
TeslaSecret
EXPOSING TESLA'S "FREE ENERGY" DEVICE
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Nikola Tesla Secret

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Contents at a Glance

Introduction

Introduction

Welcome to the Nikola Tesla Secret! I would like to dedicate this book to the many energy enthusiasts that without their hard work, this book wouldn't be possible.

Nicola Tesla Secret is not the work of a single individual, but the work of many energy enthusiasts around the world that spent countless hours and money experimenting and fine tuning this FREE source of energy; which was first discovered by the father of Electricity, Mr. Nicola Tesla.

Mr. Nicola Tesla was the first to discover this type of energy source and owned many patents on it as well. At the time, he was called a dreamer, that his invention was impossible, that he was making everything up – for the only scope to stop this technology from being made public.

However, today, over 100 years after Mr. Nicola Tesla told us about his discoveries, we are realizing that Tesla was right, and those people making fun of him were doing so to save their own pockets.

After all, its human nature to rather say that something does not work, instead of saying that we don't have an idea why it's working – especially if money is involved. We feel much better when we excuse ourselves rater then admit our stupidity.

In today's society, people are more or less the same. We have been told how the world works, how basic laws of physics work. According to the books we read, we know everything there is to know about every possible physics law. You will not find any book at any university that tells you what the truth is. In reality, we discovered only a very small percentage of physics laws, and everything that we did discovered is not fool proof either.

The problem in today's education system and society is that we are not though to be open minded and be ready for change, because theirs a lot more to be discovered then we can possibly know.

Energy Companies don't want anyone to have free electricity – otherwise they won't earn any money. They would lose their multi-billion yearly profits with free energy available. Therefore, these

companies donate millions to governments (bribing them) to make sure that free energy devices stay out of the public market. Tactics and means of suppression include buying the patent of the free energy device from the inventor or his family, suing the inventor or patent holder and even murdering the inventor in extreme cases.

During the past years, their have been many occasions when huge changes were imminent – and for the well being of everyone in the world. But the government did everything to prevent such changes – and it managed to do so very effectively.

One such occasion, was when over 100 years ago, Tesla was building a device that would have provide the whole world with an unlimited amount of totally free and clean electricity.

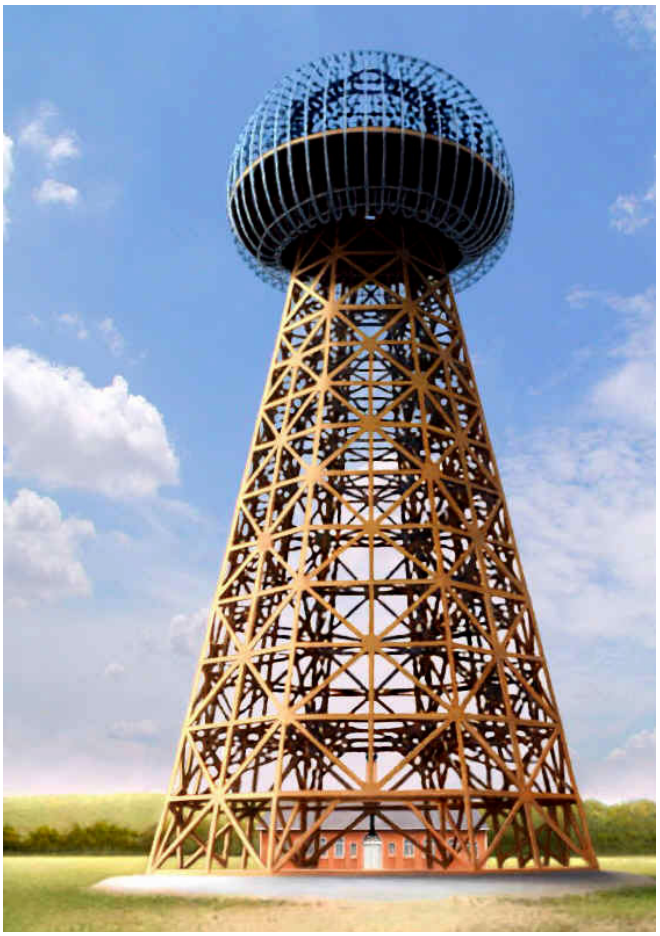
What if Tesla's invention was not suppressed at the time how would be the world we live today? *Probably a much cleaner world with far less pollution. The trillions of barrels of oils that we burned would still exist and we wouldn't need them. The ozone layer that has been extensively damaged with pollution would still protect us from the sun*

rays. Skin Cancer, Asthma Sufferers and so many pollution health related conditions would be far much less frequent, if they would exists!

But this didn’t happen; and we are still suffering the consequences to this very day.

The Magnifying Transmitter

Chapter 1



The Magnifying Transmitter

Tesla construction a huge Magnifying Transmitter at Shoreham, Long Island, a site which he named Wardenclyffe. Following his return to New York City from Colorado Springs in 1899, Tesla was jubilant and full of enthusiasm to implement his plan for the commercial application of Radiant energy. He turned to JP Morgan (An Investor) for a substantial portion of the funding to finance the huge project at Wardenclyffe.

Tesla told him that the transmitter could transmit “intelligence” to the world, Morgan assumed that he meant ordinary radio communications, but Tesla was not referring to ordinary radio transmissions. He was talking about electricity, but avoided revealing all to Morgan during this early phase of the Wardenclyffe project.

Some considerable time later, Tesla eventually felt compelled to tell Morgan the larger possibilities offered by the Magnifying Transmitter when he needed more funding to complete the project. Tesla thought that Morgan would be overwhelmed by his expanded explanation of the true capacities of the transmitter and would be anxious to

complete the work, but Tesla's assumption had backfired and Morgan refused to lay out any more money for the transmitter. Sadly, the enormous benefits that could have been made available to society by Tesla's Magnifying Transmitter project, died then and there.

One Man's Greed

Morgan had already orchestrated circumstances in Tesla's life in order to force Tesla to be dependent on him for financial backing. During an earlier period, when Tesla himself had millions from his Polyphase AC generator royalty payments and other earnings,

Morgan wanted to woo Tesla with a deal that effectively gave Morgan majority control over his patent rights and projects, but Tesla turned him down, telling Morgan that he had enough money of his own to fund his projects. While returning to his hotel from that very meeting with Morgan, however, Tesla was told that his laboratory had been burned to the ground. It represented a tremendous loss to Tesla and it shook him deeply.

Everyone, of course, felt convinced that Morgan was behind the arson. In order to save face, Morgan was embarrassed by Tesla into putting up the money to pay for the rebuilding of a new lab as an act of “philanthropy”. From that time forward, however, other financial backers were not to be found. Morgan was powerful enough to black list Tesla among the Eastern Establishment elites that previously had hobnobbed and feted with Tesla as if he was one of their own. Black listing and ostracization by officialdom and financiers lifted somewhat after Morgan’s death, but generally continued to haunt Tesla for the rest of his life.

Tesla Success

Despite the loss of Wardenclyffe, Tesla continued to refine his understanding of Radiant Energy and miniaturize the equipment needed to produce it. He eventually was able to reduce the equipment down to the size of a suit case. Such reduction in size meant a reduction is output as well – therefore the concept of having free electricity for everyone with his device was not strictly possible. But we will discuss about his invention in the next chapters.

The Nikola Tesla Secret System

Chapter 2

The Nikola Tesla Secret System

The Nikola Tesla Secret System or more specifically “energy from the sky” is a collection of methods used to gather usable energy directly from the sky.

There are many methods available to gather this type of electricity, but there are 3 in particular that are very easy and rather inexpensive to implement and use.

The methods that we will describe are as following:

- **Utilization of TV & Radio Waves**
- **Utilization of Static Electricity**
- **Utilization of Radiant Energy**

This book will explain each of the above methods in as much detail as possible to help the beginner enthusiast, and we will also explain real world implementation of each system.

Moreover, we would like to remind you that electricity is not a joke. One should never play with any electrical devices without the proper training and qualifications. Electricity, if handled improperly can kill you in an instant. This book is in no way a beginner guide to electricity. While we will try to explain everything step by step, if you don't have a basic understanding of electricity you should not try any of the methods for your own safety or get a qualified electrician to help you out.

For safety reasons, it is highly advised that before you get started and buy lot of expensive equipment enough to build a power station (or so to speak) you should keep it simply at first, and build a small unit.

While a small unit will not generate enough electrical power for your entire home – it will be much easy to build and the success rate is much higher. Proof of concept is very important, and once you have a small working model it will be much easy for you to build a larger one using the same principles.

We would like to note that this type of energy is already being used by various individuals around the world. We are not in any way the original inventors of such technology. We are alternative energy enthusiasts that after countless of hours researching and experimenting with this type of technology wanted to give something back to the community that will hopefully help even more individuals to replicate and use it.

If you are the skeptic kind of guy, and still thinks that energy from the sky is not possible, probably you wouldn't be reading this. But just in case, if you are still uncertain go over youtube.com and search for radiant energy. You will find that the technology have been replicated by many individuals from all over the world. Different setups, some more effective then others are being used to power homes and even sell electricity back to the power company.

It's really unfortunate that anything that falls under the category of "FREE Energy" is branded as a scam. We spent a lot of time on forums, asking inventors and helping replicators to replicate this technology.

Sadly not everyone can understand what they see with their own eyes. Some people do make claims blindly and will label others without even knowing who they are and what they did.

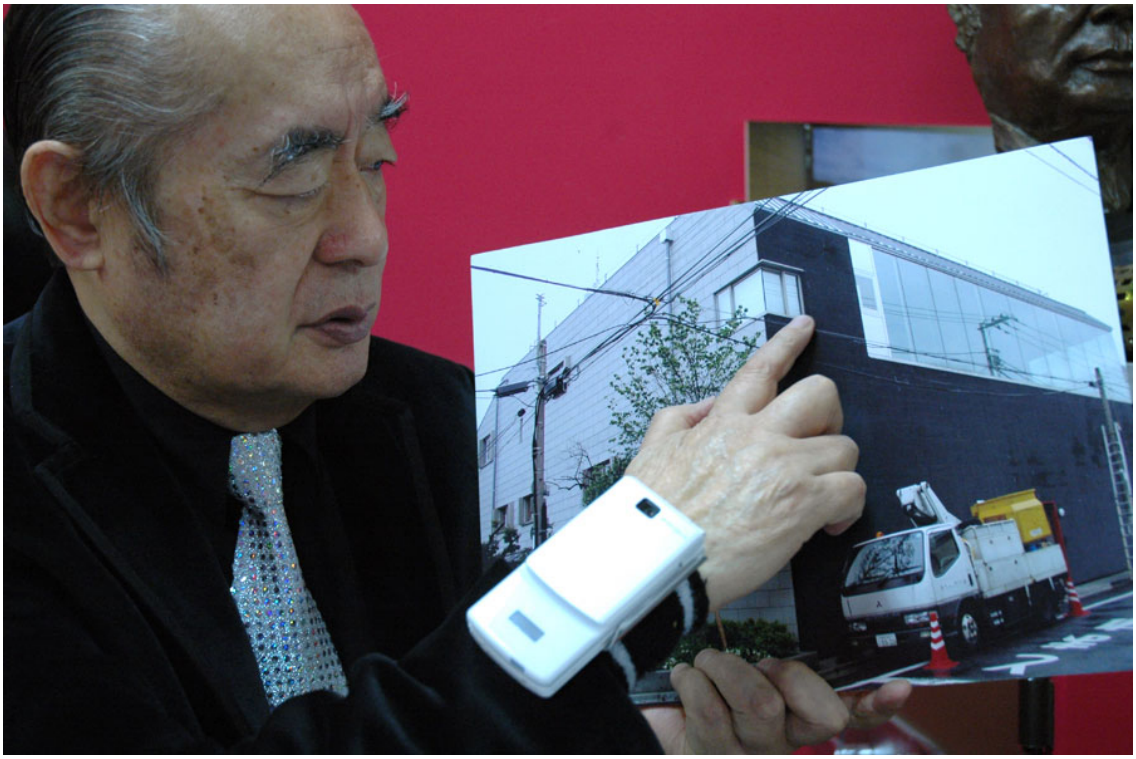
We already know that once this book is released, many websites will look at “Nikola Tesla Secret” and say, “Hey, is that FREE Energy? Then it’s a Scam!” as well as write all sort of negative things without even having tested anything. Others will email us and demand that we send them proof that what is in this book is real.

But know that we don’t need to proof anything. The proof is in this book and all you need to do is to try it yourself. Our job is to give you the tools and not to convince you that it works. The answer to this you will receive once you see the measurements on your voltmeter. And you will not believe because we told you so, but because you saw with your own eyes, as it should be for all inventors ☺

Dr. Nakamats Invention

Just before closing this chapter, we found an interesting article about Dr. Nakamats; the inventor of the Floppy Disk and various other inventions. While no technical details are provided about his invention, from his description it seen to be very similar to Mr. Tesla invention which is explained further in this book. Below you can find the original extract:

Dr. Nakamats House, completed in 2005, represents the love the inventor has for the earth. With its distinctive floppy-disk-shaped front door, the four-story concrete building is powered, Nakamats claims, by "cosmic energy," whose source is charged particles (such as the nuclei of atoms) arriving from outer space in rays at roughly the speed of light. A black "antenna" that covers most of one exterior wall collects this energy and distributes it to a converter that then produces enough electricity to power the entire facility and its roughly 30 guest rooms, which Nakamats says are used by scientific luminaries from around the world who congregate to share new ideas. Nakamats even boasts that his system is so prolific that he actually winds up selling excess electricity to Tokyo Electric Power Co. (TEPCO).



Dr. Nakamats Black Exterior Antenna

As you can see from the above picture, his antenna is in the form of a black surface and manage to get a considerable amount of excessive power with it.

While no further details are provided about his invention, it's very interesting to know that even such a popular inventor is using this type of technology with a high degree of success.

Utilization of TV & Radio Waves

Chapter 3

Utilization of TV & Radio Waves

Weather you are aware of them or not, they are everywhere. Radio Waves are being emitted all around us.

Radio waves have the longest wavelengths in the electromagnetic spectrum. These waves can be longer than a football field or as short as a football. Radio waves do more than just bring music to your radio. They also carry signals for your television and cellular phones.

The antennae on your television set receive the signal, in the form of electromagnetic waves, which are broadcasted from the television station and displayed on your television screen.

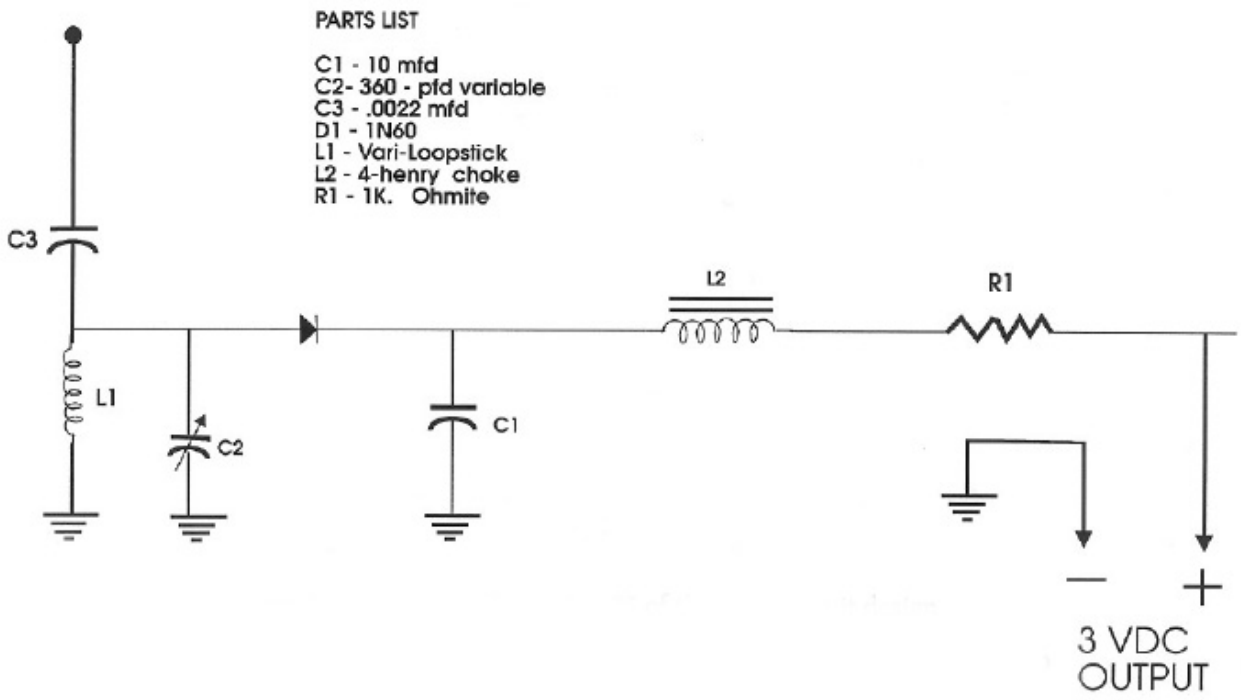
Broadcasting of Radio Waves

Cable companies have antennae or dishes which receive waves broadcasted from your local TV stations. The signal is then sent through a cable to your house.

Radio waves, while not their primarily reason for being broadcasted, they can also be used as a source of electricity.

Collecting TV & Radio Waves – Method 1

Now, let's get to work! The below diagram will show you how to use Radio waves as an energy source.

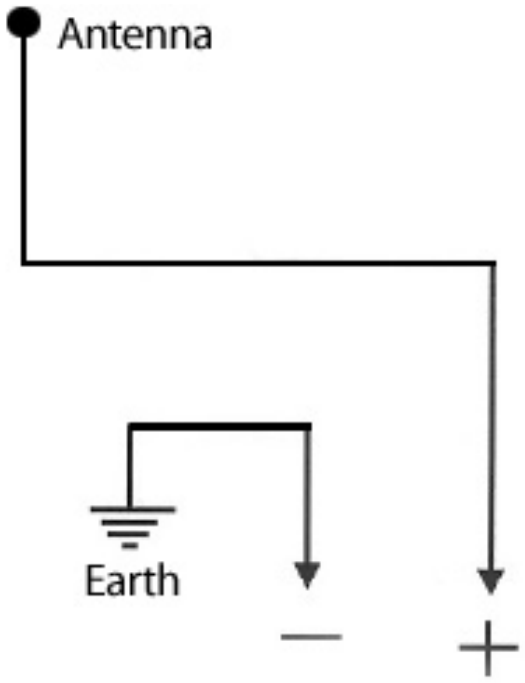


The diagram is pretty self explanatory. A single circuit will generate a tiny amount of electricity, enough to power a small motor. However, if you make 15 or more of such circuits and hook them together the tiny output will be multiplied several times over.

Radio waves are very powerful and the closer you are to a Radio or TV broadcaster the more power you will get in return.

A Simpler Proof of Concept

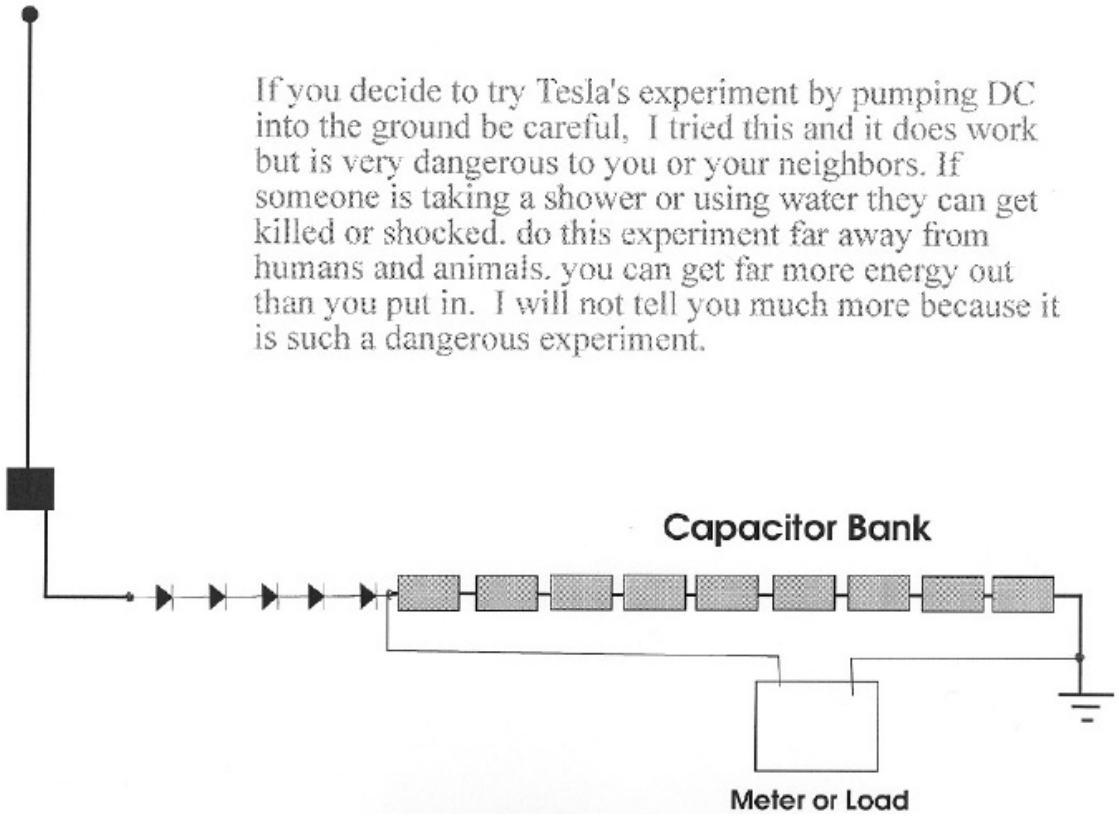
If you want a proof of concept that radio waves can be harvested using an antenna, you can try the below diagram, while its not of any particular use because most of its components have been taken out, you can still get some voltage out of it.



Basic Radio Waves Circuit - Proof of Concept

Collecting TV & Radio Waves – Method 2

Another method to harvest radio waves is shown below:



This setup is even simpler then Method 2. It consists of an antenna, hooked to diodes in series, followed by a capacitor bank to store the electricity. The capacitor bank is then earthed.

After experimenting a little bit with this setup, we found that the best way to get more output is to use multiple antennas attached together. The higher the antenna is the better due to more reception of radio waves. With this setup we managed to fully charge our capacitors bank pretty quickly.

Utilization of Static Electricity

Chapter 4

Utilization of Static Electricity

Requirements

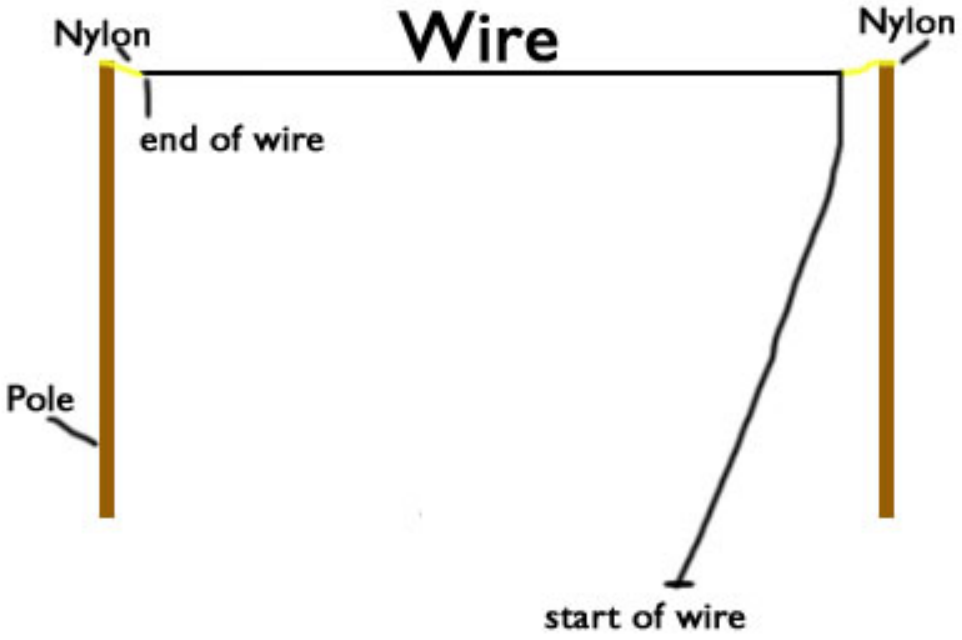
- Isolated Electric Wire (100 meters or more)
- Nylon Rope (5 meters)
- 1 Sparking Plug
- 1 Ignition Coil
- 1 Condenser of about 10 pF and at least 1500v (4 Condensers in series of 40 pF & 400v each can also be used)
- 1 Silicone Diode of 300 volts
- 12 Volts Ni-Cd Rechargeable Battery

Instructions

Start by suspending a long isolated electric wire, a few meters above the ground (the higher the better) and without touching any conducting material. The wire extremities must be isolated from the ground as well as tied with nylon at the ends (To avoid the wire from touching anything- except the nylon wire which is a poor conductor).

The length of the wire determines the accumulation rate of the electricity, while the higher the wire is place up, the more the system will be effective. The wire must remain stiff at all times as to prevent from being pulled so as to share the force of the traction.

Below you see a graphical representation of this:

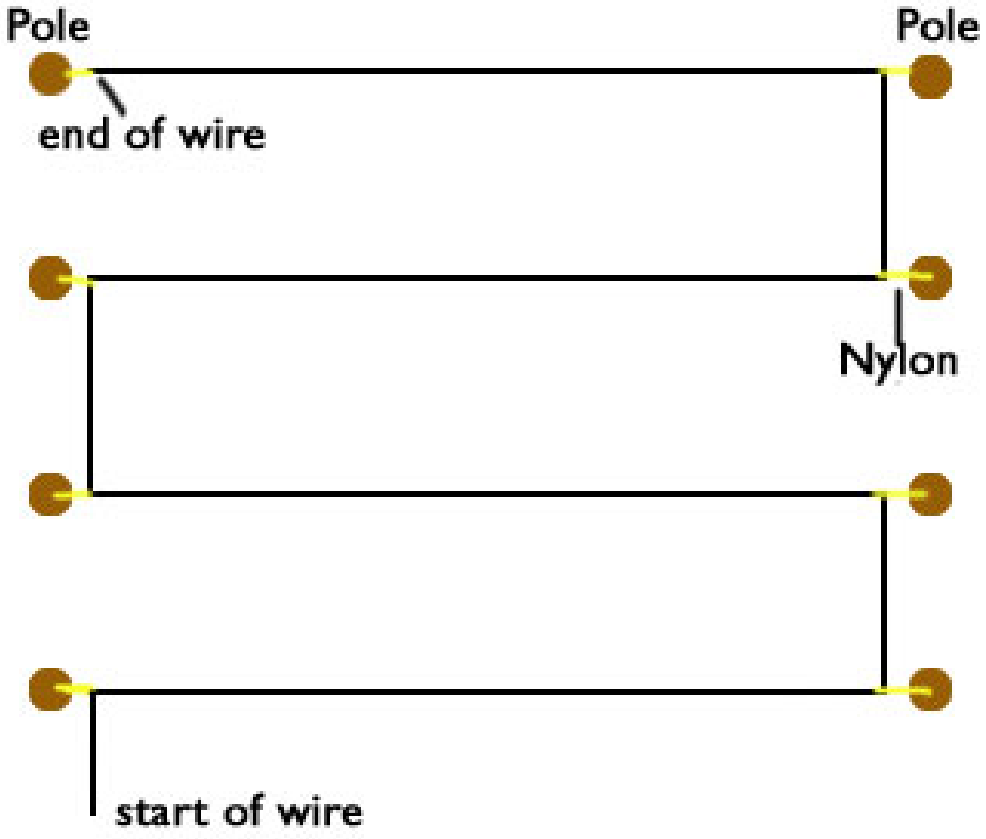


Horizontal Wire Setup - Side View

Alternative Setup

To cover more wire length while having less space, you can lay the wire in an ‘S’ shape and not just horizontally. If you opt for this setup, be sure to tie each of the extremities of the wire with nylon and not directly to the poles or anything else.

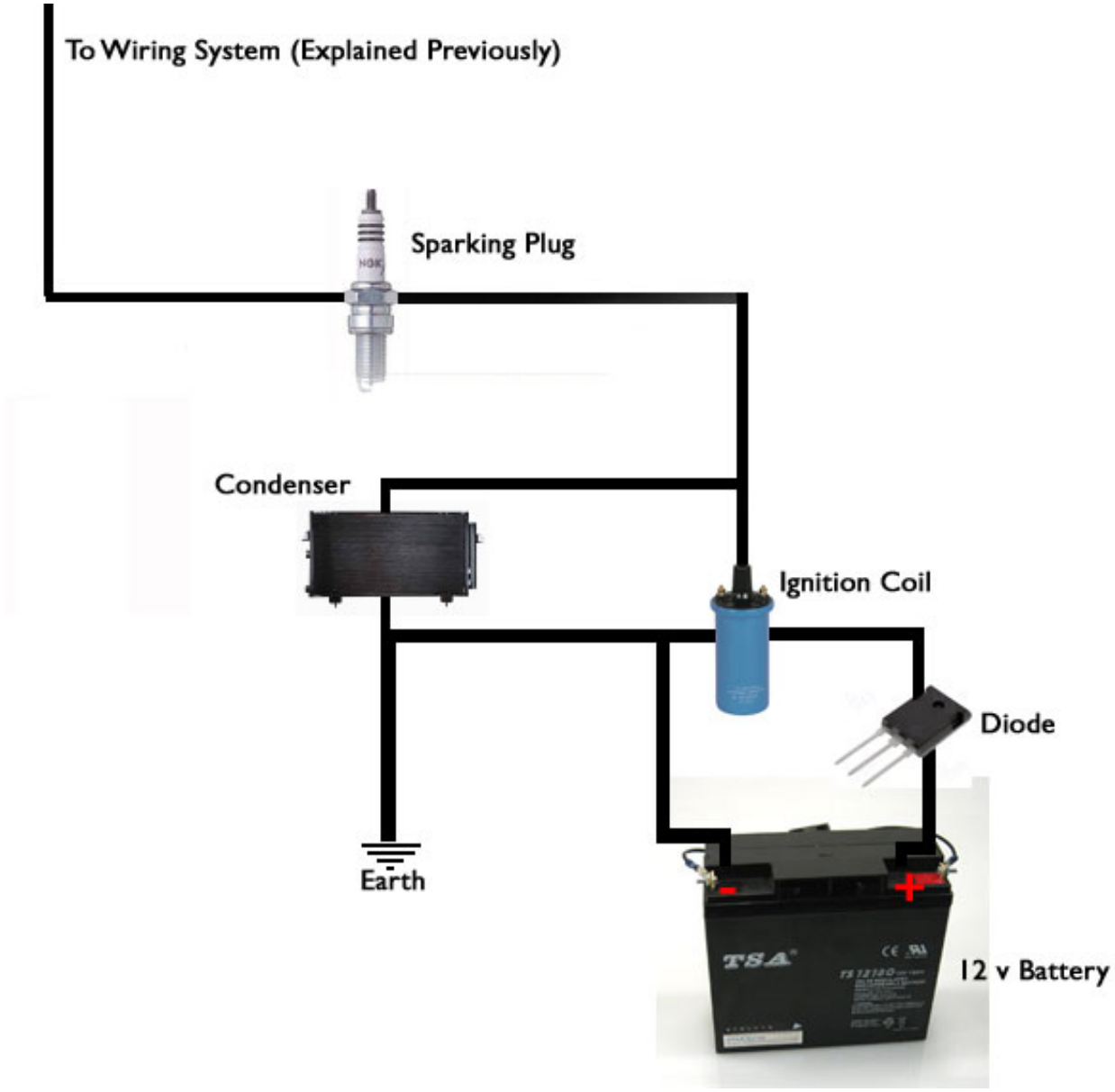
The below diagram shows such a setup from a top view perspective:



‘S’ Shaped Wire Setup - Top View

Setup

Once the wire have been laid our as per one of the previous explanations, its time to work on some of the more important components of the system. But before explaining anything, check the below diagram which is very self explanatory:



The above setup works by collecting electrostatic charges from the air, which is accumulated in the wire that was laid down in the previous pages.

When the tension increases, the two electrodes of the candle will spark, then the charge will ends in the winding to the high tension of the coil. Then, the condenser will loading itself and closes the circuit. The coil of ignition is an autotransformer, and as such it reduces high tension of the impulse. The reduced tension will comes straightened from the diode valve and ends in the positive electrode of the battery.

Note that the weather is very important, if it's windy, the efficiency of the system will increase to several times over, while on the other hand, if it's very humid the efficiency will diminish.

It is also possible to double the efficiency of the system by using a bridge rectifier instead of the diode, so as to straighten both the coming semi waves from the coil.

Utilization of Radiant Energy

Chapter 5

Utilization of Radiant Energy

Radiant energy is a type of energy that is present everywhere around the world, in unlimited quantities. It is mainly emitted from the sun in the form of sun says (During the Day), radiation from objects, as well as cosmic rays (At Night) that end up on earth. This origin of such rays is not well known; probably they come from the sun itself, other planets, or other universes. While we don't know from where it originate, we know that they end up on earth and they can be used as a source of energy.

Nikola Tesla was the first to discover this type of energy, over 100 years ago. At the time he states:

"I have harnessed the cosmic rays and caused them to operate a motive device. Cosmic ray investigation is a subject that is very close to me. I was the first to discover these rays and I naturally feel toward them as I would toward my own flesh and blood. I have advanced a theory of the cosmic rays and at every step of my investigations I have found it completely justified. The attractive features of the cosmic rays is their constancy. They shower down on us throughout

the whole 24 hours, and if a plant is developed to use their power it will not require devices for storing energy as would be necessary with devices using wind, tide or sunlight. All of my investigations seem to point to the conclusion that they are small particles, each carrying so small a charge that we are justified in calling them neutrons. They move with great velocity, exceeding that of light. More than 25 years ago I began my efforts to harness the cosmic rays and I can now state that I have succeeded in operating a motive device by means of them. I will tell you in the most general way, the cosmic ray ionizes the air, setting free many charges ions and electrons. These charges are captured in a condenser which is made to discharge through the circuit of the motor. I have hopes of building my motor on a large scale, but circumstances have not been favorable to carrying out my plan."

The Invention

Let's get started about the actual setup for this invention. Before anything else, note that we are going to go trough the basic setup of the invention to explain why it works and how it can be scaled up to cater for your electricity demand. Various setups can be implemented as well to enhance the performance of the system.

For instance, an inventor called Dr. Thomas Henry Moray improved upon Tesla's discovery to create yet another invention that taps into radiant energy. Unfortunately, he was not able to make his system available to everyone due to the energy companies of the time stopping him death on his track; even after numerous media and successful public demonstration of his device generating vast amount of electricity. While this book is not about Henry Moray's invention, if you wish to know more about him and his discoveries you can follow the link below:

http://www.nikolateslasecret.com/henry-moray.php

Utilization of Radiant Energy Overview

Now, let's get started by creating the most basic version of this intention. Note that the below setup is for a small system that will generate a few volts, just enough to power a small bulb. Once you build the basic version you will have enough knowledge to "scale up" the setup by using larger specifications which will generate far greater output.

Requirements

- Single Core Insulated Wire
- Insulated Shiny Aluminum Plate (15cm by 15cm)
- 1 - 220uF 25v Capacitor
- 4 - 1N4007 Diodes

Where to Buy? The parts can be bought from your local radio or hardware store or directly online. On EBay.com you can find various suppliers of all you will ever need – and at bottom prices too.

Instructions

Let's start with the plate. The aluminum plate, which is the most important part of the system, should have its surface clean and highly polished. It must be as large as practicable because the larger the plate is, the larger the energy generated. However, as noted previously for this example we will be using a 15cm by 15cm (6inch x 6inch) plate which is quiet small but is still enough for our example.

The plate must be insulated; you can wrap it with some tape. It's important to cover every part of the plate without leaving any angle of the aluminum visible – if needed, wrap it multiple times so that the plate is practically water proof. You can use plastic paint if you have some in handy, as long as the plate is insulated it doesn't matter what you use.

Now, connect one end of your single core insulated wire to the metal plate, be sure that the wire is touching the metal plate and not just the insulation material (tape or plastic paint). You can simply put the wire under the tape and you are done.

At this stage, you need to install the plate as high as possible. If you have access to a roof you can put it in their, and if possible, you can also increase the height further by putting the plate on a long wood stick or bamboo. The height is a crucial factor because the output will increase for every meter that the metal plate is elevated.

It’s important that you put the plate on a non conducting material such as wood or plastic – don’t use a metal pole to increase the height of the plate.

Grounding

The system must be properly grounded for it to work properly. To do this you can simply connect another wire to the “earth” of your house. Alternatively you can use a few feet of copper or aluminum tube earthed in the backyard which will do the job just as fine.

Typical Copper Earth of a Household

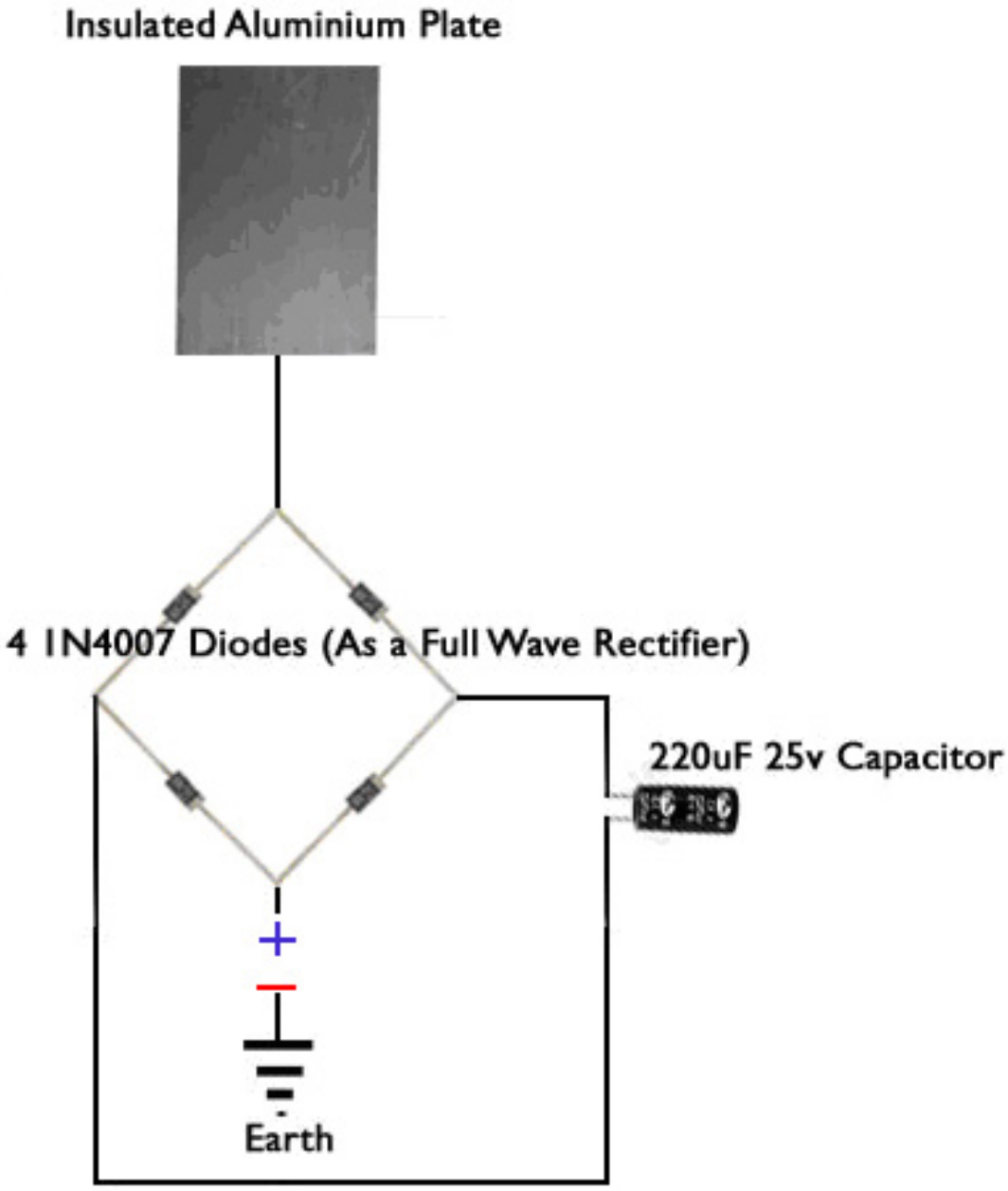
Putting Everything Together

Finally, let's make the system work! At this point you should have a wire connected to "earth" and a second wire connected to the metal plate that is located on your roof or high platform. The height factor is very important because the voltage generated will be the difference between our "earth" and the metal plate location – this means that the higher the plate is, the more the output.

We once tied the metal plate to a small helium balloon and let it go – which resulted in an elevated amount of voltage being generated. However, this step is pretty dangerous and should not be carried if you don't live in a rural area and there are no storms in sight (One can catch a lightning which is dangerous).

We are using the 4 diodes as a full wave rectifier to charge the capacitor more efficiently.

Check the next page for a diagram of the final system:



The diagram is simple enough and I'm sure that even if you are not a qualified electrician, you should manage to set up such as system pretty easily. Always remember to start small and then once you have

a working example you can scale it up and build a bigger system.

Final Thoughts

The system that we just built is relatively easy and cheap to make. You will discover that getting electricity from air is no rocket science and anyone can do it.

Once you are familiar with the system, be sure to check the official patents of Nikola Tesla that are included with your subscription of “Nikola Tesla Secret”. From the patents you will learn various other alternative ways of generating electricity from the air.

In the next chapters you will also learn how to use the electricity generate in your own home.

The Nikola Tesla Secret & & Your Home

Chapter 6

The Nikola Tesla Secret & & Your Home

Once you have one of the Nikola Tesla Secret systems (that we explained in the previous chapters) up and generating electricity, its time to connect it to your electricity system, which can be done in a variety of ways. Below you can find some diagrams of the most commonly used setups. Note that the below setups can be used for different power sources, including wind, solar and other sources of energy.

Simple Power Setup

First, keep in mind; batteries always work better in a warm temperature so you might consider buying a battery box. The battery box is great for storage, it keeps things clean and organized; it also keeps children or pets from playing around and getting hurt.

You might consider adding a system meter to act as a go between your battery and inverter. A system meter tells you how much juice the battery has left and how much power is being used at any given time.

1. Nikola Tesla Secret System

2. Charge Controller

3. Battery

4. Inverter

5. Household

Grid-Intertied Power Source System

If you are still using power from the grid, this kind of system will work the best for you. This system can also be called on-grid-tied. You can actually make the electric meter tick backwards, by producing more power than you use each day. You can actually get a credit from the electric company if the meter starts going backward. Save those credits when the phone 4 energy system is off or when more electricity will be needed. This process is known as net metering or net billing. Of course, it's always a good idea to talk to your electric company to find out the rules and regulations.

1. **Nikola Tesla Secret System**

2. **Array DC Disconnect**

3. **Inverter**

4. **AC Breaker panel**

5. **Household**

6. **Kilowatt per hour meter**

7. **Grid**

Grid-Intertied system with battery backup

You may need to rely on a battery backup system in case of down time and maintenance to the power system. The picture below shows the grid inter-tied system with the battery backup.

1. Nikola Tesla Secret System

2. Array DC disconnect

3. Charge Controller

4. Deep cycle battery

5. System meter

6. Main DC disconnect

7. Inverter

8. AC Breaker panel

9. Kilowatt per hour meter

10. Grid

11. Household

Off-Grid Power Source System

This system requires a generator to keep the battery charged for those down times. This system is pictured below.

1. Nikola Tesla Secret System

2. Array DC disconnect

3. Charge Controller

4. Deep cycle battery

5. System meter

6. Main DC disconnect

7. Inverter

8. Generator

9. AC Breaker panel

10. Household loads

System Units

Array DC Disconnect:

The DC disconnect is an important part of a system for maintenance. Using a DC disconnect makes shutting off the power much easier.

Charge Controller

A charge controller will drastically increase the life of your battery. This unit will protect the battery from being overcharged. When the battery bank is fully charged, the charge controller will interrupt the charging process. Some charge controllers also stop the battery from discharging at night time.

4v to 12 v Deep Cycle Battery

This is the type of battery you should use in your system. This is what will store all of the energy produced by your PV panels. A great place to source free deep cycle batteries from is old golf carts of forklifts.

System Meter

A system meter is used to monitor how full your battery bank is. You can also see how much power is being used at any time. This is a great unit that can monitor your whole solar electric system.

Main DC Disconnect:

This unit is placed between the battery bank and the inverter. A main DC disconnect will allow you to disconnect the inverter for maintenance.

Inverter:

The inverter is what turns the direct current (DC) into alternating current (AC). AC is what most of your household appliances use. Eg. Refrigerator, TV, VCR, Computer etc. If you do not wish to use any appliances that need AC

then you can simply use a DC input. A DC input costs around $10 from any car parts store.

You can also purchase inverters that plug into your homes power socket. These inverters will actually feed electricity back into your home through a normal power socket.

Generator:

If you are setting up a solar electric system for off-grid living you will need to use a generator. A generator is used to produce electricity for times of cloudy weather or for when you are performing maintenance on the solar electric system.

AC breaker panel:

This is the point where all of the homes electrical wiring meets with the provider of the electricity, whether it is the grid, a solar electric system or a wind electric system. This unit is usually found in a utility room a garage of or mounted in a metal box on the outside of the building.

Grid:

The grid is the main power supply coming to your house.

Household Load:

The household loads consist of anything in your home that uses power from your AC breaker panel. This includes anything that you plug into the wall.

Multi Meter

You will be using the multi-meter to measure the input amps and voltages of the batteries. Although it is okay to use a digital multi-meter, it is recommended to try and use an Analog. The reason for this is you are using a pulse DC in the SSG and an analog will go up to 1amp or more.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10A DC
UNI-T

Soldering Iron

You will use the soldering iron for soldering the circuit. The circuit will work properly without soldering the connections, but it is still a good idea to hold them firmly in place. Once you are certain all the wiring is correct, solder all the connections at one time so nothing accidently moves.

Reducing Energy Consumption

Chapter 7

Reducing Energy Consumption

Before even building our zero point magnetic power generator, you can start saving electricity straight away. Below you can find some of the most effective tips that you can implement in your home and save up to 50% or even more of your currently electricity bills - with simple steps that require little to no effort.

10 Ways to Reduce Your Energy Usage

1) Insulate and Ventilate - Properly done, insulation can reduce home heating needs to almost 1/10 of an average residence. Savings are reaped in the summer as well. Use of air conditioners can be avoided or minimized in most regions. Weather stripping and caulking control air leaks, while air exchange keeps your indoor air fresh.

2) High-efficiency appliances - Energy Star appliances consume between two and 10 times less electricity. Initial costs can be up to 15 percent more, but it will come back in energy savings. Most are higher-quality products producing less noise and lasting longer.

3) Fluorescent lighting - Replace incandescent light bulbs with compact fluorescent bulbs (CFL). Although initially costing more, CFLs use four times less energy and last an average of eight times longer (about 8,000 hours). Fluorescent tubes last up to 20,000 hours and add further efficiency. Both can be used in dimmable fixtures for a longer lifespan and more comfortable house.

There are many diseases associated with allergic and stress disorders that are referred by atopic dermatitis. Many of these diseases are associated with respiratory system, such as hay fever and asthma for example.

4) Reduce phantom power - When not in use, appliances such as televisions, computers and microwaves are still consuming power. Wasted energy can total almost 25 percent of a home's electricity bill. Choose appliances with low standby energy consumption. A good range is 0.5 to 1 watt/hour or 4 to 8 kWh/year. A power bar can cut your losses if you switch it off when you're done on the computer. You can purchase individual switches to cut power when appliances aren't in use.

5) Reduce home temperature - Lower temperature by one or two degrees, and even more at night and while you're away to ensure no heat is wasted. Install a programmable thermostat to control the temperature for you.

6) Use water efficiently - A low-flow shower head can cut water consumption in half, which reflects greatly on hot water usage. Insulate electric water heaters and pipes, but not gas water heaters (start with the pipes at six inches away).

7) Change furnace filters - A clean filter will allow the furnace to operate more efficiently. Change it once a month when it's in use.

8) Avoid batteries - If using them is a must, choose less harmful rechargeable batteries. Then charge them with power from the sun.

9) Buy locally - The further a product has to travel before it gets to you, the more energy it has consumed along the way.

10) Walk, bike, take the bus - Anything that reduces the amount you drive lowers the amount of gas you use.

Lack of Energy Efficiency at Home

Before you can make a big impact on the amount of unnecessary energy your home consumes, you have to find out which areas waste the most and what you have to trim down or shape up before you see a difference. An energy audit will point out trouble spots and provide you with the best places to start implementing solutions.

Self Audit

You should know that most energy used in the home goes to appliances and lighting, then space heating, water heating and air conditioning. The most power-hungry appliance, your fridge, eats up almost 10 percent of energy consumed in the home. Now that you have a general idea of where to look, you can find ways to save. It's good to start with those little cracks and holes throughout your home that can add up to an area the size of a window. Imagine how wasteful you'd feel leaving a window open all year round. Many people are doing just that without even knowing.

You'll be checking for places where outside air can infiltrate the home, making sure you have adequate insulation and that equipment is properly maintained, and mapping out your energy usage patterns.

- Log it - If you want to know how much energy you use on average, you'll have to check the meter and do the math. It sounds tedious, but if you can remember to do it once a week for a month, you can get a good idea of your usual energy use that time of year.

- Find leaks - Drafts can add up to 30 percent to your energy bill each year. Check around doors, windows, wall and ceiling corners, electrical outlets and switches, baseboards, pipes and wires. Often if an air leak is serious, you can feel the breeze with a wet hand or see daylight around the edges of doors. You may also be able to rattle windows and doors that aren't sealed correctly. The U.S. Department of Energy (DOE) website recommends a simple pressurization test that can help you detect less obvious leaks.

If you need more direction, the DOE links to a site offering online energy-auditing services that provide money-saving estimates based on answers you provide. Another page details how you can check insulation and HVAC systems. After that, you need to come up with a plan of attack: what areas can you afford to fix, and what should be done first? It's better to start with changes that put money back in your pocket sooner; some may save you enough to allow even more upgrades.

Hire a Professional

Most utility companies will do a home energy audit, usually charging a small or no fee for customers. You can also hire a certified home energy rater. They'll go over past utility bills (that you provide them with), examine every room of the home, and use specialized equipment such as an infrared camera, surface thermometer, blower doors and furnace efficiency meters.

Find an ENERGY STAR Partner

http://www.nikolateslasecret.com/energystar.php

Helping your HVAC System

We should all think of our homes as an energy system. So says the U.S. Department of Energy, which points out that although the furnace may create and deliver heat, it can't do so effectively if heat is lost in ducts, through walls, in the attic or through cracks in doors and windows. Even the most efficient furnace needs a little help and proper maintenance to provide the best results. Since heating and cooling often make up 45 percent of the energy bill, it's well worth it to tidy up operations.

Efficient Furnaces and Air Conditioners

If you're in the market for a new heating or cooling system, it's the perfect time to go for high-efficiency. Your contractor should be able to point out the best models and help you find the right fit for your home. If you've already insulated and been busy sealing leaks and drafts in the home, you might even be able to get away with a smaller, cheaper furnace.

Furnaces have a minimum 78 percent AFUE (Annual Fuel Utilization Efficiency) rating, but some models are over 90 percent efficient. Air conditioners go by the SEER standard (Seasonal Energy Efficiency Ratio), and must meet a minimum of SEER 13.

When ventilation has been reduced through efficiency measures, it can become necessary to install air exchange units. Heat-recovery ventilators trade indoor air for out but keep the heat from leaving, too.

Proper Maintenance

- Change furnace and air conditioning filters - Furnaces and air conditioners must work harder to pull air in through clogged filters, wasting energy to do it. If you clean or replace filters when it’s recommended, you can lower energy usage by up to 5 percent. Once a month is the usual recommendation for replacing filters.

- Clean and vacuum registers, making sure nothing blocks them.

Help the HVAC System Out

- In warm months, keep drapes closed during the day.
- In cold months, keep south-facing windows uncovered during the day and covered at night.
- Don’t leave bathroom or kitchen exhaust fans on for more than 20 minutes after preparing food or showering. If they break down, replace with high-efficiency models (which will likely also be quieter).
- Insulate ducts in unheated areas, or if buying new ducts, choose ones that come pre-insulated. A professional should be hired for anything more than minor duct repair.
- Don’t place heat-producing devices like lamps near air conditioning thermostats. It could make the system think your home is warmer than it is and overcool.
- Place window air conditioners in shade without blocking airflow.

Programmable Thermostat

Keep your thermostat set at a comfortable level. During the heating season, 68 F should be good for daytime and 55 F at night or when you're out of the house. Central air conditioning doesn't need to be set lower than 78 F in the summer, unless health conditions require otherwise. A programmable thermostat can do all the altering for you, as long as you set it in advance. You can come home to a warm home, never knowing it was cold there during the day. Programmable thermostats often cost between $40 and $150, and can save you up to $150 a year.

Energy Efficient Insulation

Chapter 8

Energy Efficient Insulation

Reducing energy use can mean a lot of things, but the most important on our list, insulation, is one that makes other measures possible. No matter how efficient your heating and cooling system is, it won't make a difference if your home's walls can't hold in the warmth. Heating and cooling can be responsible for up to 70 percent of a home's energy use. That's where insulation helps out in a big way.

Whether you want the best-rated insulation for a new home, or are looking to upgrade in an old home, energy-efficient insulation can come in many forms and vary in price widely. Adding insulation (including water heater insulation) can benefit homeowners in one of several ways:

- Lower utility bills - insulation often pays for itself in a few years; then it's all savings.
- Higher resale value of an efficient home with low bills.
- Increased comfort due to uniform temperature throughout the home. It will be warmer in winter and cooler in summer.

- Increased durability of the home - condensation, which can decay materials, is prevented.
- An energy audit can show how much insulation you have and how much more you need, but there are some places where insulation is a priority:
- Attic, including the door or hatch cover
- Under floors above unheated spaces
- Around walls in heated basements
- Exterior walls

Best Rated Insulation

R-value is a measure of how well insulation resists heat transfer, meaning how much heat is let out of or into the home. Generally a higher R-value means better insulation, but since the rating is determined in controlled conditions, it may be lower in real-life applications, especially if insulation is installed incorrectly (air pockets are present or it is compressed). Metal-frame houses can cut R-value in half, but even wood framing will lower the rating. When layers of insulation are used, the R-value of each is added together. The R-

value you'll need depends on where insulation is being installed in the home. A professional can give you exact recommendations.

According to the U.S. Department of Energy, you should consider factors such as your climate, building design and budget when selecting insulation. They recommend a handy zip code calculator that lets you enter information about where you live and what you're insulating. It compiles weather and cost information by region and tells you what R-value will be most economical.

Insulation for your Health

Of course, R-value has nothing to do with how health-friendly the insulation is. There are some insulation types that just aren't up to green home standards. But that's OK because there are also several healthy insulation alternatives that can provide comfort and leave you worry-free - as long as you balance out the efficiency measures with adequate ventilation.

Non-Green and Questionable Insulation

Insulation with a high R-value is a good choice for padding your walls, but other factors like health considerations and product life cycle come into play for many who wish to upgrade their homes. Let's face it, some insulation is better than others.

Types of Insulation

- Batt insulation is often made of mineral fiber (fiberglass or rock wool) and sold in blankets of various sizes and thicknesses. It can be the least expensive, but requires careful installation for effectiveness.
- Loose-fill insulation is loose fibers or pellets like fiberglass or cellulose (newsprint, cardboard or waste paper). It's blown into walls and the attic through a large hose. It's more costly than batt but can fill smaller spaces more easily and reduce air leakage.
- Spray insulation is a polymer like polyurethane that is injected or sprayed into walls, ceiling and floor cavities. It expands to fill the space and does double-duty as an air barrier, which can

make it competitively priced with some batt types. Spray insulation is commonly used for retrofitting.

- Rigid insulation can be large, formed sheets of fiberglass, polystyrene or polyurethane. It's often used in basements, crawl spaces and exterior walls.

Some problems with insulation

Some foamed insulations, extruded polystyrene and spray polyurethane involve the use of HCFCs (hydrochlorofluorocarbons), which although not as damaging to the ozone layer as CFCs (chlorofluorocarbons), contribute to depletion nonetheless.

Expanded polystyrene doesn't use HCFCs or CFCs, but pentane used as a blowing agent can contribute to low-level smog formation if it's not captured. The ingredient styrene has been identified by the EPA as a possible human carcinogen.

In addition to these concerns, many synthetic insulations are sourced from non-renewable petrochemicals.

Fiberglass

Formaldehyde used to bind fiberglass makes this insulation less than ideal for many because of concerns about off-gassing. The fear that fiberglass may cause cancer, respiratory diseases or allergies in the long term (like asbestos) has also been an issue although studies haven't proven a link. It does cause irritation with direct contact and high levels can aggravate asthma or bronchitis.

Some companies are now touting their green credentials and allaying fears about fiberglass being an unhealthy insulation. Owens Corning, maker of PINK fiberglass insulation, has been certified low-emission by independent, nonprofit organization GEI (Greenguard Environmental Institute). PINK is made from about 35 percent recycled content (bottles and jars) and is used in green building program Built Green Colorado.

Resources

http://www.nikolateslasecret.com/insulationguide.php

Green Insulation

There are a number of insulation manufacturers who strive to make their products low-emission, low-impact and highly efficient. From reused denim to futuristic spray-foams, there are a lot of products to consider, and others to be wary of.

Cementitious

Air Krete - This nontoxic, environmentally friendly insulation is fireproof and sound-absorbing, as well as being very low in volatile organic compounds (VOCs). Air, seawater and formaldehyde-free cement make up Air Krete’s blown-in insulation, which goes on like shaving cream and hardens into a lightweight foam. It doesn’t require treatment with chemicals for its non-combustible performance, like some other insulations do, but there have been concerns about shrinkage over time.

Spray

Icynene - This blown-in soft foam insulation also works as an air barrier, potentially stopping more than 90 percent of air infiltration and minimizing allergens and pollution that enter the home. It is installed in closed or open cavities by pouring or spraying and can expand up to 100 times its initial volume. Since it’s water-blown, it doesn’t have any ozone-depleting HCFCs. Icynene is also free of formaldehyde. R-values of the products range from 3.6 to 4 per inch.

Soy-based polyurethane

Heatlok Soya - Aside from the fact this insulation is literally green in color, it’s also pretty green in composition. Recycled plastics, vegetable oil and soy make up this spray polyurethane foam, which contains no ozone-depleting substances and works as an air and vapor barrier.

BioBased Insulation - These soy-based polyurethane spray foams create an air barrier to outdoor pollution by filling every space, which also cuts down on noise. Soybean oil is used to make them instead of

petrochemicals, and they don’t allow mold growth or serve as a food source for pests. No CFCs or VOCs are present in BioBased Insulation products and they will never settle. Their products have been recognized by many organizations in lists of innovative or top products.

Cotton

Bonded Logic - UltraTouch Natural Cotton Fiber insulation uses 85 percent post-industrial cotton, meaning denim manufacturing scraps that didn’t get to fulfill their destiny and become jeans. It’s treated with a natural fire retardant that also inhibits pests and mildew, and it’s 100 percent recyclable. No VOCs like formaldehyde are present in this insulation. It’s also easy to handle (not itchy) and sound-absorbing once installed, with a 4.1 per inch R-value. UltraTouch has tested well, receiving a Class A fire rating, and can earn users LEED credits.

These are by no means the only green insulation alternatives, but to go through them all could take a while. Others that have been

received well include cellulose-, wool- and hemp-based insulations, to name a few.

Weatherize Your Home

Chapter 9

Weatherize Your Home

Caulk, Strip and Sheet

After finding air leaks and drafts in your home, you'll want to plug them up and stop money from slowly draining out of your walls, windows and doors. The fixes can be costly and long-term, requiring professional assistance, or cheap and easy to do yourself.

Most say that adding caulking and weather stripping will pay for itself within one year through energy savings. Just make sure, before you seal leaks, that the air in the home is properly ventilated. Dust, carbon dioxide, mold and other contaminants can cause a big problem if they are allowed to build up in the home.

Plastic sheeting

If you can't afford to replace old drafty windows, which is really the best thing to do, make a quick fix by installing plastic sheeting. Just because you still have single-pane windows doesn't mean you can't cut energy lost through them. Heavy-duty plastic sheets are clear and can be cut to almost any size. Simply apply tape along the edges of

the window frame, stick the plastic down, and apply heat to make a tight seal. Then you just have to remember to close shades at night and all the time on north-facing windows.

Weather Stripping

Metal, vinyl, rubber, foam or felt are all materials that can make up weather stripping. The type you use will depend on where it is going to be used, so it’s safe to say you’ll need several kinds:

- Felt and open-cell foams - They are cheap and easy to install, which is why they can be a good choice in low-traffic areas. For other uses, however, they are easily visible, can be affected by weather and don’t do very well at blocking airflow.
- Vinyl - It costs a bit more than felt, but resists moisture and generally lasts longer.
- Metals - Stainless steel, aluminum, bronze and copper weather stripping can be affordable and last for a number of years. Older homes might do better with the look of metal as opposed to vinyl.

Caulking

Caulking is relatively inexpensive and requires little expertise to use. Simply use it to cover cracks and holes around windows and door frames, baseboards or anywhere else there's a problem. As long as a crack is no more than ¼ inch wide, caulking should fix the problem. Some caulking must be used in a gun, while other types don't require one at all. The DOE website provides a list of common caulking compounds and what uses they are best for. Water-based is the best for cleanup and is more environmentally friendly all-round than solvent-based caulk. Look for one that doesn't contain formaldehyde, like AFM Safecoat. It's also flexible and water-resistant once cured, so it can be used for a variety of applications. In general, one tube of caulking is enough for 25 feet of product if applied ¼ inch wide.

Energy Efficient Windows

The right kind for any climate

When plastic sheets, caulking and weather stripping just aren’t helping the home efficiency situation enough, replacing windows might be the only option. Single-pane windows, which are still in use in many U.S. homes, are pretty much the worst in terms of energy loss. Double-pane energy-efficient windows have special glass that can make a big difference.

The cost of installing new windows won’t be paid off for several years through energy savings, but it can have a big impact right away in

terms of comfort and function. National Fenestration Council labels let you know the window is certified to perform as claimed, and Energy Star labels mean it offers a higher level of energy efficiency. Look for windows rated at less than 0.3 cubic feet per minute of air leakage.

Homes in the Sunbelt - Double-glazed windows with spectrally selective coatings can cut your need for home cooling by up to 15 percent by reducing the amount of heat that's let into the home. They literally reflect some of the sunlight away. Other methods to keep the home cool include installing awnings on windows that face south or west, or covering windows with sun-reflecting film.

Homes in cold climates - Windows coated with low emissive (low-e) substances and filled with gas can prevent heat from escaping the home by reflecting it back into the room. Look for windows with a U-value below 0.35, which means they are better insulators.

Homes with both needs - These windows need to have both low U-values and low solar heat gain coefficient (SHGC) ratings, to get the best of both worlds. You might have to decide which is more

important for your situation, free solar heating in the winter or keeping the hot sun out in the summer.

If you are building a new home or plan to upgrade your furnace within a few years, choosing the right windows can allow you to get a smaller, less costly HVAC system.

A somewhat cheaper solution, that’s more long-term than most weatherizing methods, is installing storm windows. Whether exterior or interior, they can reduce heat loss by 25 to 50 percent, even more if they are low-e coated.

Curtains and shades can still be effective for energy-efficient windows if used correctly. In warm months, keep south-facing windows covered during the day. In cool months, allow the sun to come in through south windows during the day but cover them at night.

Energy Efficient Appliances

Chapter 10

Energy Efficient Appliances

Saving power and your money

Most people spend almost $2000 each year to power their homes. Choosing to buy appliances that are low on power consumption, such as those labeled Energy Star, can save you money. Not only that, you'll be reducing your footprint and helping to protect the environment. Switching to CFL light bulbs is a good start, but big energy savings can come with larger power-consuming appliances.

But doesn't it cost more?

The price tag of an energy-efficient appliance can initially be more than others. But the price in the store doesn't compare to the money you'll be saving while it's plugged into your outlets. If you're a really good shopper and have some time to compare, you might be able to

find an energy-efficient version that actually costs less than a standard appliance. Shopping online can be a great way to find better deals than in stores.

If you need to replace an old or broken-down appliance, going more efficient, even if it's a bit more expensive, will end up saving you money. You'll probably make up the difference in a few months to a year, and the rest will be savings. Some products, purchased in certain areas, can get you a rebate to further make up the price difference.

Why energy-efficient appliances are good

Not only are they good for your pocketbook, efficient appliances are good for the environment. According to the government's Energy Star website (it's a joint program of the U.S. Environmental Protection Agency and Department of Energy), one in ten homes using energy-efficient appliances would equal the planting of 1.7 million acres of trees.

Eligible Energy Star Appliances

- Refrigerators
- Freezers
- Dishwashers
- Clothes washers
- Air conditioners (room)
- Air cleaners (room)
- Dehumidifiers
- Water coolers
- Battery charging systems (for cordless phones, appliances, electric shavers …)

[Design note: can you put this factoid in a box? Cost per year = kWh (700) x utility rates (8.4) = total costs for 1 year ($58.80)]

The EnergyGuide label

The EnergyGuide label lists yearly average running costs and will likely display whether a product is Energy Star qualified. It also compares energy use to similar products using a bar scale with an arrow showing where the appliance sits.

Energy-efficient appliances will have lower kWh/year. If you can find that number for a current appliance, you'll be able to figure out the cost difference between old and new. Power use isn't the only efficiency measure though; some appliances will have their own factors for other savings, such as clothes washers and water usage.

Energy Efficient Light Bulbs

CFL bulbs make sense and save cents

Compact fluorescent light bulbs, or CFLs as the often spiral-shaped bulbs are known, can work just as well as any incandescent bulb, while using less energy, lasting longer and providing increased safety. If you want to ease yourself into fluorescent lighting - because it does cost more initially - replace the most often-used bulbs. Those are usually the kitchen, living room, bathroom and outdoor porch lights.

CFLs Save money

According to the government's Energy Star website, changing just five lights to efficient bulbs like CFLs would save $60 a year in energy costs. But you don't have to stop there. Although CFLs cost more, it's easy to find them on sale and they are often cheaper in large quantities. Buy enough to fit most of the fixtures in your home, even if you don't need to replace the bulbs yet. When current bulbs burn out, the new CFLs are already on hand. Almost an entire home can be lit by compact fluorescent light bulbs, meaning frequent light bulb changes will be a thing of the past and power consumption will be cut drastically.

Some CFL facts

- Last up to 10 times longer than incandescent
- Use about 2/3 less energy
- Generate only 30 percent the heat, meaning safer operation (and less heat added to the home)
- Different types can fit most regular fixtures
- Can work indoors or out

To be qualified as Energy Star, the gold standard in energy efficiency, CFLs must give off the same amount of light as regular bulbs, turn on instantly, make no noise and provide light in the warm color range.

If you have a specific fixture in mind for a CFL, like one attached to a dimmer switch, make sure to choose a bulb that is specified for that use. It's a good idea to read directions for any bulb you haven't used before to ensure you're not placing it in the wrong type of fixture. Although most CFLs are warm tones, you can purchase cool-tone bulbs for focused task lighting.

[Design note: please put this in a box. Buy CFLs with lumen outputs consistent with those of incandescent bulbs. Forty watt incandescent bulbs put out 450 lumens, 60 watt bulbs put out 800 lumens and 100 watt bulbs put out 1,600 lumens.]

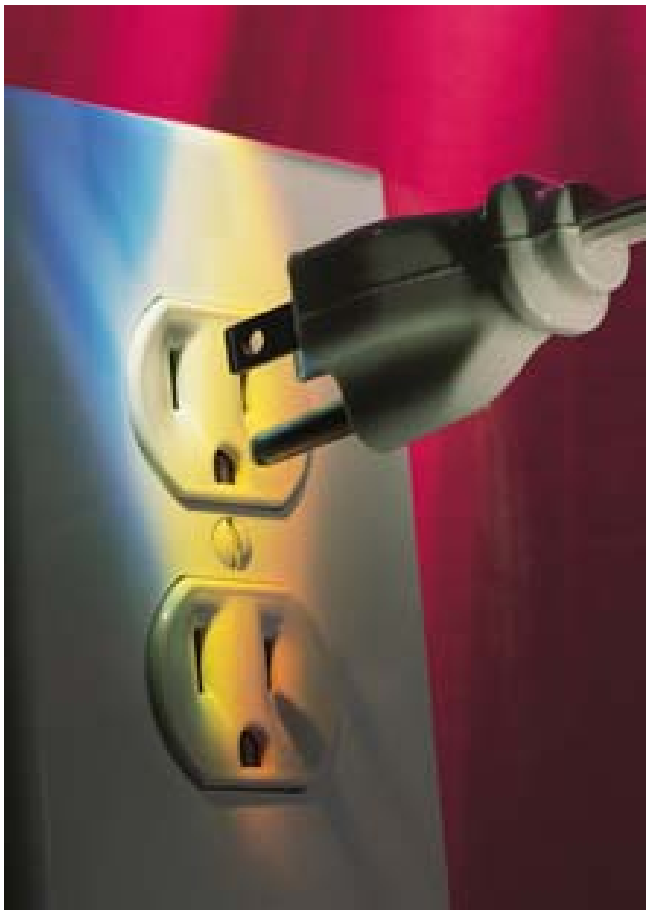
Some think LED (light emitting diode) light bulbs are the future because they'll provide even more lighting power and less energy consumption than CFLs, as well as lasting longer. But until LEDs become more affordable and readily available, CFLs are still the best

bet for saving money and energy. Now if you could just get rid of that phantom power that’s being drained from your home when you least expect it.

Reducing Wasted Energy

Chapter 11

Reducing Wasted Energy



Reduce Phantom Power

Some people give it the more ominous name of “vampire load” and some tame it down with “idle current.” But however you refer to it, standby, sleep or phantom power is still just wasted energy.

If your microwave oven displays the time when it’s not nuking TV dinners, it’s all thanks to electricity. It takes power to display the time -

on some machines even more power than it takes to actually heat food. That's because while you only use the microwave for cooking about one percent of the time (power consumption during cooking is 100 times higher), the other 99 percent of the time the clock is the only thing running.

It has been estimated that about 10 percent of total home energy use is due to appliances and electronic equipment in standby mode.

Find phantom power and Kill-A-Watt

This handy little device, and others like it, can be plugged in between an appliance and the wall, detecting just how much energy that appliance takes while in use or just waiting to be used. They usually cost about $20 to $40, well worth it to find out where you're unwittingly wasting energy in the home.

What could possibly be using that much energy?

Aside from the glaringly obvious microwave clock, power is also being consumed by televisions, stereo equipment, DVD players and

computers. Even a small amount of standby power consumption can be a problem when it's added to other appliances that are also consuming phantom power.

Why does the equipment need to be in standby?

The reason you can turn the TV on with a remote is that it was never fully turned off to begin with. If it was, the remote wouldn't be able to turn it back on. The television usually sits silently, screen off, while it saves information about the channel you were on and the volume level. If you've ever noticed the channel changes to a preset station when the power goes out, it's because the television's access to power was cut off.

Other power-drawing electronics include electric toothbrush charging stations, cell phone chargers and AC adaptors (wall warts). Many people don't realize it, but a charging device left plugged in continues to draw power even if it has nothing to recharge. The best way to solve this problem is to unplug anything that's not in use.

Solving the phantom power problem

For some areas, like computer stations or entertainment centers, unplugging is likely too difficult to be an option. That’s where power strips come in. If you plug everything into an easily accessible power bar, all you have to do is flick a switch to cut the power. What’s more, you’ll be protected from power surges that can damage equipment. Now if you could just find appliances that don’t waste energy while they’re turned on.

Save Water Save Energy

Increase efficiency and use it effectively

It’s likely that over 10 percent of your utility bill is allocated to heating water. Whether it’s for showering, washing dishes and laundry, or simply just to keep it in constant availability, it takes a lot of energy to provide the luxury (or necessity depending on how you look at it) of hot water.

Insulation, it’s not just for your walls

Most people know the key to energy efficiency in the home is to prevent heat from escaping through walls by adding insulation. But

there’s another place heat is lost - from your water heater. Like phantom power in electronics, there is standby loss in water heaters. Much of the time the water heater is using energy to maintain peak temperature, even when no water is being used.

Fitting the water heater with a thermal jacket (if the manufacturer doesn’t caution against it) can help prevent unnecessary heat loss. The hot water pipes running from the heater to taps can also be insulated. When it comes time to replace the water heater, you can go with a high efficiency model, such as the increasingly popular tankless water heaters.

Stop overheating your water

The water heater only needs to be set to 120 F, but many people have set theirs to 140 F or even 160 F. If you’re unsure, try it out for a few days. You’ll probably find you don’t notice much of a difference, and if you do you can always turn it up a bit at a time until it works for you.

Water savings in the bathroom

According to the EPA (Environmental Protection Agency), showers are responsible for 20 percent of indoor water use.

- Low-flow shower heads - Faucet aerators, which are great for reducing water use in all areas of the home, can make a big difference in the shower. They decrease the amount of water that comes from the tap, while forcing air into the stream to make up for it. You won't even notice a difference, but it can save you over 5 percent of the water you normally use, and all the heating costs associated.
- Showers instead of baths - Quick showers use a lot less water than bathing. But if you absolutely can't give them up, don't fill the tub completely; about 1/3 should do.

Other ways to conserve water and energy are washing laundry in cold cycles, running only full loads in the dishwasher and making sure to replace old equipment with energy efficient appliances.

Better Rechargeable Batteries

Recharge with alternative energy

Disposable batteries - Whether lithium or alkaline, disposable batteries aren't a good choice in terms of waste. They work well in high energy-drawing applications, but once drained they're useless. Rechargeable batteries will cost more up front, but you'll quickly realize savings by not having to buy more disposables. Alkaline batteries put out 1.5 volts initially, but this drops steadily during use, eventually to below one volt.

NiCd - Nickel Cadmium (a toxic heavy metal) batteries, although among the cheapest, are considered to have more negative

environmental impacts than most other types. NiCds have problems with damage due to overcharging and improper storage. If they aren't fully discharged before recharging, their capacity becomes reduced. It can be fixed but is somewhat of a hassle. If you have NiCd batteries that don't hold a charge anymore, make sure to recycle them and choose a different type next time around.

Better Batteries

NiMH - Nickel metal hydride batteries are a good way to reduce your energy use in the home. They can be substituted for alkaline batteries in many applications and are great for wireless keyboards, phone headsets, tape recorders, radios, pagers, cameras, walkie talkies, remote controls and digital cameras.

- 1 to 5 percent of the charge is lost daily when not in use (depends on conditions)
- 1.2 volts produced until steep decline at end of charge
- Should occasionally be completely discharged to maintain capacity
- Store more energy than NiCd but for a shorter period of time

- Up to 1000 charges depending on the brand
- Perform well in temperature extremes, but not below freezing

Despite common misconceptions, short charges won't damage these batteries. The biggest problem is with overcharging, but most chargers are made to shut off when the batteries are full. Look for smart chargers that not only stop charging when full, but can be used for storage by trickle charging to maintain the battery's charge.

Li-ion - Lithium ion batteries are more powerful in many ways but are only used in specialized contexts.

- Used in cell phones and laptop computers
- More expensive due to complex manufacturing
- Don't come in standard AAA, AA, C or D sizes. Might be a good thing though, because in the wrong charger they could ignite (alkalines will only burst).
- Must be recycled. Many places that sell them will recycle them as well.
- Store more energy for the same size

- Operate at 3.7 volts meaning one cell can be used in place of multiples of other types
- Can hold a charge for months without losing much power
- Should be stored fully or partially charged. If it loses too much charge, a safety mechanism won't allow it to be recharged.
- Must only be used with intended charger

Emergency preparedness batteries

It's a good idea to have some back-up power in case of an outage. Instead of a gas-powered generator, think about having a big rechargeable battery on hand. They can be used to jump-start your car, inflate tires, run emergency lights or radios, power your fridge or appliances, or just run home electronics when you're away from an electricity source.

Solar chargers

There are a variety of solar chargers that can accommodate your rechargeable batteries without grid hookup. They are good to have on trips, in case of emergency, or just to avoid using non-renewable

energy. Depending on the type you buy, you'll be paying around $60 to several hundred dollars. They can come as basic solar panels and hookups, or be integrated into bags or backpacks. Look for a solar charger that will work with the batteries or devices you want to recharge. With many, you'll have to buy a battery charger dock that attaches to the separately purchased solar charger.

Finding New Ways to Secure Oil

Chapter 12

Finding New Ways to Secure Oil

Oil is used for anything that is gas powered including: cars, homes, and energy generation. Some of the issues we then face is trying to reduce the amount of energy we need and the amount of gas we use.

There are many ways to try and solve this problem. Automotive makers have already taken some of the first steps in reducing the amount of gas needed on hybrid cars. There are also more strict regulations on producing cars which cycle through gas too quickly.

Some diesel powered cars require a small amount of conversion to run fully on leftover fryer fat. Simply put, you can go into McDonalds, or any other fast food restaurant, and ask for the used oil and fat from the fryer.

It sounds a little farfetched, but the vehicle will run with no problems and no damage will be done to the engine or fuel lines. The only downside is that your car will smell like fried food. This is commonly known as ‘rough biodiesel’.

The waste from the fryers, oil or fat, can go through a refining process. This refined product is called biodiesel, and it has many of the exact same properties you would find in Diesel. The car will act no different with biodiesel or with regular diesel.

Standard diesel vehicles these days allow you to use refined biodiesel without the use of a conversion kit. You can refine other waste products and use them as biodiesel such as fat from: pork, beef, poultry, or vegetable oils.

Another way cars are reducing their dependency on oil is the use of electricity to power the vehicle; these are known as hybrid Electric Cars. These cars and trucks are getting more popular and more mainstream as people are realizing how much money they can save on gas. The vehicles motors are build to use both gas and battery power to operate. When these cars break, they capture kinetic energy which is used to recharge the battery.

Due to their low emissions and excellent gas mileage, these vehicles are considered to be environmentally friendly. Some of the most popular brands are the Toyota Prius and the Honda Insight.

Along with the Hybrid electric cars, there are also fully electric cars. These vehicles rely solely on an electric motor to move the vehicle. The vehicles use something different than the standard internal combustion engine. The fully electric cars are still in development and aren't as popular as the Hybrids, but they seem to be the wave of the future.

The electric cars run on electricity alone which gives them a limited range they can travel. It is less expensive to recharge the battery than to buy gas, but the batteries don't last long enough to get you more than 40 miles at a time. The technology is still in the works, but there are many vehicles using it already.

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