes that we are living at the start of a green energy revolution and we all need to make dramatic changes in how we live and work in order to make this transformation complete.

***“... I take pride in the fact that Maryland has seen a major recent expansion in solar technology.”***

As a State Senator deeply involved in promoting green energy, I take pride in the fact that Maryland has seen a major recent expansion in solar technology. The cost of installing solar has dropped by over 70% in the last several years, spurring innovation, growth and jobs. The Solar Energy Association reports that installed solar capacity in Maryland has grown by 109% over the past year, ranking us 11th nationally.



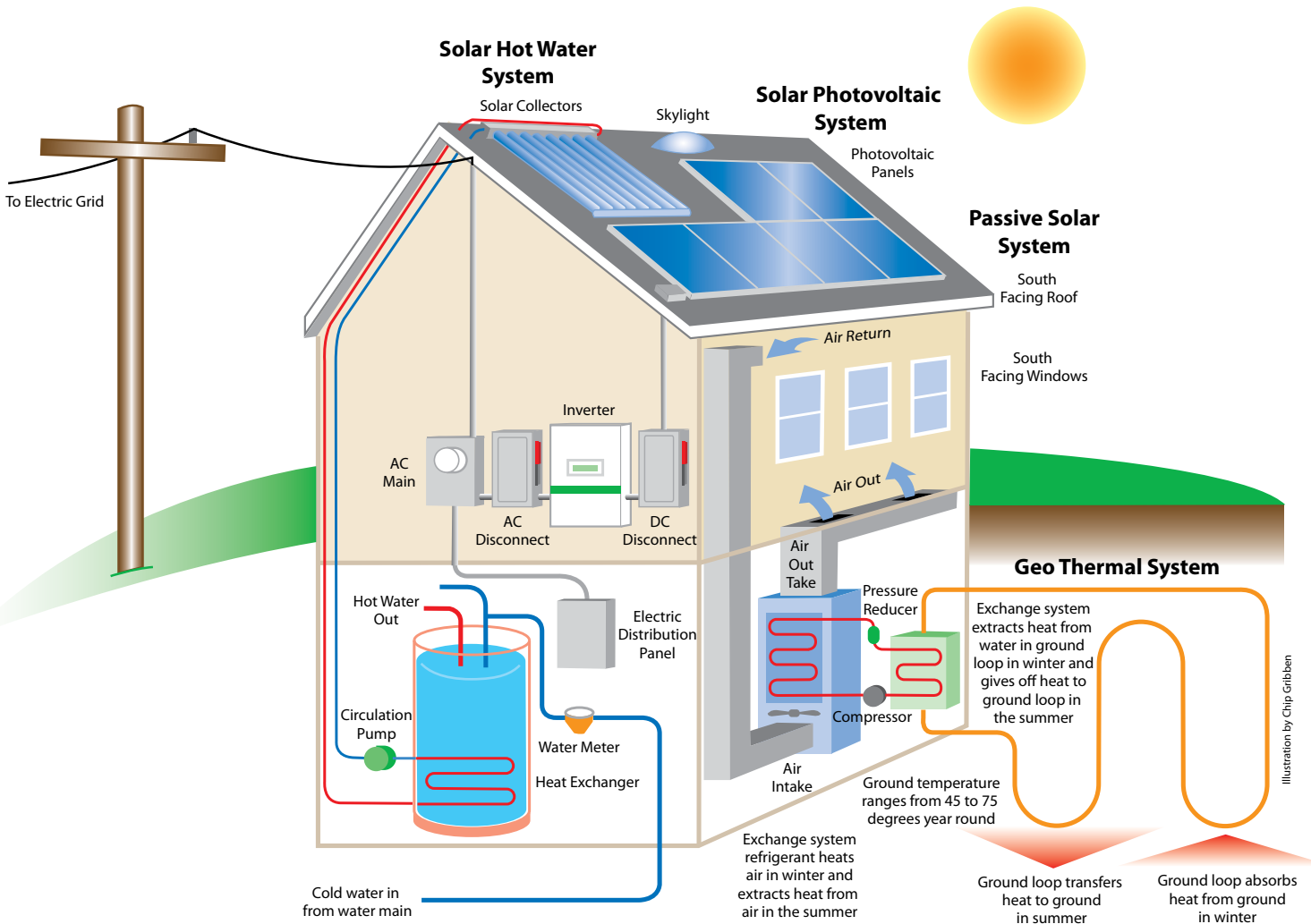
*Senator Jamie Raskin (D), represents District 20 of Montgomery County, Maryland.*

America is searching for smart clean energy solutions that will permit us to break from our deadly carbon addiction. It's time to set a national standard to achieve 100% renewable energy by 2050--at the latest.

But all progress starts local, and that's why I am thrilled that you are part of this great tour and wonderful new tradition. Enjoy and learn!

# Might Now be the Time to Go Green?

by Chip Gribben



It's a great time to consider going green by incorporating energy efficient technologies and solar into your home. Take a Sunday drive through your community and proof that solar is becoming more popular will appear on many of your neighbor's roofs. Solar has also gained popularity among electric vehicle owners who take advantage of the sunlight to charge their vehicles, offsetting both carbon and gas car emissions.

The cost to install solar has dropped 70 percent over the past 10 years and a large selection of financing options make it more affordable to go solar and go green.

Going solar can also insulate yourself from potential energy rate hikes and unreliable power. Investing in

solar, to provide electricity or hot water, will reduce your energy needs, which in turn, will help negate rising energy costs for 20-30 years.

Having an energy audit done on your home can reveal where energy is used or wasted. They supply you with information on how to lower your energy consumption and enable your solar installation to save more.

There are many ways to lower your electricity consumption (and bills) right away. Solar energy programs are gaining support as residential and commercial incentives decrease payback times and improve returns on investment. Similarly, energy efficiency programs that allow consumers and producers to share savings often

stimulate investment in new, efficient appliances and weatherization.

## Photovoltaics

Beyond the potential of limiting your monthly water heating expenses, photovoltaics (PV) produce electricity from the sun's rays. If your system produces more electricity than you use, your meter will spin backwards, and your utility will credit your account for that much energy on your next bill. This is called Net Metering and it allows you to connect your solar PV system with the electric grid, making it a two-way street.

Solar cells are assembled into modules that are interconnected to form arrays. Arrays supply power first to your home, with any extra power flowing to the grid. In both cases, the electricity is passed through an inverter to match the voltage of your utility. If your home frequently loses power, a battery backup system can supply power during power outages. Solar PV systems are durable and can be designed to be integrated into your roofing.

Before purchasing and installing a PV system it is advisable to have efficient appliances so that the energy you get from the sun is not wasted. Though the system may only provide a fraction of your total electricity, it does so during the summer when the demand is at its peak, rates are highest and there are more hours of sunlight to be captured and converted into electricity.

## Solar Water Heating

After a home's heating and cooling system, the water heater is the appliance that uses the most energy every month. Electric water heating costs typically exceed \$50 per month, while gas water heaters typically cost between \$30 and \$40. In homes with people that use a lot of hot water, more than 35% of energy costs can go to water heating. Solar water heating has the potential to reduce your reliance on electric or gas water heating and completely remove its costs from your budget.

Systems typically cost between \$7,000 and \$9,000, depending upon their size and method of collection. Two common types, flat plate and vacuum tube, work well in our region's climate. Flat plates commonly cost less than vacuum tubes, though the latter are slightly more efficient in cold weather. While flat plates last longer than vacuum tubes, the differing types have lifespans of 20 and 30 years, respectively.

Whatever method of solar water heating you choose, it is important to protect the storage tank from overheating. Most new controllers can "dump" excess heat that could potentially damage the system over periods of inactivity.

## Geothermal Systems

Geothermal systems are becoming more popular. Geothermal heat pumps (GHPs) use a fluid that runs through pipes buried in the ground either horizontally or vertically. This fluid then absorbs heat from the ground. The Earth's heat is transferred through the pipes into the circulating fluid and then transferred again into the home. Installation costs are about \$2,500 per ton (12,000 BTU), or roughly \$7,500 for a typical residential unit. Energy Star rated geothermal systems must have an energy efficiency rating (EER) of at least 14.1 to 16.2.

## Financial Incentives

As the solar industry expands, the prices continue to drop. The 'crossover point' will occur when solar generation is more affordable than other forms of energy and is therefore the preferred energy source. Areas with high cost electricity, like New York and California, have already crossed the cross-over point. This point is projected to occur in 2017 nationwide, though it could occur sooner or later as industry growth rates change. With incentives, solar is already cost effective.

There are several incentive mechanisms in use in the region. Below you will find some of the rebates and grants that are offered by local states and counties. Maryland and DC have also approved Renewable Portfolio Standards (RPS). An RPS creates an additional value for clean energy sources that include Tier 1, Tier 2 and solar Renewable Energy Credits (SRECs). The credits are a byproduct of electrical generation that embodies the beneficial attributes of each renewable energy source. The credits vary in value and are traded between generators, brokers and electricity providers. Solar RECs in the DC-Maryland market range in price from \$260-\$300.

The SREC value helps to reduce the upfront cost of solar if several years are sold at once. Aggregators are willing to buy these from homeowners and they often exceed the value of the electricity they are derived from.



# Saturday Homes

## Building 21 on the Tour

The James and Anne Robinson Nature Center is a LEED Platinum facility featuring solar panels and a geothermal system.



## Home 13 on the Tour
























This passive and solar home in Vienna, Virginia is designed to be as efficient as possible without compromising on architecture and functionality.

## Home 26 on the Tour

This Cape Cod in Glen Burnie, Maryland was remodeled to be more energy efficient including a 7.4 kWh solar panel system.



## FEATURED SOLAR/GREEN TECHNOLOGIES

-  Photovoltaic panels (PV)
-  PV panels with battery backup system
-  Solar hot water system
-  Passive solar home
-  Solar space heating
-  Radiant floor heating
-  Solar attic fan
-  Greenhouse
-  Green roof
-  Geothermal
-  Wind power
-  Strawbale construction
-  Low VOC paint and construction materials
-  Superinsulation
-  High efficient windows
-  Recycled building materials
-  Corn/wood stove
-  Energy efficient appliances
-  High efficient lighting
-  Low water consumption
-  Gray water storage system
-  Tankless water heater
-  Rainwater collection system
-  Rain garden/native plants
-  Composting
-  Alternative energy vehicle





**1 4927 Hine Drive, Shady Side, MD**

This Shady Side home built in 1993 is an ongoing experiment in living lightly or sustainably on the earth. The main features of the house are lots of insulation, low emissivity windows, a wood pellet stove, a solar cooker, nesting osprey, passive solar heating and cooling, photovoltaic power, a wood cooking stove and lots of fans instead of ducts to circulate heat. The treed living room, located on the waterside of the house, is a passive heated solar sunspace that is used as a heat source for the rest of the house. More important than these parts is the way these parts are integrated into a whole, the management practices which make it all work to create significant energy savings and the lessons learned which were carried on to my work on Passive House and Net Zero Energy designs. For more information go to Sansone Solar House on [solarvillages.org](http://solarvillages.org).

**DIRECTIONS**

Take Exit 11 (Route 4) off the beltway (I-95/I-495); head East for 11 miles to Route 258 towards Deale. At the first T, turn left onto Route 256. At the next T, turn right onto Route 468, you will pass a firehouse and turn left onto Steamboat Road. Take the 3rd left onto Olive Street. Olive Street turns slightly right and becomes Hine Drive.



**2 4800 Solomon's Island Road, Harwood, MD**



**3 420 Dodon Road, Davidsonville, MD**

Strawbale house completed in 2010. Strawbale construction in three walls with deep overhangs to protect lime plaster from the elements. The south wall is insulated passive solar design with blown in cellulose insulation. Earthen plaster interior finished with homemade (zero VOC) clay paints and alises. Site harvested trees create primary exposed support columns and beams. Extensive use of site harvested/milled timber used for both structural and trim features. Concrete countertops. Wood burning stove. Geothermal system for heating, cooling, and domestic hot water. Acid-stained concrete slab on ground floor for radiant floor heating and thermal mass for passive solar heat. House-mounted trellis keeps summer sun from reaching concrete slab. A remote 3.5 kW photovoltaic system is grid-tied with battery backup system. Permaculture landscaping with multi-fruit orchard, mushroom cultivation. Sculpture garden with 45 works by artist Pat Monk. Farm in Agricultural Preservation program. Chickens and goats.

**DIRECTIONS**

From Rt 50 east of Capital Beltway exit onto Rt 424/Davidsonville Rd

## 2016 Saturday Homes

south toward Davidsonville. Proceed past Central Ave (Rt 214) for 1.9 miles to Dodon Rd. Turn right onto Dodon Rd. Take second driveway on left (about a half mile). Follow driveway 1/3 mile past greenhouse area and 100 yds further into woods. House and driveway circle are on left.



**102 Queen Anne Bridge Road, Upper Marlboro, MD**



Original 1920s gable frame house was gutted and retrofitted with strawbales. A timberframe addition was added to one end of the house and infilled with strawbales for insulation. A small loadbearing strawbale guesthouse was built by Builders Without Borders using lime and earth plasters and as featured outside the Capital building for almost a year. A small studio using a modified infill system was built and finished in local clay plasters. A variety of strawbale and plastering techniques were used in the structures from low to high-end. Boards, timbers and posts were obtained locally and milled using our sawmill or chainsaw. Other features include a Woodmizer Sawmill, composting toilet, woodheat, round firewood stacks, a pollinator garden, stone foundation, greywater wetland and pond, native plants. Lots of experiments in local reused materials (bells made from gas cylinders, tire planters), and timbers, trees, and found objects. Key themes are local natural materials, do it your self, low cost, and non-manufactured.

### DIRECTIONS

Take Rt. 50 east. Exit on Rt. 301 south. Exit onto Rt. 214 east. Proceed 2 miles and turn right on Queen Anne Bridge Rd. Proceed 1/2 mi to stop sign. Turn left into driveway at stop sign. Note: Do not turn onto Queen Anne Bridge Rd. when you first see it crossing Rt. 301 south.



**35971 Ashby Farm Circle, Purcellville, VA**



We have utilized a number of features. One is an 8.64 PV kw ground mount system (36 panels). To this we have added a two panel solar hot water roof system. In addition we have an outdoor wood burning furnace that heats water running into a copper coil system into the air handler giving us central heating with wood. This same system heats our domestic hot water through a heat exchanger on

the water heater. We also have a few solar night lights for walkway lighting.

### DIRECTIONS

Take Rt 7 West to Round Hill, VA and take the first right (Evening Star) to stop sign. Go approx four miles and go right on Ashby Farm Circle (second Ashby Farm Circle entrance) to second house on right.



**2 Hackett Court, Poolesville, MD**



Built in 2000, this single family home has been upgraded over the past 8 years, starting with an energy audit, and includes the following: attic insulation upgraded to DoE recommended R49, recessed light sealing, along with high efficiency AC upgrade. Lighting upgraded to 95% LED. 2200+ sq ft of strand bamboo flooring. Energy Star appliance replacements installed as needed and automatic lighting controls help ensure lights are off when not in use. Finished basement multi-purpose room & bath showcases energy & water efficient fixtures with sustainably sourced materials throughout. The home boasts a 69 panel net-positive solar installation handling over 100% of the household & Electric Vehicle needs. The installation consists of two solar panel arrays: a 12.5kW 52 panel array leased in 2013 and a 4.2kW 17 panel array bought in 2014, both grid-tied. A Nissan LEAF Electric Car and a Chevy Volt Extended Range Electric Car complete the picture. The homeowners have been driving electric since 2011. Extensive data collection on the solar array energy production and electric car usage is available for review.

### DIRECTIONS

From the intersection of 109 and 107 in Poolesville, take 109 north, turn right on Jerusalem Rd & go 1.1 miles, Turn Left on Cissel Manor Rd, Turn Left on McKernon Way, House is on left at the corner of Hackett Ct & McKernon Way. 8.1 miles, Turn Right on Jerusalem Rd & go 1.1 miles, Turn Left on Cissel Manor Rd, Turn Left on McKernon Way, House is on left at the corner of Hackett Ct & McKernon Way.

## Solar Fact

Solar Energy demand has grown at about 30% per annum over the past 15 years (hydrocarbon energy demand typically grows between 0-2% per annum).



**7** **2822 Roderick Road, Frederick, MD**

This Must-see is a summer camp and environmental education facility with 2 residences on 115 acres. It features a 10 KW Bergey wind turbine. A newly constructed highly efficient conference center with sips panel construction, geo-thermal heating and cooling and utilizing water saving composting toilets. A residence heated with corn and having 5 KW of solar. Other features include a skylite ridge on the roof, solar tubes, food production in a high tunnel, extensive water mitigation with rain gardens a large Grey water leach field and 9 acres enrolled in the Conservation Reerve Enhancement Program.

**DIRECTIONS**

Take I-270 North to exit 26 Urbana (route 80) go left under the overpass, 1/2 mile left on Roderick Road for 1 mile. Farm is on Right. Look for Mountainside and the wind turbine.

**8** **23340 Ridge Road, Germantown, MD**

The 21st century farm house at Red Wiggler Community Farm was the UMD Solar Decathlon entry in 2005. Installed on the Ovid Hazen Wells Park in 2008, the 51 panels on the Solar House have generated more power than it uses year after year while being lived in continuously. As a result Red Wiggler, a certified Organic farm, converted one of its low horse power tractors to electric to use some of the excess power. The 1947 Allis Chalmers G with its new electric motor is now a working example of scale appropriate technology powered by the sun. The home also features solar water heating, triple-pane windows and doors, radiant in-floor heating, and used sustainably harvested wood and bamboo in the construction. The home was designed by an interdisciplinary team of University of Maryland students in architecture, engineering and related fields, and built by students and partners. The home took the "People's Choice" Award at the 2005 Decathlon and was donated to Red Wiggler by UMD. The house is now a full-time residence for farm staff.

**DIRECTIONS**

From 270 take exit #16 towards Damascus on Ridge Rd/Rt 27. Go a little more than 3 miles past Frederick Road (Route 355). 23340 Ridge Rd is on the west side of the road across from Davis Mill Road.



**9** **11104 Watkins Road, Germantown, MD**

Come join us for a weekend of questions, answers and a good time! See how you can enjoy a \$5 monthly utility bill and practically unlimited fresh veggies just steps away from your kitchen door or as we like to say in a real estate context, GROWING VALUE! The barn has radiant heat, passive solar heating, daylighting, and there is a garden with a hoop house for extended growing season. And there is a solar-powered electric fence. Alan is a real estate consultant with LEED AP certification and a MD Home Improvement license. We will also have gardening, farming and permaculture experts and information available. Hope to see you!

**DIRECTIONS**

Take I-270 North to Father Hurley Blvd/Rt27 North toward Damascus. Turn right on Davis Mill Road (Southern States on right at intersection) First left on Watkins Road and Right at 3rd Driveway.



**10** **11201-03 Neelsville Church Road, Germantown, MD**

Grace, beauty, and ecological integrity. These are the principles embodied in the Earth Ministry Simple Gifts project at Dayspring. This project explores ways of living more simply, justly and in harmony with the earth. There are 2 small staff cottages and a solar strawbale greenhouse. Each cottage is 1250 square feet and is designed to provide a well-crafted and energy-efficient home for a couple or small family. The cottages accomplished this in different ways including passive solar heating and cooling, well-insulated

## 2016 Saturday Homes

walls and roof (structural insulated panels (SIP)/blown cellulose), top energy-efficient windows and appliances, insulating window shades, living roof, FSC-certified framing lumber, geothermal/radiant heating and cooling, grid-tied and grid-independent photovoltaic panels, (sufficient so that we use no net energy from the grid), solar hot water, masonry heater, oak and cherry trim from trees on the land, earth plaster and milk paint wall finishes, stained concrete slab floors, bamboo and linoleum floors, fiber-cement composite siding and trim, roof water collection, and landscaping with native plants.

### DIRECTIONS

From I-270 Northbound take exit 15A, (Southbound #15) route 118 East toward MD355. Continue on 118 across MD355. At first stop sign (Scenery Drive) turn left and go three blocks to Neelsville Church Road. Turn left, and the first gravel driveway to your right will take you into the Simple Gifts cottage site.



### 4 Augustine Court, Gaithersburg, MD



We have taken our ordinary townhome and over the past 7 years we have done nearly every energy efficiency and renewable energy upgrade we could. The home features a 3.15 kW Suntech solar electricity system installed by Standard Solar and a 2 panel Schuco solar thermal hot water system. The PV system was installed in 2009. Our home also has new energy star appliances. (dishwasher, fridge, and washing machine) We installed a new high efficiency 16 SEER air conditioner, and a 95% efficient gas furnace in 2010. In 2011 we had Standard Energy Solutions perform an energy audit, which identified \$1500 worth of recommended energy retrofits, also completed by SES. We use LED lighting throughout the house. In 2013 we leased a Ford Focus Electric car and installed a level 2 charging station in the garage. In 2016 we added a used Tesla Model S to our electric vehicle fleet.

### DIRECTIONS

Our home is near the intersection of Woodfield road and East Village Ave. Head West on East Village Ave from the intersection with Woodfield road. Turn right onto Asquith road. Turn right at the Stop sign. Our home is the second townhouse on the left.



### 2933 Fairhill Road, Fairfax, VA



Originally, an 1800 sq ft home that utilized passive solar strategies, minimal footprint and recycled materials, the house received a timberframe addition 6 years ago. The addition added an 800 sq ft. shop with a new living room above, both under a planted green roof, a study tower with a garden shed underneath and greenhouse on top, added space to the upstairs bathroom and an airlock entryway. The addition applies passive solar/day lighting strategies and recycled materials much as the original home. Siting of the home north of many deciduous trees, an elongated east/west axis, ample glazing facing due south and minimal glazing on the north and west elevations contribute to its passive solar abilities. The green roof, minimal footprint, low-impact, low maintenance landscaping (minimal lawn), and a semi-pervious bluestone driveway all reduce the impact of this construction on the local ecosystem. An ultra-low-flush toilet was added this year to replace one of the existing low-flush toilets. The owners routinely compost and recycle materials. One owner works at home and the other within walking distance to the nearest metro station (<2 miles.)

### DIRECTIONS

From I-495 beltway take exit for Rt 50 Arlington Blvd. (just south of exit for I-66) west. Proceed approx. 1.5 mi. to 5th stoplight and turn right onto Cedar Lane. Proceed 1/2 mile to base of second rise and turn right onto Dogwood Ln, and then left onto Fairhill Rd.



### 8396 Idylwood Road, Vienna, VA



Originally constructed in 2007 with an addition by Windmill Hill in 2014, the house is designed to be as efficient and environmentally friendly as possible without compromising on architecture or functionality. The concrete slab with SIP construction and the triple pane windows enable effective passive and active solar heating of the home. The narrow footprint of the home is designed for air movement, and the owners have used wood milled from the property, salvaged architectural pieces, recycled components and other environmentally friendly finishes. Outside the environmentally friendly features include a living roof, a native species yard, Audubon at home certification, a rain garden, and a hybrid car. The result is a beautiful home with many advanced technologies that keep the environmental footprint low. The addition was designed by

Peter Henry with passive house standards in mind. Come learn from our decisions, successes, and challenges in design and function.

**DIRECTIONS**

From I-66 exit at route 7 west. Take the first left to Idlywood Rd. and go about 2 miles. 8396 Idlywood is between Cedar Lane and Williams Ave.



**14** 1713 N. Bryan Street, Arlington, VA



The house is a 1926 Sears and Roebuck bungalow with a second story addition designed by the Owner/Architect. Grid tied solar panels are located on the high roof. A stand-alone system powers the porch using PV panels, a pair of deep-cycle batteries, and a controller. This off-grid arrangement furnishes light for the porch, refrigeration for cold drinks and power to pump water from a 300 gallon rainwater harvest cistern.

**DIRECTIONS**

3 blocks from Courthouse Metro(walking) from the intersection of Veitch and Wilson, leave Dunkin Donuts on your right. Follow to intersection of Bryan and Key. (driving) Wilson Blvd. North on Bryan (near Whole Foods) just north of intersection of Key and Bryan, next to the church.



**15** 5909 Calla Drive, McLean, VA



The homeowner has a 1600-watt grid-tied photovoltaic system (that is producing more electricity than is used), a solar air heater with solar-powered fan, two mini-split ductless heat pumps/air

conditioners, a direct vent gas heater, a solar-powered attic fan, a solar light tube, 100% fluorescent or LED lights, cellulose insulation, a solar clothes dryer, no garbage disposal, a gas stove with no glow bar, and an organic fruit and vegetable garden with rainwater harvesting.

**DIRECTIONS**

From Maryland: Beltway to GW Parkway to McLean exit. Left on Kirby Road; 2 miles to left on Chesterbrook Rd; 1/2 mile to left on Forest Ln; 3 blocks to right on Calla Drive. From Fairfax: Route 66 East to Exit 66--Leesburg Pk; left onto Leesburg Pk; first right onto Idylwood Rd, (becomes Kirby Rd); right on Chesterbrook Rd; left on Forest Ln; right on Calla Dr

**16** 7108 Holly Avenue, Takoma Park, MD



This home is highly energy, cost and resource efficient (both building the house and living in it), as well as nurturing and healthful. Come see the simplicity, beauty and pleasure of natural building as well as many green/sustainable technologies, including straw bale, living roofs, biodiesel-fueled radiant floor heat (and a hand pump to fill our diesel cars!), and a corn stove. Also, many parts of this home are from salvaged sources, creatively adapted. Site work is as important as the building is, so there is an extensive storm water management plan, gracefully integrated into a lush beautiful garden (includes a retention pond, overflowing into a bog, with a rain garden around the corner, ending with pervious pavers on our driveway). All the aforementioned features are beautifully integrated into a soulful home.

**DIRECTIONS**

From DC - Drive north on 13th, which becomes Piney Branch Ave. Take a right on Eastern Ave., which defines the boundary between Maryland and DC. First left is Holly Ave.



**17** 231 Grant Avenue, Takoma Park, MD



We are building an urban homestead, meeting most of our energy needs from local solar power. We generate 100% of our electricity using our 4.4 kW solar panels, and we decrease our demand by using energy efficient lighting and appliances. We heat our house nearly 100% with our high efficiency Vermont Castings catalytic

## 2016 Saturday Homes

wood stove with salvaged local wood. With nearly 450 gallons of rainwater catchment capacity in 3 rain barrels, we are able to keep our water usage low. We eat fresh produce from our property nearly 12 months a year, harvesting fruit from our persimmon, plum, cherry, pear and fig trees, blueberry bushes, hardy kiwi and raspberry, concord grapes, as well as our organic vegetable garden. Most of Takoma Park is too shady for food production, but we enjoy an abundance of sunshine and take full advantage of it.

### DIRECTIONS

From the Takoma Metro Station parking lot walk down Holly Ave about 3/4th of a mile and turn right on Grant Ave. From the Beltway, take Colesville Rd. south towards Silver Spring, Turn left on Dale Ave., and then right on Piney Branch Ave., and left onto Grant Ave. just past the middle school on your left.



### 6 Pinecrest Ct., Greenbelt, MD



Our home has a 6.02 KW photovoltaic system leased from Solar City. There are 30 panels that are installed on two roof surfaces. The panels can withstand up to 130mph winds due to the manner in which they are installed. Each panel weighs slightly under 40 pounds which facilitated installation and meant that we did not have to reinforce our roof to support their weight. The panels are configured so that if any one panel is in shade, that panel no longer generates power, but the rest of the system continues to generate power. We drive two Toyota Prius hybrids and we are busy incorporating both edible plants into our landscape (blueberries, strawberries, asparagus, and herbs) and Maryland natives.

### DIRECTIONS

From the Beltway, take MD-201/Kenilworth Ave (exit 23) toward Greenbelt/Bladensburg. (Go 0.34 miles). Veer to the right, taking the ramp toward Bladensburg. Merge onto 201 S. & take the immediate ramp on the right toward MD-193/Greenbelt Rd. Turn left onto Greenbelt Rd. Go under the overpass and turn left onto Lakecrest Dr. Turn left onto Pinecrest Ct.



### 108 Ridge Road, Greenbelt, MD



This passive solar three-story was designed and pre-engineered by Acorn Deck House. House siting and design rather than manufactured devices captures the energy of the sun. Large

expanses of South-facing glass allow storage of winter sun heat in tile floors installed on concrete for storage mass. Light shafts to provide natural lighting for the ground level space pierce the front deck. The South-facing roof is steep enough to provide for solar collectors in the future. Massive trees provide shade in the summer and shelter from winter winds. The site also "borrows" spectacular 8-mile views from the Beltsville Agricultural Research Center. Dual dishwashers minimize the number of less-than-fully-loaded cycles and save water, electricity and detergent use. Closets on exterior walls provide additional insulation but require care to avoid moisture build-up.

### DIRECTIONS

From the Beltway, MD-495/95, take Exit 23 N to MD-201 N Kenilworth Avenue towards Greenbelt. Turn right on Crescent Road (450 ft on Kenilworth from Beltway Outer Loop); .4 mile on Kenilworth from Beltway Inner Loop). Turn Left on Lastner Lane, .3 mi (becomes Ridge Rd). Ramp toward Bladensburg. Merge onto 201 S. & take the immediate ramp on the right toward MD-193/Greenbelt Rd. Turn left onto Greenbelt Rd. Go under the overpass and turn left onto Lakecrest Dr. Turn left onto Pinecrest Ct.



### 14805 Carson Drive, Burtonsville, MD



Owner designed and built. Passive solar geothermal. Earth-sheltered, shaped like a truncated isosceles triangle. 445 sq ft south glazing with movable insulation. 12 in thick concrete walls extend 6 ft below floor. Thermal mass consists of 684,000 lbs of concrete, 536,000 lbs of rock, 200,000 lbs of earth (722 tons of thermal mass total), and 24,500 lbs rebar from recycled automobiles. Wood stoves provide backup heat. Summer cooling by passive thermal conduction to earth and dehumidification by conventional window air conditioner. Rock bin is outside of the house and under the berm providing 2,000 sq ft contact area with adjoining earth. R 35 walls, R 38 + R 50 ceiling insulation. Low pollution design by selection of building materials and by low pollution heating and cooling. 4 to 6 ft of earth buffer weather conditions 4 to 6 months out of phase. Air wells are used to harvest early fall ambient heat and early spring ambient coolness by pumping air into rock bin. Extensive use of glass, wood, rock, and metal. Low plastic, low formaldehyde house. Economics of putting earth over the roof for insulation did not make sense, so the house earth sheltering is done without earth over the roof. 100% battery electric car. Solar hot water heating is via evacuated tubes. No surface water discharge from site.

**DIRECTIONS**

From I- 495, go north on Rt 29 Colesville Rd, left on Greencastle, right on Carson Drive, From Baltimore, go south on I-95, right on Rt. 32, left on Rt 29, right on Greencastle, right on Carson Drive. Park on Carson Drive.



**21** 6692 Cedar Lane, Columbia, MD

The James and Anne Robinson Nature Center is a LEED Platinum facility, featuring solar panels, a geo-thermal heating/cooling system, pervious surfaces in parking areas, bamboo cabinetry, sunflower seed reception desk, and window stenciling to reduce bird strikes. The building was constructed into the hillside for insulation and has biofiltration stormwater management features, such as rain gardens and roof gardens, to capture and treat runoff. The Center has one mile of wooded hiking trails with arboretum signs. It is a multi-award-winning nature education facility that offers numerous programs for all ages throughout the year.

PLEASE NOTE: Robinson's hours are Saturday from 9am - 5PM and Sunday from Noon - 5PM. Upon arrival go to the front desk and let them know you are part of the Green Homes Tour in order to have the entrance fee waived.

**DIRECTIONS**

Route 32 to exit 17 Cedar Lane. Head north on Cedar Lane. The Center is on the left opposite Harriet Tubman Lane.

**22** 6401 Saddle Drive, Columbia, MD

We have an 11 kW solar PV system that was installed in the spring of 2015. A recent remodel of our master bathroom allowed us to incorporate a solar tube for natural lighting, dual flush toilet and energy-efficient lighting. Our yard incorporates numerous Baywise practices.

**DIRECTIONS**

Take Route 175 to 108 west. Make a left at the CVS onto Summer Cloud Way, then the first right onto Saddle Drive. We are the sixth house on the right.



**23** 5167 Ilchester Road, Ellicott City, MD

This suburban homestead features a 4kw PV array which helps to charge the Chevy Volt. Additionally it features solar hot water panels, rain barrels and 3-compartment compost bin. There is also a 9000 sq ft vegetable, pollinator, and herb garden with greenhouse.

**DIRECTIONS**

From I-95 exit onto MD-100 W. At the traffic circle take the exit for Rt. 103 W/Meadowridge Rd. Go 1.4 miles and turn right onto Ilchester Rd.



**24** 9421 Frederick Road, Ellicott City, MD

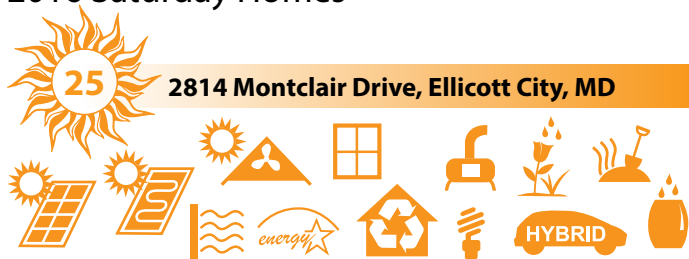
PLEASE NOTE : Miller Branch hours are Saturday from 10 am - 6 pm and Sunday from 1 - 5 pm.

HCLS Miller Branch has water conservation features, energy efficient HVAC and lighting design, recycled and local materials, low VOC materials, and a sustainable site design. Through its materials and design, the building reflects the community's historical roots (e.g., Bollman Bridge, Thomas Viaduct, Patapsco River, Ellicott City stone). Designed to capture the benefits of natural lighting and maximize energy efficiency, Howard County Library System Miller Branch is a LEED Gold facility. The branch also features rainwater filtering cisterns and a green vegetative roof to enhance the storm water management system of the building. The Enchanted Garden, an outdoor classroom, is a designated Monarch Butterfly Waystation. This building is on tour both days. [hclibrary.org](http://hclibrary.org).

**DIRECTIONS**

From Route 29: Exit onto Rt 40 westbound. Proceed about 0.25 miles. Turn left onto Saint Johns Ln. Proceed about 0.4 miles. Turn right onto Frederick Rd. HCLS Miller Branch is about 0.6 miles on the left.

## 2016 Saturday Homes

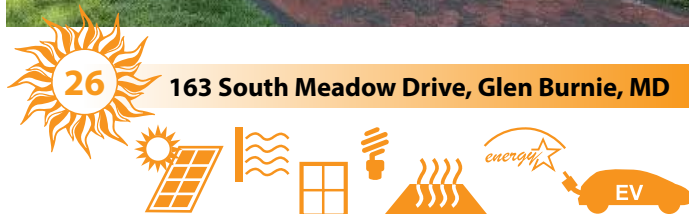


### 2814 Montclair Drive, Ellicott City, MD

This 1950s ranch house has solar PV, solar hot water, a cupola/solar chimney, solar daylight tubes, solar attic fan, solar sidewalk lights, south facing energy efficient windows, 2 highly efficient Energy Star minisplit heat pumps (26-SEER), a fireplace insert wood stove, exterior insulation finishing system (EIFS), CFL/LED lighting, kitchen counter tops made from recycled glass, and recycled floor tiles in the foyer and basement. The yard has 2 rain gardens, permeable walkways, 3 rain barrels, and 2 compost piles. There is also an aquaponics system in the basement. New features this year: 1000 gallon cistern, extensive food forest and native meadow planting, and a Chevy Volt.

#### DIRECTIONS

29 North till it ends. Make a right at the light onto Rogers Ave. Go over the I-70 bridge. Make the first left after the bridge onto Church Lane Dr. Make a right onto Deerfield Drive. Make the first left onto Montclair Drive.



### 163 South Meadow Drive, Glen Burnie, MD

This 4 bedroom 2 bath Cape Cod is small enough to make it possible to generate over 100% of our electricity needs using 40 185 watt solar panels (7.4 kW). In 2015 we added 19 280 watt panels to our garage making our total (12.7 kw). This extra capacity allows us to receive more SRECs and a larger check from BGE for the excess power we produce. In two years we hope to have a Tesla Model 3 which will replace the ICE car we keep for long trips. Our current EV, a Think City, has a realistic range of 65 miles. The home has radiant floor heating, CFL or LED lights, Energy-Star washer and dryer. The original owner had blown in insulation added to the walls and attic. While it made the house warmer in the winter the insulation impeded the flow of air in the summer from the knee wall area to the vents at the peak of the roof. After removing the shingles from the original roof 2x2s were attached and a second plywood layer was added. This allowed airflow from the vented soffits to the ridge vent. The attic stays much cooler in the summer now. The vinyl siding was installed over 1.5 inches of foil backed blue board insulation significantly increasing the overall R value

of the exterior walls. Links to Photos: <https://plus.google.com/photos/117641210862910317418/albums/5889933411918793617#photos/117641210862910317418/albums/5889933411918793617>, <https://plus.google.com/photos/117641210862910317418/albums/5556272234251591761>

#### DIRECTIONS

From the Baltimore beltway, I-695 S, take exit 2 for Maryland 10 S toward Severna Park. Take the Maryland 270 S exit. Turn left onto E Furnace Branch Rd. Turn left onto S Meadow Dr. Destination will be on the right.



### 9123 Liberty Village Way, Union Bridge, MD

This is a detached 1.5 story, built 2004; wood frame 2x6 frame construction, 5.5" fiberglass insulated sidewalls, vinyl siding; double glazed wood frame, Anderson double hung windows with exterior vinyl wrap; HVAC by original ground source geothermal Water Furnace heat pump, and electric water heater with integrated heat recovery from A/C heat waste; 18 PV 250 watt roof mounted southeast facing panels added in 2015, total 4.5 KW DC system, Solar Edge Micro-Inverters and monitoring system installed by Solar City. This is one of 18 homes in a resident planned and developed cohousing community which embraces ecological sensitivity and energy conservation, a culture of friendliness, sharing, and self directed community management with decision making by consensus.

#### DIRECTIONS

From Frederick City, east on Route 26 (Liberty Road) about 10 miles to just past Route 75, past the entry to Libertytown Regional Park, turn right on Liberty Village Way; park in Community Parking lot; walk to house; ask any resident for assistance.



### 9129 Liberty Village Way, Union Bridge, MD

This is a side-by-side duplex cape cod, 1.5 story, built 2000, wood frame 2x6 frame construction, 5.5" fiberglass insulated sidewalls; Anderson double glazed wood frame, exterior vinyl wrap double hung windows; full reinforced concrete basement with fiberglass insulated wall wrap; HVAC by original ground source geothermal



Water Furnace heat pump, 10 PV 290 watt roof mounted south facing panels added in July 2016, total 2.9 KW DC system, Solar Edge Micro-Inverters and monitoring system, installed by Trinity Solar. This is one of 18 homes in a resident planned and developed cohousing community which embraces ecological sensitivity and energy conservation, a culture of friendliness, sharing, and self directed community management with decision making by consensus.

**DIRECTIONS**

From Frederick City, east on Route 26 (Liberty Road) about 10 miles to just past Route 75, past the entry to Libertytown Regional Park, turn right on Liberty Village Way; park in Community Parking lot; walk to house; ask any resident for assistance.



**9150 Liberty Village Way, Union Bridge, MD**



This is a side-by-side duplex cape cod, 1.5 story, built 2000, wood frame 2x6 frame construction, 5.5" fiberglass insulated sidewalls; Anderson double glazed wood frame, exterior vinyl wrap double hung windows; full reinforced concrete basement with fiberglass insulated wall wrap; HVAC by original ground source geothermal Water Furnace heat pump and electric water heater with integrated heat recovery from A/C heat waste; 8 PV 260 watt roof mounted southeast facing panels added in May 2016, total 2.1 KW DC system, Solar Edge Micro-Inverters and monitoring system, installed by Solar City. This is one of 18 homes in a resident planned and developed cohousing community which embraces ecological sensitivity and energy conservation, a culture of friendliness, sharing, and self directed community management with decision making by consensus.

**DIRECTIONS**

From Frederick City, east on Route 26 (Liberty Road) about 10 miles to just past Route 75, past the entry to Libertytown Regional Park, turn right on Liberty Village Way; park in Community Parking lot; walk to house; ask any resident for assistance.



**9158 Liberty Village Way, Union Bridge, MD**



This is a detached 2 story, built 2000; upper level is wood frame 2x6 frame construction, 5.5" fiberglass insulated sidewalls, vinyl siding; double glazed wood frame, exterior vinyl wrap casement windows; lower level is full reinforced concrete, insulated concrete form (ICF) with Styrofoam insulated inner and outer surfaces, resin epoxy stucco finished; HVAC by original ground source geothermal Water Furnace heat pump, and electric water heater with integrated heat recovery from A/C heat waste; 36 PV 255 watt roof mounted southeast facing panels added in Nov 2014, total 9.18 KW DC system, Solar Edge Micro-Inverters and monitoring system. House also has attached greenhouse for passive heat gain capture and forced air transfer into living areas through power vents, installed by Maryland Solar Solutions, Inc. (MSSI). This is one of 18 homes in a resident planned and developed cohousing community which embraces ecological sensitivity and energy conservation, a culture

of friendliness, sharing, and self directed community management with decision making by consensus.

**DIRECTIONS**

From Frederick City, east on Route 26 (Liberty Road) about 10 miles to just past Route 75, past the entry to Libertytown Regional Park, turn right on Liberty Village Way; park in Community Parking lot; walk to house; ask any resident for assistance.



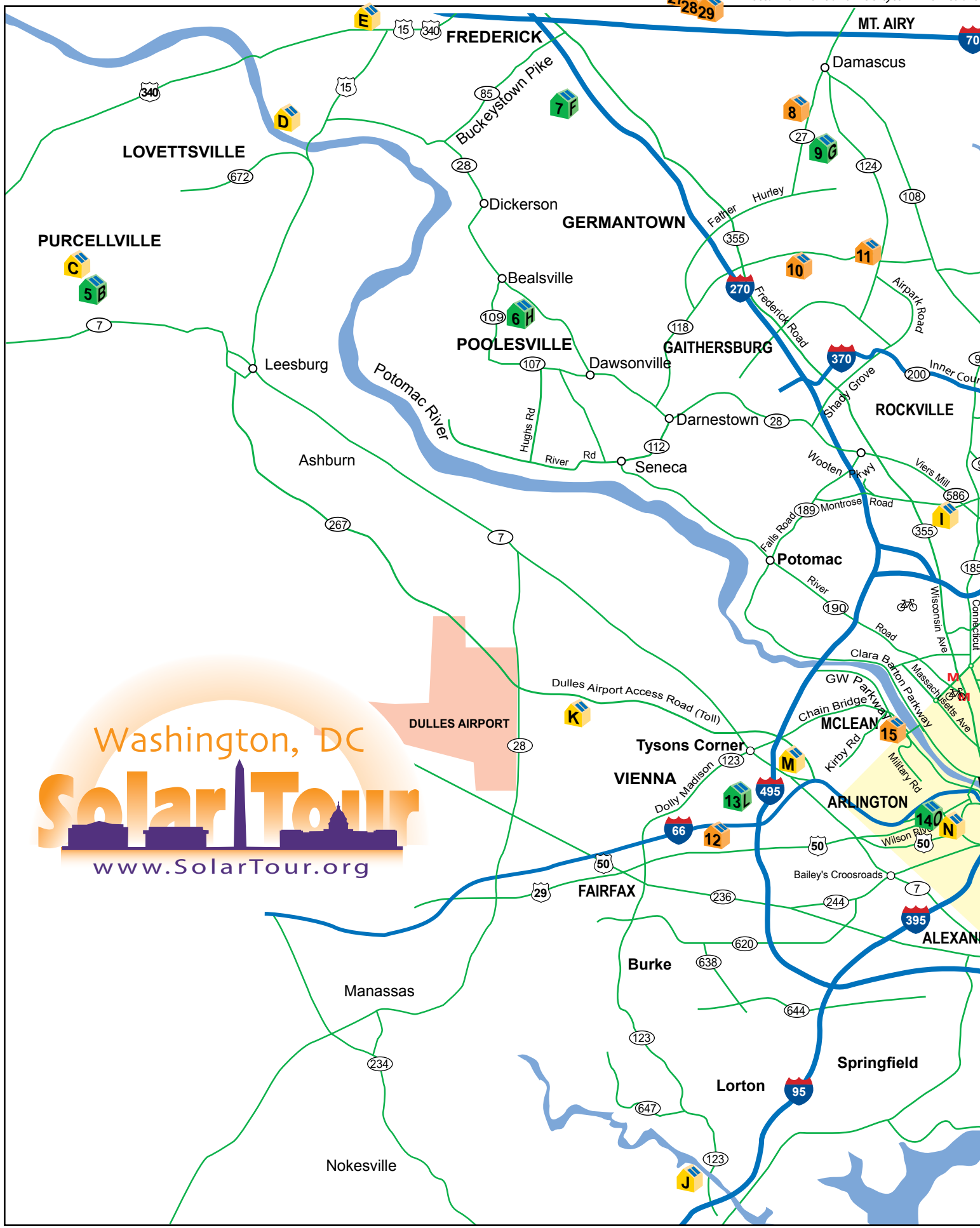
**8626 Blacks Mill Rd, Thurmont, MD**



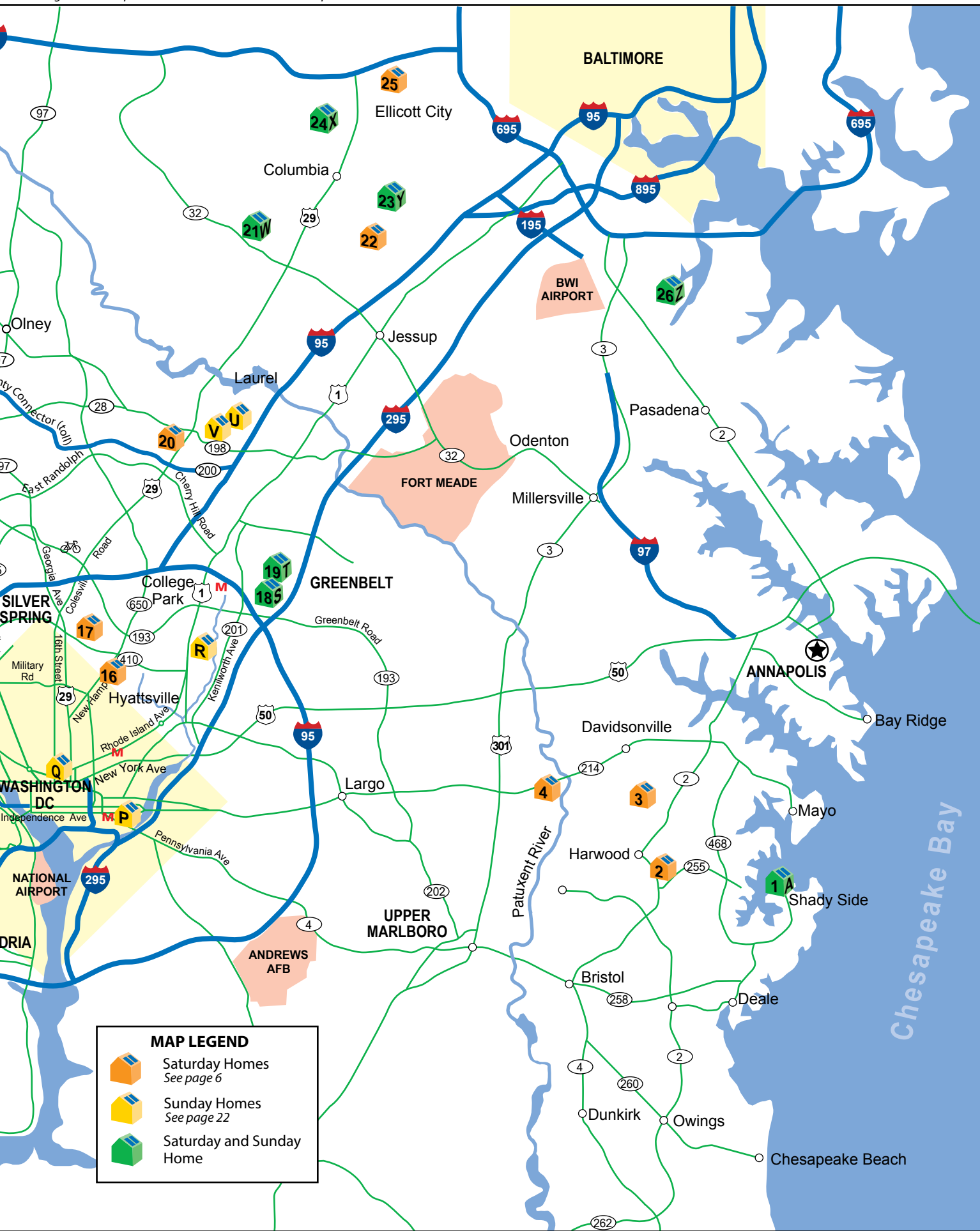
The 1750 sq. ft. home was built in 1992 and has a 17.6 kW, grid-tied, ground-mounted solar PV system. Solar supplies all electrical needs that include heating, air-to-air heat pump and central Air. The system has been on line since Oct 2013 and has generated 46 megawatt hours, approximately 25 megawatt hours per year. Calculated system payback is on track at 5 years or less. Using a Ted monitoring system for complete power monitoring of power use and generation. The farm tractors are augmented with waste vegetable oil. Other energy saving devices; Induction hotplates for canning and cooking, soaker hoses for watering organic garden with automatic water timers.

**DIRECTIONS**




Take US-15 N to slight right onto Old Frederick Rd. Continue onto MD-550 for about 5 mi. Turn left on Blacks Mill Rd. Proceed down gravel drive, across road from second church to the tan brick Cape Cod with the tall TV tower.



out of range of this map. See Directions in their home descriptions.



**MAP LEGEND**

-  Saturday Homes  
See page 6
-  Sunday Homes  
See page 22
-  Saturday and Sunday Home

# DC Area Solar Co-ops

## *A resource for all things Solar*



If you have thought about going solar, now is a great time to do so. The cost of installing solar has declined roughly 50% over the past five years. What's more, neighbors across the D.C. metro have joined this summer to go solar together through solar co-ops. Co-ops are up and running in Montgomery County, Northern Virginia, and the District. The groups are working with the help of Community Power Network (CPN) and its affiliate programs DC SUN, VA SUN, and MD SUN.

### ***“Working together makes it easy to save on solar”***

Co-op members have the opportunity to work with experts and each other to learn how solar technology works and how it can be applied to their home. More than 350 D.C.-area homeowners have gone solar with co-ops over the past three years.

Solar co-ops got their start in D.C.'s Mt. Pleasant neighborhood in 2007. CPN Executive Director Anya Schoolman's son urged the family to go solar. They quickly saw this would be an expensive and complicated process. Anya realized if she was going to take her home solar, she might as well try to take the whole neighborhood solar. This morphed into the Mt. Pleasant Solar Cooperative, which helped more than 40 neighbors go solar.

“Working together makes it easy to save on solar,” Schoolman said. “Going solar as part of a group gives

people a piece of mind that they are making the right decision for their home.”

Signing up is not a commitment to purchase panels. Once the groups are large enough, usually 20-30 members, CPN's affiliate programs help members submit a request for proposals to area installers. Each installer puts together a bid to respond to the RFP. Group members then select the installer based upon the quality of each bid.

Once a the group selects a company, the chosen installer will develop a customized proposal for each group member that reflects the price of the selected bid. At that point, group members can decide whether or not they would like to go solar.

Co-op members work with the support of their state SUN program throughout the process to learn about solar and get their questions answered. The SUN programs work closely with homeowners and selected installers to ensure the installation process goes smoothly. Co-op members then often go on to advocate for new solar programs like Community Solar and Low Income solar and to build and fight for local clean energy.

If you want to learn more, please join us for an information session or email us: [solarteam@dcsun.org](mailto:solarteam@dcsun.org).

# Community Solar

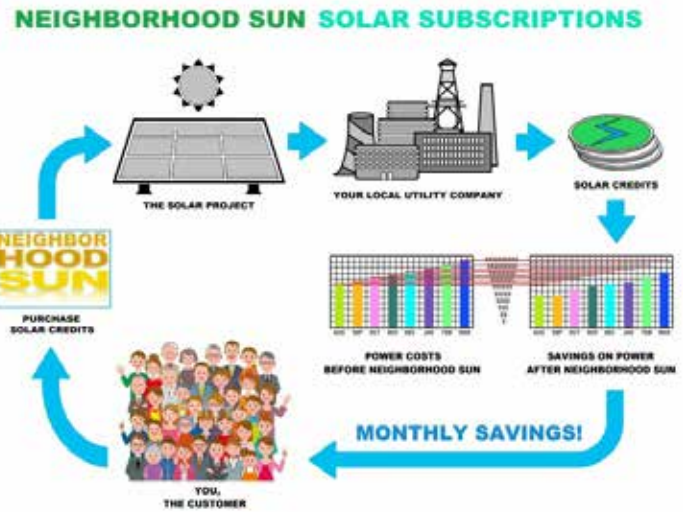
by Gary Skulnik

If you still don't have solar, it's time to get off the sidelines of the solar wave and join the clean energy revolution. Anybody who pays an electric bill can now join thanks to the new community solar program in Maryland. Rooftop solar is great, but it only works for a small group of homeowners or businesses. Community solar is coming to Maryland. Solar for everybody is no longer an empty slogan.

If you're one of the leaders of the climate movement, or have been doing "green" since before it was cool, then you're going to want to be among the first group of people to subscribe to a community solar project in Maryland. Leadership by action is just as powerful as any other kind of leadership. Demonstrating a commitment to community and to a cleaner future is important for you.

*"Maryland has made incredible strides in solar energy over the past decade."*

How does it work? Solar companies build a central solar project that provides power to community members who sign up as subscribers to the project. The project and you, the subscriber, have to be in the same utility area. You will get credited by your utility for all the



power you purchase from the solar system, just as you would if the system were on your roof. There are several new projects already getting started so finding one in your area should be easy.

Maryland has made incredible strides in solar energy over the past decade. Now it's time to finish the deal and bring solar to a scale unimaginable even just a few years ago. We can do that with community solar.

*Gary Skulnik is the CEO and Founder of Neighborhood Sun, Benefit LLC*





# Sunday Homes

## Home E on the Tour

Can you count the 69 solar panels on this home? Come out to Jefferson, Maryland and see them for yourself as well as many other energy efficient features.



## Home H on the Tour
























This sustainably energetic family in Poolesville, Maryland has a solar home that charges their EV and plug-in hybrid.



## Home Q on the Tour

This rowhouse in Northwest, Washington, DC underwent a complete remodel featuring a long list of energy efficient improvements including a 2.16 kWh solar array

### FEATURED SOLAR/GREEN TECHNOLOGIES

-  Photovoltaic panels (PV)
-  PV panels with battery backup system
-  Solar hot water system
-  Passive solar home
-  Solar space heating
-  Radiant floor heating
-  Solar attic fan
-  Greenhouse
-  Green roof
-  Geothermal
-  Wind power
-  Strawbale construction
-  Low VOC paint and construction materials
-  Superinsulation
-  High efficient windows
-  Recycled building materials
-  Corn/wood stove
-  Energy efficient appliances
-  High efficient lighting
-  Low water consumption
-  Gray water storage system
-  Tankless water heater
-  Rainwater collection system
-  Rain garden/native plants
-  Composting
-  Alternative energy vehicle



### 4927 Hine Drive, Shady Side, MD

This Shady Side home built in 1993 is an ongoing experiment in living lightly or sustainably on the earth. The main features of the house are lots of insulation, low emissivity windows, a wood pellet stove, a solar cooker, nesting osprey, passive solar heating and cooling, photovoltaic power, a wood cooking stove and lots of fans instead of ducts to circulate heat. The treed living room, located on the waterside of the house, is a passive heated solar sunspace that is used as a heat source for the rest of the house. More important than these parts is the way these parts are integrated into a whole, the management practices which make it all work to create significant energy savings and the lessons learned which were carried on to my work on Passive House and Net Zero Energy designs. For more information go to Sansone Solar House on [solarvillages.org](http://solarvillages.org).

#### DIRECTIONS

Take Exit 11 (Route 4) off the beltway (I-95/I-495); head East for 11 miles to Route 258 towards Deale. At the first T, turn left onto Route 256. At the next T, turn right onto Route 468, you will pass a firehouse and turn left onto Steamboat Road. Take the 3rd left onto Olive Street. Olive Street turns slightly right and becomes Hine Drive.

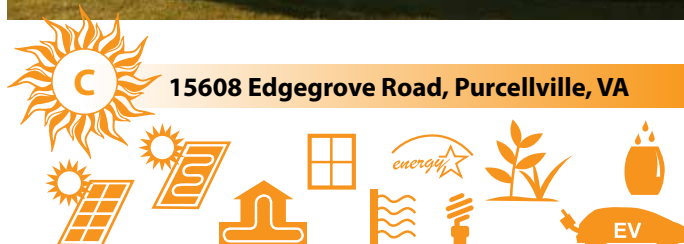


### 35971 Ashby Farm Circle, Purcellville, VA

We have utilized a number of features. One is an 8.64 PV kw ground mount system (36 panels). To this we have added a two panel solar hot water roof system. In addition we have an outdoor wood burning furnace that heats water running into a copper coil system into the air handler giving us central heating with wood. This same system heats our domestic hot water through a heat exchanger on the water heater. We also have a few solar night lights for walkway lighting.

#### DIRECTIONS

Take Rt 7 West to Round Hill, VA and take the first right (Evening Star) to stop sign. Go approx four miles and go right on Ashby Farm Circle (second Ashby Farm Circle entrance) to second house on right.



### 15608 Edgegrove Road, Purcellville, VA

Solar water heating panels on a shed; the hot water is piped underground into the home. A timer withholds power to the electric water heater during night. The geothermal heat pump is much cheaper to operate than the previous propane system. Home automation turns off lights in idle rooms and outdoors. The solar PV arrays provide the energy needed for commuting in the electric cars (BMW Z3 Roadster, Leaf and a Volt). Edible landscaping includes figs, blueberries, peaches, apples, pears, elderberries and walnuts.

#### DIRECTIONS

From Leesburg, take Hwy 7 west to the Round Hill exit. Turn right, then take the first right onto Evening Star Drive. Follow it 1.1 miles and turn right onto Woodgrove Road (Rt. 719). Go 2.8 miles and turn left onto Edgegrove Road.

Home D  
has withdrawn  
from the tour

## 2016 Sunday Homes



**4112 Old Bridge Lane, Jefferson, MD**



In addition to the 69 solar panels other features include: Geothermal heating/cooling, Energy Star appliances, LED/CFL lighting, energy monitoring, an electric car, WaterSense low water use toilets, all electric outdoor tools including an electric lawn tractor, pervious surfaces in parking areas and bamboo cabinetry.

### DIRECTIONS

From Frederick, MD - Go west on US-340 towards Harpers Ferry, WV. Take the Jefferson, MD / Lander Rd exit (house is less than 1 mile from this exit). After a light Lander Rd becomes Holter Rd. Turn left onto Camden Dr, then 1st right onto Sturbridge Ct. Next turn left onto Old Bridge Lane. The house is the third one on the right.

wind turbine. A newly constructed highly efficient conference center with sips panel construction, geo-thermal heating and cooling and utilizing water saving composting toilets. A residence heated with corn and having 5 KW of solar. Other features include a skylite ridge on the roof, solar tubes, food production in a high tunnel, extensive water mitigation with rain gardens a large Grey water leach field and 9 acres enrolled in the Conservation Reaerve Enhancement Program.

### DIRECTIONS

Take I-270 North to exit 26 Urbana (route 80) go left under the overpass, 1/2 mile left on Roderick Road 1 mile farm is on Right. Look for Mountainside and the wind turbine.



**11104 Watkins Road, Germantown, MD**



Come join us for a weekend of questions, answers and a good time! See how you can enjoy a \$5 monthly utility bill and practically unlimited fresh veggies just steps away from your kitchen door or as we like to say in a real estate context, GROWING VALUE! The barn has radiant heat, passive solar heating, daylighting, and there is a garden with a hoop house for extended growing season. And there is a solar-powered electric fence. Alan is a real estate consultant with LEED AP certification and a MD Home Improvement license. We will also have gardening, farming and permaculture experts and information available. Hope to see you!

### DIRECTIONS

Take I-270 North to Father Hurley Blvd/Rt27 North toward Damascus. Turn right on Davis Mill Road (Southern States on right at intersection) First left on Watkins Road and Right at 3rd Driveway.



**2822 Roderick Road, Frederick, MD**



This Must-see is a summer camp and environmental education facility with 2 residences on 115 acres. It features a 10 KW Bergey

## Solar Fact

Solar PV has been one of the fastest growing energy sources in the US over the past six years, with a compound annual growth rate of over 50% since 2007. Cumulative solar PV installations are forecast to increase an additional 80% over the next 18 months, surpassing 17 GW by the end of 2014.





**H** 2 Hackett Court, Poolesville, MD

Built in 2000, this single family home has been upgraded over the past 8 years, starting with an energy audit, and includes the following: attic insulation upgraded to DoE recommended R49, recessed light sealing, along with high efficiency AC upgrade. Lighting upgraded to 95% LED. 2200+ sq ft of strand bamboo flooring. Energy Star appliance replacements installed as needed and automatic lighting controls help ensure lights are off when not in use. Finished basement multi-purpose room & bath showcases energy & water efficient fixtures with sustainably sourced materials throughout. The home boosts a 69 panel net-positive solar installation handling over 100% of the household & Electric Vehicle needs. The installation consists of two solar panel arrays: a 12.5kW 52 panel array leased in 2013 and a 4.2kW 17 panel array bought in 2014, both grid-tied. A Nissan LEAF Electric Car and a Chevy Volt Extended Range Electric Car complete the picture. The homeowners have been driving electric since 2011. Extensive data collection on the solar array energy production and electric car usage is available for review.

**DIRECTIONS**

From the intersection of 109 and 107 in Poolesville, take 109 north, turn right on Jerusalem Rd & go 1.1 miles, Turn Left on Cissel Manor Rd, Turn Left on McKernon Way, House is on left at the corner of Hackett Ct & McKernon Way.

**I** 1108 Parrish Dr, Rockville, MD

The owners signed up for solar panels in April 2012, and they were installed in August 2012 and functioning in December 2012. The panels are leased from Solar City, and the homeowner pays a monthly rent/electricity bill. The panels are grid-tied and net metered. In May 2013 when the panels produced more than the homeowners used, they received a \$14.35 refund from Pepco. In the heavier-use months of July, August, September and October 2013 their Pepco bill was \$7.

**DIRECTIONS**

From Rockville Pike turn into Edmonston Drive towards the bridge (heading east). Turn right on Lewis, turn left on Parrish Dr. 1108 is next to the fire hydrant.



**J** 12334 Macrina Court, Woodbridge, VA

This 1,900 SF loft style interior townhouse has two bedrooms and three baths and is located in an Active Adult community built around 2001. A 2.5 kW solar PV system was installed on the back roof in 2010. The home has been updated with Comfortrack cellular blinds with Side Tracks to reduce window air infiltration; R-55 attic insulation; and two SolaTubes for natural light. The attic access hatch has an Energy Shield door tent with zipper access. Attic knee walls have been weatherized by installing blue board on the attic side and sealing around all edges. A jumper duct has been installed to improve cross ventilation of the upstairs bedroom. In 2013, the HVAC system - furnace and A/C - was replaced with a 16 SEER A/C and 70,000 BTU furnace. The south facing back of the home has been landscaped to reduce summer heat gain, and the sunroom, constructed in 2009, has a wide overhang on the south side for the same purpose. Energy Star appliances and LED lights in most fixtures. Combined monthly utility cost for water, gas and electric was just over \$1000 in 2015.

**DIRECTIONS**

Take I-95 South to Exit 160 (Route 123) towards Occoquan. Turn left on Old Bridge Road (Route 641). Turn right on Clipper Drive (4th light). Turn right on Faversham Way and right on Macrina Court. Home is on right side on Macrina Court.



**K** 12600 Denmark Drive, Herndon, VA

## 2016 Sunday Homes

12 electric panels with micro inverters, 6 drain-back solar collectors preheat water which is fed into a tankless gas water heater that monitors input water temperature and adjusts the flame depending on how much heat is needed.

### DIRECTIONS

From the Dulles Toll Road, take the Fairfax County Parkway and turn left onto Fox Mill Rd (VA-665). Turn right onto Keele Dr and left onto Magna Carta Road and then right onto Denmark Drive.



**8396 Idylwood Road, Vienna, VA**



Originally constructed in 2007 with an addition by Windmill Hill in 2014, the house is designed to be as efficient and environmentally friendly as possible without compromising on architecture or functionality. The concrete slab with SIP construction and the triple pane windows enable effective passive and active solar heating of the home. The narrow footprint of the home is designed for air movement, and the owners have used wood milled from the property, salvaged architectural pieces, recycled components and other environmentally friendly finishes. Outside the environmentally friendly features include a living roof, a native species yard, Audubon at home certification, a rain garden, and a hybrid car. The result is a beautiful home with many advanced technologies that keep the environmental footprint low. The addition was designed by Peter Henry with passive house standards in mind. Come learn from our decisions, successes, and challenges in design and function.

### DIRECTIONS

From I-66 exit at route 7 west. Take the first left onto Idylwood Rd. and go about 2 miles. 8396 Idylwood is between Cedar Lane and Williams Ave.

## Solar Fact

A residential solar energy system typically costs about \$3-4 per Watt. Where government incentive programs exist, together with lower prices secured through volume purchases, installed costs as low as \$2 watt - or some 10-12 cents per kilowatt hour can be achieved. Without incentive programs, solar energy costs (in an average sunny climate) range between 22-40 cents/kWh for very large PV systems.



**7619 Leonard Drive, Falls Church, VA**



Net Zero Passive House. This house was designed and constructed in 2013 to meet the Passive House standard. The result was an all-electric house with very low energy requirements. The addition of 18 solar PV panels provides more than the total annual energy used for heating, cooling and electrical use. The shell of the house is very air-tight (0.55 ach50 blower door test result), the walls are insulated with dense-packed cellulose insulation to R-40, and the attic is insulated to R-90. The house uses so little energy that it is heated and cooled with a small heat pump which is designed to heat and cool one room in a standard house but heats and cools all of this home's 3400 sf. The home's focus is a passive solar 2 story dining room. Extremely modern in construction but with a classic character, the space's natural lighting is superb. Fresh air is continually provided through an energy efficient ERV. Windows and doors are triple glazed and have multipoint locks to maintain a tight seal. South side shading has been designed to take advantage of solar gain in the cool seasons and to exclude it when hot. The hot water is provided by a GE heat pump water heater. All lights are LED. Appliances are all Energy-Star efficient.

### DIRECTIONS

From the Beltway take Exit 47 to Rt 7 East, Leesburg Pike. At first light turn right onto Ramada Road. Find a safe & legal turnaround. Go straight across Rt 7 at light and continue straight on Lisle Ave. At first stop sign take a right onto Fisher Drive then next left onto Leonard Drive. House is 4th on the right.



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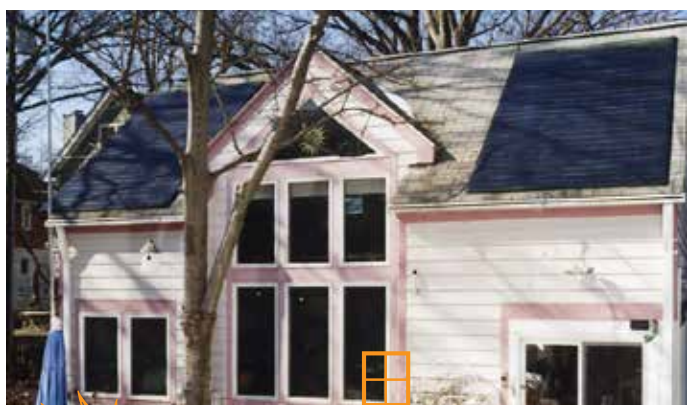
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**N** **706 North Ivy Street, Arlington, VA**

This 1920s Sears kit home was re-retrofitted in 1985 and again in 1993 to incorporate R38 insulation, double-paned low-e glass, geothermal (direct exchange) heat pump, solar water heater, and various types of photovoltaics (including peel-and-stick pv) dedicated to a battery bank. The back office building has solar roofing shingles, small wind turbine and a hydrogen fuel cell all tied to a web-enabled battery bank with solar daylighting, super insulating glass and LEDs. Three drop-and-play solar units and a demo van with PV/wind and carbon, super-capacitor batteries.

**DIRECTIONS**

From Washington take Rt. 50 west to the 10th St. exit, turn left onto N. Ivy St., and proceed to 706. This home is 2-1/2 blocks from the Clarendon Metro stop.



**O** **1713 N. Bryan Street, Arlington, VA**

The house is a 1926 Sears and Roebuck bungalow with a second story addition designed by the Owner/Architect. Grid tied solar panels are located on the high roof. A stand-alone system powers the porch using PV panels, a pair of deep-cycle batteries, and a controller. This off-grid arrangement furnishes light for the porch, refrigeration for cold drinks and power to pump water from a 300 gallon rainwater harvest cistern.

**DIRECTIONS**

3 blocks from Courthouse Metro (walking) from the intersection of Veitch and Wilson, leave Dunkin Donuts on your right. Follow to intersection of Bryan and Key. (driving) Wilson Blvd. North on Bryan (near Whole Foods) just north of intersection of Key and Bryan, next to the church.

**P** **517 13th Street SE, Washington, DC**

I have been greening my home for several years and will have been off the grid since March 2016. Other features -- novel uses of pilot lights to recover energy for heating water and dehydrating food, Tempcast masonry stove, SunDanzer refrigerator and freezer, inflector panels on some windows and on 2 skylights, a reflective roof coating, a manual grey water recovery system for dish washing, one window quilt, mini-split AC in 4 areas, passive ventilation with venting skylights, and various measures to reduce electrical pollution.

**DIRECTIONS**

Near Potomac Ave. Metro, just north of Pennsylvania Ave. on 13th Street SE. Parking within a block is usually easy.



**Q** **2233 12th Place NW, Washington, DC**

The rowhouse was built in approximately 1890 and is 12 ft wide with two floors over a crawl space, for a total of 870 sf of habitable space. When initially purchased, one-half of the first floor was uninhabitable due to water and termite damage. It has undergone a complete green renovation, including the creation of a new stair and light-monitor/solar chimney with 2.16kW roof-top photovoltaic panels. All the HVAC systems have been replaced with high efficiency units. The windows have been replaced with double-glazed, low-e wood windows that are double-hung as required due to a historic street designation. Interior improvements include a new full bath, new kitchen, study, dining and living room with a direct-vent gas fireplace. Sustainable materials include: bamboo and cork floors, low VOC paints, recycled glass tiles, and paperstone counter top. Back yard improvements include: swim spa, rainwater collection system, composting, container garden and patio space with permeable paving. The National Association of the Remodeling

## 2016 Sunday Homes

Industry— Metro DC Chapter selected the project for the 2008 Grand Award for Full House Green Remodel.

### DIRECTIONS

12th Place NW is a one-way street between Florida Ave NW, 13th St NW, W St NW, and 12th St NW. It is two and a half blocks north of the U Street / Cardozo Metro Entrance on 13th Street NW. On weekend days, nearby on-street parking is readily available.



### 4804 Guilford Road, College Park, MD

13 Sanyo HIT Power 215A panels (2.795 kW total) with Enphase microinverters and battery backup system were installed by Standard Solar in January and October 2011. Backup system feeds critical loads during grid outages. Solar panels generate 2.8 MWh/year, but we reduced electricity consumption to 2.3 MWh/year, so our meter today is lower than 5 years ago. Closed-cell foam insulation, injected into exterior walls by USAinsulation.net, and thermal curtains reduce AC usage for cooling (only 15 days in 2013) and natural gas for heating. Basement walls are insulated by spray-on foam, fiberglass bats, and fluted plastic. Low-E windows are installed by Thompson Creek. All lights are LED or fluorescent; electronic devices are on switched power strips; appliances are selected for highest efficiency rating at EnergyStar.gov. A new kitchen fridge (GE) consumes 1/2 of the old one. Summer humidity in a large basement is controlled by the super-efficient dehumidifier Santa Fe Impact XT (168 kWh total consumption in 2015). Roof and attic overheating in summer is reduced by Solaris reflective shingles, reflective foil in the attic, and ridge vent to maintain air circulation. Showerheads are low-flow, and Cimarron toilets are highly efficient. We use Kill-a-Watt electricity meter; humidity, temperature, and CO2 meters; and Black-and-Decker thermal leak detector. More info at <http://physics.umd.edu/~yakovenk/solar-home/>

### DIRECTIONS

Two blocks from the College Park Metro. Walk to the west side of the tracks, south on Bowdoin Ave and west on Guilford Rd. Driving: take Guilford Rd east from Baltimore Ave (Route 1).

## Solar Fact

Did you know that solar energy is dependent upon nuclear power? Solar Energy's nuclear power plant, though, is 93 million miles away.



### 6 Pinecrest Ct., Greenbelt, MD



Our home has a 6.02 KW photovoltaic system leased from Solar City. There are 30 panels that are installed on two roof surfaces. The panels can withstand up to 130mph winds due to the manner in which they are installed. Each panel weighs slightly under 40 pounds which facilitated installation and meant that we did not have to reinforce our roof to support their weight. The panels are configured so that if any one panel is in shade, that panel no longer generates power, but the rest of the system continues to generate power. We drive two Toyota Prius hybrids and we are busy incorporating both edible plants into our landscape (blueberries, strawberries, asparagus, and herbs) and Maryland natives.

### DIRECTIONS

From the Beltway, take MD-201/ Kenilworth Ave (exit 23) toward Greenbelt/Bladensburg. (Go 0.34 miles). Veer to the right, taking the ramp toward Bladensburg. Merge onto 201 S. & take the immediate ramp on the right toward MD-193/Greenbelt Rd. Turn left onto Greenbelt Rd. Go under the overpass and turn left onto Lakecrest Dr. Turn left onto Pinecrest Ct.



### 108 Ridge Road, Greenbelt, MD



This passive solar three-story was designed and pre-engineered by Acorn Deck House. House siting and design rather than manufactured devices captures the energy of the sun. Large expanses of South-facing glass allow storage of winter sun heat in tile floors installed on concrete for storage mass. Light shafts to provide natural lighting for the ground level space pierce the front deck. The South-facing roof is steep enough to provide for solar collectors in the future. Massive trees provide shade in the summer and shelter from winter winds. The site also "borrows" spectacular 8-mile views from the Beltsville Agricultural Research Center. Dual dishwashers minimize the number of less-than-fully-loaded cycles and save water, electricity and detergent use. Closets on exterior walls provide additional insulation but require care to avoid moisture build-up.

### DIRECTIONS

From the Beltway, MD-495/95, take Exit 23 N to MD-201 N Kenilworth Avenue towards Greenbelt. Turn right on Crescent Road (450 ft on Kenilworth from Beltway Outer Loop); .4 mile on Kenilworth from Beltway Inner Loop). Turn Left on Lastner Lane, .3 mi (becomes Ridge Rd).



**5809 Holger Ct., Laurel, MD**



Our roof's 5.8 kW PV was installed in April 2012 and provides about two-thirds of the electricity for the house. And on some days, producing more than we use. Home features energy saving washing machine, CFL lighting and super insulation in the attic. Other alt fuel features include a Prius, a 144 volt electric Ford Escort, electric powered dragster and a GE Elec-Trak garden tractor.

**DIRECTIONS**

Take I-95 to Exit 33B to 198 West towards Burtonsville. At the second light make a right onto Bond Mill Road. Take an immediate left onto Clayburn Drive. Make a right on Holger Court. Fifth house down on the right at 5809.



**5804 Holger Court, Laurel, MD**



3.7 kW solar panels are installed on the front roof of the house.

**DIRECTIONS**

Take Exit 33B off of I-95, west towards Burtonsville. Turn left onto Bond Mill Road and then take the next left onto Clayburn drive. Take the second left onto Holger Ct and see the second house on the left.



**6692 Cedar Lane, Columbia, MD**



The James and Anne Robinson Nature Center is a LEED Platinum facility, featuring solar panels, a geo-thermal heating/cooling system, pervious surfaces in parking areas, bamboo cabinetry, sunflower seed reception desk, and window stenciling to reduce bird strikes. The building was constructed into the hillside for insulation and has biofiltration stormwater management features, such as rain gardens and roof gardens, to capture and treat runoff. The Center has one mile of wooded hiking trails with arboretum signs. It is a multi-award-winning nature education facility that offers numerous programs for all ages throughout the year.

PLEASE NOTE: Robinson's hours are Saturday from 9am - 5PM and Sunday from Noon - 5PM. Upon arrival go to the front desk and let them know you are part of the Green Homes Tour in order to have the entrance fee waived.

**DIRECTIONS**

Route 32 to exit 17 Cedar Lane. Head north on Cedar Lane. The Center is on the left opposite Harriet Tubman Lane.



**9421 Frederick Road, Ellicott City, MD**



PLEASE NOTE : Miller Branch hours are Saturday from 10 am - 6 pm and Sunday from 1 - 5 pm.

HCLS Miller Branch has water conservation features, energy efficient HVAC and lighting design, recycled and local materials, low VOC materials, and a sustainable site design. Through its materials and design, the building reflects the community's historical roots (e.g.,

# 2016 Sunday Homes

Bollman Bridge, Thomas Viaduct, Patapsco River, Ellicott City stone). Designed to capture the benefits of natural lighting and maximize energy efficiency, Howard County Library System Miller Branch is a LEED Gold facility. The branch also features rainwater filtering cisterns and a green vegetative roof to enhance the storm water management system of the building. The Enchanted Garden, an outdoor classroom, is a designated Monarch Butterfly Waystation. This building is on tour both days. [hclibrary.org](http://hclibrary.org).

### DIRECTIONS

From Route 29: Exit onto Rt 40 westbound. Proceed about 0.25 miles. Turn left onto Saint Johns Ln. Proceed about 0.4 miles. Turn right onto Frederick Rd. HCLS Miller Branch is about 0.6 miles on the left.



**5167 Ilchester Road, Ellicott City, MD**



This suburban homestead features a 4kw PV array which helps to charge the Chevy Volt. Additionally it features solar hot water panels, rain barrels and 3-compartment compost bin. There is also a 9000 sq ft vegetable, pollinator, and herb garden with greenhouse.

### DIRECTIONS

From I-95 exit onto MD-100 W. At the traffic circle take the exit for Rt. 103 W/Meadowridge Rd. Go 1.4 miles and turn right onto Ilchester Rd.

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**163 South Meadow Drive, Glen Burnie, MD**



This 4 bedroom 2 bath Cape Cod is small enough to make it possible to generate over 100% of our electricity needs using 40 185 watt solar panels (7.4 kW). In 2015 we added 19 280 watt panels to our garage making our total (12.7 kw). This extra capacity allows us to receive more SRECs and a larger check from BGE for the excess power we produce. In two years we hope to have a Tesla Model 3 which will replace the ICE car we keep for long trips. Our current EV, a Think City, has a realistic range of 65 miles. The home has radiant floor heating, CFL or LED lights, Energy-Star washer and dryer. The original owner had blown in insulation added to the walls and attic. While it made the house warmer in the winter the insulation impeded the flow of air in the summer from the knee wall area to the vents at the peak of the roof. After removing the shingles from the original roof 2x2s were attached and a second plywood layer was added. This allowed airflow from the vented soffits to the ridge vent. The attic stays much cooler in the summer now. The vinyl siding was installed over 1.5 inches of foil backed blue board insulation significantly increasing the overall R value of the exterior walls. Links to Photos: <https://plus.google.com/photos/117641210862910317418/albums/5889933411918793617#photos/117641210862910317418/albums/5889933411918793617> <https://plus.google.com/photos/117641210862910317418/albums/5556272234251591761>

### DIRECTIONS

From the Baltimore beltway, I-695 S, take exit 2 for Maryland 10 S toward Severna Park. Take the Maryland 270 S exit. Turn left onto E Furnace Branch Rd. Turn left onto S Meadow Dr. Destination will be on the right.

## Solar Fact

Solar photovoltaic (PV) installations in the US have now broken through the 10 gigawatt (GW) barrier, following strong market deployment since the start of 2010.

# Electric Vehicles Pair with Clean Energy

by Charlie Garlow  
EVA/DC

**There is so much news on electric vehicles (EVs) that it is hard to know where to begin.**



*Charlie Garlow (second from left) showing his electric Porsche to students at a local school*

**L**et's start with the idea that walking, running, bicycling and mass transit are preferred ways to transport yourself and others, as they are great exercise and zero pollution, or nearly zero. EVs, however, are better/cleaner than vehicles that burn fossil fuels, for those who need a car for some, if not all, their transportation needs, which includes most of us.

Volkswagen got caught cheating on their diesel emissions tests and pledges to make things right by, among other promises, to market 30 brands of EVs over the next 10 years. That's a lot.

Meanwhile, Netherlands and Norway pledge to sell EVs for 100% of all new cars by 2025 and Germany 100% EVs by 2050.

And back home, Tesla's Model 3, promising a 200+ mile range for a \$35,000 sedan before tax credits of \$7500 federal and several thousand in state credits, set the record for most orders in a day: over 300,000 people put down a \$1,000 refundable deposit. Did you? All right!

The Chevy Bolt EV will offer roughly the same range and price with delivery even sooner. Game on! EVs are leading the way on self-driving cars with Tesla first up. In June, the first fatal accident chilled the thrill of autonomous cars, but few think this will stop these cars of the future.

Nissan and the Chevy Volt (plug in hybrid) also continue to offer great-selling cars as well as over 30 other models from Ford, BMW and others. Lots of choices await you. The range is getting longer on all these cars and prices are coming down. More EV charging stations in public areas (shopping centers, garages) as well as churches, workplaces and hotels are popping up. Most offer free electricity. Many offer free parking too.

And the electric grid is getting cleaner all the time too, as solar, wind and natural gas (boo on fossil fuels) replace highly polluting coal electricity. There goes the myth of EVs as pollution elsewhere cars.

What's not to like? The EVADC.org (Electric Vehicle Association of Washington DC), a non-profit non-partisan consumers group, advocates for more EVs as a way to reduce our addiction to oil, especially overseas oil which too often comes from OPEC countries, Venezuela and Persian Gulf countries. That reduces wars over oil and reduces our trade deficit. EVs are also a way to clean the Earth and save money on fuel and vehicle maintenance. Look for EVs in the driveways of several homes on the Tour of Solar Homes, charging on the sun!!

Buy or lease an EV. Ask your employer to authorize 120 volt EV charging at work (if you drive to work). Join Evadc.org.

# Grants and Incentives

by Charlie Garlow

## FEDERAL

The Federal tax credit for installing solar energy is 30% for residences with no maximum for solar photovoltaic or solar hot water, wind turbines and geothermal heat pumps installed after 2008. Fuel cells? \$500 credit per 0.5 kW of power. The tax credit expires on 12/31/2016.

## MARYLAND

The Residential Clean Energy Grant Program will give homeowners up to \$500 toward the installation of a solar hot water heater and up to \$1,000 for PV panels. The Clean Energy Production Tax Credit lets homeowners claim a credit on their state income tax. The credit is earned at a rate of \$0.0085 per kilowatt hour. The minimum credit is \$1,000 per year, which means your solar panel system must produce a minimum of 23,530 kWh per year. The Sales and Use Tax Exemption for Renewable Energy Equipment exempts solar equipment from the 6% sales tax. Several counties in Maryland have property tax incentives that are very generous. To apply for the Maryland Clean Energy Credit visit <https://egov.maryland.gov/mea/CleanEnergy/>

## WASHINGTON DC

The city council passed the Renewable Energy Portfolio Standard (RPS) which requires Pepco to obtain a portion of electricity from renewable energy. Rather than building its own solar projects, Pepco buys solar renewable energy credits (SRECs) on an open SREC market. People who install solar in the District can sell their SRECs into this market. One SREC is equivalent to 1000 kWh. In 2014 SRECs were selling for about 31 cents per kWh. Your solar installer can set you up with the DC Public Service Commission (PSC) to set up your SREC account. The application process takes 30 days.

## VIRGINIA

Virginia is not as generous with solar incentives. There is a 3-day tax-free holiday the first Friday in August for efficient appliances \$1500 or under. There are some local property tax exemptions for the value of your solar system. Cities and counties currently offering a solar energy equipment and facilities exemption include: Albemarle, Alexandria, Charlottesville, Chesterfield, Fairfax, Hampton, Hanover, Harrisonburg, Henrico, Isle of Wight, King and Queen, Lexington, Loudoun, Lynchburg, Prince William, Pulaski, Roanoke, Spotsylvania, Warren, Winchester and Wise. Arlington County offers Green Building incentives and exemptions on building heights or density.

You can also sell your solar/wind "RECs", or Renewable Energy Credits, to those who want or need them, if you need more money to make your solar/wind system happen. Some object to selling your solar "credits" because then others get the credit, like the power companies, so they don't have to build more solar somewhere else. If you really want to have more solar built, keep your credits, they urge. Others say, sell the credits to impress on your neighbors how much money you can make.

Keep pushing your local governments, and the national government, for more incentives. Consult your installer. They are usually on top of all the latest and greatest.

## WEBSITES

Federal: <http://energy.gov/savings/residential-renewable-energy-tax-credit>

MD: MEA homepage: <http://energy.maryland.gov/>

DC: GreenDC site: <http://green.dc.gov/green/site/>

VA: DMME Homepage: <http://www.dmme.virginia.gov/>  
<http://www.dsireusa.org> for more details



*The DSIRE (Database of State Incentives for Renewables and Efficiency) website has a listing of all the State's tax credits and incentives. The website is kept current.*

[www.dsireusa.org/](http://www.dsireusa.org/)



# Conservation Tips

1. Seal around fireplace trim, window trim and baseboards
2. Seal between sheathing and foundation on the outside
3. Weather-strip windows, doors, and joints
4. Insulate band joists area
5. Install switch plate and outlet plate insulators
6. Seal basement crawlspace, ceilings and walls
7. Install doorsweeps and new thresholds
8. Caulk and insulate all primary and secondary duct joints, except return duct joints
9. Weather-strip/insulate scuttle hole or attic access doors
10. Weather-strip vertical joints of exterior sliding doors and window air conditioners
11. Weather-strip top, bottom, and sides of garage doors
12. Install radiator reflectors
13. Install air filter alarm; clean and replace regularly
14. Insulate all accessible water heating and hot water pipes
15. Insulate the first 6 feet of cold water pipes leading into water heater
16. Insulate air-conditioner pipes and tubing
17. Install heating/cooling monitors
18. Install setback thermostat
19. Install water miser for toilet tanks, shower and faucets
20. Install hot water tank jacket and insulate with reflective foil
21. Seal around soil vent stacks in attic floor, and around all plumbing access doors
22. Seal mail chutes
23. Install temperature-controlled attic exhaust fans
24. Install dryer vent diverters (electric dryer only)
25. Set thermostat to 68°F in Winter, 78°F in Summer
26. Install automatic foundation vents
27. Install Plug-Itt in fireplaces
28. Install Cap-Itt over pull-down stairs
29. Install pulley plugs over pulleys of double hung windows
30. Reduce hot water temperature to 120°F and periodically drain tank sediment
31. Reduce boiler temperature
32. Reduce low-limit cutoff in the furnace
33. Replace incandescent bulbs with compact fluorescent, cold compact fluorescent or led bulbs
34. Add humidifiers for greater winter comfort at low temps
35. Clean air-conditioner exterior condenser unit
36. Open shades on south-facing windows on sunny days in the winter
37. Minimize use of exhaust fans when A/C or heat is in use
38. Use motion detectors with halogen lamps for outdoor lighting
39. Purchase high-efficiency appliances
40. Use "cool dry" cycle or allow dishes to air dry when using a dishwasher
41. Hang laundry outside to dry on nice days
42. Install ceiling fans to circulate air
43. Check electrical usage of your appliances with a plug-in kilowatt hour meter.
44. Reduce "vampire loads" by plugging-in your computer and devices to a single power strip and turning it off when you are done with your computer.



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# Solar Resources

## Magazines

Home Power Magazine, The Hands-on Journal of Home Made Power. This magazine covers various energy topics: solar, wind, PV systems, electric vehicles, batteries, hydrogen, domestic solar hot water, etc. 1 Year Digital Subscription (6 issues) - \$14.95. Half the price of the print edition. [www.homepower.com](http://www.homepower.com)

Mother Earth News, \$19.95 per year. The guide to living wisely features renewable energy projects and helpful sustainable living articles. Published bimonthly. [www.motherearthnews.com](http://www.motherearthnews.com)

Solar Today, The magazine of the American Solar Energy Society. Available through The American Solar Energy Society at [www.ases.org](http://www.ases.org)

## Books

Solar Electricity Handbook: 2016 Edition: A simple, practical guide to solar energy - designing and installing solar PV systems Kindle Edition by Michael Boxwell. Available on Amazon.com

Real Goods 14th Edition Solar Living Sourcebook, \$19.95. The Sourcebook provides the technical details you need to harness the sun, wind, or water for your home power generation. 600 pages. [www.realgoods.com](http://www.realgoods.com)

## Websites

American Council for Energy Efficient Economy - [www.aceee.org](http://www.aceee.org)

American Solar Energy Society - [www.ases.org](http://www.ases.org)

Database of State Incentives for Renewables & Efficiency - [www.dsireusa.org](http://www.dsireusa.org)

Interstate Renewables Council - [www.irecusa.org](http://www.irecusa.org)

Let's Go Solar! - [www.letsgosolar.com](http://www.letsgosolar.com)

MD-DC-VA Solar Energy Industries Association - [www.mdv-seia.org](http://www.mdv-seia.org)

Renewable Energy and Electric Vehicle Association - [www.reevadiy.org](http://www.reevadiy.org)

Potomac Region Solar Energy Association - [www.prsea.org](http://www.prsea.org)

Solar Energy Industries Association - [www.seia.org](http://www.seia.org)

Solar Electric Power Association - [www.solarelectricpower.org](http://www.solarelectricpower.org)

US Department of Energy  
Energy Efficiency and Renewable Energy - [www.eere.energy.gov](http://www.eere.energy.gov)

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