

29th Annual Metropolitan Washington, DC

SOLAR & GREEN

HOME TOUR

October 5-6, 2019
11am to 5pm

www.solartour.org

Presented by
Sierra Club
Mid Atlantic Solar Energy Society
American Solar Energy Society



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ON THE COVER

This Shady Side home built in 1993 is an ongoing experiment in living lightly or sustainable on the earth.



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29th ANNUAL TOUR OF SOLAR AND GREEN HOMES

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

SOLAR TOUR STAFF

John Essig - Tour Coordinator
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Chip Gribben - Guide/Website Design
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Show your solar home on a future Tour

To put your home in the tour send an email request to homes@solartour.org.

Advertising Information

To advertise in an upcoming tour send an email request to advertising@solartour.org

See www.solartour.org/sponsors.html for ad specs.



Welcome to the 29th Annual Metro Washington, D.C. Tour of Solar and Green Homes, Part of the American Solar Energy Society's National Solar Tour.

Thank you for taking part in what we hope will be an exciting and informative tour of solar and environmentally friendly homes. There's a great variety of solar and green homes on this year's tour including a 6.6 megawatt Community Solar array in Fort Washington, MD.

Because the homes are spread throughout a wide area, we suggest you plan your tour 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 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.

2019 Tour Highlights and Info

Visit the Community Solar Array in Fort Washington, MD at 2:00 pm Sunday for a guided tour of the facility. Home A on the Tour.

The MoCo Heritage Harvest Open House at Home 6 will have a Farm Tour on Saturday with produce and prepared food for sale and live music throughout the day.

Tour days and times are October 5 and 6, from 11:00 am to 5:00 pm.

Please note: Some homes are open only on Saturday, others are open only on Sunday, and a few are open both days.

Visit our website for the latest news, changes and cancellations.
www.solartour.org/updates.html

Grants and Incentives

by Chip Gribben

FEDERAL

Investment Tax Credit

The federal solar tax credit, the Investment Tax Credit (ITC), for solar photovoltaic (PV) and hot water, has been extended through 2021. The credit is 30% through 2019, 26% in 2020 and 22% in 2021. The ITC applies to both residential and commercial systems and there is no cap on its value. The legislation also allows homeowners to claim the credit as soon as construction begins as long as the system is placed in service on or after January 1, 2006 and on or before December 31, 2021. For solar hot water heating, at least half the energy used to heat the water must be from solar. The home served by the system does not need to be the taxpayer's principal residence.

There are some exemptions. If you sign a lease or Power Purchase Agreement (PPA) with a solar installer or are not the owner of the system, you cannot receive the tax credit. Pool and hot tub water-heating are exempt from the credit. For more information visit:

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

GO SOLAR FOR \$ZERO!

The graphic is a dark blue rectangle with white and yellow text. It is divided into two columns by a vertical line with a yellow circle containing the word 'OR' in the center. The left column is titled '\$0 PPA' and describes a Power Purchase Agreement where the user locks in a lower electric rate and pays \$0 for panels and installation. The right column is titled '\$0 OWN' and describes an ownership model where the user pays \$0 for panels and earns profits, with a note about fantastic financing available.

\$0 PPA
LOCK IN ELECTRIC RATE
20-30% LOWER
THAN UTILITY:
PAY \$0 FOR SOLAR PANELS
AND INSTALL with our
Power Purchase Agreement

OR

\$0 OWN
PAY \$0 FOR ELECTRIC
AND EARN PROFITS:
Own Solar Panels for
\$0 Down to Save up to
100% on Electricity Bills
Fantastic Financing Available!

At Solar Energy World we work to help families reduce their dependence on expensive, dirty energy by making it easy to switch to clean, efficient solar power because we believe tomorrow matters.



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MARYLAND

The Maryland Energy Administration is managing the state's Renewable Portfolio Standard (RPS). Currently, the RPS requires 20% of energy sold in Maryland by 2022 come from qualified renewable energy resources, with 2% coming from qualified solar resources.

Residential Clean Energy Grant Program

This program gives homeowners up to \$500 toward the installation of a solar hot water heater, up to \$1,000 for PV panels and up to \$3000 for a geothermal system. The capacity limit is 20 kW for PV, 10 to 100 square feet for solar hot water and 1 to 10 tons for geothermal. The state has a similar grant program for commercial buildings and businesses with larger systems. Visit: <https://egov.maryland.gov/mea/CleanEnergy/>

Solar Renewable Energy Certificates (SREC)

Maryland's SREC program grants homeowners one SREC for each megawatt-hour (MWh) their system produces. The credits can then be sold on the SREC Market. The program may run out of funding in about 2020.

Residential Community Solar

The Maryland Residential Community Solar program allows residents to purchase subscriptions for energy from community solar arrays, gaining the same economic advantages as having solar modules directly on their homes. In support of this program, the MEA developed the Residential Community Solar Grant Program. The program provides a monetary incentive for residents who wish to purchase (own) the energy benefits of the array. Low to moderate (LMI) residents who subscribe to a community solar array under an ownership model are incentivized at a higher rate than other subscribers. Subscriptions must be to a community solar array within the subscriber's electric utility service area. A grant will not exceed 100% of the resident's annual energy use (with maximum subscription size of 20 kW). This grant program may not be used for subscriptions to arrays under a Power Purchase Agreement (PPA).

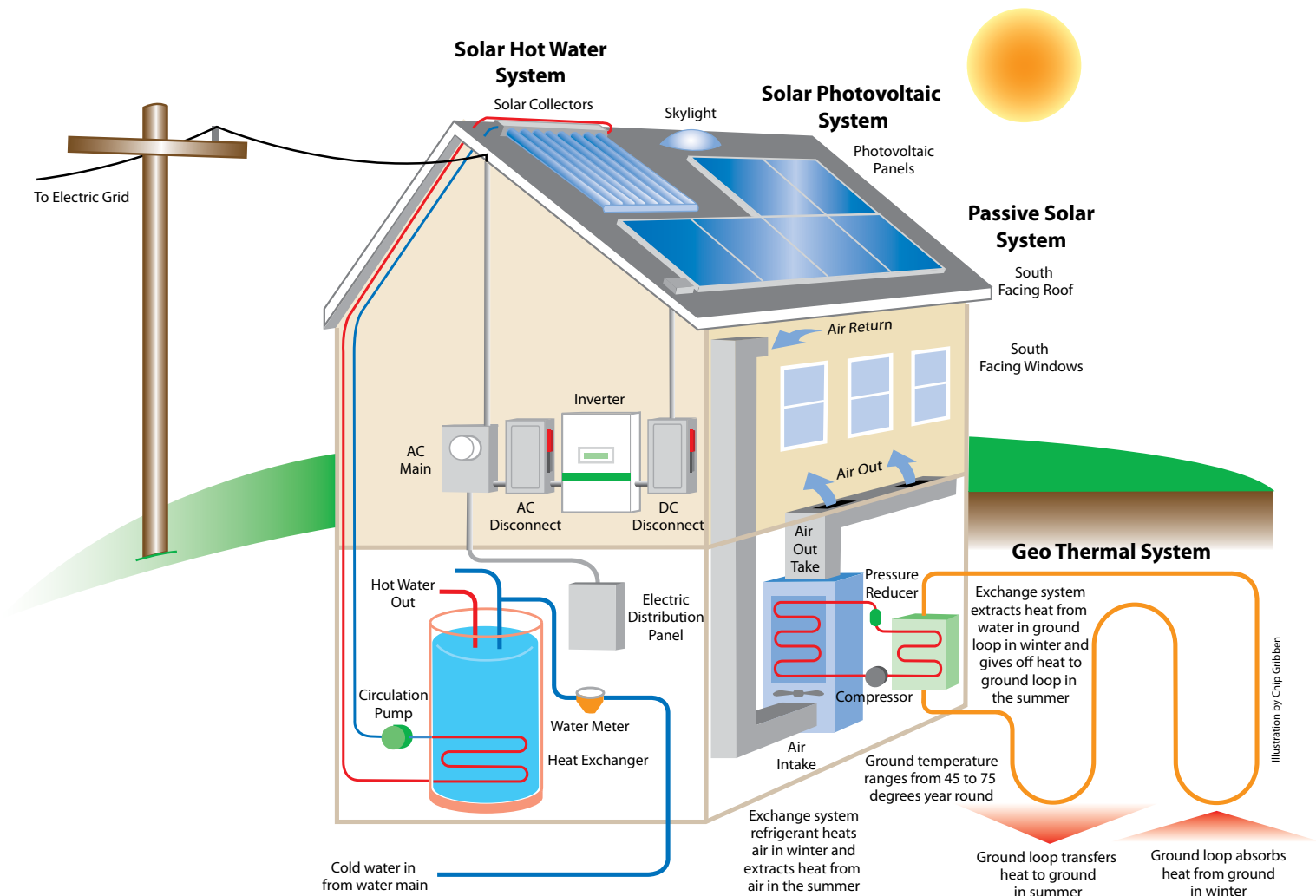
WASHINGTON DC

The city council passed their RPS which requires Pepco to obtain a portion of energy from renewable energy. Rather than building its own solar projects, Pepco buys SRECs on the open market. People who install solar in the District can sell their SRECs into this market.

Continued on Page 23

Might Now be the Time to Go Green?

by Chip Gribben



Now is the time to consider going green by incorporating energy efficient technologies and solar into your home. Installation costs have dropped 70 percent over the past 10 years and a large selection of financing options make it more affordable to go green. Solar has also gained popularity among electric vehicle owners who take advantage of the sunlight to charge their vehicles, offsetting emissions and reducing reliance on foreign oil.

Going solar can also insulate yourself from potential energy rate hikes and reliability issues within the power grid. Investing in a solar system will reduce your energy needs, which in turn, will help negate rising energy costs for 20-30 years.

Start Saving Money Now!

Having an energy audit done on your home can reveal where energy is used or wasted. The audit will provide information on where insulation improvements can be made and how to lower your energy consumption. Many solar installers provide this service.

Photovoltaics

Photovoltaics (PV) are the solar panels that produce electricity from the sun's rays. Solar cells are assembled into panels 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 electric-

ity 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.

If your system produces more electricity than you use, your utility will credit your account for that much energy on your next bill. This is called Net Metering and allows you to connect your solar PV system with the electric grid, making it a two-way street.

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 life spans of 20 and 30 years, respectively.

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

Geothermal Systems

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. A 3-ton system installed in a new house in the DC Area often runs around \$30K, including the Ground-Source Heat Pump (GSHP), ductwork, controls and wells. In areas of bedrock west of I-95, the wells alone can cost \$3500 per ton. 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, prices continue to drop. The "crossover point" has occurred in many areas of the country where 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. With incentives, solar is already cost effective.

There are several incentives in the region. In addition to Federal and State tax credits and grants, Maryland and DC have 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.

Although SREC values have decreased in some areas their value remains good in other jurisdictions that have expanded and/or extended their RPS. Now, on with the tour!

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Saturday Homes

Home 6 on the Tour

Visit the MoCo Heritage Harvest Open House featuring fresh produce, food, live music and the solar home on the farm



Home 9 on the Tour
























This home in Hillsboro, Virginia has a collective 13 kW system on the house and barn with a battery back up.



Home 11 on the Tour

This 3400 square foot home in Falls Church, VA is Net Zero with 18 PV panels and many energy efficient features.

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-efficiency windows
-  Recycled building materials
-  Corn/wood stove
-  Energy efficient appliances
-  High-efficiency 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



Open Saturday and Sunday

This Shady Side home built in 1993 is an ongoing experiment in living lightly or sustainable on the earth. The main features of the house are zoning based on use, lots of insulation, low emissivity windows, a wood pellet stove, a solar cooker, passive solar heating and cooling, photovoltaic power, a wood cooking stove and lots of fans instead of ducts to circulate heat. The timber frame 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 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 Thomas Drive. Thomas turns slightly right and becomes Hine Drive.



115 Old Farm Court, Glen Burnie, MD



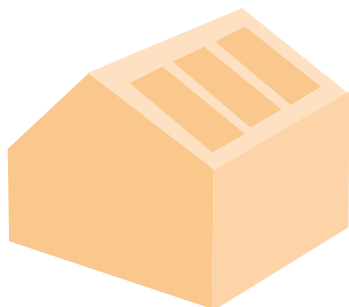
Homemade southeast facing 8 kW 3-array ground mount solar system with added 8 kW southwest facing array sharing same inverters. Old house with cast-iron radiators added geothermal 6 ton heating system. Also heat-pump water heating. Three electric vehicles (EVs) and charging stations. Have reduced annual 3000 gallon equivalent of fossil fuel burning to less than 300 gallons per year (for Prius on trips). First solar-on-pier in the State. First ground-mount solar panels in the critical area. Solar boat.

<http://aprs.org/alternative-energy.html>

DIRECTIONS From MD Route 10 north, take Sun Valley exit. Then left at light onto Furnace Branch, then 2nd right onto Thomas, then 2nd block turn right onto Country Club and immediate right onto Old Farm Rd and then left onto Old Farm Ct. House at end of culdisac.



102 Queen Anne Bridge Road, Upper Marlboro, MD



Original 1920s gable frame house was gutted and retrofit 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. Lots of experiments in local reused materials, and timbers, trees, and found objects. Key themes are local natural materials, do it your self, low cost, and non-manufactured. In 2018 we installed a Rocket Mass Heater into the little house...beautiful uniform heat, efficient, low pollution, uses sticks

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. Thomas Drive. Thomas turns slightly right and becomes Hine Drive.



7116 Garland Avenue, Takoma Park, MD



We purchased a 5.4 kW system in July 2018 as part of a MD-SUN solar coop. Solar Energy World installed 15 360 watt LG panels. We anticipated the system would provide 50% of our electrical needs annually, so we subscribed with Neighborhood Sun to use a local solar farm in Fort Washington, MD. We also have several mobile panels used to charge Voltaic batteries and mobile devices. We are also testing mobile medium arrays of 100 watt panels and battery packs for outdoor lighting and gardening projects. To conserve more, we replaced the lightbulbs with LEDs, replaced our gas furnace with a high efficiency 98% AFUE model and replaced the air conditioner with a high efficiency model EER 16.00 and SEER 25.50. To decrease our carbon footprint further, we replaced our gasoline vehicle with all electric vehicles including a used 2013 Nissan Leaf to "get our feet wet." In 2019, we purchased a Chevy Bolt, which has a range of 249 miles. Given the fast DC charging capability of the Bolt, we can take road trips.

DIRECTIONS From the Beltway, take MD-650/New Hampshire Avenue South. Drive 3 miles and turn right onto Sligo Creek Parkway. Make first right onto Flower Avenue, then a quick right at the stop sign onto Garland Avenue. Drive past Trescott Avenue T-shaped intersection. 7116 Garland Avenue is on your immediate left.



231 Grant Ave, Takoma Park, MD



We are building an urban homestead, meeting most of our energy needs from local solar power. We've been generating 95% of our electricity with 4.4 kW rooftop solar panels since 2010, and by using energy efficient lighting, windows and appliances. We heat the main floor of our modest family home with a high-efficiency Vermont Castings catalytic wood stove using salvaged local wood. An on-demand gas hot water heater is a new addition. Outside we make compost and grow many of our own groceries on just 1/6 acre, and still have space for flowers to feed pollinators and birds. We harvest fruit from persimmon, peach, plum, cherry, pear and fig trees, hardy kiwi, blueberry, goji berry and raspberry bushes, as well as vegetables from our organic garden and eggs from backyard hens. With our 330 gallon cistern we are able to keep our water usage low.

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.



11104 Watkins Road, Germantown, MD



Open Saturday and Sunday

We will be hosting the MoCo Heritage Harvest open house with farm tours on Saturday, October 5 with produce/prepared food/handmade chocolates for sale, live music, Time Bank and Repair Café representatives/info tables and a ton of fun!

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



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 designed to provide an energy-efficient home for a couple or small family. The cottages accomplished this in different ways including passive solar heating and cooling, well-insulated 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, solar hot water, masonry heater, oak and cherry trim from trees on the land, earth plaster, stained concrete slab floors, rain 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.



2914 Roderick Road, Frederick, MD



Bar-T Mountainside has been a leader in implementing green technologies on its farm campus for summer camps and after-school clubs. The site is powered by a Burgey 10 kW wind turbine and five photovoltaic systems generating 83 kW. The solar array on the farmhouse has a 7.6 kWh Lithium backup system and the multipurpose building has two 7.6 kWh lithium battery backup systems. The multipurpose building is constructed with high R Value insulated panels and designed with passive solar features. Southern and western facing windows allow solar heat gain in winter, and a vegetated awning mitigates solar heat gain in summer. A geothermal system heats and cools the building and the hydronic radiant floor system. In winter, the system radiates heat up from the floor to warm the interior; in summer, cool circulating water absorbs heat back into the floor. The building also features smart grid technologies. Other features include composting toilets and repurposed sinks, bioswales, and rain gardens.

DIRECTIONS Take I270 North to exit 26 Urbana (Route 80) go left under the overpass. After 1/2 mile, turn left on Roderick Road. Go 1 mile. Bar-T Mountainside farm is on the right. Look for the Mountainside sign and the wind turbine.



15608 Edgegrove Road, Hillsboro, VA



Open Saturday and Sunday

The home was built in 1987 and tightly sealed with extra insulation in the attic. We added solar photovoltaic panels in three phases (the barn roof is 100% peel and stick solar) and now have 13 kW capacity, enough to supply energy for the home and electric cars. We also added a battery back-up using nickel-iron batteries which have a long lifespan. Some of Thomas Edison's nickel-iron batteries are still operational. The home is heated and cooled using a ground-source heat pump. Ceiling fans, LED lighting and efficient appliances reduce energy consumption. The water heater is on a timer, so energy is not wasted. There is an organic garden with a compost bin on the uphill side. This allows the rich nutrients to flow from the compost bin directly to the garden soil. There are also blueberry bushes, figs, pear trees and apple trees. Rain barrels help by buffering the water surges and provide water by gravity feed for a variety of uses.

DIRECTIONS From the Point of Rocks bridge, follow Route 15 south to Leesburg. From Leesburg, take VA-7 west and take the Round Hill exit. Turn right onto business 7 and right onto Evening Star Drive. Go 1.1 miles and turn right onto Woodgrove Road (719). Follow that for 2.8 miles then turn left onto Edgegrove Road. Our home is a half mile on the right.



1851 Griffith Rd, Falls Church, VA



On a lot chosen for its southern exposure, this timberframe home was built in 2007. The roof and walls are made of Structural Insulated Panels; walls in the half-basement are made of Insulated Concrete Forms. Heating is through radiant floor heat, and the home is tight enough that an efficient water heater and heat exchanger are sufficient; there is no boiler or furnace. An efficient thermostatically controlled fireplace works during sudden shifts in temperature. A rain garden, swales, and a partially rock-filled driveway reduce run-off to a minimum. Solar panels were added in 2017 through the Solarize Fairfax program. The small size of this Craftsman style home contributes to its efficiency.

DIRECTIONS From the Beltway, take the VA-7 E/Leesburg Pike/Falls Church exit 0.4 mi. Merge onto VA-7 E/Leesburg Pike 246 ft. Use the 2nd from the left lane to turn left onto Lisle Ave/Magarity Rd. Continue to follow Magarity Rd 463 ft. Turn right to stay on Magarity Rd 0.7. Turn right onto Griffith Rd,



7619 Leonard Drive, Falls Church, VA



This 3400 sf Net-Zero Passive house was constructed in 2013 to meet the Passive House standard. 18 solar photovoltaic panels provide more than the annual energy used for heating, cooling and electrical use. The house is air-tight (0.55 ach50 blower door test) with R-40 dense-packed cellulose insulated walls and R-90 insulation in the attic. The house uses so little energy that it's heated and cooled with a small heat pump. The home's focus is a passive solar 2 story dining room with an abundance of natural lighting. 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. Hot water is provided by a GE heat pump water heater. All lights are LED. Appliances are all Energy-Star efficient. Installation by Prospect Solar.

DIRECTIONS Located just inside the Beltway near Tysons Corner, Exit 47 to Rt. 7 East, Leesburg Pike. At first light turn right onto Ramada Rd. Find a safe and legal turnaround. Go straight across Rt. 7 at light and continue straight on Lisle Ave. At first stop sign take a right onto Fisher Dr. then next left onto Leonard Dr. House is 4th on the right.



6226 23rd Street, Arlington, VA



This home features a 4.1 kW, grid-tied, net-metered photovoltaic system and a 160 gallon solar hot water system. The owners planted a composted organic garden, have over 25 trees and bushes on the property, and water the plants using rain barrels. This home was featured in a Washington Post Real Estate cover story in May 2006.

DIRECTIONS From East Falls Church Metro Station: Exit LEFT head north on Sycamore 1/2 block to right on Washington Blvd, go 2 blocks then LEFT on N. Quantico St., go 4 blocks then RIGHT on 23rd Street N. Or, heading West on Lee Hwy (from George Mason Dr) to LEFT on Quantico St. N, take the first left on 23rd St. N. to middle of block on right, #6226. Or west on Washington Blvd. to RIGHT on Quantico St. N., go 4 blocks to right on 23rd St. N. to middle of block on right, #6226.

Join the Revolution!

***Let's Re-Power Our World
with 100% Renewable Energy!***

Team-up with friends, family, neighbors and colleagues to make this vision a global reality.

Sign-up online for the latest news and events.

Help us build a truly sustainable world for all.

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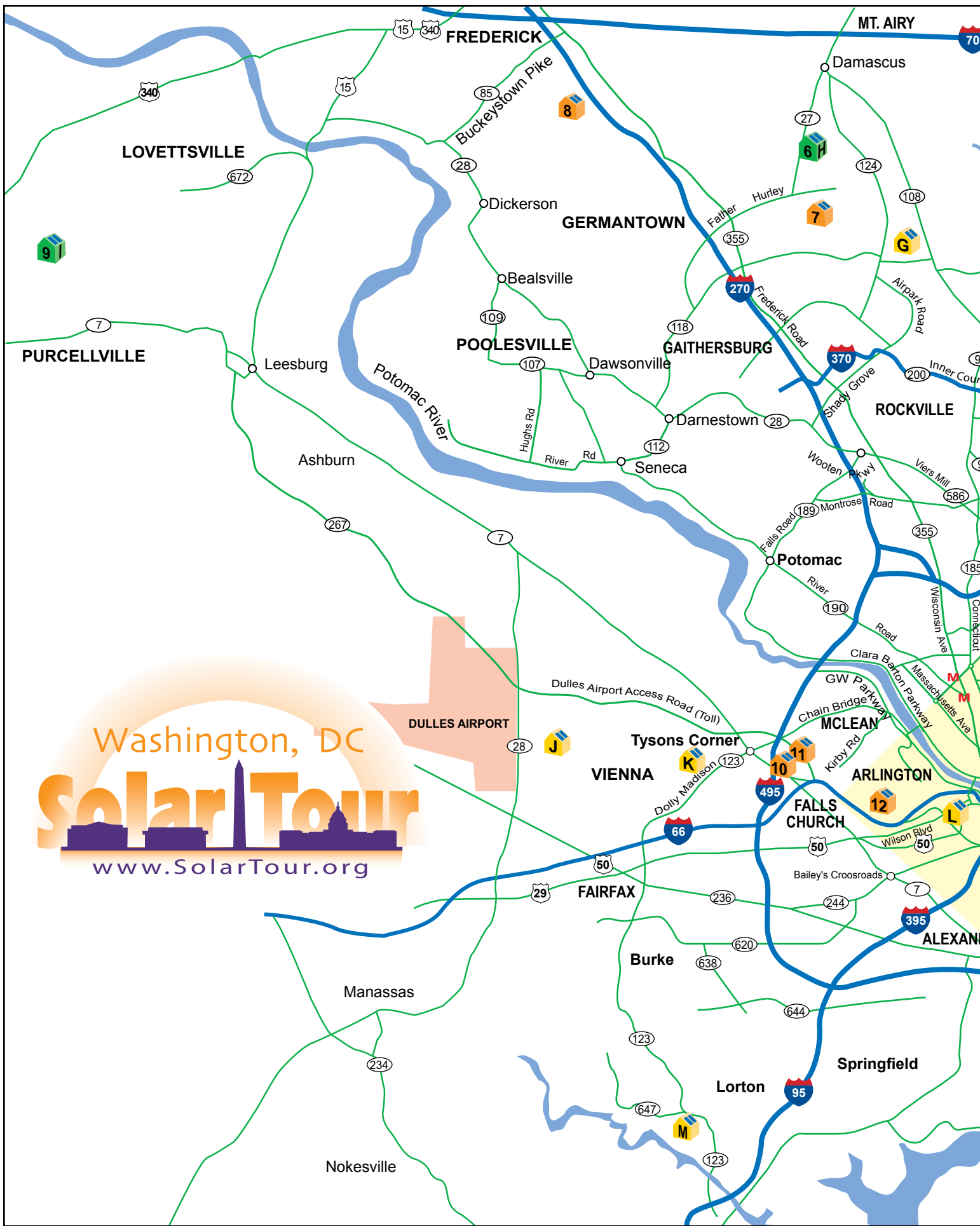


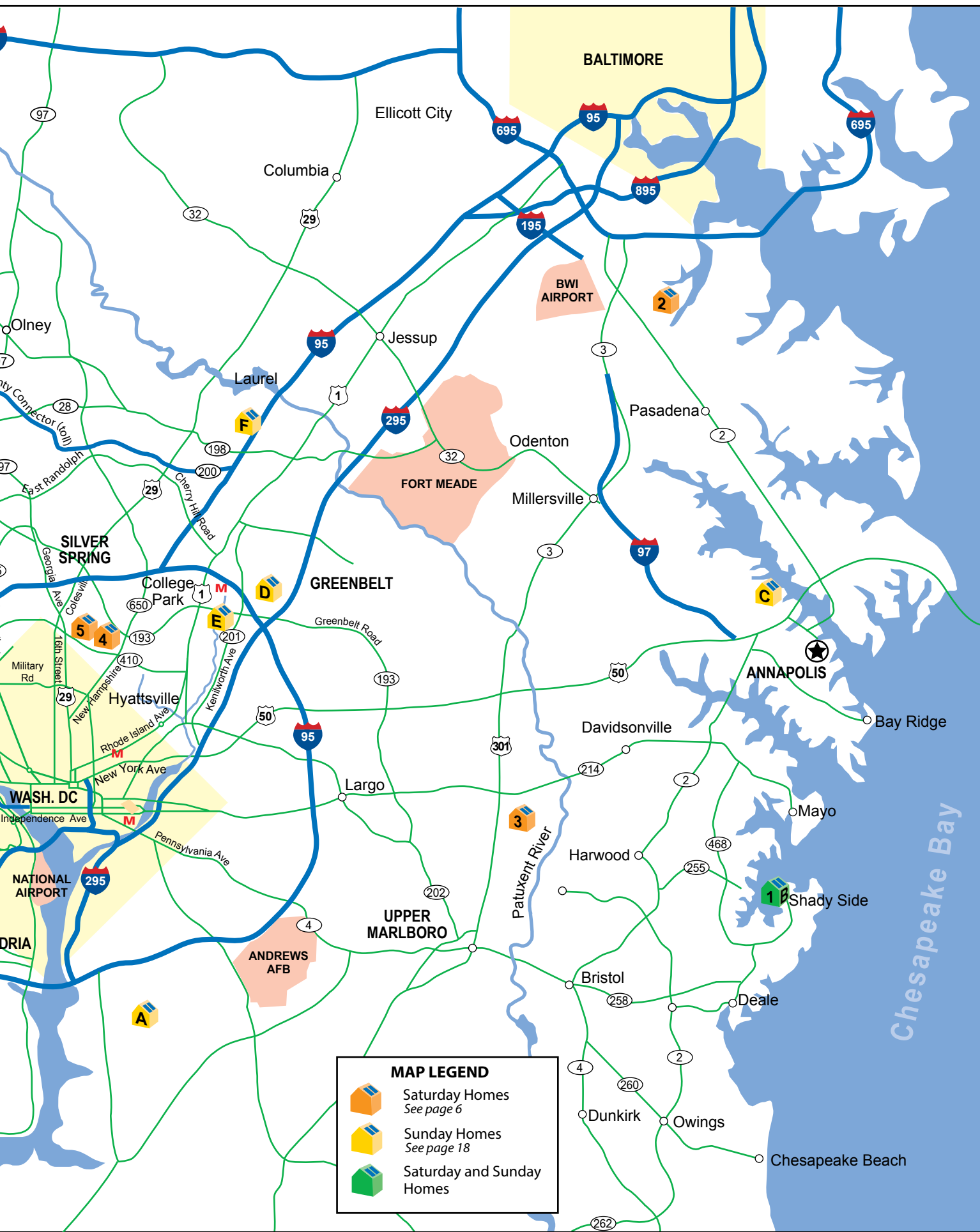
- Collaborate with industry professionals, policy makers & solar enthusiasts.
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www.mases.org

Internships available across the Mid-Atlantic Region. Apply Early!

Mid Atlantic Solar Energy Society is a 501(c)3 not-for-profit organization. Donations appreciated!





Sunday Homes

Home A on the Tour

Take a guided tour of the 6.6 MegaWatt Community Solar array located on a former landfill in Fort Washington, MD.


























Home L on the Tour

This 1920's Sears Kit home in Arlington, Virginia has a little bit of everything from solar panels to a wind turbine.



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-efficiency windows
-  Recycled building materials
-  Corn/wood stove
-  Energy efficient appliances
-  High-efficiency lighting
-  Low water consumption
-  Gray water storage system
-  Tankless water heater
-  Rainwater collection system
- Rain garden/native plants
- Composting
- Alternative energy vehicle



2301 Tucker Road, Fort Washington, MD



Come see a guided tour of the Community Solar Array at 2:00 pm Sunday!

The Panorama Project, a 6.6 MW solar array in Fort Washington, is a Community Solar project that has been operating since June 2019. There are about 22,000 PV panels each with a capacity of 300 watts with string inverters carrying 75 KWs capacity. The array is built on 25 acres of a former landfill.

The community solar project is divided into 4 different projects (as the community solar program can't accept projects of more than 2 MWs AC): two of these projects are of 1.98 MWs DC, and two of these projects are of 1.32 MWs DC. For more information on Community Solar and how to join the Community visit www.NeighborhoodSun.solar/SolarTour

DIRECTIONS From I-495 Beltway take exit 4A to merge onto MD-414 W/St Barnabas Rd toward Oxon Hill 0.3 mi. Continue on St Barnabas Rd. Drive to Tucker Rd 7 min (3.1 mi). Merge onto MD-414 W/St Barnabas Rd 0.1 mi. Use the middle lane to continue on MD-414 W/Oxon Hill Rd 0.2 mi. Turn left onto John Hanson Ln 390 ft.. Turn right onto St Barnabas Rd 0.6 mi. Turn left onto Tucker Rd 1.8 mi.



4927 Hine Drive, Shady Side, MD



Open Saturday and Sunday

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 zoning based on use, lots of insulation, low emissivity windows, a wood pellet stove, a solar cooker, passive solar heating and cooling, photovoltaic power, a wood cooking stove and lots of fans instead of ducts to circulate heat. The timber frame 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 solarvillages.org

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351 Dubois Road, Annapolis, MD



Annapolis Friends Meeting is striving to be carbon neutral. We were the first Maryland non-profit solar system in the critical area. Our ground mount Solar system by Solar City made us grid neutral and then we replaced propane heating with a heat pump and are now adding another 6 kW to compensate. We have four EV charging outlets, plus rain barrels, on demand water heating and gravel parking. Just a mile from downtown Annapolis, our facility is a great solar powered non-carbon meeting place.

DIRECTIONS Exit route 50 onto bestgate avenue (Rowe Blvd exit) and go one block to St John Neumanns Church and turn right on old Bestgate road and one block and left on Dubois. We are at the end of the road.



58 Lakeside Drive, Greenbelt, MD

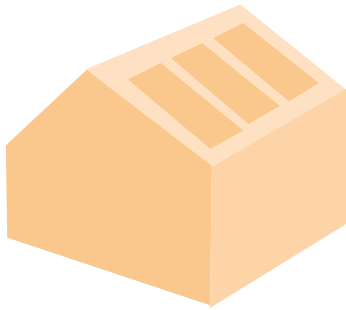


My ranch-style brick home was built in the late 50s. Solar City installed a 10 kW DC (8.9 kW AC) PV system on the east-southeast facing slopes of the roof in early 2014 and it began generating electricity in November; there were no upfront costs. A 640 gallon cistern, manufactured in Australia, is installed under a second-story porch and is attached to a soaker hose that runs through an extensive garden with a large fish pond and waterfall. My property slopes steeply toward Greenbelt Lake and water runoff from neighbors has sometimes been a severe problem. Patuxent Nursery custom landscape designed and constructed a dry riverbed ending in a rain garden/bowl backed by large boulders to funnel and capture stormwater runoff. The next year we expanded on this system.

DIRECTIONS From the Beltway, take MD-201/ Kenilworth Ave. exit (Exit 23) toward Greenbelt/Bladensburg. (Go 0.34 miles). Veer to the right, taking the ramp toward Bladensburg. Merge onto 201 S. and take the immediate ramp on the right toward MD-193/Greenbelt Rd. (0.16 miles). Turn left onto Greenbelt Rd.. After next light, go into left turn lane. Turn left onto Lakecrest Dr. Turn right at stop sign onto Lakeside Dr.



6107 Ruatan St, Berwyn Heights, MD



This modest 1959 rambler is being upgraded with the latest efficiency technology! The grid-tied solar array includes a 6 kW system with Enphase microinverters and the off-grid solar array includes a 200 W system with 2.5 kWh sealed lead acid battery bank, inverter and transfer switch. The slightly-shaded solar panels and community solar share power to the house and Tesla electric vehicle. Experiments in water conservation and off-grid backup are ongoing. The open-source home automation system provides control and data on how the systems function together. Installation by Celestial Solar Innovations, LLC."

DIRECTIONS Beltway exit for MD-201 South, follow signs for 193 West (Greenbelt Road). Left at 62nd Avenue, Right at Ruatan St. It is the blue-siding house on the left at the end of the block.



5809 Holger Ct., Laurel, MD



A 5.7 kW system was installed by Solar City in 2012 which provides up to 60 percent of the home's energy. CFL and LED lighting as well as energy efficient appliances and super insulation help reduce energy costs. The solar panels help charge a Tesla Model 3 through a Tesla Wall Connector. Home garden equipment is all electric including a GE Elek-Trac garden tractor and Worx mower. Sustainable gardening including a compost bin.

DIRECTIONS Take I-95 to Exit 33B, Rt. 198 West towards Burtonsville. At second light turn right onto Bond Mill Road. Get into the left lane and make an immediate left onto Clayburn Drive. Take the second right onto Holger Ct. 5809 will be the fifth house on the right.



6624 Belle Chase Court, Gaithersburg, MD



We have taken our ordinary single family home and completely converted it to 100% electric, powered by Solar PV. The goal is to be net zero, however we are still in the process of confirming our system supports all the consumption. The home features a 13.95 kW Silfab solar electricity system installed by Standard Energy Solutions in 2018. Our home also has smart home technology as well. We installed a new high efficiency 16 SEER heat pump both upstairs and down stairs. We use LED lighting throughout the house. We drive two 100% electric vehicles and have no fossil fuel usage.

DIRECTIONS Our home is off of Fieldcrest Rd. between Gaithersburg and Laytonsville. Take either 108 or 124 to Fieldcrest Rd. and turn on to Belle Chase Dr. Make a left onto Belle Chase Ct. and go to the end. We have a very long driveway. Feel free to park on it.



11104 Watkins Road, Germantown, MD



Open Saturday and Sunday

We will be hosting the MoCo Heritage Harvest open house with farm tours on Saturday, October 5 with produce/prepared food/handmade chocolates for sale, live music, Time Bank and Repair Café representatives/info tables and a ton of fun!

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



15608 Edgegrove Road, Hillsboro, VA



Open Saturday and Sunday

The home was built in 1987 and tightly sealed with extra insulation in the attic. We added solar photovoltaic panels in three phases (the barn roof is 100% peel and stick solar) and now have 13 kW capacity, enough to supply energy for the home and electric cars. We also added a battery back-up using nickel-iron batteries which have a long lifespan. Some of Thomas Edison's nickel-iron batteries are still operational. The home is heated and cooled using a ground-source heat pump. Ceiling fans, LED lighting and efficient appliances reduce energy consumption. The water heater is on a timer, so energy is not wasted. There is an organic garden with a compost bin on the uphill side. This allows the rich nutrients to flow from the compost bin directly to the garden soil. There are also blueberry bushes, figs, pear trees and apple trees. Rain barrels help by buffering the water surges and provide water by gravity feed for a variety of uses.

DIRECTIONS From the Point of Rocks bridge, follow Route 15 south to Leesburg. From Leesburg, take VA-7 west and take the Round Hill exit. Turn right onto business 7 and right onto Evening Star Drive. Go 1.1 miles and turn right onto Woodgrove Road (719). Follow that for 2.8 miles then turn left onto Edgegrove Road. Our home is a half mile on the right.



2021 Summershade Court, Herndon, VA



This 2250 sq. ft Ryan home built in 1981, has achieved a carbon-neutral footprint with a combination of a grid-tied, 13.3 kW PM system with battery backup, solar heated water, geothermal heat pump, Energy Star appliances, LED lighting, Tesla Model S and Model 3 EVs, and Super insulation. The original 1850 sq ft home sports a 2011 addition with has high efficiency windows, 2x6 R-27 walls and R-63 ceiling.

DIRECTIONS From the Dulles Toll Rd., take Exit 11 (Fairfax County Parkway) south. Take a left onto Rt 608 (W. Ox Rd.), right onto Ashdown Forest Dr., right onto Burchlawn St., and left onto Summershade Ct.



213 Ayr Hill Avenue NE, Vienna, VA



Home originally built in the 1960s. Second story added in 2000 by current owner. Solar panels installed in October 2015. Energy efficiency upgrades through out. Recently remodeled basement with cork flooring and with energy efficiency at the forefront of the plan. Native plants and an extensive vegetable garden. Rain barrels.

DIRECTIONS In the heart of the Town of Vienna near the intersection of Maple Ave. and Park Street NE. From the intersection of Maple and Park NE head west on Park Street to the second right which is Ayr Hill Ave. NE. 213 Ayr Hill Ave. NE is the first house on the right. The home is a Dutch Colonial with a garden on the left side yard, white picket fence and arched entry to the garden.



706 North Ivy St, 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. direct-exchange ground-coupled (geothermal) heat pump with LEDs, electrochromic glass, and various remote solar systems

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.



9200 Denali Way, Lorton, Virginia



This all-electric, contemporary, 2950 square feet, frame structure has 83% south-facing windows and skylights for optimum solar gain. A solar-powered greenhouse fan distributes heat into the house in winter and exhausts heat in summer. A vertical closed-loop geothermal system and a high velocity air-to-air system provide heating and cooling. An efficient Finnish fireplace allows the owners to enjoy a fire and is capable of heating the entire house. Insulation includes R19 fiberglass bats in the 6 inch walls, R13 fiberglass bats with R3.8 polystyrene in the 4 inch walls, and R30 fiberglass bats in the ceilings. An air-lock foyer entry, Tyvek wrap, and foam caulking reduce air infiltration. Windows are of low-E thermopane glass. Skylights and a Solatube provide daylighting, and the electric lighting is fluorescent/LED. Clerestory windows allow natural ventilation. Other energy-savers include a timer on the water heater and low-flow shower heads. The house, built in 1990, is currently on the market. Listing available at <https://matrix.brightmls.com/Matrix/Public/Portal.aspx?ID=4364664230>

DIRECTIONS Head south on I-95 to the Lorton exit. Turn right onto Lorton Rd. and go to end (approx 2 miles). Turn right onto Route 123 (Ox Road) and proceed approx 1.1 miles to traffic light (Giant Food on right). Turn left onto Palmer Road and proceed to end (0.4 mi). Turn right onto Elk Horn Road and go 0.25 miles. Turn left onto Denali Way; then take first driveway on right.

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A Green Home Starts with Energy Efficiency

By Randall Gentry

Homebuilders and homebuyers are increasingly interested in green building. But what exactly makes a home green?

Green building means improving the way that homes use energy, water, and materials to reduce impacts on human health and the environment. Building a green home means making environmentally-preferable and sustainable decisions throughout the building process—decisions that will minimize the home's environmental impact while it is being built and during the many years it will be lived in.

Energy efficiency is the place to start. That's because the energy used in homes often comes from the burning of fossil fuels at power plants, which contributes to smog, acid rain, and risks of global climate change. The less energy used, the less air pollution.

If you are building a new home, consider building a DOE Zero Energy Ready Home. These homes are typically 40-50% more energy efficient than a typical new home, and all energy needs can be met by a renewable energy system. (See energy.gov/eere/buildings/zero-energy-ready-home.) Partners can work with you to go beyond even these homes' capabilities, such as meeting Passive House requirements, implementing Environmental Protection Agency WaterSense® guidelines, or installing solar water heating and thermal solar systems.

If you don't feel you can commit to a Zero Energy Ready Home, consider an ENERGY STAR® Certified New Home. These homes are 15-30% more efficient than a typical new home. (See energystar.gov/newhomes.)

If you are adding solar power to your existing home, the U.S. Department of Energy recommends you first investigate your energy use and consider potential energy efficiency upgrades. You should

be well aware of your total electricity usage, and consider low-cost and easy-to-implement efficiency measures before installing solar. (See energy.gov/energysaver/planning-home-solar-electric-system.) Improving energy efficiency reduces the cost of the photovoltaic system.

Explore the following ways to reduce your electricity use:

- Home energy audits: A home energy audit can help you understand where your home is losing energy and what steps to take to improve its efficiency.
- Appliances and electronics: Use your appliances and electronics more efficiently, or invest in highly efficient products, such as those that carry the ENERGY STAR label.
- Lighting: Switch to energy efficient lighting, such as LED light bulbs. There are ENERGY STAR lighting products too.
- Heating and cooling: If you use electricity to heat and cool your home, your heating and cooling needs will significantly affect the amount of solar energy you need. Weatherizing your home and heating and cooling efficiently will reduce the amount of electricity you need to produce with solar.

You may be able to work with Home Performance with Energy Star to make your home more energy efficient. HPwES contractors are vetted to ensure they are qualified, and work to ensure a quality job from the initial home energy audit through project completion. Contractors may also be able to help you find incentives or low-interest financing. (See energystar.gov/campaign/improvements.)

You can find information about all Federal, state, local, and utility incentives for energy efficiency and renewable energy at www.dsireusa.org.

rggentry@hotmail.com

Community Solar

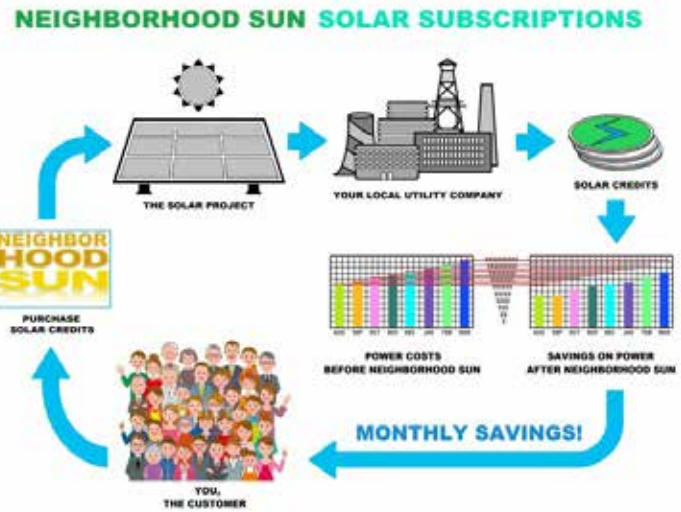
by Gary Skulnik

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.

To subscribe to Community Solar, visit www.NeighborhoodSun.solar/SolarTour.

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



Is Your Next Car Electric?

By Bob Bruninga

Residents of the DC metro area love the advantages of electric vehicles, also known as EVs, and the convenience of avoiding gas stations. They simply plug-in at home and have full range every morning.

Although there are over 300¹ EV charging stations within the greater Washington DC area, smart shoppers don't buy an EV with the idea of inconvenient public charging. They buy it for the convenience of charging at home. Over 96%² of all EV charging is done at home or at work, and most of that is from a standard 120v wall outlet. Every EV comes with a simple 120v charge cord that draws about the same power as a toaster and only costs about 20 cents an hour to charge. Many EV drivers don't use public charging because the whole value promise of an EV is charging at home.

There are now more than 42 full-size electric cars on the market in 2018 (EVADC.org). About half of them are pure battery EV's with ranges from 100 to 310 miles. The other half are plug-in hybrids that have both modest all-electric range and a gas engine for longer distances up to 600 miles range (eg. Prius-Prime). Many car manufacturers have committed to hundreds more electrified models.

Most residents have all they need for clean energy driving - a place to park and an outlet to charge. The average EV is now better, faster, cleaner and cheaper to buy, operate and maintain than the average gas car. In 2018, more than half the EV's on the market with federal incentives cost less than the average cost of a gas car (\$35k).

Further, the cost of fuel (electricity) is about 1/2 the cost of gas. And without the emissions controls and complexity of a gas engine. The cost to maintain an EV is estimated to be only 10% of that for a gas car.

Lastly, used EV's are a buyer's paradise. Three year old EV's go for about \$13K for a Chevy Volt and about \$9K for a Nissan Leaf, the two best sellers



in the world for the last eight years. During that time, these two cars alone account for over 5 billion miles of EV driving experience.

Most daily driving is within an average of 40 miles per day. This is well within the 100 mile range of a low-cost EV. For drivers with long commutes or access to only one car, a Plug-in Hybrid would work. The Prius Prime does about 30 miles daily EV driving and also has a 600 mile gas range on an 11 gallon tank. If you travel long distances of 300 miles on all-electric power, Tesla has several EVs available including the Model 3.

Combine EVs with solar, and it's a whole new world of clean energy. Just six solar panels can provide the energy to fully charge many plug-in hybrids and twelve solar panels can charge the average 40 miles-a-day of travel forever without going to a gas station. The marriage of solar and EV's is a match made in heaven that demonstrates how simple and cost effective it can be to wean ourselves from fossil fuels and our addiction to foreign oil.

For further information on EVs visit the Electric Vehicle Association of Washington DC (EVA/DC) website and join us at one of our monthly meetings to see EVs up close. <http://www.evadc.org>

(1) See <https://www.plugshare.com/>

(2) 97% charging at home and at work: <https://www.inl.gov/article/charging-behavior-revealed-large-national-studies-analyze-ev-infrastructure-needs/>

Solar Renewable Energy Certificates

D.C. residents can sell the SRECs that their panels generate for up to \$500 per megawatt-hour (MWh). What that means to you: One SREC is equivalent to 1000 kWh. If you install a 5 kilowatt (kW) system that generates 6 MWh per year, you could earn as much as \$3,000 annually by selling your certificates in the SREC market. Your solar installer can set you up with the DC Public Service Commission (PSC) to set up your SREC account.

Property Tax Exemptions

Thanks to the Solar Energy System and Cogeneration System Personal Property Tax Credit, you can also avoid paying any additional property taxes on the value you are adding to your house by installing solar. Visit: <https://energy.gov/savings/solar-energy-system-and-cogeneration-system-personal-property-tax-credit>

Low Income Residential Solar

The Solar Advantage Plus Program is an incentive for eligible low-income D.C. residents. This rebate program provides qualified applications with up to \$10,000 to cover the full cost of a 3kW to 4kW solar system. Not only will participants own the system and the energy it produces, but they will also be able to cash in SRECs. For more information visit: <https://doee.dc.gov/solar>

VIRGINIA

Virginia Sales Tax Holiday

The 3-day tax-free holiday is the first Friday in August for EnergyStar and WaterSense appliances for noncom-

mercial home or personal use - \$2500 or under. The 3-day sales tax holiday starts the first Friday in August at 12:01 am and ends the following Sunday at 11:59 pm.

Fairfax County

The county has a tax exemption for solar equipment that spans 5 years. The list of qualifying equipment includes solar heating, hot water systems, passive solar energy systems, south facing windows used as solar collectors, trombe walls, greenhouses integrated into the heating system of the structure, thermal storage systems, movable insulation, and shading devices designed primarily for shading windows to assist in summer cooling.

For a \$12,000 system (\$8,000 for equipment and \$4,000 for installation) based on a household tax rate of \$1.09, the exemption value of \$12,000 is divided by 100 and multiplied by \$1.09 for a tax credit of \$130.80. The tax credit is deducted from the property's tax bill every year for 5 years.

SRECs

If you are a Virginia resident you can sell your solar and wind SRECs. The value of SRECs is coming down but are still a way to achieve some payback on your system.

WEBSITES

Federal: <http://energy.gov/savings/residential-renewable-energy-tax-credit>
Maryland: <http://energy.maryland.gov/>
DC: <http://green.dc.gov/green/site/>
Virginia: <http://www.dmme.virginia.gov/>
<http://www.dsireusa.org> for more details

The Sierra Club is working to tear down barriers to more solar more places in Virginia.



Learn more at <http://vasierra.club/solar>

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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