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http://diy-renewable-energy.com/earth4energy/

Introduction

There is one disturbing fact that people are slowly beginning to realize. We can't depend on fossil fuels for our energy forever.

Oil prices are skyrocketing around the world. People are fighting and dying over oil reserves. The damage to our planet and our climate is irreversible and is becoming more and more apparent by the day.

Put shortly, chances are that if we don't do something about our energy situation now, our kids and their kids are going to have to face some extremely difficult challenges in the future.

But what can we do? It seems that most alternative energy choices are too expensive to mass market. As an individual, is there really anything you can do to make a difference?

We're going to answer those questions and a whole lot more throughout this book. We'll look at some of the things you can start doing right now, today, to do your part in solving the world's energy crisis.

Chapter 1: Before You Start

Renewable energy is an amazing thing, but it's not easily accessible or affordable to everyone in its current state.

That doesn't mean that there aren't things that you can do right now in order to cut down on your energy expenses.

You can start by using energy efficient fluorescent light bulbs in all of your lights.

Turn off all appliances, such as TV's and computers when they are not in use. They still consume energy, even in standby mode.

Air dry clothes and dishes when at all possible, and only run the dishwasher or clothes washer with full loads.

Avoid baths. Try to take short showers.

Keep your thermostat at a comfortable but moderate temperature. Not too cool in the summer and not too warm in the winter.

Drive sensibly and keep your car tuned up for the most fuel efficiency. Excessive speeding, rapidly accelerating and breaking can waste.

Make sure that your house is well sealed around

windows and doors. Warm or cool air escaping from homes can substantially drive up utility costs.

If you plan on using renewable energy such as wind or solar power in your home then you MUST act on the advice above. I didn't just put it there to look good. There is no point going to all the effort of making a wind or solar generator if you are going to leave lights and power points on when the appliances are not being used etc.

Chapter 2: How Solar Power Works

Solar power is an amazing thing. The Sun blasts enough energy over the surface everyday to provide us with more than enough power to sustain ourselves.

Right now, technological limitations and financial considerations are the only reasons that we aren't using solar power for the majority of our energy needs. That won't be the case forever though.

Solar power works by collecting the energy output by the sun over a specified surface area, and then converting that energy into usable electricity.

Solar panels collect and convert that energy using photovoltaic cells. The word photovoltaic literally means "light (photo) "electricity" (voltaic).

The cells are made up of semi-conductors, with silicon currently the most widely used.

When the sun's rays hit the surface of a semi-conductor, a reaction takes place. The chemical makeup of the solar panel absorbs the energy, and the energy causes electrons to break free of their atoms and in the process they create electricity.

Advances in semi-conductor technology are allowing for our solar panels to absorb and retain an increasingly growing percentage of the energy output by the sun.

Chapter 3: Build Your Own Solar Generator

Did you know that building your own solar generator is not only easy, but also extremely cost effective?

First off I am going to show you a few different applications a solar power system can be used with. The first solar power generator I will talk about will be my portable system that you can use to power just about anything you like. This is also a good system that you can take camping and you can create it for no more than $200. (If you don't know what each of the parts are used for please refer to the end of this chapter.)

Portable Solar Power Generator

This solar generator can literally pay for itself within the first few weeks that you put it into use. I have included the most basic setup below but there are some extra features you can add if you have some money left over. You can build on this system by using multiple solar panels and batteries. We will talk about wiring together multiple panels and batteries later on in the book.

Please see the below setup diagram:

1. Energy source – Solar panel(s) (12V is fine)
2. Charge controller

3. Battery
4. Inverter
5. Household loads (Laptop, TV, DVD player etc.)

This is a really simple solar power setup that you can create for less than $200. You can either purchase your solar panel or make your own. We will discuss the process of building the actual solar panel later on in the book.

This type of system is great for outdoor use. A good place to store the batteries and other electrical equipment is in your garage or shed. You can then run appliances straight off your inverter. Fridges are great to run of this type of system and you will be surprised at how much power you can save just by running your fridge from this system.

Options:
Batteries work better at warmer temperatures so it is a good idea to invest in a battery box. This will also keep the whole system neat and is a good idea if you have pets or children around. Another feature you can ad is a system meter. This will go between the battery and the inverter. The system meter will tell you how full your battery is and how much power is being used.

Grid-Intertied solar power system

This is the type of solar power system you should use if you a still using power from the grid. This is also known as on-

grid, grid-tied or a utility interactive solar electric system. If more electricity is produced by the solar system then that is used by the household loads then this will actually turn the electric meter backwards. When this happens it will credit your account and you can use this for future month's power usage when less electricity may be produced (periods of cloudy weather). This arrangement is called net metering or net billing. Please consult your local electricity provider or stats regulatory agency for further information.
Please see the below diagram of a simple grid-intertied solar power system:

1. Energy source – Solar panels

sense at about 10 cents per kilowatt hour.

Wind turbines are becoming less costly to produce, and are continuously becoming more and more efficient. Soon seeing wind turbines powering rural homes, more turbines running in windy areas, and even turbines on the ocean will be a common occurrence.

Chapter 7: Building Your Own Wind Generator

Most wind generators sold commercially can cost several thousand dollars and the price only rises from there.

Here we're going to show you how to build your own wind generator for as little as $200. These windmills can be setup to power any household appliance. Even though you can build this windmill for next to nothing, you will need to be in a windy location for this to be worth the effort. There is no point building a windmill if there is no wind, right? In which case, you should look into solar power.

Here's what you'll need to get started on your windmill:

DC Power Motor (Ametek)
Body Assembly
Tail Assembly
Blades To Collect The Wind Energy
A Hub To Connect The Propeller To The Motor
A Tower

A Battery Bank
Nuts And Bolts
Miscellaneous Hardware

The majority of the materials that you'll need can be found rather inexpensively on online and at your local hardware store.

As for the tools, you'll need a socket set, several screwdrivers, a grinder, a jigsaw, and some sandpaper.

Now that you are ready to get started we need to source all of the parts you are going to need. Below are the cheapest options to get these parts.

Finding Cheap Batteries

You'll need a good deep cycle battery to store the power from your wind generator.

These can be purchased rather inexpensively on online, but there are ways to find them for free as well.

A couple of good sources of free batteries are old golf carts and forklifts.

Companies tend to replace these batteries long before their shelf life runs out, and they just so happen to make the perfect deep cycle battery for our wind generator project.

Material for the Blades

The most efficient wind generators have a blade diameter of roughly 8 feet and a total of 3 blades. If you find that 8 feet is simply too large for your backyard than you can cut it back as needed. Just make sure the shape is the same.

Remember, our goal is to produce 1000 watts of power and to achieve this output you will need to use blades of about 8 feet in diameter with wind speeds of at least 20 miles per hour.

The best material to use to create your blade is ABS or PVC pipe. Pipe that is between 8 and 12” in diameter works the best.

Note: When using pipe, keep in mind these where intended to be used underground. We recommend painting them with

This brings us to the end of our Earth4Energy Sneak Peek...

To get the full version, simply go to:

http://diy-renewable-energy.com/earth4energy/

So, what's all included in the Earth4Energy kit?

- Earth4Energy Manual
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