

Solar Panels for All

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By Cynthia L. Michaud

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Outline

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 - B. While solar panels have been around for over a hundred years, solar panels have just improved and become affordable to be placed on residential houses.
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 - 2. Solar power is a cleaner energy source and is also free and available.
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Imagine what the United States (U.S.) could be like if all its electricity were produced from the free solar rays that come from the sun. Electricity could be harnessed from the sun on each individual residence instead of paying the electric companies for fossil-fuel-produced electricity. If done correctly, this initiative could really be a big assistance to so many struggling families that are trying to pay for utility costs along with groceries, child care and healthcare costs. There are several advantages, such as electricity for struggling families, clean energy sources from solar power, free and available energy source, and sell-back ability of any unused electricity to local power companies. There are also several disadvantages. The product and equipment for solar panels are quite expensive, and skilled labor is required to install solar panels. Also, local power companies have implemented restrictive reimbursement policies for unused electricity and higher prices for using electricity needed during low-input electricity times. Several of these disadvantages have been the reason why the solar panel programs have not been a bigger priority. However, now is the time to act while the supply is high and the demand is still low. The U.S. has delayed the necessary assistance to provide access and wide-spread use of solar panel. The U.S. should provide low- and medium-income families with residential home solar panels and the necessary conversion equipment.

Solar panels are individual solar cells put together into a panel that is used to collect solar rays that are placed in such a way that electricity is produced for a residential or commercial businesses ("Solar Panel," 2014). It can be used for several purposes, but the most feasible usages are heating water in water heaters, providing electricity for light, providing heat

for the home during cold winter months, and providing air conditioning for the hot summer months. While solar panels have been around for over a hundred years, solar panels have just recently improved and become affordable enough to be placed on residential houses. The most commonly used process of creating solar panels since the early 1990's has been a process where silicon is melted down and poured into pots made of ceramics. When this silicon cools, it turns into a solid crystal substance. This substance is then cut with diamond-edged spinning blades into wafers that can be made into solar panels (Charles, 1994).

The U.S. was the country of origin of the beginning of solar technology. The invention of the solar panel has taken many steps, beginning with the first basic solar cell. Charles Fritts first invented the technology behind the first basic solar cell in 1883. This solar cell was created by using selenium and gold, but was not very efficient. However, it did provide some light from the electricity it produced. In 1940, Russell Ohl, a U.S. physicist working for Bell Labs, was responsible for making important discoveries that led to the development of the solar transistor and solar cell. In 1946, Ohl patented his discovery and the first solar cell. The first solar panel was not created until 1950, when a science teacher from Surrey made electricity by using selenium and sunlight. This science teacher's invention resembled a crystal ball. It was discovered years later in an antique shop (Chayton, 2010; Fritts, 2014; Ohl, 2014).

There are several promising improvements to solar panels currently being tested. The most promising of these include polysilicon solar panels made from quartz, second generation thin-film, and using plasmonics and color attraction metals. The polysilicon process of making solar panels is like the current melted silicon processing currently being used. The main difference is the use of quartz instead of more precious metals like the gold that was once used.

Thin-film solar panels are another option. This type of solar panel is made of non-silicon materials, such as gallium-selenide, cadmium telluride, copper-indium or amorphous silicon. These chemicals do not crystallize like standard silicon or polysilicon substances. This flexibility allows this substance to be rolled up and carried around more easily to different locations. The problem with this type of solar panel substance is that it still has low efficiency compared to other solar panels (Goddard, 2015). The final improvement is the use of plasmonics and the use of metals or other materials that have an attraction to the color green. It also has an ability to increase intensity or decrease intensity with the colors of red and blue, respectively. This process uses stacked solar panels to produce energy (Lee, 2015).

China is the most advanced country in the field of solar panel technology. Several years back, China chose to invest large amounts of money into projects that built solar panel factories while other countries waited to see what market prices would do. These Chinese factories began producing solar panel just about the time that oil and gas prices declined again. This price decline made solar panel energy less appealing and caused a decline in the desire for this energy source. China refused to lose the advances that had been made, so they subsidized these factories and started marketing their solar panels to Western countries, such as Canada and the U.S. With these solar panels receiving the Chinese subsidy, they were marketed in the Western countries at below-cost value, which did not sit well with Western producers of solar panels. To even the market-playing field, many of these countries put heavy import tariffs on these solar panels produced in China. China tried to get around these tariffs by partnering with Taiwan and having the solar panels assembled and shipped from Taiwan. These Western countries and solar panel producers in these countries became aware of this deception and

brought this again before the courts so that Taiwan was also added as a country for which these hefty tariffs were assessed against any imported solar panels. Even with all the advances in the production of solar panels made in China, there are still opportunities for the United States to become a leading producer and advocate for the use of solar panels and solar energy (Goddard, 2015).

Even though solar panels have been around for decades, the availability has been limited to only those who could afford it. With the advances in technology of producing solar panels, now is the time to push for solar panels to be placed on homes of the average family. Solar panels can provide electricity to struggling families so that they are not spending their limited funds to heat and cool their homes. Their electricity could be produced from individual residential solar panels placed on their roofs. The solar panels provided should include enough panels so that their needed electricity would cover the costs of heating and cooling their homes daily. These savings could allow families to use their limited income for other items and not having to pay the utility companies for electrical services (*The Simple Dollar*, 2015).

Solar power has been proven to be a cleaner energy source that is more environmentally friendly than most fossil-fuel sources. Solar energy could be used instead of polluting the environment by burning fossil fuels. By using this cleaner energy source, we are reducing the destructible impact we are having on our world. Solar power is also readily available to everyone that has sunshine, which is most everyone. There are very few places where the sun does not shine for at least several hours each day. Solar rays fall on this Earth, and it costs nothing to receive it. All we have to do is capture it and make it useable for everyday energy sources.

The unused electricity could be sold to the local electric company for use in other homes or businesses. This process could be done by reverse electricity routing and sending the unused electricity back to the power grid. Electrical demand on the power grids during the hottest and coolest days is often higher than the power companies can handle. With more people creating electricity from their individual solar panels, the electrical companies would not have to provide all the needed power to everyone in the U.S.A. The electrical demand would decrease and with it, also the price of electrical kilowatt hour. The reduction in energy costs would provide extra available spending funds to these struggling low- and middle-income families (*The Simple Dollar*, 2015; Cardwell, 2016).

The disadvantages of solar panels can be as numerous as the advantages. One of the biggest disadvantage is the high cost. Each of these solar panels can easily costs over \$100. Many individual solar panels are needed to handle the electrical needs for average residential or commercial businesses. When you add all this up, the solar panels that are needed with the conversion equipment to produce electricity, the required expense could easily cost between \$10,000 and \$20,000. Unfortunately, these amounts are more than what most families have readily available to them. Without access to federal energy tax credits or a federal program to pay for these solar panels and conversion equipment, most individuals and businesses are unable to purchase this clean energy source for their electricity. This situation puts most low- and middle-income families fully dependent on the electrical companies for their electricity needs (*The Simple Dollar*, 2015).

Installation of these solar panels requires a higher technical training team of personnel. Currently, only standard roofing tilers are needed to provide new roofs on houses or

businesses. However, most solar panel installations need at least two electricians and several trained solar panel installers. Each of these trained personnel could earn approximately \$100 per hour. These trained professionals are needed to hook these solar panels up to solar panel equipment that converts solar energy to electricity and the residential power grid. The difference in cost between these different installers makes this a costly endeavor (Goldstein, 2015).

Finally, electrical companies have proven to be a disadvantage to the installation of solar panels, especially in the U.S.A. Many electrical companies have chosen to be less than accommodating and not purchase the unused electricity. If they do, they have made policies that severely limit the amount of electricity they purchase from consumers. They also have reduced the price that will be paid for this electricity. Not only do they limit the amount of electricity and price paid for electricity purchased from individuals and businesses, but they also charge more if these homes or businesses use electricity from the power company grid sources during cloudy times or during low-lighting situations like nighttime hours. These policies favor the local power companies instead of the residential home owners or businesses. Unfortunately, several local power company policies are not in favor of individuals having their own local solar energy source because then they are not purchasing their electricity from them. This stance is making it harder on individuals to afford the costs of both the solar panels and paying for any needed electricity from these power companies (*The Simple Dollar*, 2015; Cardwell, 2016).

While the U.S.A. government might not be able to place solar panels on every residential home of all the low- and middle-income families, the government should at least

start a program to start the process. The government should start with one family at a time to help the family that has the greatest need and is in the worst financial shape. For each family that the government helps, the energy assistance funds given will provide gains in that family's spending ability and self-sufficiency. While it may take a long time to show tremendous progress, the families that are able to be helped will receive and need less and less assistance in the future. The savings from the continual financial assistance of that family could be used to pay for solar panels in another home. The goal is to provide solar panels that makes enough electricity to support that family's needs for the daily household electricity. The U.S.A. government should support this program by continuing to allocate all tax energy incentive funds from business and higher-income residential homes down to these residential homes that are in the most need of assistance towards their home heating and cooling needs.

Solar panels have both advantages and disadvantages to being used in residential homes and businesses. The advantages include helping struggling families with their electrical needs, providing a cleaner, free and available energy source and supplying extra unused electricity back to the power company grid system. The disadvantages of solar panels include the cost of the solar panels and the conversion equipment, installation costs increased due to the expertise needed for installing solar panels, and the policies of the local electrical companies concerning purchasing of any unused electricity from the solar panel owner. The U.S.A. government should establish a program that starts to install solar panels on homes of the lowest income families. The government should then be able to make this family more self-sufficient so that they no longer need financial assistance from the U.S.A. government. By reducing this financial funding for this family, the government can help another family in the

same manner. With this program, the U.S.A. should provide low- and medium-income families with residential home solar panels and the necessary conversion equipment even if it is only one family at a time and takes many years to see the significant progress and effect it has on these families.

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