

Fall 2021

ASES NATIONAL SOLAR TOUR



WELCOME TO THE 26TH ANNUAL
NATIONAL SOLAR TOUR

The ASES National Solar Tour

October 2 - 3, 2021

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.



ASES NATIONAL
SOLAR TOUR

What You Should Know Before You Buy an

X

ELECTRIC CAR



Electric Cars by the Numbers



How to Charge an Electric Car



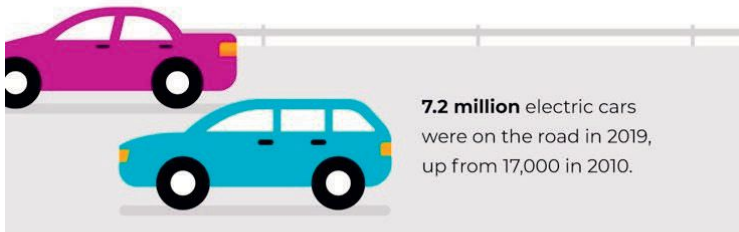
63% of respondents in a 2019 *Consumer Reports* survey were interested in buying an electric car.



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



All new Volvos will be **hybrid or electric** as of 2019.



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.

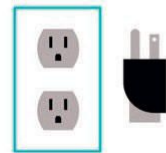


Global electric car sales increased **40%** between 2019 and 2020.



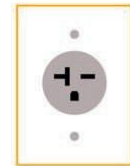
Level 1 (L1) Charging

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

say
INSURANCE

Sources:
media.volvocars.com iea.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.

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
EcoLogical - Northeastern

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

Solar Pool Heat & Solar Electric Generation & Storage - Chandler
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
Solaterre at EcoAcre - Perris
Solar Cooker Site - Sacramento
Living Vehicle Solar Site - Santa Barbara
Major Solar - Santa Rosa
Solar Photovoltaic & Hot Water Home - Sunnyvale

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, 53.55kW 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

Bozeman 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

Solar Electric & Solar Thermal - Fairlawn
"Helios" Zero Net Energy Home - Lafayette
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 - Lebahon
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

Texas

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 - Strasbourg
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
UW/W-Rock Solar Project - Janesville
The G Farm - Larsen
Struye-Johnson Solar Home - Madison
Hallquist Home PV system - Oshkosh
NE Wisconsin Residence - Oshkosh
Country Solar Home - Shawano
Poem Homes - Spring Green
Lake Michigan Wind & Sun - Sturgeon Bay
Solar + Geothermal - Wauwatosa
Solar in the Kettle Moraine - West Bend

Wyoming

Wild Horse - Laramie

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