WELCOME TO THE 26TH ANNUAL NATIONAL SOLAR TOUR
By Carly Rixham, Executive Director, American Solar Energy Society

What began as a local solar and sustainability tour at the Solar Living Institute, a former ASES Chapter, in Hopland, California, under the direction of John Schaeffer, expanded to become the National Solar Tour in 1995. Here we are in our 26th year and the first ever hybrid National Solar Tour. Over the years, the Tour has grown and is now the largest grassroots solar event in the nation!

It is an opportunity for solar enthusiasts to share their process of going solar - the benefits and the lessons learned - to attendees to educate and further the integration of renewable energy. It is also an opportunity for people interested or considering going solar to learn about going solar from real people in their area - or across the country! They can get their questions answered and find resources for financing, get recommendations on installers, learn about any local laws or incentives, and start their transition to solar.

Research shows that people are inspired to install solar panels because they see them on nearby homes. Solar panels tend to be clustered in certain neighborhoods rather than evenly distributed through a city. A Yale study shows that the installation of one additional solar photovoltaic rooftop project within the past six months increases the average number of installations within a half-mile radius by almost one-half. The findings suggest that “seeding” solar panels on a few houses in neighborhoods where they are sparse could help residential solar spread faster to more homes. The strongest predictor of whether a house will have solar panels is the density of solar panels on neighboring properties.

Although in these times of COVID we don’t like the idea of something that is contagious, the National Solar Tour is helping to spread solar contagion. It creates a platform for organizers to host their events, resources and support before, during and after hosting the events, and promotion of Local Solar Tours and Solar Sites! With the new hybrid format, there are both in-person and virtual events. Learn more and find online and in-person events near you at nationalsolartour.org.

Thank you for getting involved in the National Solar Tour.
What You Should Know Before You Buy an Electric Car

Electric Cars by the Numbers

- **63%** of respondents in a 2019 Consumer Reports survey were interested in buying an electric car.

- **JP Morgan** predicts EVs will represent **30%** of vehicle sales by 2025.

- **7.2 million** electric cars were on the road in 2019, up from 17,000 in 2010.

- Globally, the number of publicly accessible fast and slow chargers increased by **60%** in 2019.

- Global electric car sales increased **40%** between 2019 and 2020.

How to Charge an Electric Car

**Level 1 (L1) Charging**

Uses a regular **home 110-volt outlet** to charge 2 to 5 miles of range per hour.

**Level 2 (L2) Charging**

Uses a **240- or 208-volt plug** to charge 10 to 20 miles of range per hour.

**Level 3 (L3) DC Fast Charging**

Uses high-powered equipment to charge at **480 volts** to deliver 60 to 80 miles of range in 20 minutes.

Sources:
- energy.gov
- media.volvocars.com
- ia.org
- advocacy.consumerreports.org
- jpmorgan.com
Solar FAQs

Solar can provide energy to buildings in many ways. The sun can heat the building interiors passively or naturally through south-facing windows. Solar collectors and PV (photovoltaic) arrays, mounted on the roof or ground-mounted, can heat water and generate electricity for the building, and charge electric vehicles for the homeowners or employees. Adding solar to any new or retrofit building should include a holistic conservation approach that addresses such features as insulation, air tightness, ventilation, healthy building materials and water conservation. The National Solar Tour focuses on the PV systems, but many Solar Sites showcase other sustainable and energy efficient features too.

How do solar panels work?
Solar electric (photovoltaic - PV) panels absorb the sun’s energy (photons) that produce an electric current by moving electrons. PV produces direct current (DC) electricity whereas grid connected homes and businesses use more common alternating current (AC) electricity. The solar produced DC electricity is passed through an inverter to convert it to AC electricity. The AC electricity is then used to power your home or business. Any excess electricity is sent back to the grid to help power your area.

What if it is cloudy, snowy or rainy, will my panels still produce energy?
PV panels produce peak energy when it is sunny, however, your solar panels will still generate some electricity even when it is cloudy. It will just be less (~10% to 25% of optimal production). Snow will greatly reduce the energy generated from PV panels but with an appropriate tilt angle for the panels, snow can slide off or can be brushed off. Rain is good for panels as it cleans off dirt and debris so they operate efficiently and decreases the need for manual cleaning of solar panels which can risk damaging them.

How long do solar panels last?
Most solar panels are guaranteed for 25 years but last even longer since there are no moving parts as a solid state device. There is also very little maintenance with solar panels after installation with occasional inverter replacement expected after about 15 years of continuous operation. It is important that the solar power system is properly bonded and grounded to reduce any potential damage for lightning strikes and any other power surges.

Is my roof good for solar? Do I need to replace my roof?
The ideal orientation for a roof is south facing with little to no shade. This orientation will produce the most energy, however, there are many workarounds. Meet with a solar installer to come up with the best alternative solutions. Whether or not you have to replace your roof is dependent on the condition of your roof. It can be costly to remove and reinstall solar panels during roof replacement or maintenance. Therefore, if you are expecting to do work on your roof it is best to finish that work before installing solar. Ask your solar installer about the condition of your roof before installing solar or ask for the evaluation to include looking at ground-mounted panels as an option.

What is the payback period of my solar array?
The payback period is dependent on your system size, installation cost, financing payments, local weather, and the local electricity rate as well as the building’s electrical use. However, solar can be reduced by rebates and tax incentives that vary depending on where you live. There is a federal tax credit of 26% for 2021, and some states, municipalities and utilities provide additional tax credit, rebates and/or other incentives. In the USA, residential rooftop solar systems are installed at about $3.00 per Watt, payback often realized in under 5 years taking full advantage of state and federal tax incentives. Financing options often start at $0 down. Energy savings vary based on the size of the PV system (number of solar panels) and the building’s energy use therefore, energy-efficient buildings can achieve 100% electricity savings for less than buildings that use a lot of energy. All of these factors affect the payback period of your array. In most of the country, solar increases the resale value of your home as well.

How much money will I save?
There are a lot of factors that go into how much money you will spend and save which include: system size, production, weather, etc. Estimate a PV system size at pvwatts.nrel.gov. Calculate and estimate your solar savings at energysage.com/solar/calculator.

Source: energysage.com/solar/solar-faq/
40 Questions to Ask a Solar Installer

1. What year was the company established? Where are the offices?
2. Are you licensed and insured?
3. Who designs the system and forecasts estimated annual output?
4. Are the installers your employees? Do you use subcontractors for any part of the installation?
5. Do you have your own electricians on-staff in-house?
6. What financing options do you offer (Lease, PPA, Loan, Cash) and how do they differ?
7. How much can I save using solar?
8. Who does the paperwork for utility interconnection and permits? Are associated fees included in the price of the system or extra?
9. Will someone from your team be present when inspectors come to inspect?
10. Have you worked with my building department before?
11. Can my homeowner’s association stop me from putting solar on my house?
12. What happens if I sell my home?
13. Do you offer a system performance guarantee?
14. Does your system include panel-level monitoring? Does it cost anything extra? How do I access it?
15. Will the system meet local building and fire codes?
16. Do you confirm that my roof is structurally OK to hold panels?
17. Do you recommend using a central inverter, micro-inverters or optimizers? Why?
18. Should my panels be interconnected to the grid? Can I get power during a blackout?
19. Will you give me a firm quote or an estimate prior to signing a contract?
20. How are contract changes addressed? Do I have the right to cancel?
21. How long will be between the time I sign the contract until installation?
22. How long will the installation take?
23. Will there be a master electrician on site?
24. Do I need to be home during the entire installation?
25. How much money is due upfront? When are other payments due?
26. Which rebates and incentives come to me? Federal? State? Other?
27. Who is responsible for fixing any damage to my home if caused during installation? Or due to a penetration in the roof that results in a water leak?
28. Do you pro-actively monitor my system’s performance after installation and notify me if there are issues?
29. Can I add more panels/modules later?
30. Should I wait for newer technology?
31. Can I apply for shared solar or community aggregated solar?
32. What warranties are there on the different parts of the system? Who do I call if there is a problem?
33. Will my home value change? Will my real estate taxes go up?
34. Will the panel performance degrade over time?
35. Can you provide customer references?
36. What is the process for future roof replacement? Cost for removing and replacing panels?
37. What if a new building is built and shades my system?
38. Can you install a canopy system, a ground mounted system, or a tracking system if my roof isn’t appropriate?
39. Will you perform a whole house audit and let me know how to reduce all my energy demands?
40. If I have an electric vehicle, how much solar energy is needed to charge it? Can I charge it when the sun isn’t shining?
Local Solar Tours

Check out these Local Solar Tours and more at nationalsolartour.org

Alaska
Northwest Alaska Solar Tour - Deerborn
Fairbanks Solar Tour - Fairbanks

Alabama
Birmingham Solar Tour - Birmingham
Huntsville Solar Tour - Huntsville

Arkansas
Arkansas Renewable Energy Association Tour - Little Rock

Arizona
2021 Sustainable Building Tour - Flagstaff

California
Davis Driving on Sunshine - Davis
Solar Cookers International Virtual Tour - Sacramento
Bay Area Nonprofit Solar Tour - San Francisco

Colorado
Berthoud Solar Tour - Berthoud
Boulder Green Home Tour - Boulder
Chaffee County Green Homes Tour Buena Vista - Buena Vista
4CORE Solar and Net Zero Tour - Durango
Fort Collins Solar Tour - Fort Collins
Denver Metro Green Home Tour - Golden
Loveland Solar Tour - Loveland
Chaffee County Green Homes Tour Salida - Salida

Delaware
Sussex County Solar Tour - Rehoboth beach

Illinois
Green Build Home Tour - Chicago
Illinois Solar Tour - Elk Grove Village

Kentucky
Landsdowne subdivision Tour - Lexington
Wilmore Solar Tour - Wilmore

Michigan
25 Rooftop Solar Homes Tour - Detroit
Michigan Solar Home Tour - East Lansing
Grand Rapids MI Solar Tour - Grand Rapids
Meridian Solar & Sustainable Tour - Okemos
Ypsilanti Solar Tour - Ypsilanti

Mississippi
Jackson, Mississippi Local Solar Tour - Jackson

Minnesota
MRES Sustainability Tour - Minneapolis

Missouri
Heartland Renewable Energy Solar Home Tour - Kansas City

Montana
Bozeman Brewery and Bike Solar Tour - Bozeman
Whitefish Solar Tour by Northstone Solar - Whitefish

North Carolina
Sierra Club Croatan Group - Emerald Isle
NC Solar Tour - Raleigh

Nebraska
Omaha Solar Tour - Omaha

New Jersey
MSSIA's New Jersey Solar Tour - Bordentown
Sustainable Voorhees Solar Tour - Voorhees

New Mexico
New Mexico Sustainable Everything Tour - Albuquerque

New York
WNY Solar Tour - Buffalo

Ohio
Ohio "Wish You Were Here" Tour - Mentor

Oregon
2021 Go Zero Tour - Portland

Pennsylvania
Lower Merion Solar and Green Homes Tour - Ardmore
Chester County Clean Energy Tour - Chester County
Solar Tour of Lansdale - Lansdale
Philadelphia Solar Tour - Philadelphia
Philly Green Roofs Solar Tour - Philadelphia
Solar States Yo Sun Tour! - Philadelphia
Springfield/Montco Solar Tour - Springfield
Exact Solar’s Awesome Customers Tour - Yardley

Tennessee
TSEA Solar Tour - Nashville

Texas
DFW Solar Tour - Grand Prairie

Virginia
Rocktown Energy Fest - Harrisonburg
Hampton Roads Solar Tour - Norfolk

Wisconsin
Central Sands Bike Tour - Custer
Door County Solar Tour - Sturgeon Bay
Lambs Quarters Lane Solar Tour- Waupaca

Wyoming
Wyoming National Solar Tour - Laramie
Individual Solar Sites

Alaska
- Colleen & Colin’s Alaska Solar Home - Wasilla

Alabama
- Southern Cypress - Citronelle
- Solar Technology Center - Eva
- Media Fusion Solar Installation - Huntsville

Arkansas
- Church Parking Lot Array - Little Rock
- Owen Solar Home - Little Rock

Arizona
- East Mesa Solar - Mesa
- Virtual Solar Tour, Mesa, Arizona - Mesa
- Alfini House - Phoenix

California
- Show Room - Alpine
- Niles - Fremont Solar Home - Fremont
- UC Merced Science & Engineering Breezeway - Merced
- Solarterre at EcoAcre - Perris
- Solar Cooker Site - Sacramento
- Living Vehicle Solar Site - Santa Barbara
- Major Solar - Santa Rosa
- Solar Photovoltaic & Hot Water Home - Sunnysvale

Colorado
- CU Boulder “SPARC” House - Fraser
- Ambient House - Pagosa Springs

Connecticut
- TWT - Suburban Single-family - Hamden

Florida
- Sun-Powered Belleair Bluffs Home - Belleair Bluffs
- Dave Finnigan Solar Site - Celebration
- Garcia’s Solar Express - Fort Lauderdale
- PV + Thermal - Hobe Sound
- Florida Rooftop Solar Site - Hollywood
- North Pointe Solar Site - Kissimmee
- Cutler Bay Solar Solutions - Miami
- Residential Solar Home - Miami
- Charlie Behrens - Orlando
- Ovideo Tesla Solar Tile - Oviedo
- Fortress at Treasure Hills - Pensacola
- Seminole Solar Home - Seminole
- Solar Steve’s Solar Home - Seminole
- Historic Solar Home - Titusville

Georgia
- 45 Cory Court - Covington
- Yunzow Family Farm - Lilburn

Iowa
- Aging-in-Place Regular home - Salem

Illinois
- Bull Valley Solar Home - Bull Valley

Indiana
- The Ryerson’s Home - Indianapolis
- Joey’s HOA Solar Home - Indianapolis
- HOA Approved Solar Home - Lafayette

Kentucky
- Perkins Home - Louisville

Massachusetts
- Beach Nearby Solar Site - Hull
- Seaside Solar Site - Winthrop

Maryland
- Water-Side & Pier Arrays - Glen Burnie
- Solar Rooftop/EV Strategies - Rockville

Maine
- Bayside Solar Homestead - Machias
- Downeast Solar Tour - Jonesport

Michigan
- South-Facing Solar Site Dearborn
- Midwest Solar Home Edwardsburg
- Calvin Christian Reformed Church, 53 65kW Array Grand Rapids
- Forest Hills Home - Grand Rapids

Minnesota
- Rooftop Solar w/ Powerwall and EV Charging - Edina
- Ground Mounted Solar, Residential Home - Minnetonka
- West 7th Home - Saint Paul
- Northern Light Farm - Solway
- Doc Smith - Woodbury

Missouri
- Brentwood Solar Home - Brentwood
- Meadowbrook Home Solar - Eureka

Montana
- Bozemian 3.6 kW Solar Electric System - Bozeman
- Ann & Nathan’s House - Missoula
- Sawtooth Solar II - Whitefish

North Carolina
- Sunlit Catnip Gardens - Studio - Charlotte
- Mountain Solar and Wind Home - Clyde

New Hampshire
- Averill House Vineyard - Brookline
- Fowl Language Farm - Gilmanton

New Jersey
- Avila Solar Home - Pinelands
- Helios Zero Net Energy Home - Montclair
- Sussex Solar Gardens - Lafayette

New Mexico
- Historic Downtown Solar House - Albuquerque
- Rooftop Solar Walk by - Albuquerque
- Corrales, NM, Residential Solar Site - Corrales

New York
- Alfred University Tiny House - Alfred
- Farm Solar Home - Chaffee
- 1830 Carlson Farm House - Clifton Park

Ohio
- Beaverbrook Solar - Beavercreek
- Barb’s Solar Tour - Eastlake
- Armco Park Solar Array - Warren County - Lebanon
- ACE Hardware - New Middleton
- Cari & Kurt’s Solar Open House - Stow

Oregon
- Adams’ Acres - Bend

Pennsylvania
- Lower Gwynedd Township - Ambler
- Fitch Consulting - Berwick
- The Gap in the Clouds - Canadensis
- West Vincent Community Day - Chester Springs
- Mallon Patch - Leeper

Shamrock Rentals, LLC - Lock Haven
- Saint Francis University Tiny Classroom on Wheels - Loretto
- Hope - Monaca
- SpohnHome @SunnyField - Pittsburgh
- 98 Solar Panels on Thomas Blvd - Pittsburgh

South Carolina
- Solar+EV+Battery Backup - Greer

Tennessee
- Kalmer Solar Home - Collinwood
- 7866 Enchanted Ridge - El Paso
- Rio Valley Solar Home - El Paso
- KWT’s X-VAP Solar Thermal Desalination System - Houston
- Santa Rita Solar Home - San Angelo
- Credit Human HQ - San Antonio

Utah
- Solar with Sonnen Battery Backup - SLC

Virginia
- Off Grid Studio - Arlington
- Two Self-Powered Buildings - Arlington
- Hearne at Bloomingdale Ave - Henrico
- DIY Solar Site - Herndon
- Park Place Solar - Norfolk
- Clinch River Farms Solar Array - Pounding Mill
- Our Home - Roanoke
- Agritourism Farm & Solar Residence - Strasburg
- Suburban Solar Home - Vienna
- Yorktown Solar Home - Yorktown

Washington
- Banner Power Solutions Office Solar - Burlington
- The Bullitt Center - Seattle
- Sequim Energy Efficiency House - Sequim
- Sunset Hill 12 kW Rooftop w/ Electric Vehicle - Spokane
- Cottage Garden Solar - Washougal

Washington DC
- Capitol Hill Green Home

Wisconsin
- Bellevue Place - Appleton
- Summerland Ct - KJ - Appleton
- Up North Solar - Bryant
- MREA’s Headquarters - Custer
- Couillard Solar Foundation - Deerfield
- NWTC - Green Bay
- Sisters of St. Francis Solar Site - Green Bay
- UWW-Rock Solar Project - Janesville
- The G Farm - Larsen
- Stuyve-Johnson Solar Home - Madison
- Hallquist Home PV system - Oshkosh
- NE Wisconsin Residence - Oshkosh
- Country Solar Home - Shakopee
- Poem Homes - Spring Green
- Lake Michigan Wind & Sun - Sturgeon Bay
- Solar + Geothermal - Wauwatosa
- Solar in the Kettle Moraine - West Bend

Wyoming
- Wild Horse - Laramie