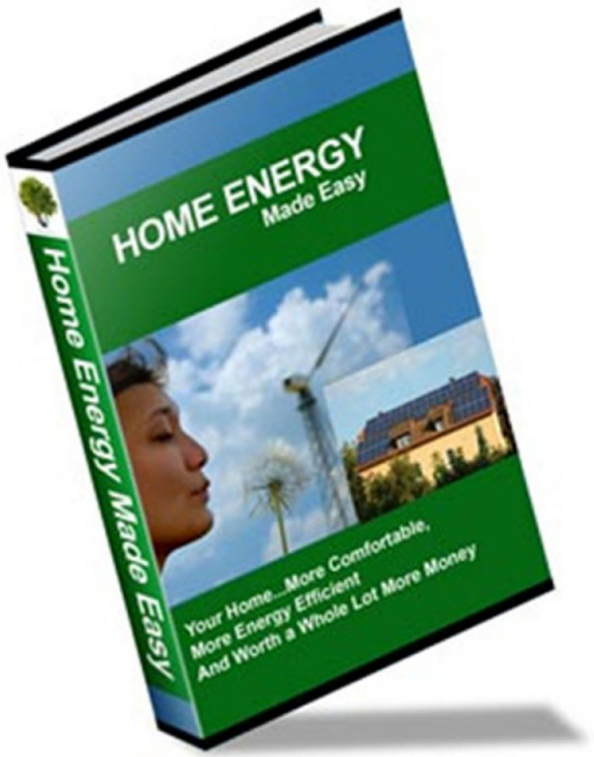
Home Energy Made Easy



The Ultimate Guide To Reducing Your Household Energy by 80% in Less Than 9 Months By Doing Simple Weekend Projects

Home Energy Made Easy

By David Sieg

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Short version: Keep this to yourself – otherwise I'll have to unleash my lawyer (and man I hate paying that guy ☺)

Warning - Electricity is Dangerous

As you know, electricity is dangerous. Even though assembling your own power generating system is easy, please consult a professional licensed electrician to tie it into your house. He/she can

also help you conform to local building codes. ALWAYS make sure that you don't introduce your power back into the grid, especially during a blackout - this may cause serious injury to a power line worker who assumes that there will be no power on a particular power line when he/she is working on it.

BATTERY GASSES - Batteries produce gasses that are combustible - that means they will explode if a spark from any source is present near the batteries. Install your battery bank in a well-ventilated area away from the rest of the system components that may produce sparks.

EXHAUST GASSES - Generators produce exhaust gasses that need to be piped out into a well-ventilated area.

GASOLINE - one huge plus in buying a diesel generator over a gasoline generator is that gasoline and gasoline fumes are highly explosive and flammable. Diesel, on the other hand, is very hard to ignite.

METHANE GASES & BIODIESEL INGREDIENTS- Methane gases, methanol, and ethanol are flammable and in certain situations, especially when mixed with oxygen, become highly explosive. It is also poisonous to breathe. Please use extreme caution when generating or using these gases and always use in a well-ventilated area.

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www.wikicommons.org for photos and illustrations used under the creative commons licensing except where indicated.

www.wikipedia.org for the same.

The National Renewable Energy Lab (NREL) and US Dept. of Energy (DOE) for the excellent work and documentation they make available to everyone. This is probably the greatest alternative energy resource on the planet.

I'd also like to thank the following contributors for allowing me to use their pictures and text.

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Bruce Padula at www.efuel100.com
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Introduction

I created this book because after reading many of the alternative energy books on the market, they all left a lot to be desired. This isn't to say there aren't many good ones, there are. But in many cases they sacrificed the low hanging fruit of energy conservation to go after the aspects, which in the end were totally meaningless if the proper foundation wasn't laid in the beginning.

For example, not a single one of them addressed the fact that air sealing your home is the single biggest cost saving (and least expensive) thing you can do. That one action alone can easily cut your energy costs IN HALF. These are easy, cheap, week-end projects, that wouldn't tax anyone's skills or pocketbook. More than adding a solar panels, or a wind turbine.

Not sexy enough, I guess.

I also didn't like the instructions. Many seemed to leave details out or important parts of the process incomplete. (If I'm guilty of it, let me know here and I'll fix it.)
dsieg@making-biodiesel-books.com

For example, while many of them concentrated on building solar panels, none of them paid the slightest attention to installing them. Maybe it's me, but putting a bunch of holes in your roof deserves a bit of extra thought and consideration.

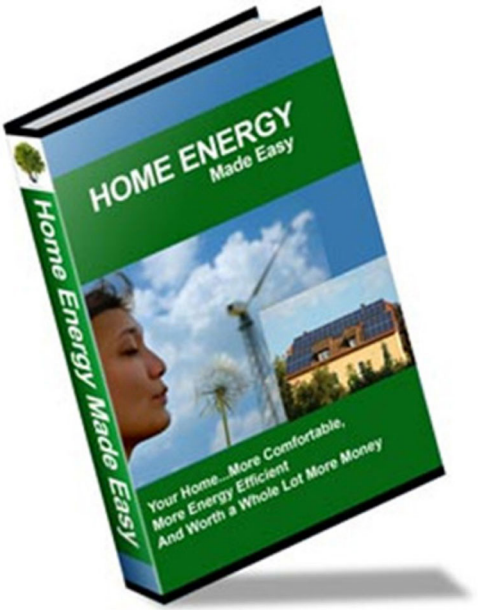
None, but one, seemed to consider the easy, inexpensive things you could do in an emergency to provide yourself with heat and/or cooling. If you've ever been through a power failure in the winter, when the inside temperature of your house is colder than the outside, you know what I mean.

One thing that really got me was none of them, except one, included info on generators. Easily the quickest and possibly easiest way of going "off the grid" In short, I thought most sucked, or were woefully incomplete.

This is starting to sound like I'm whining, so I'll stop.

David Sieg
May 2012
Des Moines, Iowa

Home Energy Made Easy



Lesson #1 …

How to Get Up and Started Quickly and Easily

Chapter 1: How to Get Up and Started Quickly and Easily

In today's lesson I'm going to explain the concept of a "free energy lifestyle", and give you a startup checklist and provide you with a weekly schedule of activities to complete.

Free Energy Made Easy lifestyle is all about taking control of your energy future. Without a doubt, the cost of energy in the coming years is going to reach unheard of proportions. This is simply a fact. If you didn't believe it yourself, you wouldn't be reading these words. This course isn't about "causes" or "failures," it's about SOLUTIONS.
You can expect this course to give you the information you need, without a bunch of fluff surrounding it. In short, this course will give you the "meat" to get the job done. If you need more in-depth information regarding any aspect, I'll have in-depth e-book available to help you.

But it will be up to you to act on the advice given. Of course, some solutions won't work for everyone but there will be enough solutions in the coming months to radically affect every aspect of your life, and change the way you look at energy forever.
Free energy? Come on…give me a break.
I'm perfectly serious. You CAN get free energy. I'm even going to show you a way, in this lesson, to GET THE GOVERNMENT TO PAY FOR YOUR ENERGY SYSTEMS! Like I said… Free energy.

There are lots of reasons why this subject has come to the forefront of everyone's mind recently…

- Many people no longer trust the energy future
- Everyone is seeing the cost of gas and utilities rise WAY beyond normal.
- Many people are aware of global warming and want to do something positive to help the environment.
- Forward thinking people (like yourself) are already putting into place back-up systems "just in case."

Why is this an unavoidable reality?

In a word, because of the "Internal Combustion Engine." Every aspect of life as we know is tied to this engine. From the electricity which powers your house, to the food which is brought to your supermarket, to the car which gets you to work. The "Peak Oil" is a symptom of the actual problem; the disease is the internal combustion engine.

If we were to replace every internal combustion engine with solar/wind/electric/whatever devices today, then the "Peak Oil" problem would disappear overnight. Or at the very least, it would have minimal impact.

First off, I'm not one who thinks that "Peak Oil" is the end of civilization as we know it. Sure, it will cause some severe changes in our lifestyle, and yes, afterwards life will be far different than it is today. But I don't see the complete and total breakdown of our social fabric as some do.

Some people will be better off than others. (Like you, if you follow what is outlined in this course) But that has always been, and always will be the case. This isn't a time for despair; it is time to act.

Here are the top ten reasons why you should start the Free Energy Made Easy Lifestyle now.

1.) You will save hundreds of dollars a month, and thousands of dollars a year. Your utilities are only going to go higher. They are already in the $200 a month range for most of you. In the last year or two you've seen them double. Expect them to double again. Can you really afford to pay $400-$500 a month for basic utilities? (In month 1 thru 6 you'll know everything you need to know to eliminate your utility bill)

2.) You'll be able to help the environment. Eliminating your dependence on the failed energy policies of the past will go a long way to cleaning up the mess we've made.

3.) You'll be able to cut the power companies completely out of your life if you want. Or better yet, have them PAY YOU. It's possible and it's called "net metering." This is a situation where you're producing more power than you're consuming and the utility companies will pay you for it.

4.) Cheap oil is a thing of the past. I think even the dimmest of bulbs can see at this point, we are looking at an altered future, no matter what. Fossil fuels will gradually be phased out of your life. This is going to happen whether you're prepared for it or not. It is simple economics. How prepared you are for that eventuality is going to be what will lessen the impact. (Month 9 will be devoted to methods and way to grow and create your own fuel)

5.) Basic transportation as we know it now is going to become unrealistic. In Europe and other places around the globe, expensive gasoline is a way of life, and has been for many years. In Europe you don't see gas-guzzling SUV's, and soon you won't see them here either. But that doesn't have to mean all forms of transportation have to stop. (In month 9 thru 12 we'll look at alternative methods of transportation)

6.) Heating your home in the winter/cooling your home in the summer is going to require new solutions. These are absolutely vital areas to consider in your life RIGHT NOW. If

you live in the Northeast, you know how deadly the cold is. The same if you live in the Southwest. Heat can also kill you. (Month 7 will be devoted to creating cheap, affordable, devices that can do both at a fraction of the cost.)

7.) Urban and suburban life as we know must undergo DRASTIC change. But it isn't change which hasn't ever been accomplished. In Europe this has already taken place and we have their years of experience to fall back on. (In the coming chapters I'm going to be exploring many of the option that have stood the test of time and have found to work)

8.) No matter what, our lifestyle is going to change in the coming years. This doesn't have to be a "bad thing." In the coming months when you find you are making a consistent effort, little by little, to solve these problems, and seeing steady savings because of them, you'll wonder what the fuss was all about.

9.) You can have a lot of fun building your own energy systems.
This doesn't have to be a drag. By doing this in small weekly chunks, you can get the whole family involved. By working together you'll build a closer, stronger, family unit.

10.) By adopting Free Energy Made Easy Concepts now, you'll be years ahead of your neighbors, and ready to deal with the coming problems.

How you do eat the energy elephant? One small bite at a time. That's what we'll be doing in the coming months, is biting into one small chuck of your personal energy picture at a time, solving it, and moving on to the next. The advantage to doing things this way is before you know it, major aspects of the problem are solved.

Energy Secret # 1

You're being lied to. If today you go and search for a solar or wind generating system you're going to say "What??!!! How can I EVER afford that??" The prices are incredibly high. Why? Because they want you to buy energy system based on your PRESENT level of energy consumption. We use an unrealistic level of energy. Unrealistic is unrealistic.
Which means it leads to unrealistic level of system needed.

What this course is going to do is show you how to REALISTICALLY lower your overall consumption of energy. Once you get it down to a manageable level, THEN we introduce money-saving ways of generating FREE energy.

This is entirely do-able, folks. But it takes looking at the energy we take for granted in an entirely different way. There is no reason you have to sacrifice comfort. You'll need to look at energy in a

different way, and change a few habits. That's all.

OK, energy secret # 2.

The state and federal US government (and many others as well) as well as many states offer grants, rebates, credits, and many other things to help you get on your way. Right now, these are not well known. But they will pay you to install these systems thereby taking the onus of producing energy from them.
I'm going to give you a list of "grants" and zero interest loans right here, from every state in the US. This is FREE money. These links are good at the time of writing. However, all websites change over time. If the link isn't good, go to the "root" of the URL. (The www. Part) and then search for your program.
http://www.dsireusa.org/index.cfm?EE=1&RE=1

Don't underestimate the power of these programs. Some are paying up to $50,000 for you to relieve the state and federal government of the responsibility.
Here are some examples of the Programs available:

Independence Light & Power - Renewable Energy Rebate
Last DSIRE Review: 02/26/2008
Incentive Type: Utility Rebate Program
Eligible Renewable/Other Technologies: Solar Water Heat, Solar Space Heat, Photovoltaics, Wind
Applicable Sectors: Commercial, Residential
Incentive Amount: Solar-thermal systems: $25-$30/sq. foot of collector area; PV systems: $2-$3/kWh; Wind-energy systems: 25% of project cost; Site assessments: 75% of fee; Repairs to existing systems: 50% of project cost

Maximum Incentive: Solar-thermal systems: $3,500; PV systems: $10,000; Wind-energy systems: $10,000; Site assessments: $375; Repairs to existing systems: $2,500
Equipment Requirements: Solar-thermal equipment must be certified by the SRCC and backed by an extended warranty

Installation Requirements: Solar-thermal equipment must be installed by an experienced solar contractor. All electrically-operated components must meet applicable safety requirements of the NEC. Website: http://www.wppisys.org/programs_services/default.asp?CategoryID=38&SubcategoryID=82

Summary:

Rebates for renewable-energy systems are available to residential and small commercial customers of all Wisconsin Public Power, Inc. (WPPI) utilities, including Independence Light & Power. Customers must reside in the service territory of the participating utility, and the system must be installed on the customer's property. Projects must be approved by the utility before installation.

The following technologies generally qualify for a cash rebate:

Residential Solar Water-Heating Systems
For new systems using electricity as the backup water-heating fuel, eligible customers will receive a rebate of $30 per square foot of collector area. For systems using propane or natural gas as the backup water-heating fuel, customers will receive $25 per square foot of collector area. The maximum award is the lesser of $3,500 or 35% of project cost.

Solar-Thermal Heating Systems
Rebates are available for solar-thermal heating systems for buildings that use electricity as their primary heat source. (Electric space heating must provide more than 50% of the building's space-heating needs.) Eligible customers will receive a rebate of $30 per square foot of collector area. The maximum award is the lesser of $3,500 or 35% of project cost.

Photovoltaic (PV) Systems
For rack-mounted or building-integrated PV systems rated 20 kilowatts (kW) or less, eligible customers will receive a rebate based on estimated annual energy production, calculated using the "PV Watts" program. A rebate of $3 per kilowatt-hour (kWh) is available for systems incorporated into new construction. A rebate of $2.50 per kWh is available for systems on existing buildings if the system is purchased from a NABCEP-certified dealer. The rebate is $2 per kWh for systems on existing buildings if the system is not purchased from a NABCEP-certified dealer. The maximum incentive is $10,000.

Small Wind-Energy Systems
For qualifying wind-energy systems rated 20 kW or less, eligible customers will receive a rebate equal to 25% of the system's cost, with a maximum incentive of $10,000. For planned grid-connected systems, the local electric utility must approve system interconnection prior to installation.

Site Assessments
Eligible customers will receive a rebate covering 75% of a site assessment if a renewable-energy system is feasible. The maximum rebate for feasibility studies is $375.

Repair of Existing Systems
For service and repairs to existing solar water-heating systems, PV systems and wind-energy systems, owners will receive a rebate equal to 50% of the cost of service and repairs, with a maximum incentive of $2,500. This includes routine maintenance, as well as major system repairs.

In addition, this course is going to give you hundreds of ways to save even more money by being able to do many of these projects yourself.

Win/win/win

What You Can Do Starting Today

Go to the website http://www.dsireusa.org/index.cfm?EE=1&RE=1

- And find out if there any state of federal grants available for your situation. If the government is willing to pay you to help solve their problem, why not take advantage of it? After all, these are your tax dollar. Spend them!
- Start by taking stock of where you expend the most energy in your lifestyle. What part of your life is causing you the most "pain." Is it heating and cooling? Is it transportation?
- How aware is your family about the coming changes? The time to start educating them is now. These changed are going to impact their lives. The sooner they get used to idea, the less effect it is going to have.
- What are the most "Energy Intensive" aspect of your life? There are 3 areas that are common to most people…heating and/or cooling, and transportation. All three are solvable.
- What are the things you think you could safely give up? If you have a houseful of daughters, then probably your hot water and bathroom electrical appliances are a major concern. Hot water and water conservation are also easily solved. And there are many ways to dry your hair without a blow-dryer and curling iron.
- Examine your utility bills. Most utility bills have a section that show when your most energy intensive months are spread out over the course of a year. Is it heating, or cooling? If you see any month's outside of these conventional areas, it's time to get curious.

This Week's Assignment

1) Get started immediately examining your lifestyle. It is crucial you know where your energy "expenditures" are. Think of this way, if you needed to set a financial budget for your family, the first thing you'd need to do is see where you're spending the most money. Then examine areas you can safely do without. An "energy budget" works the same way. First examine areas of high use/high cost. Don't worry, in the next lesson, I'll walk you through creating your own "energy budget"

2) Begin brainstorming ideas: You know your lifestyle better than anyone. When you start generating your own electricity, conservation counts! Every kilowatt you don't have to produce is less work on yourself and family. Start now looking at ways you can safely do without some things we take for granted. For example, institute a "one person, one light" rule, and enforce it! There's no reason why empty rooms need to be lit up. The same goes for TV's and radios when no one is listening and/or watching them. Make small changes now in lifestyle, and you won't need to make drastic, life-altering changes later.

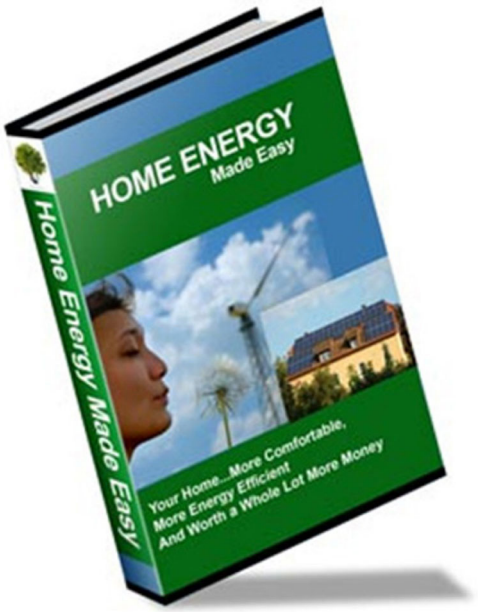
Coming Up Next ...

Lesson #2: "Getting Going Quickly: What you need to know first"

In the next lesson we'll be covering some key decisions in starting your "Free Energy Made Easy lifestyle such as energy conservation, energy decisions you need to make,

Included will be dozens of ideas to choose from as you form the perfect mix for maximizing conservation as well free energy production.

Home Energy Made Easy



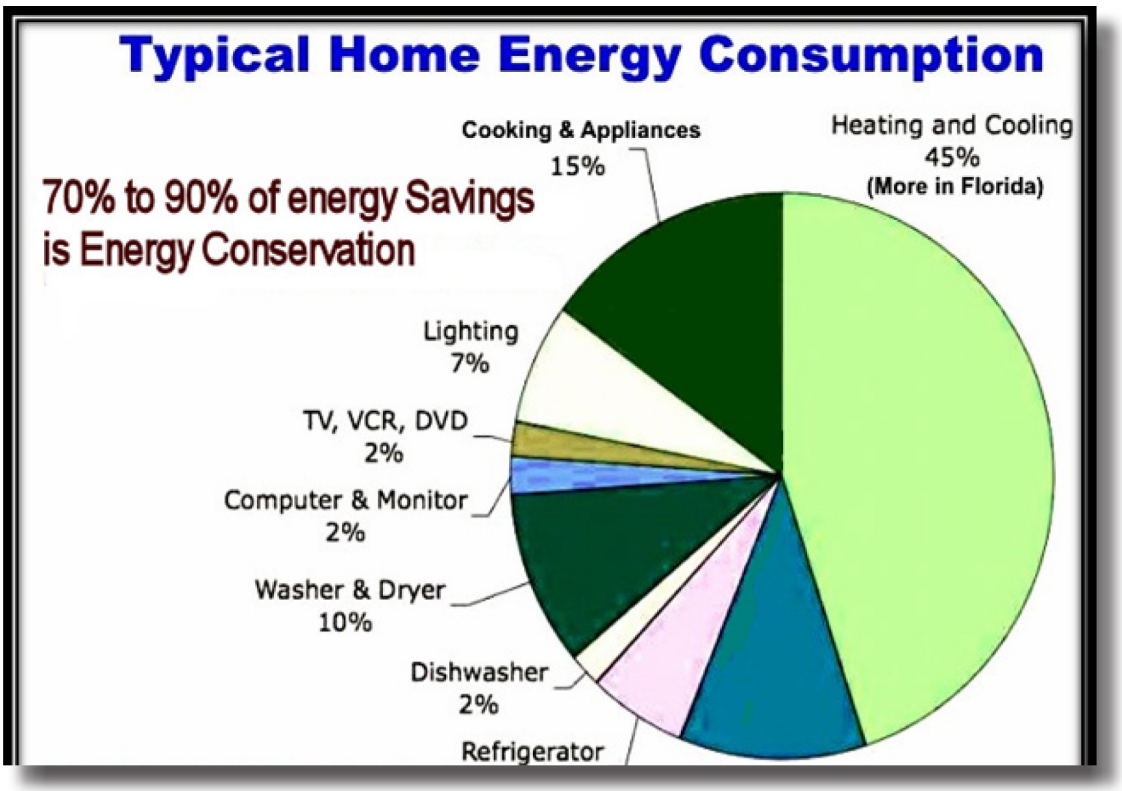
Lesson #2 …

Get Going Quickly: What You Need to Know first…

Chapter 2: Get Going Quickly: What You Need to Know First

The most important thing you need to take away from this lesson is…

70% to 90% of eliminating your utility and energy usage lies in ENERGY CONSERVATION.



Here also is a calculator you can use to immediately estimate what simple changes you can make and what it will save you.

Energy Savings Calculator

First of all, everyone's energy needs are different. There is no one size fits all here. So the first order of business is designing an energy system that is right for you, is to understand how much energy you're currently using…and where you are using it.

Why is this necessary?

- The size, and therefore, the cost of the energy system you'll need
- How your energy needs fluctuate throughout the day and over the year
- This will guide you in measures you can take NOW to reduce your energy consumption.

But first things first…

That's why the information in this course is so valuable. Because you can "scale" it up, or down, to suit your needs. It's flexible. Later on in the course, we'll see about setting up the perfect size energy system for your needs. Right now, we'll figure out what your needs are.

Some simple math you'll need to know.

Power = Amps x Volts

Or

Watts = Amps x Volts

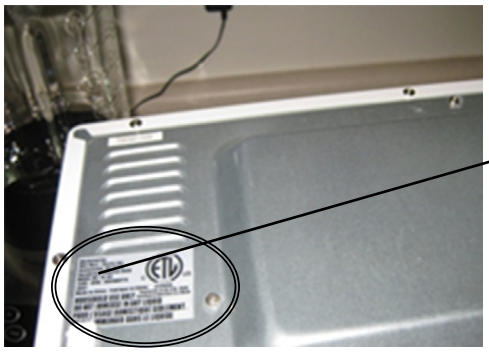
Why is this important? Because we need to find out, at any given moment, how much electricity your home consumes on a regular basis. From there we can "guesstimate" what size system you'll need to comfortable run your home.

We can also use this rough guide to eliminating wasteful energy usage.

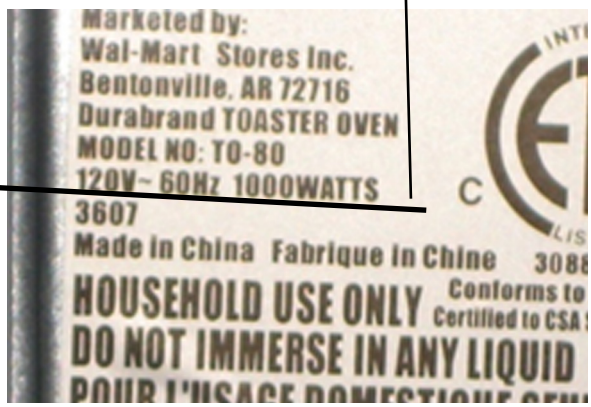
What You Can Do Starting Today

What we are going to do is called a "load analysis"

Most electrical appliances have the power rating on the back, or underside of the appliance in watts. This is good, because what we are going to do is add them all up.



On the back of every appliance you'll find the following labels, simply write down the "watts" in the form provided.



Conducting a load analysis involves recording the wattage and average daily use of all of the electrical devices which are plugged into your central power source, such as refrigerators, lights, televisions, and power tools. Some loads, like your refrigerator, use electricity all the time, while others, like power tools, use electricity intermittently. Loads that use electricity intermittently are often referred to as selectable loads. If you are willing to use your selectable loads only when you have extra power available, you may be able to install a smaller renewable energy system.

To determine your total electricity consumption:

- Multiply the wattage of each appliance by the number of hours it is used each day (be sure to take seasonal variations into account).
- Some appliances do not give the wattage, so you may have to calculate the wattage by multiplying the amperes times the volts.

Print and use this page to calculate your own usage.

Appliance	Watts	Need Rating	Usage Frequency	Home power friendly	Alternative available	Notes
Refrigerator	540	High	15 hours	No	Yes	

Here also for your convenience is some typical "loads" for many modern appliances.

Appliance	Watts	Appliance	Watts
Air conditioner, 1 ton	1500	(Sunfrost) Refrigerator (12 c.f)	70
Blow dryer	1000	100 Incandescent (100 watt)	100
Ceiling fan	10-50	Fluorescent	30
Clothes washer	1450	Computer (desktop)	80-150
Dryer (gas)	300	Computer (laptop)	20-50
Sewing machine	100	14" band saw	1100
Blender	350-500	Belt sander	1100
Dishwasher	1500	(Electric) Chain saw	1000
Microwave (.8 to 1.5 ft)	1400	Circular saw	1400
TV (25-inch color)	150	½" Drill	750
Range, large burner	2100	Electric water heater	3000
Refrigerator (22 c.f.)	540	Central air conditioner	5000
Electric clothes dryer	4800	Food processor	400
Vacuum cleaner	650		

My point in showing you this is two-fold. One, so that you can get an accurate gauge of your own energy usage.

Two, so that you can clearly see where energy savings can take place without a lot of headache and hassle. Remember, the goal of this course is that you produce your own energy. Any wasteful energy appliance you can do without is energy you don't have to produce. It moves you one step closer to your goal.

For example, a dishwasher is nice. No Question. But is it nice enough to have to produce an extra 1500 watts of electricity? This doesn't even count the electricity needed to heat the hot water, either.

Blow dryers…ditto. You'll have to produce an extra 1000 watts to use it. Or you could just let it dry the old fashioned way. That's 2500 watts of extra energy which could be safely reduced. (In my life anyway) Of course, your wife or daughters may feel differently about it.

The point is, in everyone's life there are certain small lifestyle changes you can make to reduce your energy consumption without a lot of heartache. Having an "energy budget" is the first step to understanding, then reducing your energy usage.

If your family doesn't want to give up any lifestyle changes, that's OK too. But it'll come at a price. If you're willing to pay the price in a larger energy system, that's great. The point is, at the end of this exercise, you'll know where your biggest energy usage is, and what according to your own criteria and lifestyle you can safely cut out of your life without any reduction in comfort.

This Week's Assignment

1) Start examining your energy usage and write down the energy loads of each appliance. Start thinking in terms of if you have to supply the energy yourself, would you want to keep it, or get rid of it. If no clear cut answers exist, then think in terms of what kind of alternatives are available. Many appliance offer energy saving reductions.

2) Start exploring options with your family. These are joint decisions which will affect everyone involved. The sooner they are behind you 100% the better.

Coming Up Next ...

Lesson #3: "Getting Going Quickly: What you need to know first"

In the next lesson we'll be going over different energy systems so you can start thinking about which one is right for you.