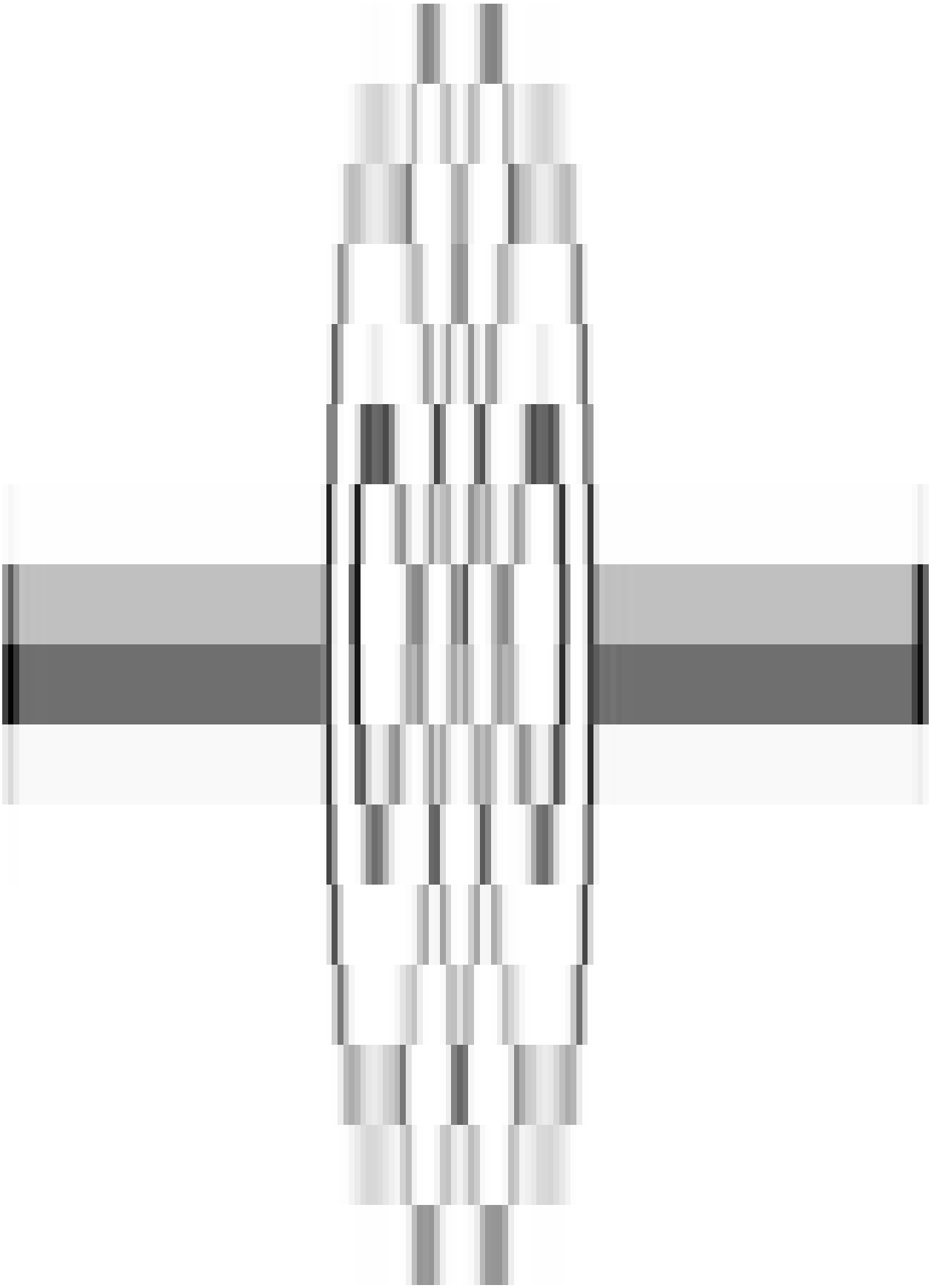

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Solar Power

A Step By Step Guide On How To Install And Design Your Solar Panels On Your Home, Tent And Vans

By

JOSH EDWARDS

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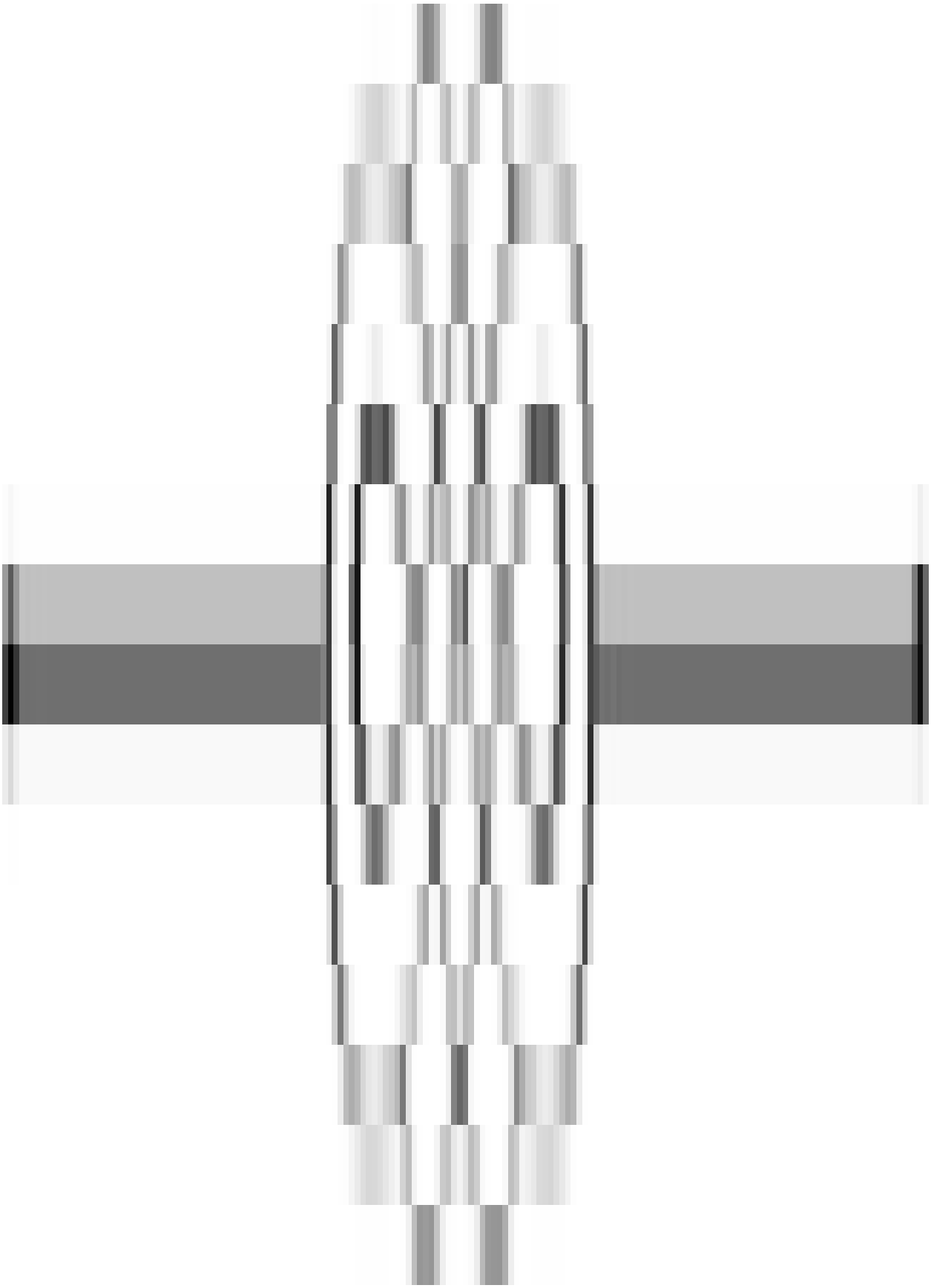
Introduction



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or a long time Solar Power was only identified as the conversion of sun light to to electricity. While this is not inaccurate most of us do not know that the energy harvested must first be converted to electrical energy to be able to produce generally functional electricity. The conversion is made possible through the photovoltaic or PV, a method that uses semiconductors to convert the sun's radiation to electrical energy.

Components of a Simple Solar Power System Solar or photovoltaic cells

The assembly of semiconductors and electronics or solar cells is enclosed in a photovoltaic module, more commonly known as a solar panel. Several solar panels are called solar panel array.

Battery

A solar panel collects and generates energy from the sun's radiation. PV panels convert this energy to direct current electricity, a current that is produced by batteries. Although connecting a DC load directly to the solar panel is possible, batteries play an important role to a properly working photovoltaic system.

Regulator

A regulator is optional yet a vital equipment in a photovoltaic system. During the cyclic process, the battery is likely to become overcharged or over-discharge, a situation that shortens the batteries' lifespan. A regulator prevents such situations from happening by regulating the batteries' condition. It maintains a stage of charge where it monitors when the battery will be overly charge or discharge. In general, a regulator keeps the batteries in the most appropriate working conditions.Converter/ Inverter

A converter allows the DC electricity stored into the batteries to be converted to AC or alternating current electricity, the type of energy that is used by the mains power supply. The DC/AC or direct/alternating converter is also called an inverter and is used to match the required current and voltage by the load. It is typical to experience some energy loss during electricity conversion.

Load

Any appliances that consumes electricity is considered a load. When choosing a load for the solar power system, it is necessary to start with a low power component before installing additional solar panels to avoid wasting of resources. PV systems are ideal for illumination as lights only consume several watts compared to bigger appliances like television, components, or computers. There are also lightings that operates on direct current electricity, allowing the use of solar power system in a low budget scale.

Solar panels, battery, regulator, converter, and load make up the solar panel system. When all of these components are installed properly, a solar power system can sustain itself for years.

Benefits of Solar Power

For most residential users, power grid is the most convenient source of electricity. It seems like a huge power shortage or outage is still in the distant future. However, the increasing worry about the exhaustion of fossil fuels is drawing authorities all over the world to exploit renewable energy sources. As solar energy is the most commercialized among other renewable energy, it is necessary to know how you, as a residential end-user, can benefit from solar power.Low-cost production

Solar power is a proven commercial energy source. Among other renewable resources such as wind, hydro, biomass, biofuel, and geothermal power, solar power the only clean energy that is able to generate a large market scale including residential users. Due to the advancement in solar energy technology and the consistent improvement of financing approaches, solar energy project implementation is steadily reducing.

China's emergence as one of the biggest manufacturer of solar panels largely affects the cost of end-user materials. The country also produces wind turbines although exports are limited unlike the global production and export of PV panels.

Infinite energy source

Depletion of fossil fuels is an unvarying threat to energy security. Fossil fuels are non-renewable energy sources and its exhaustion is inevitable, which means power supply shortages all over the world. On the other hand, renewable energy like solar, wind, and geothermal power are able to generate electricity without

depleting natural resources. These natural energies are infinite sources of energy. If installed and utilized properly and strategically, renewable energy can supply the whole world with clean electricity.

Earth friendly

Solar energy, like all green energy, produces relatively small amounts of greenhouse gases or GHG, one of the major factors to the thinning of the ozone layer. It reduces the carbon footprint in all sectors. The utilization of alternative energy also promotes the production of low carbon technology products such as LED-powered lights, low-carbon appliances, and hybrid cars. More energy efficient storage and solar panels are being developed to improve the viability of alternative energy.Modification of electricity usage

Solar power systems are not only able to generate and supply power to residential users, it also allows end-users to modify their electricity usage. This is made possible by a two-way smart grid system between the main power supplier and the consumer. When your solar power system generates excess energy, the power meter turns backwards. A synchronous inverter is necessary, as it will be the one to match the incoming main supply. When such favourable conditions occur, your electricity supplier pays you back for the excess energy generated by the solar power system. Alternative energy is by nature unpredictable as the amount of generated energy greatly depends on weather conditions.

Incessant government support

The fact that the recession hardly had an impact to alternative sources demands proves that renewable energy is a stable and continuously strengthening industry. The unrelenting government support, including incentive packages from various countries, helped boost the industry especially solar, wind, and biofuel generation. Energy smart technologies are gaining increased support from capital and private equity investors, giving way to digital and power saving applications in the market.

Governments all over the world are offering stimulus packages of tax credits and incentives to residential, commercial, and industrial users. Aside from tax deductions for individuals and companies that install solar power systems, the federal government also offers cash back reward programs, property tax

exemptions, sales tax exemptions, and electric company incentives. Even investors partner with solar companies to sponsor recycling programs and allow conscious consumers to dispose old products properly.Low maintenance and operating cost

The ideal set-up requires it to have optimum sunlight exposure during the day, and if this is achieved, then expect consistent energy generation on ideal weather conditions. However, proper operating and maintenance must be done periodically to ensure optimum collection of sunlight.

PV panels, if installed properly and strategically, are virtually maintenance free. Basic maintenance of solar panels includes keeping the solar panel array clean and free of debris. Washing the PV panels is also recommended especially if you live in a particularly dusty region. Use non-abrasive cleaners and wash cloth to avoid scratching the panels. A garden hose can be use to rinse the panels.

Life expectancy

Aside from its self-sufficiency, solar panels have an average of 20 or more years of operational life. With recent developments of materials used in building PV panels, the life expectancy and viability of solar panels is expected to improve in the coming years. During these years, approximately $2,000 is needed as maintenance and operating cost of PV panels.

Eliminate the cost and difficulties of transporting conventional fuel

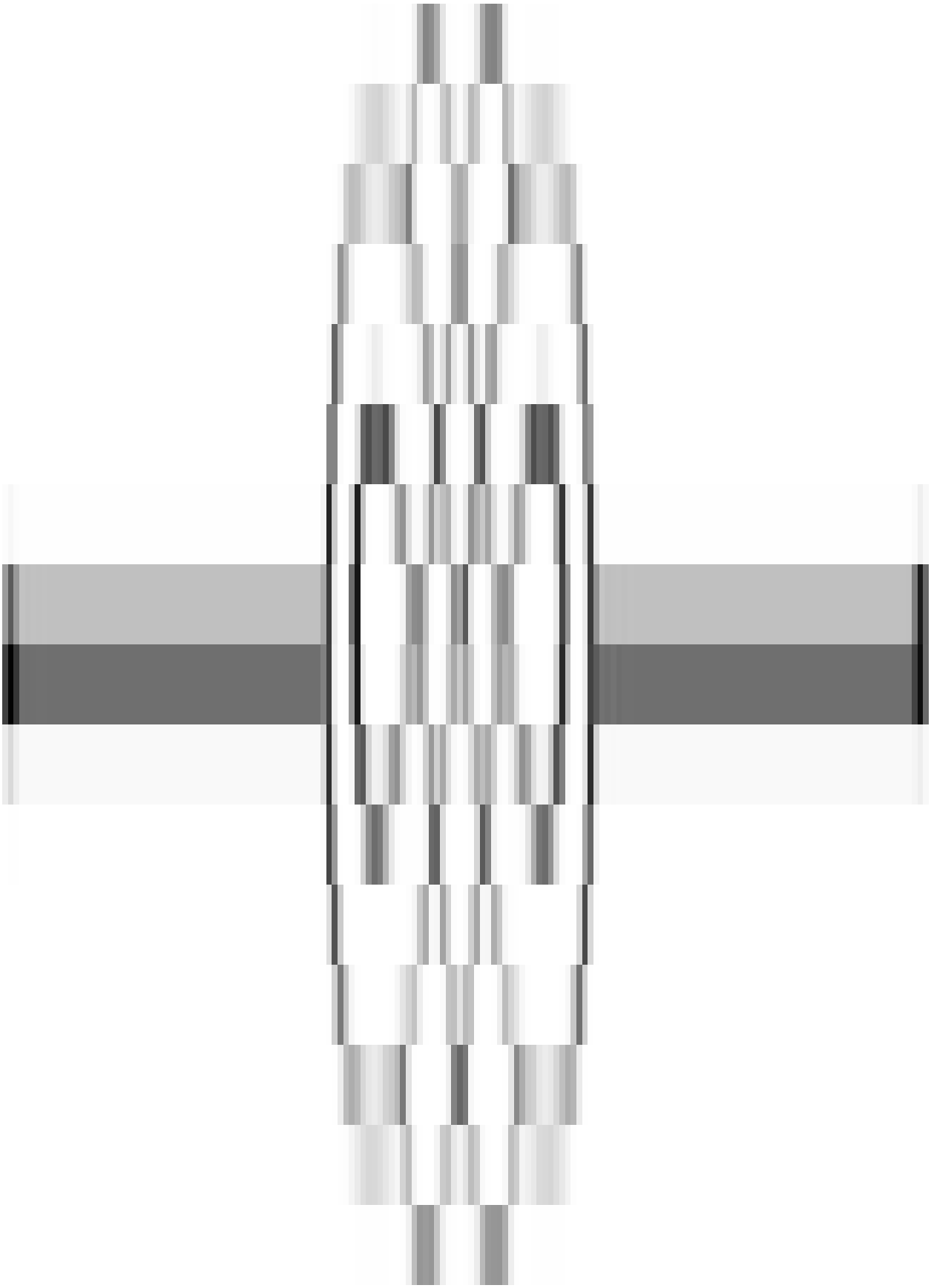
The federal government allots billions of dollars to transport fuel and other natural gas to the country for electricity generation. Solar power systems reduce such cost, as photovoltaic panels do not require fuel or natural gas to convert sunlight to electricity. Building of large solar power plants also allows local generation of environmentally friendly electricity where it can be delivered to residential, commercial, and industrial users.

Solar Lighting

Indoor solar lighting is possible via a system that collects and distributes sunlight for indoor illumination. Outdoor solar lighting is composed of simple solar power system where the lights are continuously being charged through the day and discharge at night by illuminating walkways. Lighting takes up a lot of energy and is consequently quite expensive wherein Solar Lights has really

become a very viable and affordable green option. Solar lights have a huge range and include outdoor solar flood lights, dock lights, brinkmannsolar lights and even solar powered night lights. Today in fact Solar Lights are the rage with hundreds of products and different varieties being marketed. Solar lighting is now employed inside the home and even outside it including the roof and the garden! Even commercial premises are today being fitted with solar a lighting system which is paying rich dividends not only in saving cost but also helping reduce the carbon footprint which is greatly enhanced by conventional power usage.

Solar Energy History-Present-Future



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he genesis of solar energy history goes way back to the year 1838 to an observer by the name of Edmund Becquerel who at that time had published findings on the capability of materials to change light into raw energy. Although it was fascinating at that time no one took the opportunity to pursue it then.

As time would have it, the first patent design for a motor running on solar energy was done by a man called Augustin Mouchot in 1860. Fortunately for him the monarch of France funded his project which gave him the ability to create a device that would turn solar energy into the first steam engine. This however was the beginning of things to come, for August went on to illustrate that the sun's rays can be used to make ice by connecting the steam engine to a refrigerator device. A medal was awarded to him for his discovery.

Notwithstanding, his one of a kind research was shortly becoming a financial burden for the French, who in turn seek out a cheaper arrangement with the English for a supply of coal. August worked assiduously, trying to come up with alternatives but there was no interest in such a commodity any longer for the French monarch. So the funding of the researches came to a halt!

Experimentation

The first book which was written on solar energy was by a man called William Adams in 1876. The book was titled "A Substitute for Fuel in Tropical Countries." William had conducted a number of experiments along with his student Richard Day using mirrors; they were able to create a 2.5 horsepower steam engine which was much bigger than Augustin's horsepower steam engine, whose power was just 0.5. Their design became known as the (Power Tower Concept) and is still a part of today's world.In 1883, Charles Fritz was able to convert the sun's ray into electricity.

The solar cell converted at 2% max which became a great turning point in solar energy history.

It was a Frenchman (Charles Teller) at the time of 1885 that experimented with a non-concentrating and non-reflecting solar motor. Charles became the first person to install a solar energy system onto his roof for heating water for

domestic use; no one was able to achieve it before 1885. But Charles himself had a passion for refrigeration. As a matter of fact, he was deemed the father of the particular trade. Nevertheless, his desire to pursue his dreams into refrigeration caused a lack of interest towards solar energy researches and experiments, and of course the whole solar energy thing became dormant. Who knows what our present state would have been if he had only persevered.

The first Solar Company was by John Erickson, a Swedish inventor and researcher, who also had a part to play in the development of the solar energy, created a solar power steam engine that carried similar features as Augustin's design between the years of 1868-1888. John was the one that coined these words: - "A couple of thousand years dropped in the ocean of time will completely exhaust the coal fields of Europe, unless, in the meantime, the heat of the sun is employed."

Solar Energy -Industrialization

By the time of the birthing and the dawn of the twentieth century, solar energy was no longer operated as one man experimentation, but it rather became industrialized. In 1892 Aubrey Eneas formed the very first Solar Energy Company -"The Solar Motor Co." all the way through to 1905. The company kicked off with its mission by selling the world's first consumer solar energy system to one Dr. A. J. Chandler for an astonishing figure of $2,160.00. The unit did not last a week before disaster struck and it was destroyed in a windstorm. The second unit that was sold also got destroyed in a hailstorm shortly after. These streams of events led to the company's demise causing their doors to close forever.

Largest Solar Energy System Henry Willsie also took a shot at it by building two huge solar plants in the California state. Henry manages to be the first to operate power at night after storing it in the day. His company was successful in getting the logistics up and running but, it did not succeed in the area of marketing its units to the public and eventually had to close its doors permanently in 1904.

Sun Power Co. constructed the biggest and most cost-effective solar energy system covering 10,000 square feet. Though it was able to produce an enormous amount of steam it was unable to provide sufficient pressure. The merging of Frank Sherman and E.P. Haynes in 1906 gave birth to Sun Power Co ltd. They went on to build an irrigation plant on the outskirt of Cairo that suffered an

unfortunate end through the Great War in 1914.

Solar Power - Advancements

The 1950s - the 1960s we saw a couple of advancement towards the development of the solar energy starting with the boys at Bell Laboratories, who accidentally discovered the use of silicon that evidently led them to put together a solar panel, that gave a rate of 6%. The commercial solar cell which was the first of its kind was made available to the public in 1956 at a cost of $300 per wattage. Space programs also got involved using solar technologies. The first satellite to used solar energy to generate electricity was in 1958.

Energy Crisis We recalls the energy crisis in 1970 (OPEC oil embargo). It was not until then, that those who were in authority realized how dependable our existence was on non-renewable resources, such as coal, oil and gas that they relentlessly seek alternative forms of energy. The price of solar cells had drop to an all-time low of $20.00 per wattage.

Solar Energy Failures and Lasting Potentials

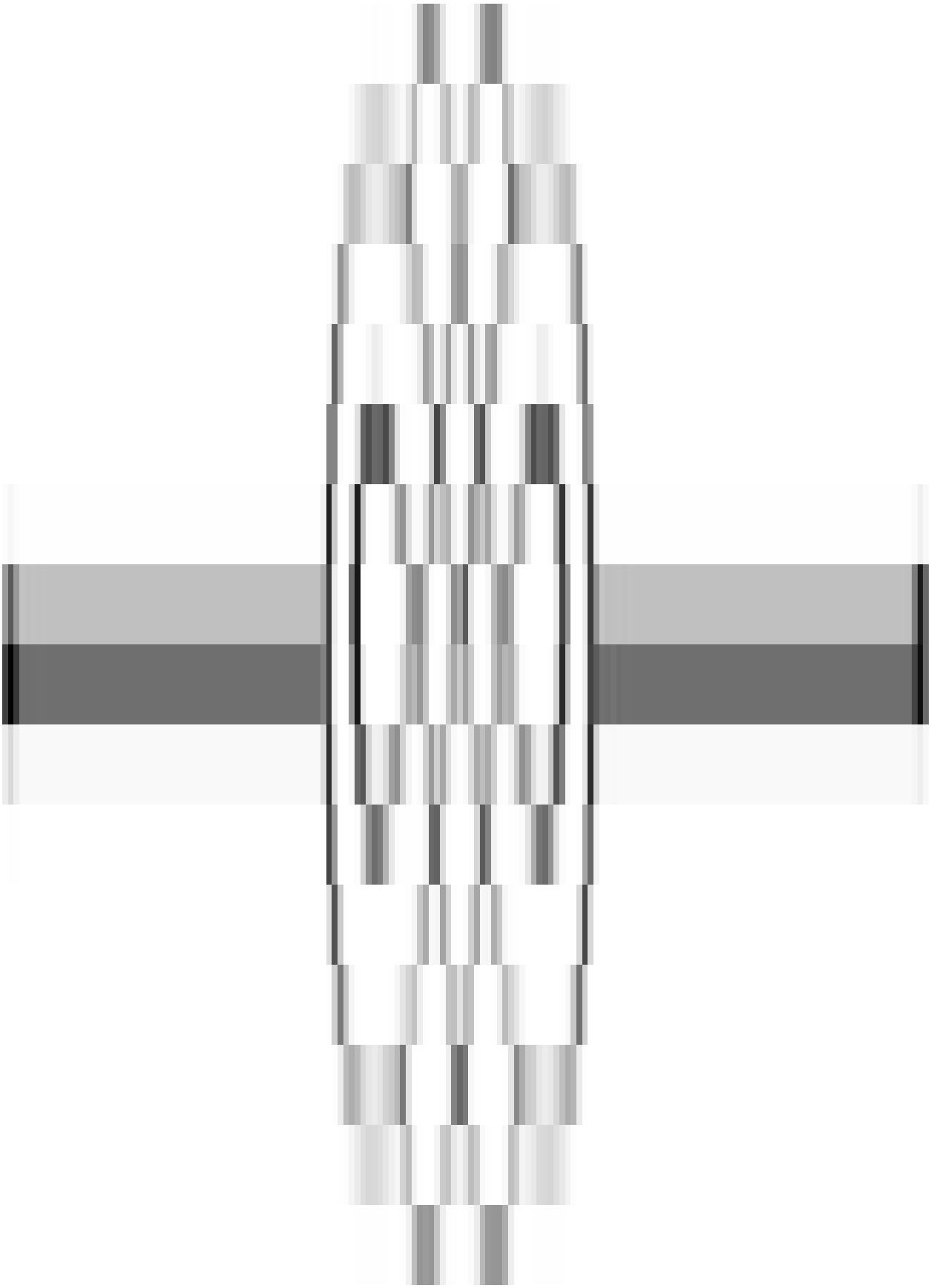
The company that were producing 95% of the world's largest amount of solar electricity in the 1980s to 1991, was situated in Los Angele and had to close their doors permanently. This closure was due to the withdrawal of their investors who became frustrated and withdrew from the project because the declining of the non- renewable fossil fuels was irreversible, while governmental incentives also, were not promising. These were the words of the chairman of the board of directors: "The failure of the world's largest solar electric company was not due to technological or business judgment failures but rather to failures of government regulatory bodies to recognize the economic and environmental benefits of solar thermal generating plants."

The Earth's Future It was calculated that solar energy that is absorbed by the Earth's atmosphere through the ocean and land masses is approx. 3,850,000 (EJ) per year. In the year 2002 generated more energy in one hour than the world used in one year. There were approx. 3,000 EJ per year in biomass which photosynthesis captures.

Having the revelation of solar energy history, has informed us as to how we may go forward as a generation seeking a greener earth. The quantum of solar energy that hits the earth's surface is so vast that in one year it is about twice the amount

that will ever be absorb from all of the earth's non-renewable resources of coal, oil, natural gas and uranium all together.

Interesting Solar Energy Facts



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t's truly important for all people to learn a few standard solar energy facts to ensure that they can truly appreciate the entire potential and various fields of applications for this plentiful energy supply. Solar power is definitely the most ecologically friendly and most desirable of all alternative energy resources. Presently yearly worldwide energy usage is around approximately 550 exajoules (523 Quadrillion BTUs) per year. Every year the earth's atmosphere, oceans, and land masses receive approximately 3,850,000 exajoules of energy from the sun's rays. Once this is taken into account anyone should be able to start to grasp precisely why the solar energy industry is eagerly working to improve processes to harness solar power. The Desertec foundation theorizes that covering just 1% of desert environments around the world with solar PV panels could very well power up the entire planet.

Listed below is a brief background of historical solar energy facts:

The use of solar power by humankind is not new; countless ancient civilizations have utilized it in one form or another.

Leonardo da Vinci was actually among the 1st modern thinkers to conceive industrial usage of solar energy to heat up water.

The French scientist Edmond Becquerel observed the photovoltaic effect while experimenting with electrolytic cells in 1839.

In 1894, Clarence Kemp, an inventor filed and obtained a patent for the design of the world's 1st solar-powered water heater.

The world's 1st solar thermal power station was built by Frank Shuman in 1913.The station that was situated in Egypt utilized parabolic trough-shaped mirrors to be able to heat water in boilers to drive a 65 horsepower engine. The engine pumped nearly 6,000 gallons of water each minute from the Nile River to adjacent crops.The first modern photovoltaic (PV) solar cell was designed at Bell Laboratories in the year 1954.

The following are a number of more technical solar energy facts:

Solar devices are one of two types, active and passive. Active solar power devices use photovoltaic cells and passive devices are thermal based.

Solar photovoltaic systems are presently the most common energy transformation devices, which make use of solar cells in modules to make light directly into electrical energy.

Thermal based solar power systems sometimes use molten salts to hold solar energy at very high temperature because of their high specific heat energy qualities.

The International Energy Agency (IEA) has forecasted that by the year 2060 around 33% of the world's power demands are going to be created by using solar power technologies like photovoltaic panels, water heaters and solar electrical power stations.

The Nokia 1610 plus was actually the first commercial solar- powered cell phone introduced by the Finnish manufacturer in 1997.

The following is a list of important solar installations throughout the

globe:

Solar Energy Generating Systems (SEGS) is a collection of 9 power facilities situated within the Mojave Desert in California. SEGS maintains the classification of being the world's biggest solar power station having a bundled production capacity of approximately 354 megawatts.

In most cases big solar power facilities make use of photovoltaic cells for electric power generation, simply because they are currently muchmore cost-effective when utilized on a large scale. The planet's biggest

photovoltaic power plant is found in Sarnia, Canada, which provides a production capacity of 97 megawatts.

The Andasol plant in Spain having an electrical power output of 250 megawatts is the second biggest solar electrical power plant in the world.

The world's biggest Scheffler reflector system located in Rajasthan, India is able to cook up to 35,000 meals a day.

The world's biggest thin-film photovoltaic power system "Waldpolenz Solar Park" is found in Germany.

Topaz Solar Farm, a 550-megawatt solar photovoltaic power facility that is presently being built, is going to be among the largest facilities after completion.

Solar energy facts about solar-powered flight:

The Astro Flight - Sunrise, an unmanned air vehicle developed in 1975 was the 1st solar-powered aircraft.

The Gossamer Penguin, created in 1980, was the 1st plane only fueled by photovoltaic cells that was capable of carrying a person.

Helios, an unmanned air vehicle, operated in part by solar PV panels maintains the record for achieving the highest altitude of 96,863 ft, as well as a world record for sustained horizontal flight by a winged aircraft.

Vanguard 1, an American satellite launched in 1958 was the world's 1st solar-powered satellite. Amazingly the satellite still orbits and it celebrated its 50th birthday in 2008.

IKAROS (Interplanetary Kite-craft Accelerated by Radiation Of the Sun) is the 1st spacecraft to successfully demonstrate solar-sailtechnology in space. The Japanese deployed the spacecraft in 2010 aboard an H-IIA rocket.

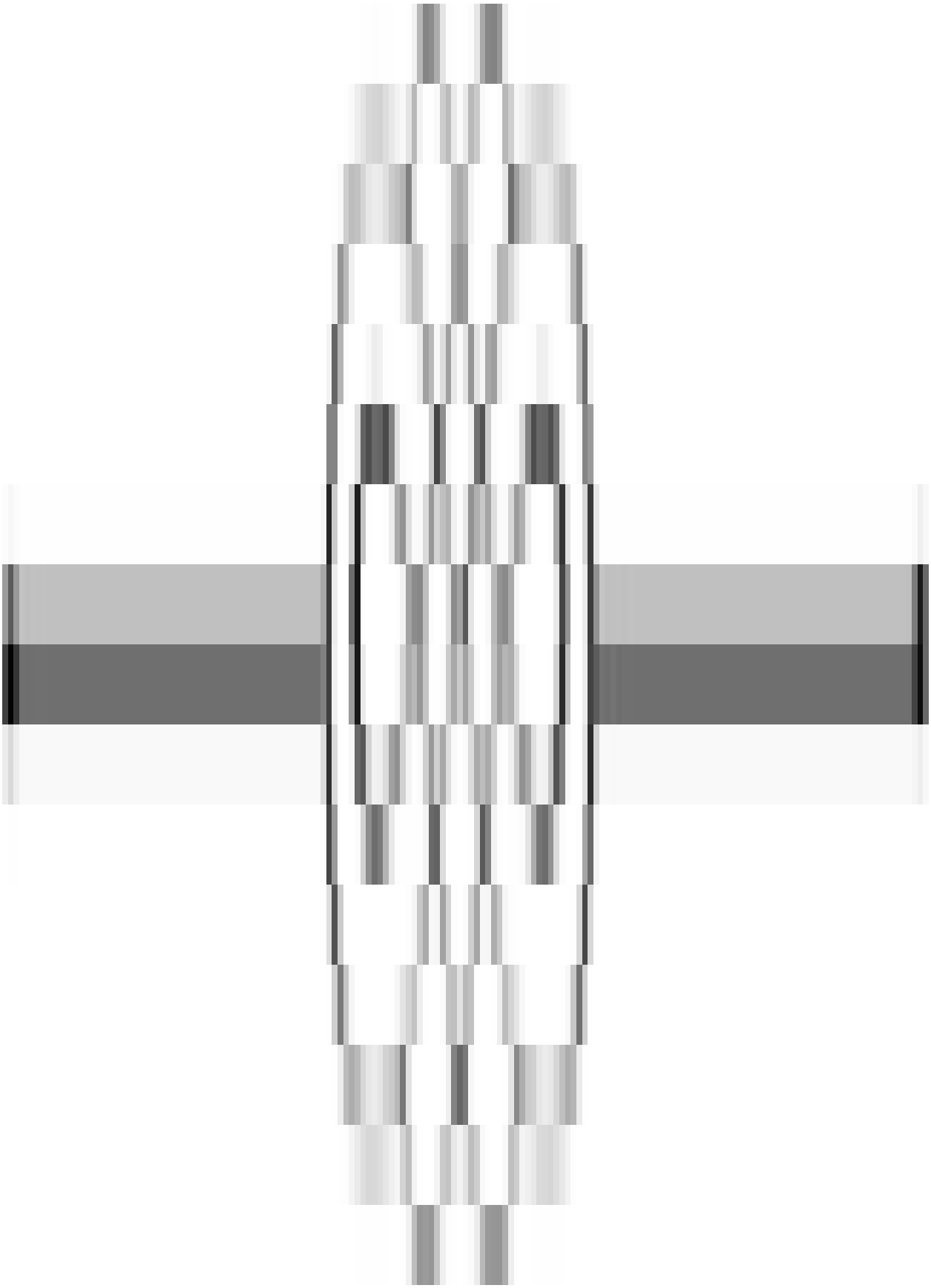
Because of the prolonged volatility of oil prices along with the fact that the average individual is actually more aware of their natural environment, there has actually been a greater push for the development of renewable energy. This elevated drive for non-fossil fuel electrical power will definitely aid to lower the cost of solar panels as well as various other renewable energy solutions. A need for corporations to appear environmentally aware has brought about significant ad efforts from energy giants including BP and General Electric, showcasing their financial investments in environmentally friendly sources of power. These energy titans are not the only ones getting into sustainable energy, the rising cost for natural gas, coal, and oil already have forced energy costs higher and made "green" energy sources which include solar power, a possible economic choice for many people. Demand pertaining to solar energy has increased at 30% yearly over the previous 15 years. In 2009, photovoltaic solar installations expanded by 20%, versus 2008, with above 7.3GW of photovoltaic solar panel installations across the globe. Earnings in 2009 from the photovoltaic solar industry also grew, getting to $38.5 billion.

The attraction to solar power is obvious. It is a virtually infinite energy source. It's free of greenhouse gas emissions, typically believed to lead to planetary climatic change. In industrialized countries that use a huge amount of air conditioning units, it makes more electricity exactly at the time you need to have it—during circumstances of highest electrical power usage. Once put in, solar power systems may very well operate for 30 years or more requiring a minimal amount of routine maintenance or management. At the same time, solar does come with some disadvantages, particularly the poor efficiency of photovoltaic solar modules, which is further reduced by the need to transform DC from the solar power cells into AC current. In addition, solar power relies on the weather conditions and also time of day, requiring battery storage or alternate systems to supplement during periods of weak power generation. Overall the beneficial

solar energy facts considerablyoutweigh the unfavorable. These positive facts assist to exhibit this very

important change in the direction of more predominant use of solar power, which definitely will provide a prosperous and healthier planet for many generations to come.

What is solar power?



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lot of financial news is being made about solar power and solar power generation. What is solar power, and how does it affect you?

First, all energy we use in the world, other than nuclear, is ultimately derived from solar power. Fossil fuels are solar power that's been converted to carbon rich compounds over the course of millennia. However, solar power as it's currently described, whether as solar power for the home, or solar power as alternative electrical generation capacity, isn't using fossil fuels, it's using the energy of the Sun directly.

Solar energy (the solar constant at the surface of the Earth) is about 164 watts per square meter. Or, put another way, over the average surface area of the earth, each square yard of your front yard receives enough energy to run two and three quarters of a 60 watt incandescent bulb (or about 12 compact fluorescent bulbs or over 20 LED bulbs).

It seems downright wasteful to not harness that energy that's coming down from space for free. There are two ways that solar power works: Solar thermal systems (where the energy of the sun is used to heat up a working fluid, which has its energy released later) and photovoltaic systems (which work from the photo-electric effect. Believe it or not, Albert Einstein's Nobel Prize comes from the photo-electric effect, not the Theory of Relativity).

Photovoltaic power systems generate electricity, at about 16% efficiency for silicon wafer based cells, and up to 40% efficiency for rare earth Gallium Arsenide cells. Most commercial photovoltaic systems use the lower efficiency silicon wafer technology, because the amount of time it would take the higher efficiency cells to pay back their initial construction and emplacement costs is prohibitive when compared to coal fired plants.

For solar power in the home, most systems are solar thermal. You run water tanks through a thick south facing wall that's painted a dark color;the water is heated by the solar energy that's absorbed, and then circulated into a holding tank in the basement. In some plans, this hot water is used for bathing and domestic uses. More innovative schemes run the hot water through radiators, or pipes in the floor, where it warms the house during the night. Photovoltaic

generators can take the edge off of an electrical bill, but because of the expense and the low efficiency, generally aren't enough to make a house energy independent throughout the year.

If you're seriously considering how solar power works and what it can do for you, talk to your utility company. Most utility companies, knowing what solar power is, will give you credits to install solar systems in your home, and will give you credit for electricity you generate and sell back to the grid.

As to the question What Is Solar Power? It's something we've been using, and will continue to use for millennia to come.

The Solar Power Energy Revolution Is Upon Us?

What is the solar revolution? I hear people talk about it every day, but what is it? Is it even real? People rail against reliance on coal, fractal mining for natural gas, pumping oil to power our cars, the list goes on... It wasn't but a year ago that the "Green Revolution" was upon us. Notice the "Revolution" term being thrown about. Makes it more exciting. How about the "Solar Revolution"? Is it upon us?

To put it plainly, yes the solar energy revolution is upon us, but probably not in the way you were expecting. The often touted solar revolution involves solar panels on every house and massive solar farms sprawling across the vast deserts of the world. I hate to be the bearer of bad new, as much as everyone would like, this will never be a reality.

The first issue is there are just not enough high sun intensity climates to make this a reality. In order to make solar power feasible, the location needs a majority of intense cloudless sunlight per day throughout theyear. Most places get less than 8 hour of direct sunlight a day at any given time during the year. Without this direct sunlight the solar panel economies just don't add up, which is key for adoption.

The second issue is not related to location but is something every location on Earth experiences, nighttime. Yes, half of our time is spent in the dark. While you might not notice, I guarantee your solar panels will notice.

Until someone invents a solar panel that works in the dark, the best efficiency achievable on a solar power system is fifty percent, which does not even include solar panel efficiencies in the high teens. This is like buying a car which only

runs half the time you want it to. A house that you can only live in half the time.

Our society is not structured to only use power during the daytime. We need electricity at night to power our lights, run our heaters and air conditioners, open the garage door, the list goes on... How do we store power for night time once the solar revolution is in full swing? No idea, this is not an easy issue to solve.

How about massive battery packs? Nope, these are prohibitively expensive, the power density is low compared to power requirements and storage efficiently results in additional power loss. The cons simply out way the benefits.

Okay, how about a giant lake, we pump water into it during the day using excess electricity and run turbines at night to generate electricity? Now were talking! But wait, electric pumps are about 50% efficient at pumping water, and turbines are 90% efficient at turning that potential energy into power. That leaves us with as system 45% efficient.

Let's do that math on this nighttime power storage. Solar cells 17% efficient. Solar systems 50% efficient due to nighttime (using a generous 12 hours of usable sunlight a day). Our giant lake storage system 45% efficient. This gives us an overall power efficiency of, waitfor it, a whopping 3.8%. For every 100 watt hour of light put in, a mere 3.8 watt hours come out. You go from being able to power a standard (non California) incandescent light bulb, to being able to power a small LED key light.

Don't get me wrong. We will implement massive solar systems and panels on a few neighborhood roofs, but nothing nearing power requirements. These systems will supplement the power grid, not drive the power grid.

But wait, I thought the solar revolution is upon us? Well it is, but not in the way you might expect. The future of solar power are small scale systems where the initial cost of implementation is tiny in comparison to connecting the same system to the power grid. These are most often rural and isolated areas. Areas where the cost to install a power cable can be in the tens of thousands of dollars, but the cost of a complete small scale solar system is in the low thousands.

Solar panels costs have been decreasing rapidly, brushless motor technology has advanced with the help of efficient low cost motor controllers. These technologies cost thousands of dollars merely a decade ago, now can be acquired for much less. Rural locations can now take advantage of these technology

advances to install small scale isolated solar power systems, saving thousands of dollars a year.

For the last century these rural environments have taken advantage of other technologies for rural locations such as wind and gas generators. Just think of the windmills scattered across America pumping water in windy weather for cattle drink and the people bath in. The future for these locations is small scale solar.

Sunlight is a power source that supplies electrically for about 8 hours a day in most climates. While for our massive power grid, this was a negative, for our rural location this is a positive. 8 hours of power for most systems will results in great performance. Let's look at a solar power well pump system.

A solar powered water pump which pumps only 2 gallons of water a minute, which can be accomplished by a very small pump, will produce almost a thousand of gallons of water a day. This is enough for the average family or at least a hundred head of cattle. And the cost? The cost of one of these small scale systems is a few thousand bucks, at least an order of magnitude less than trying to tie into the power grid.

Take a small step up to a mid-size system which produces about 5 gallons per minute and the system will produce 2400 gallons per day. This will support almost 240 head of cattle, or supply a family with all the water they could possibly use. How much does this water cost on an ongoing basis? Nothing, zero, it is completely free.

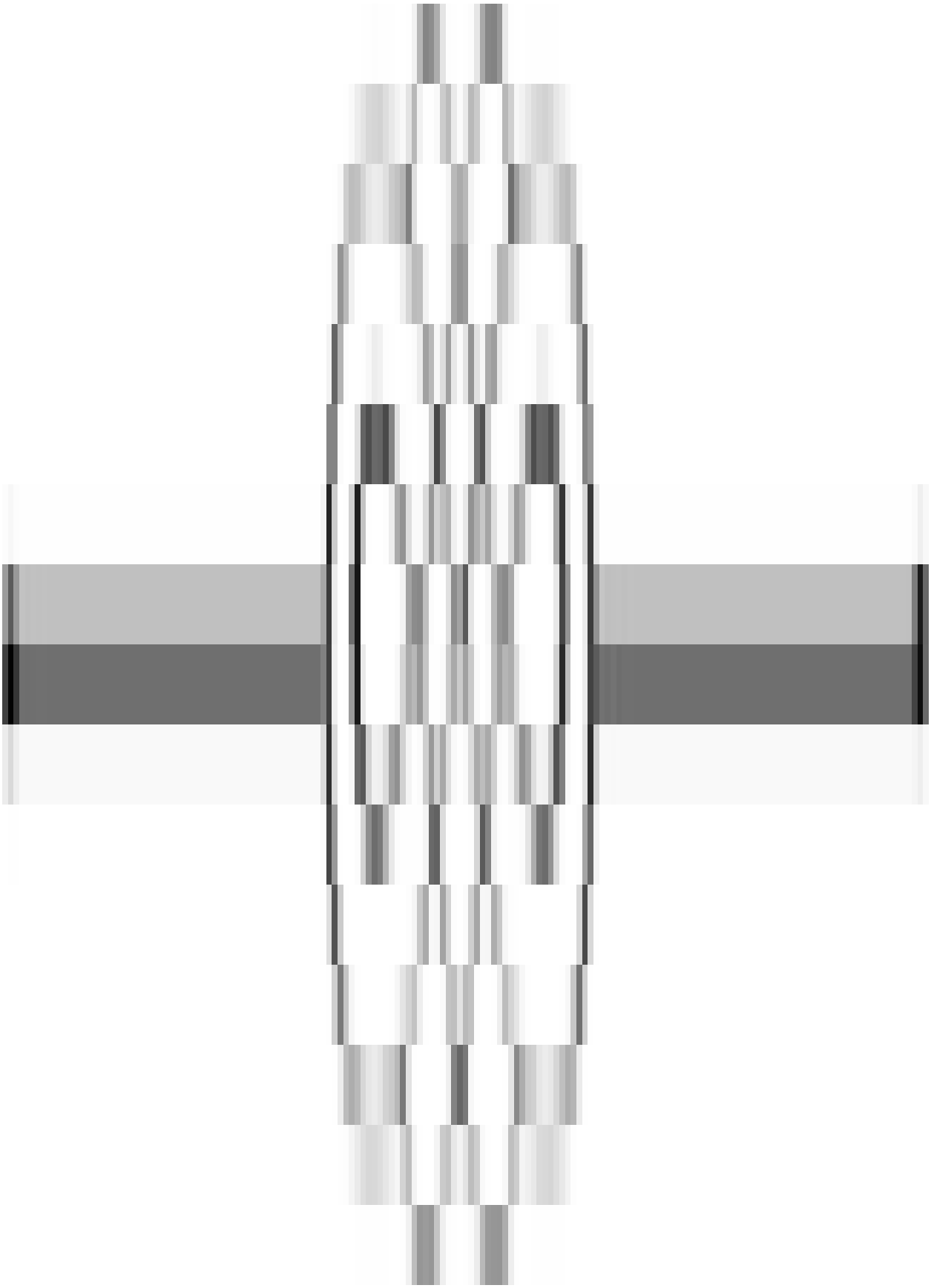
This is the future, this is the "Solar Revolution". Technology advances are enabling these small scale systems to perform tasks only limited by the imagination. Tasks not possible only a decade ago, are commonly being performed today. Pumping well water in a isolated location? No problem, just install a solar power well pump in a single weekend. Need water pumped from a pond into a storage tank? Not an issue, solar power surface pumps are readily available.

Yes, technology has enabled the "Solar Revolution", but not in the way most people think. Small scale systems have been and will continue to show up all over the place at in increased rate. These are often small, low key systems which require a keen eye to spot. Keep an eye out for them. You will be surprised on

how many you start noticing.

Rural Power Systems is the premier supplier of solar power well pump systems. Become part of the solar energy revolution today! Visit our product website to find out more and have a complete system delivered to your door in only a matter of days.

The Advantages Of Solar Energy



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here is no doubt that reduced pollution is one of the greatest advantages of using solar panels. You do not need to be a fervent ecologist to realize the severity of the environmental problems that affect out world today. The fuel crisis, the pollution, climate changes, all these issues affect us one way or the other. There is no point in denying either their importance, or our responsibility in triggering and maintaining them.

But the advantages do not limit to environmental effects, although they are incredibly relevant. There are many other benefits of using solar energy that refer to costs, maintenance or energy independence. Whether you are interested in this energy source because of a profound environmental concern, or you are more attracted to the idea of low- cost energy and money saving, going solar can prove to be a remarkably smart idea.

Below you will find a comprehensive list containing the most relevant reasons why using solar energy is beneficial, so you can have a more complex image of the reason that makes it a viable and attractive alternative to fossil fuel energy. With a wider perspective than before, you might be able to make a wiser and more informed decision.

1.Protecting the environment

We start the list of advantages with the most prominent one, the environmental benefit. There is no secret in the fact that overexploitation of the Earth's non-renewable resources will eventually lead to their paucity, to higher costs and extreme pollution. We cannot rely forever on fossil fuels to create energy, because this resource will eventually disappear. On top of that, continuing to burn fossil fuels will lead to even more pollution than today, and this will affect the climate and people's health. Turning to a clean, safe, healthy and renewable source or energy becomes imperative.

a) Solar energy is renewable

One of the first advantages is the fact that it is a renewable source of energy that we can count on for billions of years from now. The sun will keep shining. Using its power will not diminish it, like in the case of fossil fuels. When the Earth will

not be able to count on fossil fuels for energy, the Sun will still provide enough power for the whole world.

b) Solar energy is clean

Unlike fossil fuels, it is not polluting. No gas emissions, no unpleasant smells, no smoke - it is totally clean. Considering the growing problem of the greenhouse effect and the climate changes it triggers, finding cleaner sources of energy is the best way to protect the environment and reduce the negative effects fossil fuel energy has on the atmosphere. Choosing solar energy over non-renewable energy means more than simply protecting the environment. It means protecting ourselves and the generations to come. Fighting for a healthy, safe world implies stopping climate changes, global warming and air pollution.

2.Low costs

Certainly, solar energy is environmentally friendly. But, as we already mentioned, the advantages do not end there. Probably the most appealing advantage of all is the low cost. Several factors contribute to this conclusion:

a) Solar energy is free

Once you install a solar system, you can enjoy free energy as long as the Sun is up in the sky. It's for everybody, you don't have to pay for it. You can just enjoy its benefits. While fossil fuel energy is brought to you by different energy suppliers you have to pay serious money to, the sun's energy is there for free.Yes, the cost of installing such technologies can prove to be a substantial investment, but in time, you will save a lot of money on energy. If you think long-term, the benefits are considerable.

Fossil fuel energy is expensive, and you can see that on your monthly bills. It seems like every year energy prices increase and you have to pay more on the bills. It is obviously not convenient to continue like this. The cost efficiency balance of fossil fuel energy starts to lose its equilibrium in favor of the costs. Until when will you be able to continue paying expensive bills?

Looking at it this way, abandoning fossil fuel energy in favor of a low- cost type of energy is common sense. Relying on solar energy, which is free, will lower electricity bills to an affordable level. In case you choose to produce all the energy your house needs using the power of the sun, you will save serious money on bills.

b) Governmental incentives

Another one of the economic benefits of solar energy is provided by the government. You can save money by using various financial incentives. Tax incentives, various credits and rebates encourage people to go green. Learn about the incentives available in your state, and the costs of installing solar panel systems will substantially lower.

c) Low maintenance costs

The maintenance of a solar system is easy and cheap. After the initial investment in installing the solar system, the chances of spending money on it will be quite limited.

d) Fast recuperation of the initial investment

After you install the solar energy system, you will recuperate your investment in a few years, and you will be able to enjoy its benefits sooner than you thought. When it comes to the long-term advantagesof solar power, cost efficiency clearly differentiates this energy source from the rest.

e) e) Net metering

In case your system produces more energy than you need, you can sell it to your utility company. You can not only save money, but also make money with the help of your solar panels.

f) DIY solutions

You can reduce the initial investment with the help of a "Do It Yourself" kit. You can either learn to build solar panels by yourself, or just learn to install the solar panel. Enjoy the advantages of solar energy while learning something new and exciting.

1.Energy independence

a) Solar energy is self-sufficient

The perspective of energy independence is one of the most appealing reasons to choose this source of energy. Depending on another entity is always frustrating for a human being who likes to have full control over his life. Many times we have to endure power black-outs, accept increasing prices, or wait for somebody from the utility company to come to fix a problem of the energy system.

Have you ever though of the possibility of becoming completely energy independent? Having a house that provides all the energy it needs by itself spares you the frustration of depending on various energy suppliers. Once your solar energy system is able to produce all the necessary energy, your house will become self-sufficient, your bills will lower, and you will have the certainty of a constantly available source of energy. Solar energy is available anywhere

No matter how remote the area where you live is, if the Sun shines, your house will enjoy solar energy. Among the many other advantages, the fact that it can provide energy wherever it is needed is an enormous benefit. It will be able to bring light to locations where power lines cannot be installed.

A solar energy system can be easily installed in any location. Therefore, for people who would like to build vacation houses in the mountains or other remote areas, it provides a viable solution.

1.Flexibility

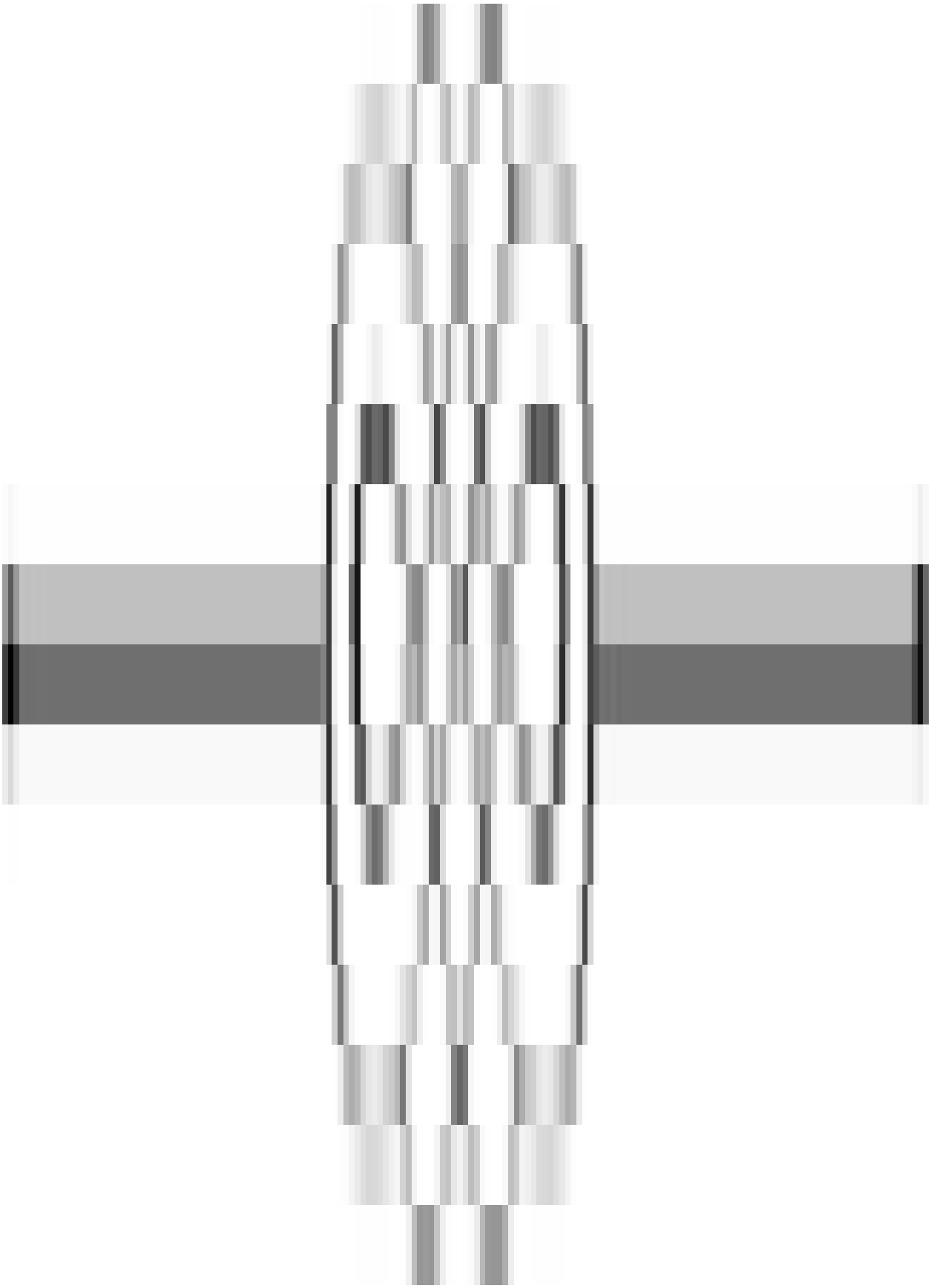
Probably the most appealing benefits are its low costs and its environmentally friendly character. The economic benefits solar energy brings are undeniable. So is the fact that it helps you contribute to protecting the environment and becoming energy independent.

Related to the idea of independence, there are other advantages that are worth mentioning. For example, solar energy systems are very flexible and adaptable to basically any situation. You can choose the solar technology that suits your needs best, install it where it fits, and invest in it depending on your budget. You can produce only a part of the energy you consume, or you can produce all the energy your house needs.

Installing the system can be done at your own pace. If you cannot buy all the solar panels at once, you can start with smaller investments, and when you have the money, you can install some more panels. If you have a small house, you can

install a small system, and so on. Solar energy is flexible, comfortable and convenient.

The Disadvantages Of Solar Energy



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espite the fact that solar energy has been used for many years, the technology is still considered to be generally new. As people focus too much on advantages, therefore, the disadvantages of solar energy are often overlooked, and many fall pray to difficulties, having to invest a lot of money on a solar array that might not even work properly for one reason or another.

If you are truly serious about using solar energy to provide your home with electricity, therefore, you will find that a thorough understanding of its disadvantages is crucial. That way, if you do your research properly, and weigh every point carefully, you will find that you can make the best decisions, and benefit from the numerous positive aspects that solar power comes with.

The Contrast between Solar and Other Green Energy Sources Solar power has been successfully used as an energy source for more than 50 years. Its advantages are well-known to those who are even remotely interested in the development of alternate power sources; however, the truth is that, when compared with some other "green" methods of power production, solar power is not considered to be in first place in terms of efficiency or consistency.

Its main rivals are: geothermal energy, wind power and hydroelectricity. Wind turbines are only starting to become more popular, and new designs are being developed all the time, so it can be considered as a viable solution for the future. When comparing it with solar energy, wind power is generally seen as being at a similar level. It is more expensive; however, it does have one advantage over solar energy, since solar energy doesn't work at night, for example. On the other hand, wind power can only be harvested in specific locations where the weather conditions are appropriate.This same problem comes up when comparing solar power to the other two energy sources too. Hydroelectricity is somewhat less clean, however, despite the fact that it does not produce direct waste. Geothermal power is extremely beneficial for the environment on the other hand, being comparable to solar energy in this regard; however, solar power is less efficient.

Nevertheless, geothermal energy is still being researched, as there are numerous problems with it, because the technology is not yet advanced enough to allow regular people to benefit from it directly, by building their own power sources. In

this regard, solar panels really shine, as, despite the cost, they can be much easier to manufacture, and maintenance issues are generally rare.

Manufacturing and Buying Costs

One of the greatest disadvantage of solar panels is their cost. Both in terms of manufacturing and buying them ready-made, the costs can be quite discouraging. Of course, the investment mostly depends on the size of the household, as well as on the type of solar energy source you want to use.

A 1 kwh photovoltaic system can range somewhere between $8,000 and

$10,000. When we think of the fact that a family living in a 3-bedroom home requires a system that can provide about 1 to 3 kw, the cost of a viable and generally stable solar panel system can double, or even triple.

Solar hot water systems are usually much more accessible, however, requiring an investment of roughly around $2000 to $4000. This is good news for those who would prefer to separate their energy sources, and perhaps use multiple systems for better efficiency.

Even better, the price for solar panel arrays has decreased considerably in the past couple of decades. Before that, the costs were more than 5 times less affordable, and the quality was less than acceptable for such an investment.

As a result of this progress, many scientists are quite confident that, soon, the price and efficiency rating of solar energy will be good enough to allow the replacement of the conventional power grid, and provide people with a useful, clean and powerful alternative to many of the energy sources known today.

Also, if you are up for it, you can buy only the parts, and make your own system based on solar panels. Depending on your needs, you can make it much more economical, at only a fraction of the price that a regular solar panel would cost. While this can be somewhat difficult, with a little work and effort it can be done.

DIY Difficulties

Of course, if you choose to make your own solar panel arrays, you will likely run into a lot of difficulties, especially if you are not used to building things from scratch. Also, in order to lower the costs, you might have to use lower quality

materials that might not last on a long term basis.

Manufacturers often emphasize the difference in quality and reliability between a solar panel they make and one that an inexperienced worker may put together. This is, of course, a marketing strategy, as well, and there is no reason why you can't build a solid, viable solar panel. The effort may be too much for some, but if you like doing some good old fashioned work, the odds will be favorable.

Location Issues

Another difficulty, regardless of the quality of the solar array you use, is the difference between various locations. The main disadvantage in this regard has to do with places where sunlight is not consistently available.For example, in places closer to the poles, during the winter season, thesun rarely even makes its appearance for more than a few hours. This can make it very difficult to use solar panels for consistent energy production. Also, in areas where the weather is particularly overcast, rainy or foggy, solar panels do provide some energy, but the efficiency is significantly reduced, and you may need more than the estimated amount in order to successfully provide electricity for your entire household.

Of course, if you live in an area where the rain doesn't fall all that often, and there is an abundance of sunshine almost every day, a solar panel array may well be the best option for you. Depending on other factors, such as the area you have available for it, and the size of the panels themselves, you may be able to achieve excellent results in this case.

Pollution and Long Term Inconsistency

Solar energy may be clean from a general point of view, however, it is still vulnerable to pollution, as this factor can diminish the efficiency of a solar panel. While most of the newer designs don't have a problem with this, older models can be quite easily affected, as the technology was not so advanced in the past, and the materials used were significantly less reliable.

While the solar panels themselves may not pose a threat to the environment, if you are using an off grid system, the chances are high that you need to use lead acid batteries. Their lifespan is much less favorable than that of a solar panel (roughly 5 years for the battery, in contrast with 20 to 30 for the panels).

As a result, not only are you faced with additional periodic costs, but the lead and sulfuric acid contained in the batteries can prove to be quite detrimental for the environment. Improperly managed, their use can lead to considerable problems.There are ways around this, of course, as more than 90 % of the

materials present in lead batteries can be recovered in the recycling process. What you need to do, therefore, is to ensure that you extend the lifespan of the batteries for as long as possible, and take them to a recycling facility afterwards.

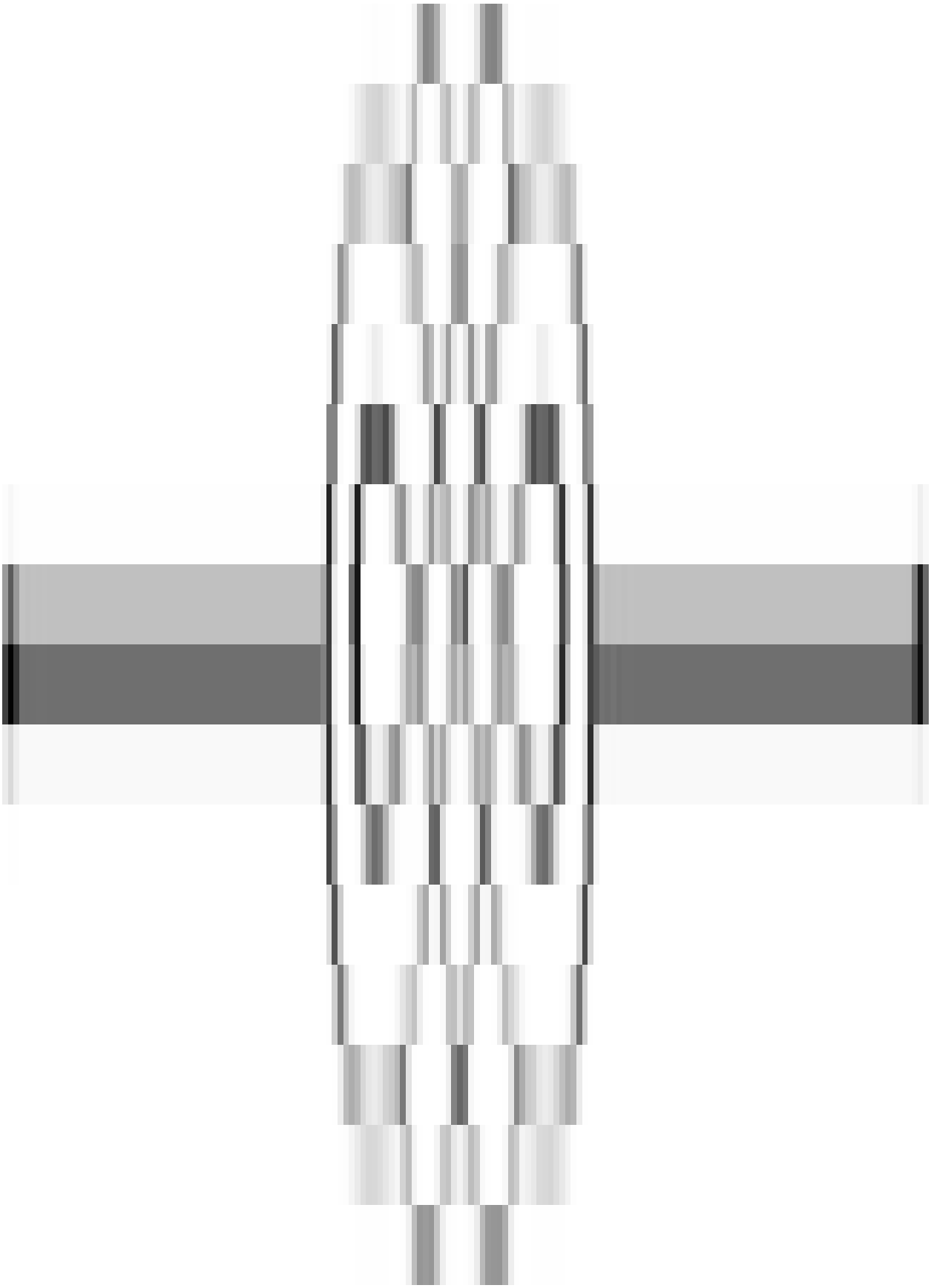
Summary

Generally, it can be said that there are a lot of disadvantages when it comes to using solar energy as an efficient power source for your home. As we have seen, however, all of these drawbacks depend on the ability of people to determine exactly what they need, and compare the results to their abilities. With a correct assessment of the situation, you may actually be able to come up with a viable solution.

There is no reason why you cannot benefit from the positive aspects of this energy source, however, it has to be noted that the technology is still in its early days, and if you want to obtain a good cost/quality ratio, you will have to do a lot of research, and be aware of all the potential issues.

However, experts estimate that, in a few years, solar energy will gradually become much cheaper, more accessible, as well as more efficient. Keep an eye out for technological advancements, therefore, if you are a solar energy enthusiast, as you never know when a good opportunity may "shine" upon you in just the right way.

Solar Energy Facts



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olar energy is generally one of the most ecologically sound and desirable sources of power these days. Let's get going with the obvious. Solar power has been in existence since the dawn of time. It has been used by microbial, plant, and animal life as a primary energy supply. Plants, using photosynthesis, create nearly all of the food on the earth and are at the base of the food chain. Furthermore the fossil fuels we rely on so heavily nowadays are created from plants and animals that lived a long time ago. Only in recent times have human beings been able to capture solar energy so that it may be utilized any time of day and night, and in any weather, stored and transferred.

Annually, the earth's atmosphere absorbs 3.85 million exajoules of energy from our sun. This most likely doesn't mean much to you, however by comparison, the entire use of electric energy by all people today around the world is just 56.7 exajoules per year. This indicates that within a few hours, the earth receives more energy from the sun than people expend during an entire year! Solar energy is a remarkably clean supply of energy simply because, in contrast to fossil fuels, making use of this kind of energy doesn't discharge carbon dioxide or other types of harmful toxins into the environment. Furthermore solar energy is collected by almost every single form of life. You've almost certainly never seen a reptile collect wood to start a fire, but you most likely have seen one lying on a rock to absorb solar energy. Solar power is probably the most environmentally sound energy option attainable right now.

Perhaps you may be wondering what exactly solar power is capable of doing for our environment. Every year, humans consume 467 exajoules of energy by utilizing several principal power sources: burning coal, gasoline, and oil, along with 'green' sources like wind, solar, and hydro energy. However, if we could capture just 10% of the sun's energy, we would have the capacity to replace all of the fossil fuel sources and have enough space for growth. Without any doubt solar energy facts like this make it clear how much better solar power is for the environment and how great the potential is for solar energy development.

Considering that you've seen some of the most remarkable solar energy facts and now have an understanding regarding what solar energy can possibly do for the environment, you'd probably want to know just exactly what solar energy is. To put it simply, solar energy is the heat and light energy emitted from the sun. The

sun constantly generates vast quantities of energy into our solar system. Approximately 30% of the sun's energy that reaches the earth is immediately deflected by the atmosphere, and another 20% is absorbed into the atmosphere. However, around 50% of the energy actually reaches the earth's surface, where it fuels photosynthesis in plants, maintains both hot tropical and warm temperate climates, maintains the temperature of the ocean, and generally speaking keeps our planet alive. All of this is accomplished without creating any pollution or destruction of natural resources.

A lot of people don't understand how solar energy functions on the technical level, and so they wonder just what solar energy is going to provide to their homes, businesses, and communities. In the last three decades, solar energy technology has developed at an accelerated rate. Solar energy is gathered at a number of large power plants in the U.S., Spain, Australia, and in other nations, where it delivers power directly to the power grid. This implies that countless houses around the globe already get electrical power generated by the sun. One of several lesser known solar energy facts is that solar power can also be employed on a considerably smaller scale. Solar panels on households and businesses, can certainly create a percentage (or possibly all) of the power these buildings have to have. On an even smaller scale, solar panel systems are put to use in India and Indonesia to disinfect water, and compact solar burners and ovens are often employed in order to cook food in other regions of the globe. Solar energy might be employed to power practically any procedure you can visualize, from large-scale power generation for towns and cities to boiling a single pot of water.

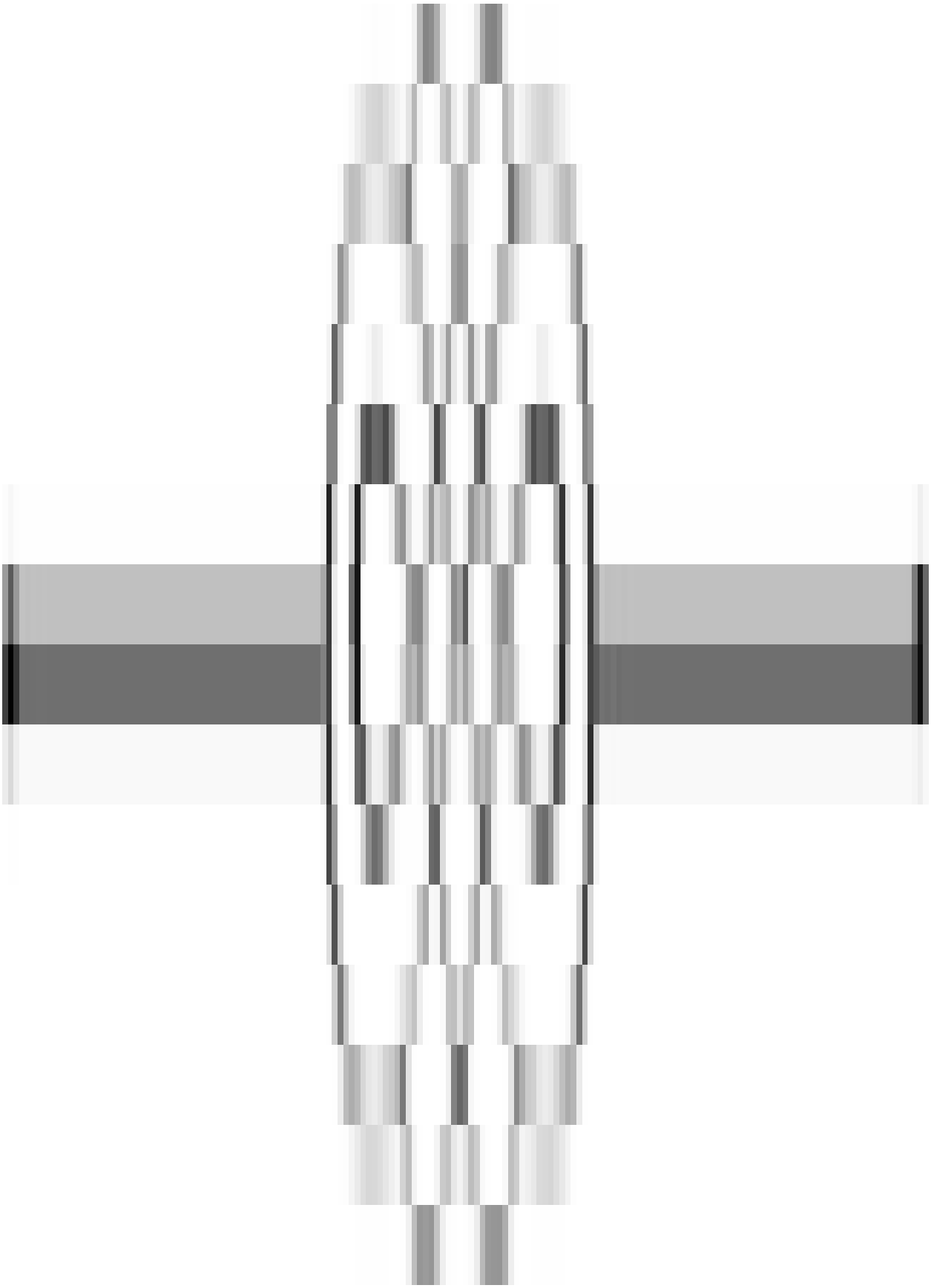
What makes all of these different uses achievable is the development of solar energy systems. You will notice two standard varieties of solarenergy technologies presently used today: solar thermal energy (STE) and photovoltaic (PV) energy. Solar thermal collectors just harness the heat or thermal energy generated by the sun. This thermal energy is generally used to heat water which in turn can easily be stored and used for common every day requirements or piped to a household heating system. STE may be stored by heating up or energizing a thermal mass that is designed to continue to radiate heat even when the sun isn't shining. Solar thermal collectors actually are significantly more efficient in comparison with photovoltaic collectors but on the other hand energy storage is somewhat more cumbersome. Photovoltaic solar panel systems produce electricity when exposed to sunlight. This electric current may be used immediately or alternatively stored by using batteries for later use. This is

actually one of the more significant solar energy facts whenever you are dealing with PV energy systems. Battery storage is incredibly significant since it means it is possible to store solar power for use through the night or during cloudy or rainy days.

Solar energy is a very important alternative power source which can help us take care of our environment. It can also help to cut down our reliance on fossil fuels. You may be asking yourself just how big of an expense it is going to be for you to convert to solar power? Solar power is not really as costly as most people think. A total solar energy system for a house can potentially cost more than $30,000, having said that this does not really mean you will be paying that total amount. To begin with, you will discover lots of different incentive plans, which include tax credits, rebates and grants, that may reduce the price of installing solar panel systems by 30% or more. One other option you might wish to look into is a smaller solar energy system that just supplements your household power needs. A smaller sized system will cost considerably less, while still lowering your current energy bills, and it will certainly help make your home much more environmentally sound. Currently most electrical power is generated using fossil fuels. So lowering your use of electrical power from the area power company by 50% is actually an important step towards establishing a sustainable power grid.In this ebook, we've made an effort to supply you with a number of

helpful and thought provoking solar energy facts. While you contemplate these facts, also think about just how much value you put on the quality of the environment and on humanity's ability to preserve it. No matter if fossil fuels do not run out during the next 50 years, it's very likely that their continued use as our primary energy source is going to wreak environmental havoc. Investing in solar power now might not instantly help you save money, but your monetary investment can certainly provide an improved future for everybody under the sun.

Important Facts About Solar Panel Rebates



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resently solar panel rebates have become popular incentives for residential and commercial electricity users to begin using solar energy. It's known that energy generated from solar panel systems definitely is one of the most green and ecologically friendly sources of energy; however it was actually the significant cost of solar panels, associated components, and setup costs that limited its use. Several years back this predicament started shifting when costs of solar panel systems began decreasing considerably. Combined with plummeting hardware costs are the federal, state and local incentives which have made solar power an economically feasible option. Not surprising, lots of residential and commercial building owners are going solar in large amounts.

Incentives for solar power can be found in the form of financial incentives, loans, exemptions, tax write-offs, rebates, and tax breaks. Solar incentives can be found at three government levels - federal, state and regional. From the federal government, a tax credit for 30% is available for solar energy system installment. A solar tax credit is usually offered for photovoltaic (PV) solar panels, solar powered water heaters, and additional technologies that rely on solar energy. For solar water heating systems, a maximum of $2000 is available. To receive the federal rebate, your solar water heating installation must be approved by SRCC (Solar Rating and Certification Corporation) or an equivalent level government agency. Only places where half of the residence's water is heated with solar power are able to get this rebate. Homeowners who produce extra credit will be able to carry it ahead to the next tax year.

Each state offers several forms of solar panel rebates. Regardless of whether it's sunny California or Vermont, every state has their own rules and regulations regarding incentive calculation and qualification conditions. Normally, states handle these types of rebates and incentives through an alternative energy fund. Anybody that would like to install a solar power system and collect the solar tax exemption will have to fill out an application with the government agency whichcontrols this fund. In nearly all cases, a sales tax exemption of as high as 100% is available with designated solar energy systems that conform with the tax rebate qualifying standards as set by the state.

Solar energy incentives are also provided by local municipalities to homeowners and companies. Such rebates substantially decrease the cost of solar panels. Each

municipality earmarks funds for its own alternative energy promotions. This fund is used to supply incentives to residential and business owners that install solar energy systems. Certain regions provide incentives just for selected solar powered products, like water heating systems. These details have to be reviewed prior to setting up solar panels. This will definitely assist you to decide on the most beneficial option and get the best solar panel rebate available.

Other incentives are additionally presented as solar panel grants by way of the renewable energy fund. These types of programs are accessible to householders, residential building owners, non-profit establishments, and individuals that have a low income. In some situations, as an alternative to a direct rebate or cash incentive, the particular local government provides property tax incentives. Within this type of package, a property owner is able to pay a reduced tax for the property. Depending on the local municipality's tax incentive, a property owner might be able to get a tax break of roughly 5-10% of the overall investment incurred on the solar power system.

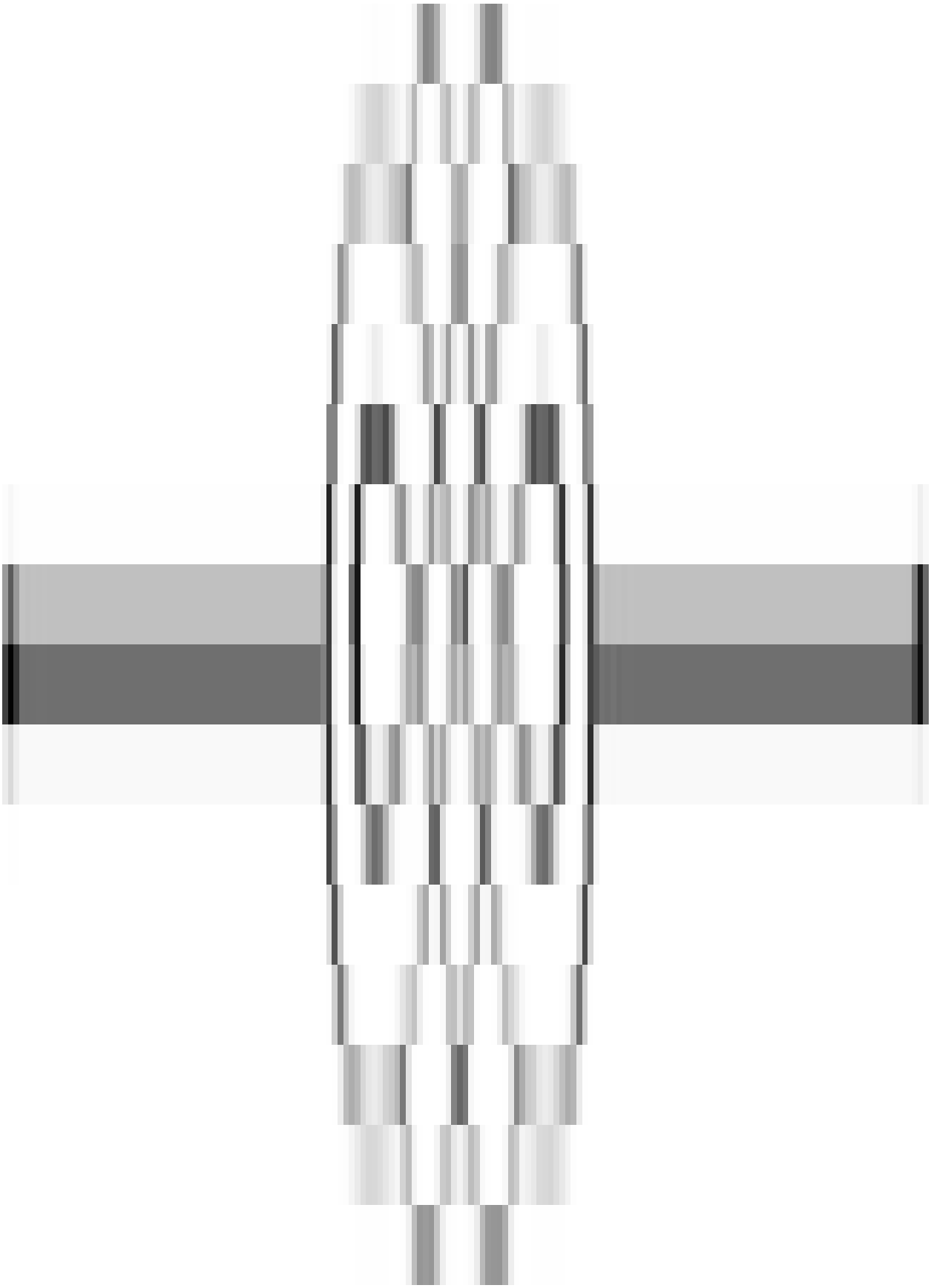
It must be pointed out that only the solar power systems which comply with the particular energy certification standards established by the government energy rating agencies fall under the particular exemption and incentive guidelines. Prior to buying any sort of solar energy system, it is essential for the buyers to check out the energy rating specifics and whether or not the system is eligible for the incentives. Solar panel rebates are accessible by every homeowner or place of business in the United States provided that the system and installment is in accordance with the incentive rules and regulations.If it turns out that after installment of the solar energy system, it is realized that the system isn't entitled for any rebate or incentive then it will be expensive. Such a scenario can come up simply because the buyer neglected to bear in mind some technical information or specific policies. This type of situation may be prevented by checking out the issue before investing in any solar powered device. Within a number of states for instance California, special regulations mandate that each individual electrical utility company operating in the state to give incentives to property owners for buying, putting in and implementing solar energy. This is why, the incentive is available it doesn't matter which power utility is delivering the electric service.

In a number of instances the cost of solar panels is further lowered because the manufactures also had been given some type of incentive plan. Add that to the incentives and rebates given to individuals by federal, state and local

governments, and it gets to be a quite attractive proposition to set up a solar power system. It is imperative to keep in mind that, in most scenarios, only one type of government incentive can be received. What this means is, a person is unable to receive rebates provided by the federal, state and local governments for the same solar power system. On the other hand, in a number of scenarios, this is actually possible depending on the guidelines, policies and regulations within a specific region. Ultimately, even federal incentives can rely on the state where the customer is claiming the incentive. It's a good idea to consult with a solar panel rebates specialist to make sure you know about all the choices available.

These types of details can be checked out on the websites associated with government departments that offer incentives for solar powered system installation. You'll find numerous factors that have an effect on an applicant's eligibility. For instance, solar panel rebates are given only after the verifying officer has inspected and certified installation of the solar panel system. When calculating the rebate, the owner's income and property value also can be evaluated. It is imperative to check these particular issues well before spending any money on buying solar panel systems.

Facts About Your Solar Energy Home



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n this context, the term 'home managers' is simply a reference to the people who make decisions in homes. In family situations, it is typically the man and woman of the house who qualify to be termed as home managers.

The five interesting facts about solar power we are just about to look at serve to debunk the common myths about this technology.

Fact 1 - Solar energy has multiple uses

Many people seem to have this misconception that solar power is only suitable for powering small appliances. The truth of the matter is that it can be used for things like heating, cooking, lighting, powering major appliances and pretty much everything else along those lines. This is especially the case in places which receive lots of sunshine all year- round where, with the help of the right technology, it is possible to tap massive amounts of solar energy.

The good thing with solar power is that it is not limited. This means that, within the same home, you can tap it for cooking, heating, cooling, lighting, powering your appliances, and pretty much everything you can think of along those lines without 'depleting' it. In that regard, it is actually superior to mains electricity, to which we tend to have a limit (that is, whereby the voltage and power rating supplied to every household is limited at some level).

Fact 2 - Solar energy can substitute mains electricity

We mention this as one of the facts that home managers may find interesting thanks to the fact that many people seem to have this perception that solar power can only complement mains electricity, but it cannot substitute it. Now that may be true in parts of the world which receive limited amounts of sunshine, but in the tropical parts of theworld which receive lots of sunshine all year-round, solar energy can actually substitute mains electricity.

You have to keep it in mind that thanks to advances in clean energy technology, it is nowadays possible (as mentioned earlier) to tap massive amounts of energy. That can then be distributed using a house wiring system to do everything that could have been done using mains electricity. What we are saying here is that

solar energy doesn't always have to play second fiddle to mains electricity. Even in parts which receive limited amounts of sunshine, we tend to have a scenario where there is a lot of sunshine during the summer. For that duration, and with the right technology, it is possible to use the power of the sun to substitute normal electricity completely.

Fact 3 - Solar energy can actually be stored

This is a something we mention among the facts that home managers may be interested in thanks to the fact that many people seem to have this misconception that solar energy can only be used during the day, when the sun shines. This myth probably developed during the earliest days when solar energy was only used for applications like heating bath water using rudimentary pieces of equipment which only worked when the sun was shining. The truth of the matter currently is, however, that it is possible to tap massive amounts of solar energy during the day when the sun is shining, and store such energy in batteries for use when the sun sets (at night).

With advances in clean energy technology, we are seeing batteries capable of storing truly huge amounts of energy entering the market. Indeed, we are moving towards an era where people living in areas that receive inadequate sunshine will soon be able to tap enough solar energy during the summer and the spring for use in the colder months. The technology we currently have is only suitable for storing energy for hours (a few days at most), but it is not hard to foresee a future where it will be possible to store solar energy for weeks or even months. It is just a question of having the right type of batteries—and a lot ofresearch is going on in that area. In the meantime, people living in areas that receive adequate sunshine all year-round have the technology through which they can store solar power collected during the day for use at night.

Fact 4 - Tapping solar energy doesn't need to be a very costly undertaking

This is the fourth of the facts home managers may find interesting. We mention it because many people seem to have this misplaced belief that using solar power doesn't make economic sense because it costs too much to tap. The truth of the matter, however, is that the technology through which solar energy is tapped has been falling in price, to a level where many people who are interested in this technology today can afford to tap it. Of course, the initial investment may look a bit hefty. But it is also worth keeping in mind the fact that having made

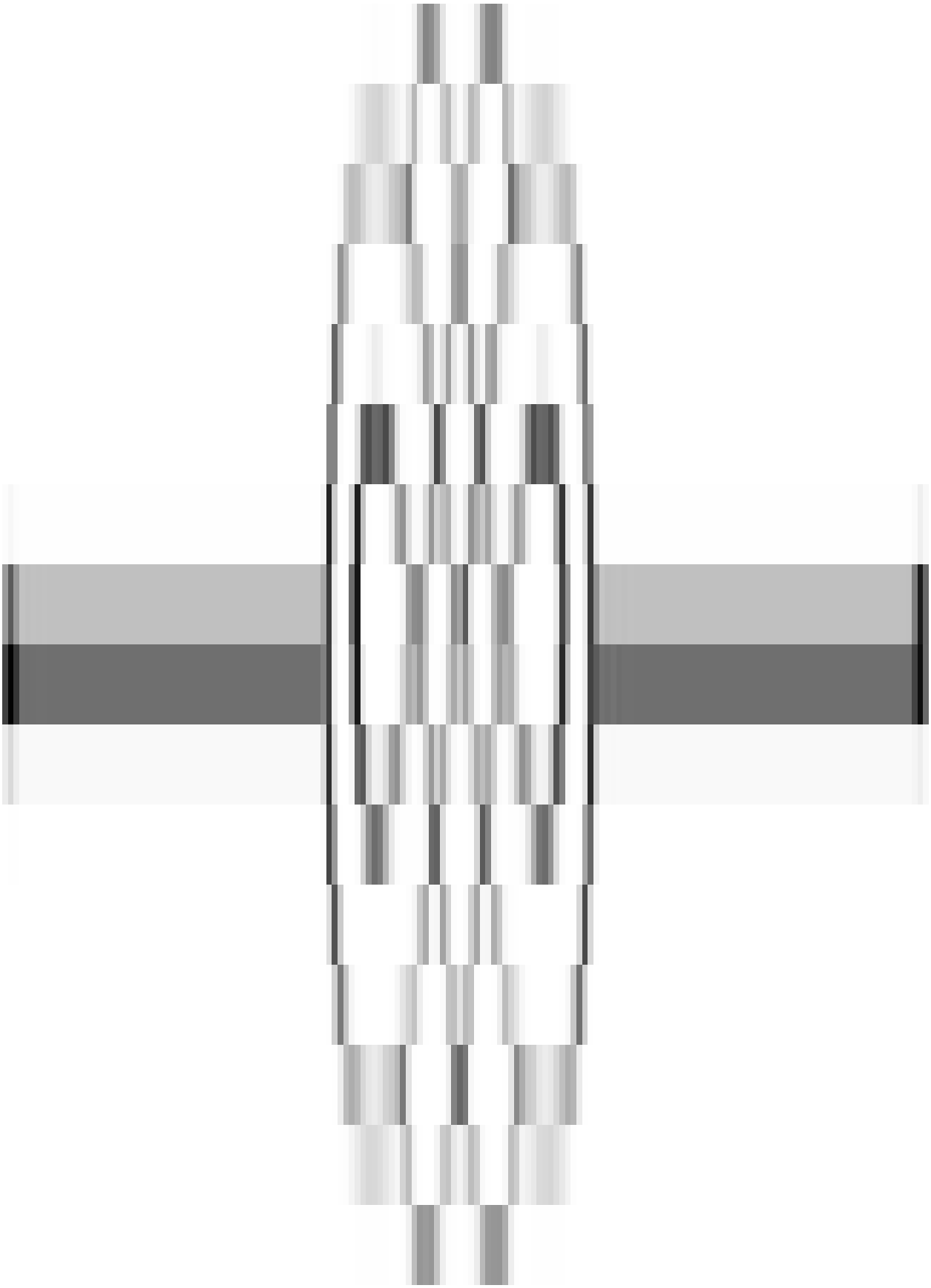
that initial investment, you stand a chance to free yourself from electricity bills (or, at least, to cut back significantly on the sums of money you spend on such bills). And then again, what you need to spend in the name of initial investment in solar energy would actually tend to be less than what you spent on getting connected to the main power grid.

Fact 5- Solar energy is reliable

This is the fifth of the facts home managers may find interesting. We bring it up because many people seem to have swallowed the myth that solar power is unreliable. And indeed, there was a time when that assertion held true. In the earliest days, the technology used to tap solar energy used to be very rudimentary. But advances in clean energy technology have brought us to a point where this energy can be very reliably tapped, distributed and used within the domestic setting.

In fact, in some places especially in tropical countries where adequate amounts of sunshine are received solar energy turns out to be more reliable than mains electricity. That is because, whereas main electricity grids are subject to outages, solar power is not. In any event, the energytapped during the parts of the day when sunshine is intense is stored up (in batteries) for use in other parts of the day when the intensity of sunshine goes down. We thus end up in a situation where solar energy can be very reliable, provided that it is tapped, stored, distributed and deployed using the right technology.

Solar Power - The Green Source Of Energy



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olar Power, a renewable source of energy, is one of the most available sources on Earth. However, being an intermittent source of energy, it needs to be enhanced by storage or another energy source. Even though solar energy systems nowadays still have low average efficiencies, due to modern technology, research is being put into developing high- efficient and low-cost systems daily. Using solar energy is beneficial because it allows a more environmentally friendly or a "greener" way of living. It is also a freely available resource, which is one of its many advantages as once installed and does not cost more than the cost of setting up and routine maintenance.

Concentrating Solar Energy Systems such as "Stirling Disks" are large solar power plants that use modern technologies to convert light energy into useful electric energy. A direct technology of using solar energy involves the usage of Photovoltaics, which is a system is directed for small appliances and homes.

Solar Power Information

It is important to know of some information about solar power before purchasing it. The definition of solar power is "energy systems that produce energy directly from sunlight". It is the conversion of sunlight to electricity. Most of our energy resources are anyway indirect forms of solar energy. Without the sun, the wind would not blow. Additionally, the sun causes evaporation of water which results in water collecting up in rivers after condensation. This water is used for hydro electrical power. Without the sun, water would be eternally locked in a solid state: ice. Moreover, bio-fuels cannot exist without the sun as well. If you were to go more into depth it is also the sun that allows life, which in turn, would provide fossil fuels. An essential fact about solar energy is that it is a renewable source of energy as sunlight could be used any time.

Solar power is transmitted directly by "photovoltaics" (PV), or indirectly with "concentrating solar power (CSP). Photovoltaics are used to powersmall to medium sized equipment such as calculators to off-grid homes.

CSP involves two methods: the first method is to simply boil water which is then used for providing power; the second and more complicated method entails technology such as the sterling engine dishes which use a sterling cycle engine

to power a generator. Another detail to keep in mind that even though installation of solar power is costly, this cost has decreased significantly over the past couple of years making it affordable for almost everyone. Furthermore, small solar applications are also being used to replace other sources in the developing world. Since solar power is a renewable source of energy, this means you can pay up front for the next twenty years or so of energy. However, non-renewable energy sources are purchased as consumed.

Solar Power Efficiency

So how efficient is solar energy in reality? Research states that the current photovoltaic conversion efficiency is about 15% and improving day by day! Additionally, some experimental models are yielding over 40% efficiencies! This shows that solar energy is becoming more superior than what is was about twenty years ago. Solar panel efficiencies are averaged at 20%. However, do not be discouraged. The most advanced solar energy systems are estimated to have an average of 40% efficiencies. However, when converting the resulting electricity (from solar energy) into light the efficiency does reduce by 15%.

Thus, solar panels do have a reduced efficiency when it comes to lighting up our homes. Nevertheless, the most proficient way of making most of solar energy is to utilize as much direct sunlight through day light and passive solar heating technologies and also use the highest efficiency solar panels for the rest of our energy requirements. High efficiency solar cells are a type of solar cell that averages the highest efficiencies in comparison to standard solar cells. Even though solar power systems generally still have low average efficiencies, a lot of research is being put into developing high-efficient and low-cost systems daily.

The Advantages of Solar Energy Technology in Your Life

Even though solar energy does have its downsides, such as intermittency, where it has to be combined with a form of storage or another source of energy, it still has many advantages to it. Such advantages include reliability, cost, environmental friendliness, aesthetics, and sustainability. Solar energy, for one, is more reliable than wind power and hydro power. This is because the sun will continue to rise for the next 4 billion years without fail, whereas, wind and water might not be available daily. In cases such as during the night and cloudy nights, where solar power is not useful the problems are eased as intermittency is 100% predictable. Furthermore, another advantage of solar power is that although

clouds diminish solar power it does not eliminate it.

One essential advantage of solar collectors is that they require minimum maintenance one installed and also provides free energy. Additionally, although solar cells do wear out, their lifespan is measured in decades. The durability of photovoltaic cells improves year by year. More importantly, even though solar cells have been an expensive method of generating electricity, this cost is reducing per kilowatt per year. In addition, solar cells also operate cheaply after installation. Furthermore, solar power has its advantages when it comes to environmental friendliness. Nowadays, everyone is going "green" in order to conserve and protect our earth. Solar power is an efficient way of going green, since it produces zero pollution.

Solar powered generators are known not to even produce any noise! Moreover, even though solar energy requires a lot of space, space that is found on rooftops of existing structures is more than enough to produce an adequate amount of solar energy without occupying any extra land area. One of the advantages of solar power is that it is estimated that our earth is continually flooded with 175 trillion Kilowatts of solar power per day. This means that there is an extraordinarily reliable annual energy supply of 1,530,000 Terrawatt hours daily. On the other hand, resources such as oil, coal, gas, nuclear power and wood produce 15 times LESS than this. So presuming that the sun is going tokeep on shining for another estimated 4 billion years, solar power is a highly sustainable resource.

However, you might be discouraged by the look of many solar cells. Do not worry. Due to the advantage of modern technology photovoltaic cells are becoming available in many colours such as black or brown, to match roof top colours. Additionally, how often is it that we would look at the rooftops of a house anyway?

Solar Power and its Benefits

This renewable source of energy has many benefits. This is the reason it is being advertised increasingly due to the combination of modern technology and simple sunlight. So what makes solar power beneficial to our lives? Well most importantly, since solar power is intermittent it is not advisable to run a solar power system in areas with low sunlight level. It is helpful to have a backup system in the events that the sun does not shine for a few days. However, on the

good side, if there is a power outage you will still have electricity if you run on solar power. If more energy is required simply add more solar panels.

Solar energy is useful because it can be used for many day to day tasks, such as heating water, drying clothes, powering attic fans and small appliances, produce lighting for both the indoors and outdoors of a building, and better yet power cars! Additionally when using solar energy, you eliminate the cost of foreign and other sources of energy in your home. Even better, utility companies might buy that extra energy from you if you solar power system produces more energy than you require.

A further benefit of solar power is that gas or power grids are not required to run solar power systems, so even if the installation is initially expensive, running the system does not cost a thing! Another vital benefit to keep in mind is that solar power technology is constantly improving in an effort to decrease cost and increase efficiency. Using solar power is beneficial because it allows a more environmentallyfriendly or a "greener" way of living with zero pollution. It is also a freely available resource, which is one of its many advantages as once installed ,it does not cost more than the cost of setting up and routine maintenance.

Solar Power Technology

Due to the rapid improvement in solar technology lately many homes are solely dependent on solar power globally. This leads to the question of how solar energy is put to use. It is claimed that most solar systems can collect heat created by sunlight striking an object. An example of this is to simply concentrate light with mirrors or lenses to produce enough heat to start a fire. This indirect method of producing solar power is known as "Concentrating Solar Power" (CSP). As briefly mentioned earlier, CSP systems use the simple technology of lenses or mirrors and tracking systems to focus a large area of sunlight into a small beam. The consequential heat is then used as the heat source for a conventional power plant. The "Parabolic Trough" and the "Stirling Dish" are two examples of concentrating technologies. In all concentrating solar power systems a working fluid is heated by the concentrated sunlight.

It is then used for either power generation or energy storage. Furthermore, it is important to provide the continuous availability of energy since solar energy is not available during the night. Since solar power is an intermittent energy

source, all available energy made available should be taken when available, stored, or transported via transmission lines to where it can be used. In storage solar energy is stored at high temperatures using molten salts. These molten salts have low-cost, high specific heat capacity and can distribute heat at temperatures compatible with conventional power systems. This expertise helps increase efficiency of the system.

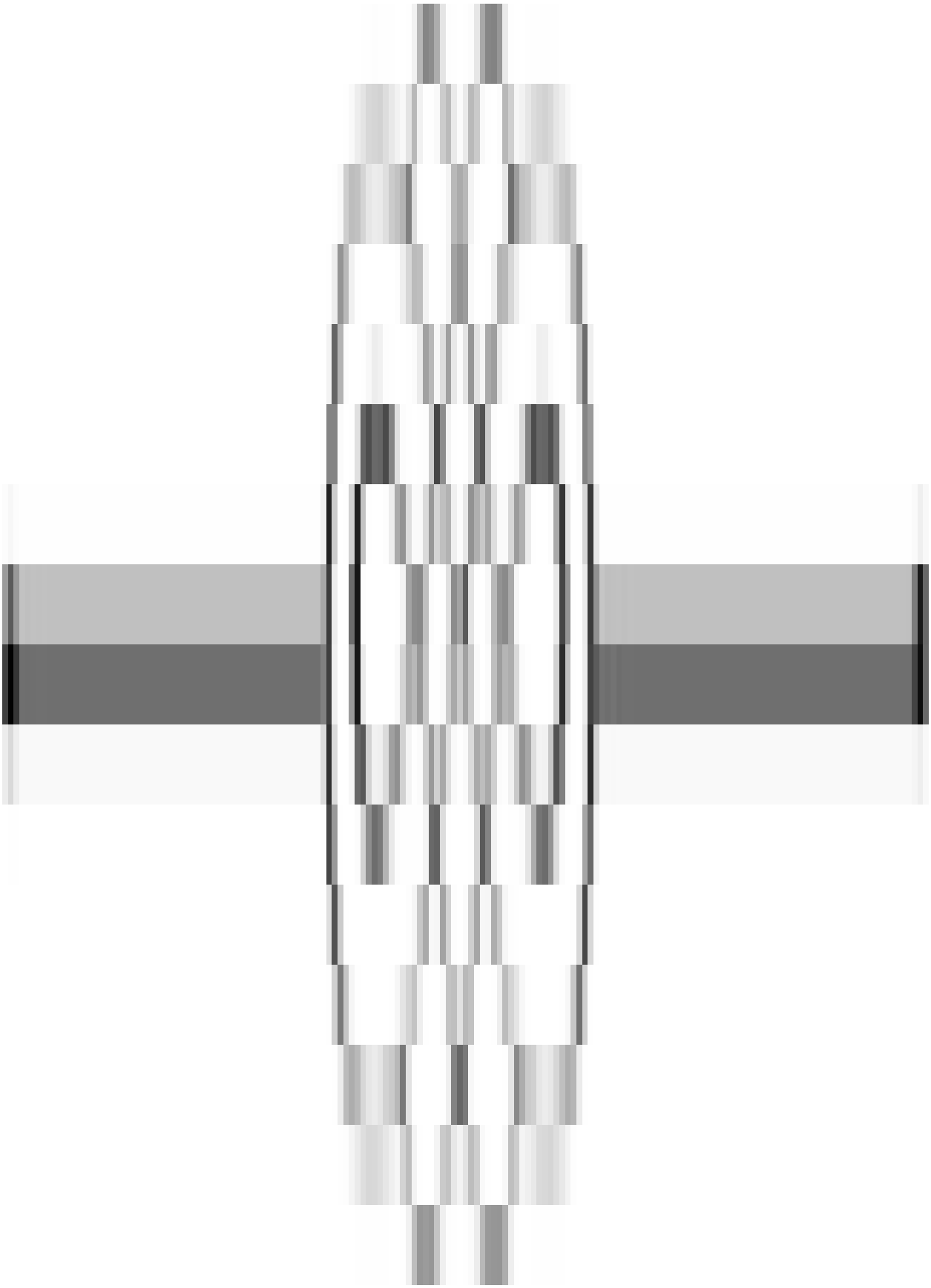
A direct method of solar technology involves the "Photoelectric Effect". It was in 1839 that Edmund Becquerel discovered the technique of producing an electric current in a solid material using sunlight. Once thismethod developed it was found out that photoelectric or photovoltaic

effects caused certain materials to switch light energy to electrical energy at an atomic level. The Photoelectric Effect uses the simple method of reflecting, absorbing or direct pass of light. However, it is only the absorbed light that actually generates electricity.

Hopefully this information should be useful if you are considering using solar power as an energy source for your home. Just remember even though there are certain disadvantages to think about, the number of advantages outweigh the number of disadvantages. These disadvantages can be improved vastly as technology improves. Additionally, it is important to keep in mind that solar powered appliances have vastly changed for the better when compared to ten years ago.

Keep in mind that solar energy systems are suitable in regions with a lot of available sunlight. So do not opt out to get a solar panel system unless you are completely sure of the surroundings. Again, as suggested earlier, it is best to have an alternate energy source in case of low availability of sunlight. Although solar power is an energy source that has only been recently utilized, it might just become the most crucial energy source of the future.

Solar power basics - is solar power right for me?



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any people are interested in solar power these days but are not sure weather it is a good investment or if their budget or location supports it. I'll answer those questions here.

Let's look at some general considerations in the solar power equation. If you currently have an average home and pay around $125 per month for electricity, at current inflation rates you will pay upwards of $90,000 for electricity over the next 30 years. It is that compounding rate working against you. This is if inflation rates stay the same. In the last decade several categories of consumables have exceeded the general inflation rate, and energy is one of them.

For the last 35 years, solar panel costs have remained constant at around $5 per watt. In the last two years the prices have dropped considerably. You can purchase high-grade panels for under $2 a watt now. As well, there is a 30% federal tax credit on residential solar. This is not a write-off, it is basically cash-back. Systems installed before 2016 qualify for this credit.

There are basically two types of solar power installations. The first is "Grid-Tie". This is where your solar panels feed electricity directly back into the power lines. When you do this, your meter "spins backwards". At night you draw power from the power lines as usual. Whatever power you created during the day comes directly of your bill. The downside of grid-tie is that if the power lines go down, you do not have power. Even in the day, your system must be turned off so that you do not feed power into lines while the repair technicians are working on them. Your location must have a "Net-Metering" agreement with the local commercial power company. This allows you to feed power into their lines and have them ostensibly pay you for it. The second type of system is "Battery-Based". This is where you charge up batteries during the day and use the power from them at night. In this type of system, you'll have power pretty much constantly. The downside is that the cost of batteries is high and they must be replaced every decade or so.

With the grid-tie system, you must have a NABCEP-certified electrical installer to build your system. Anything that attaches to the main electrical lines has to be inspected as well (permitting and inspection). With a battery-based system, if you are the home-owner, you can do the work yourself (in most jurisdictions).

The cost of having a grid-tie system professionally installed is comparable to buying batteries for a battery-based system you install yourself. You can also do a hybrid system and add some batteries to a grid-tie system to give you a little back-up power. Most people just buy a generator for back-up power on grid-tie systems.

Along with the federal tax credits, there are also many states and municipalities that offer solar tax credits and incentives. Having multiple incentive programs can significantly reduce your costs and shorten pay- back time. Pay-back time on average is 5-7 years.

With battery-based systems, what are the skills required to install a system? A solar power system is basically a battery-charging system. Instead of using a plug-in battery charger, you are using solar panels. You'll need a "charge controller". This is just like a car battery charger, but the solar panels feed it the power instead of plugging it in to the wall. Solar charge controller are much smarter than car battery chargers. They are designed for maintenance-free operation and to keep your batteries healthy. The one item in a solar charging system that makes it different than just a battery charger is the "Inverter". It changes the DC battery voltage into AC house current. Hooking-up these components is not difficult. Doing is safely requires knowing some basic guidelines as to wire sizes and physical arrangement. If you can handle basic hand-tools and could build an above-ground pool or deluxe dog house, you can build a battery-based solar power system. The major component line-up is simply: Solar panels, charge controller, batteries, inverter. You do add a circuit-breakers between each one so you can disconnect everything. There are vendors all over the US who are eager to get you what you need.Once you learn the basics, you can scale it up to any size. You are just using more panels, bigger batteries, a larger inverter and larger wire. Everything scales up nicely. The only maintenance on a battery-based solar system is keeping water in the batteries (unless you have maintenance-free batteries) and adjusting the angle of the panels a few times a year. If you like, you can buy panel mounts that automatically track the sun during the day. This gives about 20% more power. Most people just make panel mounting frames out of decking lumber or angle-iron. You are just making a rectangular frame to bolt the panels on with an axle-bolt at the bottom so you can adjust the angle of the panel. A small strut arm comes out so you can lock it in position. Simple! Panel frames can also be mounted on top of wooden poles or metal pipe.

Now let's talk about the financial aspect of solar energy. We've all been prey to what are basically ad campaigns which portray solar energy as a fringe technology. This is all part of a program which tries to protect an endangered-species, your monthly bill. Solar energy works very well. If it didn't, we would not have an International Space Station or Satellite TV. Panels are now known to last for over 40 years. This is because that is how long ago they were invented. Yes, they will be working after all readers of this article are gone. This is crucial to calculating the financial viability of a solar power installation. Why? Because whatever size installation you invest in will be paid back to you in increased home value when you sell your house. That system will still be working 40 years from now. When people look at homes in their price-range and you home has a solar power plant on it, it gives you a tremendous edge in the market. This effect will only increase. Because of this, all the energy you ever produce with a system will have been for free. You get your system cost back when you sell. I sold my solar home in 90 minutes to the second viewer for over-asking without an agent. I retired off the proceeds in my 40's. Yes, solar is a good investment.

So how much are we looking at for a system? You should not invest less than $5,000 in a system. With current federal tax credits only, for

$15,000 out-of-pocket net cost, you could produce around 65% of what you use in an average American home. You only want to produce less-than or exactly what you now use. With CD's and other investments at historically low rates and high risk, solar is quite an attractive investment. If you have state and or local solar incentives, it only gets better. You can check for incentive programs atHTTP://www.dsireusa.org. If you are a large energy user, you could spend up to $30,000 on a large system. Your cost-benefit ratio is the same. Any size system increases the value of your home instantly.

You'll need a place in the yard or on your roof that has full southern exposure. This means no tree shading for at least 5 hours during the day. For every hour more sun you have, you save 20% on your system costs (the system can be smaller). You'll need about 600 sq feet total. (say 15" X 40" for 100% of an average home)

Lastly we must talk about increasing efficiency. 30%-40% of all energy delivered to a home is lost. That is after 7%-8% of the electricity was already lost in the commercial power delivery system (telephone pole etc.) before it got to you. It is ten times cheaper to improve the efficiency of your home - than it is

to generate that lost power with solar energy. The "Hit Parade" of energy loss is as follows:

Inadequate attic insulation. You must have 14 inches of it up there.

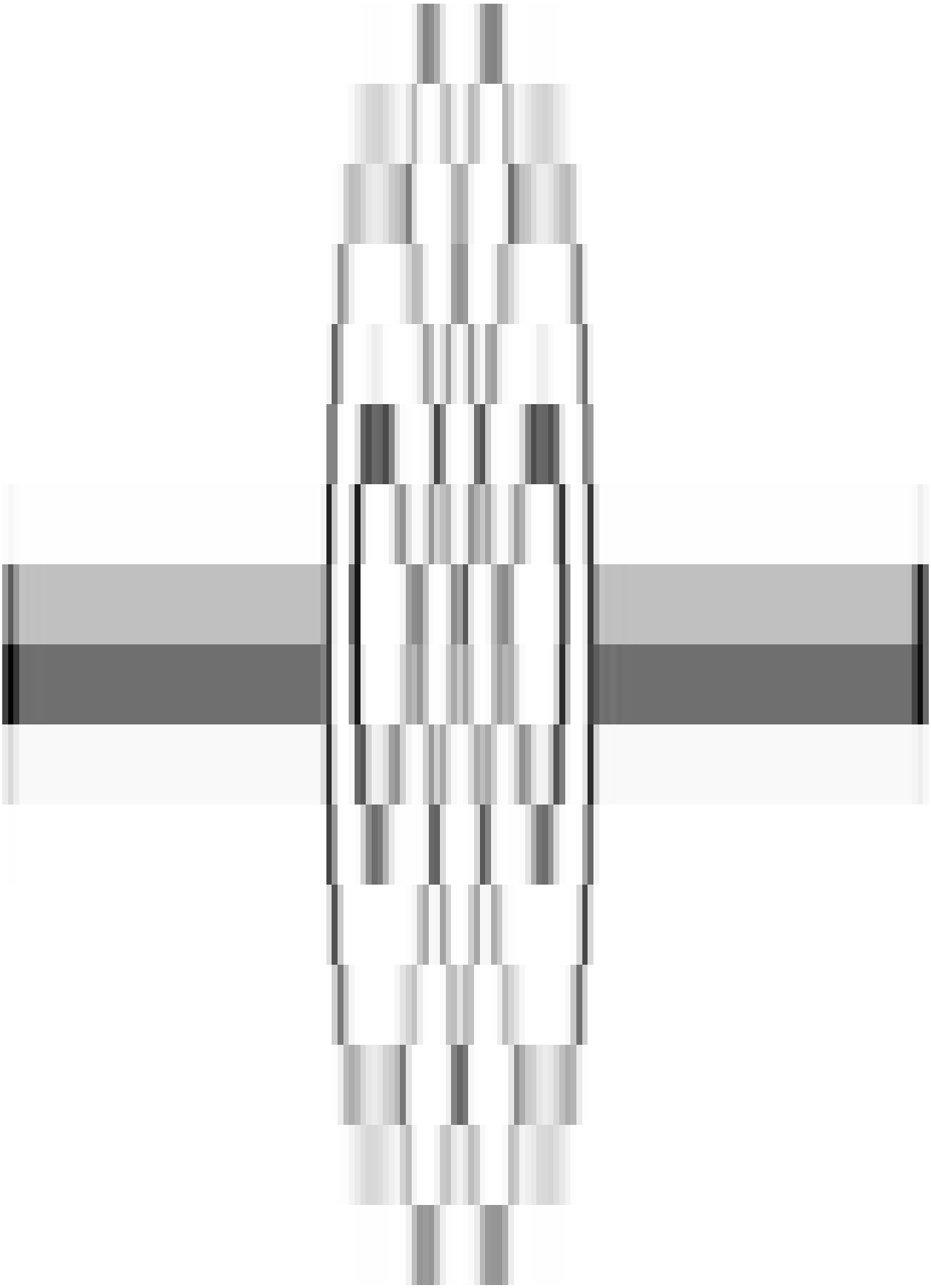
Leaky HVAC dusting systems. You ducts have fallen loose out of their openings.

Edison-type light bulbs. High-efficiency compact fluorescent bulbs save $50 per bulb.

Old inefficient HVAC systems and appliances. Replace them with Energy-Star units.

Leaky windows. Replace them with double-pane vinyl or wood windows.This has to be mentioned in the solar equation because a small amount invested first in these areas will significantly reduce your energy usage and the resulting size of the solar system you build. Sure, it's not fun or high-tech, but efficiency work really pays. Don't even consider a solar system until you tighten-up your home.

Solar Powered Energy - Some Other Forms Of It



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s I mentioned already, solar power comes in many forms. To better illustrate what I mean, consider the world's current energy sources - not just the oil and coal we use to run our computers and cars, but the food, water, and wind that's around us every day.

It's all because of the sun. Trace the food chain to its lowliest members and you'll find plants and algae - both life forms that can transform the sun's rays into energy sources through photosynthesis.

That energy allows plants to reproduce and in turn transfers to the animals and people who eat them. All energy in our food comes from the sun, even if it goes through five or six steps of the food chain before it gets to your belly.

Even the current forms of energy we use are merely old, super high- density containers for solar energy. Coal is compacted plant matter. Oil is compacted algae matter. Natural gas is the by-product of both of them.

It's all a cycle, so it's no surprise that technology has developed in recent years to take advantage of the sun's rays in as many ways as possible, not just through silicon based solar cells, but through solar collectors, insulated tubes, and more.

Solar Collectors

First thing's first - how do we take all that energy being pumped out by the sun each day and convert it into viable power for your home? It's done with solar collectors - special panels that you place in your roof, on your walls, or beside your pool to collect and trap the radiation given off by the sun and use it to produce heat. We'll get into the systems used to convert that energy into a useful form in your home soon, but for now, let's take a look at how the collectors actually work.Sometimes called solar thermal collectors, collectors are used in manyinstallations - most notably solar hot water and space heating setups. They may also be used for solar towers, solar power plants, and solar conversion for warehouses or commercial outlets.

Think of it this way. Roughly 52% of all electricity generated in the United States is done with the use of Coal. However, coal doesn't generate electricity on

its own. Usually, it is burned or broken down in a way that releases energy. That energy is then used to heat water which turns turbines. Those turbines then produce electricity which is stored and transferred to homes and businesses throughout the region.

A solar collector is taking on the same role as the coal - it's trapping energy and preparing it for conversion to a form we can actually use. Where and how you use those collectors will depend largely on what kind of energy you need. Instead of the highly unstable and generally not very useful solar radiation that comes from the sky every day, a solar collector converts the sun's energy into something that can be used to heat water or recharge a battery.

Heating Collectors

The first type of collector is used for heating. Solar heating collectors come in flat plate or evacuated tube collectors. Basically, a flat plate will heat a tank of water while evacuated tubes will transfer heat to various tubes of coolant which can be transferred to a tank for later use. The latter is more often used in commercial settings or for homes that experience freezing winters.

Flat Plate - A flat plate collector is an insulated box that contains a plate designed to absorb solar energy - usually protected beneath a set of glass or plastic layers when installed in your home. If you use the same collector plate for your pool, it may be uncovered.

Integral Collector Storage - The Integral collector storage (ICS) system is often known as a "batch system" and will usually have multipletubes or tanks contained within a single insulated box. The system will pump cold water into the tubes or tanks to heat it. The water is then transferred to your standard hot water heater which is heated by gas or electricity.

This ensures that, if your region freezes in the winter, you always have a source of hot water. The hot water heater can be set to only turn on when the water drops below a certain temperature coming from the collector. In most situations, this reduces your traditional energy use by up to 70%.

Evacuated Tube - The third type of solar collector is the evacuated tube, which encapsulates each pipe in the collector with numerous clear tubes made of glass. Each tube will have metal absorbers to trap the solar energy and heat the water.

Due to the scalability of this option, it is used often for businesses and large buildings. Another benefit here is that the evacuated tubes are not affected by things like air temperature due to the insulation. These collector types will vary greatly depending on whether you are installing a heating system, a hot water system, or a different thermal solar system.

Electricity Collectors

The collectors you've probably seen more often are the ones used for generating electricity -¬ the panels, dishes, pyramids, and towers that dot the landscape in secluded areas or in industrial parks. Different types of collectors include:

Parabolic Trough and Dish - Troughs are used by solar power plants to concentrate the energy collected from the sun to heat a pipe filled with coolant, which is then used to power boilers in a station. Parabolic dishes look like giant foil wrapped satellite dishes. They focus all of the sunlight received onto a single point where it is converted into a more useful form of energy.

Power Tower - Like something out of a scene in a science fiction movie, the power tower is surrounded by small mirrors that focus on the central point of the tower. The tower then transfers heat gathered to the base of the tower where a power station is located.

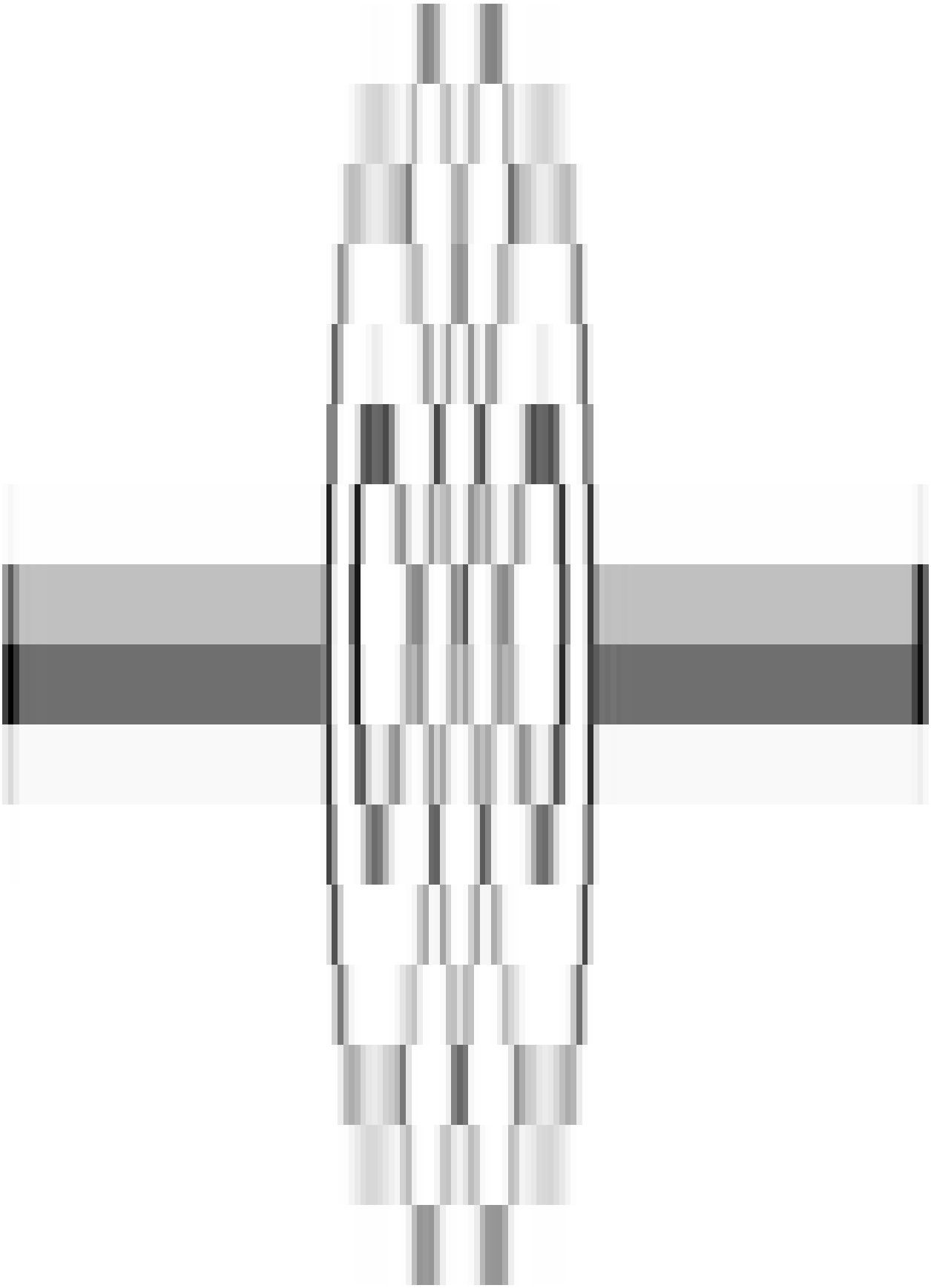
Solar Pyramid - A pyramid uses air as the conductor to turn the turbines. They require a lot of space and are covered in solar collectors that transfer heat to the air that is pushed through them.

There are a number of reasons why these systems tend not to show up on your

neighbour's roof or at the local grocery store. They're expensive to implement and require a complex system to ensure the mirrors and collectors remain concentrated in the right location throughout the day. The amount of heat generated and collected, however, is immense. This makes them perfect for power plants where cost can be outweighed by the long term benefits of a productive power plant.

The biggest issue that keeps concentrating and collecting systems from being used residentially is that they generally don't work in sub-prime conditions. If the sun is invisible or simply diffused for any period of time, they don't work well, whereas photovoltaic systems continue gathering power. So, instead of focusing on what you can't use, let's take a look at how solar collectors can be integrated into your home for thermal collection.

Buying A Solar Power System - Avoiding The Tricks And Traps



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o you're interested in switching on to home solar power? Congratulations, you'll save cash and reduce greenhouse gas emissions!

Shopping for a solar power system can be an exciting time for many people, but as with any substantial investment, you'll need to be careful who you deal with. This guide will help you separate the cream from the cons.

Like in any industry, the solar power sector has its share of unscrupulous parties who have little interest in the technology, environmental benefits and your needs. They are only chasing your money - and they'll be ruthless in doing so.

Beware of fast talking sales people

Like shopping for a new car, beware of over exuberance on a sales person's part. In some instances, this may be just genuine passion bubbling over, but in others, the sales person won't understand what they are selling; instead focusing on hype to get you to sign on the dotted line. If a question hasn't been answered properly or has been deflected, pursue a satisfactory response.

Beware of video presentations

If a sales person wants to show you a video - say no! We can practically guarantee that it will be 1% minute of information vs. 99% hype - effectively a brainwashing session. Understanding grid connect systems is quite simple and can be explained by a competent salesperson with the assistance of a single diagram.

Ignoring simple energy efficiency solutions to reduce cost

A company genuinely committed to solar power is in business to make money, however they will always offer suggestions as to how you can decrease the costs of a system.

For example, if a representative visits your house for a site inspection to gauge your needs, they might notice issues such as the use of incandescent lights instead of compact fluorescents. A good, ethical company will point out that spending a hundred dollars on switching to compact fluorescent globes can save

you thousands of dollars on extra solar panels which would be needed to power the incandescent lights. On the other hand, an unethical company will see this as a good opportunity for the sale of a larger system.

High pressure tactics

Every company uses terms like "deal ending soon", "hurry before stocks run out" - it's just the accepted language of marketing. However, some companies upon visiting your home will say things like the offer they are touting is ending the same day!

Ethical sales people will not place you under this type of pressure given the size of the investment, particularly if this is an initial enquiry and they've established that you're not overly familiar with solar power concepts. Demand time to think things over and research. Better still, if you come under this sort of pressure, see it as an indication of what the company is like and avoid them altogether.

Collusion with related industries

Some solar companies have close ties with other industries, such as roof repair and roof restoration businesses, or it may be incorporated under their own business. There's nothing wrong with that as such, but what can happen is that a householder calls in a roof repairer who then offers a fantastic deal on a solar power system using high pressure tactics.Alternatively, the roof repair company may just sow the seed, then pass on the householder details to a solar company for targeting.

Investing in a solar power system is a decision that should be made after serious thought, having been presented all the facts and after having had time for thorough research and comparing packages with different companies - you shouldn't expect to call in a tradesman for roof repairs and have them sell a solar power package to you on the same day!

Compare apples to apples

Package deals are a great way to save cash, but not all packages are created equal. For example, a company might use top quality solar panels, but skimp on the inverter, wire and frame quality in the hope that the panel brand name will dazzle you and you'll ignore the other components.

When comparing packages, do so on a component by component basis - and ask questions about why X brand is better than Y brand where there are differences.

Grey market products

It's not all that common, but in some cases in order to save money, a company will obtain components on the grey market. This is where the component is genuine, but hasn't come through the proper supply channels. In these situations, if something goes wrong with the component, the manufacturer may not honour the warranty.

Inflated performance claims

Performance guidelines for solar power systems may be exaggerated. For example, a system of a specific size may provide 50% of the average household's needs in the Northern Territory, but it certainly won't in Hobart. A good company will perform a series of complex calculationsand let you know exactly how much you electricity you can expect to generate from your own roof before even thinking about presenting you with a contract.

Shade tolerance claims

No solar panel is truly shade tolerant. It only takes shade covering a small area of a panel to reduce its performance dramatically. It simply does not pay to install panels on an area of roof where they will be in the shade during peak sun hours. Don't let anyone convince you otherwise as you'll just be wasting your money.

House re-financing

We've heard from some people they were pressured into re-financing their mortgage in order to install an expensive solar power system. This is something we strongly recommend against as the system will cost you thousands more over X years of the mortgage, negating any perceived electricity bill savings. It's wiser to opt for a smaller system that you can afford outright, or pay back in a relatively short time and then build on the system at a later date.

Fine print contracts

As with any contract, check the fine print. If the language in the contract is

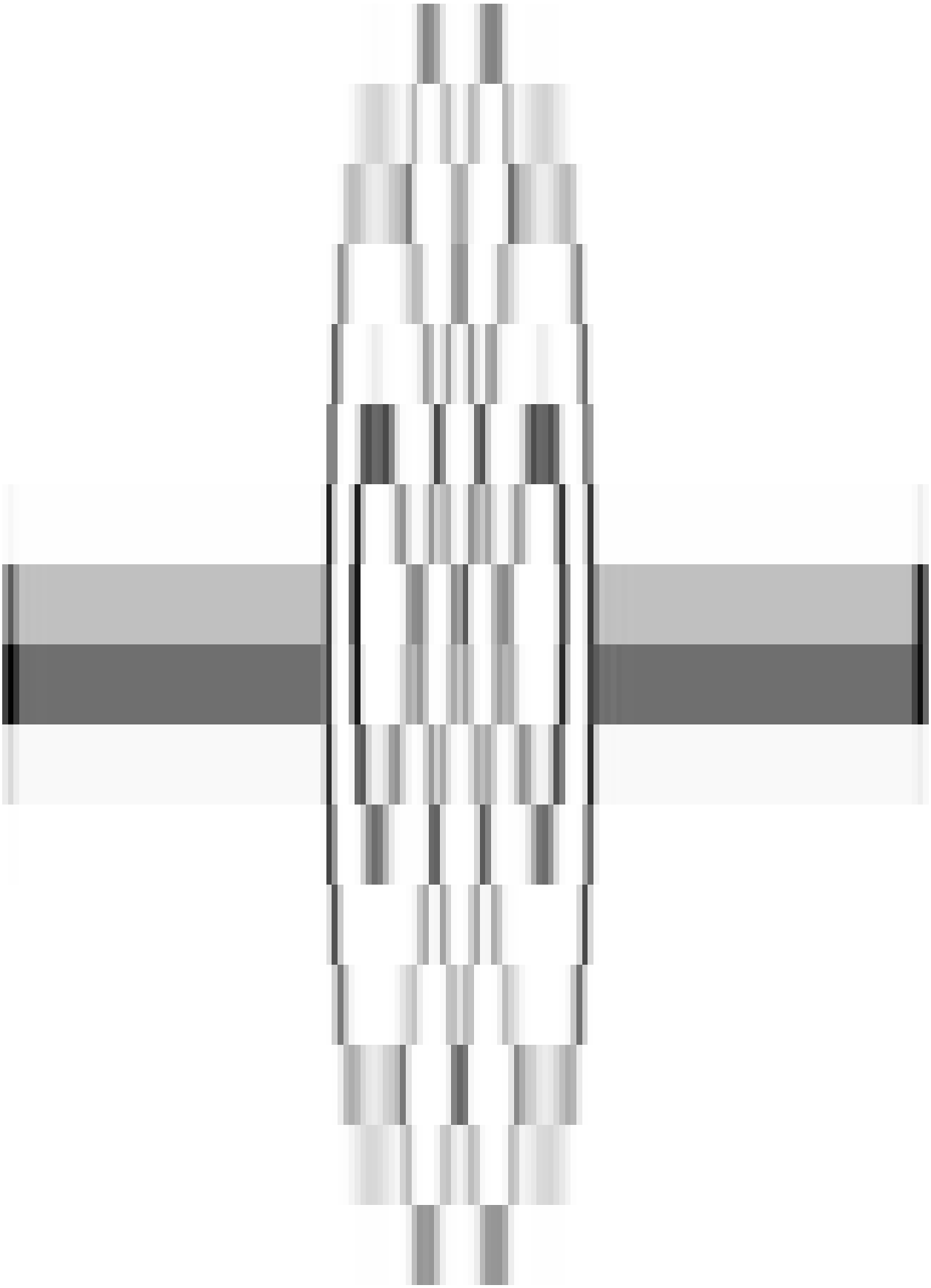
overly complex, gain legal counsel. If you do find you've been pressured into signing a contract with draconian clauses, all is not lost - seek legal advice as there are laws against what is termed an " unconscionable contract".

Gimmicks, gadgets and bonuses

Everyone loves a bonus, but when too much emphasis is placed on a bonus rather than the core product, the solar power system itself, it's cause for concern. Bear in mind that most gadgets and bonuses included with solar power packages have cost the vendor far less than the valuethey place on them. Often, you'll be better off forsaking the bonus and

negotiating a cheaper price on the system.

Solar Energy For Homes



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ince time immemorial, we as a human race have been exploiting natural resources recklessly to meet our daily needs. With time came the knowledge that in nature there are some inexhaustible resources which shall never see their end and the exhaustible resources as well which are bound to deplete from the planet sooner or later. However, we still kept utilizing these resources at neck breaking pace. Over the decades, the situation worsen so much that it has pushed us up the wall; resulting in us looking out for new resources to be used as a substitute for fuel. Gradually, modern science has given way to utilization of solar power to create electricity as also to run a number of fuel based equipments which has emerged as a savior in times of sheer disaster.

However, despite of many conscious efforts being made in order to spread awareness about utilization of solar power, there still remains a major portion of world population which still does not know what solar energy is. On the other hand, those of us who are very well aware about solar energy and its utilization do not use it because we think that utilization of solar power is an expensive and tedious process, which holds no truth. This requires awareness about solar energy information on a mass level so that people shed their fears and start utilizing solar energy. Besides, people also need to be brought face to face with the reality. So far only the class that reads newspaper regularly knows about the inexhaustible nature of the resources that we use in our daily lives. Most of us still live in a deluded world of our own and do not wish to know about the ground breaking reality that the fuel and the power that we have been utilizing lavishly, are heading towards a point of depletion where there would be no looking back.

Before people are told about solar energy and why it is important for us to have a sustainable development, it is important to make the masses aware about what solar energy is. Solar energy in simple words is the energy or the power coming from the Sun. An inexhaustible source which has been there ever since life took place on the planet, sunlighthas been blessing us in kind and form since time immemorial. Without sunlight, there can be no vegetation, no healthy life and we would be living in darkness. Sunlight has been acting as a boon for us and with the advancement in technology; modern science has now opened doors for sunlight to substitute fuel to be used to produce electricity on mass level.

There are still several remote areas across the continents where people are living without electricity or in case electric power is present, it is not sufficient to light up all the houses. These are mainly the developing countries. At such rural areas, people continue to live in stark darkness once the sun sets. Therefore, it becomes our prime goal to make use of solar power in order to produce electricity. There are innumerable facts about solar energy that one can think of which can be counted as its benefits over other power sources. For one, solar power is not a paid form of energy. In other words, sun does not send us a monthly bill for the power supplied by it which makes solar power a very economical and viable resource that must be put to use. There was a time in the past when people were skeptical about solar energy as the conversion of solar power into electric power was seen as a costly thing. However, with increasing competition in the market and more and more people dealing in solar equipments, the process has now become an efficient method for harnessing solar energy.

Solar power information is very important so as to make it a popular means among masses. Another benefit of using solar power is that is helps heal the environment. We all are bombarded with the information of our ozone layer depleting at a fast pace which has resulted in imbalance in the ecology. The effects of this major change in the environment can be realized through imbalance in the weather, natural calamities, health problems and increased pollution levels among others. This has worked as an eye opener for many who have been adopting greener routes in order to save our natural resources. However, still a lot needs to be done on that front to spread the word about solar power and making it a routinely used resource. The best part about solar power is that unlike electrical power that leaves residueand pollutes the environment, solar power does not harm the environment while producing electricity. Apart from that, the equipment that are run by solar power are also very environment friendly. These equipments are readily available in the markets. Some of these equipments can also be installed at home with the help of 'do-it-yourself' kits available in the markets.

Apart from solar power, another natural resource is the wind power which like solar power also helps cut down costs and helps save environment in the longer run. However, for wind power to be harnessed to generate electricity, wind mills need to be set up. These wind mills require large free grounds that do not have any residential colonies. In addition to that, wind mills can only be set up at places that have free flow of wind which may also result in displacement of people in large groups. Establishment of wind mills is also a very tedious and an

expensive process, one that requires a lot of capital for initial set up. As far as solar power information is concerned, there is no such need for large free grounds. Solar equipment can be installed at the terrace of buildings and factories to be used by industries and households alike which does not cause any displacement of people at all. These facts are very important for people to know about solar energy before they go ahead with the idea of installing solar panels.

Defining solar energy and learning how we get it

We see solar energy everywhere - this is actually the energy we get from the sun. The light we get from the sun is actually electro magnetic waves (and because of this, it is often also referred to as radiant energy) that are first captured by solar energy systems and then converted into a format that is useful to us. Electricity generated in this manner is being in recent times used in many homes and it has become very popular. Yes, as an alternative source, it seems that solar energy has become increasingly popular and this is very economical as well, which is another reason for its popularity. To enable a home to use this energy, a lot of devices are used and they are photovoltaic cells, solar chimney, solar water heaters and others. But we must remember that out of the raysthat come into the earth, the most (70%) gets absorbed by the water bodies, landmasses and the clouds, and the remaining (30%) gets reflected back to space. We are able to just capture a small portion of this and then we can use them in many forms like mechanical power, chemical power and electrical power.

Understanding the way solar energy work at homes

The main source of energy is the solar radiation or the energy from the sun that we get. And it is this energy that is being used today in many areas of our lives. But of all of them, the energy is being used mainly for domestic purposes, and in this, we have to depend on solar power technologies because this is what makes this possible. But you should know that solar power technologies can also be of two types and they are active solar technology and passive solar energy technology - this differentiation is being made on the basis of their functioning. In homes, solar power technologies work in three distinct phases and they involve the first step of capturing the sunlight, then converting it into a usable format and then doing the all necessary work of distributing it to the destination. While both the modes (that is active and passive) is used for homes, it is the active solar technology that is more in use for residential purposes and in this, pumps, photovoltaic panels, active solar lighting and others are used. One

example of passive solar power technology is the daylighting system that is particularly helpful for lighting up the interiors of a home. However do take note of the fact that this system is both an active technology and a passive one. How does this work - it can effectively reduce the need for air-conditioning and artificial lighting and thus reduce the need for non-solar energy consumption. And this of course cuts down on the energy bills. But for daylighting to work efficiently, it is important that the windows, skylights, sawtooth roofs, light shelves and others are properly designed. And when this is the case, the non-solar lighting needs of yours can be reduced by as much as 25%. Another way in which daylighting can work for you is by using hybrid solar lighting or HSL. In this, to track the sunlight and channelize it properly to the interiors ofthe home, optical fibers and mirrors are used. You will be able to use almost 50% of the sunlight if you do this in a home that is single storied.

You will find solar water heaters as another popular application of solar energy for homes, but they are also of two types and they are the evacuated tube collector and the glazed flat plate collector. These heaters, as the name suggests, are used to heat up water. The evacuated tube collector is the type of heater that is used for the home. Solar power technologies also are used popularly in another way and that is in the solar cooker - this is very popular too. These cookers too work on the same principle - that is, they concentrate the rays of the sun to generate steam for cooking. However these cookers work in different ways and based on this, we can say that there are three kinds of cookers - panel cookers, box cookers and reflector cookers. In the panel cooker, there is a reflective panel that is used to direct the rays of the sun to an insulated container. The box cooker on the other hand is the simplest one of the lot and it contains an insulated container and a transparent lid wherein the temperature reaches around 90 degree centigrade to 150 degree centigrade. In the reflector cooker there are many shaped mirrors that heat up the container by reflecting the rays of the sun. This cooker too can take the temperature very high - as much as 300 to 315 centigrade. But the fact remains that all these three cookers need to be dislodged to track the sun's rays and they also need to be exposed to sunlight directly, because otherwise they might not work.

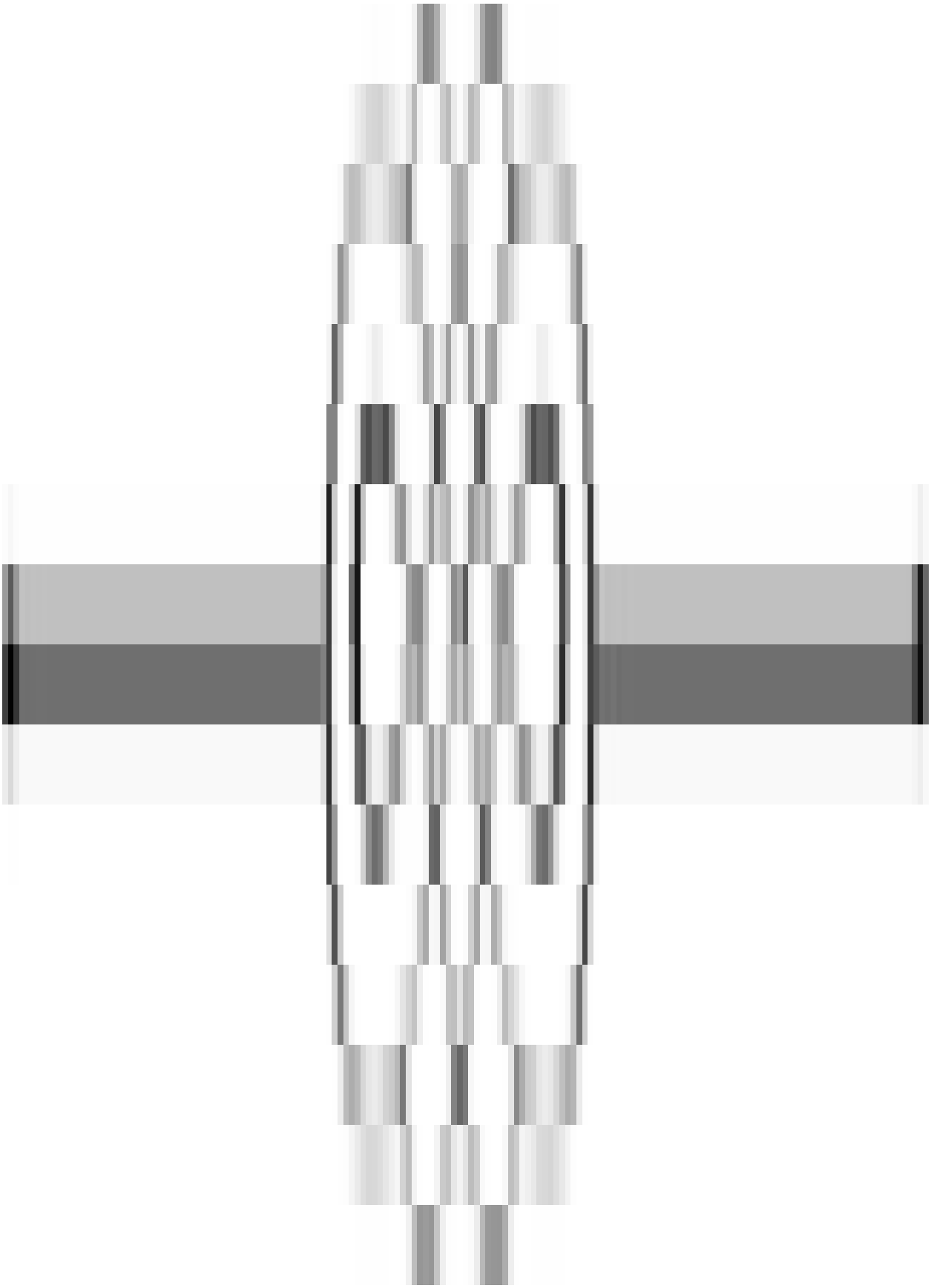
Solar energy for homes - pluses and minuses

The main reason that makes solar energy stand out is the fact that it is completely clean. And it is hugely inexpensive too. Just go ahead and install the system, and the operating expenses are almost nothing - it will operate for as

long as 25 to 30 years as well. To fully benefit, go for a bigger system using which you can also operate washing machines and air conditioners. These units can even back up power for a cloudy day. However there are those who mistrust their skillfulness and this seems to be only negative. But with mass awareness that these systemsindeed work well, this will surely go away. And above everything, when you opt for this, you also contribute to clean up the environment.

You can now easily install a home solar power system and for this, all you need is some simple information that you can get from a manual. Remember, there are many financial as well as ecological benefits. The manual will tell you where you should put it up, how to complete the installation and the wiring, where from you can get cheap parts and free batteries, and also the safety precautions. With this information, you are all ready to gain from your home solar power system.

Solar Power For Notebook And Laptop Computers



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his may seem incredible and impossible to do, but many computer technophiles are going "green" when they travel with a laptop in tow these days. If you are familiar with "extreme" or remote computing this may not seem too far fetched. Let's not forget that many professionals enjoy rugged recreational activities, but just can't always leave the office behind.

The idea of solar power for remote computing is finally catching on. It is working for everyone from the cross-country cyclist and weekend camper, to regular working stiffs that have to rough it on the job.

Solar power is not just a possibility, but could be a necessity for those that go remote. Solar panels are used to collect solar energy for direct use or storage in batteries to power up later.

Here is how solar, or photovoltaic energy is realized from the "How Stuff Works" website. If you are not an electrical engineer or scientist of some sort, don't be surprised if this does make light bulbs go off in your head. You can always come back and do further research on the Internet.

"The solar cells that you see on calculators and satellites are photovoltaic cells or modules (modules are simply a group of cells electrically connected and packaged in one frame). Photovoltaics, as the word implies (photo = light, voltaic = electricity), convert sunlight directly into electricity. Once used almost exclusively in space, photovoltaics are used more and more in less exotic ways. They could even power your house. How do these devices work?

Photovoltaic (PV) cells are made of special materials called semiconductors such as silicon, which is currently the most commonly used. Basically, when light strikes the cell, a certain portion of it is absorbed within the semiconductor material. This means that the energy of the absorbed light is transferred to the semiconductor. The energy knocks electrons loose, allowing them to flow freely. PV cells also allhave one or more electric fields that act to force electrons freed by light absorption to flow in a certain direction. This flow of electrons is a current, and by placing metal contacts on the top and bottom of the PV cell, we can draw that current off to use externally. For example, the current can power a calculator. This current, together with the cell's voltage (which is a result of its

built-in electric field or fields), defines the power (or wattage) that the solar cell can produce."

To continue, we will discuss the smaller hand held devices for cell phones and PDAs, all the way to powerful self-contained and fully remote commercial solar systems. Here are several links that describe the use of solar power for mobile computers and other wireless devices from the Do-It-Yourself perspective.

It is amazing what is already available and out in the marketplace for solar power options. As energy costs and energy conservation continue to garner interest as mainstream issues, we should see the rapid development of solar integrated design features. Soon it may be a standard feature and part of everyday portable computers.

Let's hope so, because going green is good for everyone, not just an intriguing proposition for rugged notebook users and remote computing,

Hand Held Solar Kits

Solar kits are designed to be self-contained. They combine solar cells, rechargeable batteries, and a wide selection of cables. These won't power a portable laptop yet unless it's a miser on energy, but they will keep you connected with a limitless power supply for your cell phones, Smart phones, PDAs, and smaller devices. As long as the sun is shining, or the batteries are charged up, you will have power.

Many purists will argue anything solar is not really "green", either because it will never be energy positive (will never generate more power than it took to manufacture), or because it has a battery, making it environmentally unfriendly by default.

Arguments aside, at issue for rugged and remote users is a reliable power source, and having some sense of being connected. So, solar charging devices can be considered either as "convenience efficient" or "emergency efficient". Don't take this as a challenge to engineer types that will want to get their slide rules out, just a notation that these solar kits are an honest attempt at the "plus" column for reducing the human carbon footprint. Wider adoption and acceptance of new technology usually results in greater efficiencies.

Two promising examples that have had good reviews are the reasonably

affordable products from Solar Style Dot Com, and the pricier Solio Dot Com. Do a search on YouTube and you will find many videos of Solio in action. If it did not work, we would know it by now.

Portable Solar Power Docking Stations

The idea of using solar power in remote situations is nothing new. The question for us is how well, and how fast, a solar power station will power up your notebook or laptop. Other considerations are the size, weight, and portability. You will find many products in this category, but few online reviews that confirm that these products will actually perform as advertised. The best source I have found for honest reviews in this regard is TreeHugger.com.

There are very few winners in the category of a portable solar power docking station to efficiently run a laptop computer. One that does get good reviews on the subject is the "PowerDock System".

Do an online search for PowerDock System, and you will find many retailers and dealers at different price points. So be patient and shop around. Your Mobile Desk Dot Com is the best resource for a complete descriptions of the PowerDock product line. These include from the least expensive to the most expensive: PowerDock Lite, PowerDock Basic. PowerDock Executive, and PowerDock Elite.Power Dock Systems are relatively expensive, and range in price form

a few hundred dollars on up to $450.00. The PowerDock is an attractive product design an weighs in from 5 to 13.5 pounds.

Another potential winner is the Notepower Solar Laptop Charger from Sierra Solar Systems. You will see the Notepower Solar Charger pop up along with the PowerDock in a search engine query for these type of solar products. Plug in the SmartAdapter with extended 10 foot cord included, and start charging or topping off your computer battery as long as sunshine is available.

Once again, this is not a review recommendation, but the Notepower has had favorable comments by TreeHugger.com and other reliable sources, giving no pause to mention it here. The 3 lb. Notepower is not designed with a storage battery, but the 20-30 watts of power will charge and run most laptop computers, according to the specs.

You may not consider the Notepower as a true solar docking station, but it is an attractive portable solar package for a temporary power solution. Originally priced around $250.00.

Commercial and Military Grade Solar Power Systems

Some of the best remote solar power systems are designed to meet military standards. You could even say that anything designed for military use is pretty much guaranteed to perform. These systems will compliment anything in the fully rugged notebook computer category.

Energy Technologies, Inc. in Ohio, USA makes a wide assortment of military standard power equipment for field use. Things like field deployable inverters, converters, UPS, engine-generators, along with solar power stations with the trade name Tactical Solar Products.

The product features for these Tactical Solar Products include various combinations of charge controllers, power storage batteries, AC/DC power adapters, multiple DC outputs, and a large selection of foldingsolar panels. The specific product line is the Solar Suitcase I, Solar

Suitcase II, Solar Suitcase III, Solar Suitcase IV, along with the folding SolarTacticalPanels.

Solar Suitcases I-IV can charge Lead Acid, Li-Ion, NiCad, NiMH & other types of rechargeable batteries. The nearly bullet proof folding solar collection panels are available from a 15 Watt to a hefty 330 Watt output panel set. This is "green power", but you are out of luck if you prefer a color other than the two camouflage patterns available.

You will have to call ETI for costs, as product pricing is not published on the ETI websites.

Computing Solar Power Wrap-up

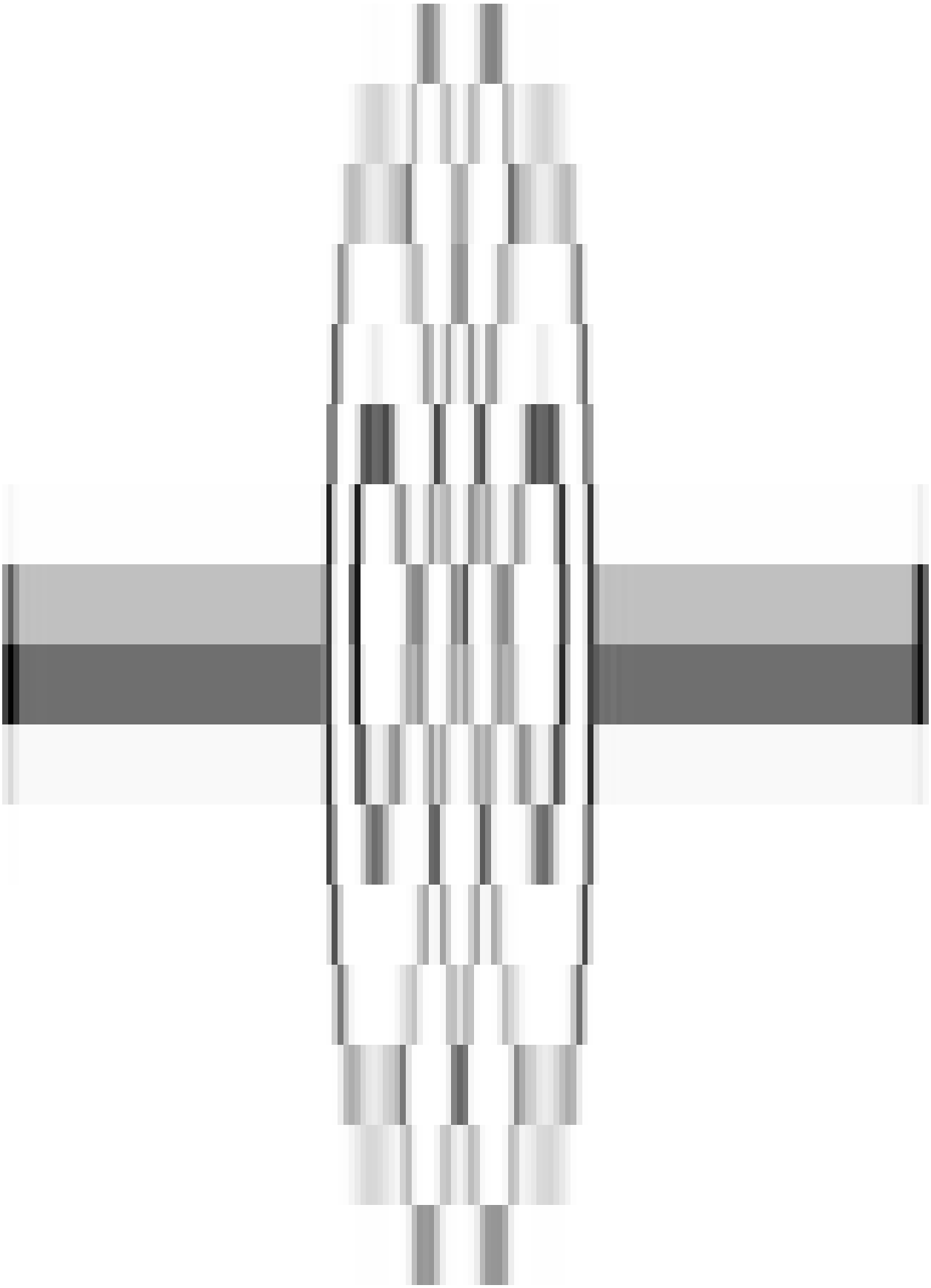
We have looked at several of the many possibilities for solar power, and going "green" with remote computing. The possibilities are becoming more reliable and starting to make more economic sense. You can try to go solar and Do-It-Yourself, or for the less technically inclined there is a wide range of retail and commercial applications for sale. We have attempted to highlight a few of the

proven DIY options, and find some of the readily available products, and systems from various online reviews.

Some of the solar power resource websites you might want to keep an eye on include: Altapower.com, RadioLabs.com, and CTSolar.com. There obviously are many more you will find now and in the future with your favorite search engine.

As computing devices become smaller and more mobile, and with nascent technology soon to push the boundaries of wireless networks, solar power could prove to be a factor in your computing future.

Reasons To Install A Solar Powered Well Pump System



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ave you ever thought about installing a solar power well pump? Do you have a rural or isolated location where you need to pump water either from the surface or from hundreds of feet underground? If so, a solar power well pump is the perfect solution.

Technology developments in both pumps and solar power have made this possible. Both solar panels and solar pumps have made advances which make them capable handling a wide range of water pumping needs. Many of these systems did not exist just a few years ago.

Below are the top 10 reasons to install a solar well pump. If you have never thought about installing a solar power system before, browse through the list and see if you can think of any uses. It is surprising, when remote low cost water pumping options are made available, ideas and uses pop into mind! Don't delay, find an install a system today.

Pump water anywhere on earth. No external power required

The problem with pumping water in rural locations is the need to run electricity to the site. For many years wind power and windmills were used in these secluded locations. Windmills are expensive and hard to maintain. There are better options today.

The breakthrough in solar water pumping is that there is no need for an external power source. The sun and the solar panels provide all of the electricity needed to pump water from hundreds of feet underground.

Solar well pumps are more efficient and more powerful than ever before

Solar power pumps of today are not like the novelty solar fountain pumps of the past. These are high power, efficient, commercial products. Top of the line solar well pumps are made of stainless steel and feature brushless DC motors.

Stainless steel is used for the pump housing and pumping mechanism for proper sanitation and to ensure a long life. The stainless steel will resist corrosion even when suspended in water for years. The stainless pumping mechanisms minimizes wear due to sand and other particles, while lifting water from deep underground.

The brushless DC motors are some of the most efficient on the market. Since they are brushless, there is never a need to remove them from the well to change the brushes. These motors are rated for tens of thousands of hours of operation without maintenance.

Systems are low cost and readily available

Solar power systems of the past had high price tags attached, in the tens of thousands of dollars. Advances in technology have made low cost systems possible and readily available. One of the main advances making this possible are solar cells and panels. Solar cell manufacturing has progressed to the point where it is very affordable. A system that previously cost tens of thousands of dollars is now in the low thousands. A 10X decrease!

A basic, but complete well pump system will cost about $2000. This baseline system will pump water from a few hundred feet deep, at a few gallons per minute flow rate. This basic system will replace most windmills, matching both depth and flow rate. They will keep a large pond full of water with no operating cost or pump enough water for a few hundred head of cattle.

Higher performance systems increase in cost to about three to four thousand dollars as more depth and flow rate are required. These systems are suitable to provide water to entire households or hundreds of head of livestock. They can replace your standard household well pump. The slight cost increase in these systems due to the higher performance, but remember these are complete systems, solar panels (a large cost) included.

Specialized systems can cost in the low tens of thousands of dollars. These are high performance systems pumping many gallons of water per second, sufficient for a complete farm or even remote village. They are overkill for most livestock and household needs. They are more suitable for large farming operations and crop irrigation.

No ongoing operating costs

After the initial system cost, which is often comparable to other well options, there are no ongoing operating costs. Normal wells burn money every time they turn on to pump water. This is not the case for solar well pumps, which get their power from the sun.

Every single day the sun is shining you are earning free money from the sun. What better deal exists? The sun shines down and water is pumped up from deep underground, saving you from overpriced electricity charges.

Much cheaper than installing main power to remote locations

Trenching main power to a remote location is costly in both time and money. This is one reason windmills of the past were so popular, since they required no electricity to operate. The "windmills of today" are solar power systems capable of pumping water without connecting to main power. You are no longer limited to how long of a power cable can be trenched into the ground or how hard the wind blows.

Complete systems can be shipped right to your door

Complete systems can be shipped right to your door in only a matter of days. It only takes two boxes, one for the pump/controller and one for the solar panels, to ship directly to your house or office. Many standard systems can be shipped by normal shipping methods (USPS, UPS, FedEx) without the need for freight shipping. This allows for shipping systems to all locations and all residences.

Systems are modular and can be upgraded over time

The components that make up solar power well pump systems are very modular. They can be swapped out and upgraded as needed. If more overcast performance is needed, extra solar panels can be added. If more water is needed per day, batteries and extra panels can be added, so water can be pumped during the night. If more volume is needed, the pump can easily be replaced to a higher power model offering higher flow.

Solar well pumps are easy to maintain

There are very few mechanical components. Solar panels are highly reliable and do not require any maintenance besides a quick wash every year or two. Brushless motors do not have brushes (hence the name) and therefore require no maintenance. The pumping mechanisms are highly reliable and are easy to replace in the field. A system should be able to pump tens of thousands of gallons without any maintenance.

Cheap to maintain

There are two items in solar well pump systems which may need occasional maintained, both of which are very low cost. Occasionally, every year to two, the

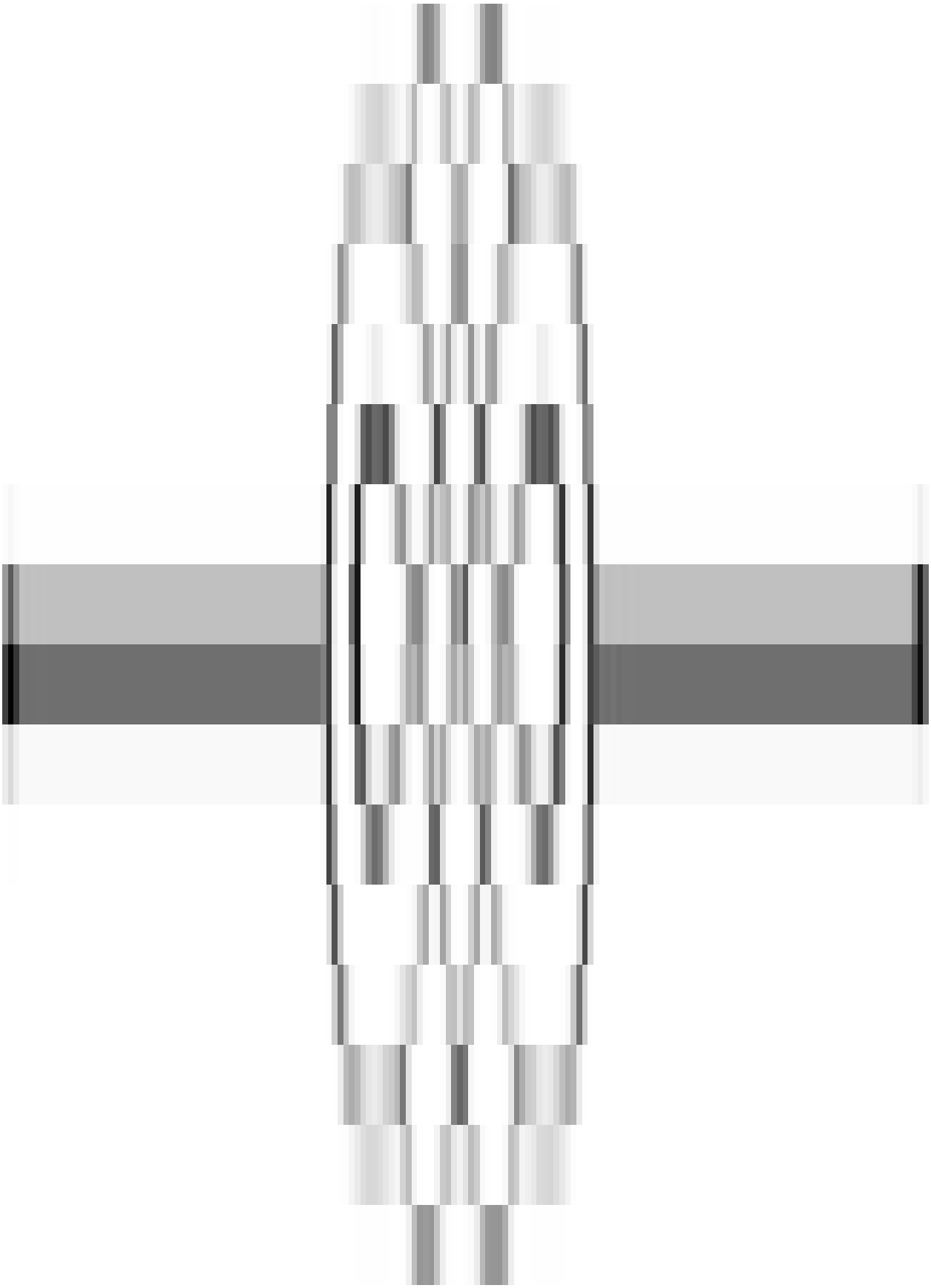
solar panels should be washed off to ensure maximum performance. Less often, about every 5 years, it is good to replace the pumping mechanisms which can degrade over time reducing performance. These mechanism cost about $20 dollars and can be replaced it the field.

Systems can be self-installed in a single weekend

Solar power well pumps systems are very simple and can be installed in a single weekend. All of the solar panel connections are made with waterproof connectors, no soldering required. The solar pump, solar panels, and sensors all connect to the controller using screw terminals,again no soldering required. The pump should connect easily to existing

power cables and plumbing. Just lower it down into the well and assuming you finish installation before night, water will start flowing!

Solar Power Roof Tile



What is meant by a solar power roof tile?

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he rays of sun generate radiant energy. Using different types of machines, this radiant energy can be captured, stored and treated to form other types of usable energy, as our needs might be. Solar power refers to the procedure of generating mechanical power, electricity or chemical power from solar energy resources. Solar chimney, solar heater, photovoltaic (PV) cells and solar roof tiles are some of the devices that can treat and harness solar energy. Among these devices, solar power roof tile has various advantages, and hence is generally preferred over other forms of commonly seen roof tiles. Roof tiles that are designed so that they can tap and process solar energy to produce electrical power or heat up water are called solar roof tiles. An industrial designer from Australia is credited with the invention of these solar roof tiles.

Getting to know the functionality of solar power roof tile

The modern day city is facing a serious problem - an acute power shortage. Solar power roof tile comprises of such techniques can solve this problem. Polycarbonate chassis is used to make up the solar power roof tiles, and it also contains a vessel of water and quite a number of photovoltaic cells (i.e. solar power cells). These solar cells are able to capture around 72%-80% of the total available sunlight. This is then transformed into heat energy, which in turn, warms up the water in the vessel. The electric wires of the building as well as the hot water system need to be connected to these tiles. The domestic requirements of electricity can be easily met by harnessing the sunlight that remains (around 20% of the total).

A handy boost to power savings is also achieved, since the roof tiles generate electricity that are well in excess of what is actually required in a home. Not much power is required from non-solar origins, since the excess electric power that is generated during the day can be easilyutilized at night. Adding to the convenience is the significant backup they provide on days when the sky remains covered with clouds. Let us now look at how the system works. An inverter is kept present, to which the photovoltaic cells are connected. This setup is then attached to the main power box of the house. An electricity grid is also used, and the power box is kept linked to this grid. Now, this electrical grid can

store all available surplus electricity. This excess electrical power can even be sold to the grid and some money can be earned. This helps the user gradually get back part of their investment on the solar roof tiles. After some time, the effective cost for producing electricity can even become zero too! Hence, installing the tiles makes sense, since they not only help a home generate its own electricity, but also prescribes a way to earn by selling off excess amounts of power.

All forms of different roof tiles can be easily matched to the solar power roof tiles, such are the designs of the latter. An estimated amount of 1.5 kilowatts of electrical power can be obtained if 200 solar power roof tiles are used. This electricity is enough for the needs of a home that has three to four bedrooms. In the current world, these tiles are in great demand, both for commercial as well as residential purposes. The commercial tiles can be installed easily and quickly, by following a simple procedure. They do not enter the building structure as such, and also have high wind resistance properties. Research show that these solar roofs can resist winds blowing at up to 120 miles per hour too. These solar power roof tiles can also be fitted in rather short spaces that might be available. Thus, wastage of excess power can be stopped, and the required amount of electricity can be produced by having the roof tiles at all places of the house that gets exposure. Other aspects of the solar tiles, like their cost figures, their efficiency and other likely side effects need to be paid due attention as well.

Gauging the utility of solar power roof tile

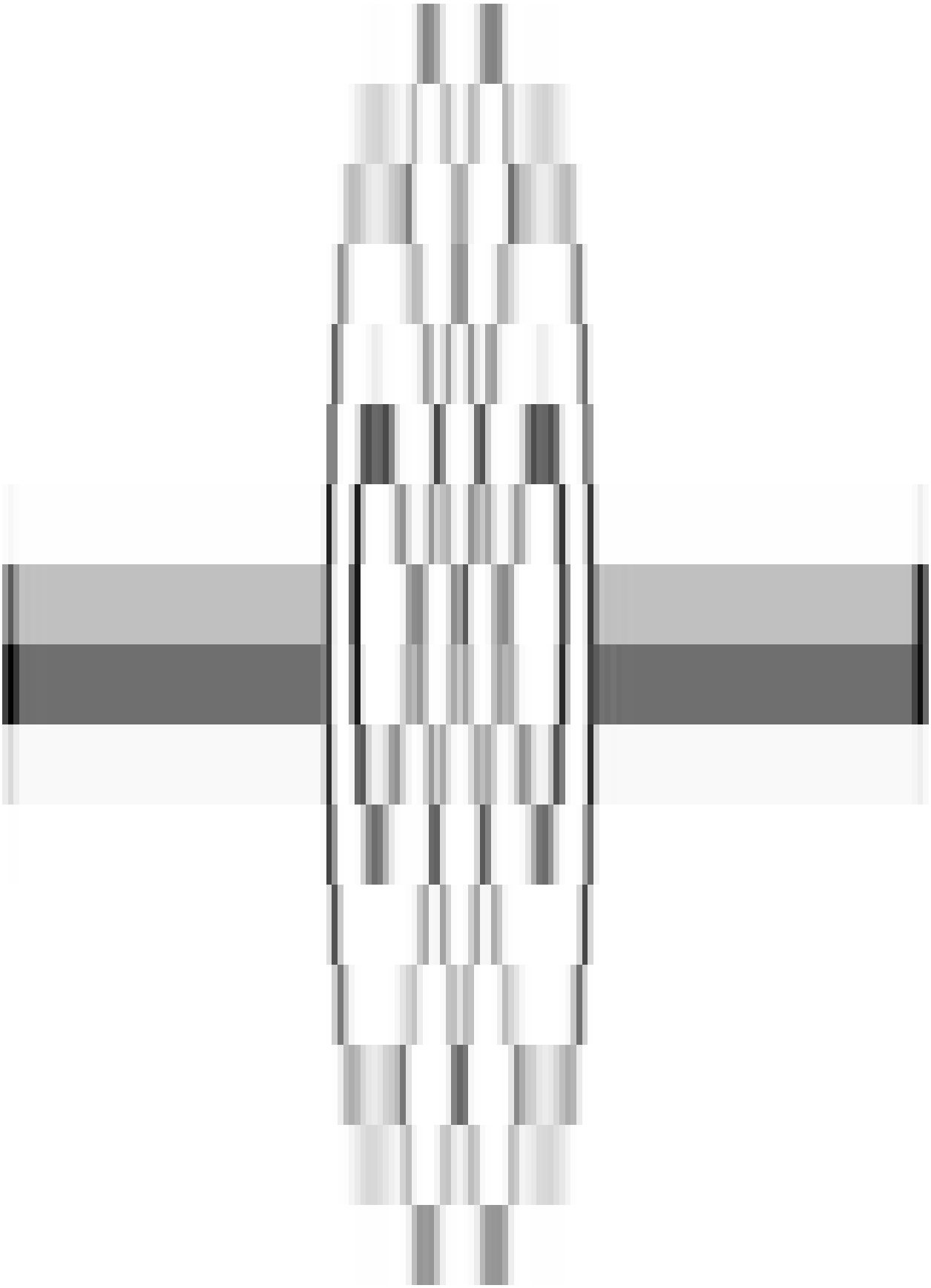
The solar power roof tiles have such structures that they can be easily matched with most types of different concrete tiles. Hence, the resultant streamlined appearance of the roof enhances the overall fashion anddécor of any building. Solar roof tiles generally need to be installed only once during one's lifespan. After installation is complete, there are absolutely no operating costs of these solar tiles, and they are expected to last around a period of thirty years. Many of the companies also offer production warranties for a 25 year period in addition.

Adding significantly to the process of installation of the solar roof tiles is the fact that, these tiles do not have other portable components that have to be moved as well. Solar power roof tile is extremely eco-friendly as well, since they do not pollute the atmosphere in any way, and do not emit any harmful greenhouse gas. Once solar roof tiles are in place, users can save extra amounts of power that is generated, produce electricity using a free and renewable source

of energy, and make the appearance of their houses visually pleasing as well. Economic benefits from these solar power tiles are also significant.

You should be installing solar power roof tile if you wish to cut down on your power bills. Home solar systems are also ideal for generating electricity in an environment-friendly way. What you should do first is to get a guide that would help you know the basic stages of installing the system, and the places that are best suited for it. Relevant security measures, as well as how the wiring should be done is also discussed in such a guide. You can also learn from where to get the components of the system at rather low prices, and the batteries totally free. Once such a guide has been consulted, you are ready to set up a solar power system at your home.

Understanding Solar Powered Air Conditioners



What is solar energy?

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ith the broadcast of Al Gore's "An Inconvenient Truth", the issue of global warming had escalated to unprecedented heights. These days, nearly all consumers are at least aware of global warming, and with the media's push to "go-green", many are now turning that awareness into constructive lifestyle changes.

One of the more prominent sub-categories associated with global warming is the issue of energy.

We all know that a considerable percentage of the world's limited energy supply is being depleted daily. Billions around the world consume natural resources in some way, either directly or through using products derived from these resources. However, even though most people are now educated on how they can make resourceful changes in their life, they still tend to overlook one area where a significant percentage of consumption occurs - energy.

Our planet is host to a wealth of natural energy resources, with fossil fuels being the one source we're most familiar with. Due to a steady increase in energy consumption, we now have dangerously fewer resources and energy reserves.

Many conscious consumers and businesses are now looking to source alternative energy to supply them with a eco-friendly energy source. Companies are now researching new and improved ways to harness natural energy through wind and water. Unlike traditional systems, these energy sources are renewable and plentiful. But there is still one element outside of our planet that offers one of the greatest energy supplies to world over - the sun.

We are now able to able to harness the energy of the sun and use it for several purposes, one of them being using heat to provide cooling. Thisis done through collecting energy through large dark grid-like panels

that are positioned to face the sun. The usage of solar powered air conditioners is not a new concept since they were used by the U.S. in the early 20th century. However, with the rise of electricity rates and the need for greater consumption,

there has been a steady increase in the commercial use of solar ACs.

SOLAR AC BENEFITS

Incentive programs -

The cost of setting up solar air conditioners can be very high. Still, a family or business opting to go with solar powered ACs can go a long way in reducing long term electricity costs. Additionally, both the federal government and many state governments offer incentive plans to solar energy users. However, since rates vary state by state, it's best to check your state to see what their specific incentive programs are.

Increase home resale value -

Furthermore, in addition to stabilizing soaring energy costs, solar energy panels are considered an investment. Many homeowners find solar features add considerable value to their home, and make their homes far more marketable in a competitive real estate market. Home buyers are known to be more attracted if two homes are comparable in every way, except that one offers solar air conditioning while the other does not.

There are also considerable savings for solar air conditioner users. IFC, a consulting firm, held a study on solar air conditioners where they show that solar energy can add $20 of home value for every $1 of year energy savings. To get a bigger-picture understanding of this, it's estimated that an annual savings of $1500 in electricity bills (due to solar energy additions) will add about $30,000 to the resale value of the home. In short, adding solar energy for air conditioning use will save consumers money in the long-run. They may even make a profit through reselling unused energy back to the state.If solar air conditioning sounds appealing, know that it does not come without its drawbacks. And as with anything else, it's best to know both the pros and cons before making a considerable investment in it.

Solar AC Drawbacks

Weather-dependent -

Solar energy panels for cooling have one obvious requirement - the sun. If solar ACs are the route you choose to go, know that you're going to have a significant

problem on days where the sun may not be clear enough for the panels to soak up the energy. While this is normally not a problem during the summer, in some areas it poses as a considerable barrier since hot humid weather can exist in cloudy, sun-less atmospheres.

In these cases, you may not have enough energy stored in the batteries to get you through the day. This problem is obviously magnified if you have a bad weather week, a bad weather season or a bad weather region. Since panels can only contribute energy when there actually is sunlight, you'll need to have some sort of storage device set up. But as you can see, solar powered air conditioning is simply not effective in areas that do not have many hours of strong sunlight.

Tracking the sun -

Being solar driven, solar energy panels need to constantly be directed towards the sun. As such, panel adjustments would need to be made each season. Most solar panel owners usually mount them in a fixed position at the latitude of the area they're in.

Cleaning -

In addition to tracking, solar panels need to be oriented and cleaned. This is particularly the case in areas where it snows. If you plan on getting a solar powered A/C, then you may want to consider placing your panels on the ground, mounded to racks or poles. Traditional solar energy systems are normally placed up high on a roof, but with snow and sleet, it becomes tricky and dangerous to clean if set up in a high, remote area of your home.

Energy conversion -

Solar panels put out DC power, which needs to be converted to AC before it can be used. There is also the added consideration of storing power to later consume during low light conditions. Most systems now have the ability to convert DC power to AC, and then place the excess power onto the Public AC utility grid. This resolves the energy storage issue, but it's advisable that you make certain your unit has this ability prior to setting it up. In addition, it's probably also best that you speak with a state representative and express your interest in solar energy.

Limited power supply -

Panels don't put out a lot of power. For example, a panel the size of an average desk can provide about 200 watts, which is about as strong as two high-powered light bulbs. To see if solar powered air conditioners suit your needs, you will need to consider the interior square footage of your home and keep in mind solar panels' limited power output.

Expensive batteries -

Aside from the issue of power storage, prospective solar energy consumers need to consider the costly battery reserve. Batteries are expensive, require maintenance, and don't last very long.

Easily broken -

Solar panels are also vulnerable to damage from hail and falling tree limbs. They are also expensive to replace.

High set-up cost -

Aside from battery costs and replacement panel costs, the initial set up cost for solar energy systems can be considerably high. In the long run the system is worth it, particularly in areas where there is constant sun and a constant need for cooling. However if you don't want to wait for the long run, and don't want to invest a small fortune in the set up process, you may want to consider energy-efficient portable air conditioners.

SMART AC ALTERNATIVES

A lot of smart green consumers know that you don't have to empty out your wallet in order to get green energy. These days, you can have your cake and eat it too. In a hot climate, costly linked with solar energy systems is frankly not a convenient option. Yet, for environmentally conscious consumers, the thought of switching on the age-old polluter known as the central air conditioning unit, is not a viable alternative. The smart AC alternative is the portable room air conditioner, which boasts considerable immediate and long-term benefits.

Benefit 1 -

Mobility. A portable AC is a mobile cooling unit that can be moved from room to room depending on where you need it.

Benefit 2 -

Portable room air conditioners provide immediate relief without the cost and time required with solar energy air conditioners. Having far fewer parts, mobile aircon units don't need to be maintained or repaired as frequently as solar energy units.

Benefit 3 -

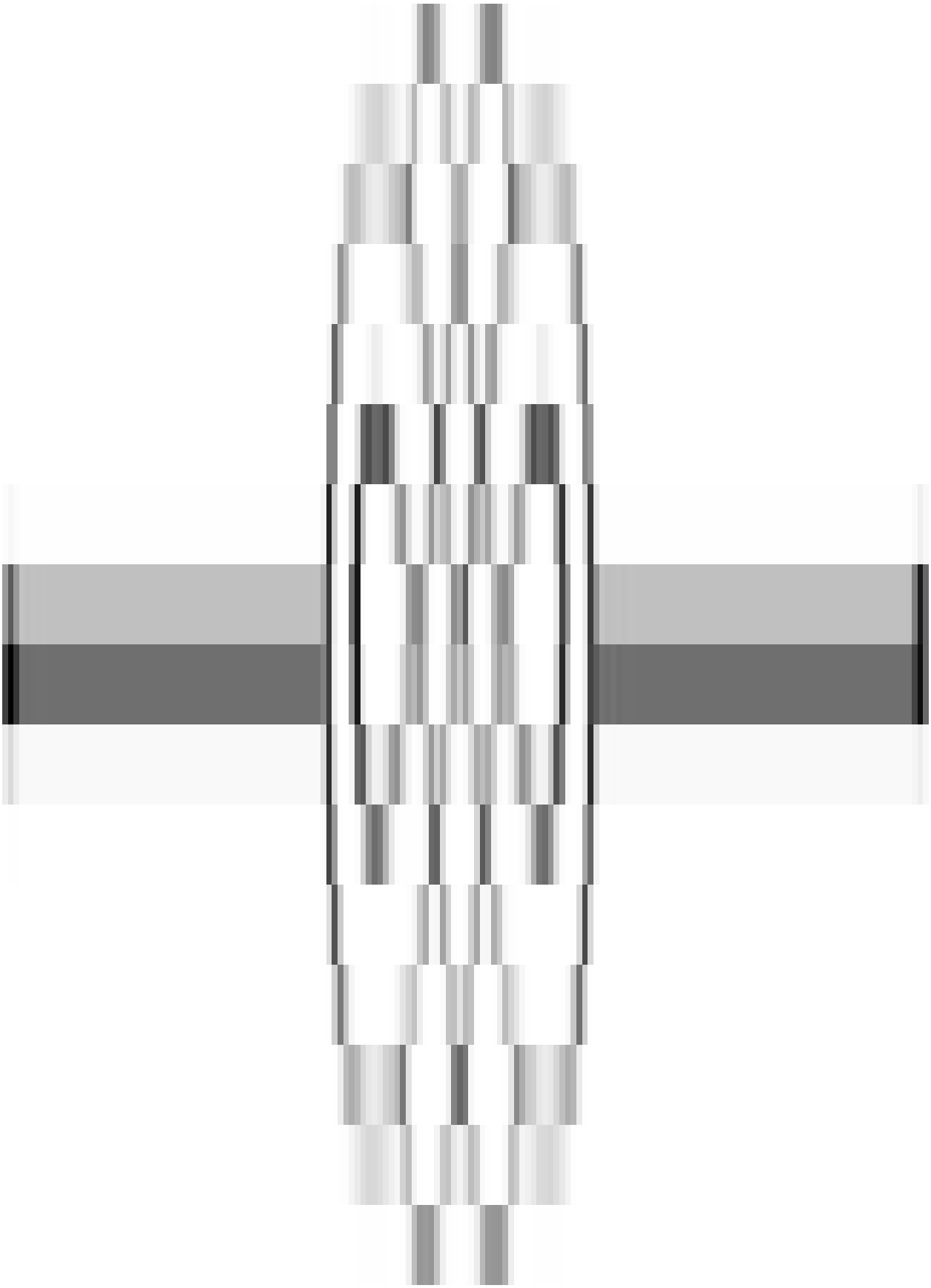
portable ACs don't need as much electricity to power them. In this way they are competitive with solar energy air conditioners. However with portable air conditioners, you don't have the high set up cost nor the problem of converting energy, storing energy, or being weather dependent. Plus, since mobile A/Cs offer sport cooling, you'll be saving money by not cooling empty or unused rooms. Your PAC unit goes right where you need it, and only where you need it.

Benefit 4 -

The majority of air conditioning units available today come with special ducting which ensures that any warm air is taken out of the room where the system is situated. This again helps to keep down the cost of cooling the room. This benefit is not available with solar air conditioners.When it comes to you buying a portable air conditioning unit, keep in

mind a few important factors to consider, such as the make, size and model of the unit as well as what special features you need yours to have. But the best option for those wanting to keep costs down is to go for smaller more basic models.

Solar Power Home



I

s solar power for homes the answer to our energy problems? Everybody knows there is mounting concerns over the state of our ever-diminishing energy resources. News articles have told us that maybe there is only enough petrol to last us another 50 years. Our use of traditional energy is excessive, unsustainable and we are running out fast. So, what can we do about it?

As ever our media sources have a handy solution. Be afraid! At every corner they spread fear. It is not just in the area of energy that they insist that we should be afraid. Be very afraid.

What they have learned is that fear sells. So, newspapers, TV news, you name it, they are all singing from one song sheet. Everyone should be afraid. If you don't believe me, check out the headlines of your newspaper today. Then tune into your TV news and see which story lines do they choose to follow?

They do like to throw in a jokey-smiley piece at the end about someone's grandmother's cat that got stuck up a tree and how the fire service got it down in one piece. They do that to imply that 'even though the world is a dangerous place', there is still something to smile about.

The world's media has an intention of spreading fear to sell their products and they don't care if they ruin your day to get their point across.

Why they do this has not what this article is about. My intention in writing this is to start you thinking about this agenda of fear, to ask you to consider that your future is not all doom and gloom as they suggest.

I am here to tell you that the world is not a dangerous place. Far from it. In fact, we could instead have newspapers and TV news hours filled with nothing but positive news - real genuine essentially important news articles that are entirely based in reality, and all positive news.

Now, before your cynicism kicks in (if it hasn't already!), I will say clearly that being positive, on its own does not make the difference. Saying there are no weeds in your garden does nothing. Weeds continue to grow regardless of positive declarations. If you want a weed-free garden, get down on your hands

and knees and pull them up once a week. That is how you get what you want in the area of weeds and gardens!

The same applies when we talk about energy. We are running out of traditional energy resources. There is no point in denying that. Instead, there is every reason to get it, to embrace what is so. Soon there will be no more petrol and gas to speak of. We can't hope to steal from our planet for ever without there being a cost to pay somewhere down the line.

Here's the thing to get though. If history teaches us anything, it is that we, as humans, have always used our superior intellect to overcome whatever grave dangers faced us as a species.

So, we ask ourselves, "Is solar power for homes the answer to our energy problems?"

You want to know my answer? Well, my answer is a resounding, No! There is no doubt in my mind that solar power for homes is not the solution.

However, what definitely IS the solution is the consistent use of solar power for homes together with the wide range of other alternative renewable energy sources such as hydro electricity and wind power.

There is no question that alternative energy is the answer to our energy problems. Maybe not today, but soon, these will be the resources that are driving our homes and industries forward.It is not whether this will happen, but when. How long before we start to impose this institutionally? How many more years must we watch China's massive coal mining industry rip into huge swathes of land? How many more nuclear reactor centers are to be built in the West? Where will we store all the radioactive surplus once the plants are closed down? Can we assume that our nations will continue to be able to afford the exorbitant upkeep costs of our nuclear plants? Already, Russian nuclear power plants are being left uncared for and their unmaintained nuclear submarines are leaking their cargo into the Baltic Sea. How long will the powers that be use their economic clout to continue to pollute our planet and poison our minds with this fear?'

I believe that solar power for homes must play a major part in solving humanity's biggest problem, the problem of survival.

You want some good news? Well, here's some. Already progress is being made.

Those looking to install solar power for homes are already enjoying good rebates and grants from many local governments. The sooner everyone gets behind solar power for homes on a national scale the better.

We could institute a state-wide solar ready house building program. The cost of installing solar power for homes would fall dramatically. What about introducing solar power plants? In certain states, such plants could supply enough energy to support the needs of whole towns, even cities.

By setting up acres of solar energy panels in untouched areas of desert lands, we could not only tap into their natural resources, but we could also radically alter the economic hardship that up to now has seemed unalterable. Already the wealthy nation of Israel is looking into this solution in the Negev Desert. What about cash-poor countries like Ethiopia and the whole area of the sub-Sahara? I mean the possibilities are endless here!As increasingly more technologically advanced solar panels feed into ever more efficient battery systems, such solar power plants would pull in enormous amounts of clean, renewable, safe and transferable energy.

So, the future is bright. With solar power for homes playing its part in this alternative energy revolution, literally anything is possible. We could be seeing whole populations getting all their energy resources for free. Why not!

The time is now for governments to make the huge investments needed for solar power for homes. The sooner we roll up our sleeves and start pulling up the proverbial weeds, the sooner we can stop living in fear and start enjoying a world full of positive news instead.

Thinking of making the switch to clean and green? Don't go shopping for your solar array before you've looked at some strategies for keeping the cost down.

If you've done any research at all you already know that the cost factor is what's preventing a large scale solar powered system from adorning every roof. The good news is that new technologies have recently been perfected that will dramatically reduce the cost of a solar power system.

Also, there are easy and affordable changes you can make right now that'll save you tons on your conversion to solar energy while keeping the planet a shade greener.

Reduce Your Use

How much power do you use right now?Your monthly energy bill will report how many KWH or kilowatt hours your household used during that month. If you haven't done anything to reduce your use up to this point you should realistically be able to cut your current amount of power use in half.

Here's how to painlessly reduce your use:

1. Insulate, insulate, insulate.

Plug every escape route you can identify.

Double up on the insulation in floors, walls and attic.

Ensure that no air is passing through dryer vents, chimneys, attic doors, electrical outlets and around doors and windows. On a breezy day hold a match or lighter flame near any suspicious areas. If it flickers, air is moving in or out. Find the leaky spot and plug it.

If it's time to replace the windows, seek out the most energy efficient types available.

2. Hot water solutions.

120° F (48° C) or less is the ideal temperature for your hot water heater for energy reduction and safety from scalding. Most families use their hot water in the morning and after supper yet the water is kept hot even when no one is in the house or everyone is asleep. Programmable water heaters only heat water when you tell them to - saving hundreds of dollars per year on your hot water heating bill.

Wrap your hot water tank with an insulating blanket (made especially for this purpose).

Better yet, install a solar hot water heater. More about that below.

3. Use a power bar.

Plug your TV, computer and stereo equipment into a power bar which can easily be turned off when the equipment isn't in use (at night and when you leave the house). When left plugged in to a regular outlet these types of equipment continue to use small amounts of power while in stand-by mode even when they're turned off.

4. Reduce heating and cooling costs.

Turn the air conditioner off or up and furnace off or down when you leave the house and save scads of money every month.Progammable heaters and air conditioners, like programmablewater heaters, heat and cool your household only when you need it.

Heat and cool only the rooms you're using at the moment and close doors to the unused rooms.

Strategically placed ceiling and rotary fans reduce the need for air conditioning.

Insulating draperies and shutters keep the indoor temperature where you want it. By preventing the escape or intrusion of air you'll have more control over the temperature in your living space. There's little point in cranking the air conditioner up if the sun is blazing through the windows, conversely, you'll lose precious heat especially at night, through uncovered windows when the weather is cold.

A solar power attic fan expels trapped heat from the attic space reducing your home cooling costs in the summer and prevents the accumulation of health threatening molds.

5. Make Use of Small Appliances and Laptops

Toaster ovens, electric kettles, electric fry pans, slow cookers, etc. need much less energy than the stovetop or oven.

Laptop computers use way less energy than desktop models.

6. Lighting Options.

Incandescent bulbs convert most of their energy to heat rather than light which makes incandescent light inefficient and expensive. Switch to those curly fluorescent bulbs or LED lights for big savings (We really like the LED bulbs which stay cool, draw very little power and emit a clean white light).

Install dimmers on your light switches to get lots of light when you need it and less light when you don't.

Eat by candle light a couple of nights a week.

A scented candle in the bathroom provides enough light while keeping the air sweet.Use solar powered motion lights around your yard to light the way safely for family and guests and to discourage intruders.

LED string lights reduce electricity needs at Christmas and look lovely year round.

7. Laundry Strategies.

Front loading washers use less power, water and detergent than top loaders.

Look for the energy star when purchasing a new washer to ensure that you're getting one of the most energy efficient models on the market.

Wash and rinse your laundry in cold water (studies have proved that there is little benefit to using hot water for laundry) and wash full loads only.

Use a solar powered clothes dryer (commonly referred to as a clothesline). Not only will you save a bundle on energy costs but the sun will bleach your whites while adding a delightful fragrance.

When you must use a dryer make use of the cool cycle as often as possible.

Appliances that make things hot or cold use the most household power. Focus on temperature altering appliances for the most dramatic energy savings. These include, refrigerator, electric oven, central air conditioning, central heating, freezer, washing machine,

dryer, electric stovetop and dishwasher. Dust or vacuum the coils on the back of your refrigerator every month or two. When the time comes to replace these appliances, purchase the most energy efficient models available.

Unplug the fridge and store perishables in a basement cold room or underground pit and add a wood burning stove or use energy efficient space heaters to further reduce your energy needs.

Passive Solar Principles - Use the Free Stuff

Passive solar applications can dramatically reduce the need for heating and air conditioning.Before you spend tens of thousands of dollars on a photovoltaic array

(solar panels) take advantage of the free stuff. Incorporate as many passive solar strategies as your situation allows. It's as simple as letting the sun in where and when you want it and keeping it out where you don't along with making use of shade trees and natural breezeways available on your property. Here's how:

Staying Cool with Passive Solar Strategies

If you're trying to keep a box of air cool in a hot environment, it makes good sense to keep the hot air out of the box by using insulation on the walls, floor and ceiling and plugging any holes that let the hot air in. Adding window and door openings to that box makes it a little trickier to keep the interior temperature stable. Here are some passive solar energy techniques to help you keep your cool.

Insulation... Lots of insulation

Awnings keep the area immediately around windows and doors from heating up and prevent overhead sun from entering the house. Install retractable roll up awnings if you want to let the light in during the winter.

Covered Verandas provide deep shade on a sunny side of the house and along with making a shady outdoor space they keep the sun from making the house overwarm.

Ceramic, stone or marble floors stay cool underfoot and can be covered with area rugs during cooler seasons.

Take advantage of the wind if you're building or renovating. Situate openings so that seasonal breezes can wend through the house.

Add shutters or insulated window coverings especially over south and west (north and west in the southern hemisphere) facing windows.

Trees, trellises and potted plantings can be situated in front of south and west facing windows to keep the sun out. Choose deciduous trees if you want the sun to come in during winter months.Plant more trees. The shade and evaporation produced by a single, mature, hardwood tree in a day is equal to the effect of 10 window mounted air conditoners running for 20 hours. All that and it purifies the air too.

Create a shady oasis on the cool side of the house. Arrange trellises, potted shrubs and plantings around a pergola and train hardy foliage to grow up the trellises and over the pergola. Surround a free standing awning with leafy plantings to establish a cool gathering place for family and friends.

Add an outdoor cooking area and keep the heat out.

Skylights and windows that are slanted inward make it very difficult to keep the sun out when you want to. If you really love the idea of a skylight and live in a hot climate, situate it in an area where direct sun will not be allowed to enter.

High ceilings work well in hot climates by allowing hot air to rise above the living space.

Warming Up with Passive Solar Energy

Insulation, it can't be overstated. Insulation is the key to maintaining a desired indoor temperature.

Thermal Mass absorbs the heat of the sun and radiates the heat into the home. Very dense materials such as ceramic tile, stone, brick and concrete soak up the heat of the sun and continue to warm the interior space for hours after the sun has set. In order to be effective the material should be at least 4 inches thick and situated where direct sunlight strikes it. Floors, window seats or half walls constructed of thermal absorbing materials situated close to south and west facing windows are some ways to catch the sun's warmth and use it to heat your home. Once you get the heat in, keep it in.

Shutters or insulated window coverings help to keep the cold out and heat in. Keep them open to allow the sun to stream through the windows and heat your space during sunny times. When the sun isn't shining, close them to prevent the loss of heat and preserve the warmth in the house.Windows and Doorways should be most abundant on the south and west sides of the house to allow lots of winter sun access to the house. Minimize windows and doors on the north side to prevent the escape of your hard earned heat.

Trees and plantings. On south and west sides of the house deciduous (leaves fall off in the winter) trees and shrubs or annual vines (hops grow really fast) shade windows during the hottest part of the year but allow the winter sun to warm your interior space when the branches lose their leaves. On the windy side of your property a row of evergreen trees block winter winds and make it easier to maintain heat in the house.

A mudroom or separate entry area gives you more control of your interior temperature by containing cold air when the door is opened to the outside.

Pergolas and Arbours - Rather than deeply shaded porches, in a cool climate you'll want to have more control over the amount of sun allowed to access your home. Train seasonal vines over a pergola or arbour to provide shade during warm seasons and sun, when the leaves fall off during cool seasons.

Roll Up awnings are a great way to shade windows during hot seasons while allowing you to let the sun's heat in during cold seasons.

Low ceilings keep your hard won heat in the living area. It's much easier and less expensive to keep a space with an 8 foot ceiling warm than it is to keep a room with lofty 16 foot ceilings heated.

Skylights, if you can't live without them, should be constructed of very well insulated glass to prevent the loss of heat.

Add a Solar Water Heater

Why start with a solar power hot water heater? Because water heating costs represent about one third of your energy costs and a solar water heater uses a low tech flat plate collector to heat the water. That means that it's the cheapest way to get into the solar energy market. Add to that the fact that cost recovery time for solar water heaters is 5 years or less and that gives you the biggest and greenest bang for your buck.

Conclusion

Thanks to reach the end of this book!

I hope you had received the needed informations to install and design your home, tents or vans.

I really appreciate an honest review to better spread the informations with other people.