



The Benefits of Solar Power **and the future possibilities for Wyckoff**

By: Camille Dash

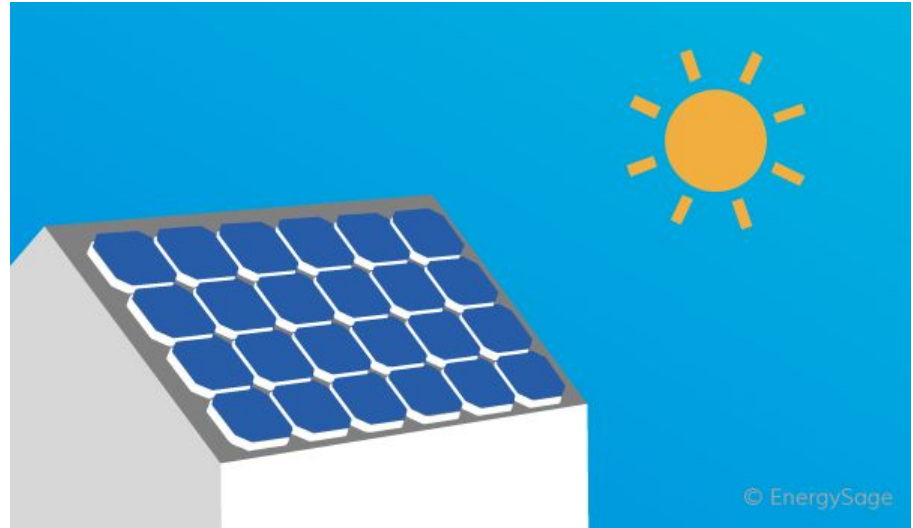
What is Solar Power

and how does it work?



Solar Energy

- Solar energy harnesses the energy from the sun, and transforms it into power that can be used by humans



© EnergySage



Solar Cells/PV

- Photovoltaic cells, or solar panels are the more widely known method of harnessing solar energy
- PV cells are made of semi-conductive material (usually silicon), and when the sunlight hits the solar cells, some electrons are released from their atoms and flow through the material, generating electricity.

Solar-Thermal Power Plants

- On a larger scale, these power plants concentrate heat from the sun to use as a power source
- The heat boils water, which drives a steam turbine to create electricity (similar to coal or nuclear power plants)



Benefits of Solar Panels

Environmental, Health and Financial



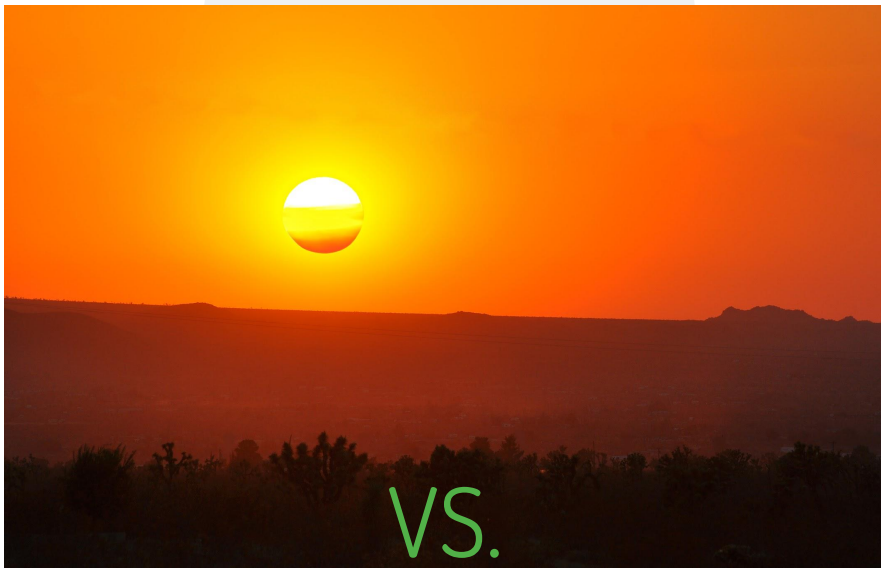


Environmental

Benefits

of switching to solar power





Environmental Benefits

- Compared to the way Americans manufacture the majority of electricity, through burning coal and natural gas, solar power is green and abundant
- The amount of energy from the sun that reaches Earth in one hour is enough to power the world for one year

Environmental Benefits

- Switching to solar helps the fight against climate change, as it doesn't put carbon dioxide into the atmosphere like burning fossil fuels does
- Clean energy

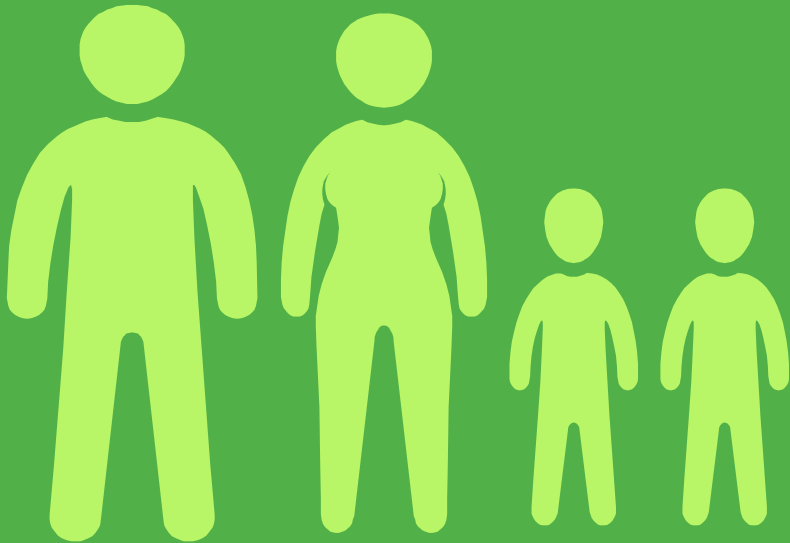




Environmental Benefits

According to US Energy Information Administration, the average CT home uses 8.280 kWh per year, so switching to solar would be the equivalent of planting 150 trees per year

In NY, switching to solar would eliminate the amount of emissions equivalent to burning 5,000 pounds of coal per year



Health Benefits

of switching to solar power



Health Benefits

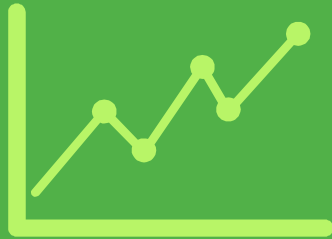
- Air quality will improve as solar power becomes more prevalent
- According to the National Renewable Energy Laboratory, switching to solar would reduce nitrous oxides, sulfur dioxide, and particulate matter emissions

Health Benefits

Fewer cases of bronchitis, and other respiratory/ cardiovascular health problems

Improvements in productivity, as people would take fewer sick days that were previously caused by health problems linked to air pollution





Financial Benefits

of switching to solar power

Financial Benefits

- Solar panels can save a homeowner money because they no longer have to pay an electric company for as much power, since their panels have produced electricity
- Although the initial purchase of solar panels is expensive, in the long-term, people save money

Financial Benefits: SREC

NJ offers the Solar Renewable Energy Credit, a solar energy incentive which equates to one megawatt of electricity generated from solar

Average 7.2 kW system earns a homeowner about 8 SRECs per year

Each SREC can be sold for about \$200, making about \$1,600 per year

This is valid for the first 10 years after installation, equaling approximately \$16,000

25-Year Savings Estimates for a 7.2-kW Home Solar System in New Jersey

Cumulative Annual Savings (USD)



● Cash Purchase **● Solar Loan** **● Power Purchase Agreement**

Paying for Solar Panels

Cash, Solar Loan, PPA



Paying in Cash

Paying in cash for a solar system does put you in debt for about 5 years, but after SRECs, savings on electric bill, and savings on income tax, you can make \$48,000 in profit in 25 years

Federal gov't
income tax
credit of 30%
of system
costs

Panels last a
long time, so
after 25 years,
you can make
\$48,000, a
24.2% return
on your
investment

Home value
also increases
with solar
panel
installation

Paying with a Loan

Paying with a loan is possible as long as you have equity in your home.

Loans will have an interest rate of 4.5% or lower and a 15 year repayment period.

There is never a point when the homeowner has lost money because of solar

Still qualify for incentives like SRECs and income tax deduction





Power Purchase Agreement

This agreement, called a PPA, is essentially the purchase of the electricity from the solar company, not the panels.

Can save about \$160 per year.

Over 25 years, this equates to about \$7500 in savings.

Benefits the environment with little financial risk.

How Many Solar Panels Do I Need?



How many solar panels are needed to power a house?

- 1) Determine the amount of kWh of energy used per year (found on electric bill).
- 2) Determine how many kWh the panels can produce (depends on location, weather, etc).
- 3) Talk to installers for a more individualized assessment.



Google Project Sunroof

1 Scott Plaza, Wyckoff, NJ 07481, USA

GO



Analysis complete. Your roof has:



1,426 hours of usable sunlight per year

Based on day-to-day analysis of weather patterns



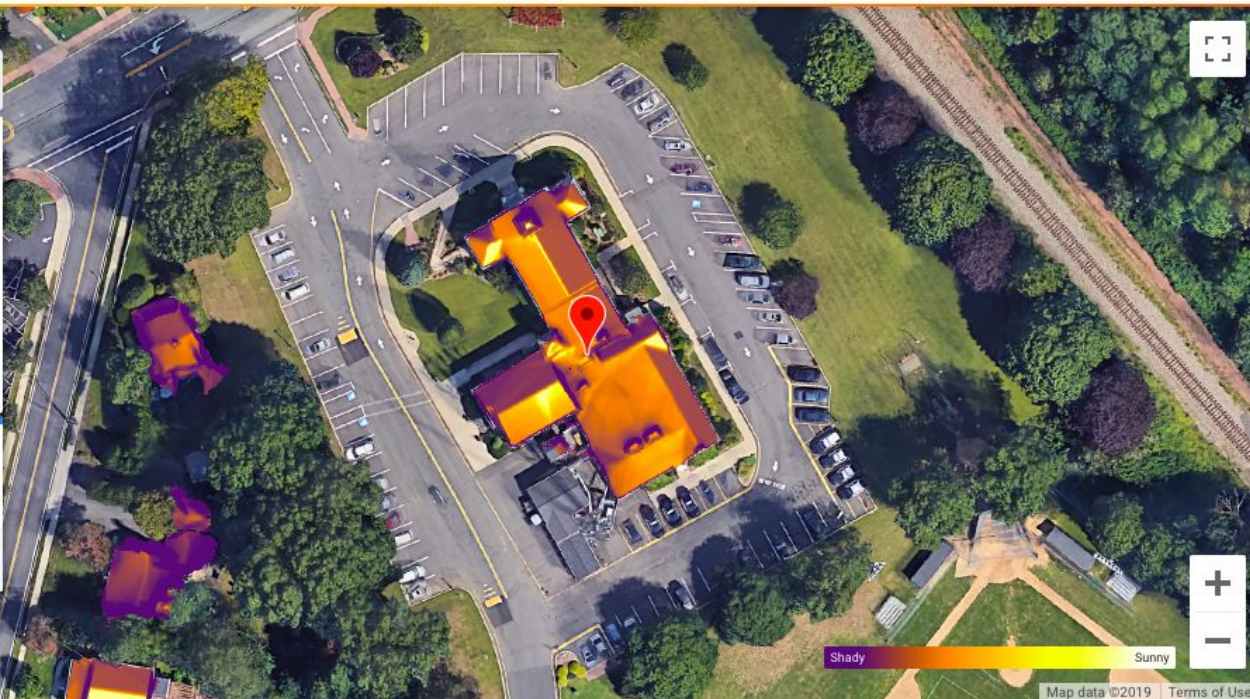
6,589 sq feet available for solar panels

Based on 3D modeling of your roof and nearby trees

\$21,000 savings

Estimated net savings for your roof over 20 years

Wrong building? Click another roof to view details.



Shady Sunny

Map data ©2019 | Terms of Use



Interview with SunFarm Solar Field Technician, Jack Pontrelli

Why do people usually want solar panels?

“

They either want to save money on electricity or help the environment. People also could want panels on their house to earn money, because if your system produces more than what your house consumes, you can sell that back to the grid.



Do people usually get solar panels for their whole house, or only for a part of it?

“

It varies, but most people do get solar for their whole house. It depends on the cost per basis - how much money they want to spend on the system and also the regulations of that state or town determines how much they are allowed to build. There are regulations if you can build something to 100% which vary from state to state.

Is the house location, shade or angle of roof ever an issue in terms of the panels being effective?

“

Yes, 100%. How many trees are on your property, the angle of your house, how big your roof is, if you're low on a hill or high on a hill, any of that stuff comes into play. You could take down trees to make it work.

Do people ever have solar panels installed places other than the roof, such as the backyard?



“

Yes, we call it a “ground mount.” It’s just a frame where the solar panels sit. You see a lot of them on farms in New Jersey, and in Massachusetts as well. Utility companies like PSE&G have solar systems that are giant ground mount systems. Some frames are installed on the tops of commercial buildings, and some are on ground allocated for solar energy generation. We have a property in Massachusetts with only solar panels on it.

What proportion of people are able to go completely off the grid?

“

There are probably a good amount of people who don't need to utilize PSE&G or Rockland Electric, but they're still hooked onto the grid, so there's still the option if they don't produce enough that they can use the grid. All of the systems I deal with are tied into the grid. There are very few people who have solar systems that go directly to batteries.



How long does the average installation take?

“

From submitting the drawings to completion of the project, it could take one year.

Solar Power in Wyckoff

Current Numbers and Plans for the Future



Solar Power in Wyckoff – By the Numbers



Despite the benefits of solar, less than 1% of all buildings in Wyckoff have solar power (as of Nov 2017)

27 buildings have solar, compared with a total of 5542 single family residences.


11 solar projects were completed from 2013 to 2017.

Stop & Shop, Goffle Road Poultry Farm, Grace United Methodist Church, and Sicomac Elementary School, are examples of schools and businesses with solar panels.



How do we increase solar power
prevalence in Wyckoff?

EDUCATION

- Most people aren't aware of how solar power has evolved since it was first introduced; it is much more efficient and affordable than it used to be
 - With the environment becoming a more important issue than ever before, getting the word out about solar panels can help make our planet greener!
 - Pamphlets, websites, and posts on social media can all help spread the word about solar power.
- 



Sources

- <https://www.nationalgeographic.com/environment/global-warming/solar-power/>
- https://www.solarpowerrocks.com/new_jersey/
- <https://news.energysage.com/health-environmental-benefits-of-solar-energy/>
- <https://news.energysage.com/how-many-solar-panels-do-i-need/>
- <https://www.wyckoff-nj.com/sites/wyckoffnj/files/pages/erifinal2018.pdf>
- <https://www.google.com/get/sunroof>



A decorative graphic on the left side of the slide features several green leaves of various sizes and shades, some with detailed vein patterns. Interspersed among the leaves are four light blue circles of different diameters. The overall aesthetic is clean and nature-themed.

Information About My Project

This project was completed as part of the Wyckoff Environmental Commission's Junior Commissioner program. Junior Commissioner Camille Dash, a student at Ramapo High School in the class of 2020, created this solar power presentation and completed the research for the project.

December 2019