SOLAR UNITED NEIGHBORS

SUN PATCH Program

Thank you for your interest in earning the SUN Patch Program!
Questions? Please feel free to reach out to us at any time at
getinvolved@solarunitedneighbors.org

ABOUT SOLAR UNITED NEIGHBORS:

We are a non-profit organization dedicated to helping people go solar, connect with other solar supporters locally and nationally, and fight for solar -friendly policies that protect the rights and interests of solar owners and solar supporters.

Go solar.

Join together.

Fight for our energy rights.

WE HELP PEOPLE GO SOLAR IN TWO WAYS:

- **Solar co-ops**: Solar co-ops are groups of neighbors in a particular community or area who are interested in going solar around the same time. Solar United Neighbors educates local residents about how solar works, generates interest in and facilitates a bulk purchase process, and provides support to co-op participants through the process of going solar.
    - Learn more about our solar co-ops here.

- **On Your Own**: Our Solar Help Desk is staffed by solar experts who help homeowners, farmers, and businesses navigate the process of going solar, connect to local installers, and review proposals to ensure that consumers get the best possible solar pricing and services available.
    - Learn more about how we can help here.

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PURPOSE OF THE SUN PATCH:
To allow kids to DISCOVER how solar works; CONNECT solar energy with their lives, community, and the planet; and TAKE ACTION on what they've learned to use solar energy as a renewable and pollution-free resource.
Note: The activities and information contained in this patch program are designed for students in high school.

Instructions on how your kids can earn the patch:
1. Complete the activities and discussions listed below in the DISCOVER, CONNECT, and TAKE ACTION sections.
2. Leader/Parent-use the information and resources contained here to facilitate conversations, answer questions, and lead activities.
3. Complete the REPORTING section at the end of this patch program document to get your Solar United Neighbors patches.
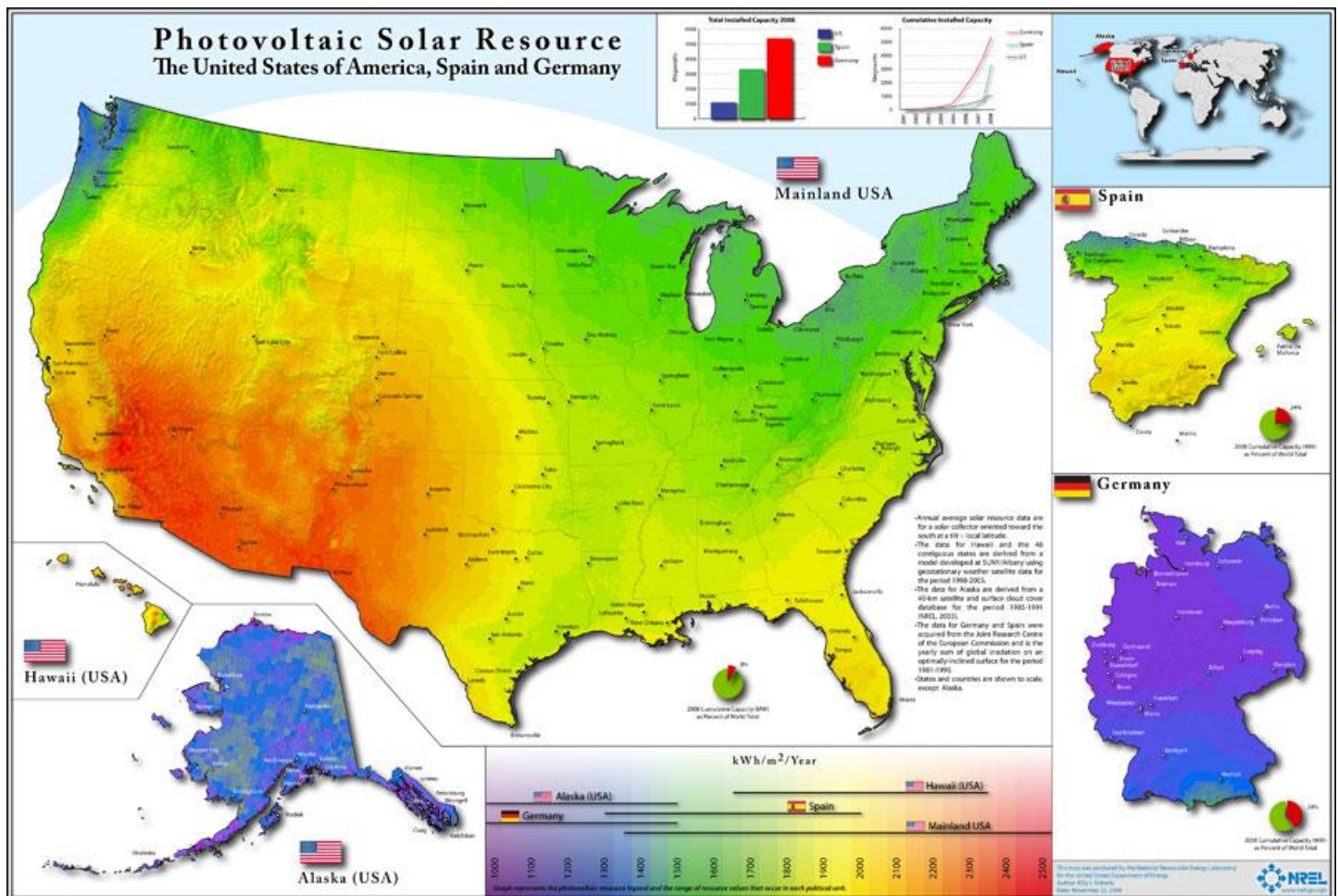
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DISCOVER

PART 1: What is solar energy?

- The sun is a large ball of burning gas in the center of our solar system. It's made of mostly hydrogen that burns hotter than you could ever imagine.
- The sun is the largest source of energy in our solar system.
- More energy from the sun hits the earth in one hour than the ENTIRE world uses in a year. That's a LOT of energy!
- The energy that the sun produces is called solar energy. Solar means "from the sun."

ACTIVITY: Use the map below to compare the level of solar resources available in the United States, Spain, and Germany. Which areas have the most solar resources? Which have the least? How does your home state stack up?

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PART 2: How solar works

- Energy from the sun can be used to create free, clean electricity!
- A solar photovoltaic (PV) cell converts sunlight into electricity.
- Most solar PV cells are made from silicon. Silicon is used to make many other products, including concrete, glass, ceramics, cosmetics, and computers.

Silicon also makes sandy beaches!

A solar panel (also called a "module") is made of solar PV cells:

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Solar panels are wired together to form a "solar array":

arrays can go on your roof:

Or on the ground:
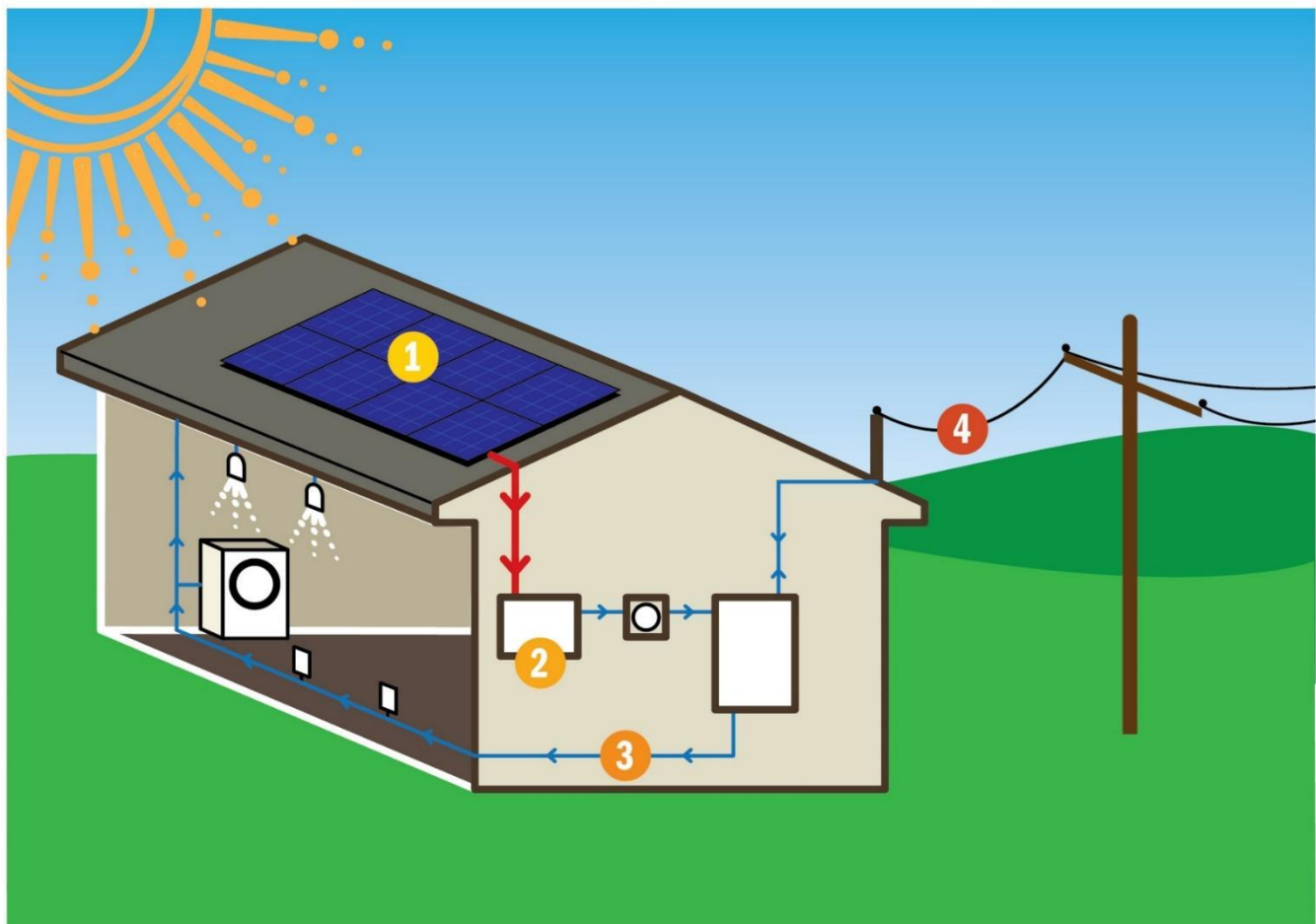
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- Electricity from your solar panels flows into your home to power your appliances and electronic device
- Excess electricity flows through your electric meter to help power your neighbors' homes, too.

1 Solar panels convert sunlight into direct current (DC) electricity

2 Inverter converts electricity from direct current (DC) to alternating current (AC)

3 Your home consumes the electricity produced by your solar array

4 Solar array connects to the local grid, allowing you to receive electricity even when the solar panels aren't producing any
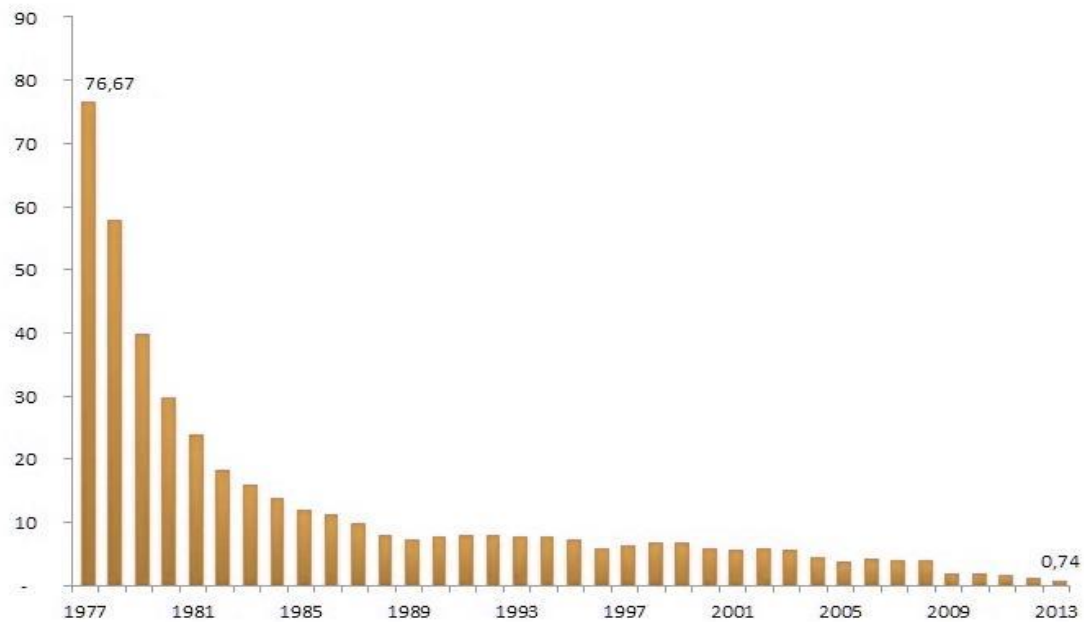
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Solar's growing role in our electric system

- Solar provides clean, renewable, locally produced energy. And solar panels are more affordable than ever! In fact, the cost of solar has dropped 90% since the 1970s.

The Swanson effect
Price of crystalline silicon photovoltaic cells, $ per watt

76,67

0,74

1977   1981   1985   1989   1993   1997   2001   2005   2009   2013

Source: Bloomberg New Energy Finance

- Around the nation and the world, more and more homes, businesses, schools, libraries, and governments are making their own electricity using solar panels.
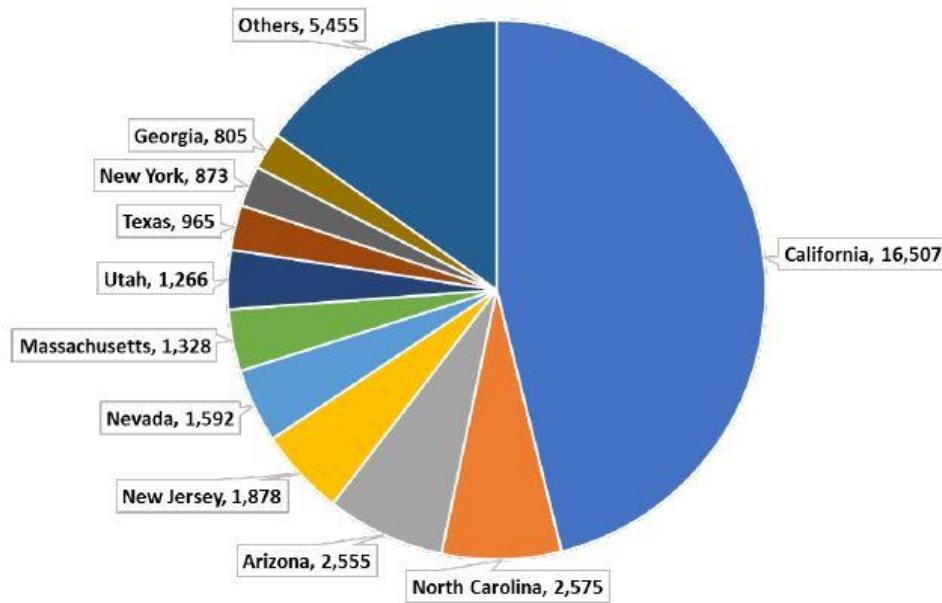
Worldwide Cumulative PV Growth (GW)

241.6

183.8

138.8

100.4

70.3

2011   2012   2013   2014   2015
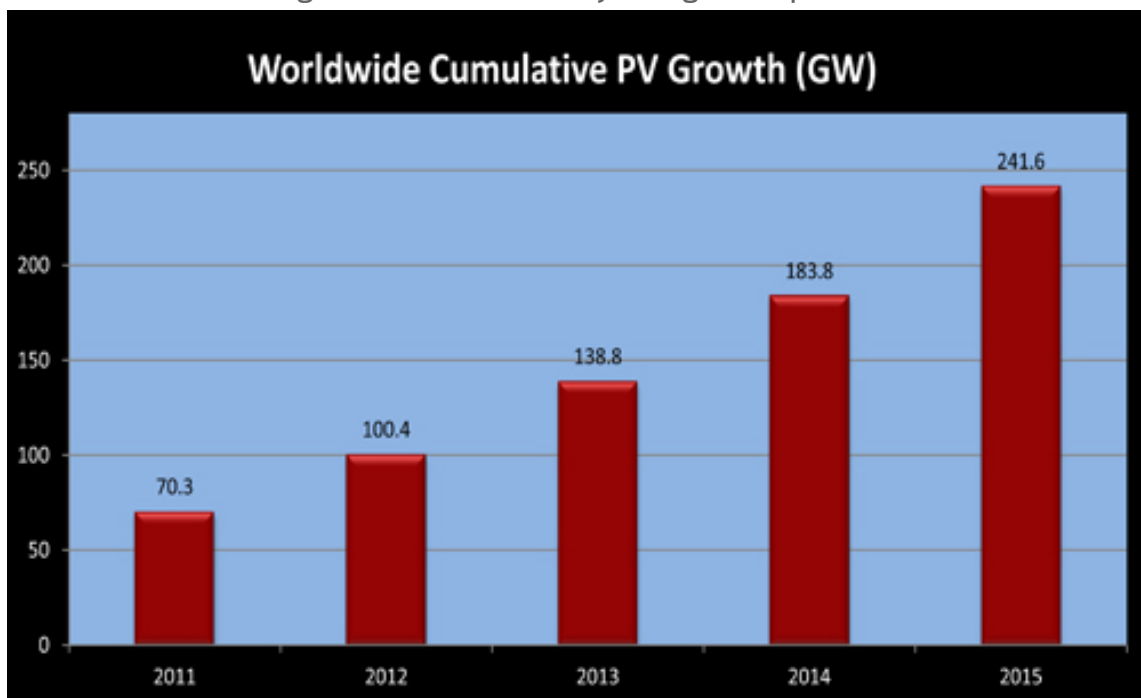
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- In the United States, California leads the way in solar installations:

Cumulative Solar Capacity through Q3 2016 (MW)

Others, 5,455
Georgia, 805
New York, 873
Texas, 965
Utah, 1,266
Massachusetts, 1,328
Nevada, 1,592
New Jersey, 1,878
Arizona, 2,555
North Carolina, 2,575
California, 16,507

ACTIVITY:

Is your home state listed on this chart? Find out more about solar in your state using the interactive map available here. How many solar arrays have been installed in your state? How many solar jobs are in your state?

CONNECT

ACTIVITY 1: Do you know anyone who has solar panels on their house? Do you have solar panels on your house? If you know someone with solar panels, *ask them about it!*

- Suggested questions:
    - Why do you have solar panels?

    - When were your solar panels installed?

    - How do your solar panels benefit you?

    - What has happened since you installed your solar panels?

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ACTIVITY 2:

Neighborhood Scavenger Hunt - take a walk (or drive) around your neighborhood and look up! Have you ever looked up at the roofs of houses before?

- How many solar panels can you can you find in your community? Don't forget to check stop lights, street lamps, construction signs…even on the ground!

- Can you find solar panels in five locations in your neighborhood? What are the solar panels powering?

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Activities for High School Students:

1. **Find out whether your home or school is good for solar:**
    a. Type the location address into Google Project Sunroof.
    b. Project Sunroof will analyze the hours of usable sunlight per year and the square footage available for solar panels at your location!

    -OR- (if Project Sunroof is not available for your location)

    c. Type the street address into Google Maps. Open Satellite View.
    d. Does the roof face south? South-facing roofs are best for solar. (East and west-facing roofs can also work for solar, but north-facing roofs do not get enough sunshine.) Use the compass tool to determine which side of the roof faces south.
    e. Are there large trees or buildings shading the roof? A shade-free roof is best for solar! Use the 3D mapping feature on the bottom right corner of the screen to see whether the south-facing roof is shaded.
    f. If your house or school has an unshaded, south-facing roof area, it may be a good spot for solar panels! Talk to your parents and teachers about installing panels at home and school.

2. **Solar creates jobs.** As more solar is installed by homeowners and utilities alike, new jobs are being created across the country. The solar industry now employs more than 260,000 people nationwide and is adding jobs far faster than the overall economy.
    - Take a deeper dive into local job creation using The Solar Foundation's Solar Job Census. The map displays solar job figures on the state and county levels. How many solar jobs are in your state? How many are in your county? Look online or in the phone book to find out how many local solar installation companies are working in your area.

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3. Be a solar ambassador in your community:
   - Sign up 20 people to learn more about solar. You can sign up folks for the Solar United Neighbors newsletter using this online form.
   - Find out if there is a solar co-op in your community and encourage your neighbors to join! Check out our listing of active solar co-ops.
   - Contact getinvolved@solarunitedneighbors.org to learn more ways to spread the word about solar and connect with our volunteer opportunities.

REPORTING

Congratulations! You've completed the SUN patch! Solar United Neighbors thanks you for learning about solar energy and helping to spread the word about solar in your community!

Instructions on how to get your SUN patches:

To receive your patch(es), please provide the information requested below and send by email to getinvolved@solarunitedneighbors.org.

Contact Name and Address:
Number of kids who participated in the program:
Number of patches requested:
Total number of hours spent on the program:
How did you hear about the SUN patch?
What did your kids learn from this program?
Additional feedback about the SUN patch program?
Mailing address that you would like us to mail your patches to:
Optional: Photos of your kids earning the SUN patch!

Once we receive your patch request information, we will work on getting your desired number of patches mailed out to you. We are happy to provide you with the patches you have earned free of charge.